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TECHNICAL EVALUATION REPORT

REVIEW OF LICENSEES' RESOLUTION OF OUTSTANDING ISSUES FROM NRC EQUIPMENT ENVIRONMENTAL QUALIFICATION SAFETY EVALUATION REPORTS (F-11 and B-60)

BALTIMORE GAS AND ELECTRIC COMPANY CALVERT CLIFFS NUCLEAR POWER PLANT UNIT 1

NRC DOCKET NO. 50-317

NRC TAC NO. 42494

NRC CONTRACT NO. NRC-03-79-118

FRC PROJECT C5257 FRC ASSIGNMENT 13 FRC TASK 487

Prepared by

Franklin Research Center 20th and Race Streets Philadelphia, PA 19103

FRC Group Leader: S. Pandey

Prepared for

Nuclear Regulatory Commission Washington, D.C. 20555

Lead NRC Engineer: N. B. Le P. Shemanski

October 13, 1982

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Reviewed by:

S. Panday

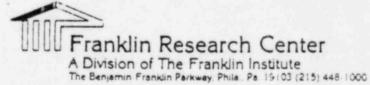
Group Leader

Approved by: -S.Pander

Project Manager

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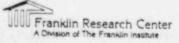


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FOREWORD

This Technical Evaluation Report was prepared by Franklin Research Center under a contract with the U.S. Nuclear Regulatory Commission (Office of Nuclear Reactor Regulation, Division of Operating Reactors) for technical assistance in support of NRC operating reactor licensing actions. The technical evaluation was conducted in accordance with criteria established by the NRC.

IDENTIFICATION OF PROPRIETARY INFORMATION

Some of the information in this technical evaluation report was obtained from manufacturers' proprietary test reports. All proprietary test reports are identified as such in Section 6, References, of this report. Checksheets in Section 4 containing proprietary information have been replaced with a checksheet page stating that the proprietary information has been removed.



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1. INTRODUCTION

1.1 PURPOSE OF THE EVALUATION

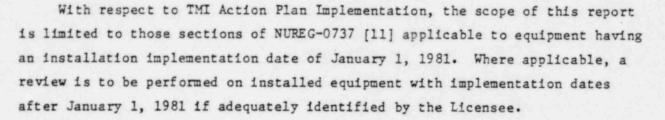
The purpose of this report is to:

- evaluate licensees' resolutions of outstanding issues related to safety-related electrical equipment environmental qualification (EEQ) discussed in the Nuclear Regulatory Commission (NRC) Safety Evaluation Reports (SERs) in accordance with NRC criteria. The objective is to identify all cases where a licensee's response has not resolved the significant qualification issues.
- o evaluate licensees' qualification documentation of safety-related electrical equipment located in harsh environments in accordance with criteria established by the NRC and to identify (1) equipment for which qualification documentation is adequate, i.e., substantiates that the equipment is capable of performing its specified design basis safety function when it is exposed to a harsh environment and (2) equipment for which qualification documentation is deficient, i.e., does not give reasonable assurance that the equipment is capable of performing its specified safety function.
- evaluate licensees' qualification documentation of safety-related electrical equipment located in harsh environments required for TMI Lessons Learned Implementation. The objective is to evaluate qualification documentation of equipment within the scope of IE Bulletin 79-01B, Supplement 3 (item 2) [7],* in accordance with criteria established by the NRC in a manner identical to the evaluation of all other safety-related electrical equipment.

1.2 SCOPE OF THE EVALUATION

The scope of this report is limited to the evaluation of environmental qualification of electrical equipment that must function to mitigate the consequences of a loss-of-coolant accident (LOCA) or high energy line break (HELB) and whose environment is adversely affected by that event.

*For References, see Section 6. Note that reference numbers are not presented in sequential order.



The NRC has determined that the evaluation of environmental qualification of equipment items (1) located in plant areas whose environment is not adversely affected by the design basis event (DBE) (e.g., equipment located in "mild" environments) or (2) required to achieve and maintain cold shutdown, is not to be included within the scope of this report. However, where the Licensee has identified these equipment items in the EEQ submittals to the NRC, these items have been listed in NRC evaluation Category III.b in this report (see Section 3 of this report for definition of NRC evaluation categories).

Qualification aspects not included within the scope of this evaluation are:

- o seismic and dynamic qualification
- o equipment protection against natural phenomena
- equipment operational service conditions (e.g., vibration, voltage, and frequency deviations)
- o equipment located where it is subjected to the outdoor environment
- o equipment protection against fire hazards
- o equipment protection against missiles
- o equipment located in plant areas whose environment is not adversely affected by the design basis event
- o equipment required to achieve and maintain cold shutdown.

1.3 GENERIC ISSUE BACKGROUND

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Safety-related electrical equipment must be capable of performing design safety functions under all normal, abnormal, and accident conditions. The purpose of equipment qualification is to provide tangible evidence that equipment will operate on demand and to verify design performance, thereby establishing assurance that the potential for common-mode failure is minimized.



Of particular concern is the assurance that equipment will remain operable during and following exposure to the harsh environmental conditions (i.e., temperature, pressure, humidity [steam], chemical sprays, radiation, and submergence) imposed as a result of a design basis accident. These harsh environments are generally defined by the limiting conditions resulting from the complete spectrum of postulated break sizes, break locations, and single failures consequent to a LOCA, main steam line break (MSLB) inside the reactor containment, or a HELB outside the reactor containment (such as a main steam or feedwater line break). In addition, depending on specific plant design features, other postulated HELB locations may be associated with:

- o the chemical and volume control system (CVCS) letdown line
- o the steam supply piping to

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- the auxiliary feedwater (AFW) pump turbine
- the reactor core isolation cooling (kCIC) pump turbine
- the high pressure core injection (HPCI) pump turbine
- the isolation condenser
- o steam generator blowdown.

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The NRC criteria for reviewing the safety of nuclear power generating stations include the requirement that the qualification of safety-related electrical equipment be substantiated by auditable documentation of the program that establishes the ability of the equipment to function as specified in the station design. This report is restricted to a technical evaluation of the equipment's ability to function in harsh environments resulting from DBEs.

Qualification criteria applied during the licensing of the older nuclear power plants have been modified over the years, and specific industry standards concerning qualification have been revised as the design of reactor systems has changed and as regulatory and operating experience has accumulated. Examples of such standards are IEEE Standards 279-71, 323-74, 383-74, 317-76, 334-80, 381-77, 382-80, 535-79, 627-80, 649-80, and 650-79. NRC NUREG documents 0413 and 0588 have been developed to address this topic. In particular, NUREG-0588 (published for comment in December 1979 and reissued as Revision 1 in July 1981) formally presented the NRC staff positions regarding selected areas of environmental qualification of safety-related electrical equipment in the resolution of General Technical Activity A-24,

"Qualification of Class IE Safety Related Equipment." The positions documented therein are applicable to plants that are or will be in the construction permit or operating license review process.

Although qualification standards and regulatory requirements have undergone considerable development, all of the currently operating nuclear power plants are required to comply with 10CFR50, Appendix A, General Design Criteria for Nuclear Power Plants, Section I, Criterion 4. This criterion states in part that "structures, systems and components important to safety shall be designed to accommodate the effects of and to be compatible with the environmental conditions associated with normal operation, maintenance, testing and postulated accidents, including loss-of-coolant accidents."

Qualification requirements are also embodied in (1) 10CFR50 Appendix A, General Design Criteria 1, 2, and 23 and (2) 10CFR50 Appendix B, Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants, Criteria III, "Design Control," and XI, "Test Control." These requirements are applicable to safety-related equipment located outside as well as inside containment.

The NRC staff has evaluated the licensees' equipment qualification programs by reviewing the qualification documentation of selected safetyrelated equipment as part of the operating license review for each plant. The NRC staff has also used a variety of methods to assure that these general requirements are met for electrical safety-related equipment. In the oldest plants, qualification was based on the fact that electrical components were of high industrial quality. After 1971, qualification was judged on the basis of IEEE Std 323-71; however, no regulatory guide was issued adopting this standard. For plants whose SERs were issued after July 1, 1974, the Commission issued Regulatory Guide 1.89, which in most respects adopted the most recent standard, IEEE Std 323-74.

In November 1977, the Union of Concerned Scientists petitioned the NRC Commissioners to upgrade current standards for the environmental qualification of safety-related electrical equipment in operating plants. Subsequently, the NRC staff instituted the Systematic Evaluation Program (SEP) to determine the degree to which the older operating nuclear power plants deviated from current

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licensing criteria. The subject of electrical equipment environmental qualification (SEP Topic III-12) was relected for accelerated evaluation as part of this program. Seismic qualification of equipment was to be addressed as a separate SEP topic. In December 1977, the NRC issued a generic letter to all SEP plant licensees requesting that they initiate reviews to determine the adequacy of existing equipment qualification documentation.

Preliminary NRC review of licensee responses led to the preparation of NUREG-0458, an interim NRC assessment of the environmental qualification of electrical equipment. This document concluded that "no significant safety deficiencies requiring immediate remedial actions were identified." However, it was recommended that additional effort should be devoted to examining the installation and environmental qualification documentation of specific electrical equipment in all operating reactors.

On May 31, 1978, the NRC Office of Inspection and Enforcement issued IE Circular 78-08, "Environmental Qualification of Safety-Related Electrical Equipment at Nuclear Power Plants," which required all licensees of operating plants (except those included in the SEP) to examine their installed safety-related electrical equipment and ensure appropriate qualification documentation for equipment function under postulated accident conditions. Subsequently, on February 8, 1979, the NRC Office of Inspection and Enforcement issued IE Bulletin 79-01, which was intended to raise the threshold of IE Circular 78-08 to the level of Bulletin, i.e., action requiring a licensee response. This Bulletin required a complete re-review of the environmental qualification of safety-related electrical equipment as described in IE Circular 78-08.

The review of the licensees' responses indicated certain deficiencies within the scope of equipment addressed, definition of harsh environments, and adequacy of support documentation. It became apparent that generic criteria were needed for evaluating the electrical equipment environmental qualification for both SEP and non-SEP operating plants. Therefore, during the second half of 1979, the Division of Operating Reactors (DOR) of the NRC issued internally a document entitled "Guidelines for Evaluating Environmental Qualification of Class IE Electrical Equipment in Operating Reactors" [3]. (The document is hereafter

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referred to as the "DOR Guidelines.") The document was prepared as a screening standard for reviewing all operating plants, including SEP plants. It was originally intended that the licensees evaluate their qualification documentation in accordance with the DOR Guidelines. However, initial NRC review of this documentation, which was compiled to support licensee submittals, revealed the need for obtairing independent evaluations and for accelerating the qualification review program.

In October 1979, the NRC awarded Franklin Research Center a contract to provide assistance in the "Review and Evaluation of Licensing Actions for Operating Reactors," which included an assignment for review of equipment environmental qualification documentation under SEP Topic III-12. The assignment was to review equipment environmental qualification documentation and to present the results in the form of a Technical Evaluation Report for the 11 oldest plants (included in the SEP review). The plants included within the assignment were the Palisades, Oyster Creek, Ginna, Haddam Neck, Yankee Rowe, LaCrosse, and Big Rock Point plants and Zion Station Units 1 and 2, Indian Point Units 2 and 3, Millstone Unit 1, Dresden Unit 2, and San Onofre Unit 1. (This assignment was completed in April 1981.)

On January 14, 1980, the NRC Office of Inspection and Enforcement issued the DOR Guidelines and IE Bulletin 79-01B, which expanded the scope of IE Bulletin 79-01 and requested additional information on environmental qualification of safety-related electrical equipment at operating facilities, excluding the 11 facilities undergoing the SEP review. This Bulletin cited the DOR Guidelines as the criteria to be used in evaluating the adequacy of the safetyrelated electrical equipment qualification. The scope of the review was expanded to include HELds (inside and outside containment) in addition to equipment aging and submergence. The NRC advised the licensees that the criteria contained in the DOR Guidelines would be used in its review of licensee submittals; NUREG-0588 would be used as a guide in cases where the DOR Guidelines do not provide sufficient detail.

In early February 1980, the NRC decided that Indian Point Units 2 and 3 and Zion Station Units 1 and 2 should be included within SEP Topic III-12 for the purpose of equipment environmental qualification review.

On February 21, 1980, the NRC and representatives of the SEP Plant Owners Group held an open meeting at NRC headquarters to discuss an accelerated review program in accordance with the DOR Guidelines. Representatives of the Indian Point Units and Zion Station also attended this meeting. The NRC formally issued to all licensees represented at the meeting the DOR Guidelines document which included a second document, "Guidelines for Identification of That Safety Equipment of SEP Operating Reactors for Which Environmental Qualification Is To Be Addressed" [3], together with the request that the licensees review their plant systems and provide additional equipment environmental qualification information to the NRC on an accelerated schedule.

For non-SEP plants, the NRC Office of Inspection and Enforcement formed a task force including a principal reviewer in each region and a task leader from headquarters. The regional members were assigned responsibility for the technical review of the licensees' responses to 12 Bull tin 79-018, and the task leader was assigned responsibility for the overall coordination of the review effort with NRC staff to assure overall consistency. The tegional reviewers held meetings with the licensees in their respective regions, which resulted in staff positions being issued in a supplement to IE Bull crin 79-012 dated February 29, 1980.

In April 1980, the NRC organizational structure was modified and the Equipment Qualification Branch was formed within the new Division of Engineering. Responsibility for reviewing the status of equipment qualification for all plants was assigned to this branch.

On May 23, 1980, the NRC issued Memorandum and Order CLI-80-21 [8], specifying that licensees and applicants aust meet the requirements set forth in the DOR Guidelines and NUREG-0588 regarding environmental qualification of safety-related electrical equipment in order to satisfy 10CFR50, Appendix A, General Design Criteria, Section I, Criterion 4. This Order also established that the SERs on this subject, to be prepared by the NRC staff, must be issued on February 1, 1981 and that all subsequent actions to be taken by license is to achieve full compliance with the DOR Guidelines or NUREG-0588 must be completed no later than June 30, 1982. The Memorandum and Order Astablished the DOR Guidelines and NUREG-0588 as acceptable interpretations of the General

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Design Criteria for an interim period. Rulemaking was proposed for the purpose of establishing a permanent interpretation of the General Design Criteria.

The staff held regional meetings with the licensees and interested parties during the week of July 13, 1980. The staff issued a second supplement to IE Bulletin 79-01B, a response to significant questions raised during the public meetings, and two Orders. The Order dated May 30, 1980 required the licensees to comply with the previously issued Commission Memorandum and Order of May 27, 1980 (CLI-80-21). The above orders required the licensees to complete the tasks identified in IE Bulletin 79-01B no 1a^{--r} than November 1, 1980 to allow the staff to comply with the February 1, 1981 date indexed by the Commission Order. The responses to the questions were issued on fel 19, 1980; and the second and third supplements to IE Bulletin 79- ...ghlighting the staff positions affecting the licensees' responses, were issued on September 29 and October 24, 1980, respectively.

In October 1980, EG&G Idaho, Inc., awarded Franklin Research Center a contract to provide assistance in the equipment environmental qualification review for 13 of the plants whose licensees responded to IE Bulletin 79-01B. The assignment was to evaluate the licensees' equipment environmental qualification submittals and to present the results in the form of a Technical Evaluation Report for each plant. The objective of this Technical Evaluation Report was to review the licensees' submittals to determine if safety-related electrical equipment was reviewed for environmental qualification in accordance with the DOR Guidelines and NUREG-0588 as required by IE Bulletin 79-01B. The NRC was to perform an audit of the qualification documentation references as part of its Safety Evaluation Program. If discrepancies were found, the avoit was to be extended. The plants included within this assigment were Nine Mile Point Unit 1, Millstone Unit 2, Salem Unit 1, Browns Ferky Units 1, 2, and 3, Brunswick Units 1 and 2, Hatch Units 1 and 2, Dresden Unit 3, and Quad Cities Units 1 and 2. (This assignment was completed in June 1981.)

In mid-1981, the NRC issued SERs on environmental qualification of safety-related electrical equipment to licensees of all operating plants.

Where additional qualification information was required, the licensees were directed to respond to the NRC within 90 days of receipt of the SER.

In May 1981, under the lidensing action assistance contract, NRC authorized Franklin Research Center to proceed with the review and evaluation of the environmental qualification of safety-related electrical equipment located in harsh environments, required for TMZ Lessons Learned Implementation on 71 operating plants.

In July 1981, the NRC conducted extensive meetings with the nuclear industry to address concerns and questions regarding qualification of safetyrelated equipment. In addition, the NRC provided licensees with detailed information with respect to the format and expected content of the licensees' 90-day responses to the NRC SERs. Draft outlines of the following proposed programs were also presented to the industry: environmental qualification of equipment located in "mild" environments, seismic and dynamic qualification, and environmental qualification of mechanical equipment.

On September 23, 1981, the NRC Commissioners considered a petition (SECY-81-486) to extend the deadline for actions to be taken by licensees to achieve environmental qualification of all safety-related equipment. On September 30, 1981, the NRC Commissioners extended this deadline to the second refueling outage after March 31, 1982.

In October 1981, the NRC authorized Franklin Research Center to include within the scope of the existing EEQ assignment (TMI Lessons Learned Implementation Equipment) the evaluation of licensees' resolutions of outstanding issues related to equipment environmental qualification discussed in the NRC SERs in accordance with NRC criteria. The assignment was to review the qualification documentation and to present the results in the form of a Technical Evaluation Report for 71 operating plants. (This report was developed within the scope of this assignment.)

On Jenuary 7, 1982, the NRC Commissioners approved the issuance of the proposed rule, "Environmental Qualification of Electric Equipment for Nuclear Power Plants," for public comment. The proposed rule was published in the Federal Register (Volume 47, No. 13) dated January 20, 1982.

In February 1982, Proposed Revision 1 to Regulatory Guide 1.89, "Environmental Qualification of Electric Equipment for Nuclear Power Plants," was issued for public comment. This regulatory guide was issued to (1) reflect current NRC positions on equipment qualification and (2) provide guidelines for meeting the NRC Commissioners proposed rule on equipment qualification.

The final rule, "Environmental Qualification of Electric Equipment for Nuclear Power Plants," was subsequently issued on April 16, 1982 by the NRC (to be published in the Federal Register) to clarify a i strengthen the criteria for environmental qualification of electrical equipment. The final rule is to be incorporated into 10CFR50 as Section 50.49, "Environmental Qualification of Electric Equipment for Nuclear Power Plants." The significant features of the rule are:

- Requalification of electrical equipment in accordance with the rule will not be required for equipment qualified or being qualified in accordance with the DOR Guidelines and IE Bulletin 79-01B or NUREC-0588, provided the qualification program commenced within 90 days after the effective d the rule.
- o The requirement to qualify equipment needed to complete one path of achieving and maintaining a cold shutdown condition has been deleted.
- A new section has been added, covering the qualification of equipment located in mild environments.
- The Commission deadline for actions to be taken by licensees to achieve environmental qualification of all safety-related equipment is extended to the second refueling outage after March 31, 1982.

On April 20, 1982, the NRC staff issued Generic Letter No. 82-09 [9] to all licensees, presenting the NRC's position and clarification of certain aspects of the environmental qualification requirements.

1.4 SPECIFIC ISSUE BACKGROUND

On May 31, 1978, the NRC Office of Inspection and Enforcement issued IE Circular 78-08, "Environmental Qualification of Safety-Related Electrical Equipment at Nuclear Power Plants," which required all licensees of operating plants to examine their installed safety-related electrical equipment and

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ensure appropriate qualification documentation for equipment function under postulated accident conditions. Subsequently, on February 8, 1979, the NRC Office of Inspection and Enforcement issued IE Bulletin 79-01, which was intended to raise the threshold of IE Circular 78-08 to the level of Bulletin, i.e., action requiring a licensee response. This Bulletin required a complete re-review of the environmental qualification of safety-related electrical equipment as described in IE Circular 78-08.

On January 14, 1980, the NRC Office of Inspection and Enforcement issued the DOR Guidelines and IE Bulletin 79-01B, which expanded the scope of IE Bulletin 79-01 and requested additional information on environmental qualification of safety-related electrical equipment at operating facilities. This Bulletin cited the DOR Guidelines as the criteria to be used in evaluating the adequacy of the safety-related electrical equipment qualification.

The NRC staff held regional meetings with the licensees and interested parties during the week of July 13, 1980. The staff issued a second supplement to IE Bulletin 79-01B, a response to significant questions raised during the public meetings, and two Orders. The Order dated May 30, 1980 required the licensees to comply with the previously issued Commission Memorandum and Order of May 27, 1980 (CLI-80-21). The above orders required the licensees to complete the tasks identified in IE Bulletin 79-01B no later than November 1, 1980 to allow the staff to comply with the February 1, 1981 date imposed by the Commission Order. The responses to the questions were issued on February 29, 1980; and the second and third supplements to IE Bulletin 79-01B, highlighting the staff positions affecting the licensees' responses, were issued on September 29 and October 24, 1980, respectively.

The NRC Office of Inspection and Enforcement performed (1) a preliminary evaluation of the Licensee's response, documented in a technical evaluation report (TER) and (2) an onsite verification inspection (October 27-29, 1980) of selected safety-related electical equipment. The condensate and feedwater systems were insepcted at Unit 1, the compressed air system was inspected at Unit 2. The inspection at both units verified proper installation of equipment, overall interface integrity, and manufacturer's nameplate data. The manufacturer's name and model number from the nameplate data were compared

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to information given in the Component Evaluation Work Sheets (CES) of the Licensee's report. The site inspection is documented for Units 1 and 2 in reports IE 50-317/80-20 and 318/80-18, respectively. No deficiencies were noted.

On May 27, 1980 [1], Baltimore Gas and Electric Company provided the NRC with an equipment environmental qualification submittal in response to IE Bulletin 79-01B for the Calvert Cliffs Nuclear Power Plant Unit 1.

On October 31, 1980 [2], Baltimore Gas and Electric submitted to the NRC further equipment environmental qualification information in response to IE Bulletin 79-01B.

On February 3, 1981 [12], Baltimore Gas and Electric submitted to the NRC additional information in response to IE Bulletin 79-01B.

The NRC issued a Safety Evaluation Report (SER) to Baltimore Gas and Electric on May 28, 1981 [13].

Requests for information [39, 40, 41, 42, 43, 44] were transmitted to the NRC by FRC to obtain qualification documentation referenced by the Licensee in its submittals, TMI Action Plan information, and correlations to NUREG-0737 [11].

By letters dated September 1, 1981 [14] and April 12, 1982 [35], Baltimore Gas and Electric transmitted to the NRC responses to the SER.

In References 16, 17, 18, 36, 37, and 38, Baltimore Gas and Electric responded to the FRC requests for additional information.

2. NRC CRITERIA FOR ENVIRONMENTAL QUALIFICATION

2.1 CRITERIA PROVIDED BY THE NRC

The screening guidelines used to evaluate the electrical equipment environmental qualification program were:

- DOR Guidelines, "Guidelines for Evaluating Environmental Qualification of Class LE Electrical Equipment in Operating Reactors," November 1979
 [3]
- NUREG-0588, Revision 1, "Interim Staff Position on Environmental Qualification of Safety-Related Electrical Equipment," July 1981 [10].

Other appropriate references used in the review of the licensees' electrical equipment environmental qualification submittals are:

- IE Bulletin 79-01B, "Environmental Qualification of Class 1E
 Equipment," January 14, 1980; Supplement No. 1, February 29, 1980;
 Supplement No. 2, September 29, 1980; and Supplement No. 3, October 24, 1980 [4, 5, 6, 7]
- NUREG-0737, "Clarification of TMI Action Plan Requirements," November 1980 [11]. This document is applicable for the selection of equipment for the evaluation of the environmental qualification of safety-related electrical equipment located in harsh environments required for TMI Lessons Learned Implementation. The scope of the review is limited to equipment associated with specific sections of NUREG-0737 which have an installation implementation date of January 1, 1981. Where applicable, a review is to be performed on installed equipment with implementation dates after January 1, 1981 if adequately identified by the licensee.

2.2 STAFF POSITIONS AND SUPPLEMENTAL CRITERIA

The NRC identified the following staff positions and supplemental criteria to be used in conjunction with the referenced screening guidelines.

2.2.1 Requirements and Applicable Criteria

Items 3 and 17 of Supplement 2 to IE Bulletin 79-01B [6] describe the application of the DOR Guidelines and NUREG-0588 to operating reactors (ORs),

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near term operating license applicants (NTOLs), and construction permit applicants (CPs). The qualification requirements and applicable criteria are stated as follows:

[Question 3]

"Define the requirements and applicable criteria for ORs, NTOLs, and OLs. Specifically address the NTOLs whose CP SER is prior to July 1974 and after July 1974. Can a CP whose SER is prior to 1974 use the DOR guidelines?"

[NRC Answer to Question 3]

"Table 1 describes the application of each document. All operating reactors as of May 23, 1980, will be evaluated against the DOR guidelines. In cases where the DOR guidelines do not provide sufficient detail, but NUREG-0588 Category II does, NUREG-0588 will be used.

TABLE 1

REQUIREMENTS

ORS	OLS		CPs
	CP SER	CP SER	en an the state of
DOR GUIDELINES	Before 7/1/74	After 7/1/74	
USE NUREG-0588	VUREG-0588	NUREG-0588	NUREG-0588
AS NECESSARY	(CA 11)	(CAT. I)	(CAT. I) or NEW RULE WHEN

REPLACEMENT COMPONENTS USE NUREG-0588 (CAT. I)

All plants licensed after May 23, 1980, shall conform to NUREG-0588. In accordance with Regulatory Guide 1.89, all such operating licenses for facilities whose construction permit SER is dated July 1, 1974 or later, are to be reviewed against IEEE Std. 323-1974. Thus, for these licensees, the operating license applicant is to qualify equipment to the Category I column in NUREG-0588. For operating licenses issued after May 23, 1980, whose construction permit SER is dated before July 1, 1974, the operating license applicant is to qualify equipment to at least Category II column of NUREG-0588; unless the licensee made commitment in the construction permit record to use the 1974 standard, or unless the operating licensee application record indicates that the 1974 standard is to be used, in such cases Column I of NUREG-0588 is to be used.

While there are differences between the Category II column of NUREG-0588 and the DOR guidelines, the differences are in details and in the

optional part of the documents. The minimum requirements set forth by these documents are general and compatible. Thus, the minimum standards set by either of the two documents are equally applicable to ORs and NTOLs."

[Question 17]

"Define the requirements for 'replacement parts.' Are they the same for 'spare' parts? Clearly discuss the alternatives for existing inventories of parts/components. If equipment is ordered to meet IEEE Std. 323-1974 standard but lead time exceeds June 1982, can we use IEEE Std. 323-1971 qualified components in the interim?"

[NRC Answer to Question 17]

"The requirements for 'replacement' and 'spare' parts are the same for the purposes of complying with the Commission order and memorandum. After May 1980, all parts used to replace presently installed parts shall be qualified to Category I of NUREG-0588 'unless there are sound reasons to the contrary.' Nonavailability and/or the fact that the part to be used as a replacement is a spare part purchased prior to May 23, 1980, and is in stock are among the factors to be considered in weighing whether there are 'sound reasons to the contrary.' All replacement parts shall as a minimum conform to the requirements described in the answer to question 3. Justification for deviation from Category I of NUREG-0588 shall be documented by the licensee and records shall be available for audit, upon request by the NRC."

2.2.2 Application of Requirements and Criteria to TMI Lessons Learned Implementation Equipment

The NRC requested an evaluation of the environmental qualification of safety-related electrical equipment located in harsh environments required for TML Lessons Learned Implementation in accordance with criteria established by the NRC in a manner identical to the evaluation of all other safety-related electrical equipment. Additionally, Item 21 of Supplement 2 to IE Bulletin 79-01B [6] states:

"TMI Lessons Learned instrumentation will be considered in the February 1, 1981 SER. This equipment is subject to the same requirements as other safety-related electrical equipment. The guidance and requirements of NUREG-0588 referenced daughter standards, and Reg Guides will be used by the staff in assessing the adequacy of the qualification information."

Item 2 of Supplement 3 to IE Bulletin 79-01B [7] states:

"IEB 79-01B required a 90 day response which was due in mid-April 1980. Supplement 1 (Feb. 1980) informed licensees that equipment which was

'planned' to be installed as a result of lessons learned need not be addressed in that response. Some of this equipment has since been installed. Supplement #2 (Q.5, Q.21) identified that the staff position was that equipment which is installed should be treated in a manner similar to all other safety-related electrical equipment and be addressed in the November 1, 1980 submittal. This position represents no change in staff position regarding the scope of the review. However, since the staff position on this issue was unclear the following will apply:

- Qualification information for installed TMI Action Plan equipment must be submitted by February 1, 1981.
- b. Qualification information for future TMI Action Plan equipment (ref. NUREG-0737, when issued), which requires NRC pre-implementation review, must be submitted with the pre-implementation review data.
- c. Qualification information for TMI Action Plan equipment currently under NRC review should be submitted as soon as possible.
- d. Qualification information for TMI Action Plan equipment not yet installed which does not require pre-implementation review should be submitted to NRC for review by the implementation date."

2.2.3 Equipment Not in the Scope of the Qualification Review

Supplement 2 of IE Bulletin 79-01B [6] permits deferment of the review of environmental qualification for all safety-related equipment items located in plant areas where the equipment is not exposed to the direct effects of a high energy line break (HELB) or to nuclear radiation emanating from circulation of fluids containing radioactive substances. Supplement 3 of IE Bulletin 79-01B [7] permits deferment of the review of environmental qualification for all equipment required to achieve and maintain the plant in a cold shutdown condition. Supplements 2 and 3 of 79-01B originally permitted deferment until after February 1, 1981 of the qualification review of equipment located in a mild environment or required to achieve and maintain the plant in a cold shutdown condition. Since the issuance of Supplements 2 and 3, the NRC has determined that the review of environmental qualification for this equipment is not within the scope of the present review program.

2.2.4 Clarification of Qualification Requirements

2.2.4.1 Service Conditions Inside Containment for a Loss-of-Coolant Accident (DOR Guidelines Section 4.1)

For pressurized water reactors (PWRs), the DOR Guidelines state that the containment temperature and pressure conditions as a function of time should be based on the most recent NRC-approved service conditions specified in the Final Safety Analysis Report (FSAR) or other licensee documentation. In the specific case of pressure-suppression type containments, the following minimum high temperature conditions may be used: (1) boiling water reactor (BWR) drywells - 340°F for 6 hours and (2) PWR ice condenser lower compartments - 340°F for 3 hours. As stated in Supplement 2 to IE Bulletin 79-01B [6], "these values are a screening device, per the Guidelines, and can be used in lieu of a plant-specific profile, provided that expected pressure and humidity conditions as a function of time are accounted for."

Service conditions should bound those expected for coolant and steam line breaks inside containment with due consideration given to analytical uncertainties. The steam line break condition should include superheated conditions, the peak temperature, and subsequent temperature/pressure profiles as functions of time. If containment spray is to be used, the impact of the spray on required equipment should be assessed.

The adequacy of a plant-specific profile depends on the assumptions and design considerations at the time the profiles were developed. The DOR Guidelines and NUREG-0588 provide guidance and considerations required to determine if the calculated plant-specific temperature/pressure profiles encompass the loss-of-coolant accident (LOCA) and HELB accidents inside containment.

2.2.4.2 Submergence

(DOK Guidelines Section 4.1, Subitem 3; and Section 4.3.2, Subitem 3) Equipment submergence (inside or outside containment) should be addressed where the possibility exists that submergence of equipment may result from HELBS or other postulated occurrences. Supplement 2 to IE Bulletin 79-01B [6] provides the following additional criterion: If the equipment satisfies the

guidance and other requirements of the DOR Guidelines or NUREG-0588 for the LOCA and HELB accidents, and the licensee demonstrates that its failure will not adversely affect any safety-related function or mislead the operator after submergence, the equipment can be considered exempt from the submergence portion of the qualification requirements.

2.2.4.3 Simulated Service Conditions and Test Duration (DOR Guidelines Section 5.2.1)

The Guidelines require that the test chamber environment envelop the required service conditions for a time equal to the period from the initiation of the accident until the service conditions return to normal. Supplement 2 to IE Bulletin 79-01B [6] provides the following additional criterion:

"Equipment designed to perform its safety-related function within a short time into an event must be qualified for a period of at least 1 hour in excess of the time assumed in the accident analysis. The staff has indicated that time is the most significant factor in terms of the margins required to provide an acceptable confidence level that a safety-related function will be completed. The 1-hour qualification requirement is based on the acceptance of a type test for a single unit and the spectrum of accidents (small and large breaks) bounded by the single test."

2.2.4.4 Test Sequence

(DOR Guidelines Section 5.2.3)

Supplement 2 to IE Bulletin 79-01B [6] provides the following additional criteria:

"Sequential testing requirements are specified in NUREG-0588 and the DOR Guidelines. Licensees must follow the test requirements of the applicable document.

- If the test has been completed without aging in sequence, justification for such a deviation must be submitted.
- If testing of a given component has been scheduled but not initiated, the test sequence/program should be modified to include aging.
- 3. Test programs in progress should be evaluated regarding the ability to comply by incorporating aging in the proper sequence. These programs would then fall in the first or second category."

2.2.4.5 Radiation

(DOR Guidelines Sections 4.1.2, 4.2.2, and 4.3.2. Subitem 2)

Supplement 2 to IE Bulletin 79-01B [6] provides the following additional criteria:

"Both the DOR Guidelines and NUREG-0588 are similar in that they provide the methods for determining the radiation source term when considering LOCA events inside containment (100% noble gases/50% iodine/1% particulates). These methods consider the radiation source term resulting from an event which completely depressurizes the primary system and releases the source term inventory to the containment.

NUREG-0578 provides the radiation source term to be used for determining the qualification doses for equipment in close proximity to recirculating fluid systems inside and outside of containment as a result of LOCA. This method considers a LOCA event in which the primary system may not depressurize and the source term inventory remains in the coolant.

NUREG-0588 also provides the radiation source term to be used for qualifying equipment following non-LOCA events both inside and outside containment (10% noble gases/10% iodine/0% particulates).

When developing radiation source terms for equipment qualification, the licensee must ensure consideration is given to those events which provide the most bounding conditions. The following table summarizes these considerations:

	LOCA	Non-LOCA HELB
Outside Containment	NUREG-0578 (100/50/1 in RCS) [*]	NUREG-0588 (10/10/0 in RCS)
Inside Containment	Larger of	
	NUREG-0588 (100/50/1 in containment)	NUREG-0588 (10/10/0 in RCS)
	or	

*The numbers in parentheses represent % noble gases/% iodine/% particulates. RCS means reactor coolant system.

NUREG-0578 (100/50/1 in RCS)

Gamma equivalents may be used when continuation of the contibutions of beta exposure has been included in accordance with the guidance given in the DOR Guidelines and NUREG-0588. Cobalt 60 is one the compable gamma radiation source for environmental qualification of satety-related equipment. Cosium 137 may also be used."

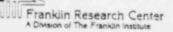
2.2.5 Additional Clarification of Qualification Requirements

The NRC has worked with a number of licensees, at their requests, to provide further clarification on environmental qualification requirements. On January 20, 1982, the NRC issued Generic Letter No. 82-09 [9] presenting staff positions on certain aspects of the qualification requirements. Generic Letter No. 82-09 states:

"1. Operator Display Instrumentation

- Q. Given the interrelated activities associated with display instrumentation (e.g., NUREG-0700, NUREG-0799, proposed Regulatory Guide 1.97 and Equipment Qualification efforts), what display instrumentation referenced in emergency operating procedures must be identified in licensee submittal to the NRC?
- A. All display instrumentation referenced in the emergency procedures need not be identified. The NRC requires that licensees need only identify and have available qualification documentation on those operator display instruments which are safety-related (see Question 2). If licensees have previously supplied a listing of all display instrumentation referenced in emergency procedures, licensees may identify (such as by the use of an *) which of those instruments are safety-related. The staff will defer review of the basis for this safety-related classification until other NRC activities¹ have been implemented. When these other activities are implemented, additional instruments presently not requiring qualification may require upgrading to a safety-related status and/or may require qualification. Licensees will be required at that time to qualify this instrumentation in accordance with the following criteria:
 - For new or upgraded instrumentation with a required operation date prior to the equipment qualification deadline, qualification must be accomplished by the equipment qualification deadline.

¹Such activities include preparation of new emergency procedures (NUREG-0799), control room design reviews (NUREG-0700), and upgrading of accident monitoring instrumentation (Reg. Guide 1.97 and NUREG-0737).



 For new or upgraded instrumentation with a required operation date after the equipment qualification deadline, qualification must be accomplished prior to equipment operation and plant acceptance.

2. Safety-Related Equipment

- Q. For Equipment Qualification purposes, what constitutes all safety-related electrical equipment?
- A. The Commission, in CLI-80-21, required the environmental qualification of only safety-related electrical equipment. Identification of the safety-related equipment installed at specific plants can be obtained from FSARs, Technical Specifications and other docketed correspondence setting forth NRC requirements or licensee commitments. Identification of safety-related equipment installed in harsh environments at specific plants must be supplied by the licensee. The necessity for upgrading nonsafety-related system to safety-related status will be the subject of other NRC reviews.

3. Replacement Parts

- Q. Please clarify the NRC requirements on replacement parts.
- A. In CLI-80-21, the Commission stated that unless there were sound reasons to the contrary, replacement equipment should be qualified to the standards set forth in Category I of NUREG-0588. The Commission's position was designed to promote the policy of upgrading the environmental qualification and reliability of installed safety-related electrical equipment. To meet this overall goal, licensees must institute internal policy practices consistent with the Commission's statement.

Situations may arise in which upgrading to NUREG-0588, Category I of replacement equipment qualified to NUREG-0588, Category II or the DOR Guidelines will not be compatible with overall station safety and performance goals. Licensees must review such situations on a case-by-case basis and determine that 'sound reasons to the contrary' do, in fact, exist which warrant the use of replacement equipment (not necessarily in-kind) qualified to the DOR Guidelines or NUREG-0588, Category II. For equipment located in a harsh environment, licensees' procedures must provide for documentation and substantiation of such determinations.

Conditions which reflect sound reasons why qualification standards for replacement of equipment in a harsh environment need not be upgraded to NUREG-0588, Category I include the following:

- The licensee has replacement equipment in stock that meets the DOR Guidelines or NUREG-0588, Category II, and procurement actions regarding such replacement equipment had commenced prior to May 23, 1980.
- Replacement equipment qualified to the NUREG-0588, Category I standards does not exist.
- 3. Replacement equipment qualified to the NUREG-0588, Category I standards is not available to meet installation and operation schedules. Equipment qualified to the DOR Guidelines or NUREG-0588, Category II may be used for an interim period until Category I equipment is obtained and an outage of sufficient duration is available for replacement. Justification for use of the non-Category I qualified replacement equipment beyond this interim period must be submitted to the NRC for approval prior to the end of the interim period and in sufficient time for reasonable NRC review.
- Replacement equipment qualified to NUREG-0588, Category I standards would require significant plant modifications to accommodate its use.
- 5. Operating performance and reliability data for the Category I equipment indicates poor overall equipment performance. For example, mean time to failure is significantly shorter for the Category I replacement equipment.
- 6. The use of replacement equipment qualified to NUREG-0588, Category I standards has a significant probability of creating human factor problems that will negatively affect plant safety and performance, e.g., (1) knowledge, skills and ability of existing plant staff require significant upgrading to operate or maintain the specific Category I replacement equipment; (2) the use of equipment qualified to Category I standards creates a one-of-a-kind application; or (3) maintenance, surveillance or calibration activities are unnecessarily complex.

5. Submergence Outside Containment

Q. For equipment qualification purposes, what are the staff requirements concerning submergence of equipment subside containment?

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A. The Staff requires that the licensee submit documentation on the qualification of safety-related equipment that could be submerged due to a high energy line break outside containment.

6. Radiation

- Q. Is the staff screening value of 4 x 10⁷ rads applicable to all operating reactors?
- A. No. This screening value is applicable only to PWRs with dry type containments. However, for PWRs with dry type containments, the licensee may choose to use plant specific analysis instead of the screening value. For plants with other containment types, the licensee must use plant specific analysis.

Acceptable to the Staff for equipment qualification purposes are radiation values developed as part of the plant licensing process provided that they are based on the TID14844 source terms and are conservatively performed. In order to assure that the methodologies are appropriate, the Staff requests two component specific sample calculations (one for inside and one for outside containment), and a brief written description of each of the methodologies used, their application and associated conservatisms. Such sample calculations and a statement by the licensee that the values of radiation exposure of components so derived are appropriate for environmental qualification of equipment will satisfy the Staff's concern on the 'Radiation Specification Value' used during the qualification reviews.

7. Containment Service Conditions

- Q. Must the Staff value (identified in the SERs) of T_{SAT} for PWRs and T_{SAT} + 20°F for BWRs be used as the maximum in-containment temperature for the purpose of equipment qualification?
- A. No. The Staff will accept the use of these values. However, an acceptable alternative to the NRC staff's temperature criterion used for the service conditions must base that service condition on the FSAR analysis or other NRC approved analysis, provided that the specific analysis, or a summary of that analysis, together with reference to the previous NRC acceptance of the analysis is submitted by the licensee. In addition, some of the information in the associated safety evaluation may require clarification.

8. One Hour Minimum Operating Time

Q. The Staff has previously indicated that certain exceptions to the one hour minimum operating time rule are permitted. Can further clarification be provided?

A. With regard to plants subject to the qualification requirements of the DOR Guidelines or Category II of NUREG-0588, for those pieces of equipment tested prior to May 23, 1980, the test data and analysis may be used to qualify the equipment to the required operating time plus an appropriate margin. The one hour margin requirement need not be applied. However, subsequent failures should be shown not to be detrimental to plant safety.

The one hour time margin rule is not applicable to equipment whose safety function is performed prior to significant changes in the environment at the equipment location.

9. Aging

- Q. Must a qualified life be developed for all safety-related electrical equipment located in harsh environments?
- A. Section 7 of the DOR Guidelines and Section 4.2, Category II of NUREG-0588, do not require a qualified life to be established for all safety-related electrical equipment located in harsh environments. A qualified life, in accordance with the provisions in IEEE 323-1974, is required for equipment, including replacement parts, qualified to Category I of NUREG-0588 that is located in a harsh environment.

An acceptable method for addressing in-service degradation is through a preventive maintenance/surveillance program with equipment and component refurbishment and/or replacement based on known susceptibility to aging degradation, the results of inspections, or manufacturers recommendations. These elements of the program lead to an understanding on a device specific basis of the nature and extent of the increased stress levels encountered during Design Basis Accidents and resultant degradation (if any) which may occur. Arrhenius or other appropriate accelerated aging methodologies may be used to establish replacement and refurbishment schedules if the component's design and materials application are sufficiently simple and the necessary data are available to allow a meaningful application.

In plants subject to the qualification requirements of either the DOR Guidelines or NUREG-0588 Category II, for equipment that has been identified as being susceptible to significant degradation due to thermal and radiation aging, the schedule for inspection of and/or replacement of the susceptible components in that equipment must be incorporated into the preventive maintenance and surveillance programs, and that information should be incorporated into the system component evaluation worksheets (SCEWS). For other equipment, the aging column in the SCEWS should be marked 'No Known Susceptibility'."

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3. METHODOLOGY USED FOR THE EVALUATION

3.1 INTRODUCTION

As discussed in Section 1.3 of this report, the NRC issued Safety Evaluation Reports (SERs) on environmental qualification of safety-related equipment to licensees of all operating plants in mid-1981.

The SERs identified various equipment qualification deficiencies as indicated below:

LEGEND: DESIGNATION FOR DEFICIENCY

-	Radiation	M	-	Margin
-	Temperature	I	-	HELB Evaluation Outside
-	Qualification Time			Containment Not Completed
-	Required Time	QM	-	Qualification Method
-	Pressure	RPN	-	Equipment Relocation or Replacement,
-	Humidity			Adequate Schedule Not Provided
-	Chemical Spray	EXN	-	Exempted Equipment Justification
-	Material Aging Evaluation,			Inadequate
	Replacement Schedule, Ongoing Equipment Surveillance	SEN	-	Separate Effects Qualification Justification Inadequate
-	Submergence	QI	-	Qualification Information Being
-	Licensee has committed			Developed
	to replace equipment	RPS	-	Equipment Relocation or Replacement Schedule Provided
		 Pressure Humidity Chemical Spray Material Aging Evaluation, Replacement Schedule, Ongoing Equipment Surveillance Submergence Licensee has committed 	 Temperature I Qualification Time Required Time QM Pressure RPN Humidity Chemical Spray EXN Material Aging Evaluation, Replacement Schedule, Ongoing SEN Equipment Surveillance Submergence QI Licensee has committed 	 Temperature I - Qualification Time Required Time QM - Pressure RPN - Humidity Chemical Spray EXN - Material Aging Evaluation, Replacement Schedule, Ongoing SEN - Equipment Surveillance Submergence QI - Licensee has committed

The SERs directed licensees to "either provide documentation of the missing qualification information which demonstrates that safety-related equipment meets the DOR Guidelines or NUREG-0588 requirements or commit to a corrective action (re-qualification, replacement [etc.]) to establish qualification by June 30, 1982." Licensees were required to respond to the NRC within 90 days of receipt of the SER.

As stated in Section 1.1, the purpose of this report is (1) to evaluate licensees' resolucions of outstanding issues related to safety-related electrical equipment environmental qualification (EEQ) discussed in the NRC's SERs in accordance with NRC criteria, and (2) to evaluate licensees' qualification documentation of safety-related electrical equipment, including

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TMI Lessons Learned Implementation equipment, located in harsh environments in accordance with criteria established by the NRC (see Section 2 of this report). The methodology used to evaluate (1) the Licensee's response to the NRC SER and (2) the equipment environmental qualification is presented herein.

3.2 METHODOLOGY

The Licensee, Baltimore Gas and Electric Company, provided a response to the SER and additional qualification information in its submittals [14, 35, 16, 17, 18, 36, 37, 38] to the NRC for Calvert Cliffs Muclear Power Plant Unit 1.

The following bases provided by the NRC were used to determine the relative completeness of the Licensee's submittals:

- Determine whether the Licensee provided specific responses to the SER concerns.
- Determine whether the Licensee proposed corrective actions and a schedule for completion of the actions.
- Determine whether the Licensee addressed the NRC's concern for margin with respect to the containment environmental conditions.
- o Determine whether the Licensee revised the environmental parameters.
- Determine whether the Licensee's System Component Evaluation Work Sheets (SCEWS) were updated to correct deficiencies and add supplemental information.
- Determine whether the Licensee provided justifications for interim operation for all unqualified equipment.
- o Determine whether the Licensee addressed aging and incorporated the results into the equipment maintenance program.

The extensive list of safety-related electrical equipment* in various locations of the plant identified by the Licensee was analyzed, and all identical equipment located within plant areas that are exposed to the same environmental service conditions was grouped together and designated an

*In this report, the term "safety-related electrical equipment" refers to the equipment defined by the two NRC Guidelines referenced in Section 2.1.

"equipment item." In this report, the term "equipment item" refers to a specific type of electrical equipment, designated by manufacturer and model, which is representative of all identical equipment in a plant area exposed to the same unvironmental service conditions (e.g., Flow Transmitter, Fischer & Porter, Model 10B2496, located within containment). This analysis resulted in a reduced listing of equipment (equipment items) that formed the basis for the review.

Appendix A contains the environmental service conditions for each location. Appendix B contains the tabulation of the equipment items, locations, function, plant identification numbers, required operating time, and applicable qualification documentation references. Appendix C lists the plant systems identified by the Licensee and the NRC as being essential to safety.

Each item in the list of safety-related electrical equipment items was reviewed in relation to:

- o the Licensee's response to the SER concerns
- technical information received from the Licensee as a result of requests for additional information (Appendix E)
- o technical data derived from the Licensee's submittal
- o NRC DOR Guidelines or NUREG-0588 Revision 1 criteria
- o the Licensee's definition of harsh service environments (Appendix A)
- o documentation cited by the Licensee as evidence of qualification
- o applicable and available qualification documentation associated with the overall equipment environmental qualification program
- o the Licensee's analysis and/or justification of qualification
- o Licensee-proposed corrective action for qualification deficiencies
- o the Licensee's equipment/part replacement schedules
- o the Licensee's technical arguments concerning the adequacy of equipment, based on system operational considerations
- o the Licensee's rationale concerning exemption of equipment from qualification.

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Topics not within the scope of the evaluation are:

- o completeness of the Licensee's listing of safety-related equipment
- o acceptability of Licensee-provided environmental service conditions.

The NRC requested an evaluation of the environmental qualification of safety-related electrical equipment located in harsh environments required for TMI Lessons Learned Implementation. The objective is to evaluate qualification documentation of equipment within the scope of IE Bulletin 79-01B, Supplement 3 (item 2), in accordance with criteria established by the NRC (see Section 2 of this report) in a manner identical to the evaluation of all other safetyrelated electrical equipment. The scope of this review is limited to TMI Action Plan equipment associated with those sections of NUREG-0737 which have an equipment installation implementation date of January 1, 1982 (sections are identified below). Where applicable, a review was to be performed on installed equipment with implementation dates after January 1, 1981 if adequately identified by the licensee.

II.B.3 (ALL/1-1-81) Post-Accident Sampling Capability of Reactor Coolant and Containment

II.D.3 (ALL/1-1-81) Direct Indication of Relief and Safety Valve Position

II.E.1.2 (PWR/1-1-81) Auxiliary Feedwater System Automatic Initiation and Flow Indication

II.E.3.1 (PWR/1-1-81) Emergency Power Supply for Pressurizer Heaters (Safety-Grade Interfaces)

II.E.4.1 (ALL/7-1/81) Dedicated Hydrogen Penetrations

II.E.4.2 (ALL/1-1-81) Containment Isolation Dependability

II.F.2 (PWR/1-1-81) Instrumentation for Detection of Inadequate Core Cooling

II.G.1 (PWR/1-1-81) Emergency Power for Pressurizer Equipment (Safety-Grade Interfaces)

II.K.2.10 (PWR/B&W/7-1-81) Safety-Grade Anticipatory Reactor Trip

II.K.3.9 (PWR/W/1-1-81) PID Controller Modification (If Hardware Change Involved)

II.K.3.12 (PWR/W/1-1-81) Anticipatory Reactor Trip upon Turbine Trip II.K.3.13 (PWR/GE/7-1-81) Separation of HPCI and RCIC Initiation Signals II.K.3.15 (BWR/GE/7-1-81) Prevention of Spurious Isolation of HPCI and RCIC Systems

II.K.3.19 (BWR/GE/7-1-81) Interlock on Recirculation Pump Loop

II.K.3.21 (BWR/GE/7-1-18) Restart of Core Spray and LPCI Systems (If Hardware Changed Out)

II.K.3.27 (BWR/GE/7-1-81) Provide Common Reference Level for Vessel Level Instrumentation (If Hardware Changed Out)

Licensees whose plants were included within the NRC Systematic Evaluation Program received a Technical Evaluation Report (TFR) in addition to the SER. The TER was based on a review of equipment environmental qualification documentation associated with the Licensee's EEQ submittals. The qualification deficiencies identified in the SER were derived from the TER. Plants included within this program were the Palisades, Oyster Creek, Ginna, Haddam Neck, Yankee Rowe, LaCrosse, and Big Rock Point plants and Zion Station Units 1 and 2, Indian Point Units 2 and 3, Millstone Unit 1, Dresden Unit 2, and San Cnofre Unit 1. For these plants, the evaluation presented herein is based on (1) the result of the initial TER, (2) the Licensee's response to the NRC SER and the TER, and (3) the Licensee's updated EEQ submittal(s).

TERs were also developed for the following plants: Nine Mile Point Unit 1, Millstone Unit 2, Salem Unit 1, Browns Ferry Units 1, 2, and 3, Brunswick Units 1 and 2, Hatch Units 1 and 2, Dresden Unit 3, and Quad Cities Units 1 and 2. The objective of those TERs was to review the Licensee's submittals to determine if safety-related electrical equipment was reviewed for environmental qualification by the Licensee in accordance with the DOR Guidelines and NUREG-0588 as required by IE Bulletin 79-01B. For these 13 plants and all other plants, excluding the 14 plants associated with the Systematic Evaluation Program, the evaluation presented herein is based solely on (1) the Licensee's response to the NRC SER and (2) the Licensee's revised EEQ submittal(s).

This technical evaluation was conducted to identify (1) whether the Licensee provided an adequate response to the SER concerns (and TER concerns,

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where applicable), (2) major deficiencies within the equipment qualification program, and (3) whether the Licensee proposed adequate corrective actions to resolve qualification deficiencies and provided a schedule for completion of the corrective actions. The TER was written primarily to address deviations from the NRC criteria and requirements. Technical data or test results that satisfy the qualification criteria are not discussed herein.

The evaluation presented in Section 4 of this report includes completed equipment environmental qualification review checksheets (partially handwritten) which compile both the technical information necessary to conduct the review and the results of the evaluation. Parameters listed on these checksheets were derived from the appropriate NRC screening criteria. The evaluation of each equipment item includes several checksheet pages. Only those checksheet pages necessary to complete the evaluation for each equipment item are included in this report. A complete listing of the checksheet pages is shown on the bottom of Checksheet la, reproduced here as Figure 3-1.

The checksheets contain the following information:

o Equipment item information (see Figure 3-1), for example:

Solenoid Valve Located in Turbine Building (Area #7) Automatic Switch Co. (ASCO) Model LB8300B61U Actuates Feedwater Control Valves (V-4269, V-4270) Licensee Reference 839 Required Operating Time: Short term (SI signal) TER Checkshee No. 1 Reference 59, Section 4.5.2.6 Licensee Submittal: Page 9 [62]; Table 3, Page 1 [1]; SCEW 1

- o Qualification deficiencies identified in the SER (see Figure 3-1)
- o Licensee's response to the SER
- o Licensee's statements and rationale for qualification
- o Licensee's corrective action and replacement schedule
- Evaluation of qualification including identification of all deficiencies
- o Evaluation of system considerations presented by the Licensee as a rationale for excluding equipment from qualification.

The results of the evaluation are summarized on Checksheet 2 (Equipment Environmental Qualification Summary Form) for each equipment item. Checksheet

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. _

Equipment Item No. 1 Solenoid Valves Located in Turbine Building (Area #7) Automatic Switch Co. (ASCO) Model LB8300B61U Actuates Feedwater Control Valves (V-4269, V-4270) Licensee Reference 1617 Required Operating Time: Short term (SI signal) TER Checksheet No. 1 Reference 59, Section 4.5.2.6 Licensee Submittal: Page 9 [62]; Table 3, Page 1 [1]; FRC SCEW 1

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY: (See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, A, S, (R), M, I, UM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

The other Desides and the other desides of the othe	con	261	163
	-	-	

Equipment Item	1.8						
Summary of Licensee Responses to the NRC SZR	15						
Equipment Environmental Qualification Summary Forms	2						
Licensee Response to NRC SER	3a,	36,	3c,	3d			
System Consideration Review	4a,	46,	4c,	4d,	4e,	42	
Equipment Environmental Qualification Review			5c, 5i,	Contract of the	5e,	5£,	
Installed TMI Lessons Learned Implementation Equipment Summary	6a,	65					
Maintenance and Replacement Schedule Summary	7a,	7b,	7c				

Checksheet Page No.

Figure 3-1. Sample Checksheet Page la

"Equipment Item"

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2 specifically identifies any qualification deficiencies determined by the evaluation and identifies the NRC qualification category to which the equipment item was assigned. A sample Checksheet 2 is presented in Figure 3-2.

All information was reviewed for conformance to the NRC criteria referenced in Section 2 of this report. As requested by the NRC, all applicable and available qualification documentation associated with the overall Equipment Environmental Qualification (EEQ) program was used by the reviewers, whether referenced by the Licensee or not.

Upon completion of the review for each equipment item, an overall evaluation of the component and a specific conclusion with respect to its qualification was developed. Based on the evaluation, each equipment item was assigned to one of the generic qualification categories provided by the NRC. The NRC category descriptions are presented in Section 3.3 of this report.

3.3 NRC QUALIFICATION CATEGORIES AND DEFINITIONS

o NRC Category I.a

EQUIPMENT THAT SATISFIES ALL APPLICABLE REQUIREMENTS OF THE DOR GUIDELINES OR NUREG-0588, OR HAS ACCEPTABLE DEVIATIONS FROM THE DOR/NUREG CRITERIA

This category includes equipment items which are fully acceptable on the basis that all applicable criteria defined in the DOR Guidelines or NUREG-0588 are (1) satisfied and the equipment has been found to be qualified or (2) sufficient information has been presented to determine that deviations from the criteria are acceptable or insignificant.

o NRC Category I.b

EQUIPMENT FOR WHICH DEVIATIONS FROM THE DOR GUIDELINES OR NUREG-0588 ARE JUDGED CONDITIONALLY ACCEPTABLE PROVIDED THAT SPECIFIC MODIFICATIONS ARE MADE

This category includes equipment items that do not satisfy one or more of the applicable criteria defined in the DOR Guidelines or NUREG-0588; however, the Licensee has stated that specific modifications will be made on or before a designated date. This equipment is considered by NRC to be conditionally acceptable provided that the specific modifications are made by the Licensee. When the modifications are completed as proposed, the Licensee states that the equipment will satisfy all applicable NRC requirements. Examples of specific modifications are (1) replacement of unqualified equipment with qualified equipment, (2) equipment hardware

	s Inklin Research Center Ivision of The Franklin Institute 1 and Race Streets, Phila., Pa. 19103 (215) 448-1000	NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No.	Page 2
QUIPM	ENT ENVIRONMENTAL QUALIFIC	CATION REVIEW OF EQUIPMENT ITE	M NO
	EQUIPMENT ENVIRONMENTAL	QUALIFICATION SUMMARY PORM	
		DESIGNA	TION:
NRC RE	DUINEMENTS	X = DEPI	CIENCY
Documen	nted Evidence of Qualification	Adequate	
Adequat	te Sicilarity Between Equipment	and Test Specimen Established	
Aging i	Degradation Evaluated Adequatel	Y Tababliabad (78 Baguira)	
Qualif:	ied ' or Replacement Schedul a , shed to Identify Aging	Degradation	
Criter	ia a sing Aging Simulation S	acisfied (If Required)	
Criter	ia Regarding Temperature/Pressu	re Exposure:	
0	Peak Temperature Adequate		
0	Peak Pressure Adequate		
	Duration Adequate	austaly.	
0	Required Profile Enveloped Ade Steam Exposure (If Required) A	deguate	_
Criter	ia Regarding Spray Satisfied		
Criter	ia Regarding Submergence Satisf	ied	
Criter	ia Regarding Radiation Satisfie	d	
Criter	ia Regarding Test Sequence Sati	sfled	
	is Regarding Test Failures or S Any) Satisfied	evere whomaries	distanti di
Criter	ia Regarding Functional Testing	Satisfied .	
Criter	ia Regarding Instrument Accurac	ry Satisfied	
Test D	uration Margin (1 hour + Functi	on Time) Satisfied	
	ia Regarding Margins Satisfied	(NUREG-0588, Cat. 1)	
Criter			
Criter		5 P SI(INATION :
	ALIFICATION CATEGORY		INATION:
NRC QU			
NRC QU	Equipment Qualified	<u>x - (</u>	
NRC QU	Equipment Qualified Equipment Qualification Pendi Equipment Qualification Not E	X = (
NRC QU	Equipment Qualified Equipment Qualification Pendi Equipment Qualification Not E Equipment Not Qualified	X = (Ing Modification Satablished	
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NRC QU I.a I.b II.a II.b II.c III.a III.a	Equipment Qualified Equipment Qualification Pendi Equipment Qualification Not E Equipment Not Qualified Equipment Satisfies All Requi or Reylacement Schedule Justi Equipment Exempt From Qualifi Equipment Not in the Scope of	X = 0 Ing Modification Established Trements Except Qualified Life Ified Ication I the Qualification Review	
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NRC QU I.a I.b II.a II.b II.c III.a III.a	Equipment Qualified Equipment Qualification Pendi Equipment Qualification Not E Equipment Not Qualified Equipment Satisfies All Requi or Reylacement Schedule Justi Equipment Exempt From Qualifi Equipment Not in the Scope of	X = 0 Ing Modification Established Trements Except Qualified Life Ified Ication I the Qualification Review	
NRC QU I.a I.b II.a II.b II.c III.a III.a	Equipment Qualified Equipment Qualification Pendi Equipment Qualification Not E Equipment Not Qualified Equipment Satisfies All Requi or Reylacement Schedule Justi Equipment Exempt From Qualifi Equipment Not in the Scope of	X = 0 Ing Modification Established Trements Except Qualified Life Ified Ication I the Qualification Review	
NRC QU I.a I.b II.a II.b II.c III.a III.a	Equipment Qualified Equipment Qualification Pendi Equipment Qualification Not E Equipment Not Qualified Equipment Satisfies All Requi or Reylacement Schedule Justi Equipment Exempt From Qualifi Equipment Not in the Scope of	X = 0 Ing Modification Established Trements Except Qualified Life Ified Ication I the Qualification Review	
NRC QU I.a I.b II.a II.b II.c III.a III.a	Equipment Qualified Equipment Qualification Pendi Equipment Qualification Not E Equipment Not Qualified Equipment Satisfies All Requi or Reylacement Schedule Justi Equipment Exempt From Qualifi Equipment Not in the Scope of	X = 0 Ing Modification Established Trements Except Qualified Life Ified Ication I the Qualification Review	
NRC QU I.a I.b II.a II.b II.c III.a III.a	Equipment Qualified Equipment Qualification Pendi Equipment Qualification Not E Equipment Not Qualified Equipment Satisfies All Requi or Reylacement Schedule Justi Equipment Exempt From Qualifi Equipment Not in the Scope of	X = 0 Ing Modification Established Trements Except Qualified Life Ified Ication I the Qualification Review	

Figure 3-2. Sample Checksheet Page 2

"Equipment Environmental Qualification Summary Form"

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modification, (3) equipment relocation above submergence level, (4) relocation or shielding of equipment from radiation source, (5) verification of qualification by additional testing, (6) equipment relocation to a mild environment, and (7) qualification testing of equipment in progress.

o NRC Category II.a

EQUIPMENT FOR WHICH QUALIFICATION DOCUMENTATION IS INSUFFICIENT TO ESTABLISH THAT THE EQUIPMENT IS OR IS NOT QUALIFIED IN ACCORDANCE WITH THE DOR GUIDELINES OR NUREG-0588

The qualification of equipment items in this category, in accordance with the requirements of the DOR Guidelines or NUREG-0588, is significantly deficient or inconclusive based upon review of (1) the documentation provided by the Licensee or (2) applicable and available qualification documentation associated with the overall equipment environmental qualification program. The qualification documentation indicates significant deficiencies, which can be categorized as follows: (1) appropriate documentation reflecting qualification has not been cited and made available for review by the Licensee and there is no knowledge of applicable documentation; (2) the Licensee is awaiting qualification from the equipment vendor; or (3) the qualification documentation indicates significant deficiencies; however, where testing was conducted, no reported failures or severe anomalies were observed which would unquestionably affect the ability of the equipment to perform its design basis safety function(s).

NRC Category II.b
 EQUIPMENT THAT IS UNQUALIFIED

This category includes equipment items whose qualification documentation has been judged to be seriously deficient based upon review of (1) the documentation provided by the Licensee, or (2) applicable and available qualification documentation associated with the overall equipment environmental qualification program. The qualification documentation indicates serious deficiencies reported during testing; for example, severe anomalies or failure of the test specimen, which could affect the ability of the equipment to perform its safety function. NRC has requested immediate written notification when an equipment item is placed in this category during the course of the review.

o NRC Category II.c

EQUIPMENT THAT SATISFIES ALL APPLICABLE REQUIREMENTS OF THE DOR GUIDELINES OR NUREG-0588 WITH THE EXCEPTION OF QUALIFIED LIFE

This category includes equipment items that are acceptable on the basis that all applicable criteria defined in the DOR Guidelines or NUREG-0588 are satisfied with the exception of the qualified life criterion. The Licensee (1) has not evaluated qualified life or replacement schedule, (2) has not adequately evaluated qualified life or replacement schedule, or (3) has not adequately intepreted qualified life in terms of calendar time. [Note: The component replacement schedule discussed in Section 7.0 of the

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DOR Guidelines is, in effect, a qualified life. It is not essential to use the term "qualified life," but the replacement schedule must be justified.]

o NRC Category III.a

EQUIPMENT THAT IS EXEMPT FROM QUALIFICATION

This category includes equipment items that are exempt from qualification on the basis that (1) the equipment does not provide a safety function (i.e., should not have been included in the equipment list submitted by the Licensee), or (2) the specific safety-related function of the equipment can be accomplished by some other designated equipment that is fully qualified and satisfies the single failure criterion. In addition, any failure of the exempt equipment must not misleed the operator or degrade the ability of qualified equipment to perform its required safety-related function.

o NRC Category III.b

EQUIPMENT NOT IN THE SCOPE OF THE QUALIFICATION REVIEW

This category includes equipment items addressed by the Licensee in the equipment environmental qualification submittals which are (1) required to achieve and maintain the plant in a cold shutdown condition or (2) located in a mild environment. Supplement 2 of IE Bulletin 79-01B permits deferment of the review of environmental qualification for all safetyrelated equipment items located in plant areas where the equipment is not exposed to the direct effects of a high energy line break (HELB) or to nuclear radiation emanating from circulation of fluids containing radioactive substances. Supplement 3 of IE Bulletin 79-01B permits deferment of the review of environmental qualification for all equipment required to achieve and maintain the plant in a cold shutdown condition. Supplements 2 and 3 of IE Bulletin 79-01B originally permitted deferment until after February 1, 1981 of the qualification review of equipment located in a mild environment or required to achieve and maintain the plant in a cold shutdown condition. Since the issuance of Supplements 2 and 3, the NRC has determined that the review of environmental qualification for this equipment is not within the scope of this report.

o NRC Category IV

EQUIPMENT FOR WHICH QUALIFICATION DOCUMENTATION HAS NOT BEEN MADE AVAILABLE FOR REVIEW

This category includes equipment items for which qualification documentation in accordance with the requirements of the DOR Guidelines or NUREG-0588 has been cited by the Licensee as evidence of qualification; however, this documentation has not been made available for review. Therefore, a conclusion cannot be reached with respect to qualification of this equipment.

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3.4 IMPLEMENTATION GUIDE FOR FULFILLING NRC CRITERIA

The NRC has requested that a detailed implementation guide for fulfilling NRC criteria be prepared as part of this assignment. The implementation guide will present a fully detailed discussion of the principal qualification criteria presented in the DOR Guidelines and NUREG-0588. The primary emphasis will be to clarify technical points, eliminate possible misconceptions, and clearly provide definitive guidance to enable licensees to understand and resolve, in an expeditious manner, qualification deficiencies identified as a result of this TER. The implementation guide (TER-C5257-532) has been prepared and issued to the NRC. The implementation guide is either appended to this TER or will be forwarded to the Licensee by the NRC under a separate letter. The Licensee is encouraged to review that document.

4. TECHNICAL EVALUATION

4.1 INTRODUCTION

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The technical evaluation presented in this section represents the equipment environmental qualification (EEQ) assessment for each equipment item listed in Appendix B in accordance with the methodology presented in Section 3 of this report. The evaluations were conducted to identify any major deficiencies within the Licensee's equipment qualification program and to determine whether the Licensee (1) provided an adequate response to the SER concerns, (2) proposed adequate corrective actions to resolve qualification deficiencies, and (3) provided a schedule for completion of the corrective actions.

The evaluations are based on the available qualification documentation provided by the Licensee, complemented in several cases by other relevant technical information. The major qualification deficiencies that have been identified and the results of the evaluation are shown in the Equipment Environmental Qualification Summary Forms (Tables 4-1, 4-2, 4-3, and 4-4) presented in Section 4.2.

Observations concerning the Licensee's qualification methodology presented in response to the NRC SER are presented in Section 4.3.

Technical evaluations of the environmental qualification of the equipment items are presented in Section 4.4.

4.2 SUMMARY OF THE EVALUATION

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The following tabulations represent a summary of the results of the equipment environmental qualification evaluation conducted in accordance with the methodology presented in Section 3.

Table 4-1 summarizes the number of equipment items assigned to each NRC qualification category as a result of the evaluation.

Table 4-2 summarizes the number of equipment items found to have a specific qualification deficiency.

Table 4-3 summarizes the number of equipment items for which the Licensee has proposed a specific corrective action to resolve a qualification deficiency.

Table 4-4 consists of Equipment Environmental Qualification Summary Forms for the equipment items, identifying (1) compliance with the qualification requirements defined in Section 2, (2) the resultant NRC qualification category, and (3) the Licensee-proposed corrective action.

TABLE 4-1

NUMBER OF EQUIPMENT ITEMS IN EACH QUALIFICATION CATEGORY

NRC CATEGOR	CATEGORY	JMBER OF DUIPMENT ITEMS
I.A	EQUIPMENT QUALIFIED- [EQUIPMENT ITEM NO(S).: 2, 3, 5, 7, 8, 9, 11, 12, 13, 60, 62]	11
I.8	EQUIPMENT QUALIFICATION PENDING MODIFICATION	7
II.A	EQUIPMENT QUALIFICATION NOT ESTABLISHED [EQUIPMENT ITEM NO(S).: 1, 4, 6, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 37, 42, 43, 44, 45, 46, 47, 48, 49, 50, 52, 55, 58, 59, 61, 66, 67, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 97 1	65
II.B	EQUIPMENT NOT QUALIFIED	0
11.0	EQUIPMENT SATISFIES ALL REQUIREMENTS EXCEPT QUALIFIED LIFE OR REPLACEMENT SCHEDULE JUSTIFIED L EQUIPMENT ITEM NO(S).: 38]	1
III.A	EQUIPMENT EXEMPT FROM QUALIFICATION- [EQUIPMENT ITEM NO(S).: 51, 53, 54, 56, 57, 68, 69, 70, 71, 72]	10
III.B	EQUIPMENT NOT IN THE SCOPE OF THE REVIEW	3
IV	DOCUMENTATION NOT MADE AVAILABLE	0
	TOTAL	97

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TABLE 4-2

QUALIFICATION DEFICIENCY SUMMARY

	0	UMBER OF EFICIENT QUIPMENT ITEMS
1.	DOCUMENTED EVIDENCE OF QUALIFICATION ADEQUATE (EQUIPMENT ITEM NO(S).: 4, 10, 15, 21, 26, 27, 37, 40, 43, 44, 45, 47, 48, 50, 52, 55, 58, 59, 61, 66, 67, 73, 75, 76, 77, 78, 79, 82, 83, 85, 90, 91, 92, 94, 95, 96]	36
2.	ADEQUATE SIMILARITY BETWEEN EQUIPMENT AND TEST SPECIMEN ESTABLISHED [EQUIPMENT ITEM NO(S).: 14, 16, 17, 18, 19, 20, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 73, 74, 77, 78, 80, 81, 83, 84, 85, 86, 87, 89, 93, 97]	34
3.	AGING DEGRADATION EVALUATED ADEQUATELY	27
4.	QUALIFIED LIFE OR REPLACEMENT SCHEDULE ESTABLISHED (IF REQUIRED) [EQUIPMENT ITEM 17, 18, 19, 2 29, 30, 31, 3 46, 49, 88]	27
5.	PROGRAM ESTABLISHED TO DENTIFY AGING DEGRADATION	4
6.	CRITERIA REGARDING AGING SIMULATION (IF REQUIRED)	3
7.	CRITERIA REGARDING TEMPERATURE/PRESSURE EXPOSURE:	
	A PEAK TEMPERATURE ADEQUATE	3
	B PEAK PRESSURE ADEQUATE	3

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QUALIFICATION DEFICIENCY SUMMARY

	D	UMBER OF EFICIENT QUIPMENT ITEMS
	C DURATION ADEQUATE	
	C EQUIPMENT ITEM NO(S) .: 42 1	
	D REQUIRED PROFILE ENVELOPED ADEQUATELY I EQUIPMENT ITEM NO(S).: 26, 27]	2
	<pre>E. = STEAM EXPOSURE (IF REQUIRED) ADEQUATE</pre>	3
8.	CRITERIA REGARDING SPRAY SATISFIED	4
9.	CRITERIA REGARDING SUBMERGENCE SATISFIED	0
10.	CRITERIA REGARDING RADIATION SATISFIED [EQUIPMENT ITEM NO(S).: 1, 6, 26, 27, 42, 46, 49, 49]	7
11.	CRITERIA REGARDING TEST SEQUENCE SATISFIED	0
12.	CRITERIA REGARDING TEST FAILURES OR SEVERE ANOMALIES (IF ANY) SATISFIED	4
13.	CRITERIA REGARDING FUNCTIONAL TESTING SATISFIED [EQUIPMENT ITEM NO(S).: 1, 6, 88]	3
14.	CRITERIA REGARDING INSTRUMENT ACCURACY SATISFIED	0
15.	TEST DURATION MARGIN (1 HOUR + FUNCTION TIME) SATISFIED	0
16.	CRITERIA REGARDING MARGINS SATISFIED (NUREG-0588, CAT. 1)-	0

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TABLE 4-3

LICENSEE CORRECTIVE ACTION SUMMARY

CORRECTIVE ACTION DESCRIPTION	NUMBER OF Equipment Items
1. EQUIPMENT REPLACEMENT WITH QUALIFIED EQUIPMENT- [EQUIPMENT ITEM NO(S).: 39, 40, 41, 52, 95, 96	6 [·]
2. EQUIPMENT MODIFICATION	0
3. EQUIPMENT RELOCATION ABOVE SUBMERGENCE LEVEL	0
4. RELOCATE OR SHIELD EQUIPMENT FROM RADIATION SOURCE	0
5. VERIFY QUALIFICATION BY ADDITIONAL TESTING/ANALYSIS [EQUIPMENT ITEM NO(S).: 52, 74, 80]	3
6. EQUIPMENT RELOCATION TO A MILD ENVIRONMENT	o
7. QUALIFICATION TESTING OF EQUIPMENT IN PROGRESS	1
8. OTHER (FOR DETAILED DESCRIPTION SEE SPECIFIC EQUIPMENT ITER [EQUIPMENT ITEM ND(S).: 10, 33, 40, 42, 43, 44, 45, 46, 47, 48, 49, 50, 55, 58, 59, 61, 66, 67, 68, 69, 71, 72, 75, 76, 77, 78, 79, 81, 82, 83, 94, 85, 86, 87, 88, 89, 90, 91, 92, 94, 97]	
SCHEDULE FOR COMPLETION OF CORRECTIVE ACTION(S) HAS BEEN PROVIDED (SEE SPECIFIC EQUIPMENT ITEM FOR COMPLETION DATE) [EQUIPMENT ITEM NO(S).: 52, 95, 96]	3 ··

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Table 4-4

EUUIPHENT ENVIRONMENTAL QUALIFICATION SUMMART FORM

	1						IPHE								
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NRC REQUIPEMENTS (DESIGNATION: X = DEFICIENCY)	1	1	1	1	1	1	1	1	1 .	1	1	1	1	1	1
		1	1	1	1	1	1	1	1	1	8	1	1	1	1
1. DOCUMENTED EVIDENCE OF GUALIZICATION ADEQUATE		1	1	1 X	1	1	1	1	1	1 X	1	1	1	1	1
2. ADEQUATE SIMILARITY BETWEEN EQUIPMENT AND	1	1	1	1	1	1	1	1	1	1	1	1	8	1	1
TEST SPECIMEN ESTABLISHED		1	1	1	1	1	1	1	1	1	1	1	1	1 X	:
3. AGING DEGRADATION EVALUATED ADEQUATELY	X	1	1	I X	1	I X	1	1	1	1	1	1	1	1 X	1
4. OUALIFIED LIFE OR REPLACEMENT SCHEDULE	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2
ESTARLISHED (IF REQUIRED)			1	3 X	1	1 1	1	1	1	1	1	1	1	1 1	1
5. PROGRAM ESTABLISHED TO IDENTIFY AGING DEGRADATION			1	1 X	1	1 X	1	1	1	1	1.	1	1	1	1
6. CRITERIA REGARDING AGING SIMULATION SATISFIED (IF REQUIRED)	X	1	1	1 1	1	1 1	1	1	1	1	1	1	1	1	
7. CRITERIA REGARDING TEMPERATURE/PRESSURE EXPOSURE:	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
A PEAK TEMPERATURE ADEQUATE		1	1	1	1	1	1	1	1	1	1	1	1	1	1
B PL'X PRESSURE ADEQUATE		1	1	1	1	1	1	1	1	1	1	1	1	1	1
C PURATION ADEQUATE		1	1	4	1	1	1	1	1	1	1	8	1	1	1
D REQUIRED PROFILE ENVELOPED ADEQUATELY		1	1		1		8	1	1	1	1	1	1	1	1
E STEAM EXPOSURE (IF REQUIRED) ADEQUATE		1		1	1		1		1	1	1	4	1	1	1
9. CRITERIA REGARDING SPRAY SATISFIED		1	1	1	1	1	1	1	1	1	1	1		1	1
9. CRITERIA REGARDING SUBMERGENCE SATISFIED		1	1	1			1		1	1	1	1	1	1	1
10. CRITERIA REGARDING RADIATION SATISFIED		1	8	1	8	1 X	1	1	1	1	1	1	1	1	1
11. CHITEKIA REGARDING TEST SEQUENCE SATISFIED		!	1	1	1	1	1		1	1	1	1	1	1	1
12. CHITERIA REGARDING TEST FAILURES OR SEVERE ANOMALIES		1		<u>ا</u>	1	1	1		1	1	1	1	1	1	1
(IF ANY) SATISFIED		1	1	1	1		1				1		1	1	1
1), CRITERIA REGARDING FUNCTIONAL TESTING SATISFIED						8 X			1	8	1		1	1	1
14. CHITERIA REGARDING INSTRUMENT ACCURACY SATISFIED										1	1,	1		1	
15. TEST DURATION MARGIN (1 HOUR + FUNCTION TIME) SATISFIED		1				1					1	1		1	\$
10, CRITERIA HEGARDING HARGING SATISFIED (HUREG-0388, CAI, 1)		1										1	1	1	1
NRC QUALIFICATION CATEGORY (DESIGNATION) X = CATEGORY)											I NAME				
	-		i .									:	:	:	:
I.A FOULPHENT QUALIFIED		i x	i x	i .							x	i .	i .	:	:
1.B EQUIPMENT QUALIFICATION PENDING NUDIFICATION				:				-				: -			:
II.A EQUIPPENT QUALIFICATION NOT ESTABLISHED	x	i -		i x		x						:			÷ .
II.B EQUIPMENT NOT QUALIFIED		i	i	1		1						i	i (;
II.C EQUIP VENT SATASFIES ALL REQUIREMENTS EXCEPT		i	i	i	i i							i -			
QUALIFIED LIFE OR REPLACEMENT SCHEDULE JUSTIFIED		1	1	i		2	ii					i .	i		i i
III.A EOUIPPENT EXEMPT FROM QUALIFICATION		1	1	1	1		1 1					i	î l	1	i i
III.B EQUIPPENT NOT IN THE SCOPE OF THE REVIEW		1	1	1	1	1	3 1	i				i	1		i.
IV DOCUMENTATION NOT MADE AVAILABLE		1	1	1	1	1	1 1	1				1	1	1	i.
		1	1	1		1 1	1 1	1	1 1			1	1	1 1	1
			1	1	2	1 1	1 1	1 1	1 1	1 3	5 1	1	1	1 1	ŧ
		•					1 1	. 1	1 1	1 1	1 1	1	1	1 1	۱.
1. EOUIPAENT REPLACEMENT WITH OUALIFIED EQUIPMENT		i	1	1		•				1 1	1	1	1	1 1	١.,
1. EQUIPAENT REPLACEMENT WITH QUALIFIED EQUIPMENT				1		ii	1 1	1							
1. EQUIPAENT REPLACEMENT WITH QUALIFIED EQUIPMENT													1	1	1
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1. EOUIPAENT REPLACEMENT WITH OUALIFIED EQUIPMENT															
1. EOUIPAENT REPLACEMENT WITH QUALIFIED EQUIPMENT															
1. EOUIPAEPT REPLACEMENT WITH OUALIFIED EOUIPMENT- 2. FOUIPMENT MODIFICATION 3. FOUIPMENT RELOCATION ABOVE THE SUBPERGENCE LEVEL- 4. RELOCATE OR SHIELD EOUIPHENT FROM RADIATION SOURCE- 5. VERIFY OUALIFICATION ET ADDITIONAL TESTING/ANALYSIS- 6. EOUIPMENT RELOCATION TO A MILD ENVIRONMENT- 7. OUALIFICATION TESTING OF EOUIPMENT IN PROGRESS-															
1. EOUIPAEUT REPLACEMENT WITH OUALIFIED EQUIPMENT										x					
1. EOUIPAENT REPLACEMENT WITH OUALIFIED EOUIPMENT										x					

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EQUIPMENT ENVIRONMENTAL GUALIFICATION SUMMARY FORM

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NRC REQUIREMENTS (DESIGNATIONIX = DEFICIENCY) 1. DOC"IMENTED EVIDENCE OF QUALIFICATION ADEGUATE 2. ADEQUATE SIMILARITY BETWEEN EQUIPMENT AND TEST SPECIMEN ESTABLISHED 3. AGING DEGRADATION EVALUATED ADEQUATELY X 4. QUALIFIED LIFE OR REPLACEMENT SCHEDULE ESTABLISHED (IF REQUIRED) 5. PROGRAM ESTABLISHED TO IDENTIFY AGING DEGRADATION 6. CRITERIA REGARDING AGING SIMULATION SATISFIED (IF REQUIRED) 7. CRITERIA REGARDING TEMPERATURE/PRESSURE EXPOSURE; A PEAK TEMPERATURE ADEQUATE		1 1 1 1 X 1 X	1	1	1 1 1 X			 	 		
B PEAK PRESSURE ADEQUATE		x x x x x x x x x x x x x x x x x x x	x x x x x x x x x x x x x x x x x x x					x x x x x x	X		
NHC GUALIFICATION CATEGORY (DESIGNATION: X = CATEGORY) 1.A EQUIPHENT QUALIFIED 1.B EQUIPHENT QUALIFICATION NOT ESTAMLISHED II.A EQUIPHENT NOT QUALIFICATION NOT ESTAMLISHED II.A EQUIPHENT NOT QUALIFICATION II.A EQUIPHENT KENPT FROM QUALIFICATION III.A EQUIPHENT NOT IN THE SCOPE OF THE REVIEW IV DOCUMFNIATION NOT XADE AVAILABLE CORRECTIVE ACTION SPECIFIED (DESIGNATIONI X = ACTION SPECIFIED) I. EQUIPHENT REPLACEMENT WITH QUALIFIED EQUIPMENT I. EQUIPHENT RELOCATION ABOVE THE SUBMERGENCE LEVEL I. EQUIPHENT RULDCATION ABOVE THE SUBMERGENCE LEVEL I. EQUIPHENT RELOCATION TO A WILD ENVIRONMENT S. EQUIPHENT RELOCATION TO A WILD ENVIRONMENT GUALIFIECATION TESTING OF EQUIPMENT T	1 1					x	X			x	

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EQUIPMENT ENVIRONMENTAL GUALIFICATION SUMMARY FORM

		1						IPHE		TEN	NUHB	ERS				
		1031	1032	1033	1034	1035	1036	1037								

FRC REQUIREMENTS	(DESIGNATION: X = DEFICIENCY)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	***************************************	1	1	1	1	\$	1	1	1	1	1	1	1	1	1	i.
	OF QUALIFICATION ADEQUATE	!	1	1	1	1	1	1 8	1	1	IX	1	1	I X	IX	1 1
2. ADEQUATE SINTLARITY			1	1	1	1	1	1	1	1	1	1	1	1	1	1
TEST SPECIMEN ESTABL	ISHED	! X	1 1	1 1	1 X	IX	1	1	1	1	1	i	1	1	1	i.
	ALUATED ADEQUATELY	i X	1 .	1	1	1	1	1	1 1	1	1	1	1 8	1	1	i.
4. QUALIFIED LIFE OR REI		1	1	1	1	1	1	1	1	i	1	i	1		i	i.
	IRED)		1 X	1	1	1	1	1	I X	1	1	i	1 1	1	i	i.
	TO IDENTIFY AGING DEGRADATION		1	1	1	1	1	1	1	1	i	i i	IX	i	i	i.
	GING SIMULATION SATISFIED (IF REQUIRED)	1	1	1	1	1	1	1	1	1	i* 1	i i	1	i i	i	i i
	EMPERATURE/PRESSURE EXPOSURES	1	1	1	1	1	1	1	1	i	i	i -	i .	i .	1	i.
	RATURE ADEQUATE		1	1	1	1	1	1	1	1	1	i	I X	i	i	i.
	URE ADEQUATE		1	1	1	1	1	1	1	1	i	i	XX	1		i
	DEQUATE		1	1	1	1	1	1		1	1	i	I X		1	i.
D REQUIRED PI	ROFILE ENVELOPED ADEQUATELY	!	1	1	1	1	i	i	i		1	i	1		i	î -
	SURE (IF REQUIRED) ADEQUATE		1	1	1	1	IX	1	i i	1 .	i	ix	1	i .	i	i i
	PRAY SATISFIED		1	1	1	1	1	1	i			i -	ix		i	i -
9. CRITERIA REGARDING SI	UBMERGENCE SATISFIED		1	1	1	1	i	i	1			i	1		i .	i.
	ADIATION SATISFIED		1	1	1	1	i	1	1				ixi		i .	i
II. CHITERIA REGARDING TH	EST SEQUENCE SATISFIED		1	i	i	1	i	1	i	i (i - 1		1			:
	EST FAILURES OR SEVERE ANOMALIES	1	1	1	i	i i	i	1	1						i .	:
(IF ANY) SATISFIE	ED		1	i	1	i i	i x					x	ixi			:
13. CRITERIA REGARDING FO	UNCTIONAL TESTING SATISFIED	11	1		1	i	1	i	i .			-				:
14. CRITERIA REGARDING IN	STRUMENT ACCURACY SATISFIED		1 1		8	1	1	i	i							i -
15. TEST DURATION MARGIN	(1 HOUR + FUNCTION TIME) SATISFIED	!	1 1		1	1	1	i 1	1.1.1				i		i	i -
16. CRITERIA REGARDING NI	ARGINS SATISFIED (NUREG-0588, CAT. 1)		1 1	1 1	2	1	1	1 1								i.
NRC QUALIFICATION CATEGOR		1	1 1	1 1	1	1	1	1 1		1 1	1 1	1	1 1	1 1	1	1
		1	1 1		1	1	1.	1 1	1 1	1 1	1 1	1	1 1		1.1	1
	1ED			1 1	1	8	: :	1 1		1 1	1 1	1	1 1	1 1		1
I.B EQUIPMENT QUALIFI	ICATION PENDING MODIFICATION	!	1 1		1	1	XI	1 1		XI	XI	X	1 1	1		1
II.A EQUIPMENT QUALIFI	CATION NOT ESTABLISHED	i X	XI	XI	1 1	IX	1	XI	1 1	1 1	1		XI	XI	X	IX
	LIFIED	!	1 1	1 1	1	1	1	1 1	1 1				1 1			1
	IES ALL REQUIREMENTS EXCEPT	1 1	1 1	1 1	1 1	1	1	1 1	1 1	1	1 1		1 1			i -
	REPLACEMENT SCHEDULE JUSTIFIED		1 1	1 1	1	1	1 1	1 1	X				1			i i
	FROM QUALIFICATION		1 1	1. 1	1	1	1	1 1								i
	THE SCOPE OF THE REVIEW		1 1	1 1	1	1	1	1 1		1	1 - 1		i i			i
	MADE AVAILABLE	*	1 1	1 1	1	1	1	1 1								i i
CORRECTIVE ACTION SPECIFI	the state of the state of the state	1 (03	1 1		1	1	1 1	1 1			1	1	1 1	1		
			1 1		1	1	1	1 1	1				l i			1
1. EQUIPAENT REPLACEMENT	WITH QUALIFIED EQUIPMENT	!	1 1		1	1	1	1 1		XI	X	X	1			1
2. EQUIPHENT MODIFICATIO)!!	1	1 1		1	1		1 1					i	1		i
3. EQUIPMENT RELOCATION	ABOVE THE SUBMERGENCE LEVEL	1	1 1		1	1	1	1 1		1			1			i
4. RELOCATE OR SHIELD EG	DUIPHENT FROM RADIATION SOURCE	1	1 1		1	1	1			1						
5. VERIFY QUALIFICATION	RY ADDITIONAL TESTING/ANALYSIS		1 1		1	1	1									i
6. EQUIPMENT RELOCATION	TO A HILD ENVIRONMENT	1			1	1	1									
7. QUALIFICATION TESTING	G OF EQUIPMENT IN PROGRESS	1				1										
S. OTHER (SEE SPECIFI	IC EQUIPMENT ITEM IF CHECKED)		1	XI		1	1				xi					
		1 1	1 1			1	1 1		1	i	-					
SCHEDULE FOR COMPLETION	OF CORRECTIVE ACTION(S) HAS BEEN PROVID	ED														
ecurine the custor the		E.111				1										

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EQUIPHENT ENVIRONS INTAL QUALIFICATION SUMMARY FORM

	1			BEER	FRO		IPAE								
	046	1047										1057			

NRC REQUIREMENTS (DESIGNATION: 1 = DEFICIENCY)	1	1	1	1	1	1	1	1	1		1	1	1	1	1
		1	1	1	1	1	1	1	4	1	1	1	1	1	1
1. DOCUMENTED EVIDENCE OF OUALIFICATION ADEQUATE		1 X	1 X	1	1 X	1	1 X	1	1	1 X	1	4	1 1	1 8	1
2. ADEQUATE SIMILARITY BETWEEN EQUIPHENT AND TEST SPECIMEN ESTABLISHED		1	1	1	1	1	1	1	1	1	1	1	1	1	1
3. AGING DEGRADATION EVALUATED ADEQUATELY				1	1		1	1	1	1	1	1	1	1	1
4. AUALIFIED LIFE OR REPLACEMENT SCHEDULE				1 X	1			1	1	1	1	1	1	1	1
ESTABLISHED (IF REOUIRED)			£		1				1	1	1	1	1	1	1
5. PROGRAM ESTABLISHED TO IDENTIFY AGING DEGRADATION			:							1		1		1	1
6. CRITERIA REGARDING AGING SIMULATION SATISFIED (IF REQUIRED)				:	:	:	:	:		:	1			:	1
7. CHITERIA REGARDING TEMPERATURE/PRESSURE EXPOSUREI				:	:	1 .	:	:	:	:		:	1	1	1
A PEAK TENPERATURE ADEQUATE		i .	:	:	:	:	:	:	:	:	:	:	:	:	:
B PEAK PRESSURF ADEQUATE		i	i	i .	i .	:	;	:		:	;	:	:	:	:
C DURATION ADEQUATE			i	i	i	i	i	i			:	:	;	:	:
D REQUIRED PROFILE ENVELOPED ADEQUATELY		i	i i	i	i	i	i .	i	i .	i .	i	i .	;		:
E STEAM EXPOSURE (IF REQUIRED) ADEQUATE			i	1	i	1	i	i	i - 1	i .	i	i .	i .	i l	i .
8. CRITEHIA REGARDING SPRAY SATISFIED			1	1 X	1	1	1	1	i	i i	i	i .	i	i –	i.
9. CRITERIA REGARDING SUBMERGENCE SATISFIED			1	1	1	1	1	i	1	1	i i	i	i	i I	i
10, CHITERIA REGARDING RADIATION SATISFIED		L	1	IX	1	1	1	1	1	1	1	1	1	1	1
11. CHITERIA REGARDING TEST SEQUENCE SATISFIED			1	1	1	1	1	1	1	1	1	1	1	8	1
12, CRITERIA REGARDING TEST FAILURES OR SEVERE ANOMALIES			1	1	1	1	1	1	1	1	1	1	1	1	1
(IF ANY) SATISFIED				1	1	1	1	1	1	1	1	1	1	1	1
13. CRITERIA REGARDING FUNCTIONAL TESTING SATISFIED						1		1	1	1	1	1	1	1	1
15. TEST DURATION MARGIN (1 HOUR + FUNCTION TIME) SATISFIED				:		5				1		1	1	1	1
16. CRITERIA REGARDING MARGINS SATISFIED (NUREG-0588, CAT. 1)				:	1			:				:		1	1
NEC QUALIFICATION CATEGORY (DESIGNATION: X = CATEGORY)	1		1	1	1	1	1								
	1			i	i .	i				:			: :		:
1.A FOUIPMENT OUALIFIED			i .	i	i i	i	i	i .		i	;				i .
1.6 EQUIPMENT QUALIFICATION PENDING MODIFICATION	1			1	i	1	i		i - 1	i .	i .	i 1			17
11.A EQUIPMENT QUALIFICATION NOT ESTABLISHED	XI	X	X	I X	X	1	X			ix		i 1	i x i	x	i -
II.B FOUIPMENT NOT QUALIFIED	1	1	1	1	1	1	1	1		1		i i	1 1		i i
11.C EQUIPMENT SATISFIES ALL REQUIREMENTS EXCEPT	1	1	1 I I	1	1	1	1 1	1		1	1	1 1	1 1		i i
QUALIFIED LIFE OR REPLACEMENT SCHEDULE JUSTIFIED				1 1	1	1	1 1	1 1	1 1	1	1	1 1	1 1		1
III.A EQUIPMENT EXEMPT FROM QUALIFICATION				1	1	1 X 1	1 1	X	X	1	XI	1 X 1	1 1		1
III.B FOULPMENT NOT IN THE SCOPE OF THE REVIEW					1				1 1	1	1	1 1	1 1		1
				1	1	1	1		1 1	1 1	1	1 1	1 1		1
CORRECTIVE ACTION SPECIFIED (DESIGNATIONE X = ACTION SPECIFIED) 1															
			1.13												1
1. EQUIPMENT REPLACEMENT WITH QUALIFIED EQUIPMENT				: :		: :									
2. EQUIPMENT MODIFICATION				: :										2.13	!
3. EQUIPMENT RELOCATION ABOVE THE SUPMERGENCE LEVEL															1
4. RELOCATE OR SHIELD EQUIPPENT FROM RADIATION SOURCE	i			1											
5. VERIFY QUALIFICATION BY ADDITIONAL TESTING/ANALYSIZ		1					x								
6. EQUIPMENT RELOCATION TO & MILD ENVIRONMENT	1	i		1		1									i
7. QUALIFICATION TESTING OF EQUIPMENT IN PROGRESS		1		1	1		1								i
8. OTHER (SEE SPECIFIC EQUIPMENT ITEM IF CHECKED)	XI	XI	X	XI	X	1 1	1			X			X	x	i
															1
SCHEDULE FOR COMPLETION OF COPRECTIVE ACTION(S) HAS BEEN PROVIDED															1

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EQUIPHENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

ANT AL

		1				FRC	EQU	IPHE	NT I	TEN	NUMB	ERS				
		1061	1062	1063				1067								
***************************************											====					**
NUC REQUIREMENTS	(DESIGNATION: X = DEFICIENCY)		1	1	!	1	1	1	1	1	1	1	!	!	1	1
1. DUCUMENTED EVIDENCE (2. AGEODATE SINILARITY)	OF QUALIFICATION ADEQUATE	i x	i	i	i .	1	i x	x	i	1	1		1	x	1	1
TEST SPECIMEN ESTABL	SHED		1	1	i	1	1	1	1	1	1	1	1		x	:
4. QUALIFIED LIFE OR REL		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5. PROGRAM ESTABLISHED	TO IDENTIFY AGING DEGRADATIUN	1	1	1	1	1	:	1	1	1	1	1	1	1	1	1
	ING SIMULATION SATISFIED (IF REQUIRED)	!	1	1	1	1	1	1	1	1	1 *				1	i
	RATURE ADEQUATE		1	1	1	i	i	i	i	i	i			i	i	i
C DURATION A	EQUATE	1	i	i	i	i	i	i .	i	i	i				i	i
E STEAM EXPOS	OFILE ENVELOPED ADEQUATELY	1	1	1	1	ł	1	1	1	1	1	1		1	1	1
	RAY SATISFIED		1	1	1	1	1	:	1	1	:	1	: 1		1	1
	DIATION SATISFIED		1	1	i .	1	i	i	i	i	i				i	i
12. CRITERIA REGARDING TH	ST FAILURES OR SEVERE ANOMALIES	1	1	1	:		:	1		i	i				1	1
13. CRITERIA REGARDING FI	NCTIONAL TESTING SATISFIED	1	1	1	1	1	:	1		1	:				1	1
	STRUMENT ACCURACY SATISFIED		!	1	1	1.	i									i
16. CRITERIA REGARDING MI	RGINS SATISFIED (NUREC- 588, CAT, 1)		i	i -	i .	i	i	i		i	:					i
NRC QUALIFICATION CATEGOR	Y (DESIGNATIONS X = CATEGORY)	1	1	1	1	1	1	1								
I.A FOUIPMENT QUALIFT		1	1 *	:	1	:	1	:		1	1					1
	CATION PENDING MODIFICATION		1	i	i	i	i	i . I		i .						i
II.8 EQUIPMENT NOT OUT	CATION NOT ESTABLISHED		1	1	1	:				1				×	x	1
	ES ALL REQUIREMENTS EXCEPT REPLACEMENT SCHEDULE JUSTIFIED		1	:	1	1	1	!								1
III.A SOUTPHENT EXEMPT	FROM QUALIFICATION	1	i	i .	i .	i .	i	i	x	x	x	x	x			i.
IV DOCUMENTATION NOT	MADE AVAILABLE	1	i	1	1 *	1	1	1								
CORRECTIVE ACTION SPECIFI	ED (DESIGNATIO , X = &CTION SPECIFIED		2828													
1. EQUIPMENT REPLACEMENT	WITH QUALIFIED EQUIPMENT	- 1	1	!	1	1	1									i
2. EGUIPHENT MODIFICATIO	N	1	i	i	i	i										1
4. RELUCATE OF SHIELD ED	ABOVE THE SUBMERGENCE LEVEL	1	1	1	1	1										1
	BY ADDITIONAL TESTING/ANALYSIS		!	1	1		1								X	
7. QUALIFICATION TESTING	OF EQUIPMENT IN PROGRESS	1	1	1	i	i							1	x		1
	C EQUIPMENT ITEM IF CHECKED	1	1	1			X	X	X	X		X	XI	1		1 3
SCHEIMLE FOR COMPLETION	OF CORPECTIVE ACTION(S) HAS BEEN PPOVIDED	1	1	1	1	1										1

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CONTENENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

	1						IPHE		TEM	NUNB	ERS				
		1077													
		1077	1071	1019	1080	1081	1083	1083	1084	1085	1085	1087	1088	1089	10
NRC REQUIREMENTS (DESIGNATIONI X = DEFICIENCY)	1														3.51
	i	i -	i -	i .		:	:	:	1	:	:	: .		:	1
1. DOCUMENTED EVIDENCE OF QUALIFICATION ADEQUATE	X	i x	i x	i x	i	i	i x	ix		i x	:	:		:	: .
2. ADECUATE SIMILARITY BETWEEN EQUIPHENT AND	1	1	1	1	1	1	1	1	i	1 .	i			:	: '
TEST SPECIMEN ESTABLISHED	1	1 X	1 1	1	1 .	I X	1	X	X	1 1	i x	i x i	i - 1	i x	i i
3. AGING DEGRADATION EVALUATED ADEQUATELY	1	1	1	1	1	1	1	1	1	1	1	1	X	1	i
ESTADLISHED (IF REQUIRED)	1	1	1	1	1	1	1	1	1	1	1	1 1	1	1	1
5. PROGRAM ESTABLISHED TO IDENTIFY AGING DEGRADATION			1		:	:		1		1	1	1 1	X	1	\$
6. CHITERIA REGARDING AGING SIMULATION SATISFIED (IF REQUIRED)	:			1	1	1					1			1	1
7. CRITERIA REGARDING TEMPERATURE/PRESSURE EXPOSUREI			:	:	:	:	:			5 m				<u>!</u>	1
A PEAK TEMPERATURE ADEQUATE	i .		:	i .	:	:	:				1		2.1	!	:
N PEAK PRESSURE ADEQUATE	1	1	1	i i	i	i .	i			:		: :	1.43	:	:
C DURATION ADEQUATE		i .	1	1	i -	i i	i	i 1	i .	i - 1	i .	; ;			;
D REQUIRED PROFILE ENVELOPED ADEQUATELY	1	£	1	1	1	1	1	1	i .	1	i .	ii		i	i.
F STEAN EXPOSURE (IF REOUIPED) ADEQUATE		1	1	1	1	1	1	1 1	1.1	1	1	i i		i	î.
0. CRITERIA REGARDING SPRAY SATISFIED		1	1	1	1	1	1	1 1	1	1	1	1 1	X	1	Î.
10, CRITERIA REGARDING RADIATION SATISFIFD				1	1	1	1	1 1	1	1	1	1 1		1	1
11. CHITEPIA REGARDING TEST SEQUENCE SATISFIED				<u>!</u>	!	1	1				1	1 1		1	1
12. CRITERIA REGARDING TEST FAILURES OR SEVERE ANOMALIES	1.1			:	:							1 1			1
(IF ANY) SATISFIED			1.1	:	:		: 1					1 1			1
13. CRITERIA REGARDING FUNCTIONAL TESTING SATISFIED				:	:						1.1				:
14. CRITERIA REGARDING INSTRUMENT ACCURACY SATISFIED			i	i	i			1.1			100		•		:
15. TEST DURATION MARGIN (1 HOUR + FUNCTION TIME) SATISFIED				i	1	i							8.13		:
16. CPITERIA REGARDING HARGINS SATISFIED (NUREG-0598, CAT. 1)	1			1	1	1	1	1							i -
NEC QUALIFICATION CATEGORY (DESIGNATIONI X = CATEGORY)															
(DESIGNATIONT & CATEGORT)				1		1	1 1	1 1		1	1 1	1 1	1	1	1
1.A EQUIPMENT QUALIFIED												1 1			1
1.8 EQUIPMENT QUALIFICATION PENDING MODIFICATION-				:											1
11.A FOULPMENT QUALIFICATION NOT ESTABLISHED			x	i .	ix	x									! .
II.B FOULPREAT NOT OUALIFIED						10		•		•					
II.C EQUIPPENT SATISFIES ALL REQUIREMENTS EXCEPT				i	1									1.0	
OUALIFIED LIFE OR REPLACEMENT SCHEDULE JUSTIFIED	1			1	1				1						
Concert Charles Concert Concert	1	1		1	1	1	1	i	i				1		i .
III.B EQUIPMENT NOT IN THE SCOPE OF THE REVIEW	1			1	1 1	1 1	1 1	1	1	1		1	1		i .
				1	1 1	1 1	1	1	1	С. 1		1	1		1
CORRECTIVE ACTION SPECIFIED (DESIGNATION) X * ACTION SPECIFIED) 1								****							
								1	1			1		1	
1. FOULPHENT REPLACEMENT WITH QUALIFIED EQUIPHENT															
2. EQUIPMENT MODIFICATION		1													
3. EGUIFMENT RELOCATION ABOVE THE SUBMERGENCE LEVEL	i	i						;		1		:			
4. RELOCATE OR SHIELD EQUIPHENT FROM RADIATION SOURCE	1	1		1			i	:					1		
5. VERIFY OUALIFICATION BY ADDITIONAL TESTING/ANALYSIS	- 1	1		1	X		i	i	i	i		i			
6. EOUIPHENT RELOCATION TO A MILD ENVIRONMENT	3	1	1	1 1	1	1	1	1	i	i	i	i	i	1	1
7. OUALIFICATION TESTING OF EQUIPMENT IN PROGRESS	. 1	. 1	. 1		1	1	1	1	1	1	1	i	1		
I CHECKED	x 1	X I	XI	X	1	XI	XI	XI	XI	X 1	XI	X 1	XI	XI	X
SCHEDULE FOR COMPLETION OF CORRECTIVE ACTION(S) HAS BEEN PROVIDED	1	1			1	1	1	1	1	1	1	1	1	1	
	1														1.0

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EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

**********************	1	1092	1093	109			1097	INTERNET AVERAGE AND
NRC REQUIREMENTS (DESIGNATION: X * DEFICIENCY)		1		1	1	1	1	1
 DOCUMENTED EVIDENCE OF GUALIFICATION ADEQUATE				***************************************	X	X * * * * * * * * * * * * * * * * * * *	x x x x x x x x x x x x x x x x x x x	-
NHC QUALIFICATION CATEGORY (DESIGNATION: X = CATEGORY) I.A EQUIPMENT QUALIFIED I.B EQUIPMENT QUALIFICATION NOT ESTABLISHED II.A EQUIPMENT QUALIFICATION NOT ESTABLISHED II.B EQUIPMENT NOT QUALIFICATION NOT ESTABLISHED II.C EQUIPMENT SATISFIES ALL REQUIREMENTS EXCEPT QUALIFIED LIFE OF REPLACEMENT SCHEDULE JUSTIFIED III.A EQUIPMENT EXEMPT FRC3 QUALIFICATION III.B EQUIPMENT NOT IN THE SCOPE OF THE REVIEW IV DOCUMENTATION NOT MADE AVAILABLE								
CORRECTIVE ACTION SPECIFIED (DESIGNATIONIX = ACTION SPECIFIED) 1. EQUIPMENT REPLACEMENT WITH QUALIFIED EQUIPMENT	x	x		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1				

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4.3 METHODOLOGY USED BY THE LICENSEE

This section includes observations concerning the Licensee's qualification methodology presented in the response [14] to the NRC SER.

4.3.1 Completeness of Safety-Related Equipment List

Section 3.1 of the NRC SER [13] identified the following concern:

"Cisplay instrumentation which provides information for the reactor operators to aid them in the safe handling of the plant was not specifically identified by the licensee. A complete list of all display instrumentation mentioned in the LOCA and HELB emergency procedures must be provided. Equipment qualification information in the form of summary sheets should be provided for all components of the display instrumentation exposed to harsh environments. Instrumentation which is not considered to be safety related but which is mentioned in the emergency procedure should appear on the list. For these instruments, (1) justification should be provided for not considering the instrument safety related and (2) assurance should be provided that its subsequent failure will not mislead the operator or adversely affect the mitigation of the consequences of the accident. The environmental qualification of post-accident sampling and monitoring and radiation monitoring equipment is closely related to the review of the TMI Lessons-Learned modifications and will be performed in conjunction with that review.

The licensee identified 227 items of equipment which were assessed by the staff. Because Units 1 and 2 are nearly identical, the review can be performed as one. Differences in the units will be identified by a parenthetical expression, with the applicable unit number enclosed."

In response to this concern, the Licensee stated [14]:

"A list of all display instrumentation mentioned in the LOCA and HELB procedures is provided in Attachment 1. This attachment lists the system, equipment component, and component number in alphanumeric sequence for Calvert Cliffs Emergency Operating Procedure-5, Loss of Reactor Coolant and Calvert Cliffs Emergency Operating Procedure-6, Steam Generator Tube Rupture. The instruments used for the Main Steam Line Rupture are the same as those for EOP-5. These instruments are located within a mild environment, i.e., one where the environment will not change under any postulated accident conditions."

It is concluded that the Licensee has provided a satisfactory response to the NRC concern.

4.3.2 Containment Spray System

Section 3.2 of the NRC SER [13] identified the following concern:

"On this basis, the staff has assumed, unless otherwise noted, that the analysis for developing the environmental envelopes for Calvert Cliffs Units 1 and 2, relative to the temperature, pressure, and the containment spray caustics, has been performed in accordance with the requirements stated above. The staff has reviewed the qualification documentation to ensure that the qualification specifications envelope the conditions established by the licensee. During this review, the staff assumed that for plants designed and equipped with an automatic containment spray system which satisfies the single-failure criterion, the main-steam-linebreak (MSLB) environmental conditions are enveloped by the large-break-LOCA environmental conditions. The staff assumed, and requires the licensee to verify, that the containment spray system is not subjected to a disabling single-component failure and therefore satisfies the requirements of Section 4.2.1 of the DOR guidelines.

Equipment submergence has also been addressed where the possibility exists that flooding of equipment may result from HELBs."

In response to this concer., the Licensee stated [14]:

"No credit is taken for the containment spray system in our LOCA and MSLB analyses which are discussed in Section 14.15 of our FSAR."

It is concluded that the Licensee has provided a satisfactory response to the NRC concern.

4.3.3 Environmental Service Conditions

4.3.3.1 Temperature, Pressure, and Humidity Conditions Inside Containment

Section 3.3 of the NRC SER [13] identified the following concern:

"The licensee has provided the results of accident analysis as follows:

	Max Temp (°F)	Max Press (psig)	Humidity (%)
LOCA	276	50	100
MSLB	269	44.5	100

The staff has concluded that the minimum temperature profile for equipment qualification purposes should include a margin to account for high-than-average temperatures in the upper regions of the containment that can exist due to stratification, especially following a postulated MSLB. Use of the steam saturation temperature corresponding to the total building pressure (partial pressure of steam plus partial pressure of

air) versus time will provide an acceptable margin for either a postulated LOCA or MSLB, whichever is controlling, as to potential adverse environmental effects on equipment.

The licensee's specified temperature (service condition) of 276°F does not satisfy the above requirement. A saturation temperature corresponding to the peak profile (296°F peak temperature at 50 psig) should be used instead. The licensee should update his equipment summary tables to reflect this change. If there is any equipment that does not meet the staff position, the licensee must provide either justification that the equipment will perform its intended function under the specified conditions or propose corrective action."

The Licensee responded to the NRC concern as follows [14]:

"We have developed a containment temperature profile which incorporates the 296°F saturation temperature corresponding to the peak pressure defined in our FSAR. We are presently re-assessing the qualification of components subjected to this higher temperature in a manner consistent with DOR Guidelines and NUREG 0588. This effort will be completed by December 31, 1981. This new containment time temperature profile is included as attachment 2."

It appears that the Licensee has not resolved the NRC concern. Since the Licensee is responsible for identifying the environments, the parameters identified by the Licensee have been used in the evaluations contained in this Technical Evaluation Report. These parameters are reproduced in Appendix A.

4.3.3.2 Temperature, Pressure, and Humidity Conditions Outside Containment

Section 3.4 of the NRC SER [13] stated the following:

"The licensee has provided the temperature, pressure, humidity and applicable environment associated with an HELB outside containment. The following areas outside containment have been addressed:

- (1) ECCC pump room (All9)
- (2) Containment recirculation pipe tunnel (A122)
- (3) West penetration room (A221)
- (4) Piping area (A224 and A428)
- (5) Radiation exhaust ventilation equipment room (A225)
- (6) East penetration room (A227)
- (7) Main steam piping penetration (A315)
- (8) East piping penetration room (A316)
- (9) Spent fuel filter room (A328)

The staff has verified that the parameters identified by the licensee for the MSLB are acceptable."



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4.3.3.3 Nuclear Radiation Dose (Inside and Outside Containment)

Section 3.8 of the NRC SER [13] identified the following concern:

"The licensee has provided values for the radiation levels postulated to exist following a LOCA. The application and methodology employed to determine these values were presented to the licensee as part of the NRC staff criteria contained in the DOR guidelines, in NUREG-0588, and in the guidance provided in IEB-79-01B, Supplement 2. Therefore, for this review, the staff has assumed that, unless otherwise noted, the values provided have been determined in accordance with the prescribed criteria. The staff review determined that the values to which equipment was qualified enveloped the requirements identified by the licensee.

The value required by the licensee inside containment is an integrated dose of 1×10^8 rads. This value envelopes the DOR guideline requirements and is therefore acceptable.

A required value outside containment of greater than 10⁻¹ rads has been used by the licensee to specify limiting radiation levels within the ECCS pump room of the auxiliary building. ...is value does not appear to consider the radiation levels influenced by the source term methodology associated with post-LOCA recirculation fluid lines. The licensee must correct this along with the associated equipment summary sheets. The licensee stated that this review is in progress and will be completed by February 1, 1981, and the results submitted to the staff."

In response to this concern, the Licensee stated [14]:

"A discussion of the source term methodology associated with post-LOCA recirculation fluid lines is provided in Attachment 4. This also includes a listing of the equipment doses. The summary sheets have been updated incorporating the calculated doses. The reassessment and re-evaluation of the qualification of components subjected to these doses will be completed by early 1982."

It is concluded that the Licensee has provided a satisfactory response to the NRC concern.

4.3.4 Chemical Spray

Section 3.6 of the NRC SER [13] identified the following concern:

"The licensee's FSAR value for the chemical concentration is 1700 ppm boric acid solution; the exact volume percent used by the vendor for qualification testing is being verified by the licensee. Therefore, for the purpose of this review, the effects of chemical spray will be considered unresolved. The staff will review the licensee's response when it is submitted and discuss the resolution in a supplemental report."

In response to this concern, the Licensee stated [14]:

"The chemical concentration for boric acid solution is being evaluated on the basis of ppm and percent solution by weight. We have received information concerning post LOCA chemistry that recently increases the safety injection tank concentrations to 280 ppm. This is presently being re-evaluated by Bechtel Corporation with scheduled completion by mid-October."

It is concluded that the Licensee has provided a satisfactory response to the NRC concern.

4.3.5 Submergence

Section 3.5 of the NRC SER [13] identified the following concern:

"The maximum submergence levels have been established and assessed by the licensee. Unless otherwise noted, the staff assumed for this review that the methodology employed by the licensee is in accordance with the appropriate criteria as established by Commission Memorandum and Order CLI-80-21.

The licensee's value for maximum submergence is 16 ft 4 in. Equipment below this level has been identified by the licensee, along with the proposed corrective action. The licensee identified five safety-related electrical components for Unit 1 and seven for Unit 2 as having the potential for becoming submerged after a postulated event. As a corrective action, the licensee proposes replacing these components; in some cases, the licensee is considering relocation of the components. The licensee has replaced the components in Unit 1 and has stated that the components in Unit 2 will be replaced before startup from the current outage. Based on its review of the licensee's submittal, the staff concurs with the proposed resolution.

In one instance, the licensee stated that the component in question--a solenoid valve in Unit 2--performs its function in less than 7 seconds, fails closed, and is not required to operate after a LOCA. In this case, the licensee should provide an assessment of the failure modes associated with the submergence of the solenoid valve. The licensee should also provide assurance that the subsequent failure of this component will not adversely affect any other safety functions or mislead an operator. Additionally, the licensee should discuss operating time, across the spectrum of events, in relation to the time of submergence. If the results of the licensee's assessment are acceptable, then the solenoid valve may be exempt from the submergence parameter of qualification.

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It is not clear from the information submitted that submergence of safety-related electrical equipment outside of containment was addressed. The licensee should address this area more specifically in the 90-day response and upgrade the CES as appropriate."

In response to this concern, the Licensee stated [14]:

"We have relocated all of the subject components on both Units 1 and 2 to an elevation above the calculated submergence level with the exception of solencid valve 2SV506. An assessment of the failure modes associated with the submergence of this valve is provided in Attachment 3. The failure modes analysis shows that the subsequent failure of 2SV506 will not adversely affect any other safety function or mislead an operator. Possible submergence of equipment outside the containment is being re-evaluated by Bechtel Corporation with completion expected by mid-October."

It is concluded that the Licensee has provided a satisfactory response to the NRC concern.

4.3.6 Aging and Qualified Life

Section 3.7 of the NRC SER [13] identified the following concern:

"The DOR Guidelines, section 7, does not require a qualified life to be established for all safety related electrical equipment, however the following actions are required:

- Detailed comparison of existing equipment to the materials identified in Appendix C of the DOR guidelines. The first supplement to IEB-79-01B requires the licensees to utilize the table and identify any additional materials as a result of their effort.
- Establish an ongoing program to review surveillance and maintenance records to identify potential age related degradations.
- Establish component maintenance and replacement schedules which include considerations of aging characteristics of the installed components.

The licensee identified a number of equipment items for which a specified qualified life was established (for examples, 5 years, 15 years, or 40 years). In its assessment of these submittals, the staff did not review the adequacy of the methodology nor the basis used to arrive at these values; the staff has assumed that the established values are based on state-of-the-art technology and are acceptable.

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For this review, however, the staff requires that the licensee submit supplemental information to verify and identify the degree of conformance to the above requirements. The response should include all the equipment identified as required to maintain functional operability in harsh environments.

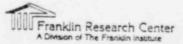
The licensee indicated that this phase of the response is outstanding and that the review is in progress. The staff will review the licensee's response when it is submitted and discuss its evaluation in a supplemental report."

In response to this concern, the Licensee stated [14]:

"We are not making a detailed comparison of the existing equipment and the materials identified in Appendix C of the DOR Guidelines. We have been using data obtained from Wyle Laboratories for evaluation of age sensitive materials. Our previous letter, Reference (d) described this effort and completion date.

A program to review surveillance and maintenance records to identify potential age related degradations will be implemented by June, 1982."

It is concluded that the Licensee has provided a satisfactory response to the NRC concern.



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4.4 EQUIPMENT ENVIRONMENTAL QUALIFICATION EVALUATION

The evaluation presented in this section of the report includes, for each equipment item, completed equipment environmental qualification review checksheets (partially handwritten) which present both the technical information necessary to conduct the review and the results of the evaluation. I EQUIPHENT ENVIRONMENTAL QUALIFICATION I I EQUIPHENT ITEM CHECKSMEET INDEX I I CALVERT CLIFFS 1 I

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ITEM				
10.		MANUFACTURER	MODEL NUMBER	LOCATION
1	SOLE TOTO VALVE	ASCO	WPHTX8320A21V	CONTAINMENT, (C230)
2	SULFNOID VALVE	ASCO	20538138VU	CONTAINMENT, (C230)
3	SOLEUNID VALVE	ASCO	NF 3320A175V	CONTAINMENT, (C230)
4	SOLEBOID VALVE	ASCO	HT8320	ECCS PUNP ROOM, (A118)
5	SOLEFOID VALVE	ASCO	2063815890	EAST PIPING PENETRATION ROOM, (A316
6	SOLENOID VALVE	ASCO	WPHTX8320A21V	CONTAINMENT, (C230)
7	SOLENDID VALVE	ASCO	NP8320A187V	HAIN STEAM PIPING PENETRATION, (A31
9	SULEFOID VALVE	ASCO	NP8320A187V	EAST PIPING PENETRATION ROOM, (A316
9	SOLENGED VALVE	ASCO	2063815RVU	EAST PIPING PENETRATION ROOM, (A316
10	SOLENOID VALVE	TELEDYHE	2111062025253	PIPING AREA (A224)
11	SOLEMOID VALVE	ASCO	NF6316235V	EAST PIPING PENETRATION ROOM, (A316
12	SULFHOID VALVE	ASCO	NP8320A195V	CONTAINMENT (C230)
13 -	SOLEPOID VALVE	ASCO	NP8316E35V	CONTAINMENT (C230)
14	POTORIZED VALVE ACTUATOR	LIMITOROUE	SMBOO	EAST PENETRATION ROOM, (A227)
15	FORTERIZED VALVE ACTUATOR	PRATT	TN20003	EAST PIPING PENETRATION RUOM, (A316
16	FOTOPIZED VALVE ACTUATOR	LIFITORQUE	SMBOO	EAST PIPING PENETRATION ROON, (A116
17	HOTORIZED VALVE ACTUATOR	LINITOROUE	SMB00	EAST PENETRATION ROOM, (A227)
18	MOTORIZED VALVE ACTUATUR	LINITORQUE	SHBOO	EAST PIPING PENETRATION ROOM, (A316
19	HUTOPIZED VALVE ACTUATOR	LIMITOROUE	SMB2	MAIN STEAN PIPING PENETPATION, (A31
20	ROTORIZED VALVE ACTUATOR	LIMITORQUE	5MB2	MAIN STEAM PIPING PENETRATION, (A31
21	POTORIZED VALVE ACTUATOR	LIMITOROUF	S#B1	ECCS PUNP ROOM, (A119)
22	FOTORIZED VALVE ACTUATOR	LIMITORQUE	SHB2	CONTAINMENT RECINCULATION PIPE TUNN
23	HOTORIZED VALVE ACTUATOR	LIMITORQUE	SMBOO	EAST PENETRATION ROOM, (A227)
24	POTOPIZED VALVE ACTUATOR	LIMITORQUE	SHB2	EAST PENETRATION POON, (A227)
25	POTORIZED VALVE ACTUATOR	LINITORQUE	SHBO	ECCS PUNP ROOM, (A118)
26	POTOPIZED VALVE ACTUATOR	I. IMITORQUE	SHAI SIZES 00, 3	CONTAINMENT, (C230)
27	POTURIZED VALVE ACTUATOR	LIMITOROUE	SHB3	CONTAINMENT, (C230)
28	NOTORIZED VALVE ACTUATOR	LIMITOROUE	SPBOO	ECCS PUMP ROOM, (A118)
29	TOFIZED VALVE ACTUATOR	LINITOROUE	SMBOO	ECCS PUMP ROOM, (A118
30	COTOFIZED VALVE ACTUATOR	LINITORQUE	SMB00	CONTAINMENT RECIRCULAT " PIPE TUNN
31	HUNDPIZED VALVE ACTUATOR	LINITORQUE	SMB2	EAST PENETRATION ROOM, (.)
32	HOTORIZED VALVE ACTUATOR	LINITOROUE	54112	CONTAINMENT RECIRCULATION FIFE TUNN
33	FLOW TRANSPITTER	FISCHER AND PORTER	1082495(6)	EAST PIPING PENFTRATION ROOM, (A)18
34	FLOW TRANSHITTER	FISCHER AND PORTER	10H2495(6)	PIPING AREA, (A224)
35	FLOW THANSTITTER	FISCHER AND PURTER	1082495(6)	WEST PENETRATION ROOM, (A221)
37	LEVEL TRADSMITTER	FISCHEP AND PORTER	1302495KPAABCB	CONTAINMENT, (C230)
36	PRESSURE INGICATOR	SIGPA	9222(3)	AUXILIARY FEFOWATER PUMP ROOM, (T60
30	PRISSURF TRANSMITTER	F1: CHER AND PORTER	SOEP1000 SERIES	MAIN STEAM PIPING PENETPATION, (A31
40	PRESSARE TRANSMITTER	FISCHER APD PORTER	SOEP1000 SERIES	CONTAINMENT, (C230)
41	PRESSURE TRANSHITTER	POSEHOUNT	104ABH	CONTAINMENT, (C230)
42	IL'CTRICAL PENETRATION	FISCHER AND PORTER	SOEP1000 SERIES	CONTAINMENT, (C230)
13	FLECTHIC MOTOR	ANCHENOL CETERAL ELECTRIC	205033	CONTAINMENT, (C230)
44	LIFCTPIC ROTOR	GEFERAL ELECTRIC	580110524108	FCCS PUMP ROOM, (A118)
45	ILL CTFIC MOTOP	RELIANCE ELECTRIC GEBERAL ELECTRIC	P14G40BNFV	ECCS PHMP ROOM, (A119)
46	FIFCTERC NOTOR	EFLIANCE ELECTRIC	5K811052C34	ECCS PUMP ROOM, (A119)
47	FLICTRIC POTOR	ALLIS CHALPERS	X323727A1AH 911, FR504005	CONTAINMENT, (C230)
48	LECTEIC MOTOR	GETELAL ELECTRIC	56811052034	FCCS PUNP ROON, (A118)
49	ELECTLIC MOTOR	FELIANCE ELECTRIC	11011037034	ECCS PUMP RODH, (A118)

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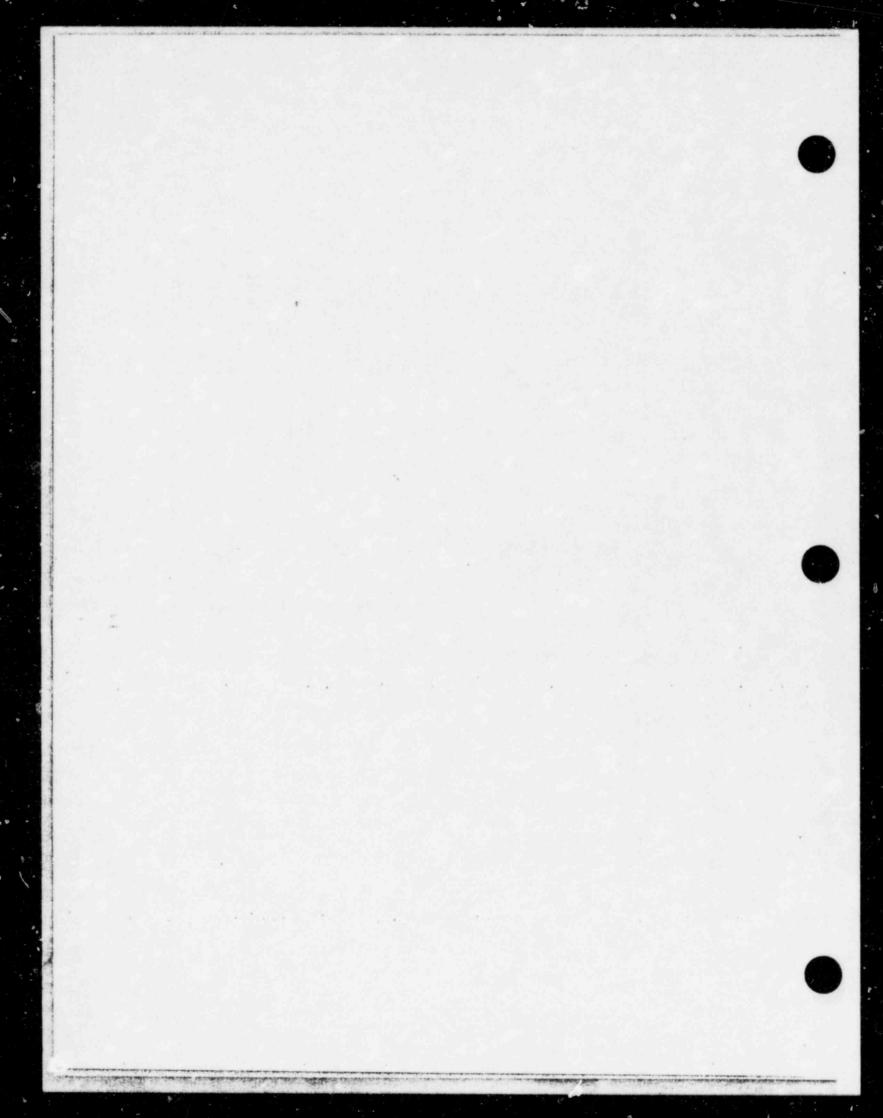
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NO.	CONFORENT	PAPHFACTUPER	HODFL NURBER	LOCATION
50	FLECTRIC POTOR			
		JOINSON CONTPOLS	RPSACA3	ECCS PUNP ROON, (A119)
51	RAPIATION DETECTOR	VESTINCHOUSE.	#123796	CONTAINMENT, (C230)
52	PANIATION MONITOR	WESTINGHOUSE	1101	CONTAINMENT, (C230)
53	LADIATION DETECTOR	REUTER-STOKES	N2827	CONTAINMENT, (C230
54	APPLIFIEP	GENERAL ATCHIC	PAGA	CUNTAINMENT, (C230)
55	FLECTPIC PEATER	FETINGHOUSE	EHRS	CONTAINMENT, (C230)
56	ELECTRICAL CONNECTOR	FINGS	KH5905	CUNTAINMENT, (C230)
57	ELECTRICAL CONNECTOR	ITT CANNON	19457	CONTAINMENT, (C230)
58	TERPINAL BLOCK	PARATHON	1600 SERIES	CUNTAINMENT, (C230)
59'	TERNINAL BLOCK	<i>LESTINGHOUSE</i>	542247	CONTAINMENT, (C230)
60	TERFILLS BLOCK	WEIPHULLER	SAK	HAIN STEAM PIPING PENETRATION, (A31
61	TERMINAL BLOCK	EUCHANAN	8112	CONTAINMENT, (C230)
to 2	TEMMINAL PLOCK	WEIDINLLER	SAX	CONTAINMENT, (C230)
63	TERMINAL BLOCK	IDFFRAN	F8848	CONTAINMENT, (C230)
64	TEPHINAL PLOCK	HOFFMAN	i +424	CONTAINMENT, (C230)
65	TEFFICAL PLOCK	FIELD	ND	CONTAINMENT, (C230)
66	TERPINAL LUG	AND	34000 SERIES	CONTAINMENT, (C230)
67	TEREINAL LUG	THUMAS AND BETTS	53000 SERIES	CONTAINHENT, (C230)
68	FLICTRICAL CUNNECTOR	PENDIX	39021	CONTAINMENT, (C230)
69	ELECTRICAL CONNECTOR	ANDHENOL	123201004	CONTAINMENT, (C230)
70	ELECTRICAL CONNECTOR	AMPHENOL	30576A	CONTAINMENT, (C230)
71	FLECTRICAL CONDECTOR	AFPHENOL	27975	CONTAINMENT, (C730)
72	FIFCTRICAL CONNECTOR	ARPHENOL	53100	CONTAINMENT, (C230)
1.1	FLECTPICAL CAPLE	ANACONDA WIRE AND CABLE	EPR/CPE	CONTATUMENT, (C230)
74	FI.S.CTRICAL CARLE	CEFRO WIRE AND CABLE	XLPE/NEOPRENE	CONTAINMENT, (C230)
75	FLECTHICAL CABLE	CFERD WIFE AND CABLE	STLICONE RUBBER/ASBESTOS HR.	CONTAINMENT, (C230)
76	FLECTPICAL CABLE	COPTIMENTAL VINE	SILICONE RUNBER/ASAESTOS BR.	CONTAINMENT, (C230)
77	FILCIRICAL CABLE	GOSTON INSULATED NIRE	XLPE/XLPE	CONTAINMENT, (C230)
78	FLECTRICAL CARLE	PAYCHEN	POLYMER AND XLPE/XLPE	CONTAINMENT, (C230)
79	ELECTRICAL CARLE	HAYCHEN	COAXIAL/XLP	
80	FLECTRICAL CARLE	CONTINENTAL WIRE	XLPE/PVC	CONTAINHERT, (C230)
81	FLECTRICAL CABLE	OFORITE	EPR/OKOLON	CONTAINMENT, (C230)
82	FLECTRICAL CARLE	RUCKIFSTOS		CUNTAINMENT, (C230)
83	LI.S.CTRICAL CARLE	ROCKBESTOS	STLICONE RUBBER/ASBESTOS BR.	CONTAINMENT, (C230)
84	FLECTRICAL CABLE		XLPE/NEOPRENE	CONTAINMENT, (C230)
85	FLECTHICAL CABLE	ROSTON INSULATED WIRE	INDUSTRITE - HYPALON/HYPALON	CONTAINMENT, (C230)
86	FLACTRIAL CARLE	ROSTON INSULATED NIPE	SILICONE RUBBER (EQUIVILENT)/H	
87	ELECTI CABLE	POSTUN INSULATED WIPE	XLPE/HYP	CONTAINMENT, ((230)
88	FLECTRICAL CAPLE	FRITE	HTK/FR	CONTAINMENT, ((230)
89		FISCPHACH HATFIELD	SILICOPE RUBBER/ASRESTOS BR.	CONTAINMENT, (C230)
	LLECTRICAL CABLE	ANACONDA WIRE AND CABLE	EPR/HYPALON	CONTAINMENT, (C230)
90	ELECTRICAL CARLE	CENFRAL FLECTRIC	SILICONE RUGBER/ASBESTOS BR.	CONTAINMENT, (C230)
91	ILECTRICAL CARLE	KPP (TF	HTK/HTFS	CONTAINMENT, (C236)
92	LUCTHICAL CABLE	TINES FIRE AND CABLE	PVC	CONTAINMENT, (C230)
93	FLICTRICAL CARLE	CONTINENTAL NILE	SILICONE RUBBER/GLASS BR.	CONTAINMENT, (C230)
	FLECTRIC HOTOR	GEAFRAL ELECTRIC	FJF	EAST PIPING PENETRATION ROOM, (A316
95	SOLFFOID VALVE	DRACAN	10222	WEST PENETRATION ROOM, (A229)
96	SHENDID VALVE	LRACOP .	10222	CONTAINMENT, (C230)
97	FLECTRICAL CARLE	CELERI FIFE ALD CANLE	SILICOPE RUBBER/ASBESTOS BR.	CONTAINNENT, (C230)



NRC Contract No. NRC-03-79-118 Franklin Research Center FRC Project No. C5257 A Division of The Franklin Institute FRC Assignment No. 13 20th and Race Streets. Phila . Pa 19103 (215) 448-10:00 FRC Task No. 487 EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO.

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EOUIPMENT ITEM NO. 1 SOLENOID VALVE LOCATED IN CONTAINMENT (C230) ASCO MODEL WPHTX8320A21V REQUIRED OPERATING TIME: 1 HOUR TER CHECKSHEET NO. 1 LICENSEE REFERENCE(S): 4026, 28, 27 FUNCTION (PLANT ID): RCP, BLEED OFF ISOLATION 1CV506 (1SV506) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 10 FUNCTION (PLANT ID): LETDOWN LINE ISOLATION 1CV516 & 1CV515 (1SV516, 1SV515) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 9, 8 FUNCTION (PLANT ID): CONTAINMENT SPRAY HEADER ISOLATION 1CV4150 & 1CV4151 (1SV4150, 1SV4151) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 181, 182 FUNCTION (PLANT ID): SI TANK VENTS (1SV623, 1SV613, 1SV643, 1SV633) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 225, 222, 231, 228

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY: (See Section 3 of this TER for Legend)

R, T, QT, (RT,) P, H, CS, (A,)(S,) (R), M, I, UM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksnee Page No.
Equipment Item	la
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, 3b, 3c, 3d -
System Consideration Review	4a, 4b, 4c, 4d, 4e, 4f
Equipment Environmental Qualification Review	-5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j
Installed TMI Lessons Learned Implementation Equipment Summary	6a, 6b

7a, 70, 7e

Maintenance and Replacement Schedule Summary

UIPMENT ENVIRONMENTAL QUALIFICA		Ib
	ATION REVIEW OF EQUIPMENT ITEM	NO. 1
MARY OF LICENSEE RESPONSES TO THE NI	RC SER - ONLY CHECKED ITEMS ARE AP	PLICABLE:
_ The Licensee (has/based) provided	d a response to the SER concerns.	
The Licensee (has/has not) specific qualified and/or will function when environmental service conditions.	cally stated that the equipment is n exposed to the applicable DBE	
The Licensee has presented informat outstanding qualification deficience	tion which shows there are no cies.	
The Licensee (has not) proposed item whose qualification has not be	d a corrective action for this equi een fully established.	Ipment
Justification for interim opera Licensee for this equipment ite	ation (has/has not) been provided b em.	by the
Corrective action specified by	the Licensee:	
Equipment replacement with Equipment modification Equipment relocation above Relocate or shield equipmen	submergence level	
Verify qualification by add Equipment relocation to a m Qualification testing of eq Other (ditional (testing/analysis) mild environment	,
The Licensee has provided other that can be construed as a basi operation.	r information for this equipment it is for justification for interim	em
corrective action. (Schedule f	vided a schedule for the proposed for accomplishing the corrective	,
The Licensee states that the equipm and/or should be exempted from envi	ment item does not require qualific	
SIGNATION OF RESULTANT NRC QUALIFICAT CIRCLED ITEM CALY: (See Section 3 of	TION EVALUATION CATEGORY BASED ON R this TER for Legend)	EVIEW
a Qualified Modification	II.c Qualified Life Deficiency III.a Exempt	
.a) Qualification Not Established .b Not Qualified	III.b Not in Scope IV Documentation Not Available	

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Franklin Research Center A Division of The Franklin Institute 20th and Race Streets. Phila., Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487</u>/488

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 1

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

DESIGNATION: NRC REQUIREMENTS X = DEFICIENCY Documented Evidence of Qualification Adequate Adequate Similarity Between Equipment and Test Specimen Established Aging Degradation Evaluated Adequately Qualified Life or Replacement Schedule Established (If Required) Program Established to Identify Aging Degradation Criteria Regarding Aging Simulation Satisfied (If Required) Criteria Regarding Temperature/Pressure Exposure: o Peak Temperature Adequate o Peak Pressure Adequate o Duration Adequate o Required Profile Enveloped Adequately o Steam Exposure (If Required) Adequate Criteria Regarding Spray Satisfied Criteria Regarding Submergence Satisfied Criteria Regarding Radiation Satisfied Criteria Regarding Test Sequence Satisfied Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied Criteria Regarding Functional Testing Satisfied Criteria Regarding Instrument Accuracy Satisfied Test Duration Margin (1 hour + Function Time) Satisfied Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)

NRC QUALIFICATION CATEGORY

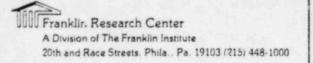
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DESIGNATION: X = CATEGORY

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I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	X
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.D	Equipment Not in the Scope of the Qual'fication Review	
vı	Documentation Not Made Available	



NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/488</u>

Page 3c

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 1

LICENSEE RESPONSE TO NRC SER

 The qualification test report referenced in the computer printout specifies a demonstrated life of 4.4 years.

 Issued letter dated 7/32/81 to Fate Engineering Co. requesting additional verification of materials for the listed solenoid valves. We expect to receive the necessary information and anticipate resolution by the end of this year.

14. An assessment of the failure modes associated with this device is found in Attachment 3.

NRC Contract No. NRC-03-79-118 Franklin Research Center FRC Project No. C5257 Page Di sion of The Franklin Institute FRC Assignment No, 13 5f Uth and Race Streets. Phila. Pa. 19103 (215) 448-1000 FRC Task No. 487/488 EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 1 NOTES: Reprences 27 and 28 are Detters from Engineering, Onc. containing informa and solenno radiation value coil regarding resistance. The Octlere state Æ at ASCO irradiated class A F H colo has 0 200 Mrd The laboratories. allow state ment 27: ASCO in referen ma " It appears that the weakest link in the coil is the lead wire connection to the magnet wire. Different lead wire is used depending on the class of coil. cordingly, based on the type of lead wire utilized in our coils, Class A coils can be irradiated to 50 million rads, Class B and Class F coils can be irradiated to 100 million rads, and Class M coils can be irradiated to 200 million rads and still be servicable rated that no test Data was rave and the second of the second second

NRC Contract No. NRC-03-79-118 Page Franklin Research Center FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 487/488 A Division of The Franklin Institute 59 20th and Race Streets. Phila . Pa 19103 (215) 448-1000

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO.

NOTES: Relance 4026 mory TU toot 207 Macone anal Д 2020 mode 50 0 nea or WPHT8300B61YF and more. WPHTX 8320A21V am Q model more. SL3 and NAMCO switches Dimit EA-740 The equipment to steam was subsecte (310 chemical • F 6% boric (05 psig; Apro evenure 23 acid solution Nalu testing alt Qu 00 000 et. 270 m mal then thata me was 0 0 a an Honorabout mat Q ramet 0 00000 TOPOT 100 - 100 - 10 - 100 - 10 - 5

A Division of The Franklin Institute 20th and Race Streets. Phila . Pa. 19103 (215) 448-1000	EDC Apploamentally 10	age I a
EQUIPMENT ENVIRONMENTAL QUALIFIC	ATION REVIEW OF EQUIPMENT ITEM NO.	2
EQUIPMENT ITEM NO. 2 SOLENOID VALVE LOCATED IN CONTAINMENT ASCO MODEL 2063813RVU REQUIRED OPERATING TIME: 1 HOUR TER CHECKSHEET NO. 2 LICENSEE REFERENCE(S): 712 FUNCTION (PLANT ID): CHECK VALVE LEAK, 1SV638, 1SV648) LICENSEE SUBMITTAL: SCEW(S) [1, 12]:	AGE DRAIN TO RWT (1SV618, 1SV628,	
DESIGNATION FOR DEFICIENCY IDENTIFIED (See Section 3 of this TER for Legend)	BY THE NRC SER - CIRCLED ITEM(S) ONLY:	
(See Section 3 of this TER for Legend)		
DESIGNATION FOR DEFICIENCY IDENTIFIED (See Section 3 of this TER for Legend) R, T, QT, RT, P, H, S, A, S, (R), M, Not stated, Not applicable		
(See Section 3 of this TER for Legend) R, T, QT, RT, P, H, S, A, S, (R), M, Not stated, Not applicable		
(See Section 3 of this TER for Legend) R, T, QT, RT, P, H, CS, A, S, (R), M,	I, QM, RPN, EXN, SEN, QI, RPS, None,	
(See Section 3 of this TER for Legend) R, T, QT, RT, P, H, S, A, S, (R), M, Not stated, Not applicable <u>LISTING OF APPLICABLE CHECKSHEETS</u> : <u>Contents</u>	I, QM, RPN, EXN, SEN, QI, RPS, None, Checksheet Page No.	
(See Section 3 of this TER for Legend) R, T, QT, RT, P, H, S, A, S, (R), M, Not stated, Not applicable <u>LISTING OF APPLICABLE CHECKSHEETS</u> : <u>Contents</u> Equipment Item	I, QM, RPN, EXN, SEN, QI, RPS, None, Checksheet Page No. la	
(See Section 3 of this TER for Legend) R, T, QT, RT, P, H, S, A, S, (R), M, Not stated, Not applicable <u>LISTING OF APPLICABLE CHECKSHEETS</u> : <u>Contents</u> Equipment Item Summary of Licensee Responses to the N	I, QM, RPN, EXN, SEN, QI, RPS, None, <u>Checksheet Page No.</u> la IRC SER lb	
(See Section 3 of this TER for Legend) R, T, QT, RT, P, H, S, A, S, (R), M, Not stated, Not applicable <u>LISTING OF APPLICABLE CHECKSHEETS</u> : <u>Contents</u> Equipment Item Summary of Licensee Responses to the N Equipment Environmental Qualification	I, QM, RPN, EXN, SEN, QI, RPS, None, <u>Checksheet Page No.</u> la IRC SER lb Summary Forms 2	
(See Section 3 of this TER for Legend) R, T, QT, RT, P, H, S, A, S, (R), M, Not stated, Not applicable <u>LISTING OF APPLICABLE CHECKSHEETS</u> : <u>Contents</u> Equipment Item Summary of Licensee Responses to the N Equipment Environmental Qualification Licensee Response to NRC SER	I, QM, RPN, EXN, SEN, QI, RPS, None, <u>Checksheet Page No.</u> la IRC SER 1b Summary Forms 2 3a, 3 b, 3c, 3d	
(See Section 3 of this TER for Legend) R, T, QT, RT, P, H, S, A, S, (R), M, Not stated, Not applicable <u>LISTING OF APPLICABLE CHECKSHEETS</u> : <u>Contents</u> Equipment Item Summary of Licensee Responses to the N Equipment Environmental Qualification	I, QM, RPN, EXN, SEN, QI, RPS, None, Checksheet Page No. la IRC SER Ib Summary Forms 2 3a, 3 b, 3c, 3d 4a, 4b, 4c, 4d, 4e, 4f	
(See Section 3 of this TER for Legend) R, T, QT, RT, P, H, S, A, S, (R), M, Not stated, Not applicable <u>LISTING OF APPLICABLE CHECKSHEETS</u> : <u>Contents</u> Equipment Item Summary of Licensee Responses to the N Equipment Environmental Qualification Licensee Response to NRC SER System Consideration Review	I, QM, RPN, EXN, SEN, QI, RPS, None, Checksheet Page No. la la lRC SER lb Summary Forms 2 3a, $3b$, $3c$, $3d$ 4a, $4b$, $4c$, $4d$, $4e$, $4fReview 5a, 5b, 5c, 5d, 5e, 5f,5g$, $5h$, $5i$, $5j$.	

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A Division of The Franklin Institute 20th and Race Streets. Phila. Pa 19103 (215) 448-1000	NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/488</u>	Page 1b
UIPMENT ENVIRONMENTAL QUALIFIC	ATION REVIEW OF EQUIPMENT ITEN	1 NO. 2
UMMARY OF LICENSEE RESPONSES TO THE I	NRC SER - ONLY CHECKED ITEMS ARE AN	PLICABLE
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	ically stated that the equipment is	•
The Licensee has presented information deficier	ation which shows there are no noise.	
The Licensee (has/has not) propose item whose qualification has not b	ed a corrective action for this equ been fully established.	ipment
Justification for interim oper Licensee for this equipment it	ation (has/has not) been provided	by the
Corrective action specified by	the Licensee:	
Equipment replacement with Equipment modification Equipment relocation above Relocate or shield equipme Verify qualification by ad Equipment relocation to a Qualification testing of e Other (submergence level nt from radiation source ditional (testing/analysis) mild environment	,
The Licensee has provided othe that can be construed as a bas operation.	r information for this equipment is for justification for interim	tem
The Licensee (has/has not) pro- corrective action. (Schedule action	vided a schedule for the proposed for accomplishing the corrective	
The Licensee states that the equip and/or should be exempted from env.	ment item does not require qualific ironmental qualification.	cation
SIGNATION OF RESULTANT NRC QUALIFICA CIRCLED ITEM ONLY: (See Section 3 of	TION EVALUATION CATEGORY BASED ON S	REVIEW
Qualified Modification a Qualification Not Established b Not Qualified	II.c Qualified Life Deficiency III.a Exempt III.b Not in Scope IV Documentation Not Available	
a Qualification Not Established .b Not Qualified	III.b Not in Scope	

Franklin Research Center A Division of The Franklin Institute 20th and Race Streets, Phila., Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/488</u>

Page 2

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 2

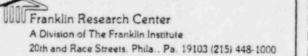
EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

DESIGNATION: X = DEFICIENCY NRC REQUIREMENTS Documented Evidence of Qualification Adequate Adequate Similarity Letween Equipment and Test Specimen Established Aging Degradation Evaluated Adequately Qualified Life or Leplacement Schedule Established (If Required) Program Established to Identify Aging Degradation Criteria Regarding Aging Simulation Satisfied (If Required) Criteria Regarding Temperature/Pressure Exposure: o Peak Temperature Adequate o Peak Pressure Adequate o Duration Adequate o Required Profile Enveloped Adequately o Steam Exposure (If Required) Adequate Criteria Regarding Spray Satisfied Criteria Regarding Submergence Satisfied Criteria Regarding Radiation Satisfied Criteria Regarding Test Sequence Satisfied Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied Criteria Regarding Functional Testing Satisfied Criteria Regarding Instrument Accuracy Satisfied Test Duration Margin (1 hour + Function Time) Satisfied Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)

NRC QUALIFICATION CATEGORY

DESIGNATION: X = CATEGORY

I.a	Equipment Qualified	X
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life	
	or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.D	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	



NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/488</u>

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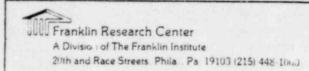
EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 2

LICENSEE RESPONSE TO NRC SER

- The qualification test report referenced in the computer printout specifies a demonstrated life of 4.4 years.
- The LOCA simulation test conducted by ASCO included a chemical spray consisting of 3000 ppm Boron as boric acid. The maximum concentration of boric acid injected into the containment during the postulated accident is expected to be 2000 ppm.

A Division of The Franklin Institute 20m and Race Streets. Phila. Pa. 19103 (215) 448-1000	NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 487 488	Page 5
EQUIPMENT ENVIRONMENTAL QUALIFIC	CATION REVIEW OF EQUIPMENT ITE	M NO2
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Checksheets 5a thru 5f	have been removed due to the	
proprietary nature of information con		
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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 3

EQUIPMENT ITEM NO. 3 SOLENOID VALVE LOCATED IN CONTAINMENT (C230) ASCO MODEL NF8320A175V REQUIRED OPERATING TIME: 1 HOUR TER CHECKSHEET NO. 3 LICENSEE REFERENCE(S): 712 FUNCTION (PLANT ID): RECIRCULATION RETURN LINE DRAIN (1SV661) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 219 FUNCTION (PLANT ID): SI TANK FILL & DRAIN (1SV621, 1SV611, 1SV641, 1SV631) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 223, 220, 229, 226

DESIG	INATION	FOI	R DI	EFICIE	ENCY	IDE	NTIFIED	BY	THE	NRC	SER	-	CIRCLED	ITEM(S)	ONLY:
(See	Section	1 3	of	this	TER	fo:	Legend)								

R, T, QT, RT, P, H, (CS)(A,) S, (R), M, I, UM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHFCKSHEETS:

concencs	Checksheet Page No.
Equipment Item	la
Summary of Licensee Responses to the NRC S	ER 15
Equipment Environmental Qualification Summ	ary Forms 2
Licensee Response to NRC SER	3a, 3b, 3c, 3d -
System Consideration Review	4a, 4b, 4e, 4d, 4e, 4£
Equipment Environmental Qualification Revi	ew <u>-5a, 5b, 5c, 5d, 5e, 5f,</u> 5g, 5h, 5i, 5j,
Installed TMI Lessons Learned Implementati Equipment Summary	on -5a, 6b
Maintenance and Replacement Schedule Summa	ry 7a, 7b, 7c-

A Division of The Franklin Institute 20th and Race Streets. Phila. Pa 19103 (215) 448-1000	NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/488</u>	Page 1b
UIPMENT ENVIRONMENTAL QUALIFIC	CATION REVIEW OF EQUIPMENT ITEM	NO. <u>3</u>
UMMARY OF LICENSEE RESPONSES TO THE D		PLICABLE:
The Licensee (has/has not) specifiqualified and/or will function whe environmental service conditions.	ically stated that the equipment is en exposed to the applicable DBE	
The Licensee has presented information outstanding qualification deficient	ation which shows there are no ncies.	
The Licensee (has/has not) propose item whose qualification has not b	ed a corrective action for this equipeen fully established.	ipment
Justification for interim oper Licensee for this equipment it	ration (has/has not) been provided h tem.	by the
Corrective action specified by	the Licensee:	
Equipment replacement with Equipment modification Equipment relocation above Relocate or shield equipme Verify qualification by ad Equipment relocation to a Qualification testing of e Other (e submergence level ent from radiation source dditional (testing/analysis) mild environment	1
The Licensee has provided othe that can be construed as a bas operation.	er information for this equipment it his for justification for interim	:en
The Licensee (has/has not) pro corrective action. (Schedule action	ovided a schedule for the proposed for accomplishing the corrective	,
The Licensee states that the equip and/or should be exempted from env	ment item does not require qualific rironmental qualification.	ation
CIRCLED ITEM ONLY: (See Section 3 o	TION EVALUATION CATEGORY BASED ON R	EVIEW
a) Qualified b) Modification L.a Qualification Not Established L.b Not Qualified	II.c Qualified Life Deficiency III.a Exempt III.b Not in Scope IV Documentation Not Available	

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A Division of The Franklin Institute 20th and Race Streets. Phila., Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/488</u>

Page 2

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 3

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

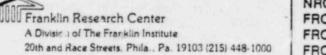
DESIGNATION: X = DEFICIENCY NRC REQUIREMENTS Documented Evidence of Qualification Adequate Adequate Similarity Between Equipment and Test Specimen Established Aging Degradation Evaluated Adequately Qualified Life or Replacement Schedule Established (If Required) Program Established to Identify Aging Degradation Criteria Regarding Aging Simulation Satisfied (If Required) Criteria Regarding Temperature/Pressure Exposure: o Peak Temperature Adequate o Peak Pressure Adequate o Duration Adequate o Required Profile Enveloped Adequately o Steam Exposure (If Required) Adequate Criteria Regarding Spray Satisfied Criteria Regarding Submergence Satisfied Criteria Regarding Radiation Satisfied Criteria Regarding Test Sequence Satisfied Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied Criteria Regarding Functional Testing Satisfied Criteria Regarding Instrument Accuracy Satisfied Test Duration Margin (1 hour + Function Time) Satisfied Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)

NRC QUALIFICATION CATEGORY

DESIGNATION: X = CATEGORY

I.a	Equipment Qualified	X
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life	
	or Replacement Schedule Justified	1 Carlot
III.a	Equipment Exempt From Qualification	
III.D	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

See equipment item no. 2 for Detailed evaluation.



NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/488</u>

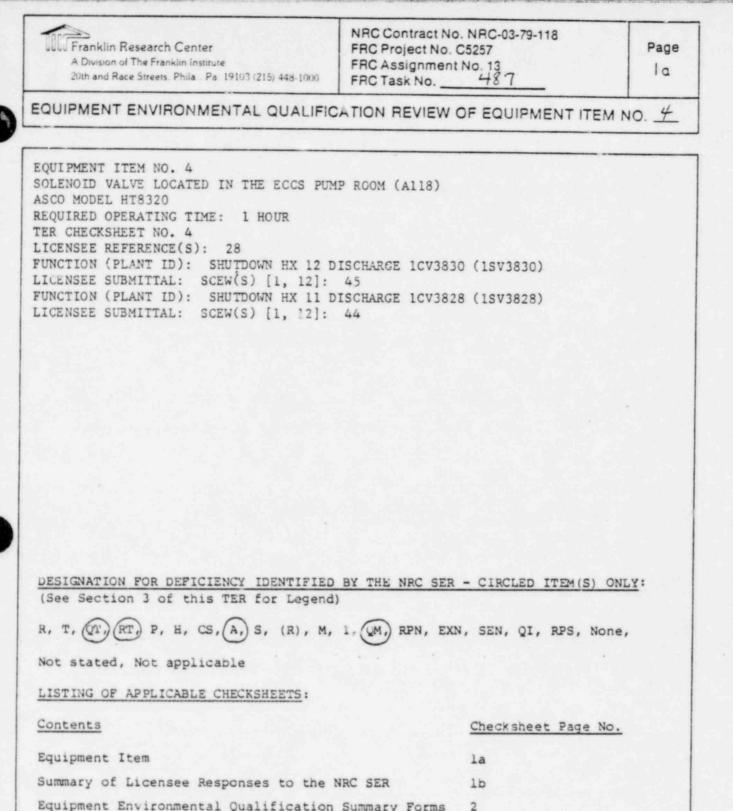
Page

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 3

LICENSEE RESPONSE TO NRC SER

- The qualification test report referenced in the computer printout specifies a demonstrated life of 4.4 years.
- The LOCA simulation test conducted by ASCO included a chemical spray consisting of 3000 ppm Boron as boric acid. The maximum concentration of boric acid injected into the containment during the postulated accident is expected to be 2800 ppm.



Equipment Environmental Qualification Summary Forms

Licensee Response to NRC SER

System Consideration Review

Equipment Environmental Qualification Review

Installed TMI Lessons Learned Implementation Equipment Summary

Maintenance and Replacement Schedule Summary

7a, 70, 7c

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3a, 3b, 3c, 3d

5g, 5h, 51, 5j-

4b, 40, 4d, 40, 4E-

-5a, 5b, 5c, 5d, 5e, 5f,

A Division of The Franklin Institute 20th and Race Streets. Phila. Pa 19103 (215) 448-1000	NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/488</u>	Page 1b
UIPMENT ENVIRONMENTAL QUALIFIC	ATION REVIEW OF EQUIPMENT ITEN	и NO. <u>4</u>
IMMARY OF LICENSEE RESPONSES TO THE 1	NRC SER - ONLY CHECKED ITEMS ARE A	PPLICABLE
The Licensee (has/ see not) provide	ed a response to the SER concerns.	
The Licensee (has/has not) specifi qualified and/or will function whe environmental service conditions.	ically stated that the equipment is an exposed to the applicable DBE	5
The Licensee has presented information outstanding qualification deficier	ation which shows there are no ncies.	
The Licensee (has/has not) propose item whose qualification has not b	ed a corrective action for this equipeen fully established.	ipment
Justification for interim oper Licensee for this equipment it	ation (has/has not) been provided	by the
Corrective action specified by	the Licensee:	
Equipment replacement with Equipment modification Equipment relocation above Relocate or shield equipme	submergence level	
Equipment relocation to a	ditional (testing/analysis) mild environment	
Qualification testing of e Other (quipment in progress)
The Licensee has provided othe that can be construed as a bas operation.	r information for this equipment i is for justification for interim	tem
The Licensee (has/has not) pro corrective action. (Schedule action	vided a schedule for the proposed for accomplishing the corrective	.)
The Licensee states that the equip and/or should be exempted from env	ment item does not require qualifi ironmental qualification.	cation
SIGNATION OF RESULTANT NRC QUALIFICA CIRCLED ITEM ONLY: (See Section 3 o	TION EVALUATION CATEGORY BASED ON f this TER for Legend)	REVIEW
A Qualified Modification	II.c Qualified Life Deficiency III.a Exempt	
a) Qualification Not Established b Not Qualified	III.b Not in Scope IV Documentation Not Available	e

A Division of The Franklin Institute 20th and Race Streets, Phila., Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/488</u>

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 4

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION: X = DEFICIENCY

Documented Evidence of Qualification Adequate Adequate Similarity Between Equipment and Test Specimen Established Aging Degradation Evaluated Adequately Qualified Life or Replacement Schedule Established (If Required) Program Established to Identify Aging Degradation Criteria Regarding Aging Simulation Satisfied (If Required) Criteria Regarding Temperature/Pressure Exposure: o Peak Temperature Adequate o Peak Pressure Adequate o Duration Adequate o Required Profile Enveloped Adequately o Steam Exposure (If Required) Adequate Criteria Regarding Spray Satisfied Criteria Regarding Submergence Satisfied Criteria Regarding Radiation Satisfied Criteria Regarding Test Sequence Satisfied Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied Criteria Regarding Functional Testing Satisfied Criteria Regarding Instrument Accuracy Satisfied Test Duration Margin (1 hour + Function Time) Satisfied Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)

NRC QUALIFICATION CATEGORY

DESIGNATION: X = CATEGORY

I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	_X_
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life	
	or Replacement Schedule Justifled	
III.a	Equipment Exempt From Qualification	
III.D	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

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A Division of The Franklin Institute 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000	NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487</u> /488	Page 3a
QUIPMENT ENVIRONMENTAL QUALIFIC	CATION REVIEW OF EQUIPMENT ITE	M NO. 4
LICENSEE RES	SPONSE TO NRC SER	
6. These components are within the	e scope of our present assessment (
action plan is not anticipated	on of the activity with subsequent until the end of this year or first	
-quarter of next.		
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NRC Contract No. NRC-03-79-118 Franklin Research Center FRC Project No. C5257 Page D. son of The Franklin Institute FRC Assignment No. 13, 5f Uth and Race Streets, Phila., Pa. 19103 (215) 448-1000 FRC Task No. 487 /488 EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 4 NOTES: References 27 and 28 are Detters prom Emaineoning, Onc, containing in Tata and solomna value Quation reaistance. Octters ota ASCO as irradiated class 4 H con 200 Mrd laboratories. The Pollowing statement wo ASCO in reference 27: made ly " It appears that the weakest link in the coil is the lead wire connection to the magnet wire. Different lead wire is used depending on the class of coil. Accordingly, based on the type of lead wire utilized in our coils, Class A coils can be irradiated to 50 million rads, Class B and Class F coils can be irradiated to 100 million rads, and Class H coils can be irradiated to 200 million rads and still be servicable sour stad test on tak aston si ta recente

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Franklin Research Center A Division of The Franklin Institute 20th and Race Streets. Phila. Pa 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 487

Page

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 5

EQUIPMENT ITEM NO. 5 SOLENOID VALVE LOCATED IN THE EAST PIPING PENETRATION ROOM (A316) ASCO MODEL 2063815RVU REQUIRED OPERATING TIME: 1 HOUR TER CHECKSHEET NO. 5 LICENSEE REFERENCE(S): 712 FUNCTION (PLANT ID): CONTAINMENT COOLER 13 SUPPLY 1CV1589 (1SV1589) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 43 FUNCTION (PLANT ID): CONTAINMENT COOLER 11 SUPPLY 1CV1581 (1SV1581) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 42 FUNCTION (PLANT ID): CONTAINMENT COOLING COIL 13 DISCHARGE 1CV1590 (1SV1590) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 41 FUNCTION (PLANT ID): CONTAINMENT COOLING COIL 11 DISCHARGE 1CV1582 (1SV1582) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 40

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY: (See Section 3 of this TER for Legend)

(RT,)(P, (H,) CS, (A,)S, (R), M, I, (M, (RPN,) EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents

Equipment Item

Summary of Licensee Responses to the NRC SER Equipment Environmental Qualification Summary Forms Licensee Response to NRC SER System Consideration Review

Equipment Environmental Qualification Review

Installed TMI Lessons Learned Implementation Equipment Summary

Maintenance and Replacement Schedule Summary

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Checksheet Page No. 1a 1b 2 3a, 3b, 3a, 3d 4a, 4b, 4c, 4d, 4e, 4f 5a, 5b, 5a, 5d, 5e, 5f, 5g, 5h, 5i, 5j 6a, 6b

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A Division of The Franklin Institute 20th and Race Streets. Phila Pa 19103 (215) 448-1000	NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/488</u>	Page 1b
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Franklin Research Center A Division of The Franklin Institute 20th and Race Streets. Phila., Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/488</u>

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 5

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION: X = DEFICIENCY

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Documented Evidence of Qualification Adequate	
Adequate Similarity Between Equipment and Test Specimen Established	
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Required)	
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	_
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	_
Criteria Regarding Test Failures or Severe Anomalies	
(If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	-
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY

DESIGNATION: X = CATEGORY

I.a	Equipment Qualified	X
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.D	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

See equipment item mo. 2 for detailed evaluation.

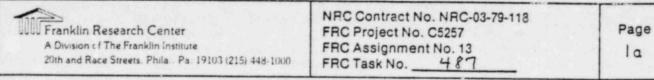
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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 6

EQUIPMENT ITEM NO. 6 SOLENOID VALVE LOCATED IN CONTAINMENT (C230) ASCO MODEL WPHTX8320A21V REQUIRED OPERATING TIME: 9 HOURS TER CHECKSHEET NO. 6 LICENSEE REFERENCE(S): 4026, 28, 27 FUNCTION (PLANT ID): PURGE AIR SAMPLE ISOLATION 1CV5291 (1SV5291) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 250 FUNCTION (PLANT ID): DOUSING FILTER SUPPLY HEADER 1CV4159 (1SV4159) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 38 FUNCTION (PLANT ID): DOUSING FILTER SUPPLY HEADER 1CV4160 (1SV4160) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 39 FUNCTION (PLANT ID): PRESSURIZER 11 VAPOR ISOLATION 1CV5465 (1SV5465) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 180 FUNCTION (PLANT ID): PRESSURIZER 11 LIQUID ISOLATION 1CV5466 (1SV5466) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 179 FUNCTION (PLANT ID): RC HOT LEG SAMPLE ISOLATION 1CV5467 (1SV5467) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 178

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY: (See Section 3 of this TER for Legend)

R, T, QI', RT, P, H, CS, A, S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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System Consideration Review

Equipment Environmental Qualification Review

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Maintenance and Replacement Schedule Summary

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Franklin Research Center A Division of The Franklin Institute 20th and Race Streets. Phila., Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 487/488

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 6

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

Documented Evidence of Qualification Adequate Adequate Similarity Between Equipment and Test Specimen Established Aging Degradation Evaluated Adequately Qualified Life or Replacement Schedule Established (If Required) Program Established to Identify Aging Degradation Criteria Regarding Aging Simulation Satisfied (If Required) Criteria Regarding Temperature/Pressure Exposure: o Peak Temperature Adequate × o Peak Pressure Adequate o Duration Adequate o Required Profile Enveloped Adequately o Steam Exposure (If Required) Adequate Criteria Regarding Spray Satisfied

Criteria Regarding Submergence Satisfied Criteria Regarding Radiation Satisfied Criteria Regarding Test Sequence Satisfied Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied

Criteria Regarding Functional Testing Satisfied Criteria Regarding Instrument Accuracy Satisfied Test Duration Margin (1 hour + Function Time) Satisfied Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)

NRC QUALIFICATION CATEGORY

I.a Equipment Qualified Equipment Qualification Pending Modification X I.b Equipment Qualification Not Established II.a Equipment Not Qualified II.b Equipment Satisfies All Requirements Except Qualified Life II.C or Replacement Schedule Justified Equipment Exempt From Qualification III.a Equipment Not in the Scope of the Qualification Review III.b Documentation Not Made Available IV

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DESIGNATION: X = DEFICIENCY

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 6

LICENSEE RESPONSE TO NRC SER

SV 4159, SV 4160 :

 Issued letter dated 7/22/81 to Tate Engineering Co. requesting additional verification of materials for the listed solenoid valves. We expect to receive the necessary information and anticipate resolution by the end of this year.

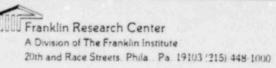
SV 5465, SV 5466, 5467 :

 These solenoid valves have been relocated on both Units 1 and 2 to an elevation above the calculated submergence level.

SV 5291:

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 The qualification test report referenced in the computer printout specifies a demonstrated life of 4.4 years.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 7

EQUIPMENT ITEM NO. 7 SOLENOID VALVE LOCATED IN THE MAIN STEAM PIPING PENET ASCO MODEL NP8320A187V REQUIRED OPERATING TIME: 9 HOURS TER CHECKSHEET NO. 7 LICENSEE REFERENCE(S): 712 FUNCTION (PLANT ID): PURGE AIR SAMPLE ISOLATION 1CV5 LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 251 DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER (See Section 3 of this TER for Legend)	- CIRCLED ITEM(S) ONLY:
(R, T, QT,) RT, P, H, CS, A, E. (R), M, I, QM, RPN, EXN Not stated, Not applicable	, SEN, QI, RPS, None,
LISTING OF APPLICABLE CHECKSHEETS:	
Contents	Checksheet Page No.
Equipment Item	la
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Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, 3b, 3c, 3d -
System Consideration Review	4a, 4b, 4c, 4d, 4e, 4f-
Equipment Environmental Qualification Review	-5a, 5b, 5c, 5d, 5c, 5f, - 5g, 5h, 5i, 5j -
Installed TMI Lessons Learned Implementation Equipment Summary	-6a, 6b-
Maintenance and Replacement Schedule Summary	-7a, 7b, 7c-

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QU	IPMENT ENVIRONMENTAL QUALIFIC	ATION REVIEW OF EQUIPMENT ITEN	4 NO. 7
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	Corrective action specified by	the Licensee:	
	Equipment replacement with Equipment modification	qualified equipment	
	Equipment relocation above	submergence level	
	Relocate or shield equipment	nt from radiation source	
	Verify qualification by add	ditional (testing/analysis)	
	Equipment relocation to a r Qualification testing of ec	mild environment	
	Other (quipment in progress)
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	Not Qualified	IV Documentation Not Available	

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 7

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM DESIGNATION: X = DEFICIENCY NRC REQUIREMENTS Documented Evidence of Qualification Adequate Adequate Similarity Between Equipment and Test Specimen Established Aging Degradation Evaluated Adequately Qualified Life or Replacement Schedule Established (If Required) Program Established to Identify Aging Degradation Criteria Regarding Aging Simulation Satisfied (If Required) Criteria Regarding Temperature/Pressure Exposure: o Peak Temperature Adequate o Peak Pressure Adequate .o Duration Adequate o Required Profile Enveloped Adequately o Steam Exposure (If Required) Adequate Criteria Regarding Spray Satisfied Criteria Regarding Submergence Satisfied Criteria Regarding Radiation Satisfied Criteria Regarding Test Sequence Satisfied Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied Criteria Regarding Functional Testing Satisfied Criteria Regarding Instrument Accuracy Satisfied Test Duration Margin (1 hour + Function Time) Satisfied Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)

NRC QUALIFICATION CATEGORY

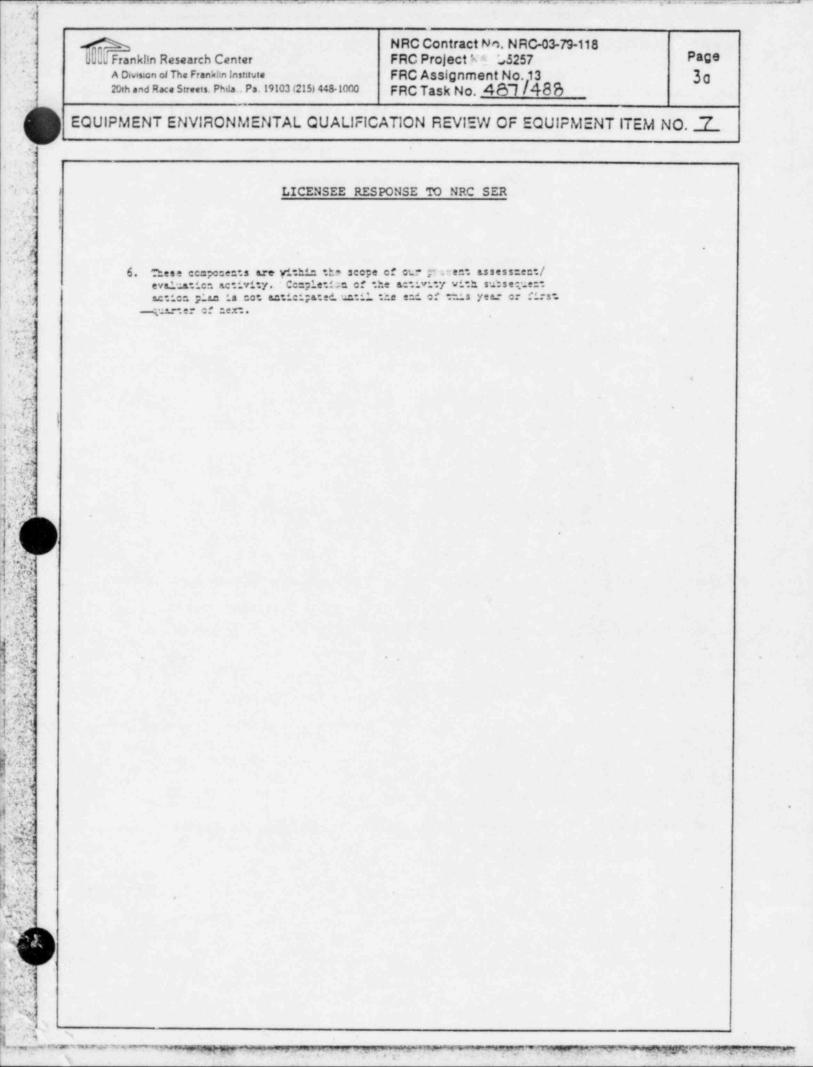
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See equipment item no. 2 for cetailed evaluation

DESIGNATION:

X = CATEGORY



Franklin Research Center A Division of The Franklin Institute 20th and Race Streets, Phila, Pa. 19103 (215) 448-1000 FRC Ta

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 8

EQUIPMENT ITEM NO. 8 SOLENOID VALVE LOCATED IN THE EAST PIPING PENETRATION ROOM (A316) ASCO MODEL NP8320A187V REQUIRED OPERATING TIME: 1 HOUR TER CHECKSHEET NO. 8 LICENSEE REFERENCE(S): 712 FUNCTION (PLANT ID): STEAM GENERATOR 12 BLOWDOWN ISOLATION 1CV4012 (1SV4012) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 120 FUNCTION (PLANT ID): STEAM GENERATOR 12 BLOWDOWN ISOLATION 1CV4013 (1SV4013) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 121 FUNCTION (PLANT ID): STEAM GENERATOR 11 BLOWDOWN ISOLATION 1CV4011 (1SV4011) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 121 FUNCTION (PLANT ID): STEAM GENERATOR 11 BLOWDOWN ISOLATION 1CV4011 (1SV4011) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 114 FUNCTION (PLANT ID): STEAM GENERATOR 11 BLOWDOWN ISOLATION 1CV4010 (1SV4010) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 113

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY: (See Section 3 of this TER for Legend)

R. T. QI, RT. P. H. CS, A. S. (R), M. I. QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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Maintenance and Replacement Schedule Summary

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Franklin Research Center A Division of The Franklin Institute 20th and Race Streets. Phila., Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/488</u>

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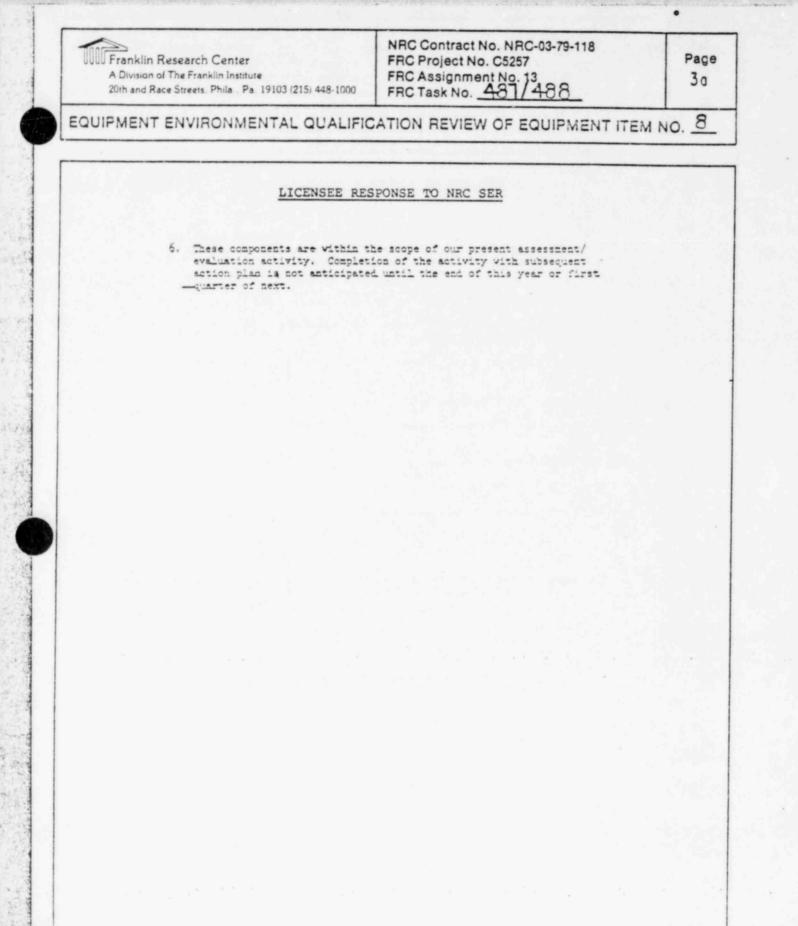
DESIGNATION: X = CATEGORY

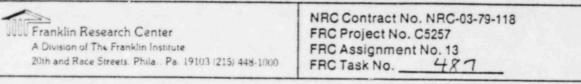
EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 8

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o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalia (If Any) Satisfied	es
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satis	fied
Criteria Regarding Margins Satisfied (NUREG-0588, (

NRC QUALIFICATION CATEGORY

I.a	Equipment Qualified	X
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life	
	or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.D	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	





EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 9

EQUIPMENT ITEM NO. 9 SOLENOID VALVE LOCATED IN THE EAST PIPING PENETRATION ROOM (A316) ASCO MODEL 2063815RVU REQUIRED OPERATING TIME: 18 SECONDS TER CHECKSHEET NO. 9 LICENSEE REFERENCE(S): 712 FUNCTION (PLANT ID): COMPONENT COOLING TO RCP ISOLATION 1CV3332 (1SV3832) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 36 FUNCTION (PLANT ID): COMPONENT COOLING FROM RCP ISOLATION 1CV3833 (1SV3833) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 37

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY: (See Section 3 of this TER for Legend)

R, (T, (QI', RT, (P, (H,) CS, (A,) S, (R), M, I, (M, (RPN,) EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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7a, 7b, 7c

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The Licensee states that the equip and/or should be exempted from env	oment item does not require qualifica vironmental qualification.	tion
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Franklin Research Center A Division of The Franklin Institute 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/488</u>

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 9

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION: X = DEFICIENCY

Documented Evidence of Qualification Adequate
Adequate Similarity Between Equipment and Test Specimen Established
Qualified Life or Replacement Schedule Established (If Required)
Program Established to Identify Aging Degradation
Criteria Regarding Aging Simulation Satisfied (If Required)
Criteria Regarding Temperature/Pressure Exposure:
o Peak Temperature Adequate
o Peak Pressure Adequate
o Duration Adequate
 Required Profile Enveloped Adequately Steam Exposure (If Required) Adequate
Criteria Regarding Spray Satisfied
Criteria Regarding Submergence Satisfied
Criteria Regarding Radiation Satisfied
Criteria Regarding Test Sequence Satisfied
Criteria Regarding Test Failures or Severe Anomalies
(If Any) Satisfied
Criteria Regarding Functional Testing Satisfied
Criteria Regarding Instrument Accuracy Satisfied
Test Duration Margin (1 hour + Function Time) Satisfied

Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)

NRC QUALIFICATION CATEGORY

DESIGNATION: X = CATEGORY

NRC Contract No. NRC-03-79-118 Frank Research Center FRC Project No. C5257 A Division of The Franklin Institute FRC Assignment No. 13 20th and Race Streets. Phila . Pa 19103 (215) 44# 1000 FRC Task No. 487 EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 10

Page la

EQUIPMENT ITEM NO. 10 SOLENOID VALVE LOCATED IN THE PIPING AREA (A224) TELEDYNE MODEL 2111062025253 REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 10 LICENSEE REFERENCE(S): NOT CITED FUNCTION (PLANT ID): STEAM GENERATOR 12 MSIV (1SV4052, 1SV4049, 1SV4048, 1SV4053, 1SV4047) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 122 THROUGH 126 FUNCTION (PLANT ID): STEAM GENERATOR II MSIV 1CV4043 (1SV4043, 1SV4044, 1SV4045, 1SV4042, 1SV4046) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 115 THROUGH 119

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM (S) ONLY: (See Section 3 of this TER for Legend)

(R,)(T,) (RT,) P,(H,) CS, (A,) S, (R), M, I, (M, RPN,) EXN, SEN, Q1, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents Checksheet Page No. Equipment Item la Summary of Licensee Responses to the NRC SER 1b Equipment Environmental Qualification Summary Forms 2 Licensee Response to NRC SER 3a, 3b, 3c, 3d-System Consideration Review 4a, 4b, 4e, 4d, 4e, 4E Equipment Environmental Qualification Review 5a, 5b, 5c, 5d, 5e, -5g, 5h, 51, 5j-Installed TMI Lessons Learned Implementation 6a, 60-Equipment Summary

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Maintenance and Replacement Schedule Summary

73, 70, 7c-

A Division of The Franklin Institute 20th and Race Streets. Phila . Pa 19103 (215) 448-1000	NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/488</u>	Page 1b
QUIPMENT ENVIRONMENTAL QUALIFIC	CATION REVIEW OF EQUIPMENT ITE	M NO. 10
SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE A	PPLICABLE
X The Licensee (has/bester) provide	ed a response to the SER concerns.	
The Licensee (has/has not) specific qualified and/or will function where environmental service conditions.	ically stated that the equipment i en exposed to the applicable DBE	3
The Licensee has presented information outstanding qualification deficient	ation which shows there are no ncies.	
X The Licensee (has/bas not) propose item whose qualification has not b	ed a corrective action for this equipeen fully establishei.	uipment
X Justification for interim oper Licensee for this equipment it	ration (has/b assnot) been provided tem.	by the
X Corrective action specified by	y the Licensee:	
Equipment replacement with Equipment modification Equipment relocation above Relocate or shield equipment	e submergence level ent from radiation source	
Verify qualification by ad Equipment relocation to a Qualification testing of e X Other (Obtain further in	equipment in progress	
The Licensee has provided othe	er information for this equipment : sis for justification for interim	ítem (
X The Licensee (are /has not) pro corrective action. (Schedule action	ovided a schedule for the proposed for accomplishing the corrective	_•)
The Licensee states that the equip and/or should be exempted from env	oment item does not require qualif: vironmental qualification.	ication
DESIGNATION OF RESULTANT NRC QUALIFICA - CIRCLED ITEM ONLY: (See Section 3 o	ATION EVALUATION CATEGORY BASED ON of this TER for Legend)	REVIEW
I.a Qualified I.b Modification II.a Qualification Not Established	II.c Qualified Life Deficiency III.a Exempt III.b Not in Scope	
II.b Not Qualified	IV Documentation Not Availabl	Le

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Franklin Research Center A Division of The Franklin Institute 20th and Race Streets, Phila., Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/488</u>

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 10

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION: X = DEFICIENCY

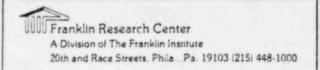
Documented Evidence of Qualification Adequate Adequate Similarity Between Equipment and Test Specimen Established Aging Degradation Evaluated Adequately Qualified Life or Replacement Schedule Established (If Required) Program Established to Identify Aging Degradation Criteria Regarding Aging Simulation Satisfied (If Required) Criteria Regarding Temperature/Pressure Exposure: o Peak Temperature Adequate o Peak Pressure Adequate o Duration Adequate o Required Profile Enveloped Adequately o Steam Exposure (If Required) Adequate Criteria Regarding Spray Satisfied Criteria Regarding Submergence Satisfied Criteria Regarding Radiation Satisfied Criteria Regarding Test Sequence Satisfied Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied Criteria Regarding Functional Testing Satisfied Criteria Regarding Instrument Accuracy Satisfied Test Duration Margin (1 hour + Function Time) Satisfied Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)

NRC QUALIFICATION CATEGORY

DESIGNATION: X = CATEGORY

I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	X
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life	
	or Replacement Schedule Justified	
III.a	Equipm nt Exempt From Qualification	
III.D	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

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NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/488</u>

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 10

LICENSEE RESPONSE TO NRC SER

6. These components are within the scope of our present a sessment/ evaluation activity. Completion of the activity with subsequent action plan is not anticipated until the end of this year or first —quarter of next.





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A Division of The Franklin Institute 20th and Race Streets Phila Pa 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 487

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 11

EQUIPMENT ITEM NO. 11 SOLENOID VALVE LOCATED IN THE EAST PIPING PENETRATION ROOM (A316) ASCO MODEL NP8316E35V REQUIRED OPERATING TIME: 9 HOURS TER CHECKSHEET NO. 11 LICENSEE REFERENCE(S): 712 FUNCTION (PLANT ID): CONTAINMENT PURGE ISOLATION 1CV1413 (1SV1413) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 249 FUNCTION (PLANT ID): CONTAINMENT PURGE ISOLATION 1CV1411 (1SV1411) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 247

(See Section 3 of this TER for Legend)	
R, T, QT, RT, P, H, CS, A, S, (R), M, I, QM, RP	PN, EXN, SEN, QI, RPS, None,
Not stated, Not applicable	나는 것은 바람에
LISTING OF APPLICABLE CHECKSHEETS:	
Contents	Checksheet Page No.
Equipment Item	la

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:

Summary of Licensee Responses to the NRC SER	lb
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, 3b, 3c, 3d
System Consideration Review	4a, 4b, 4c, 4d,
Equipment Environmental Qualification Review	5a, 5b, 5c, 5d,

Installed TMI Lessons Learned Implementation Equipment Summary

Maintenance and Replacement Schedule Summary

7a, 70, 7c

6a, 6b-

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A Division of The Fran	klin In:	stitut	e		
Oth and Race Streets.	Phila.	Pa	19103	(215) 448-	1000

NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487,488</u>

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 11

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABL
X The Licensee (has/ $\frac{1}{2}$ and provided a response to the SER concerns.
The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.
X The Licensee has presented information which shows there are no outstanding qualification deficiencies.
The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.
Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.
Corrective action specified by the Licensee:
Equipment replacement with qualified equipment Equipment modification
Equipment relocation above submergence level
Relocate or shield equipment from radiation source
Verify qualification by additional (testing/analysis)
Equipment relocation to a mild environment
Qualification testing of equipment in progress Other ()
The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
The Licensee (has/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action)
The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.
DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)
I.a Qualified II.c Qualified Life Deficiency
I.b Modification III.a Exempt
II.a Qualification Not Established III.b Not in Scope
II.b Not Qualified IV Documentation Not Available

A Division of The Franklin Institute 20th and Race Streets, Phila., Pa. 19103 (215) 448-1000

NRC QUALIFICATION CATEGORY

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NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/488</u>

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DESIGNATION:

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 11

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

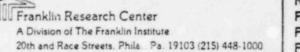
X = DEFICIENCY NRC REQUIREMENTS Documented Evidence of Qualification Adequate Adequate Similarity Between Equipment and Test Specimen Established Aging Degradation Evaluated Adequately Qualified Life or Replacement Schedule Established (If Required) Program Established to Identify Aging Degradation Criteria Regarding Aging Simulation Satisfied (If Required) Criteria Regarding Temperature/Pressure Exposure: o Peak Temperature Adequate o Peak Pressure Adequate o Duration Adequate o Required Profile Enveloped Adequately o Steam Exposure (If Required) Adequate Criteria Regarding Spray Satisfied Criteria Regarding Submergence Satisfied Criteria Regarding Radiation Satisfied Criteria Regarding Test Sequence Satisfied Criteria Regarding Test Pailures or Severe Anomalies (If Any) Satisfied Criteria Regarding Functional Testing Satisfied Criteria Regarding Instrument Accuracy Satisfied Test Duration Margin (1 hour + Function Time) Satisfied Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)

DESIGNATION: X = CATEGORY

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×_____ I.a Equipment Qualified Equipment Qualification Pending Modification I.b Equipment Qualification Not Established II.a II.D Equipment Not Qualified Equipment Satisfies All Requirements Except Qualified Life II.C or Replacement Schedule Justified III.a Equipment Exempt From Qualification III.D Equipment Not in the Scope of the Qualification Review Documentation Not Made Available IV

See equipment item no. 2 for staled evoluation



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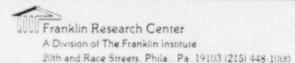
NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13, FRC Task No. <u>487/488</u>

Page 3c

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 11

LICENSEE RESPONSE TO NRC SER

- The qualification test report referenced in the computer printout specifies a demonstrated life of 4.4 years.
- The LOCA simulation test conducted by ASCO included a chemical spray consisting of 3000 pm Boron as borib acid. The maximum concentration of boric acid injected into the containment during the postulated accident is expected to be 2800 ppm.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 12

EQUIPMENT ITEM NO. 12 SOLENOID VALVE LOCATED IN CONTAINMENT (C230) ASCO MODEL NP8320A195V REQUIRED OPERATING TIME: 9 HOURS TER CHECKSHEET NO. 12 LICENSEE REFERENCE(S): 712 FUNCTION (PLANT ID): CONTAINMENT INSTRUMENT AIR HEADER 1CV2085 (1SV2085) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 12

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY: (See Section 3 of this TER for Legend)

R, T, Q1', RT, P, H, (CS, (A,) S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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Checksheet Page No.

3a, 3b, 3c, 3d-

5g,-5h,-51, 5j-

5a, 5b, 5c, 5d, 5e,

-4a, 4b, 1c, 4d, 1e, 4f-

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Equipment Item Summary of Licensee Responses to the NRC SER

Equipment Environmental Qualification Summary Forms Licensee Response to NRC SER System Consideration Review Equipment Environmental Qualification Review

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Installed TMI Lessons Learned Implementation Equipment Summary

Maintenance and Replacement Schedule Summary

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60, 60

A Division of The Franklin Institute 20th and Race Streets. Phila. Pa 19103 (215) 448-1000	NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/488</u>	Page
QUIPMENT ENVIRONMENTAL QUALIFIC	CATION REVIEW OF EQUIPMENT ITE	M NO. 12
SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE A	PPLICABLE
The Licensee (has/bee not) provid	ed a response to the SER concerns.	
The Licensee (has/has not) specif qualified and/or will function wh environmental service conditions.	ically stated that the equipment i en exposed to the applicable DBE	s
X The Licensee has presented inform outstanding qualification deficie	ation which shows there are no ncies.	
The Licensee (has/has not) propos item whose qualification has not	ed a corrective action for this equipeen fully established.	uipment
Justification for interim ope Licensee for this equipment i	ration (has/has not) been provided tem.	by the
Corrective action specified b	y the Licensee:	
Equipment replacement wit Equipment modification	h qualified equipment	
Equipment relocation abov		
Relocate or shield equipm Verify qualification by a	dditional (testing/analysis)	
Equipment relocation to a Qualification testing of	mild environment	
Other (equipment in progress)
The Licensee has provided oth that can be construed as a ba operation.	er information for this equipment sis for justification for interim	item
The Licensee (has/has not) pr	wided a schedule for the proposed	
corrective action. (Schedule action	for accomplishing the corrective	
		,
ar /or should be exempted from en	pment item does not require qualif vironmental qualification.	ication
DESIGNATION OF RESULTANT NRC QUALIFIC.	ATION EVALUATION CATEGORY BASED ON	REVIEW
- CIRCLED ITEM ONLY: (See Section 3)	of this TER for Legend)	
La Qualified Lb Modification	II.c Qualified Life Deficiency	
II.a Qualification Not Established	III.a Exempt III.b Not in Scope	
II.b Not Qualified	IV Documentation Not Availab	le

Franklin Research Center A Division of The Franklin Institute

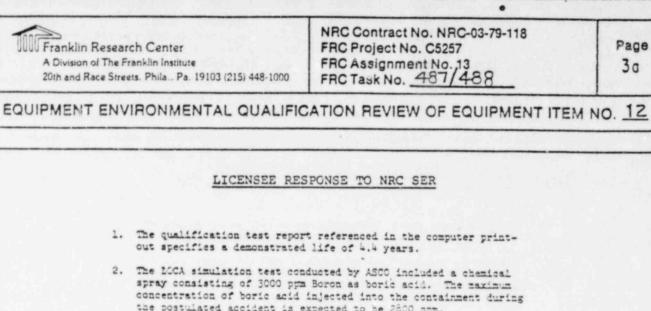
NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13

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NRC REQUIREMENTS X = Documented Evidence of Qualification Adequate Adequate Similarity Between Equipment and Test Specimen Establisher Aging Degradation Evaluated Adequately Qualified Life or Replacement Schedule Established (If Required) Program Established to Identify Aging Degradation Criteria Regarding Aging Simulation Satisfied (If Required) Criteria Regarding Temperature/Pressure Exposure: o Peak Temperature Adequate o Peak Pressure Adequate o Duration Adequate o Required Profile Enveloped Adequately o Steam Exposure (If Required) Adequate Criteria Regarding Spray Satisfied Criteria Regarding Submergence Satisfied	QUIPMENT ENVIRONMENTAL QUALIFIC	CATION REVIEW OF EQUIPM	IENT ITEM NO. 12
NRC REQUIREMENTS X = Documented Evidence of Qualification Adequate Adequate Similarity Between Equipment and Test Specimen Establisher Aging Degradation Evaluated Adequately Qualified Life or Replacement Schedule Established (If Required) Program Established to Identify Aging Degradation Criteria Regarding Aging Simulation Satisfied (If Required) Criteria Regarding Temperature/Pressure Exposure: o Peak Temperature Adequate o Peak Pressure Adequate o Duration Adequate o Required Profile Enveloped Adequately o Steam Exposure (If Required) Adequate Criteria Regarding Spray Satisfied Criteria Regarding Submergence Satisfied	EQUIPMENT ENVIRONMENTAL	QUALIFICATION SUMMARY FOR	रल
Documented Evidence of Qualification Adequate Adequate Similarity Between Equipment and Test Specimen Establisher Aging Degradation Evaluated Adequately Qualified Life or Replacement Schedule Established (If Required) Program Established to Identify Aging Degradation Criteria Regarding Aging Simulation Satisfied (If Required) Criteria Regarding Temperature/Pressure Exposure: o Peak Temperature Adequate o Peak Pressure Adequate o Duration Adequate o Required Profile Enveloped Adequately o Steam Exposure (If Required) Adequate Criteria Regarding Spray Satisfied Criteria Regarding Submergence Satisfied	NRC REQUIREMENTS		DESIGNATION: X = DEFICIENCY
Adequate Similarity Between Equipment and Test Specimen Establishe Aging Degradation Evaluated Adequately Qualified Life or Replacement Schedule Established (If Required) Program Established to Identify Aging Degradation Criteria Regarding Aging Simulation Satisfied (If Required) Criteria Regarding Temperature/Pressure Exposure: o Peak Temperature Adequate o Peak Pressure Adequate o Duration Adequate o Required Profile Enveloped Adequately o Steam Exposure (If Required) Adequate Criteria Regarding Spray Satisfied Criteria Regarding Submergence Satisfied			
Criteria Regarding Test Sequence Satisfied Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied Criteria Regarding Functional Testing Satisfied Criteria Regarding Instrument Accuracy Satisfied	Aging Degradation Evaluated Adequatel Qualified Life or Replacement Schedul Program Established to Identify Aging Criteria Regarding Aging Simulation S Criteria Regarding Temperature/Pressu o Peak Temperature Adequate o Peak Pressure Adequate o Duration Adequate o Required Profile Enveloped Ade o Steam Exposure (If Required) A Criteria Regarding Spray Satisfied Criteria Regarding Radiation Satisfie Criteria Regarding Test Sequence Sati Criteria Regarding Test Sequence Sati Criteria Regarding Test Failures or S (If Any) Satisfied Criteria Regarding Functional Testing	y e Established (If Required) Degradation Satisfied (If Required) are Exposure: equately adequate fied ed sfied Severe Anomalies g Satisfied	

I.a	Equipment Qualified	X
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	
II.D	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life	
	or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.D	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

See equipment item mo. 2 for Detailed evoluation.



the postulated accident is expected to be 2800 ppm.

A Division of The Franklin Institute 20th and Bace Streets. Phila. Pa. 19103 (215) 448-1000	NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 487	Page
EQUIPMENT ENVIRONMENTAL QUALIFIC	CATION REVIEW OF EQUIPMENT ITE	M NO. 13

EQUIPMENT ITEM NO. 13 SOLENGID VALVE LOCATED IN CONTAINMENT (C230) ASCO MODEL NP8316E35V REQUIRED OPERATING TIME: 9 HOURS TER CHECKSHEET NO. 13 LICENSEE REFERENCE(S): 712 FUNCTION (PLANT ID): CONTAINMENT PURGE ISOLATION 1CV1412 (1SV1412) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 248 FUNCTION (PLANT ID): CONTAINMENT PURGE ISOLATION 1CV1410 (1SV1410) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 246

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY: (See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, A, S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

(Not stated,) Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	la
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	Ja, 36, 36, 3d -
System Consideration Review	4a, 4b, 4c, 4d, 4e, 4E-
Equipment Environmental Qualification Review	5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 51, 5j
Installed TMI Lessons Learned Implementation Equipment Summary	6a, 65-

Maintenance and Replacement Schedule Summary 7a, 7b, 7c

A Division of The Franklin Institute 20th and Race Streets. Phila. Pa 19103 (215) 448-1000	NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/488</u>	Page 1b
UIPMENT ENVIRONMENTAL QUALIFIC	ATION REVIEW OF EQUIPMENT ITE	M NO. 13
UMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE A	PPLICABLE
The Licensee (has/	ed a response to the SER concerns.	
	ically stated that the equipment i	
qualified and/or will function whe environmental service conditions.	en exposed to the applicable DBE	3
The Licensee has presented information outstanding qualification deficient	ation which shows there are no ncies.	
The Licensee (has/has not) propose item whose qualification has not b	ed a corrective action for this equipeen fully established.	uipment
Justification for interim oper Licensee for this equipment it	ration (has/has not) been provided	by the
Corrective action specified by	the Licensee:	
Equipment replacement with Equipment modification	a qualified equipment	
Equipment relocation above	e submergence level	
Relocate or shield equipme Verify qualification by ad	ent from radiation source	
Equipment relocation to a	mild environment	
Qualification testing of e Other (quipment in progress)
The Licensee has provided other that can be construed as a bas operation.	er information for this equipment i his for justification for interim	tem
The Licensee (and (and)		
corrective action. (Schedule action	vided a schedule for the proposed for accomplishing the corrective)
The Licensee states that the equip and/or should be exempted from env	ment item does not require qualifi ironmental qualification.	cation
SIGNATION OF RESULTANT NRC QUALIFICA CIRCLED ITEM ONLY: (See Section 3 o	TION EVALUATION CATEGORY BASED ON f this TER for Legend)	REVIEW
Qualified Modification	II.c Qualified Life Deficiency	
a Qualification Not Established	III.a Exempt III.b Not in Scope	
.b Not Qualified	IV Documentation Not Availabl	e

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UU Franklin Research Center A Division of The Franklin Institute

Page FRC Project No. C5257 FRC Assignment No. 13 2 20th and Race Streets, Phila., Pa. 19103 (215) 448-1000 FRC Task No. 487/488 EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 13 EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM DESIGNATION: NRC REQUIREMENTS X = DEFICIENCY Documented Evidence of Qualification Adequate Adequate Similarity Between Equipment and Test Specimen Established Aging Degradation Evaluated Adequately Qualified Life or Replacement Schedule Established (If Required) Program Established to Identify Aging Degradation Criteria Regarding Aging Simulation Satisfied (If Required) Criteria Regarding Temperature/Pressure Exposure: o Peak Temperature Adequate o Peak Pressure Adequate o Duration Adequate o Required Profile Enveloped Adequately o Steam Exposure (If Required) Adequate Criteria Regarding Spray Satisfied Criteria Regarding Submergence Satisfied Criteria Regarding Radiation Satisfied Criteria Regarding Test Sequence Satisfied

NRC Contract No. NRC-03-79-118

Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied Criteria Regarding Functional Testing Satisfied Criteria Regarding Instrument Accuracy Satisfied

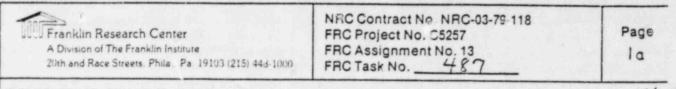
Test Duration Margin (1 hour + Function Time) Satisfied Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)

NRC QUALIFICATION CATEGORY

DESIGNATION: X = CATEGORY

I.a	Equipment Qualified	X
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	
II.D	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life	
	or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

See equipment item no. 2 for Detailed evaluation.



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 14

EQUIPMENT ITEM NO. 14 MOTORIZED VALVE ACTUATOR LOCATED IN THE EAST PENETRATION ROOM (A227) LIMITORQUE MODEL SMB00 REQUIRED OPERATING TIME: 8 HOURS TER CHECKSHEET NO. 14 LICENSEE REFERENCE(S): 1064 FUNCTION (PLANT ID): MANUAL HPSI TO LOOP 11B 1MOV626 (1MOV626) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 199 FUNCTION (PLANT ID): MANUAL HPSI TO LOOP 11A 1MOV616 (1MOV616) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 198 FUNCTION (PLANT ID): HPSI TO LOOP 11B 1MOV627 (1MOV627) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 197

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY: (See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, A, S, (R), M, I, UM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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Equipment Item

Summary of Licensee Responses to the NRC SER Equipment Environmental Qualification Summary Forms Licensee Response to NRC SER System Consideration Review Equipment Environmental Qualification Review

Installed TMI Lessons Learned Implementation Equipment Summary

Maintenance and Replacement Schedule Summary

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JOO	Franklin Research Center A Division of The Franklin Institute 20th and Race Streets. Phila . Pa 19103 (215) 448-1000	NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/488</u>	Page 1b
EQU	IPMENT ENVIRONMENTAL QUALIFIC	ATION REVIEW OF EQUIPMENT ITEM	NO. 14
SUM	MARY OF LICENSEE RESPONSES TO THE N	RC SER - ONLY CHECKED ITEMS ARE AP	PLICABLE
X	The Licensee (has/has not) provide	d a response to the SER concerns.	
	The Licensee (has not) specifi qualified and/or will function whe environmental service conditions.	cally stated that the equipment is	
×	The Licensee has presented informa outstanding qualification deficien	tion which shows there are no cies.	
_	The Licensee (has/has not) propose item whose qualification has not b	d a corrective action for this equi een fully established.	ipment
	Justification for interim oper Licensee for this equipment it	ation (has/has not) been provided b em.	by the
	Corrective action specified by	the Licensee:	
	Equipment replacement with Equipment modification Equipment relocation above Relocate or shield equipmen Verify qualification by add Equipment relocation to a s Qualification testing of equipment (submergence level nt from radiation source ditional (testing/analysis) mild environment)
	The Licensee has provided other that can be construed as a bas operation.	r information for this equipment it is for justification for interim	em
	corrective action. (Schedule :	vided a schedule for the proposed for accomplishing the corrective)
	The Licensee states that the equips and/or should be exempted from envi	ment item does not require qualific ironmental qualification.	ation
DESI - CI	GNATION OF RESULTANT NRC QUALIFICAT RCLED ITEM ONLY: (See Section 3 of	TION EVALUATION CATEGORY BASED ON R f this TER for Legend)	EVIEW
I.b II.a	Qualified Modification Qualification Not Established Not Qualified	II.c Qualified Life Deficiency III.a Exempt III.b Not in Scope IV Documentation Not Available	
	Not ydallied	IV DOCUMENTATION NOT Available	

Franklin Research Center A Division of The Franklin Institute 20th and Race Streets, Phila., Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 487/488

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DESIGNATION: X = CATEGORY

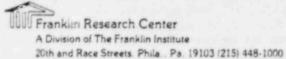
EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 14

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM DESIGNATION: X = DEFICIENCY NRC REQUIREMENTS Documented Evidence of Qualification Adequate Adequate Similarity Between Equipment and Test Specimen Established Aging Degradation Evaluated Adequately Qualified Life or Replacement Schedule Established (If Required) Program Established to Identify Aging Degradation Criteria Regarding Aging Simulation Satisfied (If Required) Criteria Regarding Temperature/Pressure Exposure: o Peak Temperature Adequate o Peak Pressure Adequate o Duration Adequate o Required Profile Enveloped Adequately o Steam Exposure (If Required) Adequate Criteria Regarding Spray Satisfied Criteria Regarding Submergence Satisfied Criteria Regarding Radiation Satisfied Criteria Regarding Test Sequence Satisfied Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied Criteria Regarding Functional Testing Satisfied Criteria Regarding Instrument Accuracy Satisfied Test Duration Margin (1 hour + Function Time) Satisfied Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)

NRC QUALIFICATION CATEGORY

I.a	Equipment Qualified	-
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	X
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life	
	or Replacement Schedule Justified	-
III.a	Equipment Exempt From Qualification	_
III.D	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

See Evaluation on Page 5f.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 14

LICENSEE RESPONSE TO NRC SER

5. Limitorque has informed us that a generic report will be available which identifies the non-metallic materials used within their MOV's and more directly provides bases for correlation to existing qualification test reports. We will receive copies of this report when issued and anticipate resolution of the outstanding items by the end of this year. Franklin Research Center A Division of The Franklin Institute 20th and Race Streets. Phila., Pa. 19103 (215) 448-1000

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NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487 (488</u>

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 14

NOTES:		"X" DENOTES APPROPRIATE MOTES
×	1.	The Licensee has not provided documentation from the manufacturer which establishes similarity between the installed equipment and the test specimen in the referenced document(s). (NOTE A)
_ <u>×</u>	2.	The Licensee has not identifies the class of the insulation system used for the motor in the motorized valve actuator.
<u>×</u>	3.	The Licensee has not identified whether or not this motorized valve actuator incorporates a motor-brake assembly.
<u>×</u>	4.	The Licensee has not identified the class of the insulation system used for the motor-brake assembly (if applicable).
_ <u>×</u>	5.	The Accensee has not identified the motor manufacturer for this motorized valve actuator.
<u>_X</u>	6.	The Licensee has not identified the manufactures of the motor-brake assembly (if applicable).
_ <u>×</u> _	7.	The Licensee has not identified the type of current used in the motorized valve actuator.
<u>_X</u>	8.	The Licensee has not identified the type of current used in the motor-brake assembly (if applicable).
_ <u>×</u>	9.	The Licensee has not established a qualified life estimate for this motorized valve accuator based on technically justifiable methods and conservative assumptions.
	10.	The Licensee has stated that the only harsh parameter that this motorized valve actuator is exposed to is radiation.
	11.	Since radiation is stated to be the only harsh parameter and considering the extensive radiation testing of the motors used in this type of motorized valve actuator, the specified radiation dose of is considered to be of sufficiently low value as to not affect this equipment item. This equipment item is considered qualified for this parameter.
	12.	The Licensee has committed to replace this equipment item. The Licensee has stated the following:

NRC Contract No. NRC-03-79-118 Franklin Research Center Page FRC Project No. C5257 A Division of The Franklin Institute FRC Assignment No. 13 FRC Task No. 487 488 59 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000 EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 14 NOTES: A. In The Licensel's response Th, to SER 12 ata tin gives cost m and when we 1 den ti meta ols M sirtly ba 220 CA 110 lina hucation ana 1101 ano. in , UI 11200 10 The fist omen specim inadiquate ling The Ticensel B has also C. Via conspondence im torand da tid 80 8 0 hey CS 2 ciccary 10 4 10h tu

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Franklin Research Center A Division of The Franklin Institute 20th and Race Streets. Phila. Pa 19103 (215) 448-1000

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 15

EQUIPMENT ITEM NO. 15 MOTORIZED VALVE ACTUATOR LOCATED IN THE EAST PIPING PENETRATION ROOM (A316) PRATT MODEL TN20003 REQUIRED OPERATING TIME: 9 HOURS TER CHECKSHEET NO. 15 LICENSEE REFERENCE(S): NOT CITED FUNCTION (PLANT ID): H2 PURGE ISOLATION 1M0V6902 (1M0V6902) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 259

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY: (See Section 3 of this TER for Legend

R, T, QT, RT, P, H, CS, A, S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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A Division of The Franklin Institute 20th and Race Streets, Phila., Pa. 19103 (215) 448-10	NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487</u> /488	Page 1b
QUIPMENT ENVIRONMENTAL QUAL	IFICATION REVIEW OF EQUIPMENT ITEN	1 NO. 15
SUMMARY OF LICENSEE RESPONSES TO T	THE NRC SER - ONLY CHECKED ITEMS ARE AP	PLICABLE
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The Licensee has presented inf outstanding qualification defi	ormation which shows there are no ciencies.	
X The Licensee (has not) pro item whose qualification has n	posed a corrective action for this equ ot been fully established.	ipment
X Justification for interim Licensee for this equipmen	operation () has 🚙) been provided t item.	by the
Corrective action specifie	d by the Licensee:	
Equipment modification Equipment relocation at Relocate or shield equi Verify qualification by Equipment relocation to	bove submergence level ipment from radiation source y additional (testing/analysis))
The Licensee has provided of that can be construed as a operation.	other information for this equipment i basis for justification for interim	tem
The Licensee (nas/has not) corrective action. (Schedu action	provided a schedule for the proposed ule for accomplishing the corrective	.)
The Licensee states that the eq and/or should be exempted from	quipment item does not require qualific environmental qualification.	cation
ESIGNATION OF RESULTANT NRC QUALIE CIRCLED ITEM ONLY: (See Section	FICATION EVALUATION CATEGORY BASED ON F 3 of this TER for Legend)	REVIEW
.a Qualified .b Modification I.a Qualification Not Established	II.c Qualified Life Deficiency III.a Exempt III.b Not in Scope	

Franklin Research Center A Division of The Franklin Institute 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/488</u>

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DESIGNATION:

X = CATEGORY

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 15

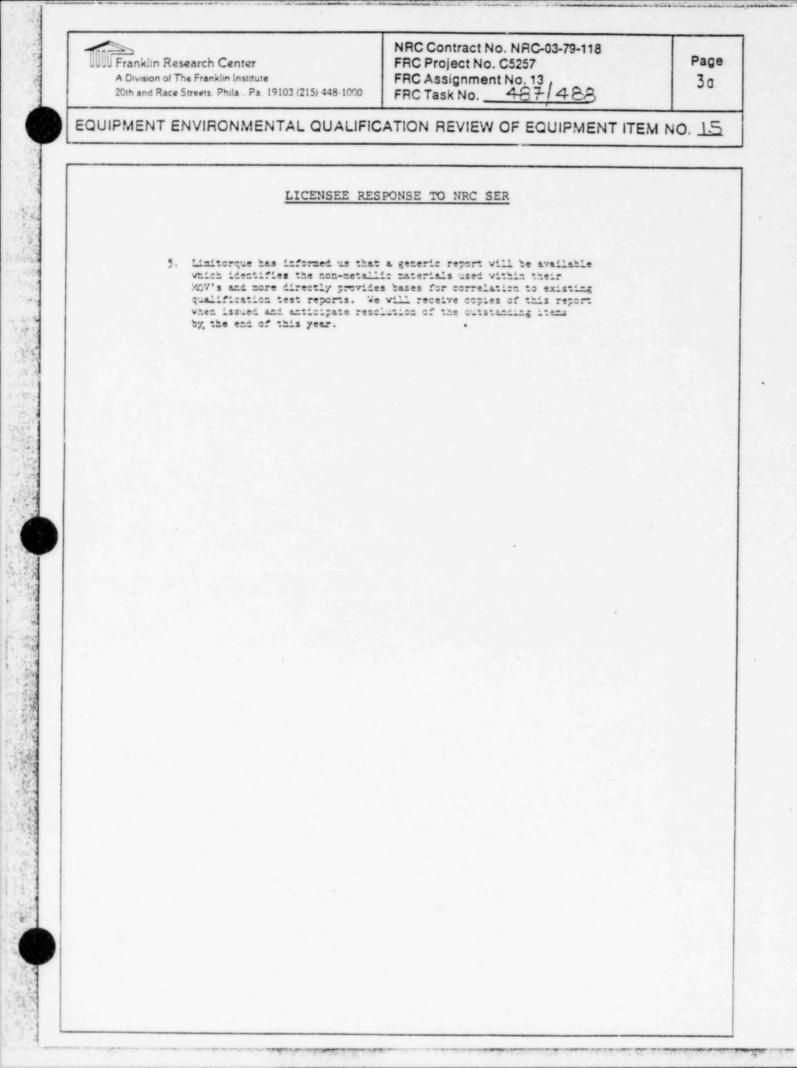
	DESIGNATION:
NRC REQUIREMENTS	X = DEFICIENCY
Documented Evidence of Qualification Adequate Adequate Similarity Between Equipment and Test Specimen Establ Aging Degradation Evaluated Adequately Qualified Life or Replacement Schedule Established (If Required	_×
Program Established to Identify Aging Degradation Criteria Regarding Aging Simulation Satisfied (If Required) Criteria Regarding Temperature/Pressure Exposure:	
 Peak Temperature Adequate Peak Pressure Adequate Duration Adequate Required Profile Enveloped Adequately 	=
o Required Profile Enveloped Adequately o Steam Exposure (If Required) Adequate Criteria Regarding Spray Satisfied Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied Criteria Regarding Test Sequence Satisfied Criteria Regarding Test Failures or Severe Anomalies	
(If Any) Satisfied Criteria Regarding Functional Testing Satisfied Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY

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I.a	Equipment Qualified
I.b	Equipment Qualification Pending Modification
II.a	Equipment Qualification Not Established
II.b	Equipment Not Qualified
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified
III.a	Equipment Exempt From Qualification
III.D	Equipment Not in the Scope of the Qualification Review
IV	Documentation Not Made Available

See Evaluation on Page 5f.



A Division of The Franklin Institute 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/488</u>

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OTES:	"X" DENOTES APPROPRIATE NOTES
<u> </u>	The Licensee has not provided documentation from the manufacturer which establishes qualification. (NOTES A, B)
_X 2.	The Licensee has not identified the class of the insulation system used for the motor in the motorized valve actuator.
<u> </u>	The Licensee has not identified whether or not this motorized valve actuator incorporates a motor-brake assembly.
<u> </u>	The Licensee has not identified the class of the insulation system used for the motor-brake assembly (if applicable).
<u>X</u> 5.	The Licensee has not identified the motor manufacturer for this motorized valve actuator.
<u> </u>	The Licensee has not identified the manufacturer of the motor-brake assembly (if applicable).
<u> </u>	The Licensee has not identified the type of current used in the motorized valve actuator.
<u>×</u> 8.	The Licensee has not identified the type of current used in the motor-brake assembly (if applicable).
<u>×</u> 9.	The Licensee has not established a qualified life estimate for this motorized valve actuator based on technically justifiable methods and conservative assumptions.
10.	The Licensee has stated that the only harsh parameter that this motorized valve actuator is exposed to is radiation.
11.	Since radiation is stated to be the only harsh parameter and considering the extensive radiation testing of the motors used in this type of motorized valve actuator, the specified radiation dose of is considered to be of sufficiently low value as to not affect this equipment item. This equipment item is considered qualified for this parameter.
12.	The Licensee has committed to replace this equipment item. The Licensee has stated the following:

NRC Contract No. NRC-03-79-118 Franklin Research Center Page FRC Project No. C5257 A Division of The Franklin Institute FRC Assignment No. 13 FRC Task No. <u>487</u>/488 5g 20th and Race Streets. Phila . Pa. 19103 (215) 448-1000 EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 15 NOTES: A Trenell he han identified qualitica Tion 0 moli 14 CAMPA lu 1100 1 ... A 3-710 ron tents In 1 nour 21 in na limit QU. h 10 60 man 40 4 IN 10 na Lorma in B ertan ann Aur he EK 218 lem

A Division of The Franklin Institute 20th and Race Streets. Phila . Pa 19103 (215) 448-1000	NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487</u>	Page
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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 14

EQUIPMENT ITEM NO. 16 MOTORIZED VALVE ACTUATOR LOCATED IN THE EAST PIPING PENETRATION ROOM (A316) LIMITORQUE MODEL SMB00 REQUIRED OPERATING TIME: 9 HOURS TER CHECKSHEET NO. 16 LICENSEE REFERENCE(S): 706, 662, 26 FUNCTION (PLANT ID): H2 PURGE ISOLATION 1M0V6903 (1M0V6903) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 260 FUNCTION (PLANT ID): H2 PURGE ISOLATION 1M0V6901 (1M0V6901) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 258

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY: (See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, A, S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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Equipment Environmental Qualification Review

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Maintenance and Replacement Schedule Summary

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A Division of The Franklin Institute 21/11 and Race Streets. Phila. Pa 19103 (215) 448-1000	NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/488</u>	Page 1b
EQUIPMENT ENVIRONMENTAL QUALIFIC	CATION REVIEW OF EQUIPMENT ITEM	NO. 16
SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APP	LICABLE:
X The Licensee (has/has 100) provid	ed a response to the SER concerns.	
X The Licensee (has/has not) specific qualified and/or will function whenvironmental service conditions.	fically stated that the equipment is then exposed to the applicable DBE	
X The Licensee has presented inform outstanding qualification deficie	ation which shows there are no ncies.	
The Licensee (has/has not) propos item whose qualification has not	ed a corrective action for this equippeen fully established.	pment
Justification for interim ope Licensee for this equipment i	ration (has/has not) been provided b	y the
Corrective action specified b	y the Licensee:	
Equipment replacement wit Equipment modification Equipment relocation abov Relocate or shield equipm Verify qualification by a Equipment relocation to a Qualification testing of Other (e submergence level ent from radiation source dditional (testing/analysis) mild environment)
The Licensee has provided othe that can be construed as a bas operation.	er information for this equipment ite sis for justification for interim	m
The Licensee (nas/has not) pro corrective action. (Schedule action	ovided a schedule for the proposed for accomplishing the corrective .))
The Licensee states that the equip and/or should be exempted from en-	pment item does not require qualifica vironmental qualification.	ation
DESIGNATION OF RESULTANT NRC QUALIFIC - CIRCLED ITEM ONLY: (See Section 3 d	ATION EVALUATION CATEGORY BASED ON RE of this TER for Legend)	EVIEW
I.a Qualified I.b Modification II.a Qualification Not Established	II.c Qualified Life Deficiency III.a Exempt III.b Not in Scope	
II.b Not Qualified	IV Documentation Not Available	

Franklin Research Center A Division of The Franklin Institute 20th and Race Streets, Phila., Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. _ 487 / 488

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DESIGNATION:

X = CATEGORY

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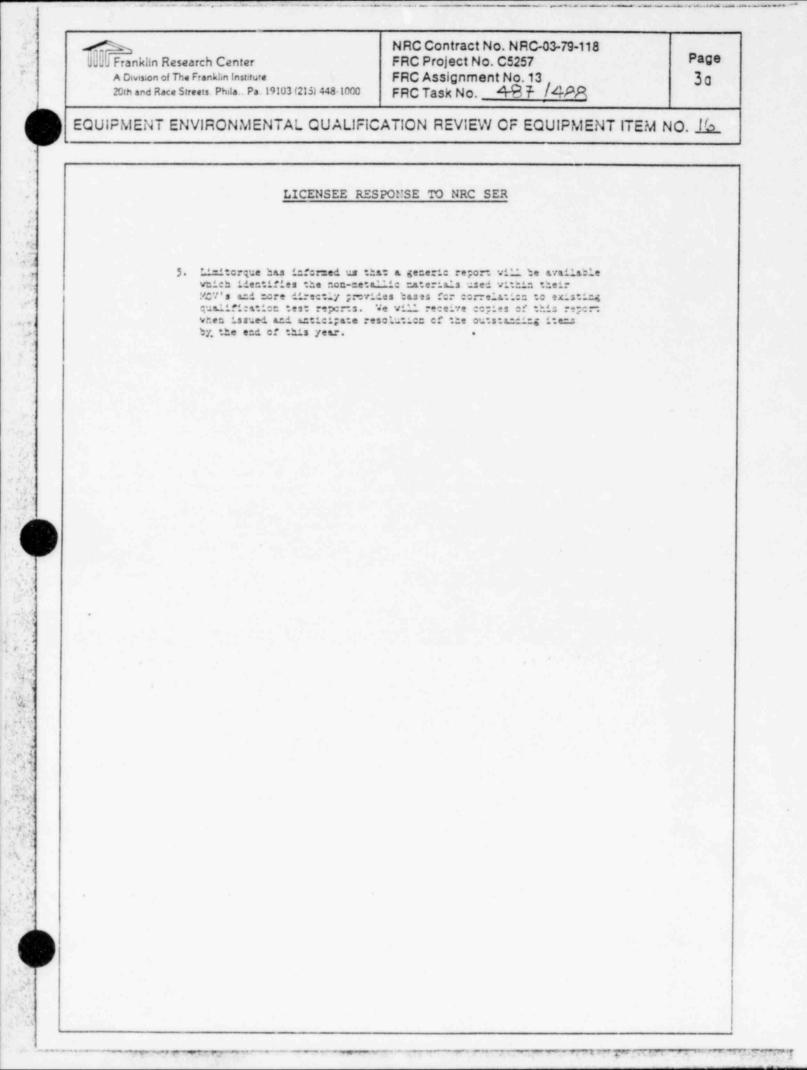
EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 16

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM DESIGNATION: X = DEFICIENCY NRC REQUIREMENTS Documented Evidence of Qualification Adequate Adequate Similarity Between Equipment and Test Specimen Established Aging Degradation Evaluated Adequately Qualified Life or Replacement Schedule Established (If Required) Program Established to Identify Aging Degradation Criteria Regarding Aging Simulation Satisfied (If Required) Criteria Regarding Temperature/Pressure Exposure: o Peak Temperature Adequate o Peak Pressure Adequate o Duration Adequate o Required Profile Enveloped Adequate' o Steam Exposure (If Required) Adequise Criteria Regarding Spray Satisfied Criteria Regarding Submergence Satisfied Criteria Regarding Radiation Satisfied Criteria Regarding Test Sequence Satisfied Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied Criteria Regarding Functional Testing Satisfied Criteria Regarding Instrument Accuracy Satisfied Test Duration Margin (1 hour + Function Time) Satisf.ed Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)

NRC QUALIFICATION CATEGORY

I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	_
II.b	Equipment Not Qualified	-
II.c	Equipment Satisfies All Requirements Except Qualified Life	
	or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.D	Equipment Not in the Scope of the Qualification Review	_
IV	Documentation Not Made Available	

See Evaluation on Page 5f.



A Division of The Franklin Institute 20th and Bace Streets, Phila, Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 487/488

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UIPMEN	T ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 16
NOTES:	"X" DENOTES APPROPRIATE NOTES
<u>×</u>	 The Licensee has not provided documentation from the manufacturer which establishes similarity between the installed equipment and the test specimen in the referenced document(s). (NOTE A)
<u>_X</u>	 The Licensee has not identified the class of the insulation system used for the motor in the motorized valve actuator.
<u>_X</u>	 The Licensee has not identified whether or not this motorized valve actuator incorporates a motor-brake assembly.
<u> </u>	 The Licensee has not identified the class of the insulation system used for the motor-brake assembly (if applicable).
<u> </u>	 The Licensee has not identified the motor manufacturer for this motorized valve actuator.
X	 The Licensee has not identified the manufacturer of the motor-brake assembly (if applicable).
<u>_X</u>	 The Licensee has not identified the type of current used in the motorized valve actuator.
<u>_X</u>	 The Licensee has not identified the type of current used in the motor-brake assembly (if applicable).
<u> </u>	 The Licensee has not established a qualified life estimate for this motorized valve actuator based on technically justifiable methods and conservative assumptions.
1	 The Licensee has stated that the only harsh parameter that this motorized valve actuator is exposed to is radiation.
1	1. Since radiation is stated to be the only harsh parameter and considering the extensive radiation testing of the motors used in this type of motorized valve actuator, the specified radiation dose of is considered to be of sufficiently low value as to not affect this equipment item. This equipment item is considered qualified for this parameter.
1	 The Licensee has committed to replace this equipment item. The Licensee has stated the following:

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A Division of The Franklin Institute 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000	NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487 / 488</u>	Page 5g
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Sanklin Research Center Division of The Franklin Institute th and Race Streets. Phila Pa 19103 (215) 448-1000	NRC Contract No. NRC-03-79-11 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 487
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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 17

EQUIPMENT ITEM NO. 17 MOTORIZED VALVE ACTUATOR LOCATED IN THE EAST PENETRATION ROOM (A227) LIMITORQUE MODEL SMB00 REQUIRED OPERATING TIME: 1 HOUR TER CHECKSHEET NO. 17 LICENSEE REFERENCE(S): 706, 662, 26 FUNCTION (PLANT ID): CONTAINMENT ISOLATION (1MOV6579) LICENSEE SUBMITTAL: ' SCEW(S) [1, 12]: 151

DESIGNATION FOR DEFICIENCY	IDENTIFIED	BY THE	NRC SER	R - CIR	CLED	ITEM (S)	ONLY:
(See Section 3 of this TER							
R, T, (T, RT, P, H, S, A,	S, (R), M,	I, QM,	RPN, EX	N, SEN	, QI,	RPS, N	lone,
Not stated, Not applicable							
LISTING OF APPLICABLE CHECK	SHEETS :						

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ee (has/has not) provide ee (has/has not) specifi and/or will function whe tal service conditions. ee has presented informa gualification deficien ee (has/has not) propose qualification has not b	ed a response to the SER concerns. cally stated that the equipment is an exposed to the applicable DBE ation which shows there are no icies. ed a corrective action for this equi- een fully established. ation (has/has not) been provided b	ipment
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and/or will function whe tal service conditions. We has presented informa g qualification deficien ee (has/has not) propose qualification has not b loation for interim oper	in exposed to the applicable DBE ition which shows there are no icies. In a corrective action for this equi een fully established. ation (has/has not) been provided b	ipment
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qualification has not b loation for interim oper	een fully established. ation (has/has not) been provided b	
lcation for interim oper ee for this equipment it	ation (has/nas not) been provided b	w the
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ive action specified by	the Licensee:	
aipment modification aipment relocation above locate or shield equipme aify qualification by ad aipment relocation to a alification testing of e	submergence level nt from radiation source ditional (testing/analysis) mild environment)
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ive action. (Schedule	for accomplishing the corrective	.)
e states that the equip Id be exempted from env	ment item does not require qualific ironmental qualification.	ation
RESULTANT NRC QUALIFICA ONLY: (See Section 3 o	TION EVALUATION CATEGORY BASED ON R f this TER for Legend)	EVIEW
ion Not Established	II.c Qualified Life Deficiency III.a Exempt III.b Not in Scope IV Documentation Not Available	
	uipment replacement with uipment modification uipment relocation above locate or shield equipme rify qualification by ad uipment relocation to a alification testing of e her (uipment relocation above submergence level locate or shield equipment from radiation source rify qualification by additional (testing/analysis) uipment relocation to a mild environment alification testing of equipment in progress her (

Franklin Research Center A Division of The Franklin Institute 20th and Race Streets. Phila.. Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487</u>488

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 17

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I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life	
	or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.D	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

See EVALUATION ON PAGE 5f.

A Division of The Franklin Institute 20th and Race Streets, Phila., Pa. 19103 (215) 448-1000

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NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>497/488</u>

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 17

LICENSEE RESPONSE TO NRC SER

5. Limitorque has informed us that a generic report will be available which identifies the non-metallic materials used within their MOV's and more directly provides bases for correlation to existing qualification test reports. We will receive copies of this report when issued and anticipate resolution of the outstanding items by the end of this year. A Division of The Franklin Institute 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000

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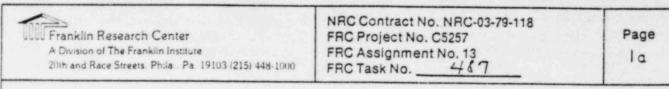
NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/488</u>

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	NVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO.
otes:	"X" DENOTES APPROPRIATE NOTES
<u>X</u> 1.	The Licensee has not provided documentation from the manufacturer which establishes similarity between the installed equipment and the test specimen in the referenced document(s). (See Note A)
<u>×</u> 2.	The Licensee has not identified the class of the insulation system used for the motor in the motorized value actuator.
<u> </u>	The Licensee has not identified whether or not this motorized valve actuator incorporates a motor-brake assembly.
<u> </u>	The Licensee has not identified the class of the insulation system used for the motor-brake assembly (if applicable).
<u>X</u> 5.	The Licensee has not identified the motor manufacturer for this motorized valve actuator.
<u>X</u> 6.	The Licensee has not identified the manufacturer of the motor-brake assembly (if applicable).
<u> </u>	The Licensee has not identified the type of current used in the motorized valve actuator.
<u> X </u>	The Licensee has not identified the type of current used in the motor-brake assembly (if applicable).
<u>X</u> 9.	
10.	The Licensee has stated that the only harsh parameter that this motorized valve actuator is exposed to is radiation.
11.	Since radiation is stated to be the only harsh parameter and considering the extensive radiation testing of the motors used in this type of motorized valve actuator, the specified radiation dose of is considered to be of sufficiently low value as to not affect this equipment item. This equipment item is considered qualified for this parameter.
12.	The Licensee has committed to replace this equipment item. The Licensee has stated the following:

A Division of The Franklin Institute 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000	NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/488</u>	Page 5g
EQUIPMENT ENVIRONMENTAL QUALIFIC	CATION REVIEW OF EQUIPMENT ITE	M NO. 17
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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 18

EQUIPMENT ITEM NO. 18 MOTORIZED VALVE ACTUATOR LOCATED IN THE EAST PIPING PENETRATION ROOM (A316) LIMITORQUE MODEL SMBOO REQUIRED OPERATING TIME: 1 HOUR TER CHECKSHEET NO. 18 LICENSEE REFERENCE(S): 662 FUNCTION (PLANT ID): INSTRUMENT AIR CONTAINMENT ISOLATION (1MOV2080) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 13

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY: (See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, A, S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None, Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents

Equipment Item

Summary of Licensee Responses to the NRC SER Equipment Environmental Qualification Summary Forms Licensee Response to NRC SER System Consideration Review Equipment Environmental Qualification Review

Installed TMI Lessons Learned Implementation Equipment Summary

Maintenance and Replacement Schedule Summary

<u>Checksheet Page No.</u> la lb 2 3a, 3b, 3c, 3d 4a, 4b, 4c, 4d, 4e, 4f 5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j

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A Divisi	in Research Center on of The Franklin Institute 1 Race Streets, Phila , Pa, 19103 (215) 448-1000	NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/488</u>	Page 1b
	T ENVIRONMENTAL QUALIFIC	ATION REVIEW OF EQUIPMENT ITEM N	10. 18
SUMMARY C	F LICENSEE RESPONSES TO THE N	RC SER - ONLY CHECKED ITEMS ARE APPL	TONDER
		STO DER SHOT CHECKED TILLE ARE APPL	ICABLE
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X The L	iconsee (has not) specifi	cally stated that the equipment is	
quali	fied and/or will function whe onmental service conditions.	n exposed to the applicable DBE	
outst	anding qualif_cation deficien	tion which shows there are no cies.	
The L	icensee (hds/has not) propose	d a corrective action for this equip	ment
item	whose qualification has not b	een fully established.	ale li e
J	ustification for interim oper	ation (has/has not) been provided by	the
1	Icensee for this equipment it	em.	
c	orrective action specified by	the Licensee:	
-	Equipment replacement with Equipment modification	qualified equipment	
_	Equipment relocation above	submergence level	
-	Relocate or shield equipmen Verify qualification by add	nt from radiation source	
-	Equipment relocation to a n	mild environment	
-	Qualification testing of ed Other (quipment in progress	
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t)	he Licensee has provided other hat can be construed as a bas:	r information for this equipment iter is for justification for interim	n
0	peration.		
T	ne Licensee (nas/has not) prov	vided a schedule for the proposed	
C	orrective action. (Schedule is ction	for accomplishing the corrective	
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and/or	censee states that the equipm r should be exempted from envi	ment item does not require qualificat	tion
- CIRCLED	ITEM ONLY: (See Section 3 of	TION EVALUATION CATEGORY BASED ON REV this TER for Legend)	/IEW
I.a Quali	fied	II.c Qualified Life Deficiency	
I.b Modif		III.a Exempt	
	fication Not Established	III.b Not in Scope	
II.b Not	(dd t t t t d d	IV Documentation Not Available	

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Franklin Research Center A Division of The Franklin Institute 20th and Race Streets, Phila., Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487</u>/488

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 18

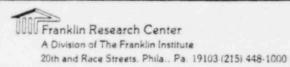
EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM DESIGNATION: X = DEFICIENCY NRC REQUIREMENTS Documented Evidence of Qualification Adequate Adequate Similarity Between Equipment and Test Specimen Established Aging Degradation Evaluated Adequately Qualified Life or Replacement Schedule Established (If Required) Program Established to Identify Aging Degradation Criteria Regarding Aging Simulation Satisfied (If Required) Criteria Regarding Temperature/Pressure Exposure: o Peak Temperature Adequate o Peak Pressure Adequate o Duration Adequate o Required Profile Enveloped Adequately o Steam Exposure (If Required) Adequate Criteria Regarding Spray Satisfied Criteria Regarding Submergence Satisfied Criteria Regarding Radiation Satisfied Criteria Regarding Test Sequence Satisfied Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied Criteria Regarding Functional Testing Satisfied Criteria Regarding Instrument Accuracy Satisfied Test Duration Margin (1 hour + Function Time) Satisfied Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) DESIGNATION:

NRC QUALIFICATION CATEGORY

I.a	Equipment Qualified	-
I.b	Equipment Qualification Pending Modification	-
II.a	Equipment Qualification Not Established	_X_
II.b	Equipment Not Qualified	-
II.c	Equipment Satisfies All Requirements Except Qualified Life	
	or Replacement Schedule Justified	-
III.a	Equipment Exempt From Qualification	-
III.D	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

See Evaluation on Page 5f.

X = CATEGORY



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 18

LICENSEE RESPONSE TO NRC SER

5. Limitorque has informed us that a generic report will be available which identifies the non-netallic materials used within their MOV's and more directly provides bases for correlation to existing qualification test reports. We will receive copies of this report when issued and anticipate resolution of the outstanding items by the end of this year. A Division of The Franklin Institute 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487 488</u>

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IOTES:	"X" DENOTES APPROPRIATE NOTES
<u> </u>	The Licensee has not provided documentation from the manufacturer which establishes similarity between the installed equipment and the test specimen in the referenced document(s). (NOTE A)
<u> </u>	The Licensee has not identified the class of the insulation system used for the motor in the motorized valve actuator.
<u> </u>	The Licensee has not identified whether or not this motorized valve actuator incorporates a motor-brake assembly.
<u>X</u> 4.	The Licensee has not identified the class of the insulation system used for the motor-brake assembly (if applicable).
<u>X</u> 5.	The Licensee has not identified the motor manufacturer for this motorized valve actuator.
<u>X</u> 6.	The Licensee has not identified the manufacturer of the motor-brake assembly (if applicable).
<u> </u>	The Licensee has not identified the type of current used in the motorized valve actuator.
<u> </u>	The Licensee has not identified the type of current used in the motor-brake assembly (if applicable).
<u>X</u> 9.	The Licensee has not established a qualified life estimate for this motorized valve actuator based on technically justifiable methods and conservative assumptions.
10.	The Licensee has stated that the only harsh parameter that this motorized valve actuator is exposed to is radiation.
11.	Since radiation is stated to be the only harsh parameter and considering the extensive radiation testing of the motors used in this type of motorized valve actuator, the specified radiation dose of is considered to be of sufficiently low value as to not affect this equipment item. This equipment item is considered qualified for this parameter.
12.	The Licensee has committed to replace this equipment item. The Licensee has stated the following:

NRC Contract No. NRC-03-79-118 - -Franklin Research Center Page FRC Project No. C5257 A Division of The Franklin Institute FRC Assignment No. 13 50 20th and Race Streets. Phila . Pa. 19103 (215) 448-1000 FRC Task No. _ 487 /488 EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 18 NOTES: A. The Licensee has ated correspondence with the manufactures These mener CUMIN nan 110111 cin 100 Sep Oa a 11 ad BILA anily 11ml 1 ond equipmen

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A Division of The Franklin Institute 20th and Race Streets. Phila. Pa 19103 (215) 448-1000	NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 487	Page
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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 19

EQUIPMENT ITEM NO. 19 MOTORIZED VALVE ACTUATOR LOCATED IN THE MAIN STEAM PIPING PENETRATION (A315) LIMITORQUE MODEL SMB2 REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 19 LICENSEE REFERENCE(S): 706 FUNCTION (PLANT ID): STEAM GENERATOR 12 FEEDWATER ISOLATION 1MOV4517 ' (1MOV4517) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 15

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY: (See Section 3 of this TER for Legend)

R, T, (T, F, P, H, CS, A, S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None, Not stated, Not applicable

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LISTING OF APPLICABLE CHECKSHEETS:

Contents

Equipment Item

Summary of Licensee Responses to the NRC SER

Equipment Environmental Qualification Summary Forms

Licensee Response to NRC SER

System Consideration Review

Equipment Environmental Qualification Review

Installed TMI Lessons Learned Implementation Equipment Summary

Maintenance and Replacement Schedule Summary

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A Division of The Franklin Institute 20th and Race Streets. Phila . Pa 19103 (215) 448-1000	NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/488</u>	Page 1b
EQUIPMENT ENVIRONMENTAL QUALIFIC	ATION REVIEW OF EQUIPMENT ITEM	NO. 19
SUMMARY OF LICENSEE RESDONGES TO THE		
SUMMARY OF LICENSEE RESPONSES TO THE !	ARC SER - UNLY CHECKED ITEMS ARE AP.	PLICABLE
X The Licensee (has/mas not) provide	ed a response to the SER concerns.	
X The Licensee (has not) specific qualified and/or will function whe environmental service conditions.	ically stated that the equipment is	
X The Licensee has presented information outstanding qualification deficier	ation which shows there are no ncies.	
The Licensee (has/has not) propose item whose qualification has not b	ed a corrective action for this equippeen fully established.	ipment
Justification for interim oper Licensee for this equipment it	ation (has/has not) been provided b em.	by the
Corrective action specified by	the Licensee:	
Equipment replacement with Equipment modification Equipment relocation above Relocate or shield equipme Verify qualification by ad Equipment relocation to a Qualification testing of e Other (e submergence level ent from radiation source ditional (testing/analysis) mild environment)
The Licensee has provided othe that can be construed as a bas operation.	r information for this equipment it is for justification for interim	em
corrective action. (Schedule	vided a schedule for the proposed for accomplishing the corrective)
The Licensee states that the equip and/or should be exempted from env	ment item does not require qualific ironmental qualification.	ation
DESIGNATION OF RESULTANT NRC QUALIFICA - CIRCLED ITEM ONLY: (See Section 3 o	TION EVALUATION CATEGORY BASED ON R f this TER for Legend)	EVIEW
I.a Qualified I.b Modification II.a Qualification Not Established	II.c Qualified Life Deficiency III.a Exempt	
II.b Not Qualified	III.b Not in Scope IV Documentation Not Available	

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A Division of The Franklin Institute 20th and Race Streets. Phila. Pa. 19103 (215) 448 1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>488</u>/487

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DESIGNATION: X = DEFICIENCY

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT IN EM NO. 17

EQUIPMENT ENJIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

Documented Evidence of Qualification Adequate Adequate Similarity Between Equipment and Test Specimen Established Aging Degradation Evaluated Adequately Qualified Life or Replacement Schedule Established (If Required) Program Established to Identify Aging Degradation Criteria Regarding Aging Simulation Satisfied (If Required) Criteria Regarding Temperature/Pressure Exposure: o Peak Temperature Adequate

o Peak Pressure Adequate

o Duration Adequate

o Required Profile Enveloped Adequately

o Steam Exposure (If Required) Adequate

Criteria Regarding Spray Satisfied

Criteria Regarding Submergence Satisfied

Criteria Regarding Radiation Satisfied

Criteria Regarding Test Sequence Satisfied

Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied

Criteria Regarding Functional Testing Satisfied Criteria Regarding Instrument Accuracy Satisfied Test Duration Margin (1 hour + Function Time) Satisfied Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)

NRC QUALIFICATION CATEGORY

Equipment Qualified I.a Equipment Qualification Pending Modification I.b _X____ Equipment Qualification Not Established II.a II.b Equipment Not Qualified Equipment Satisfies All Requirements Except Qualified Life II.C or Replacement Schedule Justified III.a Equipment Exempt From Qualification III.b Equipment Not in the Scope of the Qualification Review Documentation Not Made Available IV

See Evaluation on PAGE 5f.

DESIGNATION: X * CATEGORY



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NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487</u>/488

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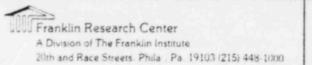
EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 19

LICENSEE RESPONSE TO NRC SER

5. Limitorque has informed us that a generic report will be available which identifies the non-netallic materials used within their MOV's and more directly provides bases for correlation to existing qualification test reports. We will receive copies of this report when issued and anticipate resolution of the outstanding items by the end of this year. A Division of The Franklin Institute 20th and Race Streets, Phila., Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>437/488</u>

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OTES:	"X" DENOTES APPROPRIATE NOTES
<u>X</u> 1.	The Licensee has not provided documentation from the manufacturer which establishes similarity between the installed equipment and the test specimen in the referenced document(s).
<u>X</u> 2.	The Licensee has not identified the class of the insulation system used for the motor in the motorized valve actuator.
<u>X</u> 3.	The Licensee has not identified whether or not this motorized valve actuator incorporates a motor-brake assembly.
<u>×</u> 4.	The Licensee has not identified the class of the insulation system used for the motor-brake assembly (if applicable).
<u>X</u> 5.	The Licensee has not identified the motor manufacturer for this motorized valve actuator.
<u>X</u> 6.	The Licensee has not identified the manufacturer of the motor-brake assembly (if applicable).
<u>X</u> 7.	The Licensee has not identified the type of current used in the motorized valve actuator.
<u>×</u> 8.	The Licensee has not identified the type of current used in the motor-brake assembly (if applicable).
<u>X</u> 9.	The Licensee has not established a qualified life estimate for this motorized valve actuator based on technically justifiable methods and conservative assumptions.
10.	The Licensee has stated that the only harsh parameter that this motorized valve actuator is exposed to is radiation.
11.	Since radiation is stated to be the only harsh parameter and considering the extensive radiation testing of the motors used in this type of motorized valve actuator, the specified radiation dose of is considered to be of sufficiently low value as to not affect this equipment item. This equipment item is considered qualified for this parameter.
12.	The Licensee has committed to replace this equipment item. The Licensee has stated the following:



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 20

EQUIPMENT I. M NO. 20 MOTORIZED VAL & ACTUATOR LOCATED IN THE MAIN STEAM PIPING PENETRATION (A315) LIMITORQUE MOD. SMB2 REQUIRED OPERATING TIME: 8 HOURS TER CHECKSHEET NO. 20 LICENSEE REFERENCE(S): 706 FUNCTION (PLANT ID): STEAM GENERATOR 11 FEEDWATER ISOLATION 1MOV4516 (1MOV4516) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 14

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY: (See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, A, S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

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LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	la
Summary of Licensee Responses to the NRC SER	lb
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, 3b, 3c, 3d
System Consideration Review	40, 40, 40, 40, 40, 45
Equipment Environmental Qualification Review	-5a, 5b, 5c, 5d, 5c, 5f, 5g, 5h, 5i, 5j
Installed TMI Lessons Learned Implementation Equipment Summary	6a, 6b-
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Maintenance and Replacement Schedule Summary

A Division of The Franklin Institute 20th and Race Streets. Phila., Pa. 19103 (215) 448-1000	NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/488</u>	Page Ib
EQUIPMENT ENVIRONMENTAL QUALIFIC	ATION REVIEW OF EQUIPMENT ITEM N	10. <u>20</u>
SUMMARY OF LICENSEE RESPONSES TO THE N	NRC SER - ONLY CHECKED ITEMS ARE APPL	ICABLE:
X The Licensee (has/has not) provide	ed a response to the SER concerns.	
X The Licensee (has not) specific qualified and/or will function whe environmental service conditions.	ically stated that the equipment is an exposed to the applicable DBE	
X The Licensee has presented informa outstanding qualification deficier	ation which shows there are no ncies.	
The Licensee (has/has not) propose item whose qualification has not b	ed a corrective action for this equip been fully established.	ment
Justification for interim oper Licensee for this equipment it	ration (has/has not) been provided by tem.	the
Corrective action specified by	y the Licensee:	
Equipment replacement with Equipment modification Equipment relocation above lelocate or shield equipme Verify qualification by ad Equipment relocation to a Qualification testing of e Other (e submergence level ent from radiation source dditional (testing/analysis) mild environment	_)
	er information for this equipment iter sis for justification for interim	1
corrective action. (Schedule	ovided a schedule for the proposed for accomplishing the corrective .)	
The Licensee states that the equip and/or should be exempted from env	oment item does not require qualification.	tion
DESIGNATION OF RESULTANT NRC QUALIFICA		IEW
- CIRCLED ITEM ONLY: (See Section 3 o	of this TER for Legend)	
I.a Qualified	II.c Qualified Life Deficiency	
I.b Modification II.a Qualification Not Established	III.a Exempt	
the second se	TTT b Not in Coope	
II.b Not Qualified	III.b Not in Scope IV Documentation Not Available	
II.b Not Qualified		

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Franklin Research Center A Division of The Franklin Institute 20th and Race Streets, Phila, Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/488</u>

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 20

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

DESIGNATION: NRC REQUIREMENTS X = DEFICIENCY Documented Evidence of Qualification Adequate Adequate Similarity Between Equipment and Test Specimen Established Aging Degradation Evaluated Adequately Qualified Life or Replacement Schedule Established (If Required) Program Established to Identify Aging Degradation Criteria Regarding Aging Simulation Satisfied (If Required) Criteria Regarding Temperature/Pressure Exposure: o Peak Temperature Adequate o Peak Pressure Adequate o Duration Adequate o Required Profile Enveloped Adequately o Steam Exposure (If Required) Adequate Criteria Regarding Spray Satisfied Criteria Regarding Submergence Satisfied Criteria Regarding Radiation Satisfied Criteria Regarding Test Sequence Satisfied Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied Criteria Regarding Functional Testing Satisfied Criteria Regarding Instrument Accuracy Satisfied Test Duration Margin (1 hour + Function Time) Satisfied Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)

NRC QUALIFICATION CATEGORY

DESIGNATION: X = CATEGORY

I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	_X_
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life	
	or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.D	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

See Evaluation on Page 5f.

A Division of The Franklin Institute 20th and Race Streets. Phila. Pa 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/488</u>

Page 3c

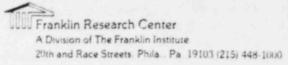
EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 20

LICENSEE RESPONSE TO NRC SER

5. Limitorque has informed us that a generic report will be available which identifies the non-metallic materials used within their MOV's and more directly provides bases for correlation to existing qualification test reports. We will receive copies of this report when issued and anticipate resolution of the custanding items by the end of this year. A Division of The Franklin Institute 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/488</u>

Page 5f

OTES:	"X" DENOTES APPROPRIATE NOTES
<u> </u>	The Licensee has not provided documentation from the manufacturer which establishes similarity between the installed equipment and the test specimen in the referenced document(s).
<u>×</u> 2.	The Licensee has not identified the class of the insulation system used for the motor in the motorized valve actuator.
<u> </u>	The Licensee has not identified whether or not this motorized valve actuator incorporates a motor-brake assembly.
<u>X</u> 4.	The Licensee has not identified the class of the insulation system used for the motor-brake assembly (if applicable).
<u>X</u> 5.	The Licensee has not identified the motor manufacturer for this motorized valve actuator.
<u>X</u> 6.	The Licensee has not identified the manufacturer of the motor-brake assembly (if applicable).
<u>X</u> 7.	The Licensee has not identified the type of current used in the motorized valve actuator.
<u>X</u> 8.	the motor-brake assembly (if applicable).
<u> </u>	The Licensee has not established a qualified life estimate for this motorized valve actuator based on technically justifiable methods and conservative assumptions.
10.	The Licensee has stated that the only harsh parameter that this motorized valve actuator is exposed to is radiation.
11.	Since radiation is stated to be the only harsh parameter and considering the extensive radiation testing of the motors used in this type of motorized valve actuator, the specified radiation dose of is considered to be of sufficiently low value as to not affect this equipment item. This equipment item is considered qualified for this parameter.
12.	The Licensee has committed to replace this equipment item. The Licensee has stated the following:



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 21

EQUIPMENT ITEM NO. 21 MOTORIZED VALVE ACTUATOR LOCATED IN THE ECCS PUMP ROOM (A119) LIMITORQUE MODEL SMB1 REQUIRED OPERATING TIME: 1 HOUR TER CHECKSHEET NO. 21 LICENSEE REFERENCE(S): NOT CITED FUNCTION (PLANT ID); MANUAL HPSI HEADER ISOLATION 1MOV656 (1MOV656) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 218

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY: (See Section 3 of this TER for Legend)

R, T, QI, RT, P, H, CS, A, S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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Equipment Item

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Installed TMI Lessons Learned Implementation Equipment Summary

Maintenance and Replacement Schedule Summary

la 1b 2 3a, 3b, 3c, 3d 4a, 4b, 4c, 4d, 4e, 4f 5a, 5b, 5c, 5d, 5c, 5f, 5g, 5h, 5i, 5j

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A Drusion of The Franklin Institute 20th and Race Streets. Phila., Pa. 19103 (215) 448-1000	NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487 /488</u>	Page 1b
EQUIPMENT ENVIRONMENTAL QUALIFIC	ATION REVIEW OF EQUIPMENT ITEM	NO. 21
SUMMARY OF LICENSEE RESPONSES TO THE N	NRC SER - ONLY CHECKED ITEMS ARE API	PLICABLE:
X The Licensee (has/has not) provide	ed a response to the SER concerns.	
X The Licensee (has not) specifi qualified and/or will function whe environmental service conditions.	ically stated that the equipment is an exposed to the applicable DBE	
X The Licensee has presented informa outstanding qualification deficien	ation which shows there are no ncies.	
The Licensee (nas/has not) propose item whose qualification has not b	ed a corrective action for this equippeen fully established.	pment
Justification for interim oper Licensee for this equipment it	ration (has/has not) been provided b	by the
Corrective action specified by	the Licensee:	
Equipment replacement with Equipment modification Equipment relocation above Relocate or shield equipme Verify qualification by ad Equipment relocation to a Qualification testing of e Other (e submergence level ent from radiation source dditional (testing/analysis) mild environment	
The Licensee has provided othe	er information for this equipment it is for justification for interim	em /
	ovided a schedule for the proposed for accomplishing the corrective)
The Licensee states that the equip and/or should be exempted from env	ment item does not require qualific rironmental qualification.	ation
DESIGNATION OF RESULTANT NRC QUALIFICA - CIRCLED ITEM ONLY: (See Section 3 o	TION EVALUATION CATEGORY BASED ON R f this TER for Legend)	EVIEW
I.a Qualified I.b Modification II.a Qualification Not Established II.b Not Qualified	II.c Qualified Life Deficiency III.a Exempt III.b Not in Scope IV Documentation Not Available	

Franklin Research Center A Division of The Franklin Institute 20th and Race Streets. Phila . Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487</u>/488

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DESIGNATION:

DESIGNATION: X = CATEGORY

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 21

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

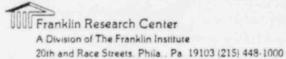
X = DEFICIENCY NRC REQUIREMENTS Documented Evidence of Qualification Adequate Adequate Similarity Between Equipment and Test Specimen Established Aging Degradation Evaluated Adequately Qualified Life or Replacement Schedule Established (If Required) Program Established to Identify Aging Degradation Criteria Regarding Aging Simulation Satisfied (If Required) Criteria Regarding Temperature/Pressure Exposure: o Peak Temperature Adequate o Peak Pressure Adequate o Duration Adequate o Required Profile Enveloped Adequately o Steam Exposure (If Required) Adequate Criteria Regarding Spray Satisfied Criteria Regarding Submergence Satisfied Criteria Regarding Radiation Satisfied Criteria Regarding Test Sequence Satisfied Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied Criteria Regarding Functional Testing Satisfied Criteria Regarding Instrument Accuracy Satisfied Test Duration Margin (1 hour + Function Time) Satisfied Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)

NRC QUALIFICATION CATEGORY

I.a Equipment Qualified ×. I.b Equipment Qualification Pending Modification Equipment Qualification Not Established II.a II.b Equipment Not Qualified Equipment Satisfies All Requirements Except Qualified Life II.c or Replacement Schedule Justified Equipment Exempt From Qualification III.a III.b Equipment Not in the Scope of the Qualification Review IV Documentation Not Made Available

See Evaluation on Page 5f.





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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 21

LICENSEE RESPONSE TO NRC SER

5. Limitorque has informed us that a generic report will be available which identifies the non-metallic materials used within their MOV's and more directly provides bases for correlation to existing qualification test reports. We will receive copies of this report when issued and anticipate resolution of the outstanding items by the end of this year. A Division of The Franklin Institute 20th and Race Streets, Phila., Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/488</u>

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 21

"X" DENOTES APPROPRIATE NOTES NOTES: X 1. The Licensee has not provided documentation from the manufacturer which establishes qualification, nor has The Licensee provided the engineering analysis cited on the component sheet. 2. The Licensee has not identified the class of the insulation X system used for the motor in the motorized valve actuator. 3. The Licensee has not identified whether or not this motorized valve actuator incorporates a motor-brake assembly. 4. The Licensee has not identified the class of the insulation system used for the motor-brake assembly (if applicable). 5. The Licensee has not identified the motor manufacturer for this motorized valve actuator. 6. The Licensee has not identified the manufacturer of the motor-brake assembly (if applicable). 7. The Licensee has not identified the type of current used in the motorized valve actuator. 8. The Licensee has not identified the type of current used in the motor-brake assembly (if applicable). 9. The Licensee has not established a qualified life estimate for this motorized valve actuator based on technically justifiable methods and conservative assumptions. 10. The Licensee has stated that the only harsh parameter that this motorized valve actuator is exposed to is radiation. 11. Since radiation is stated to be the only harsh parameter and considering the extensive radiation testing of the motors used in this type of motorized valve actuator, the specified radiation dose of is considered to be of sufficiently low value as to not affect this equipment item. This equipment item is considered qualified for this parameter. 12. The Licensee has committed to replace this equipment item. The Licensee has stated the following:

A Division of The Franklin Institute 20th and Race Streets. Phila . Pa 19103 (215) 448-1000	NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487</u>	Page
EQUIPMENT ENVIRONMENTAL QUALIFIC	ATION REVIEW OF EQUIPMENT ITE	M NO. 20
EQUIPMENT ITEM NO. 22 MOTORIZED VALVE ACTUATOR LOCATED IN CO (A122)	NTAINMENT RECIRCULATION PIPE TUNK	EL
LIMITORQUE MODEL SMB2 REQUIRED OPERATING TIME: 9 HOURS TER CHECKSHEET NO. 22 LICENSEE REFERENCE(S): 706		
FUNCTION (PLANT ID): CONTAINMENT SUMP LICENSEE SUBMITTAL: SCEW(S) [1, 12]:		
	그는 것은 것이 같은 것이야.	

R, T, QT, RT, P, H, CS, A, S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

(See Section 3 of this TER for Legend)

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Licensee Response to NRC SER	3a, 3b, 3c, 3d -
System Consideration Review	4a, 4b, 4c, 4d, 4e, 4f
Equipment Environmental Qualification Review	5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j
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Installed TMI Lessons Learned Implementation Equipment Summary

Maintenance and Replacement Schedule Summary

A Division of The Franklin Institute 20th and Race Streets. Phila. Pa 19103 (215) 448-1000	NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487</u> /488	Page Ib
EQUIPMENT ENVIRONMENTAL QUALIFIC	CATION REVIEW OF EQUIPMENT ITEM N	10. 22
SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPL	ICABLE:
X The Licensee (has/has-not) provid	ed a response to the SER concerns.	
X The Licensee (bas/has not) specif qualified and/or will function wh environmental service conditions.	en exposed to the applicable DBE	
X The Licensee has presented inform outstanding qualification deficies	ation which shows there are no ncies.	
The Licensee (has/has not) proposition the proposition has not be a set of the proposition of the proposition has not be a set of the proposition of the proposition has not be a set of the proposition of the propositi	ed a corrective action for this equip been fully established.	ment
Justification for interim ope Licensee for this equipment i	ration (has/has not) been provided by tem.	the
Corrective action specified by	y the Licensee:	
Equipment replacement with Equipment modification Equipment relocation above Relocate or shield equipme Verify qualification by ac Equipment relocation to a Qualification testing of e Other (e submergence level ent from radiation source dditional (testing/analysis) mild environment	_)
The Licensee has provided other that can be construed as a bas operation.	er information for this equipment ite sis for justification for interim	n
The Licensee (nas/has not) pro corrective action. (Schedule action	ovided a schedule for the proposed for accomplishing the corrective .)	
The Licensee states that the equip and/or should be exempted from env	pment item does not require qualification.	tion
DESIGNATION OF RESULTANT NRC QUALIFIC - CIRCLED ITEM ONLY: (See Section 3 of	ATION EVALUATION CATEGORY BASED ON RE of this TER for Legend)	TEW
I.a Qualified I.b Modification [II.a Qualification Not Established] II.b Not Qualified	II.c Qualified Life Deficiency III.a Exempt III.b Not in Scope IV Documentation Not Available	

Franklin Research Center A Division of The Franklin Institute 20th and Race Streets. Phila., Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 487 /488

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DESIGNATION: X = DEFICIENCY

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 22

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

Documented Evidence of Qualification Adequate Adequate Similarity Between Equipment and Test Specimen Established Aging Degradation Evaluated Adequately Qualified Life or Replacement Schedule Established (If Required) Program Established to Identify Aging Degradation Criteria Regarding Aging Simulation Satisfied (If Required) Criteria Regarding Temperature/Pressure Exposure: o Peak Temperature Adequate o Peak Pressure Adequate o Duration Adequate o Required Profile Enveloped Adequately o Steam Exposure (If Required) Adequate Criteria Regarding Spray Satisfied Criteria Regarding Submergence Satisfied Criteria Regarding Radiation Satisfied Criteria Regarding Test Sequence Satisfied Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied Criteria Regarding Functional Testing Satisfied

Criteria Regarding Instrument Accuracy Satisfied Test Duration Margin (1 hour + Function Time) Satisfied Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)

NRC QUALIFICATION CATEGORY

DESIGNATION: X = CATEGORY

I.a Equipment Qualified × Equipment Qualification Pending Modification I.b Equipment Qualification Not Established II.a II.b Equipment Not Qualified Equipment Satisfies All Requirements Except Qualified Life II.c or Replacement Schedule Justified Equipment Exempt From Qualification III.a III.b Equipment Not in the Scope of the Qualification Review Documentation Not Made Available IV

See Evaluation on Page 5f.

Franklin Research Center A Division of The Franklin Institute 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487</u>/488

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 22

LICENSEE RESPONSE TO NRC SER

5. Limitorque has informed us that a generic report will be available which identifies the non-metallic materials used within their MOV's and more directly provides bases for correlation to existing qualification test reports. We will receive copies of this report when issued and anticipate resolution of the outstanding items by the end of this year. A Division of The Franklin Institute 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487 (488</u>

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OTES:	"X" DENOTES APPROPRIATE NOTES
<u> X </u>	The Licensee has not provided documentation from the manufacturer which establishes similarity between the installed equipment and the test specimen in the referenced document(s).
<u>X</u> 2.	The Licensee has not identified the class of the insulation system used for the motor in the motorized valve actuator.
<u> </u>	The Licensee has not identified whether or not this motorized valve actuator incorporates a motor-brake assembly.
<u>X</u> 4.	The Licensee has not identified the class of the insulation system used for the motor-brake assembly (if applicable).
<u>×</u> 5.	The Licensee has not identified the motor manufacturer for this motorized valve actuator.
<u> </u>	The Licensee has not identified the manufacturer of the motor-brake assembly (if applicable).
<u> </u>	The Licensee has not identified the type of current used in the motorized valve actuator.
<u>×</u> 8.	The Licensee has not identified the type of current used in the motor-brake assembly (if applicable).
<u>×</u> 9.	The Licensee has not established a qualified life estimate for this motorized valve actuator based on technically justifiable methods and conservative assumptions.
10.	The Licensee has stated that the only harsh parameter that this motorized valve actuator is exposed to is radiation.
11.	Since radiation is stated to be the only harsh parameter and considering the extensive radiation testing of the motors used in this type of motorized valve actuator, the specified radiation dose of is considered to be of sufficiently low value as to not affect this equipment item. This equipment item is considered qualified for this parameter.
12.	The Licensee has committed to replace this equipment item. The Licensee has stated the following:

Franklin Pesearch Center A Division of The Franklin Institute 20th and Race Streets Phila Pa 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 487

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 23

EQUIPMENT ITEM NO. 23 MOTORIZED VALVE ACTUATOR LOCATED IN THE EAST PENETRATION ROOM (A227) LIMITORQUE MODEL SMB00 REQUIRED OPERATING TIME: 8 HOURS TER CHECKSHEET NO. 23 LICENSEE REFERENCE(S): 1064 FUNCTION (PLANT ID); HPSI TO LOOP 11A 1MOV617 (1MOV617) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 196 DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY: (See Section 3 of this TER for Legend) R, T, (QT,) (RT,) P, H, CS, (A,) S, (R), M, I, (UM,) RPN, EXN, SEN, QI, RPS, None, Not stated, Not applicable LISTING OF APPLICABLE CHECKSHEETS: Contents Checksheet Page No. Equipment Item la Summary of Licensee Responses to the NRC SER 15 Equipment Environmental Qualification Summary Forms 2 Licensee Response to NRC SER 3a, 36, 3c, 3d-System Consideration Review 42, 4b, 40, 4d, 40, 4E Equipment Environmental Qualification Review 5a, 5b, 5c, 5d, 5c, 5f, 5g, 5h, 51, 53-Installed TMI Lessons Learned Implementation 6a, 6b-Equipment Summary Maintenance and Replacement Schedule Summary 72, 70, 70-

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A Division of The Franklin Institute 20th and Race Streets. Phila. Pa 19103 (215) 448-1000	NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487</u> /488	Page Ib
EQUIPMENT ENVIRONMENTAL QUALIFIC	ATION REVIEW OF EQUIPMENT ITEM	NO. 23
SUMMARY OF LICENSEE RESPONSES TO THE N	NRC SER - ONLY CHECKED ITEMS ARE API	PLICABLE
X The Licensee (has/has not) provide	ed a response to the SER concerns.	
Y The Licensee (trans/has not) specifi qualified and/or will function whe environmental service conditions.	ically stated that the equipment is an exposed to the applicable DBE	
X The Licensee has presented informa outstanding qualification deficien	ation which shows there are no noises.	
The Licensee (has/has not) propose item whose qualification has not b	ed a corrective action for this equi been fully established.	pment
Justification for interim oper Licensee for this equipment it	ation (has/has not) been provided b	by the
Corrective action specified by	the Licensee:	
Equipment replacement with Equipment modification Equipment relocation above Relocate or shield equipme Verify qualification by ad Equipment relocation to a Qualification testing of e Other (submergence level ent from radiation source ditional (testing/analysis) mild environment)
The Licensee has provided othe that can be construed as a bas operation.	r information for this equipment it is for justification for interim	em
corrective action. (Schedule	vided a schedule for the proposed for accomplishing the corrective .)
The Licensee states that the equip and/or should be exempted from env	ment item does not require qualific. ironmental qualification.	ation
DESIGNATION OF RESULTANT NRC QUALIFICA - CIRCLED ITEM ONLY: (See Section 3 o	TION EVALUATION CATEGORY BASED ON R f this TER for Legend)	EVIEW
L.a Qualified L.b Modification L.a Qualification Not Established L.b Not Qualified	II.c Qualified Life Deficiency III.a Exempt III.b Not in Scope IV Documentation Not Available	

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Franklin Research Center A Division of The Franklin Institute 20th and Race Streets. Phila., Pa. 19103 (215) 448-1000

NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. _ 487/488

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DESIGNATION:

X = DEFICIENCY

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 23

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

Documented Evidence of Qualification Adequate Adequate Similarity Between Equipment and Test Specimen Established Aging Degradation Evaluated Adequately Qualified Life or Replacement Schedule Established (If Required) Program Established to Identify Aging Degradation Criteria Regarding Aging Simulation Satisfied (If Required) Criteria Regarding Temperature/Pressure Exposure: o Peak Temperature Adequate o Peak Pressure Adequate o Duration Adequate

o Required Profile Enveloped Adequately o Steam Exposure (If Required) Adequate

Criteria Regarding Spray Satisfied

Criteria Regarding Submergence Satisfied Criteria Regarding Radiation Satisfied Criteria Regarding Test Sequence Satisfied

Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied

Criteria Regarding Functional Testing Satisfied Criteria Regarding Instrument Accuracy Satisfied Test Duration Margin (1 hour + Function Time) Satisfied Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)

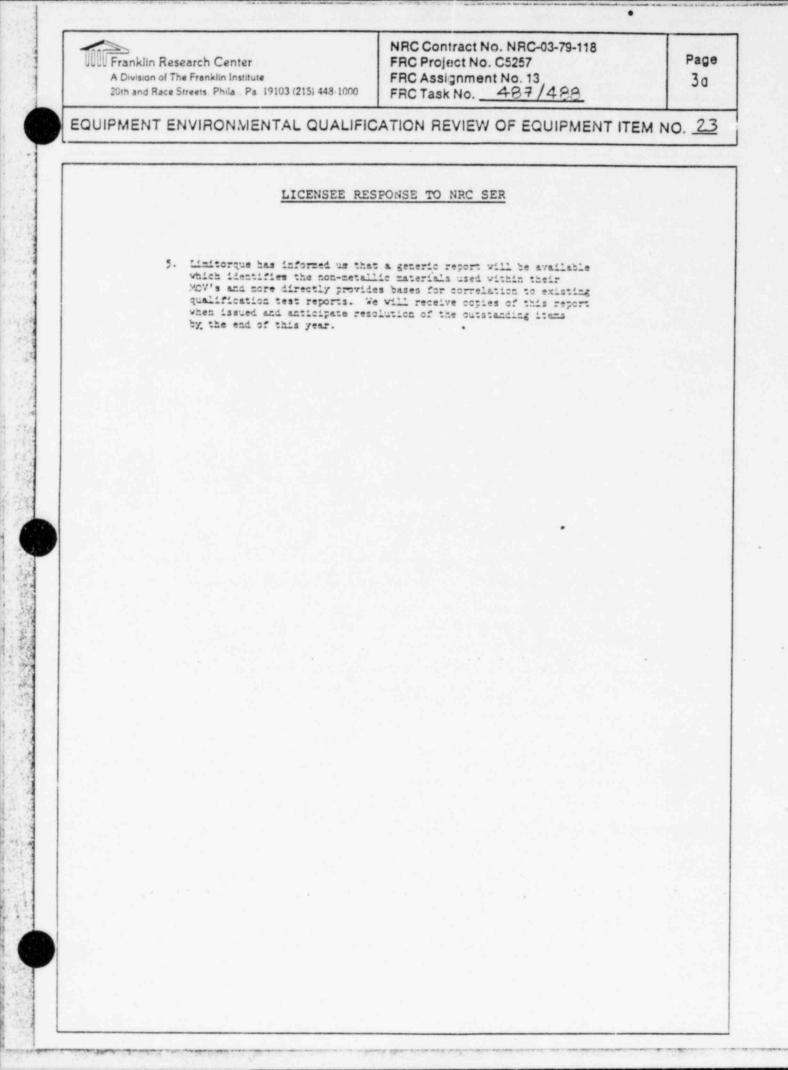
NRC QUALIFICATION CATEGORY

DESIGNATION: X = CATEGORY

I.a	Equipment Qualified
I.b	Equipment Qualification Pending Modification
II.a	Equipment Qualification Not Established
II.b	Equipment Not Qualified
II.c	Equipment Satisfies All Requirements Except Qualified Life
	or Replacement Schedule Justified
III.a	Equipment Exempt From Qualification
III.D	Equipment Not in the Scope of the Qualification Review
IV	Documentation Not Made Available

See Evaluation on Page 5f.

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A Division of The Franklin Institute 20th and Race Streets, Phila. Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/488</u>

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COPMENTE	INVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 23
OTES:	"X" DENOTES APPROPRIATE NOTES
<u> </u>	The Licensee has not provided documentation from the manufacturer which establishes similarity between the installed equipment and the test specimen in the referenced document(s). (NOTE A)
<u>×</u> 2.	The Licensee has not identified the class of the insulation system used for the motor in the motorized valve actuator.
<u>X</u> 3.	The Licensee has not identified whether or not this motorized valve actuator incorporates a motor-brake assembly.
<u>×</u> 4.	The Licensee has not identified the class of the insulation system used for the motor-brake assembly (if applicable).
<u>×</u> 5.	The Licensee has not identified the motor manufacturer for this motorized valve actuator.
<u>×</u> 6.	The Licensee has not identified the manufacturer of the motor-brake assembly (if applicable).
<u>×</u> 7.	The Licensee has not identified the type of current used in the motorized valve actuator.
<u>X</u> 8.	The Licensee has not identified the type of current used in the motor-brake assembly (if applicable).
<u>X</u> 9.	The Licensee has not established a qualified life estimate for this motorized valve actuator based on technically justifiable methods and conservative assumptions.
10.	The Licensee has stated that the only harsh parameter that this motorized valve actuator is exposed to is radiation.
11.	Since radiation is stated to be the only harsh parameter and considering the extensive radiation testing of the motors used in this type of motorized valve actuator, the specified radiation dose of is considered to be of sufficiently low value as to not affect this equipment item. This equipment item is considered qualified for this parameter.
12.	The Licensee has committed to replace this equipment item. The Licensee has stated the following:

NRC Contract No. NRC-03-79-118 12 Page FRC Project No. C5257 Franklin Research Center 50 FRC Assignment No. 13, A Division of The Franklin Institute 20th and Race Streets. Phila Pa 19103 (215) 448-1000 FRC Task No. 487 /488 EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 23 NOTES: The Trensee has ated Δ respondence Co unt imitical dated 10-10-420 a 201 provid 11 in

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Franklin Research Center A Division of The Franklin Institute 20th and Race Streets. Phila . Pa 19103 (215) 448-1000

NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. _ 487

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 24

EQUIPMENT ITEM NO. 24 MOTORIZED VALVE ACTUATOR LOCATED IN THE EAST PENETRATION ROOM (A227) LIMITORQUE MODEL SMB2 REQUIRED OPERATING TIME: 9 HOURS TER CHECKSHEET NO. 24 LICENSEE REFERENCE(S): 706 FUNCTION (PLANT ID); LPSI TO LOOP 11A 1MOV615 (1MOV615) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 206

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY: (See Section 3 of this TER for Legend)

R, T, (QI,)(RT,) P, H, CS, A, S (R), M, I, UM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

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	onklin Research Center Insion of The Franklin Institute In and Race Streets. Phila. Pa 19103 (215) 448-1000	NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 15 FRC Task No. <u>487/488</u>	Page Ib
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SUMMAR	Y OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE API	PLICABLE:
2.			
X Ine	e Licensee (has/ has not) provid	ed a response to the SER concerns.	
qua	e Licensee (has not) specif. alified and/or will function whe vironmental service conditions.	ically stated that the equipment is en exposed to the applicable DBE	
X The	e Licensee has presented information deficient	ation which shows there are no ncies.	
The ite	e Licensee (has/has not) propose em whose qualification has not b	ed a corrective action for this equi been fully established.	pment
	Justification for interim open Licensee for this equipment it	ration (has/has not) been provided b tem.	by the
	Corrective action specified by	y the Licensee:	
	Equipment replacement with	n qualified equipment	
	Equipment modification Equipment relocation above	submergence level	
	Relocate or shield equipme	ent from radiation source	
	Verify qualification by ad Equipment relocation to a		
	Qualification testing of e		
	Other ()
	The Licensee has provided othe that can be construed as a bas operation.	er information for this equipment it sis for justification for interim	em
	The Licensee (has/has not) pro	ovided a schedule for the proposed for accomplishing the corrective	
	action	for accomprishing the corrective)
The and	Licensee states that the equip /or should be exempted from env	oment item does not require qualific vironmental qualification.	ation
CIRCL	TION OF RESULTANT NRC QUALIFICA ED ITEM ONLY: (See Section 3 o	TION EVALUATION CATEGORY BASED ON R of this TER for Legend)	EVIEW
	alified	II.c Qualified Life Deficiency	
	dification alification Not Established	III.a Exempt III.b Not in Scope	6 a 11
	t Qualified	IV Documentation Not Available	

Franklin Research Center A Division of The Franklin Institute 20th and Race Streets, Phila., Pa. 19103 (215) 448-1000

NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 487/488

Page 2

DESIGNATION: X = DEFICIENCY

> DESIGNATION: X = CATEGORY

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 24

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

Documented Evidence of Qualification Adequate Adequate Similarity Between Equipment and Test Specimen Established Aging Degradation Evaluated Adequately Qualified Life or Replacement Schedule Established (If Required) Program Established to Identify Aging Degradation Criteria Regarding Aging Simulation Satisfied (If Required) Criteria Regarding Temperature/Pressure Exposure: o Peak Temperature Adequate o Peak Pressure Adequate

o Duration Adequate

o Required Profile Enveloped Adequately

o Steam Exposure (If Required) Adequate Criteria Regarding Spray Satisfied Criteria Regarding Submergence Satisfied Criteria Regarding Radiation Satisfied Criteria Regarding Test Sequence Satisfied Criteria Regarding Test Failures or Severe Anomalies

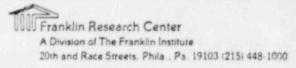
(If Any) Satisfied Criteria Regarding Functional Testing Satisfied

Criteria Regarding Instrument Accuracy Satisfied Test Duration Margin (1 hour + Function Time) Satisfied Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)

NRC QUALIFICATION CATEGORY

Equipment Qualified I.a Equipment Qualification Pending Modification I.b × Equipment Qualification Not Established II.a Equipment Not Qualified II.b Equipment Satisfies All Requirements Except Qualified Life II.c or Replacement Schedule Justified Equipment Exempt From Qualification III.a Equipment Not in the Scope of the Qualification Review III.D Documentation Not Made Available IV

See Evaluation on Page 5f.



NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487</u>/488

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 24

LICENSEE RESPONSE TO NRC SER

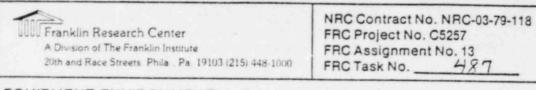
5. Limitorque has informed us that a generic report will be available which identifies the non-metallic materials used within their MOV's and more directly provides bases for correlation to existing qualification test reports. We will receive copies of this report when issued and anticipate resolution of the outstanding items by the end of this year. A Division of The Franklin Institute 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000

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NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/488</u>

Page 5f

OTES:	"X" DENOTES APPROPRIATE NOTES
<u> </u>	The Licensee has not provided documentation from the manufacturer which establishes similarity between the installed equipment and the test specimen in the referenced document(s).
<u>X</u> 2.	The Licensee has not identified the class of the insulation system used for the motor in the motorized valve actuator.
<u>×</u> 3.	The Licensee has not identified whether or not this motorized valve actuator incorporates a motor-brake assembly.
<u>×</u> 4.	The Licensee has not identified the class of the insulation system used for the motor-brake assembly (if applicable).
<u> </u>	The Licensee has not identified the motor manufacturer for this motorized valve actuator.
<u>×</u> 6.	The Licensee has not identified the manufacturer of the motor-brake assembly (if applicable).
<u>×</u> 7.	The Licensee has not identified the type of current used in the motorized valve actuator.
<u>×</u> 8.	The Licensee has not identified the type of current used in the motor-brake assembly (if applicable).
<u>×</u> 9.	The Licensee has not established a qualified life estimate for this motorized valve actuator based on technically justifiable methods and conservative assumptions.
10.	The Licensee has stated that the only harsh parameter that this motorized valve actuator is exposed to is radiation.
11.	Since radiation is stated to be the only harsh parameter and considering the extensive radiation testing of the motors used in this type of motorized valve actuator, the specified radiation dose of is considered to be of sufficiently low value as to not affect this equipment item. This equipment item is considered qualified for this parameter.
12.	The Licensee has committed to replace this equipment item. The Licensee has stated the following:



Page

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 25

EQUIPMENT ITEM NO. 25 MOTORIZED VALVE ACTUATOR LOCATED IN THE ECCS PUMP ROOM (A118) LIMITORQUE MODEL SMB0 REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 25 LICENSEE REFERENCE(S): 1620 FUNCTION (PLANT ID): HPSI HEADER ISOLATION VALVE (1MOV654) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 191

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY: (See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, A, S, (R), M, I, (M, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	la
Summary of Licensee Responses to the NRC SER	lb
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, 3b, 3c, 3d -
System Consideration Review	4a, 4b, 4c, 4d, 4e, 4£
Equipment Environmental Qualification Review	5a, 5b, 5c, 5d, 5c, 5f, 5g, 5h, 5i, 5j
Installed TMI Lessons Learned Implementation Equipment Summary	6a, 6b.

7a, 7b, 7c

Maintenance and Replacement Schedule Summary

A Division of The Franklin Institute 20th and Race Streets. Phila . r o 1/103 (215) 448-1000	NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487</u> 488	Page 1b
QUIPMENT ENVIRONMENTAL QUALIFIC	CATION REVIEW OF EQUIPMENT ITEN	M NO. <u>25</u>
SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE AN	PPLICABLE:
X The Licensee (has/ mos) provid	ed a response to the SER concerns.	
The Licensee (has/has not) specific qualified and/or will function whe environmental service conditions.	en exposed to the applicable DBE	1
X The Licensee has presented inform outstanding qualification deficies	ation which shows there are no ncies.	
The Licensee (has/has not) propose item whose qualification has not h	ed a corrective action for this equipeen fully established.	lipment
Justification for interim oper Licensee for this equipment is	ration (has/has not) been provided tem.	by the
Corrective action specified by	y the Licensee:	
Equipment replacement with Equipment modification Equipment relocation above Relocate or shield equipme Verify qualification by ad Equipment relocation to a Qualification testing of e Other (e submergence level ent from radiation source dditional (testing/analysis) mild environment)
The Licensee has provided othe that can be construed as a bas operation.	er information for this equipment i sis for justification for interim	tem
The Licensee (nas/has not) pro corrective action. (Schedule action	ovided a schedule for the proposed for accomplishing the corrective	.)
The Licensee states that the equip and/or should be exempted from env	ment item does not require qualifi	cation
DESIGNATION OF RESULTANT NRC QUALIFICA - CIRCLED ITEM ONLY: (See Section 3 o	TION EVALUATION CATEGORY BASED ON I	REVIEW
I.a Qualified I.b Modification II.a Qualification Not Established	II.c Qualified Life Deficiency III.a Exempt III.b Not in Scope	
II.b Not Qualified	IV Documentation Not Available	2

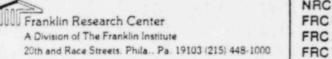
A Division of The Franklin Institute

NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 487 /488

Page 2

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QUIPME	NT ENVIAONMENTAL QUALIFIC	ATION REVIEW OF EQUIPMENT	TIEM NO23
	EQUIPMENT ENVIRONMENTAL	QUALIFICATION SUMMARY FORM	
NRC REQU	IREMENTS		IGNATION: DEFICIENCY
	ed Evidence of Qualification .	Maguata	
		and Test Specimen Established	×
	gradation Evaluated Adequately		
	d Life or Replacement Schedule		×
	Established to Identify Aging		
Criteria	Regarding Aging Simulation S.	atisfied (If Required)	
	Regarding Temperature/Pressu		
	eak Temperature Adequate		
O P	eak Pressure Adequate		
	uration Adequate		
	equired Profile Enveloped Ade		
	team Exposure (If Required) A	dequate	
	Regarding Spray Satisfied		
	Regarding Submergence Satisf		
	Regarding Radiation Satisfie		
	Regarding Test Sequence Sati Regarding Test Failures or S		
	y) Satisfied	evere Atomaries	
	Regarding Functional Testing	Satisfied	
	Regarding Instrument Accurac		
	ation Margin (1 hour + Functi		
	Regarding Margins Satisfied		
	TREASMENT AL ALMORADU		ESIGNATION: = CATEGORY
NRC QUAL	IFICATION CATEGORY	4	- CALLGOAL
I.a	Equipment Qualified		
I.b	Equipment Qualification Pendi		
II.a	Equipment Qualification Not E	stablished	X
II.b	Equipment Not Qualified		
II.c	or Replacement Schedule Justi		
III.a	Equipment Exempt From Qualifi		
III.D	Equipment Not in the Scope of Documentation Not Made Availa		
IV			

See Evaluation on Page 5f.



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NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/488</u>

Page 3c

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 25

LICENSEE RESPONSE TO NRC SER

5. Limitorque has informed us that a generic report will be available which identifies the non-metallic materials used within their MOV's and more directly provides bases for correlation to existing qualification test reports. We will receive copies of this report when issued and anticipate resolution of the outstanding items by the end of this year. A Division of The Franklin Institute 20th and Race Streets. Phila . Pa. 19103 (215) 448-1000 NRC Contract No. NRC-33-79-118 FRC Project No. C5257 FRC Assignment No. 13, FRC Task No. <u>487/488</u>

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OTES:	"X" DENOTES APPROPRIATE NOTES
<u> X </u>	The Licensee has not provided documentation from the manufacturer which establishes similarity between the installed equipment and the test specimen in the referenced document(s). (NOTE A)
<u> </u>	The Licensee has not identified the class of the insulation system used for the motor in the motorized valve actuator.
<u>×</u> 3.	The Licensee has not identified whether or not this motorized valve actuator incorporates a motor-brake assembly.
<u> </u>	The Licensee has not identified the class of the insulation system used for the motor-brake assembly (if applicable).
<u>×</u> 5.	The Licensee has not identified the motor manufacturer for this motorized valve actuator.
<u>X</u> 6.	The Licensee has not identified the manufacturer of the motor-brake assembly (if applicable).
<u>X</u> 7.	The Licensee has not identified the type of current used in the motorized valve actuator.
<u>X</u> 8.	The Licensee has not identified the type of current used in the motor-brake assembly (if applicable).
<u>×</u> 9.	The Licensee has not established a qualified life estimate for this motorized valve actuator based on technically justifiable methods and conservative assumptions.
10.	The Licensee has stated that the only harsh parameter that this motorized valve actuator is exposed to is radiation.
11.	Since radiation is stated to be the only harsh parameter and considering the extensive radiation testing of the motors used in this type of motorized valve actuator, the specified radiation dose of is considered to be of sufficiently low value as to not affect this equipment item. This equipment item is considered qualified for this parameter.
12.	The Licensee has committed to replace this equipment item. The Licensee has stated the following:

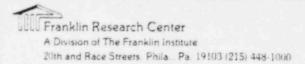
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NRC Contract No. NRC-03-79-118 1 Page Franklin Research Center FRC Project No. C5257 5g FRC Assignment No. 13 FRC Task No. <u>487</u>/488 A Division of The Franklin Institute 20th and Race Streets. Phila . Pa 19103 (215) 448-1000 EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 25 NOTES: The Licensee has cited A. conduring ININ toroug in n on 1 her ener D . nal ma. n ument 11 Pen rement.

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NRC Contract No. NRC-03-79-118
FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 487

Page

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 26

EQUIPMENT ITEM NO. 26 MOTORIZED VALVE ACTUATOR LOCATED IN CONTAINMENT (C230) LIMITORQUE MODEL SMB; SIZES 00, 3 REQUIRED OPERATING TIME: 9 HOURS TER CHECKSHEET NO. 26 LICENSEE REFERENCE(S): 706, 662 FUNCTION (PLANT ID): SI TANK 11A ISOLATION 1MOV614 (1MOV614) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 221 FUNCTION (PLANT ID): SI TANK 11B ISOLATION 1MOV624 (1MOV624) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 224 FUNCTION (PLANT ID): H2 PURGE ISOLATION 1MOV6900 (1MOV6900) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 257

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER	- CIRCLED ITEM (S) ONLY:
(See Section 3 of this TER for Legend)	
R, (T, QT, RT, P, H, CS, A, S, (R), M, I, (M, RPN, EXN	, SEN, QI, RPS, None,
Not stated, Not applicable This defici	ency for IMOV6900 only
LISTING OF APPLICABLE CHECKSHEETS:	
Contents	Checksheet Page No.
Equipment Item	la
Summary of Licensee Responses to the NRC SER	16
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, 3b, 3c, 3d
System Consideration Review	4a, 4b, 4c, 4d, 4e, 4f-
Equipment Environmental Qualification Review	5a, 5b, 5c, 5d, 5e , 5f, 5g, 5h, 5i, 5j
Installed TMI Lessons Learned Implementation Equipment Summary	6a7-6b-
Maintenance and Replacement Schedule Summary	7a, 7b, 7c-

A Division of The Franklin Institute 20th and Race Streets. Phila. Pa 19103 (215) 448-1000	NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487</u> /488	Page 1b
EQUIPMENT ENVIRONMENTAL QUALIFIC	CATION REVIEW OF EQUIPMENT ITEM	NO. 26
SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE AP	PLICABLE
X The Licensee (has/has not) provide	ed a response to the SZR concerns.	
X The Licensee (bas/has not) specific qualified and/of will function whe environmental service conditions.	ically stated that the equipment is en exposed to the applicable DBE	
The Licensee has presented information outstanding qualification deficier	ation which shows there are no ncies.	
The Licensee (has/has not) propose item whose qualification has not h	ed a corrective action for this equ been fully established.	ipment
Justification for interim oper Licensee for this equipment it	ration (has/has not) been provided tem.	by the
Corrective action specified by	y the Licensee:	
Equipment replacement with	n qualified equipment	
Equipment modification Equipment relocation above	submergence level	
Relocate or shield equipme	ent from radiation source	
Verify qualification by ad	ditional (testing/analysis)	
Equipment relocation to a Qualification testing of e	mild environment	
Other (Adrement in progress)
The Licensee has provided othe that can be construed as a bas operation.	er information for this equipment it is for justification for interim	em
corrective action. (Schedule	ovided a schedule for the proposed for accomplishing the corrective	.)
The Licensee states that the equip and/or should be exempted from env	oment item does not require qualific ironmental qualification.	ation
DESIGNATION OF RESULTANT NRC QUALIFICA - CIRCLED ITEM ONLY: (See Section 3 o	TION EVALUATION CATEGORY BASED ON F of this TER for Legend)	REVIEW
I.a Qualified I.b Modification	II.c Qualified Life Deficiency III.a Exempt	
II.a Qualification Not Established	III.a Exempt III.b Not in Scope	
II.b Not Qualified	IV Documentation Not Available	

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Franklin Research Center A Division of The Franklin Institute 20th and Race Streets. Phila.. Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 487/488

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 26

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

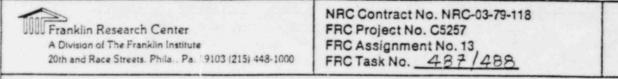
DESIGNATION: X = DEFICIENCY NRC REQUIREMENTS Documented Evidence of Qualification Adequate Adequate Similarity Between Equipment and Test Specimen Established Aging Degradation Evaluated Adequately Qualified Life or Replacement Schedule Established (If Required) Program Established to Identify Aging Degradation Criteria Regarding Aging Simulation Satisfied (If Required) Criteria Regarding Temperature/Pressure Exposure: o Peak Temperature Adequate o Peak Pressure Adequate o Duration Adequate o Required Profile Enveloped Adequately o Steam Exposure (If Required) Adequate Criteria Regarding Spray Satisfied Criteria Regarding Submergence Satisfied Criteria Regarding Radiation Satisfied Criteria Regarding Test Sequence Satisfied Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied Criteria Regarding Functional Testing Satisfied Criteria Regarding Instrument Accuracy Satisfied Test Duration Margin (1 hour + Function Time) Satisfied Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)

NRC QUALIFICATION CATEGORY

DESIGNATION: X = CATEGORY

I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.D	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

See Evaluation on Page 5f.



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 26

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LICENSEE RESPONSE TO NRC SER

5. Limitorque has informed us that a generic report will be available which identifies the non-metallic materials used within their MOV's and more directly provides bases for correlation to existing qualification test reports. We will receive copies of this report when issued and anticipate resolution of the outstanding items by the end of this year.

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A Division of The Franklin Institute 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487 / 488</u>

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		RONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 2
NOTES:		"X" DENOTES APPROPRIATE NOTES
<u>_X</u> _	man ins	e Licensee has not provided documentation from the nufacturer which establishes similarity between the stalled equipment and the test specimen in the referenced cument(s). (NOTEA)
X		e Licensee has not identified the class of the insulation stem used for the motor in the motorized valve actuator.
×		e Licensee has not identified whether or not this motorized Lve actuator incorporates a motor-brake assembly.
X		E Licensee has not identified the class of the insulation stem used for the motor-brake assembly (if applicable).
<u> </u>		e Licensee has not identified the motor manufacturer for Is motorized valve actuator.
X		Licensee has not identified the manufacturer of the cor-brake assembly (if applicable).
X		E Licensee has not identified the type of current used in motorized valve actuator.
<u> </u>		E Licensee has not identified the type of current used in motor-brake assembly (if applicable).
<u>×</u>	for	E Licensee has not established a qualified life estimate this motorized valve actuator based on technically stifiable methods and conservative assumptions.
		Licensee has stated that the only harsh parameter at this motorized valve actuator is exposed to is radiation.
	cor use rad suf ite	ace radiation is stated to be the only harsh parameter and asidering the extensive radiation testing of the motors ad in this type of motorized valve actuator, the specified liation dose of is considered to be of ficiently low value as to not affect this equipment em. This equipment item is considered qualified for this cameter.
		Licensee has committed to replace this equipment item. Licensee has stated the following:

NRC Contract No. NRC-03-79-118 Franklin Research Center FRC Project No. C5257 A Division of The Franklin Institute FRC Assignment No. 13 FRC Task No. _ 487/488 20th and Race Streets. Phila.. Pa 19103 (215) 448-1000

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 26

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NOTES: The Ticensie salso ated mannaura Ca ime TA 111 na 4 1 4 larity mi 0 N ang 14 11 hu han TANK .

A Division of The Franklin Institute 20th and Race Streets Phila. Pa 19103 (215) 448-1000	NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 487	Page
EQUIPMENT ENVIRONMENTAL QUALIFIC	ATION REVIEW OF EQUIPMENT ITEM	1 NO. 27
EQUIPMENT ITEM NO. 27 MOTORIZED VALVE ACTUATOR LOCATED IN CON LIMITORQUE MODEL SMB3 REQUIRED OPERATING TIME: 9 HOURS TER CHECKSHEET NO. 27 LICENSEE REFERENCE(S): 706, 662 FUNCTION (PLANT ID): SI TANK 12A ISOLA LICENSEE SUBMITTAL: SCEW(S) [1, 12]: FUNCTION (PLANT ID): SI TANK 12B ISOLA LICENSEE SUBMITTAL: SCEW(S) [1, 12]:	TION 1MOV634 (1MOV634) 227 TION 1MOV644 (1MOV644)	
DESIGNATION FOR DEFICIENCY IDENTIFIED (See Section 3 of this TER for Legend) R, T, QT, RT, P, H, CS, A, S, (R), M, Not stated, Not applicable LISTING OF APPLICABLE CHECKSHEETS:		
(See Section 3 of this TER for Legend) R, T, QT, RT, P, H, CS, A, S, (R), M, Not stated, Not applicable		ne,
(See Section 3 of this TER for Legend) R, T, QT, RT, P, H, CS, A, S, (R), M, Not stated, Not applicable <u>LISTING OF APPLICABLE CHECKSHEETS</u> :	I, (M) RPN, EXN, SEN, QI, RPS, NO	ne,

Equipment Environmental Qualification Summary Forms 2

Licensee Response to NRC SER

System Consideration Review

Equipment Environmental Qualification Review

Installed TMI Lessons Learned Implementation Equipment Summary

Maintenance and Replacement Schedule Summary

3a, 30, 36, 3d-4a, 4b, 4e, 4d, 4e, 4E.

5a, 5b, 5c, 5d, 5c, 5f,

5g, 5h, 51, 5j

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727 70, 70

20th and Race Streets. Phila. Pa 19103 (215) 448-1000	FRC Project No. C5257 FRC Assignment No. 13, FRC Task No. <u>487/488</u>	Page 1b
EQUIPMENT ENVIRONMENTAL QUALIFIC	CATION REVIEW OF EQUIPMENT ITE	M NO. 27
SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE A	PPLICABLE
X The Licensee (has/has not) provid	led a response to the SER concerns.	
X The Licensee (has/has not) specific qualified and/or will function whe environmental service conditions.	nen exposed to the applicable DBE	S
The Licensee has presented inform outstanding qualification deficie		
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Justification for interim ope Licensee for this equipment i	eration (has/has not) been provided tem.	by the
Corrective action specified b	by the Licensee:	
Equipment replacement wit Equipment modification Equipment relocation abov		
Relocate or shield equipm Verify qualification by a Equipment relocation to a	ent from radiation source dditional (testing/analysis)	
Qualification testing of Other ()
	er information for this equipment is sis for justification for interim	ltem
The Licensee (nas/has not) pr corrective action. (Schedule action	ovided a schedule for the proposed for accomplishing the corrective	_•)
The Licensee states that the equi and/or should be exempted from en	pment item does not require qualif: vironmental qualification.	lcation
DESIGNATION OF RESULTANT NRC QUALIFIC - CIRCLED ITEM ONLY: (See Section 3		REVIEW
I.a Qualified I.b Modification	II.c Qualified Life Deficiency III.a Exempt	
II.a Qualification Not Established] II.b Not Qualified	III.b Not in Scope IV Documentation Not Availabl	e

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A Division of The Franklin Institute 20th and Race Streets, Phila., Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/488</u>

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DESIGNATION: X = DEFICIENCY

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 27

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

Documented Evidence of Qualification Adequate Adequate Similarity Between Equipment and Test Specimen Established Aging Degradation Evaluated Adequately Qualified Life or Replacement Schedule Established (If Required) Program Established to Identify Aging Degradation Criteria Regarding Aging Simulation Satisfied (If Required) Criteria Regarding Temperature/Pressure Exposure: o Peak Temperature Adequate o Peak Pressure Adequate o Duration Adequate o Required Profile Enveloped Adequately o Steam Exposure (If Required) Adequate Criteria Regarding Spray Satisfied Criteria Regarding Submergence Satisfied Criteria Regarding Radiation Satisfied Criteria Regarding Test Sequence Satisfied Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied Criteria Regarding Functional Testing Satisfied Criteria Regarding Instrument Accuracy Satisfied Test Duration Margin (1 hour + Function Time) Satisfied Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)

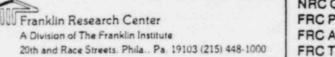
NF. QUALIFICATION CATEGORY

DESIGNATION: X = CATEGORY

I.a	Equipment Qualified
I.b	Equipment Qualification Pending Modification
II.a	Equipment Qualification Not Established
II.b	Equipment Not Qualified
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified
III.a	Equipment Exempt From Qualification
III.D	Equipment Not in the Scope of the Qualification Review
IV	Documentation Not Made Available

See Evaluation on Page 5f.

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NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/488</u>

Page 3c

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 27

LICENSEE RESPONSE TO NRC SER

5. Limitorque has informed us that a generic report will be available which identifies the non-metallic materials used within their MOV's and more directly provides bases for correlation to existing qualification test reports. We will receive copies of this report when issued and anticipate resolution of the outstanding items by the end of this year.





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A Division of The Franklin Institute 20th and Race Streets. Phila., Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/488</u>

Page 5f

TES:	"X" DENOTES APPROPRIATE NOTES
<u> </u>	The Licensee has not provided documentation from the manufacturer which establishes similarity between the installed equipment and the test specimen in the referenced document(s). (NOTE A)
<u>X</u> 2.	The Licensee has not identified the class of the insulation system used for the motor in the motorized valve actuator.
<u>X</u> 3.	The Licensee has not identified whether or not this motorized valve actuator incorporates a motor-brake assembly.
<u> </u>	The Licensee has not identified the class of the insulation system used for the motor-brake assembly (if applicable).
<u>X</u> 5.	The Licensee has not identified the motor manufacturer for this motorized valve actuator.
<u> </u>	The Licensee has not identified the manufacturer of the motor-brake assembly (if applicable).
<u> </u>	The Licensee has not identified the type of current used in the motorized valve actuator.
_X 8.	The Licensee has not identified the type of current used in the motor-brake assembly (if applicable).
<u> </u>	The Licensee has not established a qualified life estimate for this motorized valve actuator based on technically justifiable methods and conservative assumptions.
10.	The Licensee has stated that the only harsh parameter that this motorized valve actuator is exposed to is radiation.
11.	Since radiation is stated to be the only harsh parameter and considering the extensive radiation testing of the motors used in this type of motorized valve actuator, the specified radiation dose of is considered to be of sufficiently low value as to not affect this equipment item. This equipment item is considered qualified for this parameter.
12.	The Licensee has committed to replace this equipment item. The Licensee has stated the following:

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NRC Contract No. NRC-03-79-118 Page Franklin Research Center FRC Project No. C5257 A Division of The Franklin Institute FRC Assignment No. 13 FRC Task No. <u>487</u>/488 59 20th and Race Streets. Phila .. Pa. 19103 (215) 448-1000

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 27

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A Division of The Franklin Institute	NRC Contract No. NRC-03-79-118 RC Project No. C5257 RC Assignment No. 13 RC Task No. <u>487</u>	Page I a
EQUIPMENT ENVIRONMENTAL QUALIFICAT	ION REVIEW OF EQUIPMENT ITEN	NO. 28
EQUIPMENT ITEM NO. 28 MOTORIZED VALVE ACTUATOR LOCATED IN THE P LIMITORQUE MODEL SMBOO REQUIRED OPERATING TIME: 9 HOURS TER CHECKSHEET NO. 28 LICENSEE REFERENCE(S): NOT CITED FUNCTION (PLANT ID): CS & SI PUMPS RECIP LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 21 FUNCTION (PLANT ID): CS & SI PUMPS RECIP LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 21	RCULATION (1MOV659) 16 RCULATION (1MOV660)	
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R, T, (T, RT, P, H, CS, A, S, (R), M, I,	QM, RPN, EXN, SEN, QI, RPS, NO	ne.
Not stated, Not applicable	이번 그는 것은 것은 것은 것이 같아.	
LISTING OF APPLICABLE CHECKSHEETS:		
Contents	Checksheet Page N	
Contents Equipment ltem	<u>Checksheet Page N</u> la	
	la	
Equipment Item	la SER lb	
Equipment 1tem Summary of Licensee Responses to the NRC	la SER lb	
Equipment ltem Summary of Licensee Responses to the NRC Equipment Environmental Qualification Su	la SER 1b Immary Forms 2	
Equipment Item Summary of Licensee Responses to the NRC Equipment Environmental Qualification Su Licensee Response to NRC SER	la 2 SER 1b 2 mmary Forms 2 3a, 3b, 3c, 3d 4a, 4b, 4c, 4d, 4	0. 0.
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Equipment 1tem Summary of Licensee Responses to the NRG Equipment Environmental Qualification Su Licensee Response to NRC SER System Consideration Review Equipment Environmental Qualification Re Installed TMI Lessons Learned Implementa	la 15 SER 15 16 16 16 16 3a, 30, 3c, 3d 4a, 45, 4c, 4d, 4 5a, 55, 5c, 5d, 5 5g, 5h, 5i, 5j 4a, 65	0. 0.

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A Division of The Franklin Institute 20th and Race Streets. Phila. Pa 19103 (215) 448-1000	FRC Pr FRC As	ontract No. NRC-03-79-118 oject No. C5257 ssignment No. 13 sk No. <u>487/488</u>	Page 1b
QUIPMENT ENVIRONMENTAL QUALIFIC	ATION	REVIEW OF EQUIPMENT ITEM	NO. 28
SUMMARY OF LICENSEE RESPONSES TO THE N	NRC SER	- ONLY CHECKED ITEMS ARE APP	PLICABLE
X The Licensee (has/ has not) provide			
The Licensee (has/has not) specific qualified and/or will function whe environmental service conditions.	ically s en expos	tated that the equipment is ed to the applicable DBE	
$\underline{\times}$ The Licensee has presented information outstanding qualification deficient	ation wh ncies.	ich shows there are no	
The Licensee (has/has not) propose item whose qualification has not b	ed a cor been ful	rective action for this equi ly established.	pment
Justification for interim oper Licensee for this equipment it	ation (em.	has/has not) been provided b	by the
Corrective action specified by	the Li	censee:	
Equipment replacement with Equipment modification Equipment relocation above Relocate or shield equipme Verify qualification by ad Equipment relocation to a Qualification testing of e Other (submer ent from ditiona mild en	gence level radiation source 1 (testing/analysis) vironment)
The Licensee has provided othe that can be construed as a bas operation.	r infor is for	mation for this equipment it justification for interim	em
The Licensee (nas/has not) pro corrective action. (Schedule action	vided a for acc	schedule for the proposed omplishing the corrective)
The Licensee states that the equip and/or should be exempted from env	ment it ironmen	em does not require qualific tal qualification.	ation
ESIGNATION OF RESULTANT NRC QUALIFICA CIRCLED ITEM ONLY: (See Section 3 o	TION EV f this '	ALUATION CATEGORY BASED ON R TER for Legend)	EVIEW
.a Qualified .b Modification		Qualified Life Deficiency Exempt	
I.a Qualification Not Established I.b Not Qualified	III.b	Not in Scope Documentation Not Available	

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A Division of The Franklin Institute 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13, FRC Task No. <u>487/488</u>

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DESIGNATION: X = DEFICIENCY

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 28

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS X = 1 Documented Evidence of Qualification Adequate Adequate Similarity Between Equipment and Test Specimen Established Aging Degradation Evaluated Adequately Qualified Life or Replacement Schedule Established (If Required) Program Established to Identify Aging Degradation Criteria Regarding Aging Simulation Satisfied (If Required) Criteria Regarding Temperature/Pressure Exposure:

o Peak Temperature Adequate

o Peak Pressure Adequate

o Duration Adequate

Required Profile Enveloped Adequately
 Steam Exposure (If Required) Adequate

Criteria Regarding Spray Satisfied

Criteria Regarding Submergence Satisfied

Criteria Regarding Radiation Satisfied

Criteria Regarding Test Sequence Satisfied Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied

Criteria Regarding Functional Testing Satisfied Criteria Regarding Instrument Accuracy Satisfied Test Duration Margin (1 hour + Function Time) Satisfied Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)

NRC QUALIFICATION CATEGORY

DESIGNATION: X = CATEGORY

I.a	Equipment Qualified	-
I.b	Equipment Qualification Pending Modification	-
II.a	Equipment Qualification Not Established	_2
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.D	Equipment Not in the Scope of the Qualification Review	_
IV	Documentation Not Made Available	

See Evaluation on Page 5f.

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A Division of The Franklin Institute 20th and Race Streets, Phila., Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487</u>/489

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 28

LICENSEE RESPONSE TO NRC SER

5. Limitorque has informed us that a generic report will be available which identifies the non-metallic materials used within their MOV's and more directly provides bases for correlation to existing qualification test reports. We will receive copies of this report when issued and anticipate resolution of the outstanding items by the end of this year.





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Franklin Research Center A Division of The Franklin Institute 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/488</u>

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OTES:	"X" DENOTES APPROPRIATE NOTES
<u> X </u>	The Licensee has not provided documentation from the manufacturer which establishes qualification. (NOTE A, B)
<u> </u>	The Licensee has not identified the class of the insulation system used for the motor in the motorized valve actuator.
<u> </u>	The Licensee has not identified whether or not this motorized valve actuator incorporates a motor-brake assembly.
<u>X</u> 4.	The Licensee has not identified the class of the insulation system used for the motor-brake assembly (if applicable).
<u> X </u>	The Licensee has not identified the motor manufacturer for this motorized valve actuator.
<u>X</u> 6.	The Licensee has not identified the manufacturer of the motor-brake assembly (if applicable).
<u> </u>	The Licensee has not identified the type of current used in the motorized valve actuator.
<u>X</u> 8.	The Licensee has not identified the type of current used in the motor-brake assembly (if applicable).
<u> </u>	The Licensee has not established a qualified life estimate for this motorized valve actuator based on technically justifiable methods and conservative assumptions.
10.	The Licensee has stated that the only harsh parameter that this motorized valve actuator is exposed to is radiation.
11.	Since radiation is stated to be the only harsh parameter and considering the extensive radiation testing of the motors used in this type of motorized valve actuator, the specified radiation dose of is considered to be of sufficiently low value as to not affect this equipment item. This equipment item is considered qualified for this parameter.
12.	The Licensee has committed to replace this equipment item. The Licensee has stated the following:

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NRC Contract No. NRC-03-79-118 Page Franklin Research Center FRC Project No. C5257 A Division of The Franklin Institute 59 FRC Assignment No. 13 FRC Task No. _ 487/488 20th and Race Streets. Phila . Pa 19103 (215) 448-1000 EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 28 NOTES: has ated correspondence A. The Trensel with Simitorene 1u may annual 15mg as in nin ausnen? Int smy tion wa en serven This eter B The has stated That Aconsec is a MOVA milar aperator # 662 MOU relinces larity ha estate mi PIM

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FRC Project No	. C5257
FRC Assignme	nt No. 13
FRC Task No.	487

Page

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 29

EQUIPMENT ITEM NO. 29 MOTORIZED VALVE ACTUATOR LOCATED IN THE ECCS PUMP ROOM (A119) LIMITORQUE MODEL SMB00 REQUIRED OPERATING TIME: 9 HOURS TER CHECKSHEET NO. 29 LICENSEE REFERENCE(S): 1064 FUNCTION (PLANT ID): HPSI HEADER CROSS-CONNECT VALVE (A119) (1MOV655) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 190 FUNCTION (PLANT ID): HPSI HEADER CROSS-CONNECT VALVE (1MOV653) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 189

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(See Section 3 of this TER for Legend)	- CIRCLED IIEA(S) ONLI.
R, T, (T, RT, P, H, CS, A, S, (R), M, I, (M, RPN, E)	KN, SEN, QI, RPS, None,
Not stated, Not applicable	
LISTING OF APPLICABLE CHECKSHEETS:	
Contents	Checksheet Page No.
Equipment Item	la
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, 3b, 3c, 3d
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A Division of The Franklin Institute 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000	NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/488</u>	Page 1b
QUIPMENT ENVIRONMENTAL QUALIFIC	ATION REVIEW OF EQUIPMENT ITEM	NO. 29
SUMMARY OF LICENSEE RESPONSES TO THE N	NRC SER - ONLY CHECKED ITEMS ARE APP	LICABLE
X The Licensee (has/has-not) provide	ed a response to the SER concerns.	
	cally stated that the equipment is	
The Licensee has presented informa outstanding qualification deficien	tion which shows there are no cies.	
The Licensee (has/has not) propose item whose qualification has not b	ed a corrective action for this equippeen fully established.	pment
Justification for interim oper Licensee for this equipment it	ation (has/has not) been provided by	y the
Corrective action specified by	the Licensee:	
Equipment replacement with Equipment modification Equipment relocation above Relocate or shield equipme Verify qualification by ad Equipment relocation to a Qualification testing of e Other (submergence level nt from radiation source ditional (testing/analysis) mild environment	
The Licensee has provided othe that can be construed as a bas operation.	r information for this equipment ite is for justification for interim	em
The Licensee (has/has not) pro- corrective action. (Schedule action	vided a schedule for the proposed for accomplishing the corrective .)	
The Licensee states that the equip and/or should be exempted from env	ment item does not require qualifica ironmental qualification.	tion
ESIGNATION OF RESULTANT NRC QUALIFICA CIRCLED ITEM ONLY: (See Section 3 of	TION EVALUATION CATEGORY BASED ON RE f this TER for Legend)	VIEW
a Qualified b Modification <u>I.a Qualification Not Established</u> I.b Not Qualified	<pre>II.c Qualified Life Deficiency III.a Exempt III.b Not in Scope IV Documentation Not Available</pre>	

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Franklin Research Center A Division of The Franklin Institute 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/488</u>

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 29

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
NRC REQUIREMENTS	
Documented Evidence of Qualification Adequate Adequate Similarity Between Equipment and Test Specimen Establi	shed X
Aging Degradation Evaluated Adequately	×
Qualified Life or Replacement Schedule Established (If Required	shed X X
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
 Required Profile Enveloped Adequately Steam Exposure (If Required) Adequate 	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies	
(If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

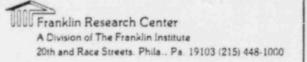
NRC QUALIFICATION CATEGORY

DESIGNATION: X = CATEGORY

I.a	Equipment Qualified
I.b	Equipment Qualification Pending Modification
II.a	Equipment Qualification Not Established
II.b	Equipment Not Qualified
II.c	Equipment Satisfies All Requirements Except Qualified Life
	or Replacement Schedule Justified
III.a	Equipment Exempt From Qualification
III.D	Equipment Not in the Scope of the Qualification Review
IV	Documentation Not Made Available

See Evaluation on Page 5f.

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 29

LICENSEE RESPONSE TO NRC SER

5. Limitorque has informed us that a generic report will be available which identifies the non-metallic mererials used within their MOV's and more directly provides bases for correlation to existing qualification test reports. We will receive copies of this report when issued and anticipate resolution of the outstanding items by the end of this year.

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A Division of The Franklin Institute 20th and Race Streets. Phila. Pa 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487</u>488

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Page 5f

NOTES:	"X" DENOTES APPROPRIATE NOTES
<u> </u>	The Licensee has not provided documentation from the manufacturer which establishes similarity between the installed equipment and the test specimen in the referenced document(s). (NOTE A)
<u> </u>	The Licensee has not identified the class of the insulation system used for the motor in the motorized valve actuator.
<u> </u>	The Licensee has not identified whether or not this motorized valve actuator incorporates a motor-brake assembly.
<u> </u>	The Licensee has not identified the class of the insulation system used for the motor-brake assembly (if applicable).
<u>X</u> 5.	The Licensee has not identified the motor manufacturer for this motorized valve actuator.
<u>X</u> 6.	The Licensee has not identified the manufacturer of the motor-brake assembly (if applicable).
<u> </u>	The Licensee has not identified the type of current used in the motorized valve actuator.
<u> X </u>	The Licensee has not identified the type of current used in the motor-brake assembly (if applicable).
<u>X</u> 9.	The Licensee has not established a qualified life estimate for this motorized valve actuator based on technically justifiable methods and conservative assumptions.
10.	The Licensee has stated that the only harsh parameter that this motorized valve actuator is exposed to is radiation.
11.	Since radiation is stated to be the only harsh parameter and considering the extensive radiation testing of the motors used in this type of motorized valve actuator, the specified radiation dose of is considered to be of sufficiently low value as to not affect this equipment item. This equipment item is considered qualified for this parameter.
12.	The Licensee has committed to replace this equipment item. The Licensee has stated the following:

õ NRC Contract No. NRC-03-79-118 Page Franklin Research Center FRC Project No. C5257 59 A Division of The Franklin Institute FRC Assignment No. 13 FRC Task No. 487/488 20th and Race Streets. Phila Pa 19103 (215) 448-1000 EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 29 NOTES : The Licensee A. has cited correspondence his init orau hick man 7 upme Tim oma mi renew



Franklin Research Center A Division of The Franklin Institute 20th and Race Streets. Phila. Pa 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 487

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 30

EQUIPMENT ITEM NO. 30 MOTORIZED VALVE ACTUATOR LOCATED IN CONTAINMENT RECIRCULATION PIPE TUNNEL (A122) LIMITORQUE MODEL SMB00 REQUIRED OPERATING TIME: 9 HOURS TER CHECKSHEET NO. 30 LICENSEE REFERENCE(S): 706, 2876 FUNCTION (PLANT ID): CONTAINMENT NORMAL SUMP MAKEUP WATER RETURN ISOLATION (1MOV5463) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 265 FUNCTION (PLANT ID): CONTAINMENT NORMAL SUMP MAKEUP WATER RETURN ISOLATION (1MOV5462) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 264

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY: (See Section 3 of this TER for Legend)

R, T, QI, RT, P, H, CS, A, S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents

Equipment Item

Summary of Licensee Responses to the NRC SER Equipment Environmental Qualification Summary Forms Licensee Response to NRC SER System Consideration Review Equipment Environmental Qualification Review

Installed TMI Lessons Learned Implementation Equipment Summary

Maintenance and Replacement Schedule Summary

Checksheet Page No.

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5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 51, 5j

6a, 6b-

7a, 7b, 7c

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A Division of The Franklin Institute 20th and Race Streets. Phila Pa. 19103 (215) 448-1000	NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/488</u>	Page Ib
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MERRI OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE A	PPLICABLE:
(The Licensee (has/has not) provid	ded a response to the SER concerns.	
The Licensee (has not) specif	fically stated that the equipment i hen exposed to the applicable DBE	
The Licensee has presented inform outstanding qualification deficie	mation which shows there are no encies.	
The Licensee (has/has not) proposition the proposition has not	sed a corrective action for this eq been fully established.	uipment
Justification for interim ope Licensee for this equipment i	eration (has/has not) been provided ltem.	by the
Corrective action specified b	by the Licensee:	
Equipment replacement wit Equipment modification Equipment relocation abov Relocate or shield equipm Verify qualification by a Equipment relocation to a Qualification testing of Other (ve submergence level ment from radiation source additional (testing/analysis) a mild environment	
The Licensee has provided oth that can be construed as a ba operation.	er information for this equipment i sis for justification for interim	ltem
corrective action. (Schedule	ovided a schedule for the proposed for accomplishing the corrective)
The Licensee states that the equi and/or should be exempted from en	pment item does not require qualifi vironmental qualification.	lcation
SIGNATION OF RESULTANT NRC QUALIFIC CIRCLED ITEM ONLY: (See Section 3	ATION EVALUATION CATEGORY BASED ON of this TER for Legend)	REVIEW
a Qualified b Modification .a Qualification Not Established	II.c Qualified Life Deficiency III.a Exempt	
.b Not Qualified	III.b Not in Scope	

A Division of The Franklin Institute 20th and Race Streets, Phila., Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/488</u>

Page 2

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 30

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

DESIGNATION: X = DEFICIENCY NRC REQUIREMENTS Documented Evidence of Qualification Adequate Adequate Similarity Between Equipment and Test Specimen Established Aging Degradation Evaluated Adequately Qualified Life or Replacement Schedule Established (If Required) Program Established to Identify Aging Degradation Criteria Regarding Aging Simulation Satisfied (If Required) Criteria Regarding Temperature/Pressure Exposure: o Peak Temperature Adequate o Peak Pressure Adequate o Duration Adequate o Required Profile Enveloped Adequately o Steam Exposure (If Required) Adequate Criteria Regarding Spray Satisfied Criteria Regarding Submergence Satisfied Criteria Regarding Radiation Satisfied Criteria Regarding Test Sequence Satisfied Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied Criteria Regarding Functional Testing Satisfied Criteria Regarding Instrument Accuracy Satisfied Test Duration Margin (1 hour + Function Time) Satisfied Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)

NRC QUALIFICATION CATEGORY

DESIGNATION: X = CATEGORY

I.a	Equipment Qualified
I.b	Equipment Qualification Pending Modification
II.a	Equipment Qualification Not Established
II.b	Equipment Not Qualified
II.c	Equipment Satisfies All Requirements Except Qualified Life
	or Replacement Schedule Justified
III.a	" .pment Exempt From Qualification
III.D	Equipment Not in the Scope of the Qualification Review
IV	Documentation Not Made Available

See Evaluation on Page 5f.

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A Division of The Franklin Institute 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/488</u>

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 30

LICENSEE RESPONSE TO NRC SER

5. Limitorque has informed us that a generic report will be available which identifies the non-metallic materials used within their MOV's and more directly provides bases for correlation to existing qualification test reports. We will receive copies of this report when issued and anticipate resolution of the outstanding items by the end of this year.





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A Division of The Franklin Institute 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/488</u>

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OTES:	"X" DENOTES APPROPRIATE NOTES
<u> X </u>	The Licensee has not provided documentation from the manufacturer which establishes similarity between the installed equipment and the test specimen in the referenced document(s). (NOTE A)
<u> </u>	The Licensee has not identified the class of the insulation system used for the motor in the motorized valve actuator.
<u>X</u> 3.	The Licensee has not identified whether or not this motorized valve actuator incorporates a motor-brake assembly.
<u>X</u> 4.	The Licensee has not identified the class of the insulation system used for the motor-brake assembly (if applicable).
<u>X</u> 5.	The Licensee has not identified the motor manufacturer for this motorized valve actuator.
X 6.	The Licensee has not identified the manufacturer of the motor-brake assembly (if applicable).
<u>X</u> 7.	The Licensee has not identified the type of current used in the motorized valve actuator.
<u>X</u> 8.	The Licensee has not identified the type of current used in the motor-brake assembly (if applicable).
<u> </u>	The Licensee has not established a qualified life estimate for this motorized valve actuator based on technically justifiable methods and conservative assumptions.
10.	The Licensee has stated that the only harsh parameter that this motorized valve actuator is exposed to is radiation.
11.	Since radiation is stated to be the only harsh parameter and considering the extensive radiation testing of the motors used in this type of motorized valve actuator, the specified radiation dose of is considered to be of sufficiently low value as to not affect this equipment item. This equipment item is considered qualified for this parameter.
12.	The Licensee has committed to replace this equipment item. The Licensee has stated the following:

NRC Contract No. NRC-03-79-118 Page Franklin Research Center FRC Project No. C5257 59 A Division of The Franklin Institute FRC Assignment No. 13 FRC Task No. _487/488 20th and Race Streets. Phila . Pa. 19103 (215) 448-1000

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 30

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A Division of The Franklin Institute 20th and Race Streets, Phila , Pa, 19103 (215) 448-1010	NRC Contract No. NRC-03-79- FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 487	118 Page
QUIPMENT ENVIRONMENTAL QUALIFIC	ATION REVIEW OF EQUIPN	12:11 ITEM NO. 31
QUIPMENT ITEM NO. 31 MOTORIZED VALVE ACTUATOR LOCATED IN TH IMITORQUE MODEL SMB2 REQUIRED OPERATING TIME: 9 HOURS TER CHECKSHEET NO. 31 LICENSEE REFERENCE(S): 706 MUNCTION (PLANT ID): LPSI TO LOOP 11B LICENSEE SUBMITTAL: SCEW(S) [1, 12]:	1MOV625 (1MOV625)	A227)
DESIGNATION FOR DEFICIENCY IDENTIFIED (See Section 3 of this TER for Legend		ITEM(S) ONLY:
R, T, (T, RT, P, H, CS, A, S, (R), M,	I, QM, RPN, EXN, SEN, QI	
Not stated, Not applicable		, RPS, None,
not ocaccal not apprecable		, RPS, None,
Contraction of the second s		, RPS, None,
LISTING OF APPLICABLE CHECKSHEETS:	Checkshe	, RPS, None, et Page No.
LISTING OF APPLICABLE CHECKSHEETS:	<u>Checkshe</u> la	
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LISTING OF APPLICABLE CHECKSHEETS: Contents Equipment Item Summary of Licensee Responses to the 1	la NRC SER 1b	
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LISTING OF APPLICABLE CHECKSHEETS: Contents Equipment Item Summary of Licensee Responses to the S Equipment Environmental Qualification Licensee Response to NRC SER	la NRC SER 1b Summary Forms 2 3a, 3b,	et Page No. 3c, 3d-
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LISTING OF APPLICABLE CHECKSHEETS: <u>Contents</u> Equipment Item Summary of Licensee Responses to the 1 Equipment Environmental Qualification Licensee Response to NRC SER System Consideration Review Equipment Environmental Qualification Installed TMI Lessons Learned Implement Equipment Summary	la NRC SER lb Summary Forms 2 3a, 3b, 4a, 4b, 5a, 5b, 5g, 5h,	et Page No. 3c, 3d- 4c, 4d, 4e, 4f- 5c, 5d, 5e, 5f,
LISTING OF APPLICABLE CHECKSHEETS: Contents Equipment Item Summary of Licensee Responses to the S Equipment Environmental Qualification Licensee Response to NRC SER System Consideration Review Equipment Environmental Qualification Installed TMI Lessons Learned Implement	la NRC SER lb Summary Forms 2 3a, 3b, 4a, 4b, 4a, 4b, 5a, 5b, 5g, 5h, atation 6a, 6b	et Page No. 3c, 3d- 4c, 4d, 4e, 4f- 5c, 5d, 5e, 5f,

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A Division of The Franklin Institute 20th and Race Streets. Phila . Pa. 19103 (215) 448-1000	NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487</u> /488	Page Ib
QUIPMENT ENVIRONMENTAL QUALIFIC	CATION REVIEW OF EQUIPMENT ITEN	1 /i NO. <u>31</u>
SUMMARY OF LICENSEE RESPONSES TO THE I	NRC SER - ONLY CHECKED ITEMS ARE AN	PLICABLE
X The Licensee (has/has not) provide		
<u>X</u> The Licensee (has not) specific qualified and/or will function whe environmental service conditions.	ically stated that the equipment is an exposed to the applicable DBE	
X The Licensee has presented information outstanding qualification deficient	ation which shows there are no ncies.	
The Licensee (has/has not) propose item whose qualification has not b	ed a corrective action for this equ been fully established.	ipment
Justification for interim oper Licensee for this equipment it	ation (has/has not) been provided	by the
Corrective action specified by	the Licensee:	
Equipment replacement with Equipment modification Equipment relocation above Relocate or shield equipme	submergence level	
Verify qualification by ad Equipment relocation to a Qualification testing of e Other (ditional (testing/analysis) mild environment	
The Licensee has provided other that can be construed as a bas operation.	r information for this equipment it is for justification for interim	iem (
The Licensee (nas/bas not) prov corrective action. (Schedule) action	vided a schedule for the proposed for accomplishing the corrective	
The Licensee states that the equipment and/or should be exempted from envi	ment item does not require qualific ironmental qualification.	ation
ESIGNATION OF RESULTANT NRC QUALIFICAT CIRCLED ITEM ONLY: (See Section 3 of	TION EVALUATION CATEGORY BASED ON P	EVIEW
.a Qualified .b Modification	II.c Qualified Life Deficiency III.a Exempt	
I.a Qualification Not Established	III.b Not in Scope IV Documentation Not Available	

Franklin Research Center A Division of The Franklin Institute 20th and Race Streets. Phila.. Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13, FRC Task No. <u>487/488</u>

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 31

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

DESIGNATION: X = DEFICIENCY NRC REQUIREMENTS Documented Evidence of Qualification Adequate Adequate Similarity Between Equipment and Test Specimen Established Aging Degradation Evaluated Adequately Qualified Life or Replacement Schedule Established (If Required) Program Established to Identify Aging Degradation Criteria Regarding Aging Simulation Satisfied (If Required) Criteria Regarding Temperature/Pressure Exposure: o Peak Temperature Adequate o Peak Pressure Adequate o Duration Adequate o Required Profile Enveloped Adequately o Steam Exposure (If Required) Adequate Criteria Regarding Spray Satisfied Criteria Regarding Submergence Satisfied Criteria Regarding Radiation Satisfied Criteria Regarding Test Sequence Satisfied Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied Criteria Regarding Functional Testing Satisfied Criteria Regarding Instrument Accuracy Satisfied Test Duration Margin (1 hour + Function Time) Satisfied Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)

NRC QUALIFICATION CATEGORY

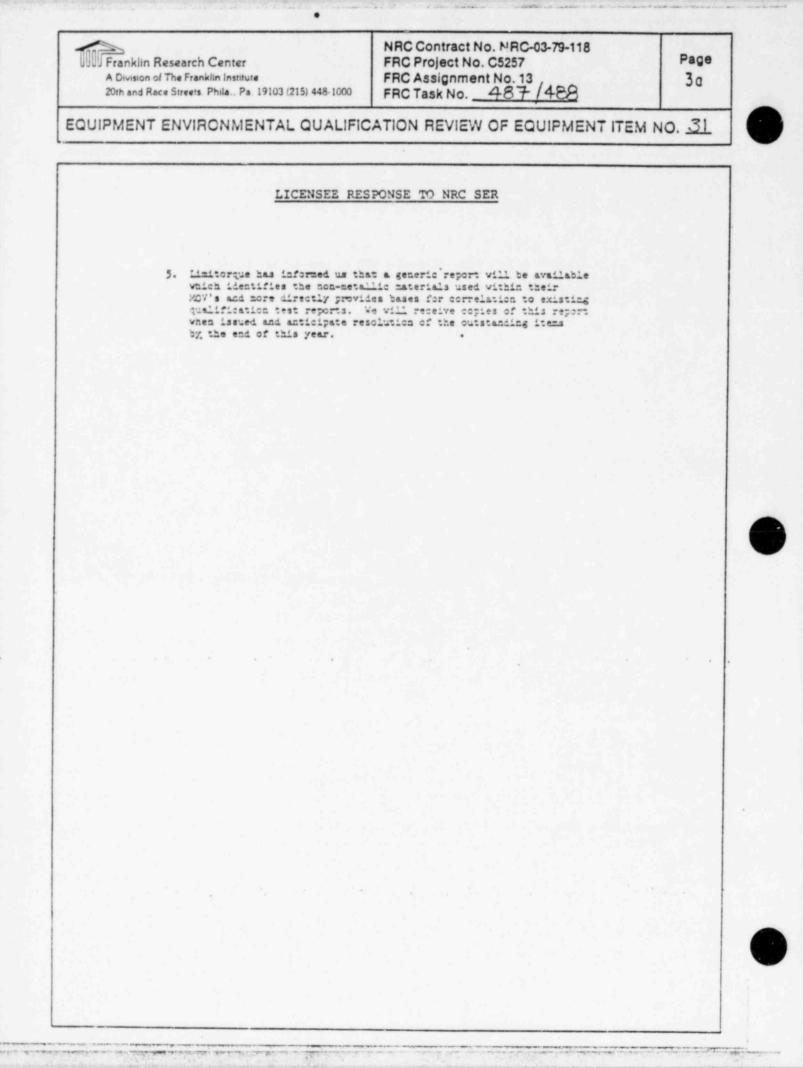
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DESIGNATION: X = CATEGORY

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I.a	Equipment Qualified
I.b	Equipment Qualification Pending Modification
II.a	Equipment Qualification Not Established
II.b	Equipment Not Qualified
II.c	Equipment Satisfies All Requirements Except Qualified Life
	or Replacement Schedule Justified
III.a	Equipment Exempt From Qualification
III.b	Equipment Not in the Scope of the Qualification Review
IV	Documentation Not Made Available

See Evaluation on Page 5f.



A Division of The Franklin Institute 20th and Race Streets. Phila... Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/488</u>

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otes:	"X" DENOTES APPROPRIATE NOTES
<u> </u>	. The Licensee has not provided documentation from the manufacturer which establishes similarity between the installed equipment and the test specimen in the referenced document(s). (NOTE A)
X 2	. The Licensee has not identified the class of the insulation system used for the motor in the motorized valve actuator.
<u>X</u> 3	. The Licensee has not identified whether or not this motorized valve actuator incorporates a motor-brake assembly.
<u> </u>	. The Licensee has not identified the class of the insulation system used for the motor-brake assembly (if applicable).
<u>X</u> 5	. The Licensee has not identified the motor manufacturer for this motorized valve actuator.
<u>X</u> 6	. The Licensee has not identified the manufacturer of the motor-brake assembly (if applicable).
<u> </u>	
<u>×</u> 8	. The Licensee has not identified the type of current used in the motor-brake assembly (if applicable).
<u>×</u> 9	. The Licensee has not established a qualified life estimate for this motorized valve actuator based on technically justifiable methods and conservative assumptions.
10	. The Licensee has stated that the only harsh parameter that this motorized valve actuator is exposed to is radiation.
11	Since radiation is stated to be the only harsh parameter and considering the extensive radiation testing of the motors used in this type of motorized valve actuator, the specified radiation dose of is considered to be of sufficiently low value as to not affect this equipment item. This equipment item is considered qualified for this parameter.
12	. The Licensee has committed to replace this equipment item. The Licensee has stated the following:
Α.	The Licensee has cited correspondence with Limitorque that may establish similarity between the installed and tested equipment; however, this information was not submitted for review.

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A Division of The Franklin Institute 20th and Race Streets, Phila., Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 487

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 32

EQUIPMENT ITEM NO. 32 MOTORIZED VALVE ACTUATOR LOCATED IN CONTAINMENT RECIRCULATION PIPE TUNNEL (A122) LIMITORQUE MODEL SMB2 REQUIRED OPERATING TIME: 9 HOURS TER CHECKSHEET NO. 32 LICENSEE REFERENCE(S): 706 FUNCTION (PLANT ID): CONTAINMENT SUMP DISCHARGE (1MOV4144) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 214

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY: (See Section 3 of this TER for Legend)

R, T, (T, RT, P, H, CS, A, S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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Equipment Item

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Summary of Licensee Responses to the NRC SER Equipment Environmental Qualification Summary Forms Licensee Response to NRC SER System Consideration Review

System consideration Review

Equipment Environmental Qualification Review

Installed TMI Lessons Learned Implementation Equipment Summary

Maintenance and Replacement Schedule Summary

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Tooc	Franklin Research Center A Division of The Franklin Institute 20th and Race Streets. Phila. Pa 19103 (215) 448-1000	NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/488</u>	Page 1b
EQUI	IPMENT ENVIRONMENTAL QUALIFIC	ATION REVIEW OF EQUIPMENT ITEM	NO. <u>32</u>
SUMM	MARY OF LICENSEE RESPONSES TO THE N	NRC SER - ONLY CHECKED ITEMS ARE AP	PLICABLE
X	The Licensee (has/hes not) provide	ed a response to the SER concerns.	
X	The Licensee (has not) specific qualified and/or will function whe environmental service conditions.	ically stated that the equipment is an exposed to the applicable DBE	
×	The Licensee has presented informa outstanding qualification deficien	ation which shows there are no ncies.	
	The Licensee (has/has not) propose item whose qualification has not b	ed a corrective action for this equ been fully established.	ipment
	Justification for interim oper Licensee for this equipment it	ation (has/has not) been provided i em.	by the
	Corrective action specified by	the Licensee:	
	Equipment replacement with Equipment modification Equipment relocation above Relocate or shield equipme Verify qualification by ad Equipment relocation to a Qualification testing of e Other (submergence level ent from radiation source ditional (testing/analysis) mild environment)
	The Licensee has provided othe that can be construed as a bas operation.	r information for this equipment it is for justification for interim	tem
	The Licensee (has/has not) pro corrective action. (Schedule action	vided a schedule for the proposed for accomplishing the corrective	.)
-	The Licensee states that the equip and/or should be exempted from env	ment item does not require qualific ironmental qualification.	cation
CI	GNATION OF RESULTANT NRC QUALIFICA RCLED ITEM ONLY: (See Section 3 o	TION EVALUATION CATEGORY BASED ON F f this TER for Legend)	REVIEW
.b	Qualified Modification Qualification Not Established	II.c Qualified Life Deficiency III.a Exempt	
and the owner of the owner owner	Not Qualified	III.b Not in Scope IV Documentation Not Available	

Franklin Research Center A Division of The Franklin Institute 20th and Race Streets. Phila., Pa. 19103 (215) 448-1000

NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 487/488

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 32

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM DESIGNATION: X = DEFICIENCY NRC REQUIREMENTS Documented Evidence of Qualification Adequate XXX Adequate Similarity Between Equipment and Test Specimen Established Aging Degradation Evaluated Adequately Qualified Life or Replacement Schedule Established (If Required) Program Established to Identify Aging Degradation Criteria Regarding Aging Simulation Satisfied (If Required) Criteria Regarding Temperature/Pressure Exposure: o Peak Temperature Adecuate o Peak Pressure Adequate o Duration Adequate o Required Profile Enveloped Adequately o Steam Exposure (If Required) Adequate Criteria Regarding Spray Satisfied Criteria Regarding Submergence Satisfied Criteria Regarding Radiation Satisfied Criteria Regarding Test Sequence Satisfied Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied Criteria Regarding Functional Testing Satisfied Criteria Regarding Instrument Accuracy Satisfied Test Duration Margin (1 hour + Function Time) Satisfied Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) DESIGNATION:

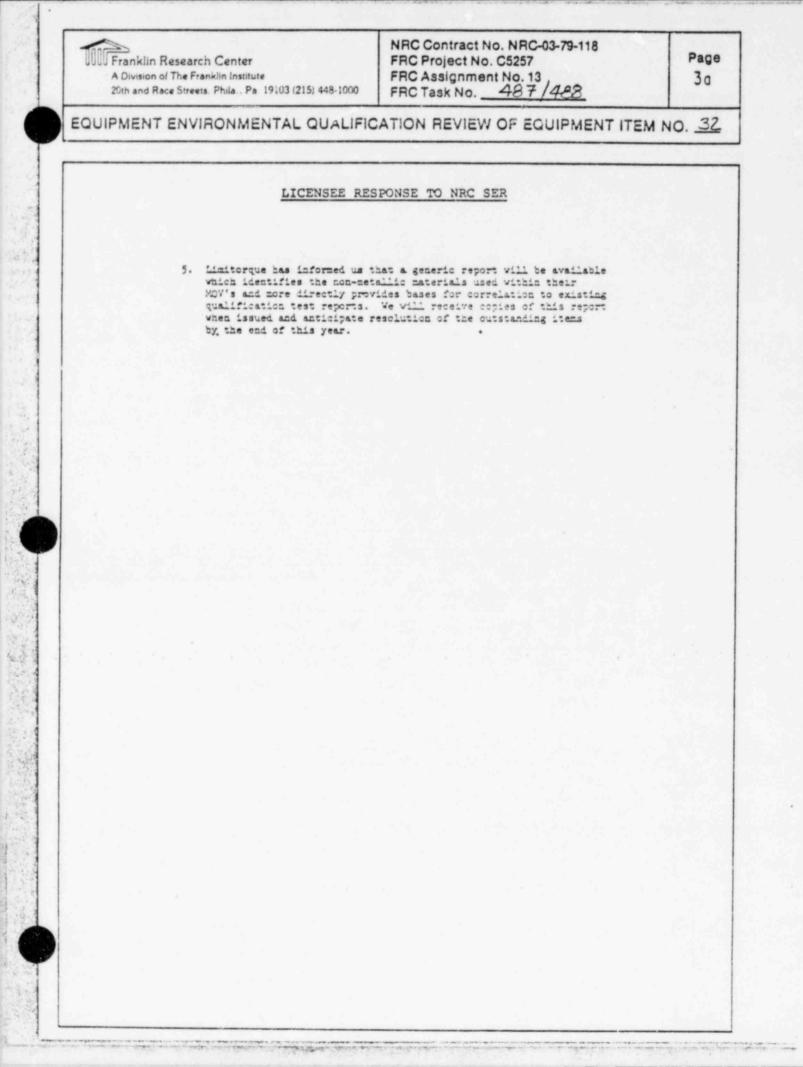
X = CATEGORY

I.a Equipment Qualified Equipment Qualification Pending Modification I.b <u>×</u> Equipment Qualification Not Established II.a II.b Equipment Not Qualified Equipment Satisfies All Requirements Except Qualified Life II.C or Replacement Schedule Justified III.a Equipment Exempt From Qualification III.b Equipment Not in the Scope of the Qualification Review Documentation Not Made Available IV

See Evaluation on Page 5f.

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NRC QUALIFICATION CATEGORY



A Division of The Franklin Institute 20th and Race Streets, Phila., Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/488</u>

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OTES:	"X" DENOTES APPROPRIATE NOTES
X	I. The Licensee has not provided documentation from the manufacturer which establishes similarity between the installed equipment and the test specimen in the referenced document(s). (NOTE A)
<u>×</u>	2. The Licensee has not identified the class of the insulation system used for the motor in the motorized valve actuator.
X	3. The Licensee has not identified whether or not this motorized valve actuator incorporates a motor-brake assembly.
X	4. The Licepsee has not identified the class of the insulation system used for the motor-brake assembly (if applicable).
X	5. The Licensee has not identified the motor manufacturer for this motorized valve actuator.
<u> </u>	 The Licensee has not identified the manufacturer of the motor-brake assembly (if applicable).
X	 The Licensee has not identified the type of current used in the motorized valve actuator.
<u> </u>	 The Licensee has not identified the type of current used in the motor-brake assembly (if applicable).
<u>×</u>	9. The Licensee has not established a qualified life estimate for this motorized valve actuator based on technically justifiable methods and conservative assumptions.
10). The Licensee has stated that the only harsh parameter that this motorized valve actuator is exposed to is radiation.
11	1. Since radiation is stated to be the only harsh parameter and considering the extensive radiation testing of the motors used in this type of motorized valve actuator, the specified radiation dose of is considered to be of sufficiently low value as to not affect this equipment item. This equipment item is considered qualified for this parameter.
12	 The Licensee has committed to replace this equipment item. The Licensee has stated the following:

. NRC Contract No. NRC-03-79-118 Page Franklin Research Center FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 487148F Di sion of The Franklin Institute 5G Oth and Race Streets. Phila., Pa. 19103 (215) 448-1000 EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 32 NOTES: has anted correspondence The Transel A mitan 11 int man 1 111 esum matis n 11 revelus. The state of the second s start at he

Franklin Research Center A Division of The Franklin Institute 20th and Race Streets. Phila... Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 487

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 33

EQUIPMENT ITEM NO. 33 FLOW TRANSMITTER LOCATED IN THE EAST PIPING PENETRATION ROOM (A316) FISCHER AND PORTER MODEL 10B2495 (6) REQUIRED OPERATING TIME: 9 HOURS TER CHECKSHEET NO. 33 LICENSEE REFERENCE(S): 646, 1782 FUNCTION (PLANT ID): FLOW TRANSMITTER (1FT6901) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 256

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY: (See Section 3 of this TER for Legend)

R, T, QI, RT, P, H, CS, A, S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents

Equipment Item

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Maintenance and Replacement Schedule Summary

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A Division of The Franklin Institute 20th and Race Streets. Phila. Fa 19103 (215) 448-1000	NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>4871488</u>	Page 1b
QUIPMENT ENVIRONMENTAL QUALIFI	CATION REVIEW OF EQUIPMENT ITEM	NO. 33
SUMMARY OF LICENSEE RESPONSES TO THE	NEC SER - ONLY CHECKED ITEMS ARE A	
		FFBICABLE
X The Licensee (has/has not) provid	ded a response to the SER concerns.	
The Licensee (has/has not) specific qualified and/or will function will environmental service conditions.	nen exposed to the applicable DBE	3
The Licensee has presented inform outstanding qualification deficie	mation which shows there are no encies.	
The Licensee (has/has not) proposition the proposition that not	sed a corrective action for this equipeen fully established.	ipment
X Justification for interim operation Licensee for this equipment is	eration (has/h as not) been provided item.	by the
\underline{X} Corrective action specified b	by the Licensee:	
Equipment replacement wit	th qualified equipment	
Equipment relocation above	ve submergence level	
Relocate or shield equipm	ment from radiation source	
Verify qualification by a	additional (testing/analysis)	
Equipment relocation to a		
Qualification testing of X Other (K.)
The Licensee has provided oth that can be construed as a ba operation.	er information for this equipment i asis for justification for interim	tem
The Licensee (nas/has not) pr corrective action. (Schedule action)	ovided a schedule for the proposed for accomplishing the corrective	.)
The Licensee states that the equi and/or should be exempted from en	pment item does not require qualifi vironmental qualification.	cation
DESIGNATION OF RESULTANT NRC QUALIFIC - CIRCLED ITEM ONLY: (See Section 3		REVIEW
I.a Qualified I.b Modification	II.c Qualified Life Deficiency	
I.a Qualification Not Established	III.a Exempt III.b Not in Scope	
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A Division of The Franklin Institute 20th and Race Streets. Phila.. Pa. 19103 (215) 448-1000

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DESIGNATION:

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 33

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

DESIGNATION: X = DEFICIENCY NRC REQUIREMENTS Documented Evidence of Qualification Adequate X Adequate Similarity Between Equipment and Test Specimen Established Aging Degradation Evaluated Adequately Qualified Life or Replacement Schedule Established (If Required) Program Established to Identify Aging Degradation Criteria Regarding Aging Simulation Satisfied (If Required) Criteria Regarding Temperature/Pressure Exposure: o Peak Temperature Adequate o Peak Pressure Adequate o Duration Adequate o Required Profile Enveloped Adequately o Steam Exposure (If Required) Adequate Criteria Regarding Spray Satisfied Criteria Regarding Submergence Satisfied Criteria Regarding Radiation Satisfied Criteria Regarding Test Sequence Satisfied Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied Criteria Regarding Functional Testing Satisfied Criteria Regarding Instrument Acturacy Satisfied Test Duration Margin (1 hour + Function Time) Satisfied Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)

NRC QUALIFICATION CATEGORY

I.a Equipment Qualified I.b Equipment Qualification Pending Modification II.a Equipment Qualification Not Established II.b Equipment Not Qualified II.c Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified III.a Equipment Exempt From Qualification III.b Equipment Not in the Scope of the Qualification Review IV Documentation Not Made Available NRC Contract No. NRC-03-79-118Franklin Research CenterA Division of The Franklin Institute20th and Race Streets. Phila., Pa. 19103 (215) 448-1000RC Assignment No. 13FRC Task No. 48 7/494

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 33

LICENSEE RESPONSE TO NRC SER

6. These components are within the scope of our present assessment/ evaluation activity. Completion of the activity with subsequent action plan is not anticipated until the end of this year or first ----quarter of next.

NRC Contract No. NRC-03-79-118 Page Franklin Research Center FRC Project No. C5257 Di sion of The Franklin Institute FRC Assignment No. 13 5f FRC Task No. 487/488 Oth and Race Streets. Phila., Pa. 19103 (215) 448-1000 EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 33 NOTES: SCEMA to lerea The hes EGUIP SENT DESCI-IPTION CUMPUNENT NUVBER 1FT322 COMPONENT FLOW XINTH MARUFACTURED' FISCHER PURIER PART NUMBER 1052495(5) the F&P report 2204-51-8-006 the stated 315 descr DESCRIPTION OF TEST

The test was initiated with three electronic force balance transmitter units, consisting of (1) an oscillator-amplifier module, (2) 1 detector coil assembly, and (3) a force motor. These transmitters are used on pressure transmitter models 1032450, 50EP1000, 50EN1000 and 50ER1000. To conserve space, the moduling elements were not included and the components of each test unit were removed from their enclosures. The three units were mounted equally spaced on an 11-1/2 in. diameter aluminum base plate.

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NRC Contract No. NRC-03-79-118 Page FRC Project No. C5257 Franklin Research Center FRC Assignment No. 13 FRC Task No. 487/477 59 A Division of The Franklin Institute 20th and Race Streets. Phila . Pa 19103 (215) 448-1000 EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 33 NOTES: The decerce has milasity setures alles and Ar int -----

A Division of The Franklin Institute 20th and Race Streets. Phila. Pa 19103 (215) 448-1000	NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 487	Page
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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 34

EQUIPMENT ITEM NO. 34 FLOW TRANSMITTER LOCATED IN THE PIPING AREA (A224) FISCHER AND PORTER MODEL 10B2495 (6) REQUIRED OPERATING TIME: 9 HOURS TER CHECKSHEET NO. 34 LICENSEE REFERENCE(S): 646, 1782 FUNCTION (PLANT ID): LPSI FLOW TO LOOP 11B (1FT322) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 201 FUNCTION (PLANT ID): HPSI FLOW TO LOOP 11B (1FT321) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 186 FUNCTION (PLANT ID): HPSI FLOW TO LOOP 11A (1FT311) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 185 FUNCTION (PLANT ID): LPSI FLOW TO LOOP 11A (1FT312) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 185 FUNCTION (PLANT ID): LPSI FLOW TO LOOP 11A (1FT312) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 200

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY: (See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, A, S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated,) Not applicable

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A Dission of The F 20th and Race Stre	Carle Defendence	FRC Pr	ontract No. NRC-03-79-118 oject No. C5257 isignment No. 13 sk No. <u>477478</u>	Page 1b
EQUIPMENT ENV	IRONMENTAL QUA	LIFICATION F	REVIEW OF EQUIPMENT ITE	M NO. 34
SUMMARY OF LICE	NSEE RESPONSES TO	THE NRC SER	- ONLY CHECKED ITEMS ARE	APPLICABLE
The License	e (has/has not) pr	ovided a res	ponse to the SER concerns	
qualified a	e (has/has,not) sp nd/or will functio al service conditi	n when expos	tated that the equipment ed to the applicable DBE	is
X The License outstanding	e has presented in qualification def	formation wh iciencies.	ich shows there are no	
The License item whose	e (has/has not) pr qualification has	oposed a cor not been ful	rective action for this ea ly established.	quipment
Justifi License	cation for interim e for this equipme	operation (nt item.	has/has not) been provided	d by the
Correct	ive action specifi	ed by the Li	censee:	
Equ	ipment replacement ipment modificatio	with qualif	ied equipment	
	ipment relocation		gence level	
Rel	ocate or shield eq	uipment from	radiation source	
Equ	ipment relocation	by additiona.	l (testing/analysis)	
Qua	lification testing	of equipment	t in progress	
Oth	er ()
The Lic that ca operation	n be construed as	other informa basis for	mation for this equipment justification for interim	item
The Lic correct action	ive action. (Sche) provided a dule for acco	schedule for the proposed omplishing the corrective	.)
The License and/or shou	e states that the old be exempted from	equipment ite m environment	em does not require qualif tal qualification.	fication
DESIGNATION OF	RESULTANT NRC QUAL	IFICATION EV	ALUATION CATEGORY BASED ON	REVIEW
- CIRCLED ITEM	ONLY: (See Section	n 3 of this 1	TER for Legend)	
L.a Qualified		II.C	Qualified Life Deficiency	
I.b Modificatio	succession of the local division in the local division of the loca	III.a	Exempt	
I.a Qualificat	ion Not Established		Not in Scope Documentation Not Availab	
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Franklin Research Center A Division of The Franklin Institute 20th and Race Streets. Phila., Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. _ 487/488

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 34

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION: X = DEFICIENCY

Documented Evidence of Qualification Adequate Adequate Similarity Between Equipment and Test Specimen Established Aging Degradation Evaluated Adequately Qualified Life or Replacement Schedule Established (If Required) Program Established to Identify Aging Degradation Criteria Regarding Aging Simulation Satisfied (If Required) Criteria Regarding Temperature/Pressure Exposure: o Peak Temperature Adequate o Peak Pressure Adequate o Duration Adequate o Required Profile Enveloped Adequately

o Steam Exposure (If Required) Adequate Criteria Regarding Spray Satisfied Criteria Regarding Submergence Satisfied Criteria Regarding Radiation Satisfied Criteria Regarding Test Sequence Satisfied Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied

Criteria Regarding Functional Testing Satisfied Criteria Regarding Instrument Accuracy Satisfied Test Duration Margin (1 hour + Function Time) Satisfied Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)

NRC QUALIFICATION CATEGORY

DESIGNATION: X = CATEGORY

I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	X
II.b	Equipment Not Quali	
II.c	Equipment Satisf' 3 / 1 Requirements Except Qualified Life	
	or Replacemer de dustified	
III.a	Equipment Example Statistication	
III.b	Equipment Not in the apope of the Qualification Review	
IV	Documentation Not Made Available	

Refer to pages 57, 59 geten 33

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E' UIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 35

EQUIPMENT ITEM NO. 35 FLOW TRANSMITTER LOCATED IN THE WEST PENETRATION ROOM (A221) FISCHER AND PORTER MODEL 10B2495 (6) REQUIRED OPERATING TIME: 9 HOURS TER CHECKSHEET NO. 35 LICENALE REFERENCE(S): 646, 1782 FUNCTION (PLANT ID): LPSI FLOW TO LOOP 12A (1FT332) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 202 FUNCTION (PLANT ID): HPSI FLOW TO LOOP 12A (1FT331) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 187 FUNCTION (PLANT ID): HPSI FLOW TO LOOP 12B (1FT341) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 188 FUNCTION (PLANT ID): LPSI FLOW TO LOOP 12B (1FT342) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 203

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY: (See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, A, S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

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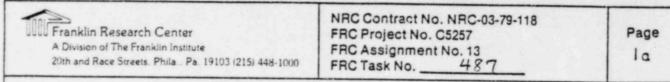
A Division of The Franklin Institute 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000	NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/468</u>	Page I b
EQUIPMENT ENVIRONMENTAL QUALIFIC	ATION REVIEW OF EQUIPMENT ITEM	NO. 35
SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE AP	PLICABLE
The Licensee (has/has not) provide	ed a response to the SER concerns.	
The Licensee (has/has not) specific qualified and/or will function whe environmental service conditions.	ically stated that the equipment is an exposed to the applicable DBE	
X The Licensee has presented information outstanding qualification deficier	ation which shows there are no ncies.	
The Licensee (has/has not) propose item whose qualification has not b	ed a corrective action for this equ been fully established.	ipment
Justification for interim oper Licensee for this equipment it	ation (has/has not) been provided	by the
Corrective action specified by	the Licensee:	
Equipment replacement with Equipment modification Equipment relocation above Relocate or shield equipme Verify qualification by ad Equipment relocation to a Qualification testing of e Other (e submergence level ent from radiation source ditional (testing/analysis) mild environment)
The Licensee has provided othe that can be construed as a bas operation.	r information for this equipment it is for justification for interim	tem
corrective action. (Schedule	vided a schedule for the proposed for accomplishing the corrective	.)
The Licensee states that the equip and/or should be exempted from env	ment item does not require qualific ironmental qualification.	cation
DESIGNATION OF RESULTANT NRC QUALIFICA - CIRCLED ITEM ONLY: (See Section 3 o	TION EVALUATION CATEGORY BASED ON F f this TER for Legend)	REVIEW
I.a Qualified I.b Modification II.a Qualification Not Established II.b Not Qualified	II.c Qualified Life Deficiency III.a Exempt III.b Not in Scope IV Documentation Not Available	

A Division of The Franklin Institute 20th and Race Streets. Phila., Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. _ 48-7/485

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	EQUIPMENT ENVIRONME	ENTAL QUALIFICATION SUMMART	FORM
			DESIGNATION:
RC REQU	IREMENTS		X = DEFICIENCY
	4		
	ed Evidence of Qualificat		
		pment and Test Specimen Esta	ablished X
ing De	gradation Evaluated Adequ	uately	
		hedule Established (If Requ:	Ired)
	Established to Identify 2		
		ion Satisfied (If Required)	
	Regarding Temperature/P	ressure Exposure:	
	eak Temperature Adequate		
	eak Pressure Adequate uration Adequate		
	equired Profile Enveloped	d Maguately	
	team Exposure (If Require		
	Regarding Spray Satisfie		
	Regarding Submergence Sa		
	Regarding Radiation Sat.		
	Regarding Test Sequence		
	Regarding Test Failures		
	y) Satisfied		
riteria	Regarding Functional Tes	sting Satisfied	
	Regarding Instrument Act		
	ation Margin (1 hour + F		
riteria	Regarding Margins Satis	fied (NUREG-0588, Cat. I)	
			DESIGNATION:
RC QUAL	IFICATION CATEGORY		X = CATEGORY
	Equipment Qualified		
	Equipment Qualification	Pending Modification	
	Equipment Qualification		X
	Equipment Not Qualified		×
		Requirements Except Qualifi	ed Life
	or Replacement Schedule		
	Equipment Exempt From Qu		
		pe of the Qualification Rev	iew
11.0			

Refer to page st & sg of iten 33



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 36

EQUIPMENT ITEM NO. 36 LEVEL TRANSMITTER LOCATED IN CONTAINMENT (C230) FISCHER AND PORTER MODEL 13D2495KBAABCB REQUIRED OPERATING TIME: 8 HOURS TER CHECKSHEET NO. 36 LICENSEE REFERENCE(S): 646, 1782 FUNCTION (PLANT ID): STEAM GENERATOR 12 LEVEL (1LT1121, 1LT1106, 1LT1123D, ILT1123C, 1LT1123B, 1LT1123A) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 22 THROUGH 27 FUNCTION (PLANT ID): STEAM GENERATOR 11 LEVEL (1LT1111, 1LT1105, 1LT1113D, ILT1113C, 1LT1113B, 1LT1113A) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 16 THROUGH 21

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY: (See Section 3 of this TER for Legend)

R, T, QI, RT, P, H, CS, A, S, (R), M, I, M, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

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QUIPME	NT ENVIRONMENTAL QUALIFI	ICATION REVIEW OF EQUIPMENT ITEN	1 NO. 35
SUMMARY (OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE AP	PLICABLE:
		ded a response to the SER concerns.	1
qual	Licensee (has/has_not) speci fied and/or will function w conmental service conditions	fically stated that the equipment is hen exposed to the applicable DBE •	-
The loutst	Licensee has presented information and ing qualification deficient	mation which shows there are no encies.	
X The item	licensee (has/ has not) proposition has not	sed a corrective action for this equ been fully established.	ipment
X	Justification for interim operation in the second s	eration (has/h as not) been provided item.	by the
X	Corrective action specified 1	by the Licensee:	
-	Equipment replacement with Equipment modification Equipment relocation above Relocate or shield equipment		
-	Verify qualification by a Equipment relocation to a Qualification testing of Other (additional (testing/analysis) a mild environment	
5	he Licensee has provided oth	ner information for this equipment is asis for justification for interim	tem.
c	The Licensee (has/has not) proprective action. (Schedule ction	covided a schedule for the proposed a for accomplishing the corrective	.)
The L and/o	icensee states that the equi r should be exempted from en	ipment item does not require qualific avironmental qualification.	cation
ESIGNATI CIRCLED	ON OF RESULTANT NRC QUALIFIC ITEM ONLY: (See Section 3	CATION EVALUATION CATEGORY BASED ON 1 of this TER for Legend)	REVIEW
	ified fication ification Not Established	II.c Qualified Life Deficiency III.a Exempt III.b Not in Scope	
	Qualified	III.D NOT IN Scope IV Documentation Not Available	

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EQUIPMENT ENVIRONMENTAL	QUALIFICATION SUMMARY FORM	
NRC REQUIREMENTS		SIGNATION: DEFICIENCY
Documented Evidence of Qualification A Adequate Similarity Between Equipment Aging Degradation Evaluated Adequately Qualified Life or Replacement Schedula Program Established to Identify Aging Criteria Regarding Aging Simulation Sa Criteria Regarding Temperature/Pressur o Peak Temperature Adequate o Peak Pressure Adequate o Duration Adequate o Required Profile Enveloped Adec o Steam Exposure (If Required) Adec o Steam Exposure (If Required) Adec criteria Regarding Spray Satisfied Criteria Regarding Radiation Satisfied Criteria Regarding Test Sequence Satisf Criteria Regarding Test Sequence Sati (If Any) Satisfied Criteria Regarding Functional Testing Criteria Regarding Instrument Accurac Test Duration Margin (I hour + Functi Criteria Regarding Margins Satisfied	and Test Specimen Establishe Y e Established (If Required) Degradation atisfied (If Required) re Exposure: quately dequate ied d sfied evere Anomalies Satisfied on Time) Satisfied	
NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a Equipment Qualified I.b Equipment Qualification Pendi II.a Equipment Qualification Not E		X

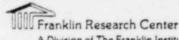
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- II.c Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified III.a Equipment Exempt From Qualification
- III.b Equipment Not in the Scope of the Qualification Review IV Documentation Not Made Available



A Division of The Franklin Institute 20th and Race Streets. Phila., Pa. 19103 (215) 448-1000 NRC Contract No. NRC-02-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/488</u>

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 36

LICENSEE RESPONSE TO NRC SER

10. We had previously committed to replacing these transmitters and have ordered Barton transmitters for inside containment and Rosemount for outside containment applications. Delivery is anticipated in sufficient time for installation during our next scheduled refueling outages; Unit 1 Cycle 6 and Unit 2 Cycle 5. The Barton qualification test program is scheduled for completion and issuance of final reports by November, 1981. The utility sponsored Rosemount program is scheduled for completion by May, 1982. An additional three months will be necessary for our evaluation/assessment and subsequent acceptance of the qualification of these devices. These will be qualified to the Category I requirements. Franklin Research Center

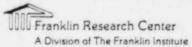
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20th and Race Streets. Phila. Pa. 19103 (215) 448-1000

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NOTES:		
	Qualification for steam-high temperature and pressure exposure has not been established. It appears that R_{1} and $q-5L-Book$ established that the test chamber time-dependent	
	temperature/pressure profile exceeded the postulated accident profile for 2.75 hours. However, the test time duration did not envelop the required accident profile.	_
	More importantly, it is clear from WCAP 9157 that the same Fischer & Porter transmitter failed the environmental test after 6 minutes. Clearly this equipment fails to satisfy the NRC	_
	criteria which requires that short-term safety-functions must be qualified for a period of at least 1 hour in excess of required operating time.	_
	FRC notes that in a 9/29/79 felle Westinghouse has responded to NRC questions relative to Topical Append (WCAP-9157). Westinghouse has stated that Fischer & Porter transmitter type 1082496 are	
	adequately qualified for short-term protective functions;	
	however, the NRC has noted that these transmitters are no longer acceptable for HELB applications. In addition, Westinghouse stated that Fischer & Porter transmitters types 10B2496,	
	50EP1041, and 50EP1031, are applicable for non-HELB applications.	



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 37

EQUIPMENT ITEM NO. 37 PRESSURE INDICATOR LOCATED IN THE AUXILIARY FEEDWATER PUMP ROOM (T603) SIGMA MODEL 9222(3) REQUIRED OPERATING TIME: 8 HOURS TER CHECKSHEET NO. 37 LICENSEE REFERENCE(S): NOT CITED FUNCTION (PLANT ID): STEAM GENERATOR 12 OUTLET PRESSURE (1PI4009) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 137 FUNCTION (PLANT ID): STEAM GENERATOR 11 OUTLET PRESSURE (1FI3992) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 135

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY: (See Section 3 of this TER for Legend) R, T, QT, RT, P, H, CS, A, S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

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Maintenance and Replacement Schedule Summary

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QUIPMENT ENVIRONMENTAL QUALIFIC	ATION REVIEW OF EQUIPMENT ITE	M NO. 37
SUMMARY OF LICENSEE RESPONSES TO THE N	NRC SER - ONLY CHECKED ITEMS ARE A	PPLICABLE:
The Licensee (has/has not) provide	d a response to the SER concerns.	
The Licensee (has/has not) specifi qualified and/or will function whe environmental service conditions.	cally stated that the equipment i en exposed to the applicable DBE	S
The Licensee has presented informa outstanding qualification deficien	tion which shows there are no cies.	
The Licensee (has/has not) propose item whose qualification has not b	ed a corrective action for this equeen fully established.	uipment
Justification for interim oper Licensee for this equipment it	ation (has/has not) been provided	by the
Corrective action specified by	the Licensee:	
Equipment replacement with Equipment modification Equipment relocation above Relocate or shield equipme Verify qualification by ad Equipment relocation to a Qualification testing of er Other (submergence level nt from radiation source ditional (testing/analysis) mild environment	,
The Licensee has provided othe that can be construed as a bas operation.	r information for this equipment : is for justification for interim	item .
The Licensee (nas/has not) pro- corrective action. (Schedule action	vided a schedule for the proposed for accomplishing the corrective	_•)
The Licensee states that the equips and/or should be exempted from envi	ment item does not require qualifi	ication
DESIGNATION OF RESULTANT NRC QUALIFICA - CIRCLED ITEM ONLY: (See Section 3 o)	TION EVALUATION CATEGORY BASED ON 2 this TER for Legend)	REVIEW
I.a Qualified I.b Modification II.a Qualification Not Established II.b Not Qualified	II.c Qualified Life Deficiency III.a Exempt III.b Not in Scope IV Documentation Not Availabl	e

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 37

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

DESIGNATION: X = DEFICIENCY NRC REQUIREMENTS × Documented Evidence of Qualification Adequate Adequate Similarity Between Equipment and Test Specimen Established Aging Degradation Evaluated Adequately Qualified Life or Replacement Schedule Established (If Required) Program Established to Identify Aging Degradation Criteria Regarding Aging Simulation Satisfied (If Required) Criteria Regarding Temperature/Pressure Exposure: o Peak Temperature Adequate o Peak Pressure Adequate o Duration Adequate o Required Profile Enveloped Adequately o Steam Exposure (If Required) Adequate Criteria Regarding Spray Satisfied Criteria Regarding Submergence Satisfied Criteria Regarding Radiation Satisfied Criteria Regarding Test Sequence Satisfied Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied Criteria Regarding Functional Testing Satisfied Criteria Regarding Instrument Accuracy Satisfied Test Duration Margin (1 hour + Function Time) Satisfied Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)

NRC QUALIFICATION CATEGORY

DESIGNATION: X = CATEGORY

I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	×
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life	
	or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.D	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 38

EQUIPMENT ITEM NO. 38 PRESSURE TRANSMITTER LOCATED IN THE MAIN STEAM PIPING PENETRATION (A315) FISCHER AND PORTER MODEL 50EP1000 SERIES REQUIRED OPERATING TIME: 8 HOURS TER CHECKSHEET NO. 38 LICENSEE REFERENCE(S): 646, 1782 FUNCTION (PLANT ID): STEAM GENERATOR 12 OUTLET PRESSURE (1PT4008) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 138 FUNCTION (PLANT ID): STEAM GENERATOR 11 OUTLET PRESSURE (1PT3991) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 136

DESIC	SNATION	FOI	R DI	EFICIE	ENCY	IDEN	NTIFIED	BY	THE	NRC	SER	-	CIRCLED	ITEM(S)	ONLY:
(See	Section	1 3	of	this	TER	for	Legend)								

R, T, QT, RT, P, H, CS, A, S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

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Not stated, Not applicable

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A Division of The Franklin Institute 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000	NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 467/488	Page Ib
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SUMMARY OF LICENSEE RESPONSES TO THE N	RC SER - ONLY CHECKED ITEMS ARE APP	LICABLE
The Licensee (has/has not) provide	d a response to the SER concerns.	
The Licensee (has/has_not) specifi qualified and/or will function whe environmental service conditions.	cally stated that the equipment is in exposed to the applicable DBE	
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Corrective action specified by	the Licensee:	
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A Division of The Franklin Institute 20th and Race Streets. Phila., Pa. 19103 (215) 448-1000

NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. _487/488

Page 2

DESIGNATION: X = DEFICIENCY

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 36

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

Documented Evidence of Qualification Adequate Adequate Similarity Between Equipment and Test Specimen Established Aging Degradation Evaluated Adequately Qualified Life or Replacement Schedule Established (If Required) Program Established to Identify Aging Degradation Criteria Regarding Aging Simulation Satisfied (If Required) Criteria Regarding Temperature/Pressure Exposure: o Peak Temperature Adequate o Peak Pressure Adequate

o Duration Adequate

o Required Profile Enveloped Adequately

o Steam Exposure (If Required) Adequate Criteria Regarding Spray Satisfied

Criteria Regarding Submergence Satisfied Criteria Regarding Radiation Satisfied

Criteria Regarding Test Sequence Satisfied

Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied

Criteria Regarding Functional Testing Satisfied Criteria Regarding Instrument Accuracy Satisfied Test Duration Margin (1 hour + Function Time) Satisfied Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)

NRC QUALIFICATION CATEGORY

I.a Equipment Qualified _____ Equipment Qualification Pending Modification I.b Equipment Qualification Not Established II.a II.b Equipment Not Qualified Equipment Satisfies All Requirements Except Qualified Life II.c or Replacement Schedule Justified III.a Equipment Exempt From Qualification III.b Equipment Not in the Scope of the Qualification Review Documentation Not Made Available IV

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DESIGNATION: X = CATEGORY

A Division of The Franklin Institute 20th and Race Streets. Phila. Pa 19103 (215) 448-1000

NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 487

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 39

FQUIPMENT ITEM NO. 39
PRESSURE TRANSMITTER LOCATED IN CONTAINMENT (C230)
FISCHER AND PORTER MODEL 50EP1000 SERIES
REQUIRED OPERATING TIME: 9 HOURS
TER CHECKSHEET NO. 39
LICENSEE REFERENCE(S): 646, 1782
FUNCTION (PLANT ID): PRESSURIZER 11 PRESSURE (1PT103-1)
LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 173
FUNCTION (PLANT ID): PRESSURIZER 11 PRESSURE (1PT103)
LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 172

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER	- CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)	
R, T, QT, RT, P, H, CS, A, S, (R), M, I, QM, RPN, EX	N, SEN, QI, RPS, None,
Not stated, Not applicable	
LISTING OF APPLICABLE CHECKSHEETS:	
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Licensee Response to NRC SER	3a, 3b, 3c, 3d -
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Equipment Environmental Qualification Review	5a, 5b, 5c, 5d, 5c, 5f, -5g, 5h, 5i, 5j
Installed TMI Lessons Learned Implementation	62, 60-
Equipment Summary	
Maintenance and Replacement Schedule Summary	7a, 7b, 7e-

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QUIPMENT ENVIRONMENTAL QUALIF	ICATION REVIEW OF EQUIPMENT ITEM	NO. 3
SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE AP	PLICABLE
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The Licensee (has/has not) speci qualified and/or will function w environmental service conditions	fically stated that the equipment is hen exposed to the applicable DBE	
The Licensee has presented inform outstanding qualification deficit	mation which shows there are no encies.	
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The Licensee has provided oth that can be construed as a ba operation.	ner information for this equipment it asis for justification for interim	em
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Franklin Research Center A Division of The Franklin Institute 20th and Race Streets. Phila., Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13, FRC Task No. 487 1488

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 39

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

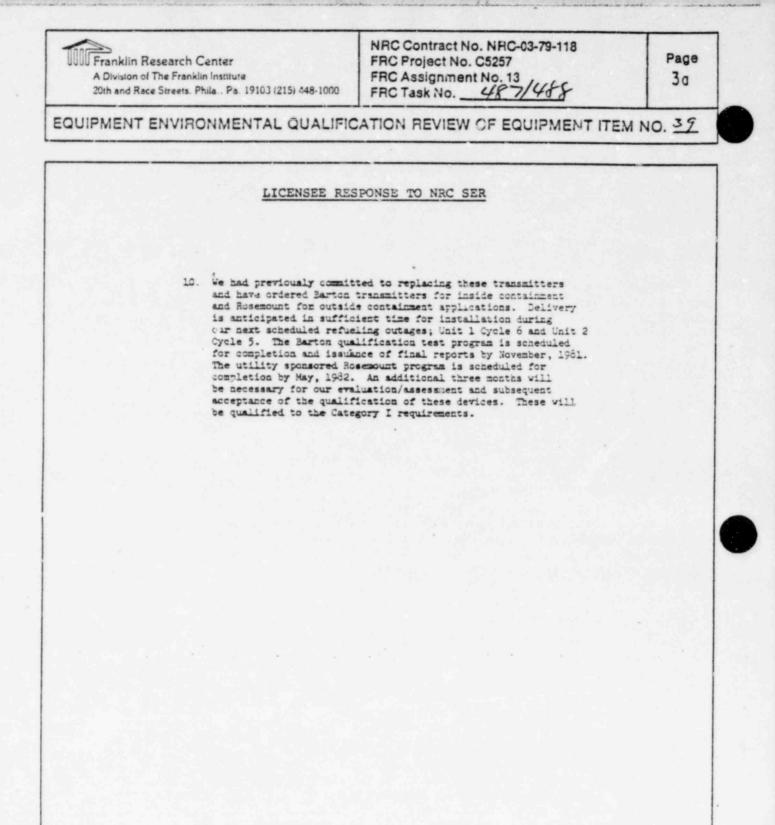
DESIGNATION: X = DEFICIENCY NRC REQUIREMENTS Documented Evidence of Qualification Adequate Adequate Similarity Between Equipment and Test Specimen Established Aging Degradation Evaluated Adequately Qualified Life or Replacement Schedule Established (If Required) Program Established to Identify Aging Degradation Criteria Regarding Aging Simulation Satisfied (If Required) Criteria Regarding Temperature/Pressure Exposure: o Peak Temperature Adequate o Peak Pressure Adequate o Duration Adequate o Required Profile Enveloped Adequately o Steam Exposure (If Required) Adequate Criteria Regarding Spray Satisfied Criteria Regarding Submergence Satisfied Criteria Regarding Radiation Satisfied Criteria Regarding Test Sequence Satisfied Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied Criteria Regarding Functional Testing Satisfied Criteria Regarding Instrument Accuracy Satisfied Test Duration Margin (1 hour + Function Time) Satisfied Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)

NRC QUALIFICATION CATEGORY

DESIGNATION: X = CATEGORY

I.a	Equipment Qualified
I.b	Equipment Qualification Pending Modification
II.a	Equipment Qualification Not Established
II.b	Equipment Not Qualified
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified
III.a	Equipment Exempt From Qualification
III.b	Equipment Not in the Scope of the Qualification Review
IV	Documentation Not Made Available

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A Division of The Franklin Institute 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000	NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 487	Page
EQUIPMENT ENVIRONMENTAL QUALIFICA	TION REVIEW OF EQUIPMENT ITEM	NO. 40
1TE122HD, 1TE122H	B, 1TE122CD, 1TE122CC, 1TE122CA, IC, 1TE122HB, 1TE122HA, 1TE112CA, IC, 1TE112HB, 1TE112HA)	
DESIGNATION FOR DEFICIENCY IDENTIFIED (See Section 3 of this TER for Legend)	BY THE NRC SER - CIRCLED ITEM (S) ON	ILX:
(R, T, (T, RT, P, H, (S, A, S, (R), (M,	I, (M, RPN,) EXN, SEN, QI, RPS, None	
Not stated, Not applicable	\sim	2,
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LISTING OF APPLICABLE CHECKSHEETS:		
LISTING OF APPLICABLE CHECKSHEETS:	Checksheet Page No.	
	<u>Checksheet Page No.</u> la	
Contents	la	
<u>Contents</u> Equipment Item	la RC SER 1b	
<u>Contents</u> Equipment Item Summary of Licensee Responses to the N	la RC SER 1b	
Contents Equipment Item Summary of Licensee Responses to the N Equipment Environmental Qualification	la RC SER 1b Summary Forms 2	
<u>Contents</u> Equipment Item Summary of Licensee Responses to the N Equipment Environmental Qualification Licensee Response to NRC SER	la RC SER 1b Summary Forms 2 3a, 3b, 3c, 3d - 4a, 4b, 4c, 4d, 4e,	-
Contents Equipment Item Summary of Licensee Responses to the N Equipment Environmental Qualification Licensee Response to NRC SER System Consideration Review	la RC SER 1b Summary Forms 2 3a, 3b, 3c, 3d 4a, 4b, 4c, 4d, 4e, Review 5a, 5b, 5c, 5d, 5e, 5g, 5h, 5i, 5j	-
Contents Equipment Item Summary of Licensee Responses to the N Equipment Environmental Qualification Licensee Response to NRC SER System Consideration Review Equipment Environmental Qualification Installed TMI Lessons Learned Implemen	la RC SER lb Summary Forms 2 3a, 3b, 3e, 3d 4a, 4b, 4c, 4d, 4e, 4a, 4b, 4c, 4d, 4e, Seview 5a, 5b, 5c, 5d, 5e, 5g, 5h, 5i, 5j tation 6a, 6b	-

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A Division of The Franklin Institute 20th and Race Streets. Phila. Pa 19103 (215) 448-1000	NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/488</u>	Page 1b
EQUIPMENT ENVIRONMENTAL QUALIFIC	CATION REVIEW OF EQUIPMENT ITEM	NO. 40
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SUMMARY OF LICENSEE RESPONSES TO THE	ARC SER - ONLY CHECKED ITEMS ARE AP	PLICABLE
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The Licensee (has/has not) specif qualified and/or will function whe environmental service conditions.	ically stated that the equipment is en exposed to the applicable DBE	
The Licensee has presented inform outstanding qualification deficies	ation which shows there are no ncies.	
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X Justification for interim open Licensee for this equipment is	ration (has/has to been provided tem.	by the
X Corrective action specified by	y the Licensee:	
Z Equipment replacement with Equipment modification		
Equipment relocation above Relocate or shield equipme		
Verify qualification by ac Equipment relocation to a	ditional (testing/analysis)	
Qualification testing of e	equipment in progress	
Other ()
The Licensee has provided othe that can be construed as a bas operation.	er information for this equipment i sis for justification for interim	tem
X The Licensee (has/besite) pro	ovided a schedule for the proposed	
corrective action. (Schedule action NEXT SCHEDULED (for accomplishing the corrective	•)
The Licensee states that the equip and/or should be exempted from env	oment item does not require qualific vironmental qualification.	cation
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- CIRCLED ITEM ONLY: (See Section 3 of	of this TER for Legend)	
I.a Qualified	II.c Qualified Life Deficiency	
I.D Modification II.a Qualification Not Established	III.a Exempt III.b Not in Scope	
II.b Not Qualified	IV Documentation Not Available	e

A Division of The Franklin Institute 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/488</u>

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DESIGNATION: X = DEFICIENCY

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 40

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

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Documented Evidence of Qualification Adequate Adequate Similarity Between Equipment and Test Specimen Established Aging Degradation Evaluated Adequately Qualified Life or Replacement Schedule Established (If Required) Program Established to Identify Aging Degradation Criteria Regarding Aging Simulation Satisfied (If Required) Criteria Regarding Temperature/Pressure Exposure: o Peak Temperature Adequate o Peak Pressure Adequate o Duration Adequate o Required Profile Enveloped Adequately o Steam Exposure (If Required) Adequate Criteria Regarding Spray Satisfied Criteria Regarding Submergence Satisfied Criteria Regarding Radiation Satisfied Criteria Regarding Test Sequence Satisfied Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied Criteria Regarding Functional Testing Satisfied Criteria Regarding Instrument Accuracy Satisfied

Test Duration Margin (1 hour + Function Time) Satisfied Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)

NRC QUALIFICATION CATEGORY

DESIGNATION: X = CATEGORY

I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	_X_
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life	
	or Replacement Schedule Justified	-
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	
VI	Documentation Not Made Available	

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A Division of The Franklin Institute 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000	NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/488</u>	Page 30
QUIPMENT ENVIRONMENTAL QUALIFIC	CATION REVIEW OF EQUIPMENT ITE	M NO. 40
LICENS AR RES	SPONSE TO NRC SER	
evaluation activity. Complet:	te scope of our present assessment/ ion of the activity with subsequent d until the end of this year or first	
The Licensee's SCEW indicatives will be replaced during the "	tes that this equipment next scheduled outage".	

A Division of The Franklin Institute 20th and Race Streets, Phila, Pa 19103 (215) 448-1000

NRC Contract No. NRC-03-79-118
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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 41

EQUIPMENT ITEM NO. 41 PRESSURE TRANSMITTER LOCATED IN CONTAINMENT (C230) FISCHER AND PORTER MODEL 50EP1000 SERIES REQUIRED OPERATING TIME: 8 HOURS TER CHECKSHEET NO. 41 LICENSEE REFERENCE(S): 646, 1782 FUNCTION (PLANT ID): PRESSURIZER 11 PRESSURE (1PT102A, B, C, D) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 174, 175, 176, 177 FUNCTION (PLANT ID): STEAM GENERATOR 11 PRESSURE (1PT1013A, B, C, D) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 127, 128, 129, 130 FUNCTION (PLANT ID): STEAM GENERATOR 12 PRESSURE (1PT1023A, B, C, D) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 131, 132, 133, 134

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER	- CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)	
R, T, QI, RT, P, H, CS, A, S, (R), M, I, QM, RPN, EX	N, SEN, QI, RPS, None,
Not stated, Not applicable	
LISTING OF APPLICABLE CHECKSHEETS:	
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System Consideration Review	4a, 4b, 4c, 4d, 4e, 4f
Equ pment Environmental Qualification Review	<u>5a, 5b, 5c, 5d, 5e, 5f,</u> - 5g, 5h, 5i, 5j
Installed TMI Lessons Learned Implementation Equipment Summary	-6a, 6b-
Maintenance and Replacement Schedule Summary	-7a, 7b, 7c

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A Division of The Franklin Institute 20th and Race Streets. Phila. Pa 19103 (215) 448-1000	NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment N. 13 FRC Task No. <u>487/457</u>	Page 1b
QUIPMENT ENVIRONMENTAL QUALIFIC	CATION REVIEW OF EQUIPMENT ITE	M NO. 41
SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE A	PPLICABLE
X The Licensee (has/has not) provid	led a response to the SER concerns.	
The Licensee (has/has not) specif qualified and/or will function wh environmental service conditions.	ically stated that the equipment i en exposed to the applicable DBE	s
The Licensee has presented inform outstanding qualification deficie	ation which shows there are no noises.	
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Justification for interim ope Licensee for this equipment i	ration (has/ has not) been provided tem.	by the
Corrective action specified b	y the Licensee:	
Equipment replacement wit	h qualified equipment	
Equipment relocation abov	e submergence level	
Relocate or shield equipm Verify gualification by a	ent from radiation source dditional (testing/analysis)	
Equipment relocation to a	mild environment	
Qualification testing of Other (equipment in progress)
The Licensee has provided oth that can be construed as a ba operation.	er information for this equipment is sis for justification for interim	item
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corrective action. (Schedule action	for accomplishing the corrective)
The Licensee states that the equip and/or should be exempted from en-	pment item does not require qualif: vironmental qualification.	ication
DESIGNATION OF RESULTANT NRC QUALIFIC. - CIRCLED ITEM ONLY: (See Section 3 of	ATION EVALUATION CATEGORY BASED ON of this TER for Legend)	REVIEW
I.a Qualified	II.c Qualified Life Deficiency	
I.b Modification II.a Qualification Not Established	III.a Exempt III.b Not in Scope	
II.b Not Qualified	IV Documentation Not Availabl	Le

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A Division of The Franklin Institute 20th and Race Streets, Phila., Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. _457 488

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 91

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

DESIGNATION: X = DEFICIENCY NRC REQUIREMENTS Documented Evidence of Qualification Adequate Adequate Similarity Between Equipment and Test Specimen Established ____ Aging Degradation Evaluated Adequately Qualified Life or Replacement Schedule Established (If Required) Program Established to Identify Aging Degradation Criteria Regarding Aging Simulation Satisfied (If Required) Criteria Regarding Temperature/Pressure Exposure: o Peak Temperature Adequate o Peak Pressure Adequate o Duration Adequate o Required Profile Enveloped Adequately o Steam Exposure (If Required) Adequate Criteria Regarding Spray Satisfied Criteria Regarding Submergence Satisfied Criteria Regarding Radiation Satisfied Criteria Regarding Test Sequence Satisfied Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied Criteria Regarding Functional Testing Satisfied Criteria Regarding Instrument Accuracy Satisfied Test Duration Margin (1 hour + Function Time) Satisfied Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)

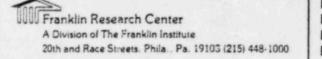
NRC QUALIFICATION CATEGORY

DESIGNATION: X = CATEGORY

I.a	Equipment Qualified	-
I.b	Equipment Qualification Pending Modification	X
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	-
IV	Documentation Not Made Available	

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 41

LICENSEE RESPONSE TO NRC SER

10. We had previously committed to replacing these transmitters and have ordered Barton transmitters for inside containment and Rosemount for outside containment applications. Delivery is anticipated in sufficient time for installation during our next scheduled refueling outages; Unit 1 Cycle 6 and Unit 2 Cycle 5. The Barton qualification test program is scheduled for completion and issuance of final reports by November, 1981. The utility sponsored Rosemount program is scheduled for completion by May, 1982. An additional three months will be necessary for our evaluation/assessment and subsequent acceptance of the qualification of these devices. These will be qualified to the Category I requirements.

NRC Contract No. NRC-03-79-118 Franklin Research Center FRC Project No. C5257 A Division of The Franklin Institute FRC Assignment No. 13 20th and Race Streets. Phila., Pa 19103 (215) 448-1000 48-FRC Task No.

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 42

EQUIPMENT ITEM NO. 42 ELECTRICAL PENETRATION LOCATED IN CONTAINMENT (C230) AMPHENOL MODEL 205033 REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 42 LICENSEE REFERENCE(S): 21 FUNCTION (PLANT ID): CONTAINMENT PENFTRATION ASSEMBLY (12EA4, 12WA6, 12WA3, 1ZEA7, 1ZWB7, 1ZWB2, 1ZWB1, 1ZEB6, 1ZEB3, 1ZEB1, 1ZEC1, 1ZEC9, 1ZEC4, 1ZEC6, 1ZWC1, 1ZWC4, 1ZWC6) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 96 THROUGH 112 FUNCTION (PLANT ID): CONTAINMENT PENETRATION ASSEMBLY (12EE4, 12EE9, 12WE3, 1ZWE9)LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 50, 51, 52, 53 FUNCTION (PLANT ID): CONTAINMENT PENETRATION ASSEMBLY (12EE1, 12EE7, 12WE1, 1ZWE7) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 46, 47, 48, 49

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY: (See Section 3 of this TER for Legend) (CS, (A,) S, (R), (M,) I, QM, RPN, EXN, SEN, QI, RPS, None, (RT,) P, H, R, T, (21, Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
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Licensee Response to NRC SER	3a, 3b, 3c, 3d
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Equipment Environmental Qualification Review	5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 51, 5j
Installed TMI Lessons Learned Implementation Equipment Summary	6a, 6b-

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Maintenance and Replacement Schedule Summary

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A Division of The Franklin Institute 20th and Race Streets. Phila Pa 19103 (215) 448-1000	NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No	Page Ib
QUIPMENT ENVIRONMENTAL QUALIFIC	CATION REVIEW OF EQUIPMENT ITEM	NO. 42
SUMMARY OF LICENSEE RESPONSES TO THE	NEC SER - ONLY CHECKED ITEMS ARE APP	LICABLE:
Y The Licensee (has/h as not) provide	ed a response to the SER concerns.	
The Licensee (has/has not) specif qualified and/or will function who environmental service conditions.	ically stated that the equipment is en exposed to the applicable DBE	
The Licensee has presented information outstanding qualification deficies	ation which shows there are no ncies.	
The Licensee (has/has not) propose item whose qualification has not h	ed a corrective action for this equi been fully established.	pment
Justification for interim oper Licensee for this equipment is	ration (has/ has no t) been provided b tem.	y the
X Corrective action specified by	y the Licensee:	
Equipment replacement with Equipment modification Equipment relocation above Relocate or shield equipme Verify qualification by ad Equipment relocation to a Qualification testing of e X Other (e submergence level ent from radiation source dditional (testing/analysis) mild environment	
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The Licensee (mas/has not) pro corrective action. (Schedule action	ovided a schedule for the proposed for accomplishing the corrective	y
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DESIGNATION OF RESULTANT NRC QUALIFICA - CIRCLED ITEM ONLY: (See Section 3 o	TION EVALUATION CATEGORY BASED ON RE of this TER for Legend)	EVIEW
I.a Qualified I.b Modification II.a Qualification Not Established II.b Not Qualified	II.c Qualified Life Deficiency III.a Exempt III.b Not in Scope IV Documentation Not Available	

Franklin Research Center A Division of The Franklin Institute 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>UF7/UF8</u>

Page 2

DESIGNATION:

X = DEFICIENCY

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 42

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

Documented Evidence of Qualification Adequate Adequate Similarity Between Equipment and Test Specimen Established Aging Degradation Evaluated Adequately Qualified Life or Replacement Schedule Established (If Required) Program Established to Identify Aging Degradation Criteria Recarding Aging Simulation Satisfied (If Required) Criteria Regarding Temperature/Pressure Exposure: o Peak Temperature Adequate o Peak Pressure Adequate o Duration Adequate o Required Profile Enveloped Adequately o Steam Exposure (If Required) Adequate Criteria Regarding Spray Satisfied Criteria Regarding Submergence Satisfied Criteria Regarding Radiation Satisfied Criteria Regarding Test Sequence Satisfied Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied Criteria Regarding Functional Testing Satisfied Criteria Regarding Instrument Accuracy Satisfied Test Duration Margin (1 hour + Function Time) Satisfied Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)

NRC QUALIFICATION CATEGORY

DESIGNATION: X = CATEGORY

I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	×
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

Statistical and the second second

Franklin Research Center A Division of The Franklin Institute 20th and Race Streets. Phila.. Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>4F7</u>/48

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 42

LICENSEE RESPONSE TO NRC SER

 These components are within the scope of our present assessment/ evaluation activity. Completion of the activity with subsequent action plan is not anticipated until the end of this year or first —quarter of next.

NRC Contract No. NRC-03-79-118 Page Franklin Research Center FRC Project No. C5257 A Division of The Franklin Institute FRC Assignment No. 13 50 FRC Task No. 487/488 20th and Race Streets, Phila, Pa. 19103 (215) 448-1000 EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 42 EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW Criteria: DOR Guidelines X; NUREG-0588, Cat. I__; NUREG-0588, Cat. II ___. NRC REQUIREMENTS DEFICIENCY WITH SECTION REFERENCE LICENSEE QUALIFICATION (X OR (DOR/0588-I/0588-II) SUBMITTAL DOCUMENTATION NOTE NO.) EQUIPMENT DESCRIPTION Electrical Penetistim Equipment Type Epitrical, Penetides amphend amphenal Manufacturer's Name (5.2.2/-/-) Type I and I Type, 263 Model Number (5.2.2/-/-) Serial Number N/A : Not states. Features/Mounting In SHELL (5.2.6/-/-)of Containment Connections/Interfaces watstated ; not stated (5.2.6/-/-) Containnents test chanber Location/Elevation VBRIDUS NA Equipment ID No. seep-1a QUALIFICATION REPORT (8.0/5.0/5.0) 123-1252: 123-1252 Report ID Number 6/74 : april 16, 1974 Report Date apphinel emphenr Issued by colvert Cliffs Prepared for Not States Referenced Reports Qualification Method Tert. (5.1, 5.3/2.1, 2.4/2.1, 2.4)QUALIFICATION TEST PROGRAM Functional Test Description nent 4 (5.2.5/2.2.9/2.2.9) Operating Conditions : Vance (-/2.2.10/2.2.10)Load/Cycles/Voltage/ Current/Freq.

 Franklin Research Center
 NRC Contract No. NRC-03-79-118

 A Division of The Franklin Institute
 FRC Project No. C5257

 20th and Race Streets. Phila.. Pa. 19103 (215) 448-1000
 FRC Task No. _487/488

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUI

NRC REQUIREMENTS DEFICIENCY WITH SECTION REFERENCE LICENSEE QUALIFICATION (X OR (DOR/0588-I/0588-II) SUBMITTAL DOCUMENTATION NOTE NO.) maintain dectrics Acceptance Criteria VA (5.2.5/2.2.1/2.2.1) and ignet & her link free unt sontest Accuracy (5.2.5/-/-) Number of Specimens 2 + 6. yes Test Instruments Calibrated Safety Function (Active/ Not stated : Not Stated Passive) (-/2.1.3/2.1.3) MA : 124 hrs Test Duration (5.2.1/-/-) Notel stondays AV14 Accident Duration (Envir. Above Normal) (5.2.1/-/-) Not stated Not applicated MA LOCH gradiation Required Function Time Test Sequence (General) : Note (5.2.3/2.3.1/2.3.1)Test Sequence (NUREG-0588, Cat. I) (-/2.3.1/-) 1. Representative Sample 2. Baseline Data 3. Performance Extremes 4. Thermal Aging 5. Radiation Aging 6. Wear Aging 7. Vibration/Seismic 8. DBE Exposure 9. Post-DBE Exposure 10. Inspection Aging Not Stater Not Stated X (5.2.4, 7.0/4.0/4.0) Thermal Aging/Basis Material Aging Evaluation (7.0/-/-)Materials Susceptible (Thermal) (5.2.4, 7.0/-/-) Radiation Aging, Type

Page 5b Franklin Research Center A Division of The Franklin Institute 20th and Race Streets. Phila .. Pa. 19103 (215) 448-1000

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NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 487/488

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 42

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-1/0588-11)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO.)
Radiation Aging, Dose (rd)	Notstatel!	Sie accident das	
Radiation Aging, Dose Rate	J	1.	
Radiation Aging, Method	MA	Tet	
Materials Susceptible (Radiation) (5.2.4, 7.0/-/-)	Wotspred	none edentified	()
Operational Aging (-/4.2/-)	Nitstate	fould current	
Other Age Conditioning (-/4.2/-)	NA	Not states	
Qualified Life Claimed/ Established (5.2.4/4.10/-)	NIT States	Not stated	X
Normal Ambi Semperature Normal Ambi Siation Normal Ambi Seculity	Not stated	Not staded	
On-Going Scheellance and Preventive Maintenance (7.0/-/-)	Cliff Cliff Program	NA	
On-Going Analysis of Failures and Degradation (7.0/-/-)	V		
Margin (General) (6.0/3.0/3.0)	Not	Notstated	
Margin (NUREG-0588, Cat. I) (-/3.2/-) 1. Temperature (+15°F) 2. Pressure (+10%,	Stated		
<pre>10 psig max) 3. Radiation (not required) 4. Time (+10%, +1 hour</pre>	V		
+ function time minimum)			:

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20th and Race Streets. Phila., Pa. 19103 (215) 448-1000

NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/464</u>

1.20

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 42

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-1/0588-11)	LICENSEE	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO.)
	1	DOCCMENTATION	!
ACCIDENT CONDITIONS			
LOCA/MSLB/HELB/Uncontrolled	i sa la fi		
(4.1, 4.2, 4.3.1, 4.3.3/	: LOCA !	LOCA	i
1.1, 1.2, 1.5/1.1, 1.2, 1.5)			1
Radiation Type	14	Sama.	
	1 Januari	1	iv
Radiation Dose (rd)	1×108	CIZZ GUARTER	- 1
(4.1.2/1.4/1.4)	1 210	6.122 to 1.03 1 10 P	Nede
Radiation Dose Rate (rd/hr)		0	in m
Radiation Qual. Method	Not is suter !	Notsztel	
(5.3.1/-/-)	Struct	1200	· ·
Proximity to Concentrated		1.	1
Radiation		NA	
(4.1.2/1.4.6/1.4.6)	i / i		i
Powissent Currentitle to	! !		!
Equipment Susceptible to Beta Radiation (4.1.2/-/-)			
beta Radiation (4.1.2/-/-)			
Radiation Dose (Normal +			
Accident) (4.1.2/-/-)	:		i
Plateout Dose Considered			1
(-/1.48/1.48)			1
,,,		1	
Gamma + Beta Dose (rd)			
(4.1.2/1.4.7/1.4.7)	: \/] :	U	

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20th and Race Streets Phila Pa 19103 (215) 448-1000

NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 487,488

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 42

NRC REQUIREMENTS DEFICIENCY WITH SECTION REFERENCE LICENSEE QUALIFICATION (X OR (DOR/0588-1/0588-II) SUBMITTAL DOCUMENTATION NOTE No.) ENVIRONMENTAL PROFILE OF ACCIDENT CONDITIONS Notstaded Rate of Temp./Press. Increase 296/so/100/2h: 276-286/32-00/ NO/ 15 M. Peak: °F/psig/RH/Time Decrease To: "F/psig/RH/Time !195/10/10/10/10/200-270/22-25/20/45m; NRe 253-201/16-22/NO/23 Tt . Decrease To: °F/psig/RH/Time : deres to 120 F- mind . Decrease To: °F/psig/RH/Time . Equipment Surface Tempera-NIA. ture (MSLB) (-/1.2.5.C, 2.2.6/1.2.5.C, 2.2.6) NA Nice Spray Qualification Method (5.3.2/1.3, 2.2.8/1.3, 2.2.8) 0.28% Spray Composition (4.1.4/1.3, 2.2.8/ 1.3, 2.2.8) 6 Spray Density (gpm/ft²) non Spray Duration Submergence Duration (4.1.3/2.2.5/2.2.5)In-Leakage Considered (5.2.6, 5.3.2/-/-) Time to Submergence Dust Environment (-/2.2.11/2.2.11)

Di sion	n Research Center nof The Franklin Institute Race Streets, Phila., Pa. 19103	(215) 44	48-1000	FR	C Pro	oject N signm	No. NI No. C52 ent No 48	57					Page 5f
UIPMEN	T ENVIRONMENTA	LQU	ALIFIC	ATI	ON F	EVIE	WOF	EQU	IPM	ENT	ITE	MNC). U:
compe .													
IOTES:						10							
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	MI in	,		+							-	2	-
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		TES	ST' SEQUE	SON				57	1				
		-	e 11 110										
	TEST	MOUDE	LE M NO	-									
	Individual Hodules	<u>II II</u>	<u>11</u> <u>17</u>	Y	VI	111	<u>111V</u>	<u>X1</u>	X	<u>xi</u>	<u>z:</u>		
	Individual nodules						÷.,						
	Weight & Dimensions		X		x	x	x	X	X	X	x		
	He Leak Test		x	X		X	x		X	x	X		
	Dielectric	x x x x		X	X		X	x	X	×	×		
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-	Weight & Dimensions	n n	-x	x	x	2							
		xx	÷ x	x	x	2							
		X X	x	x	x	x							
	IR	xx	X	x	×	x	·						
	Continuity	XX	X	X	X	×		1.	·				
	Assembled As Complet	e Pene	tration	-									
		X X	X _	X.	x	X	x		x	x	X		
	Dielectric	X X	x	x	X	×	X	• *	x	x	x		8
	IR	x x	x	Χ.	X	x	X	x	x	x	x		
	Continuity	x x	X	X.	X	X	X	X	x	x	X		
		x x	x	х.	X	x	X	-	x	X	X		
	N2 Over Pressure	x x	X	x	X	x	X		X	x	×		
		x x	X	X	×	· X .	x		x	x	X		
	IR (During Env.Tess)	x x	X	X	X	X	X		x	X	x		
	IR(After Env.Test)		X	X .	X	x	x		×	x	X		
	Dielectric	X	x	X	X	~	*	-	X	X -	X		
		XX	x	X	X	X	X		X	X	X		
	He Leak Test			*			X	- *	X	X	Å		. A.
		XX		~			X		X	×	X		
Charles .		X X		X			X.		X	×	*		
				×			*		×	×	*		
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	a share a second				~	1							
	 Failed He Leak 		- Pits y with B			Surfa	ce						

A Division of The Franklin Institute 20th and Race Streets. Phila Pa 19103 (215) 448-1000	NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/488</u>	Page 5g
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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 42

NOTES: 3. although the penetrations contain moterials subject to age relite whe are 24 belen degra nd atin 0 Luite red 202 ut recor 5 astablishi two 11 PA 11

TABLE II

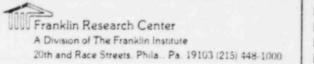
the second s

IRRADIATION SAMPLES

ITEM NO.		Nominal Elevation from Sot- nu of Cannister (laches)	(R/Hr x 10 ⁶)	Nominal Total RAD Dose (R x 10 ⁸) (Roentgens)	
2.1	Polyurethane O-ring (an H.S. Holule !!	4.94	2.20	7.034	
. 2	Omniseal C-Seal w/spring (on H8 Module 111))	2.81	2.12	0.996	
3.	Ethylene Propolene O-ring (on HU Module IV)	7.06	1.94	0.912	
	Molydisulphide C-seal w/o-ring (on HB Hodule Y	9.19	1.51	0.710	
. 5.	Tech seal C-seal w/spring (on HB Module Vil	0.69	1.30	0.611	÷
. 6.	Silicone O-ring (Hodule size)	UNK	0:26	0.122	
. 7.	Ethylene Propolene O-ring (Module size)	UNK	.0.26	0.122	
8.	Silicone O-ring(12" Hdr. Pit. size)	17	0.26	0.122	
. 9.	Ethylene Propolene O-ring(12" Hdr. Plt. size) .	17	0.25	0.122	
	Module Grommet (LOFT 2 5/15"x 1 1/8")	16.	.0.30	0.141	1
. 11.	Silicone Rubber Boot	UNK	0.26	0.122	
	AWG # 1/0 Copper Contact	1.5	1.74	0.318	
13.	Cad Plated Bolt	1.5	1.74	0.818	9
	Coax Connector (205-0074)	1.5	1.74	0.818	
. 15.	Connector Plate, Blue Diallyl Phthalate	.17 *	0.26	0.122	
. 16	Wire Samples	12.5	0.73	0.913	
, 17.	Teflon Tape	UNK *	0.26	0.122	
18.	Astrel Tensile Specimen	6.0	2.10	0.987	
19.	DC-98011 (Small cup sample)	UNK	0.26	0.122 . N	
20.	Araldite 6005 epoxy, 9130 hardner with	1 T E 1			
1.1	Novacite /1250 Filler	UNK	0.26	0.122	
21	Tensile Specimens	6.0	1.94	0.987	
	"Where actual location of sample in Test				Re
	cannister was not recorded, "UNK" is				۲.
	indicated and the minimum RAD dose is specified	d ,			11
1. 10 1.	although a considerably higher RAD dose may				ē.
	have been encountered ** (See Table 1)				

and in the second states of the second party and

NRC Contract No. NRC-03-79-118 Page Franklin Research Center FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. _487/488 A Division of The Franklin Institute 5h 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000 EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 42 NOTES: Test Conditions The test was charged at 10:00 AM, February 4, 1972, and discharged at 9:00 AM, February 6, 1972 for an exposure of 47 hours or 1.03 x 108 R. The thermocouple measuring the ambient air temperature near the maximum flux location within the canister reached 92°F shortly after the irradiation commenced, and remained constant until discharge. Conversion from Roentgens (R) to rads is a direct one only for soft tissue with a low energy absorption coefficient. To obtain a dose in rads for your material, you would have to arrive at an energy absorption coefficient. I trust this information will satisfy your requirements. Please call upon us if we can be of further assistance. I will look forward to seeing you in early March. the san Thomas



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Page

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 43

EQUIPMENT ITEM NO. 43 ELECTRIC MOTOR LOCATED IN THE ECCS PUMP ROOM (A119) GENERAL ELECTRIC MODEL 5KB11052A108 REQUIRED OPERATING TIME: 9 HOURS TER CHECKSHEET NO. 43 LICENSEE REFERENCE(S): NOT CITED FUNCTION (PLANT ID): LPSI PUMP 11 (1MA104) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 204 FUNCTION (PLANT ID): LPSI PUMP 12 (1MA404) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 205

DESIC	NATION	FOI	R DE	FICIE	ENCY	IDEN	TIFIED	BY	THE	NRC	SER	-	CIRCLED	ITEM (S) (DNLY:
(See	Section	1 3	of	this	TER	for	Legend)									

R, T, (Q1,)(RT,) P, H, CS, (A,) S, (R), M, I, (W,) RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Ç.	-	-	*	-	-	*	10
-	1	11	5	e	11	ς.	3

Checksheet Page No.

3a, 3b, 3c, 3d

5a, 5b, 5c, 5d, 5e, 5g, 5k, 51, 5j

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Equipment Item

Summary of Licensee Responses to the NRC SER Equipment Environmental Qualification Summary Forms Licensee Response to NRC SER System Consideration Review

Equipment Environmental Qualification Review

Installed TMI Lessons Learned Implementation Equipment Summary

Maintenance and Replacement Schedule Summary

70, 70, 70

60, 60

and the second second

A Division of The Franklin Institute 20th and Race Streets. Phila Pa. 19103 (215) 448-1000	NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>48 7/48</u>	Page 1b
QUIPMENT ENVIRONMENTAL QUALIFIC	CATION REVIEW OF EQUIPMENT ITEM	M NO. <u>43</u>
SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE A	PPLICABLE
X The Licensee (has/has not) provid	ed a response to the SER concerns.	
The Licensee (has/has not) specif qualified and/or will function wh environmental service conditions.	ically stated that the equipment is en exposed to the applicable DBE	S
The Licensee has presented inform outstanding qualification deficies	ation which shows there are no ncies.	
X The Licensee (has/has not) propose item whose qualification has not h	ed a corrective action for this equipeen fully established.	uipment
X Justification for interim oper Licensee for this equipment i	ration (has/ has not) been provided tem.	by the
X Corrective action specified by	y the Licensee:	
Equipment replacement with	n qualified equipment	
Equipment modification Equipment relocation above	submergence level	
Relocate or shield equipme		
Verify qualification by ac		
Equipment relocation to a		
Qualification testing of a		
-a	Smertinevaluarian	/
The Licensee has provided other that can be construed as a bas operation.	er information for this equipment i sis for justification for interim	tem
X The Licensee (net/has not) pro	ovided a schedule for the proposed	
corrective action. (Schedule	for accomplishing the corrective	
action		.)
The Licensee states that the equir	oment item does not require qualifi	
and/or should be exempted from env	vironmental gualification.	cation
ESIGNATION OF RESULTANT NRC QUALIFICA	ATION EVALUATION CATEGORY BASED ON	REVIEW
CIRCLED ITEM ONLY: (See Section 3 of	or this TER for Legend)	
.a Qualified	II.c Qualified Life Deficiency	
.b Modification	III.a Exempt	
I.a Qualification Not Established I.b Not Qualified	III.b Not in Scope IV Documentation Not Availabl	

Franklin Research Center A Division of The Franklin Institute 20th and Race Streets. Phila., Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/468</u>

Page 2

DESIGNATION:

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 43

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

X = DEFICIENCY NRC REQUIREMENTS Documented Evidence of Qualification Adequate Adequate Similarity Between Equipment and Test Specimen Established Aging Degradation Evaluated Adequately Qualified Life or Replacement Schedule Established (If Required) Program Established to Identify Aging Degradation Criteria Regarding Aging Simulation Satisfied (If Required) Criteria Regarding Temperature/Pressure Exposure: o Peak Temperature Adequate o Peak Pressure Adequate o Duration Adequate o Required Profile Enveloped Adequately o Steam Exposure (If Required) Adequate Criteria Regarding Spray Satisfied Criteria Regarding Submergence Satisfied Criteria Regarding Radiation Satisfied Criteria Regarding Test Sequence Satisfied Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied Criteria Regarding Functional Testing Satisfied Criteria Regarding Instrument Accuracy Satisfied Test Duration Margin (1 hour + Function Time) Satisfied Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)

NRC QUALIFICATION CATEGORY

DESIGNATION: X = CATEGORY

I.a	Equipment Qualified
I.b	Equipment Qualification Pending Modification
II.a	Equipment Qualification Not Established
II.b	Equipment Not Qualified
II.c	Equipment Satisfies All Requirements Except Qualified Life
	or Replacement Schedule Justified
III.a	Equipment Exempt From Qualification
III.b	Equipment Not in the Scope of the Qualification Review
IV	Documentation Not Made Available

A Division of The Franklin Institute 20th and Race Streets. Phila., Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/488</u>

Page 3c

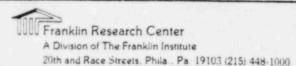
EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 43

LICENSEE RESPONSE TO NRC SER

 These components are within the scope of our present assessment/ evaluation activity. Completion of the activity with subsequent action plan is not anticipated until the end of this year or first quarter of next.







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Page

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 44

EQUIPMENT ITEM NO. 44 ELECTRIC MOTOR LOCATED IN THE ECCS PUMP ROOM (A119) RELIANCE ELECTRIC MODEL P14G408NFV REQUIRED OPERATING TIME: 9 HOURS TER CHECKSHEET NO. 44 LICENSEE REFERENCE(S): NOT CITED FUNCTION (PLANT ID): EAST ECCS PUMP ROOM COOLING FANS (1M1448) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 252 FUNCTION (PLANT ID): WEST ECCS PUMP ROOM COOLING FANS (1M0448) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 262

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SE	R - CIRCLED ITEM (S) ONLY:
(See Section 3 of this TER for Legend)	
R, T, QT, RT, P, H, CS, A, S, (R), M, I, QM, RPN, E	XN, SEN, QI, RPS, None,
Not stated, Not applicable	
LISTING OF APPLICABLE CHECKSHEETS:	
Contents	Checksheet Page No.
Equipment Item	la
Summary of Licensee Responses to the NRC SER	lb
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, 3b, 3c, 3d
System Consideration Review	42, 4b, 40, 4d, 4e, 4f
Equipment Environmental Qualification Review	5a, 5b, 5c, 5d, 5c, 5f, 5g, 5h, 5i, 5j
Installed TMI Lessons Learned Implementation Equipment Summary	6a, 6b

and the second second

Maintenance and Replacement Schedule Summary

70,70,70

EQUIPMENT ENVIRONMENTAL QUALIFICA SUMMARY OF LICENSEE RESPONSES TO THE NI X The Licensee (has/has not) specific qualified and/or will function when environmental service conditions. The Licensee has presented information outstanding qualification deficience X The Licensee (has/has not) specific qualified and/or will function when environmental service conditions. The Licensee has presented information X The Licensee (has/has not) proposed item whose qualification has not be X Justification for interim operative X Justification for interim operative	RC SER - ONLY CHECKED ITEMS ARE APP d a response to the SER concerns. cally stated that the equipment is n exposed to the applicable DBE tion which shows there are no cies. d a corrective action for this equi een fully established.	PLICABLE
 X The Licensee (has/has not) provided The Licensee (has/has not) specific qualified and/or will function when environmental service conditions. The Licensee has presented informat outstanding qualification deficient X The Licensee (has/has not) proposed item whose qualification has not be X Justification for interim operation 	d a response to the SER concerns. cally stated that the equipment is n exposed to the applicable DBE tion which shows there are no cies. d a corrective action for this equi een fully established.	
 The Licensee (has/has not) specific qualified and/or will function when environmental service conditions. The Licensee has presented informat outstanding qualification deficience (has/has-not) proposed item whose qualification has not be <u>X</u> Justification for interim operation 	cally stated that the equipment is n exposed to the applicable DBE tion which shows there are no cies. d a corrective action for this equi een fully established.	pment
outstanding qualification deficient X The Licensee (has/has not) proposed item whose qualification has not be X Justification for interim opera	cies. d a corrective action for this equi een fully established.	pment
Item whose qualification has not be \underline{X} Justification for interim opera	een fully established.	pment
X Justification for interim opera Licensee for this equipment ite	ation (has/has ant) been provided h	
	em.	y the
X Corrective action specified by	the Licensee:	
Equipment replacement with Equipment modification Equipment relocation above Relocate or shield equipmen Verify qualification by add Equipment relocation to a m Qualification testing of eq X Other (<u>equipment assess</u>)	submergence level nt from radiation source ditional (testing/analysis) mild environment suipment in progress	_)
The Licensee has provided other that can be construed as a basi operation.	r information for this equipment it is for justification for interim	em
action	for accomplishing the corrective)
The Licensee states that the equipm and/or should be exempted from envi	ment item does not require qualific ironmental qualification.	ation
DESIGNATION OF RESULTANT NRC QUALIFICAT - CIRCLED ITEM ONLY: (See Section 3 of	TION EVALUATION CATEGORY BASED ON R f this TER for Legend)	EVIEW
	II.c Qualified Life Deficiency III.a Exempt III.b Not in Scope IV Documentation Not Available	

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Franklin Research Center A Division of The Franklin Institute 20th and Race Streets, Phila., Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/488</u>

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DESIGNATION: X = DEFICIENCY

EQUISMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 44

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS X = I Documented Evidence of Qualification Adequate Adequate Similarity Between Equipment and Test Specimen Established Aging Degradation Evaluated Adequately Qualified Life or Replacement Schedule Established (If Required) Program Established to Identify Aging Degradation Criteria Regarding Aging Simulation Satisfied (If Required) Criteria Regarding Temperature/Pressure Exposure:

o Peak Temperature Adequate

o Peak Pressure Adequate

o Duration Adequate

Required Profile Enveloped Adequately
 Steam Exposure (If Required) Adequate
 Criteria Regarding Spray Satisfied

Criteria Regarding Submergence Satisfied

Criteria Regarding Radiation Satisfied

Criteria Regarding Test Sequence Satisfied

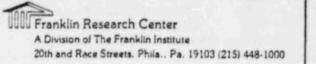
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied

Criteria Regarding Functional Testing Satisfied Criteria Regarding Instrument Accuracy Satisfied Test Duration Margin (1 hour + Function Time) Satisfied Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)

NRC QUALIFICATION CATEGORY

DESIGNATION: X = CATEGORY

I.a	Equipment Qualified
I.b	Equipment Qualification Pending Modification
II.a	Equipment Qualification Not Established
II.b	Equipment Not Qualified
II.c	Equipment Satisfies All Requirements Except Qualified Life
	or Replacement Schedule Justified
III.a	Equipment Exempt From Qualification
III.D	Equipment Not in the Scope of the Qualification Review
IV	Documentation Not Made Available



NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/468</u>

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 44

LICENSEE RESPONSE TO NRC SER

 These components are within the scope of our present assessment/ evaluation activity. Completion of the activity with subsequent action plan is not anticipated until the end of this year or first quarter of next.



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QUIPMENT ENVIRONMENTAL QUALIFICA	TION REVIEW OF EQUIPMENT ITE	M NO. 45
EQUIPMENT ITEM NO. 45 ELECTRIC MOTOR LOCATED IN THE ECCS PUMP GENERAL ELECTRIC MODEL 5K811052C34 REQUIRED OPERATING TIME: 8 HOURS TER CHECKSHEET NO. 45 LICENSEE REFERENCE(S): NOT CITED FUNCTION (PLANT ID): HPSI PUMP 11 (1MA LICENSEE SUBMITTAL: SCEW(S) [1, 12]:	108) .	
DESIGNATION FOR DEFICIENCY IDENTIFIED (See Section 3 of this TER for Legend)	BY THE NRC SER - CIRCLED ITEM(S)	ONLY:
R, T, (T, RT, P, H, CS, A, S, (R), M,	I, (M, RPN, EXN, SEN, QI, RPS, NO	one,
Not stated, Not applicable		
LISTING OF APPLICABLE CHECKSHEETS:		
Contents	Checksheet Page N	
Equipment Item		ło.
Summary of Licensee Responses to the N	la	¥0.
		<u>ło.</u>
Equipment Environmental Qualification	RC SER 1b	<u>40.</u>
Equipment Environmental Qualification : Licensee Response to NRC SER	RC SER 1b	<u>ło.</u>
	RC SER 15 Summary Forms 2	<u>io.</u>
Licensee Response to NRC SER	RC SER 1b Summary Forms 2 3a, 3b, 3c, 3d 4a, 4b, 4c, 4d, 4	₩0. ₩0. ₩0. ₩0. ₩0. ₩0.
Licensee Response to NRC SER System Consideration Review	RC SER 1b Summary Forms 2 3a, 3b, 3c, 3d 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 5 5g, 5h, 5i, 5j	<u>10.</u> 19. 45- 59. 55.
Licensee Response to NRC SER System Consideration Review Equipment Environmental Qualification Installed TMI Lessons Learned Implemen	RC SER 1b Summary Forms 2 3a, 3b, 30, 3d 4a, 4b, 4c, 4d, Review 5a, 5b, 5c, 5d, 3 5g, 5h, 5i, 5j tation 6a, 6b	₩0. ₩0. ₩0. ₩0. ₩0.

A Division of The Franklin Institute 20th and Race Streets. Phila Pa 19103 (215) 448-1000	NRC Contract No. NHC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/488</u>	Page Ib
QUIPMENT ENVIRONMENTAL QUALIFIC	CATION REVIEW OF EQUIPMENT ITER	M NO. <u>45</u>
SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE A	PPLICABLE
X The Licensee (has/has not) provide	ed a response to the SER concerns.	
The Licensee (has/has not) specif: qualified and/or will function whe environmental service conditions.	ically stated that the equipment i en exposed to the applicable DBE	3
The Licensee has presented information outstanding qualification deficient	ation which shows there are no ncies.	
X The Licensee (has/ had not) propose item whose qualification has not b	ed a corrective action for this equipeen fully established.	uipment
X Justification for interim open Licensee for this equipment is	ration (has/ has_not) been provided tem.	by the
X Corrective action spacified by	the Licensee:	
Equipment replacement with Equipment modification Equipment relocation above Relocate or shield equipme Verify qualification by ad Equipment relocation to a Qualification testing of e X Other (<u>Equipment Asse</u>	e submergence level ent from radiation source diitional (testing/analysis) mild environment equipment in progress)
The Licensee has provided othe	er information for this equipment is for justification for interim	ltem
X The Licensee (mas/has not) pro corrective action. (Schedule action	ovided a schedule for the proposed for accomplishing the corrective	. .)
The Licensee states that the equip and/or should be exempted from env	oment item does not require qualifi vironmental qualification.	cation
DESIGNATION OF RESULTANT NRC QUALIFICA - CIRCLED ITEM ONLY: (See Section 3 o	TION EVALUATION CATEGORY BASED ON of this TER for Legend)	REVIEW
I.a Qualified I.b Modification II.a Qualification Not Established	II.c Qualified Life Deficiency III.a Exempt III.b Not in Scope	
II.b Not Qualified	IV Documentation Not Availabl	1

Franklin Research Center A Division of The Franklin Institute 20th and Race Streets. Phila., Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>497/488</u>

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 45

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

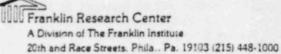
DESIGNATION: X = DEFICIENCY NRC REQUIREMENTS Documented Evidence of Qualification Adequate × Adequate Similarity Between Equipment and Test Specimen Established Aging Degradation Evaluated Adequately Qualified Life or Replacement Schedule Established (If Required) Program Established to Identify Aging Degradation Criteria Regarding Aging Simulation Satisfied (If Required) Criteria Regarding Temperature/Pressure Exposure: o Peak Temperature Adequate o Peak Pressure Adequate o Duration Adequate o Required Profile Enveloped Adequately o Steam Exposure (If Required) Adequate Criteria Regarding Spray Satisfied Criteria Regarding Submergence Satisfied Criteria Regarding Radiation Satisfied Criteria Regarding Test Sequence Satisfied Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied Criteria Regarding Functional Testing Satisfied Criteria Regarding Instrument Accuracy Satisfied Test Duration Margin (1 hour + Function Time) Satisfied Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)

NRC QUALIFICATION CATEGORY

DESIGNATION: X = CATEGORY

I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	_X
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life	
	or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.D	Equipment Not in the Scope of the Qualification Review	
IV	Decumentation Not Made Available	

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 45

LICENSEE RESPONSE TO NRC SER

6. These components are within the scope of our present assessment/ evaluation activity. Completion of the activity with subsequent action plan is not anticipated until the end of this year or first quarter of next.





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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 46

EQUIPMENT ITEM NO. 46 ELECTRIC MOTOR LOCATED IN CONTAINMENT (C230) RELIANCE ELECTRIC MODEL X323727A1AW REQUIRED OPERATING TIME: 8 HOURS TER CHECKSHEET NO. 46 LICENSEE REFERENCE(S): 31, 32, 33 FUNCTION (PLANT ID): CONTAINMENT COOLING FAN 12 (1MB114) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 33 FUNCTION (PLANT ID): CONTAINMENT COOLING FAN 14 (1MB414) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 35 FUNCTION (PLANT ID): CONTAINMENT COOLING FAN 13 (1MB402) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 34 FUNCTION (PLANT ID): CONTAINMENT COOLING FAN 11 (1MB102) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 32

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY: (See Section 3 of this TER for Legend)

R, T, (1) (1) P, H, (3) A, S, (R), (M) I, UM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	la
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, 3b, 3c, 3d
System Consideration Review	42, 40, 40, 10, 10, 4E
Equipment Environmental Qualification Review	5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j

Installed TMI Lessons Learned Implementation Equipment Summary

Maintenance and Replacement Schedule Summary

a, 70, 70

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QUIPMENT ENVIRONMENTAL QUALIFIC	ATION REVIEW OF EQUIPMENT ITE	M NO. <u>46</u>
UMMARY OF LICENSEE RESPONSES TO THE N	NRC SER - ONLY CHECKED ITEMS ARE A	PPLICABLE
X The Licensee (has/ has not) provide		
The Licensee (has/has not) specifi qualified and/or will function whe environmental service conditions.	ically stated that the equipment i an exposed to the applicable DBE	s
The Licensee has presented informa outstanding qualification deficien	ation which shows there are no ncies.	
X The Licensee (has/ has not) propose item whose qualification has not b	ed a corrective action for this equeen fully established.	uipment
X Justification for interim oper Licensee for this equipment it	ration (has/ has not) been provided :em.	by the
X Corrective action specified by	the Licensee:	
Equipment replacement with Equipment modification Equipment relocation above Relocate or shield equipme	submergence level	
Verify qualification by ad Equipment relocation to a Qualification testing of e	ditional (testing/analysis) mild environment	
× Other (equipment asses	ssment/evaluation)
The Licensee has provided othe that can be construed as a bas operation.	er information for this equipment in this for justification for interim	ltem
X The Licensee (mas/has not) pro corrective action. (Schedule action	vided a schedule for the proposed for accomplishing the corrective)
The Licensee states that the equip and/or should be exempted from env	ment item does not require qualifi ironmental qualification.	cation
ESIGNATION OF RESULTANT NRC QUALIFICA CIRCLED ITEM ONLY: (See Section 3 o	TION EVALUATION CATEGORY BASED ON f this TER for Legend)	REVIEW
a Qualified b Modification I.a Qualification Not Established	II.c Qualified Life Deficiency III.a Exempt	
I.b Not Qualified	III.b Not in Scope IV Documentation Not Availabl	.e

A Division of The Franklin Institute 20th and Race Streets. Phila., Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/488</u>

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 46

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION: X = DEFICIENCY

Documented Evidence of Qualification Adequate	_
Adequate Similarity Between Equipment and Test Specimen Established	
Aging Degradation Evaluated Adequately	×
Qualified Life or Replacement Schedule Established (If Required)	×
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	X
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	×
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies	1
(If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

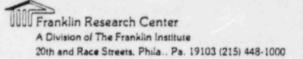
NRC QUALIFICATION CATEGORY

Along the first section of the

DESIGNATION: X = CATEGORY

I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	×
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life	
	or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.D	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

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THE REAL WARDER PROCESSING.

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 56

LICENSEE RESPONSE 'TO NRC SER





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QUIPMENT ENVIRONMENTA	L QUALIFIC	ATION REVIEW OF EQUIPME	NT ITEM NO. 46
EOUIPMENT	ENVIRONMEN	TAL QUALIFICATION REVIEW	
		street and the second streets	
criteria: box Guiderines	X ; NUREG-0	0588, Cat. I; NUREG-0588,	Cat. II
NRC REQUIREMENTS WITH SECTION REFERENCE			DEFICIENCY
(DOR/0588-I/0588-II)	LICENSI SUBMIT		(X OR NOTE NC.)
EQUIPMENT DESCRIPTION Equipment Type	Electric	Electric motor	
Manufacturer's Name (5.2.2/-/-)	Reliance	Reliance	
Model Number (5.2.2/-/-)	× 323727	ALAW Frame 5005	
Serial Number	N.O	not stated	
<pre>Features/Mounting (5.2.6/-/-)</pre>		150/75 Hp	
Connections/Interfaces (5.2.6/-/-)	Ţ	notstated	
Location/Elevation	Containme	x.†	
Equipment ID No.	(12)m8-11		
QUALIFICATION REPORT (8.0/5.0/5.0)	-4	02 14	
Report ID Number	PSR31, 12,	33 : Fep 288	1
Report Date	417/73	Apr: 17, 1973	
Issued by	American Filterco.	Air : American Air Filter Comp	any
Prepared for	notstabel	Bechtel Assoc.	
Referenced Reports	wtstatel	none	
Qualification Method	1	i.	
(5.1, 5.3/2.1, 2.4/2.1, 2.4	1) : +22	type test	+
QUALIFICATION TEST PROGRAM			
Functional Test Description (5.2.5/2.2.9/2.2.9)	N.D	notor operation during	9
Operating Conditions	: (
(-/2.2.10/2.2.10)	:]	N. D.	1
Load/Cycles/Voltage/	: 1	1 0.0.	1

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NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-1/0588-11)	LICENSEE SUBMITTAL	QUALIFICATION (X OR DOCUMENTATION NOTE NO.)
Acceptance Criteria (5.2.5/2.2.1/2.2.1)	N/A	notstated
Accuracy (5.2.5/-/-)		N-D.
Number of Specimens	:/	
Test Instruments Calibrated	1	notstated
Safety Function (Active/ Passive) (-/2.1.3/2.1.3)	Active	Active
Test Duration (5.2.1/-/-)	15 hrs.	3m/4-2he/1week
Accident Duration (Envir. Above Normal) (5.2.1/-/-)	27 has.	
Required Function Time	Shuo.	
Test Sequence (General) (5.2.3/2.3.1/2.3.1)	1	puage (separate tests) DIBE
Test Sequence (NUREG-0588, Cat. I) (-/2.3.1/-)		
 Representative Sample Baseline Data Performance Extremes Thermal Aging Radiation Aging Wear Aging Vibration/Seismic DBE Exposure Post-DBE Exposure 		
10. Inspection	1.1.1	
Aging (5.2.4, 7.0/4.0/4.0) Thermal Aging/Basis	N.D.	IREE GuideNEG/ICS/SC-2-A:X Dote1
Material Aging Evaluation (7.0/-/-)		notstad
Materials Susceptible (Thermal) (5.2.4, 7.3/-/-)		Not stated
Radiation Aging, Type	b. D.	V, B (Analysis)

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NRC REQUIREMENTS WITH SECTION APPERENCE (DOR/0588-1/0588-11)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO.)
Radiation Aging, Dose (rd)	100 E 6	1.9x10 R (Analysis)	x voted
Radiation Aging, Dose Rate	N. D.		
Radiation Aging, Method	: 	Analysis	
Materials Susceptible (Radiation) (5.2.4, 7.0/-/-)	Kot stated	all non-metallies	
Operational Aging (-/4.2/-)	ω.ο.	> days at 10 perg 12000F	
Other Age Conditioning (-/4.2/-)		not stated	Ì
Qualified Life Claimed/ Established (5.2.4/4.10/-)	None	nots fated	
Normal Ambient Temperature Normal Ambient Radiation Normal Ambient Humidity			
On-Going Surveillance and Preventive Maintenance (7.0/-/-)	0.0		X Note 3
On-Going Analysis of Failures and Degradation (7.0/-/-)	N-D.		
Margin (General) (6.0/3.0/3.0)			
Margin (NUREG-0588, Cat. I) (-/3.2/-)		1	
 Temperature (+15°F) Pressure (+10%, 10 psig max) 			
 Radiation (not required) 	:		
<pre>4. Time (+10%, +1 hour + function time minimum)</pre>			1

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NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO.)
ACCIDENT CONDITIONS			
LOCA/MSLB/HELB/Uncontrolled (4.1, 4.2, 4.3.1, 4.3.3/ 1.1, 1.2, 1.5/1.1, 1.2, 1.5)	LOCA		
Radiation Type	8	seeaging	1
Radiation Dose (rd) (4.1.2/1.4/1.4)	100 EOGR		
Radiation Dose Rate (rd/hr) Radiation Qual. Method (5.3.1/-/-)	netstated J	Ţ	
Proximity to Concentrated Radiation (4.1.2/1.4.6/1.4.6)		notstated	
Equipment Susceptible to Beta Radiation (4.1.2/-/-)		not stated	
Radiation Dose (Normal + Accident) (4.1.2/-/-)	ICOECOR	1.9 ×10°R (malypio)	x Note 2
Plateout Dose Considered (-/1.48/1.48)		NO	
Gamma + Beta Dose (rd) (4.1.2/1.4.7/1.4.7)	100EOGR	1.9×10°R (analpri)	x Note 2





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NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-1/0588-11)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE No.)
	!	!	:
ENVIRONMENTAL PROFILE	1		1
OF ACCIDENT CONDITIONS :			1
Rate of Temp./Press.	1350=/10	1	1
Increase	135°F/429510	phor stalid	i
Peak: °F/psig/RH/Time		12-1-1	1
reak. 1/parg/mi/ine	175/46/100/3700	300/75/100% / 3hr and 4-2hr.	:
Decrease To: "F/psig/RH/Time	RT/4/1391.		
Rise Decreas To: °F/psig/RH/Time	1100.5/		1
becreas - io. r/parg/m/lime	190 F/13 paig/100	0/16.7 has.	:
Decrease To: °F/psig/RH/Time	RT/4/27ho.		1
Equipment Surface Tempera-			
ture (MSLB) (-/1.2.5.C,			1
2.2.6/1.2.5.C, 2.2.6)			1
Spray Qualification Method		· · · · · ·	1
(5.3.2/1.3, 2.2.8/1.3,		test	1
2.2.8)	1		1
Spray Composition	.28%	1.41	
(4.1.4/1.3, 2.2.3/	(Composition?)	notstated	xNote
1.3, 2.2.8)	(contraction)		1
Spray Density (gpm/ft ²)			-
	1	box.	i e
Spray Duration	N.D	wtstated	<u>.</u>
Submergence Duration			-
(4.1.3/2.2.5/2.2.5)	: :		1
In-Leakage Considered			
(5.2.6, 5.3.2/-/-)			
	1		1.1
Time to Submergence			1
Dust Environment			
(-/2.2.11/2.2.11)			i i

NRC Contract No. NRC-03-79-118 Franklin Research Center FRC Project No. C5257 Page D. sion of The Franklin Institute FRC Assignment No. 13 5f 20th and Race Streets. Phila., Pa. 19103 (215) 448-1000 FRC Task No. 487/488 EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 46 NOTES: require qualification for steam/answere, clanical spray and radiation exposure in addition to aging (desmal). Note1: PSR #33 was referenced by the licensee as evidence of qualification For aging. This document does not contain the accelerated aging time/temperatures conditions of the test nor doesit determine a qualified life lased on the test. Inaddition the submitted report stated that after 48 hours of no load aperation during the aging cycle "an increase in noise and vibration level was noted." The report stated that this was caused by a loss of lubricont. No subsequent analysis or explanation was given for this anomaly. Note 2: PSR# (31) contains a materials analysis for radiation endurance. No maximum threshold value was stated for the Dow Corning varnish on the bearing gread? Inaddition it is not clean if the motor to lead Splice materials were addressed Note3: No replacement scheduals were given for components expected lives less than the life. notor grease etc

NRC Contract No. NRC-03-79-118 Franklin Research Center Page FRC Project No. C5257 A Division of The Franklin Institute 59 FRC Assignment No. 13 FRC Task No. _487/488 EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 46 NOTES: Note4: The composition and duration of the chemical spray was not stated. It is noted the test was designed around the referenced The IEEE Guide atting the composition was not specifically stated

A SHARE SHOT SHEET ST

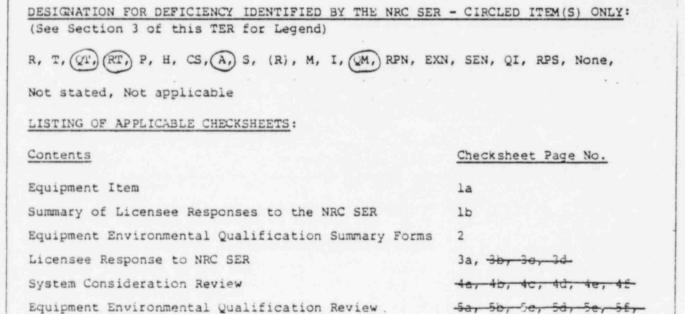
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Franklin Research Center A Division of The Franklin Institute 20th and Race Streets, Phila, Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 487

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 47

EQUIPMENT ITEM NO. 47 ELECTRIC MOTOR LOCATED IN THE ECCS PULP ROOM (A119) ALLIS CHALMERS MODEL MODEL 911FR50400S REQUIRED OPERATING TIME: 8 HOURS TER CHECKSHEET NO. 47 LICENSEE REFERENCE(S): NOT CITED FUNCTION (PLANT ID): CONTAINMENT SPRAY PUMP'11 (1MA107) LICENSEE SUBMITTAL: SCEW(S) [1, 1.]: 183 FUNCTION (PLANT ID): CONTAINMENT SPRAY PUMP 12 (1MA407) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 184



5g, 5h, 51, 5j

-63, 60-

7a, 7b, 7c

Equipment Environmental Qualification Review .

Installed TMI Lessons Learned Implementation Equipment Summary

Maintenance and Replacement Schedule Summary

A Division of The Franklin Institute 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000	NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/488</u>	Page 1 b
QUIPMENT ENVIRONMENTAL QUALIFIC	CATION REVIEW OF EQUIPMENT ITEN	4 NO. <u>47</u>
SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE AN	PPLICABLE
X The Licensee (has/ has not) provid	ed a response to the SER concerns.	
The Licensee (has/has:not) specific qualified and/or will function whe environmental service conditions.	ically stated that the equipment is en exposed to the applicable DBE	1
The Licensee has presented inform outstanding qualification deficie	ation which shows there are no ncies.	
X The Licensee (has/ has not) propos item whose qualification has not	ed a corrective action for this equ been fully established.	ipment
X Justification for interim ope Licensee for this equipment i	ration (has/ has not) been provided tem.	by the
X Corrective action specified b	y the Licensee:	
Equipment replacement wit Equipment modification Equipment relocation abov		
Relocate or shield equipm	ent from radiation source	
Verify qualification by a Equipment relocation to a	mild environment	
Qualification testing of X Other (equipment in progress	
)
The Licensee has provided other that can be construed as a bas operation.	er information for this equipment i sis for justification for interim	tem
X The Licensee (nes/has not) pro corrective action. (Schedule action <u>equipment assessment</u>	for accomplishing the corrective	.)
	oment item does not require qualific	cation
DESIGNATION OF RESULTANT NRC QUALIFIC - CIRCLED ITEM ONLY: (See Section 3 of	ATION EVALUATION CATEGORY BASED ON 1 of this TER for Legend)	REVIEW
La Qualified Lb Modification	II.c Qualified Life Deficiency III.a Exempt	
I Qualification Not Established I.b Not Qualified	III.b Not in Scope	
the Mark Church I Start	IV Documentation Not Available	

A Division of The Franklin Institute 20th and Race Streets, Phila., Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/488</u>

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 47

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

DESIGNATION: X = DEFICIENCY NRC REQUIREMENTS Documented Evidence of Qualification Adequate Adequate Similarity Between Equipment and Test Specimen Established Aging Degradation Evaluated Adequately Qualified Life or Replacement Schedule Established (If Required) Program Established to Identify Aging Degradation Criteria Regarding Aging Simulation Satisfied (If Required) Criteria Regarding Temperature/Pressure Exposure: o Peak Temperature Adequate o Peak Pressure Adequate o Duration Adequate o Required Profile Enveloped Adequately o Steam Exposure (If Required) Adequate Criteria Regarding Spray Satisfied Criteria Regarding Submergence Satisfied Criteria Regarding Radiation Satisfied Criteria Regarding Test Sequence Satisfied Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied Criteria Regarding Functional Testing Satisfied Criteria Regarding Instrument Accuracy Satisfied Test Duration Margin (1 hour + Function Time) Satisfied Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)

NRC QUALIFICATION CATEGORY

DESIGNATION: X = CATEGORY

I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.D	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

A Division of The Franklin Institute 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/488</u>

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 47

LICENSEE RESPONSE TO NRC SER

6. These components are within the scope of our present assessment/ evaluation activity. Completion of the activity with subsequent action plan is not anticipated until the end of this year or first quarter of next.

 Franklin Research Center
 NRC Contract No. NRC-03-79-118

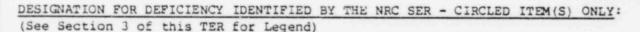
 A Division of The Franklin Institute
 FRC Project No. C5257

 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000
 FRC Assignment No. 13

 FRC Task No. _____487

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 48

EQUIPMENT ITEM NO. 48 ELECTRIC MOTOR LOCATED IN THE ECCS PUMP ROOM (A118) GENERAL ELECTRIC MODEL 5K811052C34 REQUIRED OPERATING TIME: 8 HOURS TER CHECKSHEET NO. 48 LICENSEE REFERENCE(S): NOT CITED FUNCTION (PLANT ID): HIGH PRESSURE SAFETY INJECTION PUMP 12 (1MA408) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 193 FUNCTION (PLANT ID): HIGH PRESSURE SAFETY INJECTION PUMP 13 (1MA110) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 194 FUNCTION (PLANT ID): HIGH PRESSURE SAFETY INJECTION PUMP 13 (1MA110) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 194



R, T, QT, RT, P, H, CS, A, S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents

L ... Ipment Item

Summary of Licensee Responses to the NRC SER Equipment Environmental Qualification Summary Forms Licensee Response to NRC SER System Consideration Review Equipment Environmental Qualification Review

Installed TMI Lessons Learned Implementation Equipment Summary

Maintenance and Replacement Schedule Summary

Checksheet Page No.

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5a, 5b, 5c, 5d, 5e, 5f,-

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Sec. A.

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la

1b

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7a, 70, 7e-

A Division of The Franklin Institute 20th and Race Streets. Phila. Pa 19103 (215) 448-1000	NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/488</u>	Page 1b
EQUIPMENT ENVIRONMENTAL QUALIFIC	CATION REVIEW OF EQUIPMENT ITEN	NO. <u>48</u>
SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE A	PPLICABLE
X The Licensee (has/has not) provid	ed a response to the SER concerns.	
The Licensee (has/has not) specif qualified and/or will function wh environmental service conditions.	ically stated that the equipment is en exposed to the applicable DBE	5
The Licensee has presented inform outstanding qualification deficie	ation which shows there are no ncies.	
X The Licenses (has/has not) propos item whose qualification has not	ed a corrective action for this equipeen fully established.	uipment
X Justification for interim ope Licensee for this equipment i	ration (has/ has-not) been provided tem.	by the
\underline{X} Corrective action specified b	y the Licensee:	
Equipment replacement with Equipment modification	h qualified equipment	
Equipment relocation abov Relocate or shield equipm		
Verify qualification by a		
Equipment relocation to a	mild environment	
Qualification testing of Other (<u>equipment assess</u>		
~ other (comprised assess	SMENTS JUNTION)
	er information for this equipment i sis for justification for interim	tem
X The Licensee (mas/has not) pr	ovided a schedule for the proposed	
corrective action. (Schedule	for accomplishing the corrective	
action		_•)
The Licensee states that the equi and/or should be exempted from en	pment item does not require qualifi vironmental qualification.	cation
DESIGNATION OF RESULTANT NRC QUALIFIC - CIRCLED ITEM ONLY: (See Section 3		REVIEW
I.a Qualified I.b Modification	II.c Qualified Life Deficiency III.a Exempt	
(I.a) Qualification Not Established	III.b Not in Scope	
II.b Not Qualified	IV Documentation Not Availabl	

A Division of The Franklin Institute 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/488</u>

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 48

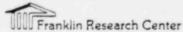
EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

	DESIGNATION:
NRC REQUIREMENTS	X = DEFICIENCY
Documented Evidence of Qualification Adequate	X
Adequate Similarity Between Equipment and Test Specimen	
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If I	Required)
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Requin	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	and the second
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies	
(If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat.	

NRC QUALIFICATION CATEGORY

DESIGNATION: X = CATEGORY

I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	X
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.D	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	



A Distant of The Franklin Institute

NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13

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20th and Race Streets. Phila. Pa. 19103 (215) 448-1000 FRC Task No. 487/488 EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 48 LICENSEE RESPONSE TO NRC SER These components are within the scope of our present assessment/ evaluation activity. Completion of the activity with subsequent action plan is not anticipated until the end of this year or first quarter of next. and make on the second state of the second and the second second second 100,000

Franklin Research Center A Division of The Franklin Institute 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487</u>

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 49

EQUIPMENT ITEM NO. 49 ELECTRIC MOTOR LOCATED IN CONTAINMENT (C230) RELLANCE ELECTRIC MODEL X324356A6AW REQUIRED OPERATING TIME: 9 HOURS TER CHECKSHEET NO. 49 LICENSEE REFERENCE(S): 31, 32, 33 FUNCTION (PLANT ID): CONTAINMENT FILTER 11 FAN (1MB105) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 28 FUNCTION (PLANT ID): CONTAINMENT FILTER 12 FAN (1MB405) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 29 FUNCTION (PLANT ID): CONTAINMENT FILTER 13 FAN (1MB121) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 30 FUNCTION (PLANT ID): CONTAINMENT FILTER 13 FAN (1MB121) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 30 FUNCTION (PLANT ID): CONTAINMENT FILTER 13 FAN (1MB121) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 31

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY: (See Section 3 of this TER for Legend)

R, T, (T) RT P, H, (S) A, S, (R), M I, UM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents

Checksheet Page No.

Equipment Item

Summary of Licensee Responses to the NRC SER Equipment Environmental Qualification Summary Forms Licensee Response to NRC SER System Consideration Review

Equipment Environmental Qualification Review

Installed TMI Lessons Learned Implementation Equipment Summary

Maintenance and Replacement Schedule Summary

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la 1b 2 3a, 3b, 3e, 3d 4a, 4b, 4c, 4d, 1e, 4f 5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 51, 5j

a, 70, 70

A Dr. sion of The Franklin Institute 20th and Race Stree's, Phila., Pa. 19103 (215) 448-1000	NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/488</u>	Page 1b
QUIPMENT ENVIRONMENTAL QUALIFIC	ATION REVIEW OF EQUIPMENT ITER	M NO. <u>49</u>
SUMMARY OF LICENSEE RESPONSES TO THE N	NRC SER - ONLY CHECKED ITEMS ARE A	PPLICABLE
X_ The Licensee (has/ has not) provide	ed a response to the SER concerns.	
The Licensee (has/has not) specifi qualified and/or will function whe environmental service conditions.	cally stated that the equipment is an exposed to the applicable DBE	5
The Licensee has presented informa outstanding qualification deficien	tion which shows there are no cies.	
X The Licensee (has/ has not) propose item whose qualification has not b	d a corrective action for this equieen fully established.	lipment
X Justification for interim oper Licensee for this equipment it	ation (has/ has not) been provided em.	by the
\underline{X} Corrective action specified by	the Licensee:	
Equipment replacement with Equipment modification Equipment relocation above Relocate or shield equipme Verify qualification by ad Equipment relocation to a re Qualification testing of each X Other (Compment asses	submergence level nt from radiation source ditional (testing/analysis) mild environment quipment in progress	
The Licensee has provided other	r information for this equipment i is for justification for interim	tem
X The Licensee (mas/has not) pro- corrective action. (Schedule action	vided a schedule for the proposed for accomplishing the corrective	•)
The Licensee states that the equips and/or should be exempted from envi	ment item does not require qualifi	cation
ESIGNATION OF RESULTANT NRC QUALIFICAT CIRCLED ITEM ONLY: (See Section 3 of	TION EVALUATION CATEGORY PASED ON f this TER for Legend)	REVIEW
.a Qualified .b Modification I.a Qualification Not Established	II.c Qualified Life Deficiency III.a Exempt III.b Not in Scope	
I.b Not Qualified	IV Documentation Not Available	0

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NRC Contract No. NRC-03-79-118 Page Franklin Research Center FRC Project No. C5257 A Division of The Franklin Institute FRC Assignment No. 13 2 20th and Race Streets. Phila.. Pa. 19103 (215) 448-1000 FRC Task No. 487/488 EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 49 EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM DESIGNATION: NRC REQUIREMENTS X = DEFICIENCY Documented Evidence of Qualification Adequate Adequate Similarity Between Equipment and Test Specimen Established ×× Aging Degradation Evaluated Adequately Qualified Life or Replacement Schedule Established (If Required) Program Established to Identify Aging Degradation Criteria Regarding Aging Simulation Satisfied (If Required)

Criteria Regarding Temperature/Pressure Exposure:

- o Peak Temperature Adequate
- o Peak Pressure Adequate
- o Duration Adequate
- o Required Profile Enveloped Adequately

o Steam Exposure (If Required) Adequate Criteria Regarding Spray Satisfied Criteria Regarding Submergence Satisfied Criteria Regarding Radiation Satisfied Criteria Regarding Test Sequence Satisfied Criteria Regarding Test Failures or Severe Anomalies

(If Any) Satisfied Criteria Regarding Functional Testing Satisfied Criteria Regarding Instrument Accuracy Satisfied Test Duration Margin (1 hour + Function Time) Satisfied Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)

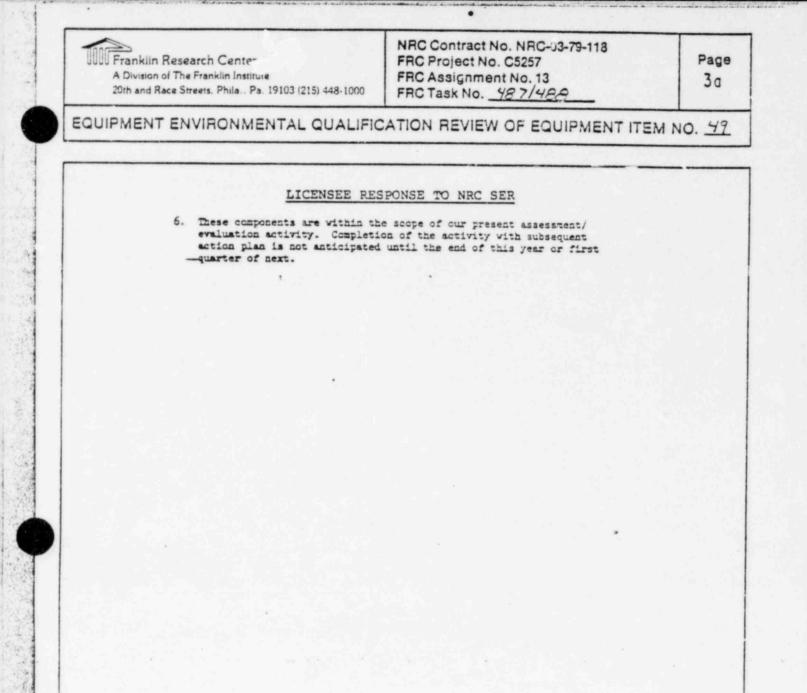
NRC QUALIFICATION CATEGORY

DESIGNATION: X = CATEGORY

×

I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	-
II.a	Equipment Qualification Not Established	_X
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	





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A Division of The Franklin Institute 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000

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Criteria: DOR Guidelines X	; NUREG-0588,	Cat. I; NUREG-0588, Ca	t. II
NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO.)
EQUIPMENT DESCRIPTION		Electric motor	1
Equipment Type	Electric		
Manufacturer's Name (5.2.2/-/-)	Reliance	Reliance	1
Model Number (5.2.2/-/-)	X 323727ALAW	Frame 5005	
Serial Number	N.0	not stated	-
<pre>Features/Mounting (5.2.6/-/-)</pre>		150/75 Hp	-
Connections/Interfaces (5.2.6/-/-)		notstated	-
Location/Elevation	Containment		
Equipment ID No.	(12)MB-105 405		:
QUALIFICATION REPORT (8.0/5.0/5.0)	-121		
Report ID Number	-121 PSR31, 22, 33	A=p 288	i
Report Date	417/2	April 7, 1973	-
Issued by	American Air	American Air Filto, Company	i
Prepared for	Filterco.	Bechtel Assoc.	1
Referenced Reports	utstated	none	-
Qualification Method (5.1, 5.3/2.1, 2.4/2.1, 2.4)	test	type test	
QUALIFICATION TEST PROGRAM Functional Test Description (5.2.5/2.2.9/2.2.9)	N.O	motor operation during environmental test	
Operating Conditions (-/2.2.10/2.2.10) Load/Cycles/Voltage/	:)	N. D.	1

A Division of The Franklin Institute 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/488</u>

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 49

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION (X OR DOCUMENTATION NOTE NO.)
Acceptance Criteria		notstated
(5.2.5/2.2.1/2.2.1)	N/A	1
(51215) 21212) 21212)	11	i i
Accuracy (5.2.5/-/-)	:]	: N-D. :
Number of Specimens	1	1.
	: /	1
Test Instruments Calibrated	÷1	: notstalled :
Safety Function (Active/		Active
Passive) (-/2.1.3/2.1.3)	Active	
Test Duration (5.2.1/-/-)	15 has.	3m/4-2he/1week
Accident Duration (Envir.	27 has.	1
Above Normal) (5.2.1/-/-)	a / has.	1 · · · · · · · · · · · · · · · · · · ·
Required Function Time	Sho.	
Test Sequence (General)	i	Disage (separate touts)
(5.2.3/2.3.1/2.3.1)	1	prage (separate tests) DBE
Test Sequence (NUREG-0588,		:
Cat. I) (-/2.3.1/-)	i	i i
1. Representative Sample	-	
2. Baseline Data	1	
3. Performance Extremes	1	
4. Thermal Aging	1	
5. Radiation Aging	:	1
6. Wear Aging	1	
7. Vibration/Seismic	1	1
8. DBE Exposure	1	4
9. Post-DBE Exposure		
10. Inspection	-	
Aging	1	1
(5.2.4, 7.0/4.0/4.0)	· N.D.	IREE Guide NEG/ICS/SC-2-A X Dote1
Thermal Aging/Basis	N.U.	1
Material Aging		
Evaluation $(7.0/-/-)$	1	notstudd !
Materials Susceptible		
(Thermal) (5.2.4, 7.0/-/-)	: *	not stated
Radiation Aging, Type	0.0	
rearderou udrudt tibe		· X, B (Analysis)

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NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO.)
Radiation Aging, Dose (rd)	100E6	1.9x10 R (Analysis)	x voted
Radiation Aging, Dose Rate	. D.		
Radiation Aging, Method	u.o.	Analysis	
Materials Susceptible (Radiation) (5.2.4, 7.0/-/-)	not stated	all non-metallies	
Operational Aging (-/4.2/-)	w.o.	> daugs at 10 porg 1200 F	
Other Age Conditioning (-/4.2/-)		not stated	
Qualified Life Claimed/ Established (5.2.4/4.10/-)	None	nots faited	
Normal Ambient Temperature Normal Ambient Radiation Normal Ambient Humidity			
On-Going Surveillance and Preventive Maintenance (7.0/-/-)	0.0		X Note 3
On-Going Analysis of Failures and Degradation (7.0/-/-)	N.D.		
Margin (General) (6.0/3.0/3.0)			
Margin (NUREG-0588,			
<pre>Cat. I) (-/3.2/-) 1. Temperature (+15°F) 2. Pressure (+10%,</pre>			
 Radiation (not required) 	:	:	1
<pre>4. Time (+10%, +1 hour + function time minimum)</pre>	-		

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 49

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-1/0588-11)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO.)
ACCIDENT CONDITIONS LOCA/MSLE/HELE/Uncontrolled (4.1, 4.2, 4.3.1, 4.3.3/ 1.1, 1.2, 1.5/1.1, 1.2, 1.5)	LOCA		
Radiation Type Radiation Dose (rd) (4.1.2/1.4/1.4)	8 100 EOGR	seeaging	
Radiation Dose Rate (rd/hr) Radiation Qual. Method (5.3.1/-/-)	notstated J	Ţ	
Proximity to Concentrated Radiation (4.1.2/1.4.6/1.4.6)	: : : :	notstated	
Equipment Susceptible to Beta Radiation (4.1.2/-/-)		not stated	
Radiation Dose (Normal + Accident) (4.1.2/-/-)	ICOECGR	1.9 × 10°R (makipia)	x Notez
Plateout Dose Considered (-/1.48/1.48)		NO	
Gamma + Eeta Dose (rd) (4.1.2/1.4.7/1.4.7)	100EOGR	1.9×10°R (analpri)	XNotea

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Page

5e

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE No.)
ENVIRONMENTAL PROFILE OF ACCIDENT CONDITIONS			
Rate of Temp./Press. Increase	135°F/42psigboo		
Peak: °F/psig/RH/Time	275/46/100/3700	300/75/100%/ 3hr and 4-2hr.	
Decrease To: °F/psig/RH/Time	·K1/4/1201		1
Rise Decrease To: °F/psig/RH/Time	190°F/13poig/100	0/16.7 has.	1
Decrease To: °F/psig/RH/Time	RT/4/27/20.		1000
Equipment Surface Tempera- ture (MSLB) (-/1.2.5.C,			1
2.2.6/1.2.5.C, 2.2.6)			1
Spray Qualification Method (5.3.2/1.3, 2.2.8/1.3, 2.2.8)		test	
Spray Composition			1
(4.1.4/1.3, 2.2.8/ 1.3, 2.2.8)	(composition?)	nots fated	xNote
Spray Density (gpm/ft ²)	D.U.	Lot	
Spray Duration	N.D	notstated	1
Submergence Duration (4.1.3/2.2.5/2.2.5)			
In-Leakage Considered			:
(5.2.6, 5.3.2/-/-) Time to Submergence			
rime co papmergence			
Dust Environment	:		1
(-/2.2.11/2.2.11)	·		1



NRC Contract No. NRC-03-79-118 Franklin Research Center FRC Project No. C5257 Page D. sion of The Franklin Institute FRC Assignment No. 13 5f .0th and Race Streets. Phila .. Pa. 19103 (215) 448-1000 FRC Task No. 487/488 EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 42 NOTES: These notors require qualification For steampersure, clemical opray and radiation expresses in addition to aging Glemal). Note1: PSR #33 was referenced by the licensee as evidence of qualification for aging. This document does not contain the accelerated aging time/temperature conditions of the test nor doesit determine a qualified life lased on the test. Inaddition the submitted report stated that after 48 hours of no load operation during the aging cycle "anincrease in roise and vibration level was noted." The report stated that this was caused by a loss of lubricant. No subsequent analysis on explanation was given for this anomaly. Note 2: PSR# (31) contains a materials analysis For radiation endurance. No maximum threshold value was stated For the Dow Corning Varnish on the bearing greade Inaddition it is not clean if the motor to lead Splice materials were addressed Note3: No replacement scheduals were given for components expected lives less than the estimated plant life. (notor grease etc for a make the part of the second a ser an an a ser a s

NRC Contract No. NRC-03-79-118 Franklin Research Center Page FRC Project No. C5257 59 A Division of The Franklin Institute FRC Assignment No. 13 20th and Race Streets. Phila . Pa. 19103 (215) 448-1000 FRC Task No. _487/488

NOTES: Note 4: The composition and duration of the chemical Splan was not Stated. It is no à. signed around to referenced 1a tough theom cal ly stated 4 a surface result and the first state An and the second s and the second secon

A Division of The Franklin Institute 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000	NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487</u>	Page I a
EQUIPMENT ENVIRONMENTAL QUALIFIC.	M NO. <u>50</u>	
EQUIPMENT ITEM NO. 50 ELECTRIC MOTOR LOCATED IN THE ECCS PUM JOHNSON CONTROLS MODEL M81ACA3 REQUIRED OPERATING TIME: 9 HOURS TER CHECKSHEET NO. 50 LICENSEE REFERENCE(S): NOT CITED FUNCTION (PLANT ID): EAST ECCS PUMP RO LICENSEE SUBMITTAL: SCEW(S) [1, 12]: FUNCTION (PLANT ID): WEST ECCS PUMP RO LICENSEE SUBMITTAL: SCEW(S) [1, 12]:	00M VENT DAMPER (1M05437) 253 00M VENT DAMPER (1M05439)	
DESIGNATION FOR DEFICIENCY IDENTIFIED		ONLY:
(See Section 3 of this TER for Legend) R. T. QT. RT. P. H. CS. A. S. (R), M.		
Not stated, Not applicable	1, (1) MH, DAN, DDN, QI, MD, M	,,
LISTING OF APPLICABLE CHECKSHEETS:		
Contents	Checksheet Page N	lo l
Equipment Item	la	
Summary of Licensee Responses to the N		
Equipment Environmental Qualification		
Licensee Response to NRC SER	3a, 3b, 3c, 3d	
System Consideration Review Equipment Environmental Qualification	4a, 4b, 4c, 4d, 4 Review 5a, 5b, 5c, 5d, 5 5g, 5h, 5i, 5j	
Installed TMI Lessons Learned Implemen Equipment Summary		
Maintenance and Replacement Schedule S	Summary 7a, 7b, 7c-	

A Division of The Franklin Institute 20th and Race Streets. Phila Pa 19103 (215) 448-1000	NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/488</u>	Page Ib
QUIPMENT ENVIRONMENTAL QUALIFI	CATION REVIEW OF EQUIPMENT ITEN	NO. <u>50</u>
SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE AN	PPLICABLE:
X The Licensee (has/has not) provid	ded a response to the SER concerns.	
The Licensee (has/has not) species qualified and/or will function with environmental service conditions.	fically stated that the equipment is hen exposed to the applicable DBE	
The Licensee has presented inform outstanding qualification deficie	mation which shows there are no encies.	
X The Licensee (has/ has not) proposite the second	sed a corrective action for this equipeen fully established.	ipment
X Justification for interim operation Licensee for this equipment is	eration (has/ has not) been provided item.	by the
X Corrective action specified b	by the Licensee:	
Equipment replacement with Equipment modification Equipment relocation above Relocate or shield equipm Verify qualification by a Equipment relocation to a Qualification testing of X Other (<u>equipment acc</u>	ve submergence level ment from radiation source additional (testing/analysis) a mild environment equipment in progress)
The Licensee has provided oth that can be construed as a ba operation.	er information for this equipment i sis for justification for interim	tem
X The Licensee (nas /has not) pr corrective action. (Schedule action	ovided a schedule for the proposed for accomplishing the corrective	.)
The Licensee states that the equi and/or should be exempted from en	pment item does not require qualifi vironmental qualification.	cation
ESIGNATION OF RESULTANT NRC QUALIFIC CIRCLED ITEM ONLY: (See Section 3	ATION EVALUATION CATEGORY BASED ON of this TER for Legend)	REVIEW
.a Qualified .b Modification I.J Qualification Not Established I.b Not Qualified	II.c Qualified Life Deficiency III.a Exempt III.b Not in Scope IV Documentation Not Available	e

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 50 EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM DESIGNATION: X = DEFICIENCY NRC REQUIREMENTS × Documented Evidence of Qualification Adequate Adequate Similarity Between Equipment and Test Specimen Established Aging Degradation Evaluated Adequately Qualified Life or Replacement Schedule Established (If Required) Program Established to Identify Aging Degradation Criteria Regarding Aging Simulation Satisfied (If Required) Criteria Regarding Temperature/Pressure Exposure: o Peak Temperature Adequate o Peak Pressure Adequate o Duration Adequate o Required Profile Enveloped Adequately o Steam Exposure (If Required) Adequate Criteria Regarding Spray Satisfied Criteria Regarding Submergence Satisfied Criteria Regarding Radiation Satisfied Criteria Regarding Test Sequence Satisfied Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied Criteria Regarding Functional Testing Satisfied Criteria Regarding Instrument Accuracy Satisfied Test Duration Margin (1 hour + Function Time) Satisfied Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) DESIGNATION: X = CATEGORY NRC QUALIFICATION CATEGORY I.a Equipment Qualified ×____ Equipment Qualification Pending Modification I.b Equipment Qualification Not Established II.a II.b Equipment Not Qualified Equipment Satisfies All Requirements Except Qualified Life II.C or Replacement Schedule Justified III.a Equipment Exempt From Qualification

III.b Equipment Not in the Scope of the Qualification Review

and a second of the second of the second second

Documentation Not Made Available

IV

A Division of The Franklin Institute 20th and Race Streets, Phila., Fz. 19103 (215) 448-1000

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO.

LICENSEE PESPONSE TO NRC SER

6. These components are within the scope of our present assessment/ evaluation activity. Completion of the activity with fift aguent action plan is not anticipated until the end of this year or first quarter of next.





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NRC Contract No. NRC-03-79-118 Franklin Pesearch Center FRC Project No. C5257 A Division of The Franklin Institute FRC Assignment No. 13 20th and Race Streets. Phila . Pa 19103 (215) 448-1000 487 FRC Task No.

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 51

EQUIPMENT ITEM NO. 51 RADIATION DETECIOR LOCATED IN CONTAINMENT (C230) WESTINGHOUSE MODEL WL23796 REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 51 LICENSEE REFERENCE(S): NOT CITED FUNCTION (PLANT ID): FISSION CHAMBER 1NI004(F) (INI004(F)) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 142 FUNCTION (PLANT ID): FISSION CHAMBER 1NI003(F) (1NI003(F)) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 141 FUNCTION (PLANT ID): FISSION CHAMBER 1NI002(F) (1NI002(F)) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 140 FUNCTION (PLANT ID): FISSION CHANBER INIO01(F) (INIO01(F)) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 139

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY: (See Section 3 of this TER for Legend)

(R,) T, (QI) (RT,) P, (H,) (CS,) (A,) S, (R), M, I, (M,) RPN, EXN, SEN, QI, RPS, "ne,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

72.35

Contents	Checksheet Page No.
Equipment Item	la
Summary of Liconsee Responses to the NRC SER	16
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, 3b, 3c, 3d
System Consideration Review	4a, 4b, 4c, 4d, 4e, 41-
Equipment Environmental Qualification Review	-Sa, 5b, Se, 5d, 5e, 5f, - - 5g, Sh, Si, Sj
Installed TMI Lessons Learned Implementation Equipment Summary	6a, 6b-
Maintenance and Replacement Schedule Summary	~a, 75, 70

A Division of The Franklin Institute 20th and Race Streets. Phila. Pa 19103 (215) 448-1000	NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>4F7/48F</u>	Page
QUIPMENT ENVIRONMENTAL QUALIFIC	ATION REVIEW OF EQUIPMENT ITEN	NO. <u>51</u>
SUMMARY OF LICENSEE RESPONSES TO THE I	NRC SER - ONLY CHECKED ITEMS ARE AN	PPLICABLE
X The Licensee (has/has_not) provide	ed a response to the SER concerns.	
The Licensee (has/has not) specific qualified and/or will function who environmental service conditions.	ically stated that the equipment is an exposed to the applicable DBE	5
The Licensee has presented information outstanding qualification deficier	ation which shows there are no ncies.	
The Licensee (has/has not) propose item whose qualification has not h	ed a corrective action for this equipeen fully established.	uipment
Justification for interim oper Licensee for this equipment it	ration (has/has not) been provided	by the
Corrective action specified by	the Licensee:	
Equipment replacement with Equipment modification Equipment relocation above Relocate or shield equipme Verify qualification by ad	e submergence level ent from radiation source dditional (testing/analysis)	
Equipment relocation to a Qualification testing of e Other ()
The Licensee has provided othe that can be construed as a bas operation.	er information for this equipment i is for justification for interim	tem
corrective action. (Schedule	vided a schedule for the proposed for accomplishing the corrective	•)
The Licensee states that the equip and/or should be exempted from env	ment item does not require qualifi ironmental qualification.	cation
DESIGNATION OF RESULTANT NRC QUALIFICA - CIRCLED ITEM ONLY: (See Section 3 o	TION EVALUATION CATEGORY BASED ON of this TER for Legend)	REVIEW
I.a Qualified I.b Modification II.a Qualification Not Established	II.c Qualified Life Deficiency	
II.b Not Qualified	III.b Not in Scope IV Documentation Not Availabl	е

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Franklin Research Center A Division of The Franklin Institute 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>471488</u>

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 51

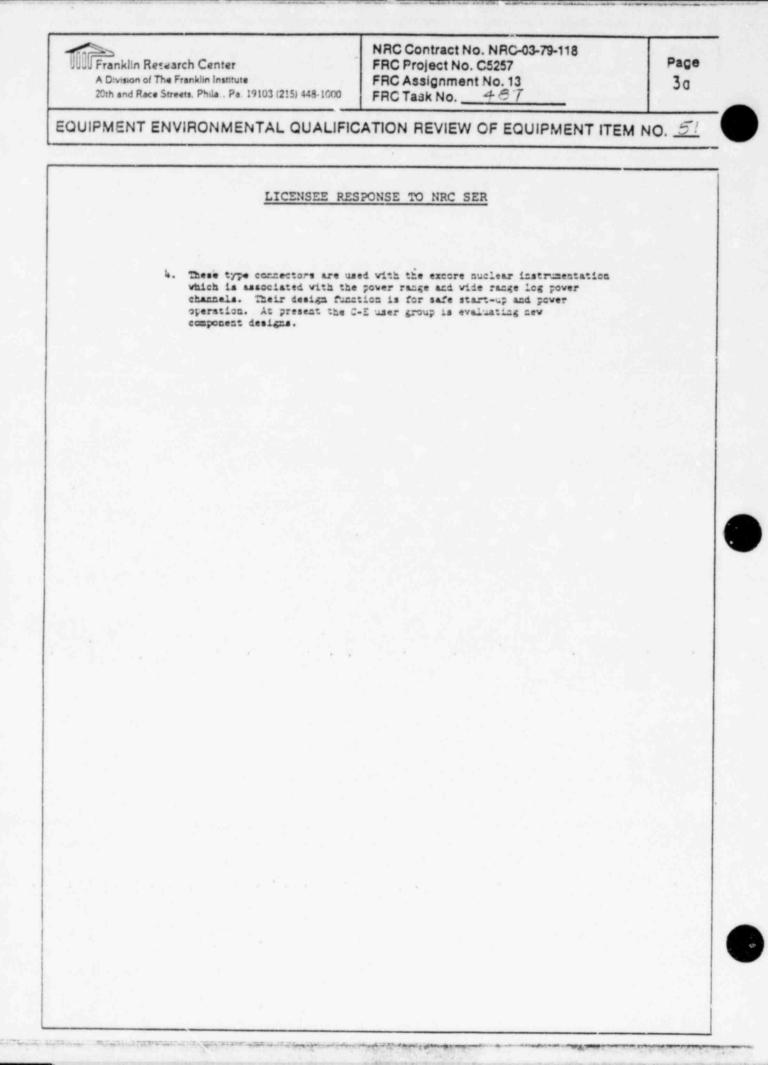
EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

DESIGNATION: X = DEFICIENCY NRC REQUIREMENTS Documented Evidence of Qualification Adequate Adequate Similarity Between Equipment and Test Specimen Established Aging Degradation Evaluated Adequately Qualified Life or Replacement Schedule Established (If Required) Program Established to Identify Aging Degradation Criteria Regarding Aging Simulation Satisfied (If Required) Criteria Regarding Temperature/Pressure Exposure: o Peak Temperature Adequate o Peak Pressure Adequate o Duration Adequate o Required Profile Enveloped Adequately o Steam Exposure (If Required) Adequate Criteria Regarding Spray Satisfied Criteria Regarding Submergence Satisfied Criteria Regarding Radiation Satisfied Criteria Regarding Test Sequence Satisfied Criteria Regarding Test Pailures or Severe Anomalies (If Any) Satisfied Criteria Regarding Functional Testing Satisfied Criteria Regarding Instrument Accuracy Satisfied Test Duration Margin (1 hour + Function Time) Satisfied Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)

NRC QUALIFICATION CATEGORY

DESIGNATION: X = CATEGORY

I.a	Equipment Qualified	-
I.b	Equipment Qualification Pending Mcdification	
II.a	Equipment Qualification Not Established	_
II.D	Equipment Not Qualified	
II.C	Equipment Satisfies All Requirements Except Qualified Life	
	or Replacement Schedule Justified	-
III.a	Equipment Exempt From Qualification	×
III.D	Equipment Not in the Scope of the Qualification Review	
VI	Documentation Not Made Available	



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 51

SYSTEM CONSIDERATION REVIEW

The Licensee has stated that this equipment item does not require environmental qualification and/or should be exempted from qualification. The Licensee's rationale has been evaluated and the reasons for concurrence/ non-concurrence with the technical basis of the Licensee's position are presented below.

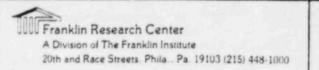
Reason for Concurrence

- X Equipment does not provide a safety function or mitigate the consequences of a design basis accident. Equipment Environmental Qualification is not required by the DOR Guidelines. (NRC Qualification Evaluation Category IIIs)
 - Equipment is not exposed to a harsh environment by the accident it is intended to mitigate. See note (1) on page 4b. (NRC Qualification Evaluation Category IIIt)
 - Backup (equipment/system) is available which completely performs the safety function. The backup (equipment/system) is environmentally qualified and appears to meet single active failure criterion. See note (1) on page 4b. (NRC Qualification Evaluation Category IIIa)

Reason for Non-Concurrence

- Backup (equipment/system) is not fully capable of performing the intended safety function or accident mitigating function.
- Backup (equipment/system) is not environmentally qualified and can be exposed to a hostile environment simultaneously with the primary equipment.
- Backup (equipment/system) is subject to a potentially disabling single active failure.
- Failure of the primary equipment can compromise the ability of other safety-related equipment to perfoits specified safety function.
 - Failure of the primary equipment can result in erroneous indication which could mislead an operator.
 - Requirement for continued functioning throughout the post-accident period necessitates environmental qualification.

This equipment has been eremysted. by NRC.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 52

EQUIPMENT ITEM NO. 52 RADIATION MONITOR LOCATED IN CONTAINMENT (C230) WESTINGHOUSE MODEL 1101 REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 52 LICENSEE REFERENCE(S): NOT CITED FUNCTION (PLANT ID): CONTAINMENT AREA MONITORS (1PE5316A) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 152 FUNCTION (PLANT ID): CONTAINMENT AREA MONITORS (1RE5316D) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 155 FUNCTION (PLAN'T ID): CONTAINMENT AREA MONITORS (1RE5316C) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 154 FUNCTION (PLANT ID): CONTAINMENT AREA MONITORS (1RE5316B) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 153

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY: (See Section 3 of this TER for Legend)

H, (CS) (A,) S, (R), M, I, (M,) RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

114	10.00				
1 100 100	-	100	-		-
Con	-	С.	11	ς.	3
Aug. 10.00					

Equipment Item

Summary of Licensee Responses to the NRC SER Equipment Environmental Qualification Summary Forms 2 Licensee Response to NRC SER System Consideration Review

Equipment Environmental Qualification Review

Installed TMI Lessons Learned Implementation Equipment Summary

Maintenance and Replacement Schedule Summary

Checksheet Page No. 1a

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3a, 3b, 3c, 3d-

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-5g, 5h, 51, 53 -

6a, 60

7a, 7b, 7e-

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EQUIPMENT ENVIRONMEN	TAL QUALIFICATION	N REVIEW OF EQUIPMENT ITE	M NO. 52
SUMMARY OF LICENSEE RESPO	DNSES TO THE NRC SE	ER - ONLY CHECKED ITEMS ARE	APPLICABLE
		Notes and the second	
X The Licensee (has/has	not) provided a r	esponse to the SER concerns.	•
X The Licensee (has/has qualified and/or will environmental service	function when exp	stated that the equipment is bosed to the applicable DBE	is
The Licensee has pres outstanding qualifica	sented information ation deficiencies.	which shows there are no	
The Licensee (has/has item whose qualificat	not) proposed a c ion has not been f	corrective action for this equally established.	quipment
X Justification for Licensee for this	interim operation equipment item.	(has/h ao-no t) been provided	d by the
\underline{X} Corrective action	specified by the	Licensee:	
Equipment mod Equipment rel Relocate or s X Verify qualif	ocation above subm shield equipment fr fication by addition	ergence level om radiation source nal (testing/ analysis)	
Equipment rel	ocation to a mild testing of equipm	environment)
The Licensee has that can be const operation.	provided other inf rued as a basis fo	ormation for this equipment r justification for interim	item
corrective action	. (Schedule for a	a schedule for the proposed ccomplishing the corrective MRHCR of 1982 (UNIT 1)	
The Licensee states t and/or should be exem	hat the equipment pted from environm	item does not require qualif ental qualification.	lication
DESIGNATION OF RESULTANT - CIRCLED ITEM ONLY: (Se	NRC QUALIFICATION e Section 3 of thi	EVALUATION CATEGORY BASED ON s TER for Legend)	REVIEW
I.a Qualified		c Qualified Life Deficiency	
II.a Qualification Not Es	tablished III	.a Exempt .b Not in Scope Documentation Not Availab	
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Franklin Research Center A Division of The Franklin Institute 20th and Race Streets, Phila., Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 487/488

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 52

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION: X = DEFICIENCY

> DESIGNATION: X = CATEGORY

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Documented Evidence of Qualification Adequate	×
Adequate Similarity Between Equipment and Test Specimen Established	
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Required)	-
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Meguate	-
o Peak Pressure Adec tate	-
o Duration Adequation	_
o Required Profile voloped Adequately	
o Steam Exposure (* guired) Adequate	
Criteria Regarding Spr fied	
Criteria Regarding Sucher the Satisfied	
Criteria Regarding Radiat tisfied	
Criteria Regarding Test anguance Satisfied	
Criteria Regarding Test Failures or Severe Anomalies	

(If Any) Satisfied Criteria Regarding Functional Losing Satisfied Criteria Regarding Instrument Actually Satisfied

Test Duration Margin (1 hour + Bunstion Time) Satisfied Criteria Regarding Margins Satisfied (NUAPG-0588, Lat. 1

NRC QUALIFICATION CATEGORY

I.a Equipment Qualified Equipment Qualification Pending Modification ×_____ I.b Equipment Qualification Not Established II.a II.b Equipment Not Qualified Equipment Gatisfies All Requirements Except Qualified Life II.c or Replacement Schedule Justified III.a Equipment Exempt From Qualification Equipment Not in the Scope of the Qualification Review III.b IV Documentation Not Made Available

A Division of The Franklin Institute 20th and Race Streets, Phila., Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>+87/488</u>

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 52

6. These components are within the scope of our present assessment/ evaluation activity. Completion of the activity with subsequent action plan is not anticipated until the end of this year or first —quarter of next. DATED 9/1/81

12. We have installed a High Range Gamma Radiation Monitoring System as part of the TMI Action Plan. This equipment is in the process of evaluation/assessment to the appropriate MURED 0568 requirements. This system extends the containment radiation monitoring capability over a range of 10° to 10° R/kr. The existing Westinghouse containment monitors are being assessed/ evaluated for normal containment conditions as initially intended in the FSAR. Franklin Research Center A Division of The Franklin Institute 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 52

INSTALLED TMI LESSONS LEARNED IMPLEMENTATION EQUIPMENT SUMMARY

NRC requested an evaluation of the environmental qualification of safetyrelated electrical equipment located in harsh environments required for TMI Lessons Learned Implementation. The objective is to evaluate qualification documentation of equipment within the scope of IE Bulletin 79-01B, Supplement 3 (item 2), in accordance with criteria established by the NRC (see Section 2 of this report) in a manner identical to the evaluation of all other safetyrelated electrical equipment. The scope of this review is limited to TMI Action Plan equipment associated with specific sections of NUREG-0737 which have an installation implementation date of January 1, 1981 (sections are identified below). Where applicable, a review is to be performed on installed equipment with implementation dates after January 1, 1981 if adequately identified by the licensee.

With respect to this equipment item, it is noted (applicable section checked):

____ The Licensee does not provide adequate information with respect to identification of TMI Action Plan equipment installed as of 1/1/81.

The Licensee has not provided the correlation of this equipment item with the specific sections of NUREG-0737. [The correlation is needed to ensure that all items are included in the review, e.g., if a transmitter is identified as a TMI Action Plan item, are the cable and the terminal blocks associated with the device also identified?]

- The Licensee has not provided the approximate installation date for the TMI Action Plan equipment items so that the appropriate qualification criteria (NUREG-0588 or DOR Cuidelines) can be used in the EEQ evaluation.
- ____ The Licensee has provided a standard Owners' Group position with respect to a NUREG-0737 technical area.
- The Licensee has requested extensions of implementation dates.
- The Licensee has stated that this equipment item is associated with the following section of NUREG-0737. (This list of applicable NUREG-0737 sections has been identified by NRC as sections within the scope of this review):
 - II.B.3 (ALL/1-1-81) Post-Accident Sampling Capability of Reactor Coolant and Containment
 - ____ II.D.3 (ALL/1-1-81) Direct Indication of Relief and Safety Valve Position

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NRC Contract No. NRC-03-79-118 Page Franklin Research Center FRC Project No. C5257 A Division of The Franklin Institute FRC Assignment No. 13 la 20th and Race Streets. Phila., Pa. 19103 (215) 448-1000 FRC Task No. _ EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 53 EQUIPMENT ITEM NO. 53 RADIATION DETECTOR LOCATED IN CONTAINMENT (C230) REUTER-STOKES MODEL M2827 REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 53 LICENSEE REFERENCE(S): NOT CITED FUNCTION (PLANT ID): PROPORTIONAL COUNTER INIO04(P) (INIO04(P)) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 150 FUNCTION (PLANT ID): PROPORTIONAL COUNTER INIO03(P) (INIO03(P)) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 149 FUNCTION (PLANT ID): PROPORTIONAL COUNTER 1N1002(P) (1N1002(P)) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 148 FUNCTION (PLANT ID): PROPORTIONAL COUNTER INIOO1(P) (INIOO1(P)) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 147 DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY: (See Section 3 of this TER for Legend) (R,) T, (QT,) (RT,) P, H, (CS, (A,) S, (R), M, I, (M,) RPN, EXN, SEN, QI, R.S, None, Not stated, Not applicable LISTING OF APPLICABLE CHECKSHEETS: Contents Checksheet Page No. Equipment Item la Summary of Licensee Responses to the NRC SER 15 Equipment Environmental Qualification Summary Forms 2 Licensee Response to NRC SER 3a, 3b, 3c, 3d-System Consideration Review 4a, 4b, 4c, 4d, 4e, 4f Equipment Environmental Qualification Review -5a, 3b, 5c, 5d, 5e, 5f; 5g, 5h, 31, 5j

Maintenance and Replacement Schedule Summary

Equipment Summary

Installed TMI Lessons Learned Implementation

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6a, 6b

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A Division of The Franklin Institute 20th and Race Streets. Phila Pa. 19103 (215) 448-1000	NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/488</u>	Page 1b
QUIPMENT ENVIRONMENTAL QUALIFIC	CATION REVIEW OF EQUIPMENT ITE	M NO. 53
SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE A	PPLICABLE:
X The Licensee (has/b as not) provid	ed a response to the SER concerns.	
	ically stated that the equipment i	
The Licensee has presented inform outstanding qualification deficies	ation which shows there are no ncies.	
The Licensee (has/has not) propose item whose qualification has not h	ed a corrective action for this equipeen fully established.	uipment
Justification for interim oper Licensee for this equipment is	ration (has/has not) been provided tem.	by the
Corrective action specified by	y the Licensee:	
Equipment replacement with Equipment modification Equipment relocation above Relocate or shield equipme Verify qualification by ac Equipment relocation to a Qualification testing of e	e submergence level ent from radiation source dditional (testing/analysis) mild environment	·
Other (The Licensee has provided other that can be construed as a bas operation.	er information for this equipment is for justification for interim	tem)
corrective action. (Schedule	ovided a schedule for the proposed for accomplishing the corrective)
X The Licensee states that the equip and/or should be exempted from env	oment item does not require qualifivironmental qualification.	cation
ESIGNATION OF RESULTANT NRC QUALIFICA CIRCLED ITEM ONLY: (See Section 3 of	TION EVALUATION CATEGORY BASED ON of this TER for Legend)	REVIEW
	II.c Qualified Life Deficiency AIL.a Exempt III.b Not in Scope	
I.b Not Qualified	IV Documentation Not Availabl	e

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A Division of The Franklin Institute 20th and Race Streets. Phila Pa. 19103 (215) 448-1000	NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/488</u>	Page 2
EQUIPMENT ENVIRONMENTAL QUALIFIC	CATION REVIEW OF EQUIPMENT ITE	M NO. 53
EQUIPMENT ENVIRONMENTAL	QUALIFICATION SUMMARY FORM	
NRC REQUIREMENTS	DESIGNA X = DEFI	
Documented Evidence of Qualification Adequate Similarity Between Equipment		_

Aging Degradation Evaluated Adequately Qualified Life or Replacement Schedule Establis' 1 (If Required) Program Established to Identify Aging Degradati-a Criteria Regarding Aging Simulation Satisfied (If Required) Criteria Regarding Temperature/Pressure Exposure: o Peak Temperature Adequate o Peak Pressure Adequate o Duration Adequate o Required Profile Enveloped Adequately o Steam Exposure (If Required) Adequate Criteria Regarding Spray Satisfied Criteria Regarding Submergence Satisfied Criteria Regarding Radiation Satisfied Criteria Regarding Test Sequence Satisfied Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied Criteria Regarding Functional Testing Satisfied Criteria Regarding Instrument Accuracy Satisfied Test Duration Margin (1 hour + Function Time) Satisfied Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) DESIGNATION: X = CATEGORY NRC QUALIFICATION CATEGORY Equipment Qualified I.a Equipment Qualification Pending Modification _____ ____ I.b Equipment Qualification Not Established II.a II.b Equipment Not Qualified

II.c Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified III.a Equipment Exempt From Qualification III.b Equipment Not in the Scope of the Qualification Review Documentation Not Made Available IV

NRC Contract No. NRC-03-79-118 Franklin Research Center A Division of The Franklin Institute 20th and Race Streets. Phila., Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>48.7/4657</u>

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 53

LICENSEE RESPONSE TO NRC SER

4. These type connectors are used with the excore nuclear instrumentation which is associated with the power range and wide range log power channels. Their design function is for safe start-up and power operation. At present the C-E user group is evaluating new component designs. A Division of The Franklin Institute 20th and Race Streets, Phila., Pa. 19103 (215) 448-1000

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NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. ______

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO.

SYSTEM CONSIDERATION REVIEW

The Licensee has stated that this equipment item does not require environmental qualification and/or should be exempted from qualification. The Licensee's rationale has been evaluated and the reasons for concurrence/ non-concurrence with the technical basis of the Licensee's position are presented below.

Reason for Concurrence

- X Equipment does not provide a safety function or mitigate the consequences of a design basis accident. Equipment Environmental Qualification is not required by the DOR Guidelines. (NRC Qualification Evaluation Category IIIa)
 - Equipment is not exposed to a harsh environment by the accident it is intended to mitigate. See note (1) on page 4b. (NRC Qualification Evaluation Category IIIb)
 - Backup (equipment/system) is available which completely performs the safety function. The backup (equipment/system) is environmentally qualified and appears to meet single active failure criterion. See note (1) on page 4b. (NRC Qualification Evaluation Category IIIa)

Reason for Non-Concurrence

- Backup (equipment/system) is not fully capable of performing the intended safety function or accident mitigating function.
- Backup (equipment/system) is not environmentally qualified and can be exposed to a hostile environment simultaneously with the primary equipment.
- Backup (equipment/system) is subject to a potentially disabling single active failure.
- Failure of the primary equipment can compromise the ability of other safety-related equipment to perform its specified safety function.
 - Failure of the primary equipment can result in erroneous indication which could mislead an operator.
- Requirement for continued functioning throughout the post-accident period necessitates environmental qualification.

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Franklin Research Center A Division of The Franklin Institute 20th and Race Streets, Phila., Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 487

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 54

EQUIPMENT ITEM NO. 54 AMPLIFIER LOCATED IN CONTAINMENT (C230) GENERAL ATOMIC MODEL PA6A REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 54 LICENSEE REFERENCE(S): NOT CITED FUNCTION (PLANT ID): PREAMPLIFIER 1PA604 (1PA604) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 146 FUNCTION (PLANT ID): PREAMPLIFIER 1PA603 (1PA603) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 145 FUNCTION (PLANT ID): PREAMPLIFIER 1PA602 (1PA602) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 144 FUNCTION (PLANT ID): PREAMPLIFIER 1PA601 (1PA601) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 143

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY: (See Section 3 of this TER for Legend)

R. (T.) (T.) RT.) P. H. (CS. A.) S. (R), M. I. (M.) RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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Equipment Environmental Qualification Review

Installed TMI Lessons Learned Implementation Equipment Summary

Maintenance and Replacement Schedule Summary

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QUIPMENT ENVIRONMENTAL QUALIFI	CATION REVIEW OF EQUIPMENT ITE	NO. 59
SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE A	PPLICABLE:
X The Licensee (has/has not) provid	ded a response to the SER concerns.	
The Licensee (has/has not) specific qualified and/or will function when with the service conditions.	fically stated that the equipment is nen exposed to the applicable DBE	S
The Licensee has presented inform outstanding qualification deficie	mation which shows there are no encies.	
The Licensee (has/has not) propos item whose qualification has not	sed a corrective action for this equipeen fully established.	uipment
Justification for interim ope Licensee for this equipment i	eration (has/has not) been provided	by the
Corrective action specified b	by the Licensee:	
Equipment replacement with Equipment modification Equipment relocation abov Relocate or shield equipm Verify qualification by a Equipment relocation to a Qualification testing of Other (re submergence level ment from radiation source additional (testing/analysis) mild environment)
The Licensee has provided oth that can be construed as a ba operation.	er information for this equipment i sis for justification for interim	tem
The Licensee (has/has not) pr corrective action. (Schedule action	ovided a schedule for the proposed for accomplishing the corrective	•)
The Licensee states that the equi and/or should be exempted from en	pment item does not require qualifi vironmental qualification.	cation
DESIGNATION OF RESULTANT NRC QUALIFIC - CIRCLED ITEM ONLY: (See Section 3	ATION EVALUATION CATEGORY BASED ON of this TER for Legend)	REVIEW
L.a Qualified L.b Modification L.a Qualification Not Established	II.c Qualified Life Deficiency	

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Franklin Research Center A Division of The Franklin Institute 20th and Race Streets. Phila., Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>UF 7/488</u>

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 54

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

DESIGNATION: X = DEFICIENCY

NRC REQUIREMENTS

Documented Evidence of Qualification Adequate Adequate Similarity Between Equipment and Test Specimen Established Aging Degradation Evaluated Adequately Qualified Life or Replacement Schedule Established (If Required) Program Established to Identify Aging Degradation Criteria Regarding Aging Simulation Satisfied (If Required) Criteria Regarding Temperature/Pressure Exposure:

- o Peak Temperature Adequate
- o Peak Pressure Adequate
- o Duration Adequate
- o Required Profile Enveloped Adequately

o Steam Exposure (If Required) Adequate Criteria Regarding Spray Satisfied Criteria Regarding Submergence Satisfied

Criteria Regarding Radiation Satisfied Criteria Regarding Test Sequence Satisfied

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Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied

Criteria Regarding Functional Testing Satisfied Criteria Regarding Instrument Accuracy Satisfied Test Duration Margin (1 hour + Function Time) Satisfied Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)

NRC QUALIFICATION CATEGORY

DESIGNATION: X = CATEGORY

I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life	
	or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	X
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

Franklin Research Center A Division of The Franklin Institute 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 487 488

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 54

LICENSEE RESPONSE TO NRC SER

4. These type connectors are used with the excore nuclear instrumentation which is associated with the power range and wide range log power channels. Their design function is for safe start-up and power operation. At present the C-E user group is evaluating new component designs. Franklin Research Center A Division of The Franklin Institute 20th and Race Streets. Phila.. Pa. 19103 (215) 448-1000 NFIC Contract No. NFC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. _4F7/4FF .

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4a

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 59

SYSTEM CONSIDERATION REVIEW

The Licensee has stated that this equipment item does not require environmental qualification and/or should be exempted from qualification. The Licensee's rationale has been evaluated and the reasons for concurrence/ non-concurrence with the technical basis of the Licensee's position are presented below.

Reason for Concurrence

- Equipment does not provide a safety function or mitigate the consequences of a design basis accident. Equipment Environmental Qualification is not required by the DOR Guidelines. (NRC Qualification Evaluation Category IIIa)
- Equipment is not exposed to a harsh environment by the accident it is intended to mitigate. See note (1) on page 4b. (NRC Qualification Evaluation Category IIIb)
- Backup (equipment/system) is available which completely performs the safety function. The backup (equipment/system) is environmentally qualified and appears to meet single active failure criterion. See note (1) on page 4b. (NRC Qualification Evaluation Category IIIa)

Reason for Non-Concurrence

- Backup (equipment/system) is not fully capable of performing the intended safety function or accident mitigating function.
- Backup (equipment/system) is not environmentally qualified and can be exposed to a hostile environment simultaneously with the primary equipment.
- Backup (equipment/system) is subject to a potentially disabling single active failure.
- Failure of the primary equipment can compromise the ability of other safety-related equipment to perform its specified safety function.
- Failure of the primary equipment can result in erroneous indication which could mislead an operator.
- ____ Requirement for continued functioning throughout the post-accident period necessitates environmental qualification.

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A Division of The Franklin Institute 20th and Race Streets. Phila Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 487

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 55

EQUIPMENT ITEM NO. 55 ELECTRIC HEATER LOCATED IN CONTAINMENT (C230) WESTINGHOUSE MODEL EHRS REQUIRED OPERATING TIME: 9 HOURS TER CHECKSHEET NO. 55 LICENSEE REFERENCE(S): 1571 FUNCTION (PLANT ID): HYDROGEN RECOMBINER 11 (1008) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 254 FUNCTION (PLANT ID): HYDROGEN COMBINER 12 (1009) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 255

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY: (See Section 3 of this TER for Legend) R, T, QT, RT, P, H, CS, A, S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None, Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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Equipment Environmental Qualification Review

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QUIPMENT ENVIRONMENTAL QUALIFIC	CATION REVIEW OF EQUIPMENT ITER	VI NO. <u>55</u>
SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE A	PPLICABLE:
X The Licensee (has/ has not) provid	ed a response to the SER concerns.	
The Licensee (has/has not) specif qualified and/or will function wh environmental service conditions.	ically stated that the equipment is en exposed to the applicable DBE	s
The Licensee has presented inform outstanding qualification deficies	ation which shows there are no ncies.	
X The Licensee (has/has not) propose item whose qualification has not h	ed a corrective action for this equipeen fully established.	uipment
X Justification for interim open Licensee for this equipment is	ration (has/ has not) been provided tem.	by the
X Corrective action specified by	y the Licensee:	
Equipment replacement with Equipment modification Equipment relocation above Relocate or shield equipme Verify qualification by ac Equipment relocation to a Qualification testing of e X Other (<u>equipment con</u>)	e submergence level ent from radiation source iditional (testing/analysis) mild environment equipment in progress	
The Licensee has provided other that can be construed as a bas operation.	er information for this equipment is sis for justification for interim	tem
X The Licensee (nes/has not) pro corrective action. (Schedule action	ovided a schedule for the proposed for accomplishing the corrective)
The Licensee states that the equip and/or should be exempted from env	oment item does not require qualifinition and qualification.	cation
ESIGNATION OF RESULTANT NRC QUALIFICA CIRCLED ITEM ONLY: (See Section 3 of	TION EVALUATION CATEGORY BASED ON	REVIEW
La Qualified Lb Modification	II.c Qualified Life Deficiency III.a Exempt	
I.a Qualification Not Established	III.b Not in Scope	

A Division of The Franklin Institute 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>48 2488</u>

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	EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY F	ORM
		DESIGNATION:
RC REC	UIREMENTS	X = DEFICIENCY
cumer	ted Evidence of Qualification Adequate	X_
	e Similarity Letween Equipment and Test Specimen Estab	
	Degradation Evaluated Adequately	
	ed Life or Replacement Schedule Established (If Requir	ed)
	Established to Identify Aging Degradation	
	a Regarding Aging Simulation Satisfied (If Required)	
iteri	a Regarding Temperature/Pressure Exposure:	
0	Peak Temperature Adequate	
0	Peak Pressure Adequate	
	Duration Adequate	
	Required Profile Enveloped Adequately	
	Steam Exposure (If Required) Adequate	
	a Regarding Spray Satisfied	
	a Regarding Submergence Satisfied	
	a Regarding Radiation Satisfied	
	la Regarding Test Sequence Satisfied	
	a Regarding Test Failures or Severe Anomalies	
	Any) Satisfied	againing, solution
	a Regarding Functional Testing Satisfied La Regarding Instrument Accuracy Satisfied	
	aration Margin (1 hour + Function Time) Satisfied	
	la Regarding Margins Satisfied (NUREG-0588, Cat. I)	
	a regularing marging bacibrica (nonad boos) date 1/	
		DESIGNATION:
RC QUI	ALIFICATION CATEGORY	X = CATEGORY
. a	Equipment Qualified	
.b	Equipment Qualification Pending Modification	
I.a	Equipment Qualification Not Established	X
I.b	Equipment Not Qualified	
I.C	Equipment Satisfies All Requirements Except Qualified	Life
	or Replacement Schedule Justified	
II.a	Equipment Exempt From Qualification	
II.D V	Equipment Not in the Scope of the Qualification Revie Documentation Not Made Available	

A Division of The Franklin Institute 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000

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NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/488</u>

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 55

LICENSEE RESPONSE TO NRC SER

6. These components are within the scope of our present assessment/ evaluation activity. Completion of the activity with subsequent action plan is not anticipated until the end of this year or first —quarter of next.

. NRC Contract No. NRC-03-79-118 Franklin Research Center Page FRC Project No. C5257 Di sion of The Franklin Institute FRC Assignment No. 13 5f Oth and Race Streets, Phila Pa 19103 (215) 448-1000 FRC Task No. 487/488 EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 55 NOTES: These heaters require qualification to steam/ radiation and clemeal source expansion to Hermal inaddition aging evidence + licamaa we Δ p. 12 mc a afgual Sali rep de ot 0 al lance tere and cannot qual therefore Ca Ha. Que Not Established. deat

A Division of The Franklin Institute 20th and Race Streets, Phila, Pa 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 487

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 56

EQUIPMENT ITEM NO. 56 ELECTRICAL CONNECTOR LOCATED IN CONTAINMENT (C230) KINGS MODEL KH5905 REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 56 LICENSEE REFERENCE(S): NOT CITED FUNCTION (PLANT ID): CONNECTORS LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 92 FUNCTION (PLANT ID): CONNECTORS LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 93

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY: (See Section 3 of this TER for Legend)

R, T, Q1, RT, P, H, CS, A, S, (R), M, I, WM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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A Division of The Franklin Institute 20th and Race Streets. Phila. Pa 19103 (215) 448-1000	NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487</u> /488	Page 1b
EQUIPMENT ENVIRONMENTAL QUALIFI	CATION REVIEW OF EQUIPMENT ITEM	A NO. 56
SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE AN	PPLICABLE
X The Licensee (has/has not) provid	a second	
The Licensee (has/has:not) specis qualified and/or will function we environmental service conditions.	fically stated that the equipment is hen exposed to the applicable DBE	3
The Licensee has presented inform outstanding qualification deficie	mation which shows there are no encies.	
X The Licensee (has not) propos item whose qualification has not	sed a corrective action for this equipeen fully established.	ipment
Justification for interim ope Licensee for this equipment i	eration (has/has not) been provided item.	by the
Corrective action specified b	by the Licensee:	
Equipment replacement wit Equipment modification Equipment relocation abov Relocate or shield equipm Verify qualification by a Equipment relocation to a Qualification testing of Other (ve submergence level ment from radiation source additional (testing/analysis) a mild environment)
The Licensee has provided oth that can be construed as a ba operation.	ner information for this equipment in asis for justification for interim	tem
corrective action. (Schedule	ovided a schedule for the proposed for accomplishing the corrective	•)
The Licensee states that the equi and/or should be exempted from en	pment item does not require qualifinity in the second seco	cation
DESIGNATION OF RESULTANT NRC QUALIFIC - CIRCLED ITEM ONLY: (See Section 3	CATION EVALUATION CATEGORY BASED ON of this TER for Legend)	REVIEW
I.a Qualified I.b Modification II.a Qualification Not Established	II.c Qualified Life Deficiency III.a Exempt III.b Not in Scope	

Franklin Research Center Division of The Franklin Institute 20th and Race Streets, Phila., Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487 / 488</u>

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 56

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION: X = DEFICIENCY

Documented Evidence of Qualification Adequate Adequate Similarity Between Equipment and Test Specimen Established Aging Degradation Evaluated Adequately Qualified Life or Replacement Schedule Established (If Required) Program Established to Identify Aging Degradation Criteria Regarding Aging Simulation Satisfied (If Required) Criteria Regarding Temperature/Pressure Exposure: o Peak Temperature Adequate o Peak Pressure Adequate o Duration Adequate o Required Profile Enveloped Adequately o Steam Exposure (If Required) Adequate Criteria Regarding Spray Satisfied Criteria Regarding Submergence Satisfied Criteria Regarding Radiation Satisfied Criteria Regarding Test Sequence Satisfied Criteria Regarding Test Failures or Severe Anomalies

(If Any) Satisfied Criteria Regarding Functional Testing Satisfied Criteria Regarding Instrument Accuracy Satisfied Test Duration Margin (1 hous + Function Time) Satisfied Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)

NRC QUALIFICATION CATEGORY

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DESIGNATION: X * CATEGORY

The second states and the second states

I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	-
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life	
	or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	×
III.D	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

A Division of The Franklin Institute 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 487/485

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 56

LICENSEE RESPONSE TO NRC SER

4. These type connectors are used with the excore nuclear instrumentation which is associated with the power range and wide range log power channels. Their design function is for safe start-up and power operation. At present the C-Z user group is evaluating new component designs. Franklin Research Center A Division of The Franklin Institute 20th and Race Streets. Phila., Pa. 19103 (215) 448-10:00 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 487/488

Page 4a

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 56

SYSTEM CONSIDERATION REVIEW

The Licenset has stated that this equipment item does not require environmental qualification and/or should be exempted from qualification. The Licensee's rationale has been evaluated and the reasons for concurrence/ non-sonsurrence with the technical basis of the Licensee's position are presented below.

Reason for Concurrence

- Equipment does not provide a safety function or mitigate the consequences of a design basis accident. Equipment Environmental Qualification is not required by the DOR Guidelines. (NRC Qualification Evaluation Category IIIa)
 - Equipment is not exposed to a harsh environment by the accident it is intended to mitigate. See note (1) on page 4b. (NRC Qualification Evaluation Category IIIb)
- Backup (equipment/system) is available which completely performs the safety function. The backup (equipment/system) is environmentally qualified and appears to meet single ______//2000 failure criterion. See note (1) on page 4b. (NRC Qualification Evaluation Category IIIa)

Reason for Non-Concurrence

- Backup (equipment/system) is not fully capable of performing the intended safety function or accident mitigating function.
- Backup (equipment/system) is not environmentally qualified and can be exposed to a hostile environment simultaneously with the primary equipment.
- Backup (equipment/system) is subject to a potentially disabling single active failure.
- Failure of the primary equipment can compromise the ability of other safety-related equipment to perform its specified safety function.
- Failure of the primary equipment can result in erroneous indication which could mislead an operator.
- Requirement for continued functioning throughout the post-accident period necessitates environmental qualification.

This equipment (nuclear instrumentation) has been exempted from qualification, and This has been noted by The Accensee in PSR # 5187

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A Division of The Franklin Institute FRC Assig	act No. NRC-03-79-118 ct No. C5257 Pag nment No. 13 I c No. <u>487</u>
EQUIPMENT ENVIRONMENTAL QUALIFICATION REV	IEW OF EQUIPMENT ITEM NO.
EQUIPMENT ITEM NO. 57 ELECTRICAL CONNECTOR LOCATED IN CONTAINMENT (C23 ITT CANNON MODEL 19457 REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 57 LICENSEE REFERENCE(S): NOT CITED FUNCTION (PLANT ID): CONNECTORS LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 89	0)
DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRG (See Section 3 of this TER for Legend) $R_1(T_1)(2T_1)(RT_2)$ P, (H,)(CS, (A,) S, (R), M, I, (M,) RPR	
(See Section 3 of this TER for Legend) R.T. (T. RT.) P. H. (CS. A. S. (R), M. I. (M. RPM	
(See Section 3 of this TER for Legend) R. T. QT. RT. P. H. CS. A. S. (R), M. I. QM. RPM Not stated, Not applicable	
(See Section 3 of this TER for Legend) R.T. (T. RT.) P. H. (CS. A. S. (R), M. I. (M. RPM	N, EXN, SEN, (I,) RPS, None,
(See Section 3 of this TER for Legend) R. T. (T. (RT.) P. H. (S. A. S. (R), M. I. (M.) RPN Not stated, Not applicable <u>LISTING OF APPLICABLE CHECKSHEETS</u> : <u>Contents</u>	A, EXN, SEN, (I, RPS, None, Checksheet Page No.
(See Section 3 of this TER for Legend) R.T. T. T. P. H. S. A. S. (R), M. I. M. RPN Not stated, Not applicable <u>LISTING OF APPLICABLE CHECKSHEETS</u> : <u>Contents</u> Equipment Item	A, EXN, SEN, (I, RPS, None, Checksheet Page No. la
(See Section 3 of this TER for Legend) R.T. (T. (RT.) P. H. (S. A. S. (R), M. I. (M. RPM Not stated, Not applicable <u>LISTING OF APPLICABLE CHECKSHEETS</u> : <u>Contents</u> Equipment Item Summary of Licensee Responses to the NRC SER	I, EXN, SEN, (I, RPS, None, <u>Checksheet Page No.</u> la lb
(See Section 3 of this TER for Legend) R. T. (T. (RT.) P. H. (S. A. S. (R), M. I. (M. RPM Not stated, Not applicable <u>LISTING OF APPLICABLE CHECKSHEETS</u> : <u>Contents</u> Equipment Item Summary of Licensee Responses to the NRC SER Equipment Environmental Qualification Summary Fo	Checksheet Page No. la lb 2
(See Section 3 of this TER for Legend) R. T. T. RT. P. H. S. A. S. (R), M. I. M. RPN Not stated, Not applicable <u>LISTING OF APPLICABLE CHECKSHEETS</u> : <u>Contents</u> Equipment Item Summary of Licensee Responses to the NRC SER Equipment Environmental Qualification Summary For Licensee Response to NRC SER	Checksheet Page No. la lb Jorms 2 Ja, 3b, 3c, 3d
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(See Section 3 of this TER for Legend) R. T. T. RT. P. H. S. A. S. (R), M. I. M. RPN Not stated, Not applicable <u>LISTING OF APPLICABLE CHECKSHEETS</u> : <u>Contents</u> Equipment Item Summary of Licensee Responses to the NRC SER Equipment Environmental Qualification Summary For Licensee Response to NRC SER System Consideration Review	Checksheet Page No. la lb orms 2 3a, 3b, 3c, 3d 4a 4b, 4c, 4d, 4e, 4f 5a, 5b, 5c, 5d, 5e, 5f,

Franklin Res	search Center			
A Dis sion of T	he Franklin Instit	ute		
20th and Race	Streets. Phila., P	a 19103	(215) 44	48-1000

NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487 (488</u>

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 57

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICAN	BLE:
X The Licensee (has/has not) provided a response to the SER concerns.	•
The Licensee (has/has not) specifically stated that the equipment is	
qualified and/or will function when exposed to the applicable DBE	
environmental service conditions.	
The Licensee has presented information which shows there are no outstanding qualification deficiencies.	
outstanding qualification dericiencies.	
The Licensee (hee/has not) proposed a corrective action for this equipment	
item whose qualification has not been fully established.	
Justification for interim operation (has/has not) been provided by the	e
Licensee for this equipment item.	
Corrective action specified by the Licensee:	
Equipment replacement with qualified equipment Equipment modification	
Equipment relocation above submergence level	
Relocate or shield equipment from radiation source	
Verify qualification by additional (testing/analysis)	
Equipment relocation to a mild environment	
Qualification testing of equipment in progress	
Other ()	
The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.	
The Licensee (has/has not) provided a schedule for the proposed	
corrective action. (Schedule for accomplishing the corrective	
action)	
mba fianna ababa bhab bh	
The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.	1
and/or should be exempted from environmental qualitication.	
SIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW	1
CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)	
a Qualified II.c Qualified Life Deficiency	
b Modification (III.a Exempt)	
b Modification (III.a Exempt) .a Qualification Not Established III.b Not in Scope	
b Modification (III.a Exempt) .a Qualification Not Established III.b Not in Scope	
b Modification (III.a Exempt) .a Qualification Not Established III.b Not in Scope	
b Modification (III.a Exempt) .a Qualification Not Established III.b Not in Scope	

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UIPM	ENT ENVIR	ONMENTAL C	UALIFICAT	ION REVIEW	OF EQUIPM	NENT ITEM NO). 5
	EQU	IPMENT ENVIRO	NMENTAL QUI	ALIFICATION	SUMMARY FOR	RM	
NDC DE	UTDEMENING					DESIGNATION X = DEFICIEN	C
ANC RES	UIREMENTS						
Documer	ted Eviden	ce of Qualifi	cation Adec	quate			
Adequat	e Similari	ty Between Eq	uipment and	d Test Speci	men Establi	ished	
Aging 1	egradation	Evaluated Ad	lequately				_
Qualif	led Life or	Replacement	Schedule Es		If Required	3)	
Program	a Establish	ed to Identif	y Aging Deg	gradation			
		g Aging Simul			equired)		
		g Temperature		Exposure:			
		rature Adequa	ite				
		ure Adequate					
	Duration A						
		rofile Envelo					
		sure (If Requ		uate			-
		g Spray Satis					-
		g Submergence					
		g Radiation S					
		ig Test Sequer					-
		g Test Failur	es or Seve	re Anomalies	5		
	Any) Satisf						
		g Functional					-
Criter	ia Regardin	g Instrument	Accuracy S	atistied			-
Test D	iration Mag	gin (1 hour +	Function	Time) Satisi	tied T		-
Criter	ia Regardin	ng Margins Sat	LISTIED (NU	REG-0588, Ca	it. 1)		_
						DESIGNATI	ON:
NRC QU	ALIFICATION	CATEGORY				X = CATEG	ORY
I.a	Equipment	Qualified					
I.b		Qualificatio	on Pending	Modification	1		_
II.a		Qualificatio					_
** -	Equipment	Not Qualifie	ed				_
II.b	Equipment	Satisfies Al	11 Requirem	ents Except	Qualified 1	Life	
II.C	or Peolac	cement Schedul					
II.c III.a	Equipment	Exempt From	Qualificat	ion	and the second second		5
II.c	Equipment Equipment	Exempt From Not in the Station Not Made	Scope of th	e Qualificat	tion Review	_2	5

Franklin Research Center A Division of The Franklin Institute 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 4460/447

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. LICENSEE RESPONSE TO NRC SER 4. These type connectors are used with the excore nuclear instrumentation which is associated with the power range and wide range log power channels. Their design function is for safe start-up and power operation. At present the C-E user group is evaluating new component designs. an to contraction Section of the sector of the sector of the sector of the sector of

Franklin Research Center A Division of The Franklin Institute 20th and Race Streets, Phila., Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487</u> /488

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 57

SYSTEM CONSIDERATION REVIEW

The Licensee has stated that this equipment item does not require environmental qualification and/or should be exempted from qualification. The Licensee's rationale has been evaluated and the reasons for concurrence/ non-consustance with the technical basis of the Licensee's position are presented below.

Reason for Concurrence

- Equipment does not provide a safety function or mitigate the consequences of a design basis accident. Equipment Environmental Qualification is not required by the DOR Guidelines. (NRC Qualification Evaluation Category IIIa)
 - Equipment is not exposed to a harsh environment by the accident it is intended to mitigate. See note (1) on page 4b. (NRC Qualification Evaluation Category IIIb)

Backup (equipment/system) is available which completely performs the safety function. The backup (equipment/system) is environmentally qualified and appears to meet single active failure criterion. See note (1) on page 4b. (NRC Qualification Evaluation Category IIIa)

Reason for Non-Concurrence

Backup (equipment/system) is not fully capable of performing the intended safety function or accident mitigating function.

- Backup (equipment/system) is not environmentally qualified and can be exposed to a hostile environment simultaneously with the primary equipment.
- Backup (equipment/system) is subject to a potentially disabling single active failure.
- Failure of the primary equipment can compromise the ability of other safety-related equipment to perform . its specified safety function.
- Failure of the primary equipment can result in erroneous indication which could mislead an operator.
- Requirement for continued functioning throughout the post-accident period necessitates environmental qualification.

This equipment (nuclear instrumentation) has been exempted by The NRC from qualification and This has been noted by The Licensee in PSR # 187

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FRC Assignment	No. 13
FRC Task No.	487

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 58

EQUIPMENT ITEM NO. 58 TERMINAL BLOCK LOCATED IN CONTAINMENT (C230) MARATHON MODEL 1600 SERIES REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 58 LICENSEE REFERENCE(S): 21 FUNCTION (PLANT ID): TERMINAL BLOCK LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 79

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY: (See Section 3 of this TER for Legend)

R, T, QI, RT, P, H, CS, A, S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

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Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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Equipment Item

Summary of Licensee Responses to the NRC SER

Equipment Environmental Qualification Summary Forms

Licensee Response to NRC SER

System Consideration Review

Equipment Environmental Qualification Review

Installed TMI Lessons Learned Implementation Equipment Summary

Maintenance and Replacement Schedule Summary

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EQUIPMENT ENVIRONMENTAL QUALIFIC	CATION REVIEW OF EQUIPMENT ITEM	1 NO. 58
SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE AP	PLICABLE
X The Licensee (has/hae not) provide	ed a response to the SER concerns.	*
The Licensee (has/hes-not) specific qualified and/or will function whe environmental service conditions.	ically stated that the equipment is en exposed to the applicable DBE	
The Licensee has presented information outstanding qualification deficier	ation which shows there are no ncies.	
X The Licensee (has/has not) propose item whose qualification has not h	ed a corrective action for this equ been fully established.	ipment
X Justification for interim open Licensee for this equipment it	ration (has/h as not) been provided tem.	by the
\underline{X} Corrective action specified by	y the Licensee:	
Equipment replacement with Equipment modification	a second s	
Equipment relocation above Relocate or shield equipme	ant from radiation source	
Equipment relocation to a	diticnal (testing/analysis) mild environment	
Qualification testing of e	quipment in progress)
The Licensee has provided othe that can be construed as a bas operation.	er information for this equipment it ais for justification for interim	ter
X The Licensee (has not) pro corrective action. (Schedule action	ovided a schedule for the proposed for accomplishing the corrective	.)
The Licensee states that the equip and/or should be exempted from env	ment item does not require qualific rironmental qualification.	cation
DESIGNATION OF RESULTANT NRC QUALIFICA - CIRCLED ITEM ONLY: (See Section 3 o	TION EVALUATION CATEGORY BASED ON F f this TER for Legend)	REVIEW
I.a Qualified I.b Modification	II.c Qualified Life Deficiency III.a Exempt	
II.a Qualification Not Established	III.t Not in Scope IV Documentation Not Available	

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A Division of The Franklin Institute 20th and Race Streets, Phila., Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 4F7/4F8

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO.

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

Documented Evidence of Qualification Adequate Adequate Similarity Between Equipment and Test Specimen Established Aging Degradation Evaluated Adequately Qualified Life or Replacement Schedule Established (If Required) Program Established to Identify Aging Degradation Criteria Regarding Aging Simulation Satisfied (If Required) Criteria Regarding Temperature/Pressure Exposure: o Peak Temperature Adequate o Peak Pressure Adequate o Duration Adequate o Required Profile Enveloped Adequately o Steam Exposure (If Required) Adequate Criteria Regarding Spray Satisfied Criteria Regarding Submergence Satisfied Criteria Regarding Radiation Satisfied Criteria Regarding Test Sequence Satisfied Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied

Criteria Regarding Functional Testing Satisfied Criteria Regarding Instrument Accuracy Satisfied Test Duration Margin (1 hour + Function Time) Satisfied Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)

NRC QUALIFICATION CATEGORY

I.a Equipment Qualified I.b Equipment Qualification Pending Modification II.a Equipment Qualification Not Established II.b Equipment Not Qualified II.c Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified III.a Equipment Exempt From Qualification III.b Equipment Not in the Scope of the Qualification Review IV Documentation Not Made Available

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DESIGNATION: X = DEFICIENCY

> DESIGNATION: X = CATEGORY

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 58

LICENSEE RESPONSE TO NRC SER

7. The materials used in the construction of these blocks have been determined to be age insensitive, life established at greater than 120 years. The terminal blocks installed at Calvert Cliffs are mounted within NEMA4 rated enclosures. These enclosures provide sufficient protection from direct impingement of any chemical spray. However, we are still in the process of evaluating the various qualification reports available and expect to complete the evaluation/assessment activity by the end of this year or the first part of next.

D. sion of The Franklin Institute 20th and Race Streets Phila. Pa. 19103 (215) 448-1000	NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13, FRC Task No. <u>487/487</u>	Pag .5f
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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEN NO. 58

NOTES:

The licensee has indicated that Amphenol Report 123-1252 is applicable

to this equipment. However no mention of this equipment is made in the

referenced report.

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	A Division of The Franklin Institute

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 59

EQUIPMENT ITEM NO. 59 TERMINAL BLOCK LOCATED IN CONTAINMENT (C230) WESTINGHOUSE MODEL 542247 REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 59 LICENSEE REFERENCE(S): NOT CITED FUNCTION (PLANT ID): TERMINAL BLOCK LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 80

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY: (See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, A, S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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Co	n	т.	ø	n	С	54

Equipment Item

Summary of Licensee Responses to the NRC SER Equipment Environmental Qualification Summary Forms Licensee Response to NRC SER System Consideration Review

Equipment Environmental Qualification Review

Installed TMI Lessons Learned Implementation Equipment Summary

Maintenance and Replacement Schedule Summary

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6a, 6b

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EQUIPMENT ENVIRONMENTA	QUALIFICATION REVIEW OF	EQUIPMENT ITEM NO. 59
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SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:
X The Licensee (has/has not) provide	ed a response to the SER concerns.
The Licensee (has/has not) specific qualified and/or will function who environmental service conditions.	ically stated that the equipment is en exposed to the applicable DBE
The Licensee has presented information outstanding qualification deficies	ation which shows there are no ncies.
X The Licensee (has/has not) propose item whose qualification has not h	ed a corrective action for this equipment been fully established.
X Justification for interim oper Licensee for this equipment is	ration (has (has not) been provided by the tem.
\underline{X} Corrective action specified by	y the Licensee:
Equipment replacement with Equipment modification Equipment relocation above Relocate or shield equipme Verify qualification by ac Equipment relocation to a	e submergence level ent from radiation source dditional (testing/analyzis) mild environment
Qualification testing of e	equipment in progress
The Licensee has provided other that can be construed as a bas operation.	er information for this equipment item sis for justification for interim
The Licensee (has/has not) pro corrective action. (Schedule action	for accomplishing the corrective
The Licensee states that the equip and/or should be exempted from env	pment item does not require qualification vironmental qualification.
DESIGNATION OF RESUL ANT NRC QUALIFICA	ATION EVALUATION CATEGORY BASED ON REVIEW
- CIRCLED ITEM ONLY: (See Section 3 of	ATION EVALUATION CATEGORY BASED ON REVIEW of this TER for Legend)
- CIRCLED ITEM ONLY: (See Section 3 of I.a Qualified	of this TER for Legend) II.c Qualified Life Deficiency
- CIRCLED ITEM ONLY: (See Section 3 of L.a Qualified L.b Modification	of this TER for Legend) II.c Qualified Life Deficiency III.a Exempt
- CIRCLED ITEM ONLY: (See Section 3 of I.a Qualified	of this TER for Legend) II.c Qualified Life Deficiency

A Division of The Franklin Institute 20th and Race Streets. Phila., Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/418</u>

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 179

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	~
	Lished X
Adequate Similarity Between Equipment and Test Specimen Establ	
Aging Degradation Evaluated Adequately Qualified Life or Replacement Schedule Established (If Require	
	ed)
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies	
(If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY

DESIGNATION: X = CATEGORY

I.a	Equipment Qualified	_
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	_
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life	
	or Replacement Schedule Justified	-
III.a	Equipment Exempt From Qualification	
III.D	Equipment Not in the Scope of the Qualification Review	_
IV	Documentation Not Made Available	

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NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/468</u>

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 59

LICENSEE RESPONSE TO NRC SER

6. These components are within the scope of our present assessment/ evaluation activity. Completion of the activity with subsequent action plan is not anticipated until the end of this year or first —quarter of next.

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EQUIPMENT ENVIRONMENTAL QUALIFIC	ATION REVIEW OF EQUIPMENT ITE	M NO. 60
LQUIPMENT ITEM NO. 60 TERMINAL BLOCK LOCATED IN THE MAIN STE WEIDMULLER MODEL SAK REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 60 LICENSEE REFERENCE(S): 1738 FUNCTION (PLANT ID): TERMINAL BLOCK LICENSEE SUBMITTAL: SCEW(S) [1, 12]:		

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY: (See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, A, S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None, Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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Summary of Licensee Responses to the NRC SER Equipment Environmental Qualification Summary Forms Licensee Response to NRC SER System Consideration Review Equipment Environmental Qualification Review

Installed TMI Lessons Learned Implementation Equipment Summary

Maintenance and Replacement Schedule Summary

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A Division of The Franklin Institute 20th and Race Streets. Phila. Pa 19103 (215) 448-1000	NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No/488	Page Ib
QUIPMENT ENVIRONMENTAL QUALIFIC	CATION REVIEW OF EQUIPMENT ITEN	NO. 62
UMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE AN	PPLICABLE:
The Licensee (has/has not) provid	ed a response to the SER concerns.	
The Licensee (has/has not) specif qualified and/or will function wh environmental service conditions.	ically stated that the equipment is en exposed to the applicable DBE	•
X The Licensee has presented inform outstanding qualification deficie	ation which shows there are no ncies.	
The Licensee (has/has not) propositem whose qualification has not	ed a corrective action for this equipeen fully established.	ipment
Justification for interim ope Licensee for this equipment i	ration (has/has not) been provided tem.	by the
Corrective action specified by	y the Licensee:	
Equipment replacement with Equipment modification Equipment relocation above Relocate or shield equipme Verify qualification by ac Equipment relocation to a Qualification testing of Other (e submergence level ent from radiation source dditional (testing/analysis) mild environment)
The Licensee has provided othe that can be construed as a bas operation.	er information for this equipment i sis for justification for interim	tem ,
The Licensee (has/has not) pro corrective action. (Schedule action	ovided a schedule for the proposed for accomplishing the corrective	.)
The Licensee states that the equip and/or should be exempted from en	pment item does not require qualifi vironmental qualification.	cation
ESIGNATION OF RESULTANT NRC QUALIFIC CIRCLED ITEM ONLY: (See Section 3 of	ATION EVALUATION CATEGORY BASED ON of this TER for Legend)	REVIEW
a Qualified b Modification I.a Qualification Not Established I.b Not Qualified	II.c Qualified Life Deficiency III.a Exempt III.b Not in Scope IV Documentation Not Availabl	e

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Franklin Research Center A Division of The Franklin Institute 20th and Race Streets, Phila, Pa. 19103 (215) 448-100 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 487/488

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QUIPMENT ENVIRONMENTAL QUALIFIC	CATION REVIEW OF EQUIPME	NT ITEM N	10.60
EQUIPMENT ENVIRONMENTAL	QUALIFICATION SUMMARY FORM		
		DESIGNATIO	N :
NRC REQUIREMENTS	x	- DEFICIE	NCY
Documented Evidence of Qualification	Adequate		
Adequate Similarity Between Equipment	and Test Specimen Establis	hed	
Aging Degradation Evaluated Adequatel			
Qualified Life or Replacement Schedul	e Established (If Required)	_	
Program Established to Identify Aging		_	
Criteria Regarding Fjing Simulation S		_	
Criteria Regarding Temperature/Pressu	re Exposure:		
o Peak Temperature Adequate		-	_
o Peak Pressure Adequate			
o Duration Adequate			
o Required Profile Enveloped Ade		· · ·	-
o Steam Exposure (If Required) A	dequate		
Criteria Regarding Spray Satisfied Criteria Regarding Submergence Satisf	lind		
Criteria Regarding Radiation Satisfie			
Criteria Regarding Test Sequence Sati			
Criteria Regarding Test Failures or S			
(If Any) Satisfied			
Criteria Regarding Functional Testing	Satisfied	- 1. S. S. S. T.	
Criteria Regarding Instrument Accurac		_	
Test Duration Margin (1 hour + Functi			
Criteria Regarding Margins Satisfied	(NUREG-0588, Cat. I)		
		DESIGNAT	TION:
NRC QUALIF ATION CATEGORY		X = CATE	GORY
I.a Equipment Qualified			X
I.b Equipment Qualification Pendi	ng Modification	_	
II.a Equipment Qualification Not H			

- II.b Equipment Not Qualified II.c Equipment Satisfies All Requirements Except Qualified Life
- or Replacement Schedule Justified
- III.a Equipment Exempt From Qualification
 III.b Equipment Not in the Scope of the Qualification Review
- IV Documentation Not Made Available

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20th and Race Streets. Phila. Pa. 19103 (215) 448-1000

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 60

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-1/0588-11)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO.)
ACCIDENT CONDITIONS			
LOCA/MSLB/HELB/Uncontrolled (4.1, 4.2, 4.3.1, 4.3.3/ 1.1, 1.2, 1.5/1.1, 1.2, 1.5)	LOCA		ļ
Radiation Type	GAMMA	GAMMA	1
Radiation Dose (rd) (4.1.2/1.4/1.4)	2.97×105	200 Mrd.	
Radiation Dose Rate (rd/hr) Radiation Qual. Method (5.3.1/-/-)	NOT STATED	0.62 Mrd/L	
Proximity to Concentrated Radiation (4.1.2/1.4.6/1.4.6)			
Equipment Susceptible to Beta Radiation (4.1.2/-/-)			
Radiation Dose (Normal + Accident) (4.1.2/-/-)	2.97 × 105		
Plateout Dose Considered (-/1.48/1.48)	-		
Gamma + Beta Dose (rd) (4.1.2/1.4.7/1.4.7)	-		

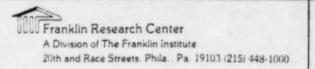


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NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-1/0588-11)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE No.)
ENVIRONMENTAL PROFILE OF ACCIDENT CONDITIONS			
Pata of Torn (Dress	:	SLB/LOCA	1
Rate of Temp./Press. Increase	160/2.6/ND	GROUP I PROFILE	-
		475/75/10 2 MIN.	i
Peak: °F/psig/RH/Time		1375/70/00/4min.	1
Decrease To: °F/psig/RH/Time		1350/110/100/2.6HR	i
Decrease To: °F/psig/RH/Time		340/85 100/9HR	1
secrease io. r/psig/m/lime		300/70/100/ 12 HR	1
Decrease To: °F/psig/RH/Time			1
quipment Surface Tempera-		* 425 FOR GROUP IL PROFILE	:
ture (MSLE) (-/1.2.5.C,	_		i .
2.2.6/1.2.5.C, 2.2.6)			1
pray Qualification Method			
5.3.2/1.3, 2.2.8/1.3,	-	TEST	1
pray Composition		0.28 m H3 BO3	
4.1.4/1.3, 2.2.8/	NA	(3000 ppm boron)	1
		0.064 Na2 5204	
pray Density (gpm/ft ²)		NaOH ph = 10.5	1
pray Duration		0.15 gpm/sqst.	1
	NOT STATEP	~24 hr.	1
ubmergence Duration 4.1.3/2.2.5/2.2.5)	NA	-24 hr.	:
			:
n-Leakage Considered 5.2.6, 5.3.2/-/-)			!
5.2.0, 5.3.2/-/-)			
ime to Submergence			1
ust Environment			;
-/2.2.11/2.2.11)	1.4	_	
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NRC Contract No. NRC-03-79-11
FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 487

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 61

EQUIPMENT ITEM NO. 61 TERMINAL BLOCK LOCATED IN CONTAINMENT (C230) BUCHANAN MODEL 8112 REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 61 LICENSEE REFERENCE(S): NOT CITED FUNCTION (FLANT ID): TERMINAL BLOCK LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 81

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY: (See Section 3 of this TER for Legend)

R, T, QI, RT, P, H, CS, A, S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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Equipment Environmental Qualification Review

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Maintenance and Replacement Schedule Summary

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EQUIPMENT ENVIRONMENTAL QUALIFIC	CATION REVIEW OF EQUIPMENT ITEN	1 NO. 6/
SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE AF	PLICABLE
X The Licensee (has/has not) provide	ed a response to the SER concerns.	
The Licensee (has/has not) specific <u>qualified and/or</u> will function whe environmental service conditions.	ically stated that the equipment is en exposed to the applicable DBE	-
The Licensee has presented information outstanding qualification deficier	ation which shows there are no ncies.	
The Licensee (has/has_not) propose item whose qualification has not b	ed a corrective action for this equ been fully established.	ipment
Justification for interim oper Licensee for this equipment it	ration (has/h as-not) been provided	by the
Corrective action specified by	the Licensee:	
Equipment replacement with Equipment modification Equipment relocation above		
Relocate or shield equipme Verify qualification by ad	ent from radiation source	
Equipment relocation to a	mild environment	
Y Other (Le)
The Licensee has provided othe	r information for this equipment is is for justification for interim	tem
The Licensee (has/has not) pro corrective action. (Schedule action	vided a schedule for the proposed for accomplishing the corrective	.)
The Licensee states that the equip and/or should be exempted from env	ment item does not require qualific	
DESIGNATION OF RESULTANT NRC QUALIFICA - CIRCLED ITEM ONLY: (See Section 3 o	TION EVALUATION CATEGORY BASED ON F	REVIEW
I.a Qualified I.b Modification	II.c Qualified Life Deficiency	
IL a Qualification Not Established	III.a Exempt III.b Not in Scope IV Documentation Not Available	

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A Division of The Franklin Institute 20th and Race Streets, Phila., Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/468</u>

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 61

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION: X = DEFICIENCY

> DESIGNATION: X = CATEGORY

Documented Evidence of Qualification Adequate	X
Adequate Similarity Between Equipment and Test Specimen Established	
Aging Degradation Eval ated Adequately	
Qualified Life or Replacement Schedule Established (If Required)	
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Savere Anomalies	
(If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY

I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	X
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life	
	or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.D	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

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A Division of The Franklin Institute 20th and Race Streets, Phila, Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. _____YF7/465

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 61

LICENSEE RESPONSE TO NRC SER

7. The materials used in the construction of these blocks have been determined to be age insensitive, life established at greater than 120 years. The terminal blocks installed at Calvert Cliffs are mounted within NEGA4 rated enclosures. These enclosures provide sufficient protection from direct impingement of any chemical spray. However, we are still in the process of evaluating the various qualification reports available and expect to complete the evaluation/assessment activity by the end of this year or the first part of next. A Division of The Franklin Institute 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 487

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 62

EQUIPMENT ITEM NO. 62 TERMINAL BLOCK LOCATED IN CONTAINMENT (C230) WEIDMULLER MODEL SAK REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 62 LICENSEE REFERENCE(S): 3644 FUNCTION (PLANT ID): TERMINAL BLOCK LICENSEE SUBMITTAL:' SCEW(S) [1, 12]: 83

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY: (See Section 3 of this TER for Legend)

R, T, QT, RT, P, B, CS, A, S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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EQUIPMENT ENVIRONMENTAL QUALIFI	CATION REVIEW OF EQUIPMENT ITEM	NO. 63
SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE AP	PLICABLE:
The Licensee (has/has not) provid	ded a response to the SER concerns.	
The Licensee (has/has not) species qualified and/or will'function with environmental service conditions.	fically stated that the equipment is hen exposed to the applicable DBE	
X The Licensee has presented inform outstanding qualification deficie	mation which shows there are no encies.	
The Licensee (has/has not) propositem whose qualification has not	sed a corrective action for this equ been fully established.	ipment
Justification for interim opensee for this equipment is	eration (has/has not) been provided item.	by the
Corrective action specified b	by the Licensee:	
Equipment replacement with Equipment modification Equipment relocation above Relocate or shield equipm Verify qualification by a Equipment relocation to a Qualification testing of Other (ve submergence level ment from radiation source additional (testing/analysis) a mild environment	,
The Licensee has provided oth that can be construed as a ba operation.	ner information for this equipment in asis for justification for interim	tem
The Licensee (nas/has not) pr corrective action. (Schedule action	ovided a schedule for the proposed a for accomplishing the corrective	.)
The bloensee states that the equi and/or should be exempted from en	pment item does not require qualific avironmental qualification.	cation
DESIGNATION OF RESULTANT NRC QUALIFIC - CIBCLED ITEM ONLY: (See Section 3	CATION EVALUATION CATEGORY BASED ON I of this TER for Legend)	REVIEW
1.a Qualified 1.b Modification II.a Qualification Not Established	II.c Qualified Life Deficiency III.a Exempt III.b Not in Scope	

Franklin Research Center A Division ci The Franklin Institute 20th and Rice Streets, Phila., Pa. 19103 (215) 448-1000

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 67

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

Documented Evidence of Qualification Adequate Adequate Similarity Between Equipment and Test Specimen Established Aging Degradation Evaluated Adequately Qualified Life or Replacement Schedule Established (If Required) Program Established to Identify Aging Degradation Criteria Regarding Aging Simulation Satisfied (If Required) Criteria Regarding Temperature/Pressure Exposure: o Peak Temperature Adequate

- o Peak Pressure Adequate
- o Duration Adequate
- o Required Profile Enveloped Adequately
- o Steam Exposure (If Required) Adequate Criteria Regarding Spray Satisfied

Criteria Regarding Submergence Satisfied

- Criteria Regarding Radiation Satisfied
- Criteria Regarding Test Sequence Satisfied
- Criteria Regarding Test Failures or Severs Anomalies

(If Any) Satisfied

Criteria Regarding Functional Testing Satisfied Criteria Regarding Instrument Accuracy Satisfied Test Duration Margin (1 hour + Function Time) Satisfied Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)

NRC QUALIFICATION CATEGORY

DESIGNATION:

DESIGNATION: X = DEFICIENCY

X = CATEGORY

I.a	Equipment Qualified	_X_
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life	
	or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	
VI	Documentation Not Made Available	

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 62

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW

Criteria: DOR Guidelines X ; NUREG-0588, Cat. I__; NUREG-0588, Cat. II ___.

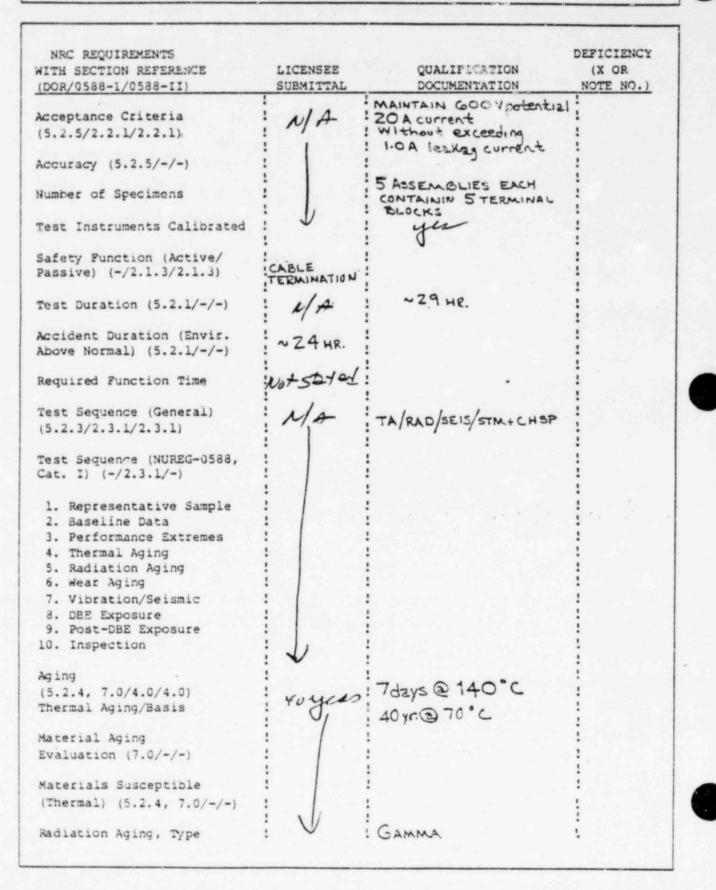
NRC REQUIREMENTS NITH SECTION REFERENCE ((DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO.)
EQUIPMENT DESCRIPTION Equipment Type	TERMINAL	FERMINAL BLOCK	
Manufacturer's Name (5.2.2/-/-)	WEIDMULLER	WEIDMULLER	-
Model Number (5.2.2/-/-)	SAK	SAK 4 SAK GN SAK 10	-
Serial Number	: .		1
<pre>?eatures/Mounting (5.2.6/-/-)</pre>	NOT STATED	HOFFMAN NEMA-4 ENCLOSURE	1
		C - YI PE V	
Connections/Interfaces (5.2.6/-/-)	NOT STATED	G.E. XLPE VULICENE type XHHW S158053L #12AWG, 600V	1
ocation/Elevation	INSICE	4 .24110, 0000	-
quipment ID No.	CONTAINMENT		-
UALIFICATION REPORT (8.0/5.0/5.0) Report ID Number	F-C5205-3	F-C5205-3	
Report Date		OCTOBER 1979	1
Issued by	FIRL	FIRL	
Prepared for		WEIDMULLER TERMNATIONS	1
Referenced Reports		월 20일 - 영상 명원 문	
Qualification Method	1	TEST	
5.1, 5.3/2.1, 2.4/2.1, 2.4)			1
UALIFICATION TEST PROGRAM Functional Test Description (5.2.5/2.2.9/2.2.9)		I.R. MEASUREMENTS (IMIN., 500 VDC)	
Operating Conditions		600 VAC; 150 VAC	1
(-/2.2.10/2.2.10) Load/Cycles/Voltage/ Current/Freq.		during spray exposure due to excessive leakage current	NOTE 1

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NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO.)
Radiation Aging, Dose (rd)	Notstad	SEE ACLIDENT DOSE	
Radiation Aging, Dose Rate	: /	1	1.101
Radiation Aging, Method		1	1.000
Materials Susceptible (Radiation) (5.2.4, 7.0/-/-)			
Operational Aging (-/4.2/-)		VIBRATION AGING S	
Other Age Conditioning (-/4.2/-)	V	SEISMIC TESTING	
Qualified Life Claimed/ Established (5.2.4/4.10/~)	4. yen	10 101100	
Normal Ambient Temperature Normal Ambient Radiation Normal Ambient Humidity	Notszieł U	AT 70°C	1
On-Going Surveillance and Preventive Maintenance (7.0/-/-)	Colour Cliffs Pronto		
On-Going Analysis of Failures and Degradation (7.0/-/-)	-V-	Notstate	
Margin (General) (6.0/3.0/3.0)	NA	Notsiare	C
Margin (NUREG-0588, Cat. I) (-/3.2/-)		1	
<pre>1. Temperature (+15°F) 2. Pressure (+10%,</pre>			
 Radiation (not required) 		\bigvee	
<pre>4. Time (+10%, +1 hour + function time minimum)</pre>		1	

A Division of The Franklin Institute 20th and Race Streets, Phila., Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>497/455</u>

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NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO.)
ACCIDENT CONDITIONS			
LOCA/MSLB/HELB/Uncontrolled (4.1, 4.2, 4.3.1, 4.3.3/ 1.1, 1.2, 1.5/1.1, 1.2, 1.5)	LOCA	LOCA/MSLB	
Radiation Type	GAMMA	GAMMA	1
Radiation Dose (rd) (4.1.2/1.4/1.4)	1.0 × 108	200 Mrd.	
Radiation Dose Rate (rd/hr) Radiation Qual. Method (5.3.1/-/-)	NOT STATED	0.62 Mrd/L	
Proximity to Concentrated Radiation (4.1.2/1.4.6/1.4.6)		NA	
Equipment Susceptible to Beta Radiation (4.1.2/-/-)			
Radiation Dose (Normal + Accident) (4.1.2/-/-)	1.0×108-d		
Plateout Dose Considered (-/1.48/1.48)	-	1	
Gamma + Beta Dose (rd) (4.1.2/1.4.7/1.4.7)	-	V	

A Division of The Franklin Institute 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>4571488</u>

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 62

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NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE No.)
ENVIRONMENTAL PROFILE OF ACCIDENT CONDITIONS			
Rate of Temp./Press. Increase		SLB/LOCA GROUP I PROFILE	1
Peak: °F/psig/RH/Time	: 296/50/ 2H	475/75/10 2 MIN.	
Decrease To: °F/psig/RH/Time	195/14/10/10H	375/70/00/4MIN. 1350/110/100/2.6HR	
Decrease To: °F/psig/RH/Time	decrease 7 0	340/85 100/9HR 340/85 100/9HR 300/70/100/12 HR	
Decrease To: °F/psig/RH/Time	120 in , rday	# 425 FOR GROUP IL PROFILE	
Equipment Surface Tempera- ture (MSLB) (-/1.2.5.C,	-		1
2.2.6/1.2.5.C, 2.2.6)			
Spray Qualification Method (5.3.2/1.3, 2.2.8/1.3, 2.2.8)	-	TEST	-
Spray Composition		: 0.28 m H3 BO3	
(4.1.4/1.3, 2.2.8/ L.3, 2.2.8)	: 021%	(3000 PP n boron)	1
Spray Density (gpm/ft ²)	-	Nach ph = 10.5	
pray Duration	NOT STATEP	0.15 gpm/sqst.	
Submergence Duration (4.1.3/2.2.5/2.2.5)	NA	~24 hr.	
n-Leakage Considered 5.2.6, 5.3.2/-/-)	-	-	-
ime to Submergence	1	-	
Just Environment	-		
(-/2.2.11/2.2.11)		1	:

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10001	Franklin Research Center
	Di sion of The Franklin Institute
	20th and Race Streets. Phila Pa. 19103 (215) 448-1000

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 62

NOTES: The report made the following statement - the anomalo, no

5.8 DESCRIPTION OF FRESH SPRAY EFFECTS ON ELECTRICAL ENERGIZING

As indicated in Section 5.5, the introduction of room-temperature, fresh solution as a spray into the test vessel coincided with large charging/leakage currents (i.e., >1.0 A) until the potentials were lowered to approximately 150 V, which lowered leakage/charging currents to <1.0 A.

This effect had not been previously observed or documented with similar tests conducted at FRC. The effect may involve the splices used between the Kapton-insulated wire and the XLPE-insulated wire, which were covered with two layers of Alpha heat-shrinkable tubing. This splicing method was relatively new at FRC; but it had been used successfully in previous tests, including dummy runs for this program.

The reason for the effect is uncertain, but it is postulated that the thermal gradients between the cold spray solution (approximately 30°7 (27°C)) and the prevailing vessel conditions of approximately 300°7 (149°C) caused a temporary and intermittent low-resistance circuit (somewhere in one or more splice areas) to a ground potential, with resultant high and intermittent leakage currents (>1.0 A at 600 V). The leakage paths appeared to heal themselves after recirculation of the spray solution was started; the recirculating solution was hot (i.e., approximately 200°7 (93°C)). Because many of the heatskrinkable tubings were cracked, it is believed that the splice verformance was contributing to the large leakage currents, but the healing mechanism is not presently understood."

A Division of The Franklin Institute 20th and Race Streets Phila . Pa 19103 (215) 448-1000	NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 487	Page
QUIPMENT ENVIRONMENTAL QUALIFIC	CATION REVIEW OF EQUIPMENT ITEM	NO. <u>63</u>
FOULPMENT ITEM NO. 63		

JUNCTION BOX LOCATED IN CONTAINMENT (C230) HOFFMAN MODEL F8848 REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 63 LICENSEE REFERENCE(S): NOT CITED FUNCTION (PLANT ID): JUNCTION BOX LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 95

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY: (See Section 3 of this TER for Legend) R, T, QT, RT, P, H, CS, A, S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None, Not stated, Not applicable LISTING OF APPLICABLE CHECKSHEETS: Contents Checksheet Page No. Equipment Item la Summary of Licensee Responses to the NRC SER 15 Equipment Environmental Qualification Summary Forms 2 Licensee Response to NRC SER 3a, 3b, 3c, 3d System Consideration Review 4a, 4b, 4c, 4d, 4e, 4f-Equipment Environmental Qualification Review -5a, 5b, 50, 5d, 5e, 5f,

installed TMI Lessons Learned Implementation Equipment Summary

Maintenance and Replacement Schedule Summary

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-7a, 7b, 7c

5g, 5h, 51, 5j

A Division of The Franklin Institute 20th and Race Streets, Phila., Pa 19103 (215) 448-1000	NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No/4F5	F je Ib
QUIPMENT ENVIRONMENTAL QUALIFIC	CATION REVIEW OF EQUIPMENT ITE	M NO. 6.
SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - GNLY CHECKED ITEMS ARE A	PPLICABLE
The Licensee (has/has not) provid	ed a response to the SER concerns.	
The Licensee (has/has not) specifingualified and/or will function when environmental service conditions.	ically stated that the equipment i en exposed to the applicable DBE	5
The Licensee has presented inform outstanding qualification deficies	ation which shows there are no ncies.	
The Licensee (has/has not) propose item whose qualification has not h	ed a corrective action for this equebeen fully established.	uipment
Justification for interim oper Licensee for this equipment is	ration (has/has not) been provided tem.	by the
Corrective action specified by	y the Licensee:	
Equipment replacement with Equipment modification Equipment relocation above Relocate or shield equipme Verify qualification by ac Equipment relocation to a Qualification testing of a Other (e submergence level ent from radiat on source dditional (testing/analysis) mild environment)
The Licensee has provided other that can be construed as a bas operation.	er information for this equipment sis for justification for interim	item
The Licensee (has/has not) pro corrective action. (Schedule action	ovided a schedule for the proposed for accomplishing the corrective)
The Licensee states that the equip and/or should be exempted from env	pment item does not require qualif. vironmental qualification.	ication
DESIGNATION OF RESULTANT NRC QUALIFICA - CIRCLED ITEM ONLY: (See Section 3 of	AFION EVALUATION CATEGORY BASED ON of this TER for Legend)	REVIEW
I.a Qualified I.b Modification II.a Qualification Not Established	II.c Qualified Life Deficiency III.a Exempt	

NRC Contract No. NRC-03-79-118 Page Franklin Research Center FRC Project No. C5257 A Division of The Franklin Institute FRC Assignment No. 13 2 20th and Race Streets. Phila .. Pa. 19103 (215) 448-1000 FRC Task No. _ 487/488 EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 63 EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM DESIGNATION: X = DEFICIENCY NRC REQUIREMENTS Documented Evidence of Qualification Adequate Adequate Similarity Between Equipment and Test Specimen Established Aging Degradation Evaluated Adequately Qualified Life or Replacement Schedule Established (If Required) Program Established to Identify Aging Degradation Criteria Regarding Aging Simulation Satisfied (If Required) Criteria Regarding Temperature/Pressure Exposure: o Peak Temperature Adequate o Peak Pressure Adequate o Duration Adequate

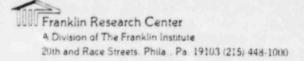
o Required Profile Enveloped Adequately o Steam Exposure (If Required) Adequate Criteria Regarding Spray Satisfied Criteria Regarding Submergence Satisfied Criteria Regarding Radiation Satisfied Criteria Regarding Test Sequence Satisfied Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied Criteria Regarding Functional Testing Satisfied Criteria Regarding Instrument Accuracy Satisfied Test Duration Margin (1 hour + Function Time) Satisfied Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)

NRC QUALIFICATION CATEGORY

DESIGNATION: X = CATEGORY

I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
IIa	Equipment Exempt From Qualification	
III.)	Equipment Not in the Scope of the Qualification Review	X
IV	Documentation Not Made Available	

This stem is merely in endowed for electrical equipment which is undurked claumbers in this TER



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 64

EQUIPMENT ITEM NO. 64 JUNCTION BOX LOCATED IN CONTAINMENT (C230) HOFFMAN MODEL F4424 REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 64 LICENSEE REFERENCE(S): NOT CITED FUNCTION (PLANT ID): JUNCTION BOX LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 94

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY: (See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, A, S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated,) Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

c 14.	-	-	-	-	-	-	-
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Checksheet Page No.

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4a, 4b, 4c, 4d, 4e, 4f-

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Equipment Item Summary of Licensee Responses to the NRC SER Equipment Environmental Qualification Summary Forms Licensee Response to NRC SER System Consideration Review

Equipment Environmental Qualification Review

Installed TMI Lessons Learned Implementation Equipment Summary

Maintenance and Replacement Schedule Summary

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EQUIPMENT ENVIR	ONMENTAL QUALIFIC	CATION REVIEW OF EQUIPMENT ITE	M NO. 6
SUMMARY OF LICENS	EE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE I	APPLICABLE
The Licensee	(has/has not) provid	ed a response to the SER concerns.	
qualified and	(has/has not) specif /or will'function wh service conditions.	ically stated that the equipment i en exposed to the applicable DBE	is
X The Licensee outstanding g	has presented inform ualification deficie	ation which shows there are no ncies.	
The Licensee item whose qu	(has/has not) proposalification has not	ed a corrective action for this equipeen fully established.	luipment
Justifica Licensee	tion for interim open for this equipment i	ration (has/has not) been provided tem.	by the
Correctiv	e action specified b	y the Licensee:	
Equip Equip	ment replacement with ment modification	h qualified equipment	
	ment relocation above	e submergence level	
Reloc	ate or shield equipme	ent from radiation source	
Verif	y qualification by ac	dditional (testing/analysis)	
Equip	ment relocation to a	mild environment	
Quall Other		equipment in progress)
The Licen that can operation	be construed as a bas	er information for this equipment sis for justification for interim	item
The Licen: corrective action	see (has/has not) pro e action. (Schedule	ovided a schedule for the proposed for accomplishing the corrective	
The Licensee	states that the equip	pment item does not require qualif	, ication
and/or should	be exempted from env	vironmental qualification.	
DESIGNATION OF RE: - CIRCLED ITEM ON	SULTANT NRC QUALIFICA	ATION EVALUATION CATEGORY BASED ON of this TER for Legend)	REVIEW
I.a Qualified I.b Modification		II.c Qualified Life Deficiency III.a Exempt	
	Not Established	III.b Not in Scope	
II.b Not Qualified			

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 6

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION: X = DEFICIENCY

> DESIGNATION: X = CATEGORY

Documented Evidence of Qualification Adequate Adequate Similarity Between Equipment and Test Specimen Established Aging Degradation Evaluated Adequately Qualified Life or Replacement Schedule Established (If Required) Program Established to Identify Aging Degradation Criteria Regarding Aging Simulation Satisfied (If Required) Criteria Regarding Temperature/Pressure Exposure: o Peak Temperature Adequate o Peak Pressure Adequate o Duration Adequate

o Required Profile Enveloped Adequately o Steam Exposure (If Required) Adequate

Criteria Regarding Spray Satisfied

Criteria Regarding Submergence Satisfied Criteria Regarding Radiation Satisfied

Criteria Regarding Test Sequence Satisfied Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied

Criteria Regarding Functional Testing Satisfied Criteria Regarding Instrument Accuracy Satisfied Test Duration Margin (1 hour + Function Time) Satisfied Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)

NRC QUALIFICATION CATEGORY

I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	-0-
III.b	Equipment Not in the Scope of the Qualification Review	<u>_X</u>
IV	Documentation Not Made Available	

This equipment is only an indenne for equipment enaburated elsewhere in this TER.

Franklin Research Center A Division of The Franklin Institute 20th and Race Streets, Phila . Pa 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. _ 487

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 65

EOUIPMENT ITEM NO. 65 JUNCTION BOX LOCATED IN CONTAINMENT (C230) FIELD FABRICATED, MODEL NOT STATED REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 65 LICENSEE REFERENCE(S): NOT CITED FUNCTION (PLANT ID): JUNCTION BOX LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 78

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY: (See Section 3 of this TER for Legend)

R, T, QI', RT, P, H, CS, A, S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

(Not stated,) Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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Checksheet Page No.

la Equipment Item Summary of Licensee Responses to the NRC SER 1b Equipment Environmental Qualification Summary Forms 2 3a, 3b, 30, 3d-Licensee Response to NRC SER 4a, 4b, 40, 4d, 4e, 4E-System Consideration Review 5a, 5b, 50, 5d, 5e, SE,

Equipment Environmental Qualification Review

Installed TMI Lessons Learned Implementation Equipment Summary

Maintenance and Replacement Schedule Summary

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5g, 5h, 51, 5j

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QUIPMENT ENVIRONMENTAL QUALIFIC	ATION REVIEW OF EQUIPMENT ITEM	NO. 65
SUMMARY OF LICENSEE RESPONSES TO THE N	IRC SEF - ONLY CHECKED ITEMS ARE AP	PLICABLE
The Licensee (has/has not) provide	d a response to the SER concerns.	
The Licensee (has/has not) specifi qualified and/or will function whe environmental service conditions.	cally stated that the equipment is in exposed to the applicable DBE	
X The Licensee has presented informa outstanding qualification deficien	tion which shows there are no cies.	
The Licensee (has/has not) propose item whose qualification has not b	d a corrective action for this equi een fully established.	ipment
Justification for interim oper Licensee for this equipment it	ation (has/has not) been provided hem.	by the
Corrective action specified by	the Licensee:	
Equipment replacement with Equipment modification Equipment relocation above Relocate or shield equipme Verify qualification ty ad Equipment relocation to a Qualification testing of equipment Other (submergence level nt from radiation source ditional (testing/analysis) mild environment)
The Licensee has provided other that can be construed as a bas operation.	r information for this equipment it is for justification for interim	em.
The Licensee (has/has not) pro- corrective action. (Schedule action	vided a schedule for the proposed for accomplishing the corrective	.)
The Licensee states that the equips and/or should be exempted from envi	ment item does not require qualific ironmental qualification.	ation
ESIGNATION OF RESULTANT NRC QUALIFICA CIRCLED ITEM ONLY: (See Section 3 of	TION EVALUATION CATEGORY BASED ON R f this TER for Legend)	EVIEW
.a Qualified .b Modification I.a Qualification Not Established I.b Not Qualified	II.c Qualified Life Deficiency III.a Exempt III.b Not in Scope IV Documentation Not Available	

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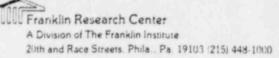
Franklin Research Center A Division of The Franklin Institute 20th and Bace Streets, Phila, Pa. 19103 (215) 448-100 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 40/487

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20th and Race Streets. Phila Pa. 19103 (215) 448-10	00 FRC Task No. 40/488
QUIPMENT ENVIRONMENTAL QUAL	IFICATION REVIEW OF EQUIPMENT ITEM NO. 63
EQUIPMENT ENVIRONMEN	TAL QUALIFICATION SUMMARY FORM
	DESIGNATION:
NRC REQUIREMENTS	X = DEFICIENCY
and the second	and the second
Documented Evidence of Qualificati	
Adequate Similarity Between Equipm Aging Degradation Evaluated Adequa	
Qualified Life or Replacement Sche	dule Established (If Required)
Program Established to Identify Ag	
Criteria Regarding Aging Simulatio	n Satisfied (If Required)
Criteria Regarding Temperature/Pre	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped	
o Steam Exposure (If Required	
Criteria Regarding Spray Satisfied Criteria Regarding Submergence Sat	
Criteria Regarding Radiation Satis	
Criteria Regarding Test Sequence S	
Criteria Regarding Test Failures o	
(If Any) Satisfied	
Criteria Regarding Functional Test	ing Satisfied
Criteria Regarding Instrument Accu	
Test Duration Margin (1 hour + Fun	
Criteria Regarding Margins Satisfi	ed (NUREG-0588, Cat. I)
	DESIGNATION:
NRC QUALIFICATION CATEGORY	X = CATEGORY
I.a Equipment Qualified	
I.b Equipment Qualification Pe	nding Modification
II.a Equipment Qualification No	t Established
II.b Equipment Not Qualified	the second s
II.c Equipment Satisfies All Re	quirements Except Qualified Life

or Replacement Schedule Justified III.a Equipment Exempt From Qualification III.b Equipment Not in the Scope of the Qualification Review X IV Documentation Not Made Available

This equipment is the endowed for electural equipment which & evoluated elsewhere in This TER.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 66

EQUIPMENT ITEM NO. 66 TERMINAL LUG LOCATED IN CONTAINMENT (C230) AMP MODEL 34000 SERIES REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 66 LICENSEE REFERENCE(S): 21 FUNCTION (PLANT ID): TERMINAL LUG LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 84

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY: (See Section 3 of this TER for Legend)

R, T, QI, RT, P, H, CS, A, S, (R), M, I, QM, RFN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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Checksheet Page No.

3a, 3b, 3e, 3d

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-4a, 4b, -4c, 4d, 4e, 4E-

-5a, 5b, 50, 5d, 5e, 5f,

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Equipment Item Summary of Licensee Responses to the NRC SER Equipment Environmental Qualification Summary Forms Licensee Response to NRC SER System Consideration Review

Equipment Environmental Qualification Review

Installed TMI Lessons Learned Implementation Equipment Summary

Maintenance and Replacement Schedule Summary

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QUIPMENT ENVIRONMENTAL QUALIFIC	CATION REVIEW OF EQUIPMENT ITE	M NO. 66
SUMMARY OF LICENSEE RESPONSES TO THE	NEC SER - ONLY CHECKED TTEMS ADD A	
X The Licensee (has/has not) provid		
X The Licensee (has/has not) specific qualified and/or will 'function when vironmental service conditions.	nen exposed to the applicable DBE	3
The Licensee has presented inform outstanding qualification deficie	mation which shows there are no encies.	
The Licensee (has/bas not) propos item whose qualification has not	sed a corrective action for this equipment fully established.	uipment
Justification for interim ope Licensee for this equipment i	eration (has/ has not) been provided .tem.	by the
\mathbf{X} Corrective action specified b	by the Licensee:	
Equipment replacement wit Equipment modification Equipment relocation abov Relocate or shield equipm	ve submergence level	
Verify qualification by a Equipment relocation to a Qualification testing of	dditional (testing/analysis) mild environment	
× Other (maluation)
The Licensee has provided oth that can be construed as a ba operation.	er information for this equipment i sis for justification for interim	ltem
The Licensee (base/has not) pr corrective action. (Schedule action	ovided a schedule for the proposed for accomplishing the corrective)
The Licensee states that the equi and/or should be exempted from en	pment item does not require qualifivity vironmental qualification.	lcation
ESIGNATION OF RESULTANT NRC QUALIFIC CIRCLED ITEM ONLY: (See Section 3	ATION EVALUATION CATEGORY BASED ON of this TER for Legend)	REVIEW
.a gualified .b Modification I.a Qualification Not Established	II.c Qualified Life Deficiency III.a Exempt III.b Not in Scope	
I.b Not Qualified	IV Documentation Not Availabl	.e

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Franklir. Research Center A Division of The Franklin Institute 20th and Race Streets. Phila... Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/458</u>

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DESIGNATION: X = DEFICIENCY

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 64

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

Documented Evidence of Qualification Adequate Adequate Similarity Between Equipment and Test Specimen Established Aging Degradation Evaluated Adequately Qualified Life or Replacement Schedule Established (If Required) Program Established to Identify Aging Degradation Criteria Regarding Aging Simulation Satisfied (If Required) Criteria Regarding Temperature/Pressure Exposure: o Peak Temperature Adequate

- o Peak Pressure Adequate
- o Duration Adequate
- Required Profile Enveloped Adequately
 Steam Exposure (If Required) Adequate

Criteria Regarding Spray Satisfied

Criteria Regarding Submergence Satisfied Criteria Regarding Radiation Satisfied Criteria Regarding Test Sequence Satisfied Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied

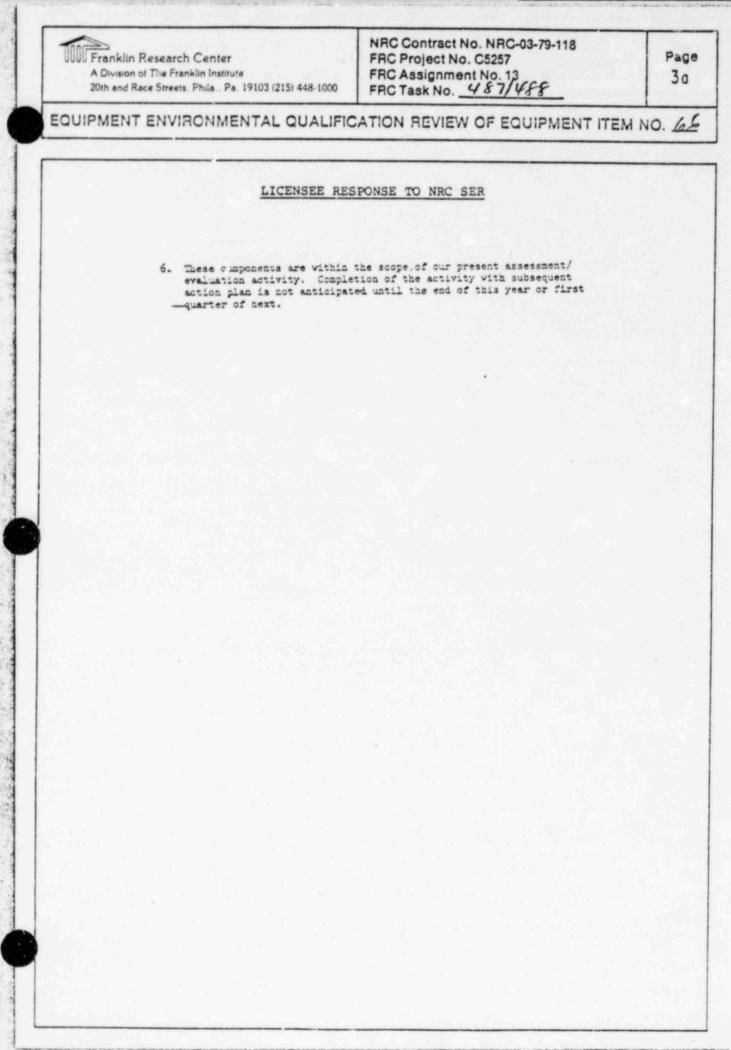
Criteria Regarding Functional Testing Satisfied Criteria Regarding Instrument Accuracy Satisfied Test Duration Margin (1 hour + Function Time) Satisfied Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)

NRC QUALIFICATION CATEGORY

DESIGNATION: X = CATEGORY

I.a	Equipment Qualified	-
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	->
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life	
	or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.D	Equipment Not in the Scope of the Qualification Review	-
IV	Documentation Not Made Available	-

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Dision of The Franklin Institute Oth and Race Streets. Phila. Pa. 19103 (215) 448-1000	NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/481</u>	Page 5 f
EQUIPMENT ENVIRONMENTAL QUALIFIC	CATION REVIEW OF EQUIPMENT ITE	M NO. 66
NOTES:		
The licensee has indicated that A	mphenol Report 123-1252 is applica	able
to this equipment. However no men		
referenced report.		
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	al construction and a second second	
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A Division of The Franklin Institute 20th and Race Streets. Phila Pa. 19103 (215) 448-1000	NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487</u>	
EQUIPMENT ENVIRONMENTAL QUALIFIC	ATION REVIEW OF EQUIPMENT ITEM N	C

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EQUIPMENT ITEM NO. 67 TERMINAL LUG LOCATED IN CONTAINMENT (C230) THOMAS AND BETTS MODEL 53000 SERIES REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 67 LICENSEE REFERENCE(S): NOT CITED FUNCTION (PLANT ID): TERMINAL LUG LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 85

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY: (See Section 3 of this TER for Legend)

(R, T, QT, (RT) (P, H, CS, A, S, (R), M, I, (M, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents Checksheet Page No. Equipment Item la Summary of Licensee Responses to the NRC SER 15 Equipment Environmental Qualification Summary Forms 2 Licensee Response to NRC SER 3a, 3b, 3c, 3d-System Consideration Review 4a, 4b, 4c, 4d, 4e, 4f-Equipment Environmental Qualification Review 5a, 5b, 5c, 5d, 5e, 5f, 59, 5h, 51, 5j Installed TMI Lessons Learned Implementation 60, 60-Equipment Summary

Maintenance and Replacement Schedule Summary

-7ay 70y 70-

PARTICIAL PROPERTY AND

A Division of The Franklin Institute 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000	NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/465</u>	Page 1b
QUIPMENT ENVIRONMENTAL QUALIFIC	ATION REVIEW OF EQUIPMENT ITE	M NO. 6
SUMMARY OF LICENSEE RESPONSES TO THE N	NRC SER - ONLY CHECKED ITEMS ARE A	PPLICABLE
X The Licensee (has/hee not) provide	d a response to the SER concerns.	
The Licensee (has/has not) specifi qualified and/or will function whe environmental service conditions.	cally stated that the equipment is an exposed to the applicable DBE	S
The Licensee has presented informa outstanding qualification deficien	tion which shows there are no cies.	
Y The Licensee (has/has not) propose item whose qualification has not b	ed a corrective action for this equipeen fully established.	uipment
X Justification for interim oper Licensee for this equipment it	ation (has/h as not) b een provided em.	by the
X Corrective action specified by	the Licensee:	
Equipment replacement with Equipment modification	qualified equipment	
Equipment relocation above		
Relocate or shield equipme Verify qualification by ad		
Equipment relocation to a	mild environment	
Qualification testing of e)
The Licensee has provided othe that can be construed as a bas operation.	r information for this equipment i is for justification for interim	tem
The Licensee (nas/has not) pro corrective action. (Schedule action	vided a schedule for the proposed for accomplishing the corrective	•)
The Licensee states that the equip and/or should be exempted from env	ment item does not require qualifi ironmental qualification.	cation
ESIGNATION OF RESULTANT NRC QUALIFICA CIRCLED ITEM ONLY: (See Section 3 o	TION EVALUATION CATEGORY BASED ON f this TER for Legend)	REVIEW
.a Qualified	II.c Qualified Life Deficiency	
.b Modification I.a Qualification Not Established	III.a Exempt III.b Not in Scope	
I.b Not Qualified	IV Documentation Not Availabl	e

Franklin Research Center A Division of The Franklin Institute DL 1. D. 10103 (015) 110 1000

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NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13

Page 2

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FO	ORM
	DESIGNATION:
NRC REQUIREMENTS	X = DEFICIENCY
Documented Evidence of Qualification Adequate	V
Adequate Similarity Between Equipment and Test Specimen Estab.	lished
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Require	ed)
Program Established to Identify Aging Degradation	C-1200 - 00 - 000000
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies	
(If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUMEG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY

I.a Equipment Qualified Equipment Qualification Pending Modification I.b ____ Equipment Qualification Not Established II.a II.b Equipment Not Qualified II.c Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified III.a Equipment Exempt From Qualification III.b Equipment Not in the Scope of the Qualification Review IV Documentation Not Made Available

A Division of The Franklin Institute 20th and Race Streets. Phila., Pa. 19103 (215) 448-1000

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 67

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LICENSEE RESPONSE TO NRC SER

6. These components are within the scope of our present assessment/ evaluation activity. Completion of the activity with subsequent action plan is not anticipated until the end of this year or first —quarter of next.

A Division of The Franklin Institute 20th and Race Streets, Phila, Pa 19103 (215) 448-1000	NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 487	Page I a
EQUIPMENT ENVIRONMENTAL QUALIFIC	CATION REVIEW OF EQUIPMENT ITEM I	NO. <u>68</u>
EQUIPMENT ITEM NO. 68 ELECTRICAL CONNECTOR LOCATED IN CONT BENDIX MODEL 3902-1 REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 68 LICENSEE REFERENCE(S): NOT CITED FUNCTION (PLANT ID): CONNECTORS LICENSEE SUBMITTAL: SCEW(S) [1, 12]		
DESIGNATION FOR DEFICIENCY IDENTIFIES (See Section 3 of this TER for Legend	1)	
(See Section 3 of this TER for Legend R. T. QT. RT. P, H, CS, A. S, (R), M	and has been added as a standard with a second of the second standard with a standard with a second standard with a standard	
(See Section 3 of this TER for Legend	1)	
(See Section 3 of this TER for Legend R, T, QT, RT, P, H, CS, A, S, (R), M Not stated, Not applicable	1)	
(See Section 3 of this TER for Legend R, T, QT, RT, P, H, CS, A, S, (R), M Not stated, Not applicable LISTING OF APPLICABLE CHECKSHEETS:	i) , I, QM, RPN, EXN, SEN, QI, RPS, None	
(See Section 3 of this TER for Legend R. T. OT. RT. P. H. CS. A. S. (R), M. Not stated, Not applicable <u>LISTING OF APPLICABLE CHECKSHEETS</u> : <u>Contents</u>	i) , I, QM, RPN, EXN, SEN, QI, RPS, None <u>Checksheet Page No.</u> la	
(See Section 3 of this TER for Legend R. T. QT. RT. P. H. CS. A. S. (R), M. Not stated, Not applicable <u>LISTING OF APPLICABLE CHECKSHEETS</u> : <u>Contents</u> Equipment Item	i) , I, QM, RPN, EXN, SEN, QI, RPS, None <u>Checksheet Page No.</u> la NRC SER lb	
(See Section 3 of this TER for Legend R. T. T. RT. P. H. CS. A. S. (R), M. Not stated, Not applicable <u>LISTING OF APPLICABLE CHECKSHEETS</u> : <u>Contents</u> Equipment Item Summary of Licensee Responses to the	i) , I, QM, RPN, EXN, SEN, QI, RPS, None <u>Checksheet Page No.</u> la NRC SER lb	
(See Section 3 of this TER for Legend R. T. QT. RT. P. H. CS. A. S. (R), M Not stated, Not applicable <u>LISTING OF APPLICABLE CHECKSHEETS</u> : <u>Contents</u> Equipment Item Summary of Licensee Responses to the Equipment Environmental Qualification	i) I, M, RPN, EXN, SEN, QI, RPS, None <u>Checksheet Page No.</u> la NRC SER b n Summary Forms 2	
(See Section 3 of this TER for Legend R. T. T. RT. P. H. CS. A. S. (R), M. Not stated, Not applicable <u>LISTING OF APPLICABLE CHECKSHEETS</u> : <u>Contents</u> Equipment Item Summary of Licensee Responses to the Equipment Environmental Qualification Licensee Response to NRC SER	A) I. (M) RPN, EXN, SEN, (I, RPS, None <u>Checksheet Page No.</u> la NRC SER b Summary Forms 2 3a, 3b, 3c, 3d 4a, 4b, 4c, 4d, 4c,	,
(See Section 3 of this TER for Legend R. T. QT. RT. P. H. CS. A. S. (R), M. Not stated, Not applicable <u>LISTING OF APPLICABLE CHECKSHEETS</u> : <u>Contents</u> Equipment Item Summary of Licensee Responses to the Equipment Environmental Qualification Licensee Response to NRC SER System Consideration Review	a) I, (M) RPN, EXN, SEN, (QI) , RPS, None Checksheet Page No. la NRC SER b n Summary Forms 2 3a, $\frac{3b}{3c}$, $\frac{3c}{3d}$ 4a, $\frac{4b}{4c}$, $\frac{4c}{4d}$, $\frac{4c}{4c}$, h Review $\frac{5a}{5b}$, $\frac{5c}{5c}$, $\frac{5d}{5c}$, $\frac{5c}{5c}$, $\frac{5d}{5c}$, $\frac{5c}{5c}$, $\frac{5d}{5c}$, $\frac{5c}{5c}$,

Franklin Research Center A Division of The Franklin Institute 20th and Race Streets Phila Va. 19103 (215) 448-1000	NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/488</u>	Page 15
QUIPMENT ENVIRONMENTAL QUALIFIC	CATION REVIEW OF EQUIPMENT ITE	M NO. 68
SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE	APPLICABLE:
\underline{X} The Licensee (has/hes-not) provid	ed a response to the SZR concerns.	
The Licensee (has/has not) specif qualified and/or will function wh environmental service conditions.	ically stated that the equipment i en exposed to the applicable DBE	Ls
The Licensee has presented inform outstanding qualification deficies	ation which shows there are no ncies.	
The Licensee (has/has not) propose item whose qualification has not h	ed a corrective action for this equation for this equation fully established.	quipment
X Justification for interim oper Licensee for this equipment is	ration (has/had-not) been provided	i by the
X Corrective action specified by		
Equipment replacement with Equipment modification		
Equipment relocation above Relocate or shield equipme Verify qualification by ac	ent from radiation source dditional (testing/analysis)	
Equipment relocation to a Qualification testing of e Other (EVALUATION	mild environment equipment in progress	,
The Licensee has provided othe that can be construed as a bas operation.	er information for this equipment sis for justification for interim	item
<u>X</u> The Licensee (nas/has not) pro corrective action. (Schedule action	ovided a schedule for the proposed for accomplishing the corrective	
The Licensee states that the equip and/or should be exempted from env	oment item does not require qualif vironmental qualification.	ication
ESIGNATION OF RESULTANT NRC QUALIFICA CIRCLED ITEM ONLY: (See Section 3 of	TION EVALUATION CATEGORY BASED ON	REVIEW
a Qualified b Modification La Qualification Not Established	II.c Qualified Life Deficiency III.a Exempt III.b Not in Scope	
I.b Not Qualified	IV Documentation Not Availab	le

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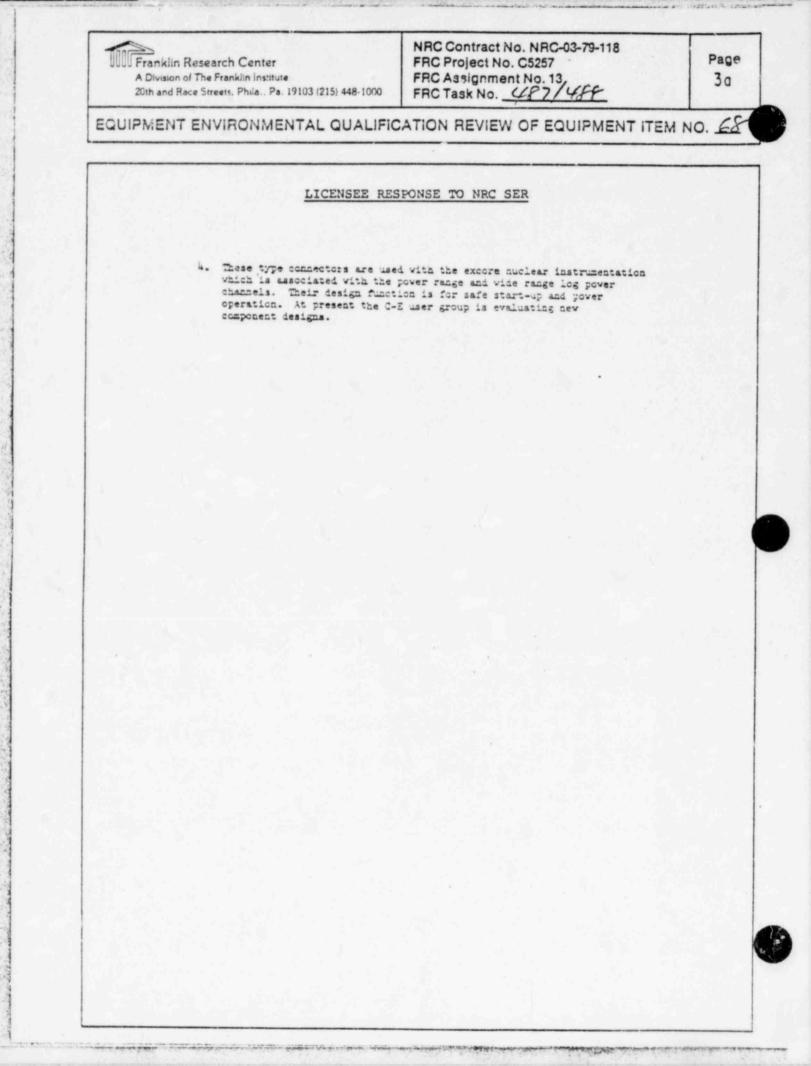
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NRC Contract No. NRC-03-79-118 Page FRC Project No. C5257 Franklin Research Center A Division of The Franklin Institute FRC Assignment No. 13 2 FRC Task No. 487/488 20th and Race Streets. Phila., Pa. 19103 (215) 448-1000 EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 68 EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM DESIGNATION: X = DEFICIENCY NRC REQUIREMENTS Documented Evidence of Qualification Adequate Adequate Similarity Between Equipment and Test Specimen Established Aging Degradation Evaluated Adequately Qualified Life or Replacement Schedule Established (If Required) Program Established to Identify Aging Degradation Criteria Regarding Aging Simulation Satisfied (If Required) Criteria Regarding Temperature/Pressure Exposure: o Peak Temperature Adequate o Peak Pressure Adequate o Duration Adaquate O Required Profile Enveloped Adequately o Steam Exposure (If Required) Adequate Criteria Regarding Spray Satisfied Criteria Regarding Submergence Satisfied Criteria Regarding Radiation Satisfied Criteria Regarding Test Sequence Satisfied Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied Criteria Regarding Functional Testing Satisfied Criteria Regarding Instrument Accuracy Satisfied Test Duration Margin (1 hour + Function Time) Satisfied Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) DESIGNATION: X = CATEGORY NRC QUALIFICATION CATEGORY

Equipment Qualified I.a Equipment Qualification Pending Modification I.b Equipment Qualification Not Established II.a II.b Equipment Not Qualified Equipment Satisfies All Requirements Except Qualified Life II.c or Replacement Schedule Justified III.1 Equipment Exempt From Qualification III.D Equipment Not in the Scope of the Qualification Review IV Documentation Not Made Available

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A Division of The Franklin Institute 20th and Race Streets. Phila., Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 487 488

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 68

SYSTEM CONSIDERATION REVIEW

The Licensee has stated that this equipment item does not require environmental qualification and/or should be exempted from qualification. The Licensee's rationale has been evaluated and the reasons for concurrence/ non-concurrence with the technical basis of the Licensee's position are presented below.

Reason for Concurrence

- Y Equipment does not provide a safety function or mitigate the consequences of a design basis accident. Equipment Environmental Qualification is not required by the DOR Guidelines. (NRC Qualification Evaluation Category IIIa)
 - Equipment is not exposed to a harsh environment by the accident it is intended to mitigate. See note (1) on page 4b. (NRC Qualification Evaluation Category IIIb)
 - Backup (equipment/system) is available which completely performs the safety function. The backup (equipment/system) is environmentally qualified and appears to meet single active failure criterion. See note (1) on page 4b. (NRC Qualification Evaluation Category IIIa)

Reason for Non-Concurrence

- Backup (equipment/system) is not fully capable of performing the intended safety function or accident mitigating function.
- Backup (equipment/system) is not environmentally qualified and can be exposed to a hostile environment simultaneously with the primary equipment.
 - Backup (equipment/system) is subject to a potentially disabling single active failure.
- Failure of the primary equipment can compromise the ability of other safety-related equipment to perform its specified safety function.
- Pailure of the primary equipment can result in erroneous indication which could mislead an operator.
 - Requirement for continued functioning throughout the post-accident period necessitates environmental qualification.

This equipment item (muclear instrumentation) has bein exempted from qualification by NRC and has been noted by The Ticinsel in PSR # 5187

A Division of The Franklin Institute 20th and Race Streets. Phila. Pa 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 487

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 69

EQUIPMENT ITEM NO. 69 ELECTRICAL CONNECTOR LOCATED IN CONTAINMENT (C230) AMPHENOL MODEL 82-320-1004 REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 69 LICENSEE REFERENCE(S): NOT CITED FUNCTION (PLANT ID): CONNECTORS LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 91

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER (See Section 3 of this TER for Legend)	- CIRCLED ITEM(S) ONLY:
R, T, (T, RT) P, H, (S, A, S, (R), M, I, (M, RPN, EX	N, SEN, QI, RPS, None,
Not stated, Not applicable	
LISTING OF APPLICABLE CHECKSHEETS:	
Contents	Checksheet Page No.
Equipment Item	la
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Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, 3b, 3c, 3d
System Consideration Review	4a, 4b, 4e, 4d, 4e, 4f
Equipment Environmental Qualification Review	-Sa, -3b, 5c, 5d, 5e, 5f, -5g, 5h, 5t, 5j-
Installed TMI Lessons Learned Implementation Equipment Summary	-6a, 6b
Maintenance and Replacement Schedule Summary	-7a, 7b, 7c-

A Decision of The Franklin Institute 20an and Race Streets. Phila. Pa 19103 (215) 448-1000	NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/488</u>	Page 1b
QUIPMENT ENVIRONMENTAL QUALIFIC	ATION REVIEW OF EQUIPMENT ITEN	M NO. <u>69</u>
SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE A	PPLICABLE
X The Licensee (has/has not) provide	ed a response to the SER concerns.	
The Licensee (has/has not) specifiqualified and/or will function whe environmental service conditions.	ically stated that the equipment is an exposed to the applicable DBE	3
The Licensee has presented information outstanding qualification deficient	ation which shows there are no acies.	
X The Licensee (has/ has not) propose item whose qualification has not b	ed a corrective action for this equipeen fully established.	uipment
X Justification for interim oper Licensee for this equipment it	ration (has/ hao not) been provided tem.	by the
X Corrective action specified by	the Licensee:	
Equipment replacement with	qualified equipment	
Equipment modification Equipment relocation above	submargance laval	*
Falocate or shield equipme		
Verify qualification by ad	ditional (testing/analysis)	
Equipment relocation to a Qualific esting of e	mild environment	
X Other	duipment in progress	
The Licensee	er information for this equipment i	tem
operation.	sis for justifization for interim	
X The Licensee (nes/has not) pro	ovided a schedule for the proposed	
corrective action. (Schedule	for accomplishing the corrective	
action		-)
The Licensee states that the equip and/or should be exempted from env	ment item does not require qualifivity in a second se	cation
ESIGNATION OF RECULTANT NDC OUN TRAC	TON PULLINGTON CLARGOON STORE OF	D. CRUZ CO.
DESIGNATION OF RESULTANT NRC QUALIFICA - CIRCLED ITEM ONLY: (See Section 3 of	of this TER for Legend)	REVIEW
.a Qualified	II.c Qualified Life Deficiency	
.b Modification	III.a Exempt]	
I.a Qualification Not Established I.b Not Qualified	III.b Not in Scope IV Documentation Not Availabl	

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Franklin Research Center A Division of The Franklin Institute 20th and Race Streets. Phila.. Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13, FRC Task No. 487/488

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DESIGNATION: X = DEFICIENCY

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 69

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

Documented Evidence of Qualification Adequate Adequate Similarity Between Equipment and Test Specimen Established Aging Degradation Evaluated Adequately Qualified Life or Replacement Schedule Established (If Required) Program Established to Identify Aging Degradation Criteria Regarding Aging Simulation Satisfied (If Required) Criteria Regarding Temperature/Pressure Exposure: o Peak Temperature Adequate

- o Peak Pressure Adequate
- o Duration Adequate
- o Required Profile Enveloped Adequately

o Steam Exposure (If Required) Adequate Criteria Regarding Spray Satisfied

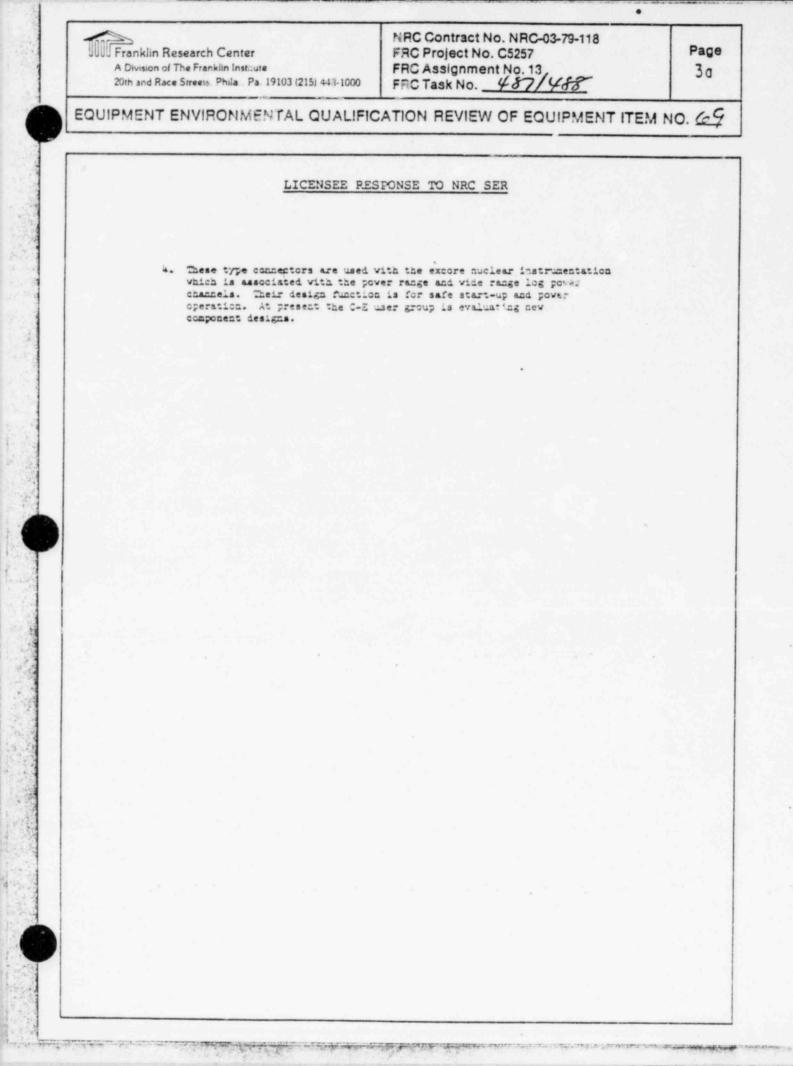
Criteria Regarding Submergence Satisfied Criteria Regarding Radiation Satisfied Criteria Regarding Test Sequence Satisfied Criteria Regarding Test Failures or Severe Anomalies

(If Any) Satisfied Criteria Regarding Functional Testing Satisfied Criteria Regarding Instrument Accuracy Satisfied Test Duration Margin (1 hour + Function Time) Satisfied Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)

NRC QUALIFICATION CATEGORY

DESIGNATION: X = CATEGORY

I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life	
	or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	_X_
III.b	Equipment Not in the Scope of the Qualification Review	
VI	Documentation Not Made Available	



Franklin Research Center A Division of The Franklin Institute 20th and Race Streets, Phila., Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 487/489

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 69

SYSTEM CONSIDERATION REVIEW

The Licensee has stated that this equipment item does not require environmental qualification and/or should be exempted from qualification. The Licensee's rationale has been evaluated and the reasons for concurrence/ non-concurrence with the technical basis of the Licensee's position are presented below.

Reason for Concurrence

- X Equipment does not provide a safety function or mitigate the consequences of a design basis accident. Equipment Environmental Qualification is not required by the DOR Guidelines. (NRC Qualification Evaluation Category IIIa)
 - Equipment is not exposed to a harsh environment by the accident it is intended to mitigate. See note (1) on page 4b. (NRC Qualification Evaluation Category IIIb)
- Backup (equipment/system) is available which completely performs the safety function. The backup (equipment/system) is environmentally qualified and appears to meet single active failure criterion. See note (1) on page 4b. (NRC Qualification Evaluation Category IIIa)

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Reason for Non-Concurrence

- Backup (equipment/system) is not fully capable of performing the intended safety function or accident mitigating function.
- Backup (equipment/system) is not environmentally qualified and can be exposed to a hostile environment simultaneously with the primary equipment.
- Backup (equipment/system) is subject to a potentially disabling single active failure.
- Failure of the primary equipment can compromise the ability of other safety-related equipment to perform its specified safety function.
- Failure of the primary equipment can result in erroneous indication which could mislead an operator.
- Requirement for continued functioning throughout the post-accident period necessitates environmental qualification.

This equipment item (nuclear instrumentation) has been exempted from qualification by NRC and has been noted by The Licensee in PSR # (18).

A Division of The Franklin Institute 20th and Race Streets. Phila . Pa. 19103 (215) 448-1000	NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 487	Pag
QUIPMENT ENVIRONMENTAL QUALIFIC	CATION REVIEW OF EQUIPMENT ITEN	A NO. 70

EQUIPMENT ITEM NO. 70 ELECTRICAL CONNECTOR LOCATED IN CONTAINMENT (C230) AMPHENOL MODEL 30576-A REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 70 LICENSEE REFERENCE(S): 21 FUNCTION (PLANT ID): CONNECTORS LICENSEE SUEMITTAL: SCEW(S) [1, 12]: 90

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY: (See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, A, S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	la
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Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, 3b, 3c, 3d
System Consideration Review	4a, 4b, 4c, 4d, 4e, 4E
Equipment Environmental Qualification Review	52, 50, 50, 51, 50, 5f, 5g, 5h, 51, 3j
Installed TMI Lessons Learned Implementation Equipment Summary	62, 60-

Maintenance and Replacement Schedule Summary 7a, 7b,

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A Division of The Franklin Institute 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000	NRC Contract No. NRC-03-79-118 FRC Project Nc. C5257 FRC Assignment No. 13 FRC Task No. <u>487/488</u>	Page Ib
QUIPMENT ENVIRONMENTAL QUALIFIC	ATION REVIEW OF EQUIPMENT ITEN	NO. 72
SUMMARY OF LICENSEE RESPONSES TO THE N	NRC SER - ONLY CHECKED ITEMS ARE A	PPLICABLE
X The Licensee (has/has not) provide	ed a response to the SER concerns.	
The Licensee (has/has not) specifi qualified and/or will function whe environmental service conditions.	ically stated that the equipment is an exposed to the applicable DBE	5
The Licensee has presented informa outstanding qualification deficier		
The Licensee (has/has not) propose item whose qualification has not b	ed a corrective action for this equipeen fully established.	uipment
Justification for interim oper Licensee for this equipment it	ration (has/has not) been provided	by the
Corrective action specified by	the Licensee:	
Equipment replacement with Equipment modification Equipment relocation above Relocate or shield equipme Verify qualification by ad Equipment relocation to a Qualification testing of e Other (e submergence level ent from radiation source dditional (testing/analysis) mild environment	,
	er information for this equipment is ais for justification for interim	ltem
corrective action. (Schedule	ovided a schedule for the proposed for accomplishing the corrective	_•)
X The Licensee states that the equip and/or should be exempted from env	oment item does not require qualificition.	cation
DESIGNATION OF RESULTANT NRC QUALIFICA - CIRCLED ITEM ONLY: (See Section 3 of	TION EVALUATION CATEGORY BASED ON of this TER for Legend)	REVIEW
L.a Qualified L.b Modification L.a Qualification Not Established LL.b Not Qualified	II.c Qualified Life Deficiency III.a Exempt III.b Not in Scope IV Documentation Not Availabl	e

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Franklin Research Center A Division of The Franklin Institute 20th and Race Streets, Phila., Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 4F7/4FF

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DESIGNATION: X = CATEGORY

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 70

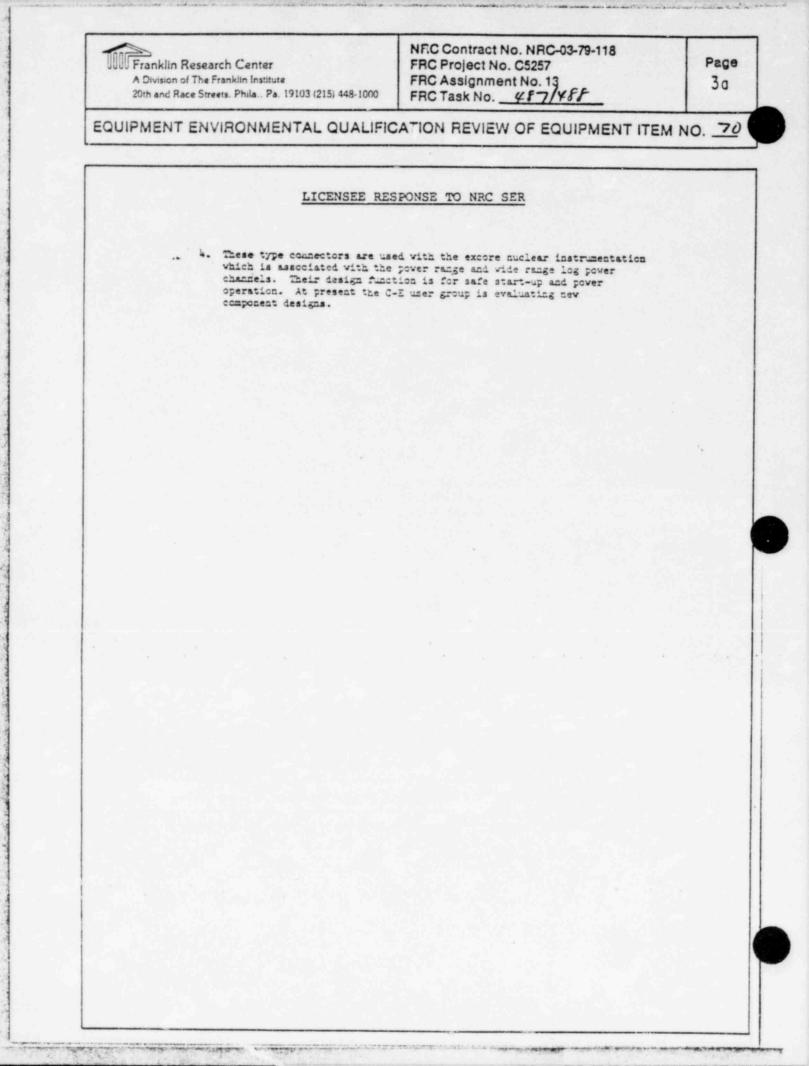
EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

DESIGNATION: X = DEFICIENCY NRC REQUIREMENTS Documented Evidence of Qualification Adequate Adequ te Similarity Between Equipment and Test Specimen Established Aging Degradation Evaluated Adequately Qualified Life or Replacement Schedule Established (If Required) Program Established to Identify Aging Degradation Criteria Regarding Aging Simulation Satisfied (If Required) Criteria Regarding Temperature/Pressure Exposure: o Peak Temperature Adequate o Peak Pressure Adequate o Duration Adequate o Required Profile Enveloped Adequately o Steam Exposure (If Required) Adequate Criteria Regarding Spray Satisfied Criteria Regarding Submergence Satisfied Criteria Regarding Radiation Satisfied Criteria Regarding Test Sequence Satisfied Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied Criteria Regarding Functional Testing Satisfied Criteria Regarding Instrument Accuracy Satisfied Test Duration Margin (1 hour + Function Time) Satisfied Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)

NRC QUALIFICATION CATEGORY

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I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	X
III.D	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	



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NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 4871488

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 70

SYSTEM CONSIDERATION REVIEW

The Licensee has stated that this equipment item does not require environmental qualification and/or should be exempted from qualification. The Licensee's rationale has been evaluated and the reasons for concurrence/ non-concurrence with the technical basis of the Licensee's position are presented below.

Reason for Concurrence

- X Equipment does not provide a safety function or mitigate the consequences of a design basis accident. Equipment Environmental Qualification is not required by the DOR Guidelines. (NRC Qualification Evaluation Category IIIa)
 - Equipment is not exposed to a harsh environment by the accident it is intended to mitigate. See note (1) on page 4b. (NRC Qualification Evaluation Category IIIb)
 - Backup (equipment/system) is available which completely performs the safety function. The backup (equipment/system) is environmentally gualified and appears to meet single active failure criterion. See note (1) on page 4b. (NRC Qualification Evaluation Category IIIa)

Reason for Non-Concurrence

- Backup (equipment/system) is not fully capable of performing the intended safety function or accident mitigating function.
- Backup (equipment/system) is not environmentally qualified and can be exposed to a hostile environment simultaneously with the primary equipment.
 - Backup (equipment/system) is subject to a potentially disabling single active failure.
- Failure of the primary equipment can compromise the ability of other safety-related equipment to perform its specified safety function.
- Failure of the primary equipment can result in erroneous indication which could mislead an operator.
- Requirement for continued functioning throughout the post-accident period necessitates environmental qualification.

The equipment has been exempted GNRC.

Distion of The Franklin Institute With and Race Streets. Phila. Pa. 19103 (215) 448-1000	NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>YF7/YF8</u>	Page 5 f
EQUIPMENT ENVIRONMENTAL QUALIFIC	ATION REVIEW OF EQUIPMENT ITE	M NO. 70

NOT	TES:									
	The	licensee	has	indicated	that Amphenol	Report	123-1252	is	applicable	

to this equipment. However no mention of this equipment is made in the

referenced report.

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Thank			
Franklin Research	Cent	er	
A Division of The Fran	klin Ins	stitut	e
20th and Race Streets.	Phila.	Pa	19103 (215) 448-1000

NRC Contract No. NRC-03-79-118	
FRC Project No. C5257	
FRC Assignment No. 13	
FRC Task No. 487	

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 71

EQUIPMENT ITEM NO. 71 ELECTRICAL CONNECTOR LOCATED IN CONTAINMENT (C230) AMPHENOL MODEL 279-75 REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 71 LICENSEE REFERENCE(S): NOT CITED FUNCTION (PLANT ID): CONNECTORS LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 88

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY: (See Section 3 of this TER for Legend)

R, (T, (T, RT, P, H, (S, A, S, (R), M, I, (M, RPN, EXN, SEN, (I), RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents

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Equipment Item

Summary of Licensee Responses to the NRC SERItEquipment Environmental Qualification Summary Forms2Licensee Response to NRC SER3aSystem Consideration Review4aEquipment Environmental Qualification Review5a

Installed TMI Lessons Learned Implementation Equipment Summary

Maintenance and Replacement Schedule Summary

<u>Checksheet Page No.</u> la lb 2 3a, 3b, 3c, 3d 4a, 4b, 4c, 4d, 4c, 4f 5a, 5b, 5c, 5d, 5c, 5f, 5g, 5h, 5i, 5j 6a, 6b

70, 70, 70

A Division of The Franklin Institute 20th and Race Streets. Phila Pa 19103 (215) 448-1000	NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/488</u>	Page 1b
EQUIPMENT ENVIRONMENTAL QUALIFIC	ATION REVIEW OF EQUIPMENT ITEN	1 NO. 71
SUMMARY OF LICENSEE RESPONSES TO THE N	NRC SER - ONLY CHECKED ITEMS ARE AP	PLICABLE
X The Licensee (has/has not) provide	ed a response to the SER concerns.	
The Licensee (has/has not) specifi qualified and/or will function whe environmental service conditions.	ically stated that the equipment is en exposed to the applicable DBE	
The Licensee has presented information outstanding qualification deficier	ation which shows there are no ncies.	
X The Licensee (has/ has not) propose item whose qualification has not b	ed a corrective action for this equ been fully established.	ipment
X Justification for interim oper Licensee for this equipment it	ation (has/ has not) been provided tem.	by the
\underline{X} Correcti action specified by	the Licensee:	
Equipment replacement with Equipment modification Equipment relocation above		
Relocate or shield equipme Verify qualification by ad	ent from radiation source ditional (testing/analysis)	
Equipment relocation to a Qualification testing of e Other (EVALUATION	quipment in progress)
The Licensee has provided othe that can be construed as a bas operation.	r information for this equipment is is for justification for interim	tem
As not <u>X</u> The Licensee (has/has not) pro corrective action. (Schedule action	vided a schedule for the proposed for accomplishing the corrective	•)
The Licensee states that the equip and/or should be exempted from env	ment item does not require qualific ironmental qualification.	cation
DESIGNATION OF RESULTANT NRC QUALIFICA - CIRCLED ITEM ONLY: (See Section 3 o	TION EVALUATION CATEGORY BASED ON I f this TER for Legend)	REVIEW
I.a Qualified I.b Modification II.a Qualification Not Established	II.c Qualified Life Deficiency [III.a Exempt] III.b Not in Scope	
II.b Not Qualified	IV Documentation Not Available	

Franklin Research Center A Division of The Franklin Institute 20th and Race Streets. Phila... Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/488</u>

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DESIGNATION: X = CATEGORY

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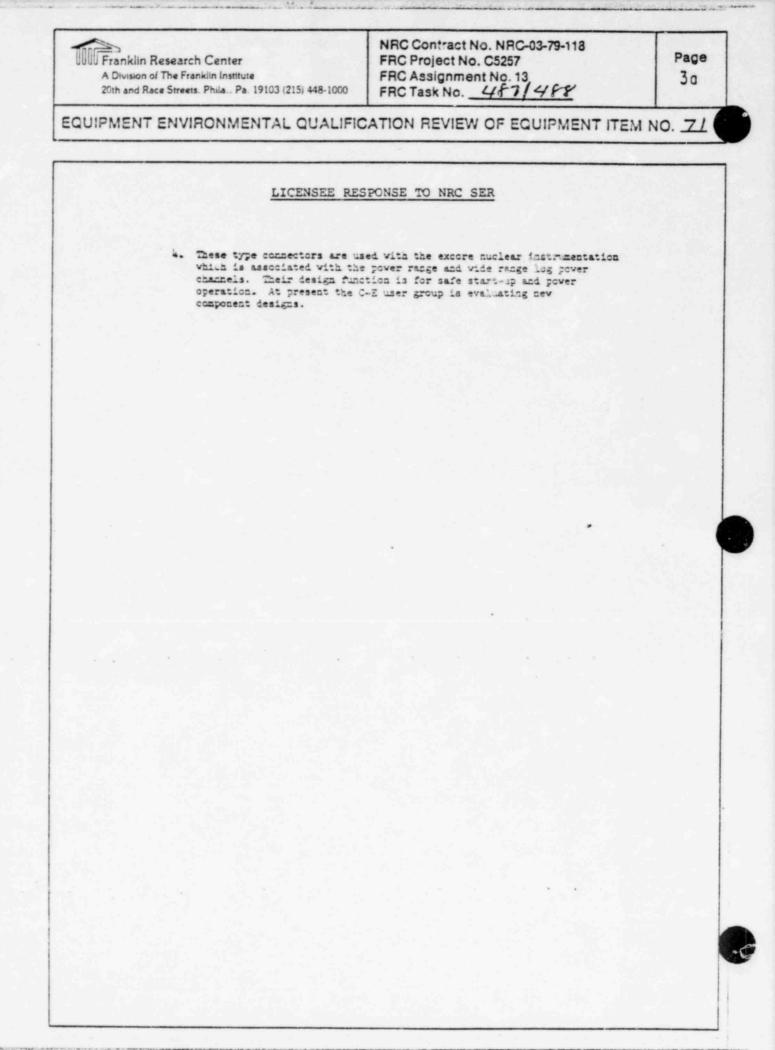
EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 71

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

	DESIGNATION:
NRC REQUIREMENTS	X = DEFICIENCY
Documented Evidence of Qualification Adequate	
Adequate Similarity Between Equipment and Test Specimen Establ	ished
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established ("f Require	d)
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies	
(If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	
	and the second

NRC QUALIFICATION CATEGORY

I.a Equipment Qualified
I.b Equipment Qualification Pending Modification
II.a Equipment Qualification Not Established
II.b Equipment Not Qualified
II.c Equipment Satisfies All Requirements Except Qualified Life
or Replacement Schedule Justified
III.a Equipment Exempt From Qualification
III.b Equipment Not in the Scope of the Qualification Review
IV Documentation Not Made Available



W Franklin Research Center A Division of The Lanklin Institute 20th and Race Streets, Phila, Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-18 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 487 /499

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 71

SYSTEM CONSIDERATION REVIEW

The Licensee has stated that this equipment item does not require environmental qualification and/or should be exempted from qualification. The Licensee's rationale has been evaluated and the reasons for concurrence/ non-concurrence with the technical basis of the Licensee's position are presented below.

Reason for Concurrence

- Equipment does not provide a safety function or mitigate the consequences of a design basis accident. Equipment Environmental Qualification is not required by the DOR Guidelines. (NRC Qualification Evaluation Category IIIa)
 - Equipment is not exposed to a harsh environment by the accident it is intended to mitigate. See note (1) on page 4b. (NRC Qualification Evaluation Category IIIb)
 - Backup (equipment/system) is available which completely performs the safety function. The backup (equipment/system) is environmentally qualified and appears to meet single active failure criterion. See note (1) on page 4b. (NRC Qualification Evaluation Category IIIa)

Reason for Non-Concurrence

- Backup (equipment/system) is not fully capable of performing the intended safety function or accident mitigating function.
- Backup (equipment/system) is not environmentally qualified and can be exposed to a hostile environment simultaneously with the primary equipment.
- Backup (equipment/system) is subject to a potentially disabling single active failure.
- Failure of the primary equipment can compromise the ability of other safety-related equipment to perform its specified safety function.
 - Failure of the primary equipment can result in erroneous indication which could mislead an operator.
 - Requirement for continued functioning throughout the post-accident period necessitates environmental qualification.

This equipment item (nuclear instrumentation) has been exempt by NRC and too from qualification and has been noted by The Treinsee in PSR # (18).

Franklin Research Center A Division of The Franklin Institute 20th and Race Streets Phila. Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 487

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 22

EQUIPMENT ITEM NO. 72 ELECTRICAL CONNECTOR LOCATED IN CONTAINMENT (C230) AMPHENOL MODEL 53100 REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 72 LICENSEE REFERENCE(S): NOT CITED FUNCTION (PLANT ID): CONNECTORS LICENSEE SUBMITTAL: SCEW(3) [1, 12]: 86

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY: (See Section 3 of this TER for Legend)

R. T. QT. RT. P. H. CS. A. S. (R), M. I. QM. RPN. EXN. SEN. QI. RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents

Equipment Item

Summary of Licensee Responses to the NRC SER

Equipment Environmental Qualification Summary Forms

Licensee Response to NRC SER

System Consideration Review

Equipment Environmental Qualification Review

Installed TMI Lessons Learned Implementation Equipment Summary

Maintenance and Replacement Schedule Summary

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6a, 60-

Checksheet Page No.

3a, 3b, 3c, 3d

59, 5h, 51, 51

4a, 4b, 4c, 4d, 4e, 4f

-5a, 5b, 50, 5d, 5e, 5f,

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A Dission of The Franklin Institute 20th and Race Streets, Phila, Pa 19103 (215) 448-1000	NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487 408</u>	Page 1b
QUIPMENT ENVIRONMENTAL QUALIFIC	CATION REVIEW OF EQUIPMENT ITEN	1 NO. 72
SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE AF	PLICABLE
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The Licensee (has/has not) specifi qualified and/or will function whe environmental service conditions.	ically stated that the equipment is en exposed to the applicable DBE	
The Licensee has presented information outstanding qualification deficier	ation which shows there are no ncies.	
X The Licensee (has/ has not) propose item whose qualification has not b	ed a corrective action for this equ been fully established.	ipment
Justification for interim oper Licensee for this equipment it	ration (has/ has not) been provided tem.	by the
X Corrective action specified by	y the Licensee:	
Equipment replacement with Equipment modification Equipment relocation above		
Relocate or shield equipme Verify qualification by ad	ent from radiation source dditional (testing/analysis)	
Equipment relocation to a Qualification testing of e	mild environment	
X Other (FVALMATION)
that can be construed as a bas operation.	er information for this equipment i sis for justification for interim	tem
X The Licensee (nas/her not) pro corrective action. (Schedule action	ovided a schedule for the proposed for accomplishing the corrective	
	oment item does not require qualific vironmental qualification.	cation
ESIGNATION OF RESULTANT NRC QUALIFICA CIRCLED ITEM ONLY: (See Section 3 o	TION EVALUATION CATEGORY BASED ON 1 of this TER for Legend)	REVIEW
.a Qualified .b Modification I.a Qualification Not Established I.b Not Qualified	II.c Qualified Life Deficiency III.a Exempt III.b Not in Scope IV Documentation Not Available	2

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Franklin Research Center A Division of The Franklin Institute 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/488</u>

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 72

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION: X = DEFICIENCY

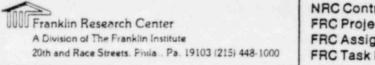
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Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)

NRC QUALIFICATION CATEGORY

DESIGNATION: X = CATEGORY

I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life	
	or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	X
III.D	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 72

LICENSEE RESPONSE TO NRC SER

4. These type connectors are used with the excore nuclear instrumentation which is associated with the power range and wide range log power channels. Their design function is for safe start-up and power operation. At present the C-E user group is evaluating new component designs. Franklin Research Center A Division of The Franklin Institute 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 487/488

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 72

SYSTEM CONSIDERATION REVIEW

The Licensee has stated that this equipment item does not require environmental qualification and/or should be exempted from qualification. The Licensee's rationale has been evaluated and the reasons for concurrence/ non-sensurrence with the technical basis of the Licensee's position are presented below.

Reason for Concurrence

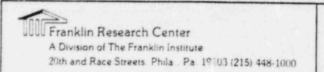
- X Equipment does not provide a safety function or mitigate the consequences of a design basis accident. Equipment Environmental Qualification is not required by the DOR Guidelines. (NRC Qualification Evaluation Category IIIa)
 - Equipment is not exposed to a harsh environment by the accident it is intended to mitigate. See note (1) on page 4b. (NRC Qualification Evaluation Category IIIb)
- Backup (equipment/system) is available which completely performs the safety function. The backup (equipment/system) is environmentally qualified and appears to meet single active failure criterion. See note (1) on page 4b. (NRC Qualification Evaluation Category IIIa)

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Reason for Non-Concurrence

- Backup (equipment/system) is not fully capable of performing the intended safety function or accident mitigating function.
- Backup (equipment/system) is not environmentally qualified and can be exposed to a hostile environment simultaneously with the primary equipment.
- Backup (equipment/system) is subject to a potentially disabling single active failure.
- Failure of the primary equipment can compromise the ability of other safety-related equipment to perform its specified safety function.
- Failure of the primary equipment can result in erroneous indication which could mislead an operator.
- Requirement for continued functioning throughout the post-accident period necessitates environmental qualification.

This equipment item (nuclear instrumentation) was exempt by NLC from qualification and has been noted by The Licensee in PSR # 18



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FRC Project No. C5257
FRC Assignment No. 13
FRC Task No487

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 73

EQUIPMENT ITEM NO. 73 ELECTRICAL CABLE LOCATED IN CONTAINMENT (C230) ANACONDA WIRE AND CABLE MODEL EPR/CPE REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 73 LICENSEE REFERENCE(S): 3000 FUNCTION (PLANT ID): CABLE LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 55 FUNCTION (PLANT ID): CABLE LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 74

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY: (See Section 3 of this TER for Legend)

R, T, (QT) (RT.) P, H, (CS.) (A.) S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

contents	Checksheet Page No.
Equipment Item	la
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Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, 3b, 3c, 3d
Sistem Consideration Review	42, 4b, 4c, 4d, 4c, 4f
Equipment Environmental Qualification Review	-5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j
Installed TMI Lessons Learned Implementation Equipment Summary	6a, 6b -

Maintenance and Replacement Schedule Summary 70, 70, 70-

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No. 13 87 + 488	Page Ib
OF EQUIPMENT ITEM N	10. <u>73</u>
HECKED ITEMS ARE APPL	ICABLE
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Franklin Research Center A Division of The Franklin Institute 20th and Race Streets, Phila., Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>1879488</u>

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 73

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

DESIGNATION: X = DEFICIENCY NRC REQUIREMENTS Documented Evidence of Qualification Adequate Adequate Similarity Between Equipment and Test Specimen Established Aging Degradation Evaluated Adequately Qualified Life or Replacement Schedule Established (If Required) Program Established to Identify Aging Degradation Criteria Regarding Aging Simulation Satisfied (If Required) Criteria Regarding Temperature/Pressure Exposure: o Peak Temperature Adequate o Peak Pressure Adequate o Duration Adequate o Required Profile Enveloped Adequately o Steam Exposure (If Required) Adequate Criteria Regarding Spray Satisfied Criteria Regarding Submergence Satisfied Criteria Regarding Radiation Satisfied Criteria Regarding Test Sequence Satisfied Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied Criteria Regarding Functional Testing Satisfied Criteria Regarding Instrument Accuracy Satisfied Test Duration Margin (1 hour + Function Time) Satisfied Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)

NRC QUALIFICATION CATEGORY

DESIGNATION: X = CATEGORY

I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	_X_
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life	
	or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.D	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	-

Franklin Research Center A Division of The Franklin Institute 20th and Race Streets, Phila., Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>4874488</u>

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 73

LICENSEE RESPONSE TO NRC SER

8. We have completed an extensive review of purchase orders, specifications and inspection reports for cables. This review was completed July 22, 1981. We have updated our computer printout to include the insulation jacket compounds purchased and installed at Calvert Cliffs. We have correlated this information with various FIRL and other laboratory test reports. The assessment/ evaluation activity is not expected to be complete until the end of this year.

	Research Center 1 The Franklin Institute ce Streets, Phila . Pa. 19103 (2	5	RC Contract No. RC Project No. C RC Assignment RC Task No. <u>4</u>	05257 No. 13	- Page 5f
EQUIPMENT	ENVIRONMENTAL	QUALIFICAT	TON REVIEW C	OF EQUIPMENT ITEN	NO. 73
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A CONTRACT STORY

Franklin Research Center A Division of The Franklin Institute 20th and Race Streets. Phila. Pa 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487+488</u>

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 73

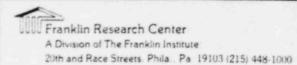
NOTES: TEST REPORT DESCRIPTION is:

A group of electrical cables submitted by The Anaconda Company were subjected to a qualification test program in general accordance with IEEE standards^{1,2} including thermal aging (150°C for 168 h), gamma irradiation (200 Mrad) and simulation of a combined steam-line-break (SLB) accident and loss-of-coolant accident (LOCA)³ while electrically energized. This report deals specifically with six cables, identified as single.conductor, FR-EP, low voltage power and control cable, and FR-EP/CPE control and instrumentation cable.

The simulation of the combined SLB/LOCA lasted 16 days; it included a rapid rise in temperature to 385°F/66 psig, a dwell at this superheatedsteam condition for 10 min, a saturated-steam exposure at several lower temperatures and a final dwell at 230°F/6 psig for 9 days. The electrical integrity of the cables was evaluated by means of insulation resistance measurements, ability to maintain electrical loading during the steam/ chemical-spray exposure, and by post-test mandrel-bend and high-potentialwithstand tests.

The program was conducted by The Franklin Institute Research Laboratories (FIRL) during the period from October 1977 through January 1978.

- IEEE Std 383-1974, IEEE Standard for Type Test of Class IE Electric Cables, Field Splices, and Connections for Nuclear Power Generating Stations, The Institute of Electrical and Electronics Engineers, Inc., New York, NY, 1974.
- IEEE Std 323-1974, IEEE Standard for Qualifying Class IE Equipment for <u>Nuclear Power Generating Stations</u>, The Institute of Electrical and Electronics Engineers, Inc., New York, NY, 1974.
- Simulated SLB and LOCA exposure requirements were selected by the client. See Section 3.3.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 74

EQUIPMENT ITEM NO. 74 ELECTRICAL CABLE LOCATED IN CONTAINMENT (C230) CERRO WIRE AND CABLE MODEL XLPE/NEOPRENE REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 74 LICENSEE REFERENCE(S): 1208 FUNCTION (PLANT ID): CABLE LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 61

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY: (See Section 3 of this TER for Legend)

R, T, QT RT, P, H, CS, A, S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None, Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	la
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, 3b, 3c, 3d-
System Consideration Review	4a, 4b, 4c, 4d, 4e, 45-
Equipment Environmental Qualification Review	-Sa, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j-
Installed TMI Lessons Learned Implementation Equipment Summary	-6ay-68

Maintenance and Replacement Schedule Summary

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Franklin Research Center A Division of The Franklin Institute 20th and Race Streets, Phila., Pa. 19103 (215) 448-1000 NRC Contract No. NPC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487</u>/<u>489</u>

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 74

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

DESIGNATION: X = DEFICIENCY NRC REQUIREMENTS Documented Evidence of Qualification Adequate Adequate Similarity Between Equipment and Test Specimen Established Aging Degradation Evaluated Adequately Qualified Life or Replacement Schedule Established (If Required) Program Established to Identify Aging Degradation Criteria Regarding Aging Simulation Satisfied (If Required) Criteria Regarding Temperature/Pressure Exposure: o Peak Temperature Adequate o Peak Pressure Adequate o Duration Adequate o Required Profile Enveloped Adequately o Steam Exposure (If Required) Adequate Criteria Regarding Spray Satisfied Criteria Regarding Submergence Satisfied Criteria Regarding Radiation Satisfied Criteria Regarding Test Sequence Satisfied Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied Criteria Regarding Functional Testing Satisfied Criteria Regarding Instrument Accuracy Satisfied Test Duration Margin (1 hour + Function Time) Satisfied Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)

NRC QUALIFICATION CATEGORY

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DESIGNATION: X = CATEGORY

I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	_X
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life	
	or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	-
IV	Documentation Not Made Available	
III.D	Equipment Exempt From Qualification Equipment Not in the Scope of the Qualification Review	-

Franklin Research Center A Division of The Franklin Institute 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/488</u>

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 74

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LICENSEE RESPONSE TO NRC SER

8. We have completed an extensive review of purchase orders, specifications and inspection reports for cables. This review was completed July 22, 1981. We have updated our computer printout to include the insulation jacket compounds purchased and installed at Calvert Cliffs. We have correlated this information with various FIRL and other laboratory test reports. The assessment/ evaluation activity is not expected to be complete until the end of this year.

10.00

Di sion ol	Research Center 1 The Franklin Institute ce Streets, "hila., Pa. 19103 (2	F	RC Contract No. RC Project No. C RC Assignment RC Task No. <u>4</u>	No. 13	- Page 5f
EQUIPMENT	ENVIRONMENTAL	QUALIFICAT	ION REVIEW C	OF EQUIPMENT I	TEM NO. 74
The Lic	censee has not p	resented suf	ficient info	mation to esta	blish
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· .				truction to the test	The Real Property lies and the real Property lie
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	tion documentation	(see also Section	on 6.0 below).		-
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Franklin Research Center Dision of The Franklin Institute Oth and Race Streets, Phila., Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>4875488</u>

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 74

NOTES: TEST REPORT DESCRIPTION:

In the event of an accident at a nuclear power station in which the primary system is ruptured and steam is released, equipment and components which are internal to the containment vessel and which are involved in safety-related systems must continue to function. In particular, many electrical cables must remain functional after exposure to nuclear radiation, chemical sprays, and the temperature, pressure, and moisture environment that results from the accident.

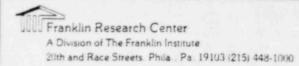
The test program described in this report was conducted to determine the adequacy of certain electrical cables intended for nuclear power plant service. In this program, samples of the cables were subjected to irradiation, exposure to a steam environment and chemical spray while electrically energized.

The four types of cable tested were the following:

- S-1: 12 AWG 7 conductor, silicone rubber insulation with overall asbestos braid
- S-2: Same as above, different silicone formula
- S-3: Same as above, different silicone formula
- XP: 12 AWG 5 conductor, cross-linked polyethylene insulated, with overall neoprene jacket

5. CONCLUSIONS

Samples of four types of electrical cable were subjected to total doses of 5×10^7 and 10^8 rad of radiation from a Cobalt-60 source. The same cables were then placed in a test chamber and subjected to steam and borated water spray for an extended period. Subsequently, they were examined and subjected to insulation tests. It can be concluded that the performance of the cable will be acceptable for use under the condition simulated in these tests without any loss of performance.



NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 487

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 75

EQUIPMENT ITEM NO. 75 ELECTRICAL CABLE LOCATED IN CONTAINMENT (C230) CERRO WIRE AND CABLE MODEL SILICONE RUBBER/ASBESTOS BRAID REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 75 LICENSEE REFERENCE(S): NOT CITED FUNCTION (PLANT ID): CABLE LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 72

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY: (See Section 3 of this TER for Legend)

R, T, QT, (RT,) P, H, CS, A, S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page
Equipment Item	la
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, 3b, 3c, 3d
System Consideration Review	-4a, 4b, 4c, 4d,
Equipment Environmental Qualification Review	5a, 5b, 5c, 5d, 5g, 5h, 5i, 5t

Installed TMI Lessons Learned Implementation Equipment Summary

Maintenance and Replacement Schedule Summary

7a, 7b, 7e-

No.

A Division of The Franklin Institute 20th and Race Streets. Phila Pa 1910	3 (215) 448-1000 NRC Contract No. NRC FRC Project No. C5257 FRC Assignment No. 13 FRC Task No	Part
EQUIPMENT ENVIRONMENT	AL QUALIFICATION REVIEW OF EC	UIPMENT ITEM NO. 2
SUMMARY OF LICENSEE RESPON	SES 10 THE NRC SER - ONLY CHECKE	D ITEMS ARE APPLICABLE
X The Licensee (has/has-	not provided a response to the	SER concerns.
The Licensee (has/has qualified and/or will environmental service	not) specifically stated that th function when exposed to the app conditions.	e equipment is blicable DBE
— The Licensee has prese outstanding qualificat	nted information which shows the ion deficiencies.	re are no
The Licensee (has/has item whose qualification	not) proposed a corrective action has not been fully established	n for this equipment d.
Justification for Licensee for this	interim operation (has/ has_not) - equipment item.	been provided by the
Corrective action :	specified by the Licensee:	
Equipment modif		
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	cation to a mild environment testing of equipment in progress	
X Other (_ dile	Town dreument ater	applicable,
The Licensee has pr that can be constru operation.	covided other information for th ed as a basis for justification	is equipment item for interim
X The Licensee (has / h	as not) provided a schedule for (Schedule for accomplishing the	the proposed
action	(Schedule for accomplishing the	e corrective .)
The Licensee states that and/or should be exempt	at the equipment item does not re- ed from environmental qualification	equire qualification tion.
DESIGNATION OF RESULTANT NF - CIRCLED ITEM ONLY: (See	C QUALIFICATION EVALUATION CATES Section 3 of this TER for Legend	GORY BASED ON REVIEW
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II.b Not Qualified	IV Documentation	Not Available

A Division of The Franklin Institute 20th and Race Streets. Phila.. Pa. 19103 (215) 448-1000 RC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 467/468

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 75

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

DESIGNATION : X = DEFICIENCY NRC REQUIREMENTS Documented Evidence of Qualification Adequate Adequate Similarity Between Equipment and Test Specimen Established Aging Degradation Evaluated Adequately Qualified Life or Replacement Schedule Established (If Required) Program Established to Identify Aging Degradation Criteria Regarding Aging Simulation Satisfied (If Required) Criteria Regarding Temperature/Pressure Exposure: o Peak Temperature Adequate o Peak Pressure Adequate o Duration Adequate o Required Profile Enveloped Adequately o Steam Exposure (If Required) Adequate Criteria Regarding Spray Satisfied Criteria Regarding Submergence Satisfied Criteria Regarding Radiation Satisfied Criteria Regarding Test Sequence Satisfied Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied Criteria Regarding Functional Testing Satisfied Criteria Regarding Instrument Accuracy Satisfied Test Duration Margin (1 hour + Function Time) Satisfied Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)

NRC QUALIFICATION CATEGORY

DESIGNATION: X = CATEGORY

I.a	Equipment Qualified
I.b	Equipment Qualification Pending Modification
II.a	Equipment Qualification Not Established
II.b	Equipment Not Qualified
II.c	Equipment Satisfies All Requirements Except Qualified Life
	or Replacement Schedule Justified
III.a	Equipment Exempt From Qualification
III.D	Equipment Not in the Scope of the Qualification Review
IV	Documentation Not Made Available

A Division of The Franklin Institute 20th and Race Streets, Phila., Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 487/488

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 75

LICENSEE RESPONSE TO NRC SER

8. We have completed an extensive review of purchase orders, specifications and inspection reports for cables. This review was completed July 22, 1981. We have updated our computer printout to include the insulation jacket compounds purchased and installed at Calvert Cliffs. We have correlated this information with various FIRL and other laboratory test reports. The assessment/ evaluation activity is not expected to be complete until the end of this year.

A Division of The Franklin Institute 20th and Race Streets, Phila, Pa 19103 (215) 448-1000	NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 487	Page
QUIPMENT ENVIRONMENTAL QUALIFIC	ATION REVIEW OF EQUIPMENT ITE	M NO. 76
EQUIPMENT ITEM NO. 76 ELECTRICAL CABLE LOCATED IN CONTAINMEN CONTINENTAL WIRE MODEL SILICONE RUBBEN REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 76 LICENSEE REFERENCE(S): NOT CITED FUNCTION (PLANT ID): CABLE LICENSEE SUBMITTAL: SCEW(S) [1, 12]:	R/ASBESTOS BR	
DESIGNATION FOR DEFICIENCY IDENTIFIED		ONLY:
DESIGNATION FOR DEFICIENCY IDENTIFIED (See Section 3 of this TER for Legend R, T, (T, RT, P, H, CS, A, S, (R), M,)	
(See Section 3 of this TER for Legend)	

Contents	Checksheet Page No.
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Maintenance and Replacement Schedule Summary

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QUIPMENT ENVIRONMENTAL QUALIFIC	ATION REVIEW OF EQUIPMENT ITEN	M NO. 78
SUMMARY OF LICENSEE RESPONSES TO THE 1	NRC SER - ONLY CHECKED ITEMS ARE A	PLICABLE
X The Licensee (has/has not) provide	ed a response to the SER concerns.	
The Licensee (has/has not) specifi qualified and/or will function whe environmental service conditions.	cally stated that the equipment is an exposed to the applicable DBE	S
The Licensee has presented informa outstanding qualification deficier	ation which shows there are no noises.	
X The Licensee (has/ has not) propose item whose qualification has not b	ed a corrective action for this equipeen fully established.	uipment
Justification for interim oper Licensee for this equipment it	ation (has /has not) been provided em.	by the
X Corrective action specified by	the Licensee:	
Equipment replacement with Equipment modification Equipment relocation above Relocate or shield equipme Verify qualification by ad Equipment relocation to a Qualification testing of e	submergence level nt from radiation source ditional (testing/analysis) mild environment	2_)
The Licensee has provided othe that can be construed as a bas operation.	r information for this equipment i is for justification for interim	tem
The Licensee (nas not) pro corrective action. (Schedule action)	vided a schedule for the proposed for accomplishing the corrective	•)
The Licensee states that the equip and/or should be exempted from env	ment item does not require qualifi ironmental qualification.	cation
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.a Qualified .b Modification I.a Qualification Not Established I.b Not Qualified	II.c Qualified Life Deficiency III.a Exempt III.b Not in Scope IV Documentation Not Availabl	e

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NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 460/466

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20th and Race Streets. Phila.. Pa. 19103 (215) 448-1000 FRC Task No. 487/485 EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 24 EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM DESIGNATION: NRC REQUIREMENTS X = DEFICIENCY Documented Evidence of Qualification Adequate × Adequate Similarity Between Equipment and Test Specimen Established Aging Degradation Evaluated Adequately Qualified Life or Replacement Schedule Established (If Required) Program Established to Identify Aging Degradation Criteria Regarding Aging Simulation Satisfied (If Required) Criteria Regarding Temperature/Pressure Exposure: o Peak Temperature Adequate o Peak Pressure Adequate o Duration Adequate o Required Profile Enveloped Adequately o Steam Exposure (If Required) Adequate Criteria Regarding Spray Satisfied Criteria Regarding Submergence Satisfied Criteria Regarding Radiation Satisfied Criteria Regarding Test Sequence Satisfied Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied Criteria Regarding Functional Testing Satisfied Criteria Regarding Instrument Accuracy Satisfied Test Duration Margin (1 hour + Function Time) Satisfied Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) DESIGNATION: NRC QUALIFICATION CATEGORY X = CATEGORY I.a Equipment Qualified

	The second second	
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.D	Equipment Not in the Scope of the Qualification Review	-
IV	Documentation Not Made Available	

A Division of The Franklin Institute 20th and Race Streets. Phila., Pa. 19103 (215) 448-1000

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NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 487/488

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 76

LICENSEE RESPONSE TO NRC SER

8. We have completed an extensive review of purchase orders, specifications and inspection reports for cables. This review was completed July 22, 1981. We have updated our computer printout to include the insulation Jacket compounds purchased and installed at Calvert Cliffs. We have correlated this information with various FIRL and other laboratory test reports. The assessment/ evaluation activity is not expected to be complete until the end of this year. A Division of The Franklin Institute 20th and Race Streets. Phila. Pa 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487</u>

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 77

EQUIPMENT ITEM NO. 77 ELECTRICAL CABLE LOCATED IN CONTAINMENT (C230) RAYCHEM MODEL XLPE/XLPE REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 77 LICENSEE REFERENCE(S): 1816, 4602 FUNCTION (PLANT ID): CABLE LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 60

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY: (See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS (A, S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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EQUIPMENT ENVIRONMENTAL QUALIFIC	ATION REVIEW OF EQUIPMENT ITEM	NO. 7
SUMMARY OF LICENSEE RESPONSES TO THE N	NRC SER - ONLY CHECKED ITEMS ARE AP	PLICABLE
The Licensee (has/has not) provide	ed a response to the SER concerns.	
The Licensee (has/has not) specific qualified and/or will function whe environmental service conditions.	ically stated that the equipment is an exposed to the applicable DBE	-
The Licensee has presented information outstanding qualification deficier	ation which shows there are no ncies.	
The Licensee (has/has not) propose item whose qualification has not b	ed a corrective action for this equippeen fully established.	pment
Justification for interim oper Licensee for this equipment it	ation (has/ has not), been provided b em.	by the
\mathcal{A} Corrective action specified by	the Licensee:	
Equipment replacement with Equipment modification Equipment relocation above Relocate or shield equipme Verify qualification by ad	e submergence level ent from radiation source ditional (testing/analysis)	
Equipment relocation to a Qualification testing of e Other (mild environment)
The Licensee has provided othe that can be construed as a bas operation.	r information for this equipment it is for justification for interim	em
The Licensee (has not) pro corrective action. (Schedule action	vided a schedule for the proposed for accomplishing the corrective)
The Licensee states that the equip and/or should be exempted from env	ment item does not require qualific ironmental qualification.	ation
DESIGNATION OF RESULTANT NRC QUALIFICA - CIRCLED ITEM ONLY: (See Section 3 o	TION EVALUATION CATEGORY BASED ON R f this TER for Legend)	EVIEW
I.a Qualified I.b Modification II.a Qualification Not Established	II.c Qualified Life Deficiency III.a Exempt III.b Not in Scope	
rr.b Not Qualified	IV Documentation Not Available	

A Division of The Franklin Institute 20th and Race Streets, Phila., Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>478/487</u>

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QUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 7				
EQUIPMENT ENVIRONMENTAL	L QUALIFICATION SUMMARY FOR			
		DESIGNATION:		
NRC REQUIREMENTS		X = DEFICIENCY		
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Documented Evidence of Qualification	Adequate	×		
Adequate Similarity Between Equipment		shed X		
Aging Degradation Evaluated Adequated	Ly			
Qualified Life or Replacement Schedul		1)		
Program Established to Identify Aging				
Criteria Regarding Aging Simulation S				
Criteria Regarding Temperature/Pressu	ure Exposure:			
o Peak Temperature Adequate				
o Peak Pressure Adequate				
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 Required Profile Enveloped Ade Steam Exposure (If Required) A 				
Criteria Regarding Spray Satisfied	and a co			
Criteria Regarding Submergence Satis	fied			
Criteria Regarcing Radiation Satisfic				
Criteria Regarding Test Sequence Sat:				
Criteria Regarding Test Failures or S	Severe Anomalies			
(If Any) Satisfied				
Criteria Regarding Functional Testing				
Criteria Regarding Instrument Accurat				
Test Duration Margin (1 hour + Funct.				
Criteria Regarding Margins Satisfied	(NUREG-0588, Cat. 1)			
		DESIGNATION:		
NRC QUALIFICATION CATEGORY		X = CATEGORY		

Equipment Qualified I.a <u>×</u> Equipment Qualification Pending Modification I.b Equipment Qualification Not Established II.a II.b Equipment Not Qualified Equipment Satisfies All Requirements Except Qualified Life II.c or Replacement Schedule Justified III.a Equipment Exempt From Qualification III.b Equipment Not in the Scope of the Qualification Review IV Documentation Not Made Available

Franklin Research Center A Division of The Franklin Institute 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000 NRC Contract No. NRC-0. 79-118 FRC Project No. C5257 FRC Assignment No. 13, FRC Task No. <u>487</u>/488

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 27

LICENSEE RESPONSE TO NRC SER

8. We have completed an extensive review of purchase orders, specifications and inspection reports for cables. This review was completed July 22, 1981. We have updated our computer printout to include the insulation jacket compounds purchased and installed at Calvert Cliffs. We have correlated this information with various FIRL and other laboratory test reports. The assessment/ evaluation activity is not expected to be complete until the end of this year.

D sion of Th	earch Center ne Franklin Institute Streets, Phila Pa 19103 (21	FRO	C Contract No. Project No. C Assignment P Task No. <u>4</u>	No. 13	Page 5 f
EQUIPMENT E	NVIRONMENTAL	QUALIFICATIO	N REVIEW C	F EQUIPMENT	TEM NO. 7
The Lic	ensee has not pr	resented suff	icient infor	mation to esta	blish
	ence between the				
					(See 28. 451)
as requ	ired by DOR Guid	delines and/or	r_IEEE-383-7	74	
	Test Specimen - The	test specimen sh	ould be the com		
				ly be considered val	
				truction to the test	Concession of the local division of the loca
				rt of the qualifica-	
	tion documentation	(see also Section	8.0 below).		
	2.2	Type Test Samples.	The samples tes	ited	
-		uld contain the cond jacket, binder tape.			
		and field splices whi			
		and mere aprinte + 11	ich are representa	tive	
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	of the lists sents	he cable category be sizes which have be ative of these cate	ing qualified. Tab en considered repr	le 1	
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A Division of The Franklin Institute 20th and Race Streets. Phila. Pa 19103 (215) 448-1000	NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>477/478</u>	Pag 5g
EQUIPMENT ENVIRONMENTAL QUALIFIC	ATION REVIEW OF EQUIPMENT ITE	MNO. 7
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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 27

NOTES:

The licensee has not identified the cable characteristics (such as facket and insulation thickness) which would establish the applicability of the referenced report to the installed cables. This is particularly important because certain 1000V multiconductor Flamtrol cables have been observed to have insulation properties significantly different than the cables tested in the referenced report (F-C4033-1). Of particular concern was a tendency of conductor insulation to experience dielectric. breakdown at voltage levels considerably below those expected for polyethylene cable. Total insulation thickness (i.e. cable jacket plus conductor insulation) and cross linking electron beam energy used during fabrication are believed to be critical parameters. The licensee should provide the information on the cable insulation thickness (jacket and conductor insulation) and any other characteristics which demonstrate that the installed cable is the same as the cable in the

referenced test.

Note 2- the licensee has not provided an evaluation of aging degradation for the cable nor an estimated qualified life.

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO.

NOTES:

The cable described in the refer youts are

SUBJECT

The Effects of Radiation and Aging on Flamtrol^{TP} Insulated Wire

Object

This report covers insulation resistance measurements made at elevated temperature and pressure on Flamtrol insulated wire after it had been exposed to various conditions of radiation and heat aging.

These tests are to simulate accident conditions in a nuclear power station where the insulated wires would be exposed to elevated temperature (>340 F) and pressure (>60 psi). Since these conditions can occur at any time during the life of the station, the samples were exposed to various radiation doses and aging times before these tests.

Material

Flamtrol; 6080211-10 Black P7-09-24-71-2 0.D.=.181"; 1.D.=.116*

subject Flamtrol - U. E. & C. Tests

Object:

This report covers dielectric strength retention, accelerated water absorption and insulation resistance tests at pressure and temperature on AWG 10 and 14 Flamtrol insulated wire. These tests are part of the contract tests for the United Engineers and Constructors Inc. Frevious work on AWG 12 Flamtrol insulated wire was reported in Test Report EM #5238.

! Material:

Flamtrol, 60C0511-14, CA14-005 Flamtrol, 60C08.11-10, P7-2-29-72-4 A Division of The Franklin Institute 20th and Race Streets. Phila Pa 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. ____487

Page

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 78

EQUIPMENT ITEM NO. 78 ELECTRICAL CABLE LOCATED IN CONTAINMENT (C230) RAYCHEM MODEL POLYMER AND XLPE/XLPE REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 78 LICENSEE REFERENCE(S): 4603, 4604 FUNCTION (PLANT ID): CABLE LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 57

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY: (See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, A, S, (R), M, I, WM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents

Checksheet Page No.

Equipment ItemlaSummary of Licensee Responses to the NRC SERlbEquipment Environmental Qualification Summary Forms2Licensee Response to NRC SER3a, 3b, 3c, 3d -System Consideration Review4a, 4b, 4c, 4d, 4e, 4fEquipment Environmental Qualification Review5a, 5b, 5c, 5d, 5c, 5d, 5c, 5f, 5f, 5c, 5d, 5c, 5c, 5d,

Installed TMI Lessons Learned Implementation Equipment Summary

Maintenance and Replacement Schedule Summary

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6a, 60.

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EQUIPMENT ENVIRONMENTAL QUALIFIC	CATION REVIEW OF EQUIPMENT ITEN	NO. 7
SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE AN	PPLICABLE
X The Licensee (has/bas not) provid	ed a response to the SER concerns.	
The Licensee (has/has not) specific qualified and/or will function whe environmental service conditions.	en exposed to the applicable DBE	-
The Licensee has presented inform outstanding qualification deficie	ation which shows there are no ncies.	
The Licensee (has/has not) propos item whose qualification has not	ed a corrective action for this equipeen fully established.	lipment
X Justification for interim ope Licensee for this equipment i	ration (has/h as_not) been provided tem.	by the
X Corrective action specified b	y the Licensee:	
Equipment replacement wit Equipment modification Equipment relocation abov Relocate or shield equipm Verify qualification by a Equipment relocation to a Qualification testing of X Other (e submergence level ent from radiation source dditional (testing/analysis) mild environment equipment in progress)
The Licensee has provided oth that can be construed as a ba operation.	er information for this equipment i sis for justification for interim	tem
The Licensee (Rady has not) pro- corrective action. (Schedule action	ovided a schedule for the proposed for accomplishing the corrective)
The Licensee states that the equip and/or should be exempted from en-	pment item does not require qualifi vironmental qualification.	cation
DESIGNATION OF RESULTANT NRC QUALIFIC - CIRCLED ITEM ONLY: (See Section 3 of	ATION EVALUATION CATEGORY BASED ON of this TER for Legend)	REVIEW
I.a Qualified I.b Modification II.a Qualification Not Established	II.c Qualified Life Deficiency III.a Exempt	
II.b Not Qualified	III.b Not in Scope JV Documentation Not Available	

Franklin Research Center A Division of The Franklin Institute 20th and Race Streets. Phila., Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>4871488</u>

Page 2

DESIGNATION: X = DEFICIENCY

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 78

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

Decumented Evidence of Qualification Adequate Adequate Similarity Between Equipment and Test Specimen Established Aging Degradation Evaluated Adequately Qualified Life or Replacement Scnedule Established (If Required) Program Established to Identify Aging Degradation Criteria Regarding Aging Simulation Satisfied (If Required) Criteria Regarding Temperature/Pressure Exposure: o Peak Temperature Adequate o Peak Pressure Adequate o Duration Adequate o Required Profile Enveloped Adequately o Steam Exposure (If Required) Adequate Criteria Regarding Spray Satisfied Criteria Regarding Submergence Satisfied Criteria Regarding Radiation Satisfied Criteria Regarding Test Sequence Satisfied Criteria Regarding Test Failures or Severe Anomalies

(If Any) Satisfied Criteria Regarding Functional Testing Satisfied Criteria Regarding Instrument Accuracy Satisfied Test Duration Margin (1 hour + Function Time) Satisfied Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)

NRC QUALIFICATION CATEGORY

DESIGNATION: X = CATEGORY

I.a	Equipment Qualified
I.b	Equipment Qualification Pending Modification
II.a	Equipment Qualification Not Established
II.b	Equipment Not Qualified
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified
III.a	Equipment Exempt From Qualification
III.b	Equipment Not in the Scope of the Qualification Review
IV	Documentation Not Made Available

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Franklin Research Center A Division of The Franklin Institute 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 78

LICENSEE RESPONSE TO NRC SER

8. We have completed an extensive review of purchase orders, specifications and inspection reports for cables. This review vas completed July 22, 1981. We have updated our computer printout to include the insulation jacket compounds purchased and installed at Calvert Cliffs. We have correlated this information with various FIRL and other laboratory test reports. The assessment/ evaluation activity is not expected to be complete until the end of this year.

D. sion o	lesearch Center 1 The Franklin Institute ce Streets, Phila., Pa. 19103 ()	FRO	C Contract No C Project No. C Assignment C Task No.	t No. 13	Page 5 f
EQUIPMENT	ENVIRONMENTAL	QUALIFICATIO	N REVIEW	OF EQUIPMENT	ITEM NO. 7
The If	ances has not a	manage and sufficient			
	censee has not p				X
equiva	lence between th	e cable tested	and the 1	nstalled cable	(see 50.851)
as requ	ired by DOR Gui	delines and/or	IEEE-383-	74	
	1	the state of the second state			
2.	. Test Specimen - The				
				iy be considered val	diversion of the local
				truction to the test	
				rt of the qualifica-	
-	tion documentation	(see also Section i	3.0 below).		
				a grade and	
	2.2	Type Test Samples. uid contain the condu	The samples te	sted	
	ers.	jacket, binder tape, or	erall jacket, shi	eld-	
	ung. of t	and field splices which he cable category bein	h are representa g qualified. Tab	tive ble 1	
	lists	sizes which have beer	considered rep		
	. lengt	ative of these catego ins should be sufficien	t to permit relia	ala.	
	good good	readings and evaluation testing practice.	on consistent w	th	
	ELECTRIC CARLES, FIELD SP	LIVES AND CONVECTIONS			
		Table 1		Bd 183-1874	
	And a state of the second state of the second state	Representative Cable	n for Type Teta		
	Up to 1000 V multiconductor	Tes.	SPELLOA	متلا	
	aonima ceure or Shuelaed multicenductor Menut cable river las velore (as	The Lase		1/C - 14 or 12 AWO	
	ading modereration but a pre-	thermal and rediation *1 Dos ure draigh basis mont	23.3	1/C or 1/C - 14 or 12 AWG 1/C or s1/C -	
		SUBMIA LOO		14 0 12 ATC 1/C- 4.4 0 2 ATC.	
		NATION FAITH CALLS	2.5.6	1/C = 1+ @ 12 AWQ	
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	nghai a bie	Dermai and radiation	2.3.2	16 AWG or actual cable	
			2.4		
	CORELAS, UTARIAS OF ROMENAS LANSINGENT CREAM	dear (5 bass erest	1.5 4	NUTURE ALM	
	CORRENT D'ESTAT OF Special Des D'UCLES LOS DAS	douts base event scould be writed fame test on pratice and boosture retuiner Upernal and reliation of power	1.5.6 1.7.1 1.3.3	NTULI ALB	
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	special los (nu c.e os cabes	doorgo baaa erwen Autouistice wenices interest Uremperature aad thousture menusinge Urempaister deruge baar erwest uremices interest wingtoor wenices interest ungtie the cable autorsticky	1.5.6 1.7.1 1.3.3	NCTUAL BAR	
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	Sendle Der Cheroborou pe	dough base event scould base event writed films test writed films test writed films test Upermailler relations et posere design base event umulations writed for a table united for a table united by White the scolar Upermails and relations et posere Upermails even Upermails even Upermails event	1.5.4 1.7.1 1.3.3 2.4 1.3.8	2.10 - 10 A #C or actual	`
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A Division of The Franklin Insti 20th and Race Streets. Phila	tute	NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/488</u>	Page 5g
EQUIPMENT ENVIRONM	ENTAL QUALIFIC	CATION REVIEW OF EQUIPMENT ITE	NO. 7
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Franklin Research Center A Division of The Franklin Institute 20th and Race Streets, Phila. Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 49748

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QUIPMENT ENVIRONMENTA	QUALIFICATION REVIEW C	F EQUIPMENT ITEM NO. 7
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NOTES:

The licensee has not identified the cable characteristics (such as jacket

and insulation thickness) which would establish the applicability of the

referenced report to the installed cables. This is particularly

important because certain 1000V multiconductor Flamtrol cables have

been observed to have insulation properties significantly different

than the cables tested in the referenced report (F-C4033-1). Of particular

concern was a tendency of conductor insulation to experience dielectric.

breakdown at voltage levels considerably below those expected for

polyethylene cable. Total insulation thickness (i.e. cable jacket plus

conductor insulation) and cross linking electron beam energy used during fabrication are believed to be critical parameters.

The licensee should provide the information on the cable insulation thickness (jacket and conductor insulation) and any other characteristics which demonstrate that the installed cable is the same as the cable in the referenced test.

Note 2- the licensee has not provided an evaluation of aging degradation for the cable nor an estimated qualified life.

Franklin Research Center A Division of The Franklin Institute 20th and Race Streets, Phila, Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 487/488

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 7

NOTES:

Insulation Resistance Tests on Cable at Elevated Temperature and Pressure

Object

These tests are intended to simulate conditions in a nuclear power station when a loss of coolant accident would subject cables to the impingement of high temperature steam leaking from the containment area onto the cables.

Material

EPD 1656 This cable is composed of an 88A insulated pair, AWG 20, with a drain wire wrapped with an aluminized Mylar shield and covered with a Flamtrol jacket.

FURITOR

At Elevated Temperature and Pressure

Object

- These tests are intended to simulate conditions in a nuclear power station when a loss of coolant accident would subject cables to the impingement of high temperatu: steam leaking from the containment area onto the cables. Previous work on this project has been reported in Test Reports EM #644 and 668.

Material

EPD 1656

This cable is composed of an SSA insulated pair, AWG 20, with a drain wire, wrapped with an aluminized Mylar Shield and covered with a Flamtrol jacket.

Test Report EM #644 covers results of tests on this cable before irradiation. This report and Test Report EM #668 cover measurements made on the cable after exposure to 500 megarads of irradiation using a one MEV electron beam at a dose rate of 12 MR per minute.

A Division of The Franklin Institute 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000	NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487</u>	Page I a
EQUIPMENT ENVIRONMENTAL QUALIFIC	CATION REVIEW OF EQUIPMENT ITE	M NO. <u>79</u>
EQUIPMENT ITEM NO. 79 ELECTRICAL CABLE LOCATED IN CONTAINME	NT (C230)	
RAYCHEM MODEL COAXIAL/XLP REQUIRED OPERATING TIME: NOT STATED	N1 (6250)	
TER CHECKSHEET NO. 79 LICENSEE REFERENCE(S): NOT CITED FUNCTION (PLANT ID): CABLE		

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY: (See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, A, S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None, Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

			S

Checksheet Page No.

Equipment Item Summary of Licensee Responses to the NRC SER Equipment Environmental Qualification Summary Forms Licensee Response to NRC SER System Consideration Review

Equipment Environmental Qualification Review

Installed TMI Lessons Learned Implementation Equipment Summary

Maintenance and Replacement Schedule Summary

-6a, 6b

3a, 3b, 3c, 3d-

-59, 5h, 51, 5j

42, 40, 40, 40, 40, 40,

5a, 5b, 5c, 5d, 5e,

la

1b

2

70, 70, 70

A Division of The Franklin Institute 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000	NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487</u> /458	Page Ib
QUIPMENT ENVIRONMENTAL QUALIFIC	CATION REVIEW OF EQUIPMENT ITEM	1 NO. 79
SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE AN	PLICABLE
X The Licensee (has/has not) provide	ed a response to the SER concerns.	
The Licensee (has/has not) specif: qualified and/or will function who environmental service conditions.	ically stated that the equipment is en exposed to the applicable DPE	3
The Licensee has presented information outstanding qualification deficies		
The Licensee (has/has not) propose item whose qualification has not h		lipment
Justification for interim open Licensee for this equipment it	ration (has/ has not) been provided tem.	by the
X Corrective action specified by	y the Licensee:	
Equipment replacement with Equipment modification	n qualified equipment	
Equipment relocation above		
Relocate or shield equipme Verify qualification by ac		
Equipment relocation to a	mild environment	
Qualification testing of e X Other (equipment in progress)
	er information for this equipment i sis for justification for interim	tem
The Licensee (pas/has not) pro corrective action. (Schedule action	ovided a schedule for the proposed for accomplishing the corrective	.)
The Licensee states that the equip and/or should be exempted from env	pment item does not require qualifi vironmental qualification.	cation
DESIGNATION OF RESULTANT NRC QUALIFICA - CIRCLED ITEM ONLY: (See Section 3 of	The Space space is a subspace of the Space o	REVIEW
La Qualified Lb Modification	II.c Qualified Life Deficiency III.a Exempt	
I.a Qualification Not Established	III.a Exempt III.b Not in Scope	
11.b Not Qualified	IV Documentation Not Availabl	е

A Division of The Franklin Institute 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 437/485

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20th and Race Streets. Phila Pa. 19103 (215) 448-1006 FRC Task No		
EQUIPMENT ENVIRONMENTAL QUALIFY	ICATION SUMMARY FORM	
	DESIGNATION:	
IRC REQUIREMENTS	X = DEFICIENCY	
Documented Evidence of Qualification Adequate	· <u>X</u>	
Adequate Similarity Between Equipment and Tes	st Specimen Established	
Aging Degradation Evaluated Adequately		
Qualified Life or Replacement Schedule Establ	Lished (if Required)	
Program Established to Identify Aging Degrada	Acton	
Criteria Regarding Aging Simulation Satisfied	I (II Reduired)	
Criteria Regarding Temperature/Pressure Expos	sure:	
o Peak Temperature Adequate		
o Peak Pressure Adequate		
 Duration Adequate Required Profile Enveloped Adequately 		
 Required Profile Enveloped Adequately Steam Exposure (If Required) Adequate 		
Criteria Regarding Spray Satisfied		
Criteria Regarding Submergence Satisfied		
Criteria Regarding Radiation Satisfied		
Criteria Regarding Test Sequence Satisfied		
Criteria Regarding Test Failures or Severe A	nomalies	
(If Any) Satisfied		
Criteria Regarding Functional Testing Satisf	ied	
Criteria Regarding Instrument Accuracy Satis	fied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-	0588, Cat. I)	
	DESIGNATION:	
NRC QUALIFICATION CATEGORY	$\chi = CATEGORY$	
I.a Equipment Qualified		
I.b Equipment Qualification Pending Modi	fication	
II.a Equipment Qualification Not Establis	hed X	
II.b Equipment Not Qualified		
II.c Equipment Satisfies All Requirements	Except Qualified Life	
or Replacement Schedule Justified		
III.a Equipment Exempt From Qualification	alification Review	
III.D Equipment Not in the Scope of the Qu	dilligation verses	

IV Documentation Not Made Available

Franklin Research Center A Division of The Franklin Institute 20th and Race Concets. Phila., Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 487/485

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5j

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 79

NOTES:

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8. We have completed an extensive review of purchase orders, specifications and inspection reports for cables. This review was completed the 22, 1981. We have updated our computer and installed at Calvert Cliffs. We have compounds purchased with various FIRL and other laboratory test reports. The assessment/ of this year. A Division of The Franklin Institute 20th and Race Streets, Phila, Pa 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 487

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 80

EQUIPMENT ITEM NO. 80 ELECTRICAL CABLE LOCATED IN CONTAINMENT (C230) CONTINENTAL WIRE MODEL XLPE/PVC REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 80 LICENSEE REFERENCE(S): 2818 FUNCTION (PLANT ID): CABLE LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 59 FUNCTION (PLANT ID): CABLE LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 76

 DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:

 (See Section 3 of this TER for Legend)

 R, T, (T) (RT) P, H, (S) (A, S, (R), (M, I, QM, RPN, EXN, SEN, QI, RPS, None,

 Not stated, Not applicable

 LISTING OF APPLICABLE CHECKSHEETS:

 Contents
 Checksheet Page No.

 Equipment Item
 la

 Summary of Licensee Responses to the NRC SER
 lb

Equipment Environmental Qualification Summary Forms

Licensee Response to NRC SER

System Consideration Review

Equipment Environmental Qualification Review

Installed TMI Lessc is Learned Implementation Equipment Summary

Maintenance and Replacement Schedule Summary

70, 70, 70

60, 60

3a, 30, 30, 30, 3d

5g, 5h, 51, 5j

42, 4b, 10, 4d, 4e,

-5a, 5b, 5c, 5d, 5e, 5f,

2

A Division of The Franklin Institute 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000	NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>4874488</u>	Page Ib
QUIPMENT ENVIRONMENTAL QUALIFIC	CATION REVIEW OF EQUIPMENT ITEM	NO. <u>80</u>
SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE A	PPLICABLE
X The Licensee (has/bac not) provide	ed a response to the SER concerns.	
X The Licensee (bee/has not) specific qualified and/or will function who environmental service conditions.	ically stated that the equipment is en exposed to the applicable DBE	5
The Licensee has presented inform outstanding qualification deficies	ation which shows there are no ncies.	
X. The Licensee (has/has not) propose item whose qualification has not it item whose qualification has not it	ed a corrective action for this equipeen fully established.	uipment
Justification for interim oper Licensee for this equipment is	ration (has/ has not) been provided tem.	by the
\underline{X} Corrective action specified by	y the Licensee:	
Equipment replacement with Equipment modification Equipment relocation above Relocate or shield equipme Verify qualification by ad Equipment relocation to a Qualification testing of e Other (e submergence level ent from radiation source dditional (testing/analysis) mild environment)
The Licensee has provided othe that can be construed as a bas operation.	er information for this equipment i sis for justification for interim	tem
X The Licensee (has/bas not) pro corrective action. (Schedule action <u>END of 1981 - NO</u>	ovided a schedule for the proposed for accomplishing the corrective SPECIFIC DATE)
The Licensee states that the equip and/or should be ex. spted from env	oment item does not require qualifivironmental qualification.	cation
ESIGNATION OF RESULTANT NRC QUALIFICA CIRCLED ITEM ONLY: (See Section 3 of	ATION EVALUATION CATEGORY BASED ON of this TER for Legend)	REVIEW
.a Qualified Modification I.a Qualification Not Established I.b Not Qualified	II.c Qualified Life Deficiency III.a Exempt III.b Not in Scope IV Documentation Not Availabl	e

A Division of The Franklin Institute 20th and Race Streets, Phila., Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487 + 488</u>

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DISIGNATION:

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 80

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

X = DEFICIENCY NRC REQUIREMENTS Documented Evidence of Qualification Adequate X Adequate Similarity Between Equipment and Test Specimen Established Aging Degradation Evaluated Adequately Qualified Life or Replacement Schedule Established (If Required) Program Established to Identify Aging Degradation Criteria Regarding Aging Simulation Satisfied (If Required) Criteria Regarding Temperature/Pressure Exposure: o Peak Temperature Adequate o Peak Pressure Adequate o Duration Adequate o Required Profile Enveloped Adequately o Steam Exposure (If Required) Adequate Criteria Regarding Spray Satisfied Criteria Regarding Submergence Satisfied Criteria Regarding Radiation Satisfied Criteria Regarding Test Sequence Satisfied Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied Criteria Regarding Functional Testing Satisfied Criteria Regarding Instrument Accuracy Satisfied Test Duration Margin (1 hour + Function Time) Satisfied Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)

NRC QUALIFICATION CATEGORY

DESIGNATION: X = CATEGORY

I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	-
II.a	Equipment Qualification Not Established	X
II.b	Equipment Not Qualified	-
II.c	Equipment Satisfies All Requirements Except Qualified Life	
	or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

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Franklin Research Center A Division of The Franklin Institute 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000

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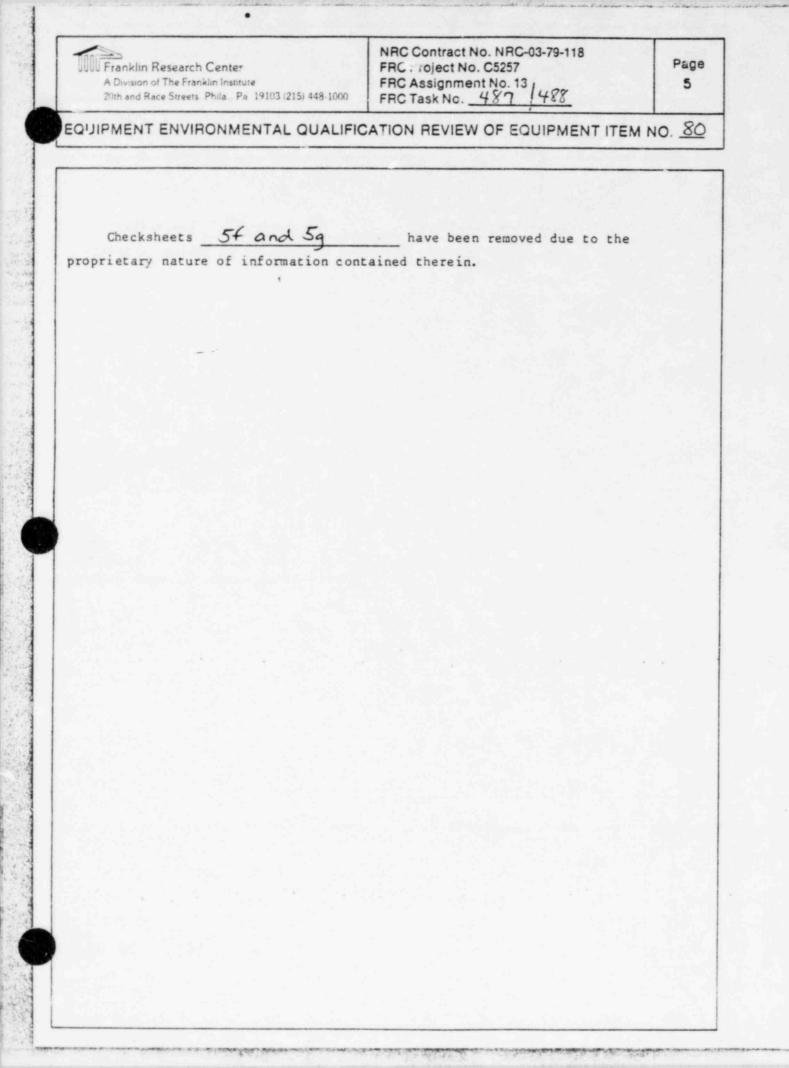
NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>4874488</u>

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 20

LICENSEE RESPONSE TO NRC SER

8. We have completed an extensive review of purchase orders, specifications and inspection reports for cables. This review was completed July 22, 1981. We have updated our complete printout to include the insulation jacket compounds purchased and installed at Calvert Cliffs. We have correlated this information with various FIRL and other laboratory test reports. The assessment/ evaluation activity is not expected to be complete until the end of this year.



A Division of The Frank Institute 20th and Race Streets, Phila, Pa. 19103 (215) 448-1000		age
EQUIPMENT ENVIRONMENTAL QUALIFIC	ATION REVIEW OF EQUIPMENT ITEM NO.	81
EQUIPMENT ITEM NO. 81 ELECTRICAL CABLE LOCATED IN CONTAINME OKONITE MODEL EPR/OKOLON REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 81 LICENSEE REFERENCE(S): 4593 FUNCTION (PLANT ID): CABLE LICENSEE SUBMITTAL: SCEW(S) [1, 12]:		
DESIGNATION FOR DEFICIENCY IDENTIFIED (See Section 3 of this TER for Legend	BY THE NRC SER - CIRCLED ITEM(S) ONLY:	
(See Section 3 of this TER for Legend		
(See Section 3 of this TER for Legend)	
(See Section 3 of this TER for Legend R, T, (T) (RT, P, H, (S, A, S, (R), M,)	
(See Section 3 of this TER for Legend R, T, (QT) (RT, P, H, (CS) , A, S, (R), M, Not stated, Not applicable)	
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A Division of The Franklin Institute 20th and Race Streets. Phila. Pa 19103 (215) 448-1000	NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>4F7/45F</u>	Page I b
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SUMMARY OF LICENSEE RESPONSES TO THE N		
	ANG BER - ONDI CHECKED ITENS ARE A	PPLICABLE
X The Licensee (has/h as not) provide	ed a response to the SER concerns.	
The Licensee (has/has not) specifi qualified and/or will function whe environmental service conditions.	ically stated that the equipment-is an exposed to the applicable DBE	-
The Licensee has presented informa outstanding qualification deficier	ation which shows there are no ncies.	
X The Licensee (has/has_not) propose item whose qualification has not b	ed a corrective action for this equipeen fully established.	ipment
Justification for interim oper Licensee for this equipment it	ation (has/has not) been provided	by the
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I.a Qualified I.b Modification	II.c Qualified Life Deficiency III.a Exempt	
II.a Qualification Not Established	III.b Not in Scope	
II.b Not Qualified	IV Documentation Not Availabl	e

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	DESIGNATION:	
NRC REQUIREMENTS	X = DEFICIENCY	
Documented Evidence of Qualification Adequate		
Adequate Similarity Between Equipment and Test Specimes	n Established X	
Aging Degradation Evaluated Adequately		
Qualified Life or Replacement Schedule Established (If	Required)	
Program Established to Identify Aging Degradation		
Criteria Regarding Aging Simulation Satisfied (If Requ	ired)	
Criteria Regarding Temperature/Pressure Exposure:		
o Peak Temperature Adequate		
o Peak Pressure Adequate		
o Duration Adequate		
o Required Profile Enveloped Adequately		
o Steam Exposure (If Required) Adequate		
Criteria Regarding Spray Satisfied		
Criteria Regarding Submergence Satisfied		
Criteria Regarding Radiation Satisfied		
Criteria Regarding Test Sequence Satisfied		
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied		
Criteria Regarding Functional Testing Satisfied		
Criteria Regarding Instrument Accuracy Satisfied		
Test Duration Margin (1 hour + Function Time) Satisfie	d	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat.		
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	DESIGNATION:	
NRC QUALIFICATION CATEGORY	X = CATEGORY	
I.a Equipment Qualified		
I.b Equipment Qualification Pending Modification		
II.a Equipment Qualification Not Established	<u> </u>	
II.b Equipment Not Qualified		
II.c Equipment Satisfies All Requirements Except Qu	alified Life	
or Replacement Schedule Justified		
III.a Equipment Exempt From Qualification		
III.b Equipment Not in the Scope of the Qualificatio	n Review	

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IV Documentation Not Made Available

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 81

8. We have completed an extensive review of purchase orders, specifications and inspection reports for cables. This review was completed July 22, 1981. We have updated our computer printout to include the insulation jacket compounds purchased and installed at Calvert Cliffs. We have correlated this information with various FIRL and other laboratory test reports. The assessment/ evaluation activity is not expected to be complete until the end of this year.

Di sion of	esearch Center The Franklin Institute e Streets, Phila , Pa. 19103 (21	FRC	Project No. (Assignment		Page 5f
EQUIPMENT E	ENVIRONMENTAL	QUALIFICATION	REVIEW C	OF EQUIPMENT ITE	EM NO. 2
na bria babarra			L. L	<u></u>	
The Lic	ensee has not pr	esented suffic	ient info	mation to establ	Lish .
equival	lence between the	cable tested	and the is	nstalled cable (s	see 5g)
as requ	ired by DOR Guid	elines and/or	IEEE-383-	74	
	1.1.1.1.1.1.1		·		
2.	Test Specimen - The				
				ly be considered valid	·
				truction to the test	
				rt of the qualifica-	
	tion documentation ((see also Section 8.	0 below).		
				Contraction of the second	
	500U	Type Test Samples. T ild contain the conduct jacket, binder tape, ove and field splices which	or, insulation, mall jacket, shi	fill-	
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-		. 030" Okonite insulation - 6	

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EQUIPMENT ITEM NO. 82 ELECTRICAL CABLE LOCATED IN CONTAINME ROCKBESTOS MODEL SILLCONE RUBBER/ASBE		

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY: (See Section 3 of this TER for Legend) R, T, (QI', (RT,) P, H, (CS, (A,) S, (R), M, I, UM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

REQUIRED OPERATING TIME: NOT STATED

LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 62

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): CABLE

TER CHECKSHEET NO. 82

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The Licensee (has/has not) specif: qualified and/or will function who environmental service conditions.	ically stated that the equipment is en exposed to the applicable DBE	5
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I.a Qualified I.b Modification II.a Qualification Not Established	II.c Qualified Life Deficiency III.a Exempt III.b Not in Scope	

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ТЕМ NO. <u>δ</u>
IGNATION:
DEFICIENCY
_ <u>×</u>
ESIGNATION:
= CATEGORY
X

II.c Equipment Satisfies All Requirements Except Qualified Life

- or Replacement Schedule Justified
- III.a Equipment Exempt From Qualification III.b Equipment Not in the Scope of the Qualification Review
- IV Documentation Not Made Available

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 82

LICENSEE RESPONSE TO NRC SER

8. We have completed an extensive review of purchase orders, specifications and inspection reports for cables. This review was completed July 22, 1981. We have updated our computer printout to include the insulation jacket compounds purchased and installed at Calvert Cliffs. We have correlated this information with various FIRL and other laboratory test reports. The assessment/ evaluation activity is not expected to be complete until the end of this year.

NRC Contract No. NRC-03-79-118 Page Franklin Research Center FRC Project No. C5257 A Division of The Franklin Institute FRC Assignment No. 13 la 20th and Race Streets. Phila . Pa. 19103 (215) 448-1000 FRC Task No. EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 83 EQUIPMENT ITEM NO. 83 ELECTRICAL CABLE LOCATED IN CONTAINMENT (C230) ROCKBESTOS MODEL XLPE/NEOPRENE REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 83 LICENSEE REFERENCE(S): 4607 FUNCTION (PLANT ID): CABLE LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 69 DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY: (See Section 3 of this TER for Legend) R, T, (T, (RT,) P, H, (CS, (A,) S, (R), M, I, UM, RPN, EXN, SEN, QI, RPS, None, Not stated, Not applicable LISTING OF APPLICABLE CHECKSHEETS: Contents Checksheet Page No. Equipment Item la Summary of Licensee Responses to the NRC SER 15 Equipment Environmental Qualification Summary Forms 2 Licensee Response to NRC SER 3a, 3b, 3c, 3d-System Consideration Review 4a, 4b, 4c, 4d, 4e, 4E Equipment Environmental Qualification Review -5a, 50, 5c, 5d, 5c, 5f, 5g, 5h, 51, 51 Installed TMI Lessons Learned Implementation 62, 60-Equipment Summary Maintenance and Replacement Schedule Summary 70, 70, 70-

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SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE AP	PLICABLE
X The Licensee (has/ has not) provide	ed a response to the SER concerns.	
X The Licensee (has/has not) specific qualified and/or will function whe environmental service conditions.	ically stated that the equipment to en exposed to the applicable DBE	-
The Licensee has presented information outstanding qualification deficier	ation which shows there are no ncies.	
X The Licensee (has/has not) propose item whose qualification has not h	ed a corrective action for this equ been fully established.	ipment
Justification for interim oper Licensee for this equipment it	ration (has/h as not) been provided tem.	by the
K Corrective action specified by	y the Licensee:	
Equipment replacement with Equipment modification Equipment relocation above	e submergence level	
Relocate or shield equipme Verify qualification by ad	ditional (testing/analysis)	
Equipment relocation to a Qualification testing of e Other (mild environment equipment in progress)
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The Licensee (<u>nec</u> /has not) pro corrective action. (Schedule action	ovided a schedule for the proposed for accomplishing the corrective	.)
The Licensee states that the equip and/or should be exempted from env	oment item does not require gualific vironmental qualification.	ation
DESIGNATION OF RESULTANT NRC QUALIFICA - CIRCLED ITEM ONLY: (See Section 3 o	ATION EVALUATION CATEGORY SASED ON F of this TER for Legend)	FYIEW
I.a Qualified I.b Modification II.a Qualification Not istablished II.b Not Qualified	<pre>II.c Qualified Life Deficiency III.a Exempt III.b Not in Scope IV Documentation Not Available</pre>	

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DI	ESIGNATION:
NRC REQUIREMENTS X	DEFICIENCY
Documented Evidence of Qualification Adequate	×
Adequate Similarity Between Equipment and Test Specimen Establishe	ed X
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Required)	
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies	
(If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

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I.a	Equipment Qualified
I.b	Equipment Qualification Pending Modification
II.a	Equipment Qualification Not Established
II.D	Equipment Not Qualified
II.c	Equipment Satisfies All Requirements Except Qualified Life
	or Replacement Schedule Justified
III.a	Equipment Exempt From Qualification
III.b	Equipment Not in the Scope of the Qualification Review
IV	Documentation Not Made Available

Franklin Research Center A Division of The Franklin Institute 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. ______

Page 30

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. &

LICENSEE RESPONSE TO MRC SEP

8. We have completed an extensive review of put-hase orders, specifications and inspection reports for cables. This review was completed July 22, 1981. We have updated air computer printout to include the insulation jacket compound, purchased and installed at Calvert Cliffs. We have correlated this information with various FIRL and other laboratory test reports. The assessment/ evaluation activity is not expected to be complete until the end of this year.

Di sion of	Research Center 1 The Franklin Institute ce Streets, Phila., Pa. 19103 (2	215) 448-1000	NRC Contract No FRC Project No. 0 FRC Assignment FRC Task No. <u>4</u>	C5257 No. 13	Page 5 f
EQUIPMENT	ENVIRONMENTAL	QUALIFICA	TION REVIEW	OF EQUIPMENT IT	EM NO. 8
		N.			
The Lic	ensee has not pr	resented su	ifficient info	mation to establ	lish
equival	ence between the	a cable tes	ted and the in	nstuiled cable (see Se ASh
as requ	ired by DOR Guid	ielines and	/or IEEE-383-	74	
2.	Test Specimen - The	test speciper	should be the sam	e model as the	
	equipment being qua	lified. The :	type test should on	ly be considered vali	d
· · ·	for equipment ident	idal in design	and material cons	truction to the test	
	spacimen. Any devi	ations should	be evaluated as ca	rt of the qualifica-	
	tion documentation				
	shore	uld contain the c	ples. The samples te conductor, insulation, ape, overall jacket, shi	ñ11-	
	ing.	and field splices	ape, overall jacket, in s which are represente y being qualified. Tal	tive	
and the second	lists	sizes which hav	e been considered rep		
	senta	ative of these	categories. The sam		
	iengt test	ative of these ins should be suf readings and ev	categories. The sam incient to permit relia aluation consistent w	Die	
	iengt test	ative of these ins should be suf	categories. The sam incient to permit relia aluation consistent w	Die	
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NRC Contract No. NRC-03-79-118 Page FRC Project No. C5257 Frank in Research Center FRC Assignment No. 13 FRC Task No. 487/488 59 A Division of The Franklin Institute 20th and Race Streets, Phila . Pa. 19103 (215) 448-1000 EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. P.3 NOTES: The installed Cable is YSTEM: ELECTRICAL SASYSTEMI MISC JULASENT: CARLE EGUIPHENT" DESCRIPTION CUMPULENT HUMBER CELXXX CUMPUNENT CABLE MANUFALTUREN RUCKBESTUS PART NUMBER XLPE/NEO" ACCURACY NA LUCATION C230 CONTAINMENT The lable in the referenced report CABLE CONSTRUCTIONS #12 7/.0305" tinned copper conductor Sample No. S-1 .060" thickness Rockbestos KS-400, methyl-vinyl silicone rubber insulation Fiberglass braid, with lacquer finish -----7 conductors cabled Silicone rubber impregnated glass binder tape .045" thick esbestos braid with flame-retardant saturant Sample No. S-2 The same as above, except using G.E.'s 9025 pethyl-phenyl silicone rubber insulation Sample No. S-3 The same as above, except using Dow Corning's X32330 methyl-phenyl silicone rubber insulation

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NRC Contract No. NRC-03-79-118 Franklin Research Center Page FRC Project No. C5257 FRC Assignment No. 13 A Division of The Franklin Institute 5h 20th and Race Streets, Phila. Pa. 19103 (215) 448-1000 FRC Task No. 4 P 455 EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 83 NOTES : #12 7/.0305" tinned copper conductor . Sample No. KP .045" thickness flame retardant cross-linked polyethylene insulation 7 conductors cabled Silicone rubber impregnated glass binder tape Glass reinforced asbestos tape .060" thickness flame retardant neoprene jacket Further A PROPERTY OF A

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A Division of The Franklin Institute 20th and Race Streets. Phila. Pa 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 487

Page

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 84

EQUIPMENT ITEM NO. 84 ELECTRICAL CABLE LOCATED IN CONTAINMENT (C230) BOSTON INSULATED WIRE MODEL INDUSTRITE - HYPALON/HYPALON REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 84 LICENSEE REFERENCE(S): 630, 4596 FUNCTION (PLANT ID): CABLE LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 67

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY: (See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS A, S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents

Equipment Item

Summary of Licensee Responses to the NRC SER Equipment Environmental Qualification Summary Forms

Licensee Response to NRC SER

System Consideration Review

Equipment Environmental Qualification Review

Installed TMI Lessons Learned Implementation Equipment Summary

Maintenance and Replacement Schedule Summary

Checksheet Page No.

2 3a, 3b, 3c, 3d +a; 4b, 4c, 4d, 4e, 4f -5a, 5b, 5c, 5d, 5c, 5f, 5g, 5h, 51, 5j

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QUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY OF LICENSEE RESPONSES TO THE NRC SE ✓ The Licensee (has/has not) provided a r ✓ The Licensee (has/has not) specifically qualified and/or will function when exp environmental service conditions. The Licensee has presented information outstanding qualification deficiencies. ✓ The Licensee has presented information outstanding qualification has not been f ✓ The Licensee (has/has not) proposed a c item whose qualification has not been f ✓ Justification for interim operation Licensee for this equipment item. ✓ Corrective action specified by the — Equipment replacement with qual Equipment modification — Equipment relocation above submul Relocate or shield equipment from Verify qualification to a mild of Qualificat	- ONLY CHECKED ITEMS ARE APPLIC sponse to the SER concerns. stated that the equipment is sed to the applicable DBE hich shows there are no rrective action for this equipment ly established. (has/has not) been provided by t icensee: fied equipment spence level	CABLE
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The Licensee has provided other info that can be construed as a basis for	nt in progress	
that can be construed as a basis for)
operation.	mation for this equipment item justification for interim	
X The Licensee (mas/has not) provided	schedule for the proposed	
corrective action. (Schedule for ac	complishing the corrective	
action	.)	
The Licensee states that the equipment is and/or should be exempted from environme	em does not require qualification.	on
ESIGNATION OF RESULTANT NRC QUALIFICATION E CIRCLED ITEM ONLY: (See Section 3 of this	ALUATION CATEGORY BASED ON REVI TER for Legend)	EW
	Qualified Life Deficiency	
	Exempt	
I.b Not Qualified IV	Not in Scope	

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Franklin Research Center A Division of The Franklin Institute 20th and Race Streets, Phila., Pa. 19103 (215) 448-1000

NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 487/488

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 2

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION: X = DEFICIENCY

> DESIGNATION: X = CATEGORY

Documented Evidence of Qualification Adequate Adequate Similarity Between Equipment and Test Specimen Established Aging Degradation Fvaluated Adequately Qualified Life or Replacement Schedule Established (If Required) Program Established to Identify Aging Degradation Criteria Regarding Aging Simulation Satisfied (If Required) Criteria Regarding Temperature/Pressure Exposure: o Peak Temperature Adequate o Peak Pressure Adequate

o Duration Adequate

o Required Profile Enveloped Adequately

o Steam Exposure (If Required) Adequate Criteria Regarding Spray Satisfied Criteria Regarding Submergence Satisfied Criteria Regarding Radiation Satisfied

Criteria Regarding Test Sequence Satisfied Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied

Criteria Regarding Functional Testing Satisfied Criteria Regarding Instrument Accuracy Satisfied Test Duration Margin (1 hour + Function Time) Satisfied Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)

NRC QUALIFICATION CATEGORY

Equipment Qualified I.a Equipment Qualification Pending Modification I.b Equipment Qualification Not Established II.a Equipment Not Qualified II.b Equipment Satisfies All Requirements Except Qualified Life II.C or Replacement Schedule Justified III.a Equipment Exempt From Qualification Equipment Not in the Scope of the Qualification Review III.D Documentation Not Made Available IV

A Division of The Franklin Institute 20th and Race Streets. Phila Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>499</u>/484

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 84

LICENSEE RESPONSE TO NRC SER

8. We have completed an extensive review of purchase orders, specifications and inspection reports for cables. This review was completed July 22, 1981. We have updated our computer printout to include the insulation jacket compounds purchased and installed at Calvert Cliffs. We have correlated this information with various FIRL and other laboratory test reports. The assessment/ evaluation activity is not expected to be complete until the end of this year.

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	search Center he Franklin Institute Streets. Phila., Pa. 19103 (215)	FRC Pro	ntract No. N oject No. C52 signment No. sk No. <u>48</u>	0.13	Page 5 f
EQUIPMENT E	NVIRONMENTAL C	UALIFICATION R	EVIEW OF	EQUIPMENT ITEN	1 NO. 54
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	specimen. Any devia	ations should be eval	uated as pa	nt of the qualifica-	
	tion documentation	(see also Section 8.0) below).		
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A Division of The Franklin Institute 20th and Race Streets. Phila. Pa 19103 (215) 448-1000	NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>4F7/4FF</u>	Page 5g
QUIPMENT ENVIRONMENTAL QUALIFIC	CATION REVIEW OF EQUIPMENT	ITEM NO. PY
NOTES:	e de la companya de l	
The prospelled cable is	Desented on :	
	•	
SYSTEM: ELECTRICAL SUBSYSTEM: MISC		
ERUIPMENT: CARLE		
EQUIP VENT		•
CUMPUNENT NU		
COMPONENT		
C18LE		
42% UF & C T UREH 60310N	INS. WIRE	
PART NUMBER	SITE-HYP/HYP	
ACCORACY		
NA		
LOCATION C230		
CUNTAI	NKENT	
The action of an	it la total	toto
Out referenced my	algenia Via	and
cura as follow		
Insulation resistance readings were tak	en periodically during the test under te	moera-
tures and pressures specified.		
Insulation resistance values were read	al al a seres	
BIW Part No. 7244-H-002 — Single Pair BIW Part No. 87244-H-002 — Single Pa		
Results are plotted on a curve in which See pages 13 and 14.		
Effect of Irradiation	김 교무 학생님께서는 다	
In order to provide information with re	espect to the effect of exposure of ra	diation
on the behavior of the cable under t sample of the two-pair instrument cab to the containment environmental test	le, BIW Part No. 7245-H-004, was sub	omitted
dose of radiation.		and the second state of the second second second second
	E630]	

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NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/488</u>

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 34

2/0	#16	AWG	soli	d copp	er an	d cons	tantan	1			
600	volt			1				1			
Shie	1d	alu	minum	rp11	cover	ed by	copper	braid	for	100%	coverage
Prop	rieta	ry f	lame	retard	ant b	inding	tape	1			

[4596]

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NRC Contract No. NRC-03-79-118 Franklin Research Center FRC Project No. C5257 Page A Division of The Franklin Institute FRC Assignment No. 13 la 20th and Race Streets. Phila Pa 19103 (215) 448-1000 FRC Task No. 487 EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 85 EQUIPMENT ITEM NO. 85 ELECTRICAL CABLE LOCATED IN CONTAINMENT (C230) BOSTON INSULATED WIRE MODEL SILICONE RUBBER (EQUIVALENT)/HYPALON REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 85 LICENSEE REFERENCE(S): 4598 FUNCTION (PLANT ID): CABLE LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 68 DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY: (See Section 3 of this TER for Legend) R, T, (QT) (RT,) P, H, (CS,)(A,) S, (R), M, I, UM, RPN, EXN, SEN, QI, RFS, None, Not stated, Not applicable LISTING OF APPLICABLE CHECKSHEETS: Contents Checksheet Page No. Equipment Item la Summary of Licensee Responses to the NRC SER 15 Equipment Environmental Qualification Summary Forms 2 Licensee Response to NRC SER 3a, 30, 3c, System Consideration Review 40, 40, 40, 40, 40, 40, Equipment Environmental Qualification Review 5a, 5b, 5c, 5d, 5e, 5f, 5g, 5n, 51, 5j Installed TMI Lessons Learned Implementation 6a, 60-Equipment Summary Maintenance and Replacement Schedule Summary 70, 70, 70-

A Division of The Franklin Institute 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000	NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 487/488	Page 15
QUIPMENT ENVIRONMENTAL QUALIFIC	ATION REVIEW OF EQUIPMENT ITEM	NO. 2
SUMMARY OF LICENSEE RESPONSES TO THE I	NRC SER - ONLY CHECKED ITEMS ARE APP	LICABLE
The Licensee (has/has not) provide	ed a response to the SER concerns.	
The Licensee (has/hes_pot) specific qualified and/or will function whe environmental service conditions.	ically stated that the equipment is en exposed to the applicable DBE	
The Licensee has presented information outstanding qualification deficient	ation which shows there are no ncies.	
X The Licensee (has/has_not) propose item whose qualification has not b	ed a corrective action for this equip been fully established.	pment
Justification for interim oper Licensee for this equipment it	ration (has/ <u>bas_not</u>) been provided by tem.	the
A Corrective action specified by	the Licensee:	
Equipment replacement with Equipment modification Equipment relocation above Relocate or shield equipme Verify qualification by ad Equipment relocation to a Qualification testing of e	e submergence level ent from radiation source ditional (testing/analysis) mild environment equipment in progress)
The Licensee has provided othe that can be construed as a bas operation.	er information for this equipment ite is for justification for interim	m
Y The Licensee (bes/has not) pro corrective action. (Schedule action	for accomplishing the corrective	
The Licensee states that the equip and/or should be exempted from env	ment item does not require qualifica Fironmental qualification.	tion
ESIGNATION OF RESULTANT NRC QUALIFICA CIRCLED ITEM ONLY: (See Section 3 o	TION EVALUATION CATEGORY BASED ON RE f this TER for Legend)	VIEW
.a Qualified .b Modification	II.c Qualified Life Deficiency	
.D Modification I.a Qualification Not Established	III.a Exempt III.b Not in Scope	
I.b Not Qualified	IV Documentation Not Available	

- and the construction of the part of the

Franklin Research Center A Division of The Franklin Institute 20th and Race Streets. Phila., Pa. 19103 (215) 448-1000

Street.

NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 4 8-7/48

Page 2

UIPMENT ENVIRONMENTAL QU	ALIFICATION REVIEW OF EQUIPME	NT ITEM NO. d
EQUIPMENT ENVIRONM	MENTAL QUALIFICATION SUMMARY FORM	
		DESIGNATION:
IRC REQUIREMENTS	X	= DEFICIENCY
ocumented Evidence of Qualifica	ation Adequate	hed X
Meguate Similarity Between Equi	ipment and Test Specimen Establish	hed X
ging Degradation Evaluated Adeq		
Qualified Life or Replacement Sc	chedule Established (If Required)	
Program Established to Identify		
Criteria Regarding Aging Simulat		
Criteria Regarding Temperature/P	Pressure Exposure:	
o Peak Temperature Adequate		
o Peak Pressure Adequate		
o Duration Adequate		
o Required Profile Envelope		
o Steam Exposure (If Requir		
Criteria Regarding Spray Satisfi		
Criteria Regarding Submergence S		
Criteria Regarding Radiation Sat		
Criteria Regarding Test Sequence		
Criteria Regarding Test Failures	s or Severe Anomalles	
(If Any) Satisfied	and a factorial	
Criteria Regarding Functional Te		
Criteria Regarding Instrument Ac		
Test Duration Margin (1 hour + F Criteria Regarding Margins Satis		
criteria Regarding Margins Sacis	siled (noned-0500; cat. 1)	
		DESIGNATION:
NRC QUALIFICATION CATEGORY		X = CATEGORY
I.a Equipment Qualified		
I.b Equipment Qualification	Pending Modification	
II.a Equipment Qualification		×
II.b Equipment Not Qualified		
	Requirements Except Qualified Li	fe
or Replacement Schedule		
III.a Equipment Exempt From Qu		
	ope of the Qualification Review	-
IV Documentation Not Made 1	Available	

A Division of The Franklin Institute 20th and Race Streets, Phila., Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>477/448</u>

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. FY

LICENSEE RESPONSE TO NRC SER

8. We have completed an extensive review of purchase orders, specifications and inspection reports for cables. This review was completed July 22, 1981. We have updated sur computer printout to include the insulation Jacket compounds purchased and installed at Culvert cliffs. We have correlated this information with various FIRL and other laboratory test reports. The assessment/ evaluation activity is not expected to be complete until the end of this year.

D. sion of 1	rsearch Center The Franklin Institute Streets, Phila, Pa 19103 (215	FRC Pro	ntract No. bject No. Cl signment N sk No. <u>4</u> 8	10.13	Page 5 f
EQUIPMENT E	NVIRONMENTAL	QUALIFICATION R	EVIEW O	F EQUIPMENT ITEN	NO. 25
The Lic	ensee has not pr	esented sufficie	int infor	mation to establ	ish
				stalled cable (s	
*	ired by DOR Guid				
	Test Specimen - The	test specimen should	20 200 520	e model as the	
				ly be considered valid	
•				truction to the test	
	specimen. Any cevia	tions should be evalu	lated as pa	rt of the qualific-	
	tion documentation (see also Section 8.0	below).		
		* *			
		Type Test Samples. The			
	475.	acket, binder tape, over:	il jacket, shi	iciá.	
	ing.	and field splices which a	re representa	sive	× •
		e cable category being q		AND ADDRESS OF MALERS IN A MARKET MARKET ADDRESS ADDRE	
	lists s	izes which have been co	insidered rep	7 0 -	
And the second second second second	.engt.	tive of these categorie is should be sufficient to	permit rolia	Sie.	
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	LETAL RESTRICT Las prices for last mouto prices for	Charmel and radiation *1 Docume Smith Davis arest subulation	2423	1/C or ¥/C = 14 or 11 ARC 1/C or 11/C = 14 or 11 ARC	
	LETAL RESTRICT Las prices for last mouto prices for	Chernical and radiation 12 Doctore Shirth Data events sum us boe menticul fame test unif in finan cable unif in finan cable unif in finan cable	7.3.2 2.4 7.5.6 2.5.4	1/C or M/C = 14 or 12 AMO 1/C or 12 AMO 1/C or 12 AMO 1/C = 14 or 12 AMO 1/C = 14 or 12 AMO 7/C = 16, 14 or 12 AMO	
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A Dission of The Franklin Institute 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000	NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>467/465</u>	Page 1b
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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO.

LICENSEE RESPONSE TO NRC SER

8. We have completed an extensive review of purchase orders, specifications and inspection reports for cables. This review was completed July 22, 1981. We have updated our computer printout to include the insulation jacket compounds purchased and installed at Calvert Cliffs. We have correlated this information with various FIRL and other laboratory test reports. The assessment/ evaluation activity is not expected to be complete until the end of this year.

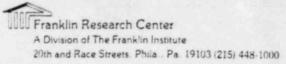
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NRC Contract No. NRC-03-79-118 Page FRC Project No. C5257 Franklin Research Center 59 A Division of The Franklin Institute FRC Assignment No. 13 FRC Task No. 487 484 20th and Race Streets. Phila Pa 19103 (215) 448-1000 EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 86 NOTES: The SCr w sheet state 3TSTEN: ELECTRICAL SUNSYSTEM: MISC EGUIPMENT: CARLE THUTP'NENT-UESCRIPTION *********************************** CUPPLIENT NUMBER CHLXXX CUMPULENT 31640 FARUFACTURER HUSTUN INSUL. HINE PAHI NUMHER XLPE/HYP ACCURACY NA LOCATION C230-CONTAINMENT The testriput stendy; Ha cable tester as. CABLE CONSTRUCTION 2/2 =15 4003 75 XLP INSULATION ALUMA / MYLAR SHIELD & DRAIN WIRE FLAME BARRIES TUPES NEOFRENE JACKET 13850 0.00223040/

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 8

EQUIPMENT ITEM NO. 87 ELECTRICAL CABLE LOCATED IN CONTAINMENT (C230) KERITE MODEL HTK/FR REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 87 LICENSEE REFERENCE(S): 1783 FUNCTION (PLANT ID): CABLE LICENSEE SUBMITTAI: SCEW(S) [1, 12]: 66

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY: (See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, A, S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents

Equipment Item

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Summary ⁶ Licensee Responses to the NRC SER Equipment Environmental Qualification Summary Forms Licensee Response to NRC SER

System Consideration Review

Equipment Environmental Qualification Review

Installed TMI Lessons Learned Implementation Equipment Summary

Maintenance and Replacement Schedule Summary

2 3a, 3b, 3c, 3d 4a, 4b, 4c, 4d, 4c, 4<u>f</u> 5a, 5b, 5c, 5d, 5c, 5f, 5g, 5h, 5i, 5j

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QUIPMENT ENVIRONMENTAL QUALIFIC	CATION REVIEW OF EQUIPMENT ITEM	1 NO. <u>87</u>
SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE A	PPLICABLE
X The Licensee (has/has not) provid	led a response to the SER concerns.	
The Licensee (has/has, not) specif qualified and/or will function wh environmental service conditions.	ically stated that the equipment i then exposed to the applicable DBE	S
The Licensee has presented inform outstanding qualification deficie	mation which shows there are no encies.	
X The Licensee (has/has not) propos item whose qualification has not	sed a corrective action for this eq been fully established.	uipment
	eration (has/h as not) been provided	by the
X Corrective action specified b	by the Licensee:	
Equipment replacement with Equipment modification Equipment relocation above Relocate or shield equipm Verify qualification by a Equipment relocation to a Qualification testing of X Other (EVALUATION	ve submergence level ment from radiation source additional (testing/analysis) a mild environment equipment in progress	
The Licensee has provided oth	her information for this equipment asis for justification for interim	item
X The Licensee (nac/has not) proceeding (Schedule action)	rovided a schedule for the proposed e for accomplishing the corrective	.)
The Licensee states that the equ and/or should be exempted from e	ipment item does not require quali: nvironmental qualification.	fication
DESIGNATION OF RESULTANT NRC QUALIFI - CIRCLED ITEM ONLY: (See Section 3	CATION EVALUATION CATEGORY BASED OF this TER for Legend)	N REVIEW
I.a Qualified I.b Modification II.a Qualification Not Established II.b Not Qualified	II.c Qualified Life Deficiency III.a Exempt III.b Not in Scope IV Documentation Not Availa	

 Image: Streets. Phila.. Pa. 19103 (215) 448-1000
 NRC Contract No. NRC-03-79-118

 FRC Project No. C5257

 FRC Assignment No. 13

 FRC Task No. ____487, 488

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EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM DESIGNATION: NRC REQUIREMENTS X = DEFICIENCY

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 87

Documented Evidence of Qualification Adequate Adequate Similarity Between Equipment and Test Specimen Established Aging Degradation Evaluated Adequately Qualified Life or Replacement Schedule Established (If Required) Program Established to Identify Aging Degradation Criteria Regarding Aging Simulation Satisfied (If Required) Criteria Regarding Temperature/Pressure Exposure: o Peak Temperature Adequate o Peak Pressure Adequate o Duration Adequate o Required Profile Enveloped Adequately o Steam Exposure (If Required) Adequate Criteria Regarding Spray Satisfied Criteria Regarding Submergence Satisfied Criteria Regarding Radiation Satisfied Criteria Regarding Test Sequence Satisfied Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied Criteria Regarding Functional Testing Satisfied Criteria Regarding Instrument Accuracy Satisfied Test Duration Margin (1 hour + Function Time) Satisfied Criteria Regarding Margins Satisfied (NUREG-0538, Cat. I)

NRC QUALIFICATION CATEGORY

I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	_ <u>X</u> _
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life	
	or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

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DESIGNATION: X = CATEGORY

A Division of The Franklin Institute 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 487/488

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 87

LICENSEE RESPONSE TO NRC SER

8. We have completed an extensive review of purchase orders, specifications and inspection reports for cables. This review was completed July 22, 1981. We have updated our computer printout to include the insulation jacket compounds purchased and installed at Calvert Chiffs. We have correlated this information with various FIRL and other laboratory test reports. The assessment/ evaluation activity is not expected to be complete until the end of this year.

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EQUIPMENT E	NVIRONMENTAL	QUALIFICATIO	ON REVIEW O	F EQUIPMENT ITEN	NO. 87
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2.	Test Specimen - The				
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<u></u>	ers. ing.	Type Test Sample uld contain the con jacket, binder tape and field splices wi be cable category b	ductor, insulation. , overall jacket, shi hich are representa	fil. leid-	12
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EQUIPMENT ENVIRONMENTAL QUALI	FICATION REVIEW OF EQUIPMENT ITE	M NO. &
NOTES:		
PGR # 1783 discrib	hes The Kerite calles	as:
Two cables were tested:		
(1) Power Cable, 3/c No. 12	(7) AWG, FR Insulation, FR Jacket	
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MANUFAC K	ERITE	
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A Division of The Franklin Institute 20th and Race Streets. Phila . Pa 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 487

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 88

EQUIPMENT ITEM NO. 88 ELECTRICAL CABLE LOCATED IN CONTAINMENT (C230) HATFIELD MODEL SILICONE RUBBER/ASBESTOS BRAID REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 88 LICENSEE REFERENCE(S): NOT CITED FUNCTION (PLANT .): CABLE LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 64

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY: (See Section 3 of this TER for Legend)

R, T, QI, RT, P, H, CS, A, S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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C			<u> </u>	. .		.	3

Checksheet Page No.

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Equipment Item Summary of Licensee Responses to the NRC SER Equipment Environmental Qualification Summary Forms Licensee Response to NRC SER System Consideration Review

Equipment Environmental Qualification Review

Installed TMI Lessons Learned Implementation Equipment Summary

Maintenance and Replacement Schedule Summary

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A Division of The Franklin Institute 20th and Race Streets. Phila. Pa 19103 (215) 448-1000	NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/487</u>	Page Ib
QUIPMENT ENVIRONMENTAL QUALIFIC	ATION REVIEW OF EQUIPMENT ITE	M NO. <u>81</u>
SUMMARY OF LICENSEE RESE NSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE A	PPLICABLE
X The Licensee (has/has not) provide	ed a response to the SER concerns.	
The Licensee (has/has not) specific qualified and/or will function whe environmental service conditions.	ically stated that the equipment is an exposed to the applicable DBE	4
The Licensee has presented informa outstanding qualification deficier	ation which shows there are no ncies.	
X The Licensee (has/h as not) propose item whose qualification has not b	ed a corrective action for this equipeen fully established.	uipment
X Justification for interim oper Licensee for this equipment it	ration (has/ has-not) been provided tem.	by the
Corrective action specified by	the Licensee:	
Equipment replacement with Equipment modification Equipment relocation above Relocate or shield equipme Verify qualification by ad Equipment relocation to a Qualification testing of e Other (e submergence level ent from radiation source dditional (testing/analysis) mild environment equipment in progress)
The Licensee has provided othe that can be construed as a bas operation.	er information for this equipment is for justification for interim	item
X The Licensee (nee/has not) pro corrective action. (Schedule action	ovided a schedule for the proposed for accomplishing the corrective)
The Licensee states that the equip and/or should be exempted from env	oment item does not require qualification.	lcation
ESIGNATION OF RESULTANT NRC QUALIFICA CIRCLED ITEM ONLY: (See Section 3 c	ATION EVALUATION CATEGORY BASED ON of this TER for Legend)	REVIEW
.a Qualified	II.c Qualified Life Deficiency III.a Exempt	
L.b Modification II.a Qualification Not Established II.b Not Qualified	III.b Not in Scope IV Documentation Not Availabl	0

Franklin Research Center A Division of The Franklin Institute 20th and Race Streets. Phila.. Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 487/488

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DESIGNATION: X = DEFICIENCY

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 88

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

Documented Evidence of Qualification Adequate Adequate Similarity Between Equipment and Test Specimen Established Aging Degradation Evaluated Adequately Qualified Life or Replacement Schedule Established (If Required) Program Established to Identify Aging Degradation Criteria Regarding Aging Simulation Satisfied (If Required) Criteria Regarding Temperature/Pressure Exposure: o Peak Temperature Adequate

- o Peak Pressure Adequate
- o Duration Adequate
- o Required Profile Enveloped Adequately

o Steam Exposure (If Required) Adequate Criteria Regarding Spray Satisfied Criteria Regarding Submergence Satisfied Criteria Regarding Radiation Satisfied

Criteria Regarding Test Sequence Satisfied Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied

Criteria Regarding Functional Testing Satisfied Criteria Regarding Instrument Accuracy Satisfied Test Duration Margin (1 hour + Function Time) Satisfied Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)

NRC QUALIFICATION CATEGORY

DESIGNATION: X = CATEGORY

I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	X
II.b	Equipment Not Qualified	-
II.c	Equipment Satisfies All Requirements Except Qualified Life	
	or Replacement Schedule Justified	-
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

A Division of The Franklin Institute 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13, FRC Task No. <u>497/458</u>

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 52

LICENSEE RESPONSE TO NRC SER

8. We have completed an extensive review of purchase orders, specifications and inspection reports for cables. This review was completed July 22, 1981. We have updated our computer printout to include the insulation jacket compounds purchased and installed at Calvert Cliffs. We have correlated this information with various FIRL and other laboratory test reports. The assessment/ evaluation activity is not expected to be complete until the end of this year.

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QUIPMENT ENVIRONMENTAL QUALIFIC	CATION REVIEW OF EQUIPMENT ITEM N	NO. 02
NOTES:		
	Tabauaau 5, 1070	
	February 5, 1970	_
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Mr. E. F. Magic, Senior Buye BECHTEL CORPORATION	F .	
Post Office Box 607		
Gaithersburg, Maryland 20760		·
Dear Mr. Magio:	• • • •	-
Subject Bid #	6750-E-14, 6750-E-15, 6750-E-16	-
Calves	rt Cliffs Nuclear Power Plant	
Please refer to my letter of Fe	bruary 3rd which transmitted to you	_
clarify that test report, this is	ort of February 2nd. In order to to inform you that the cable was	_
subjected to the following temp	eratures:	_
13 Hours at 290° F (14	8°C)	
7 Days (163 Hours) at 2	27°F (108°C)	
	Very truly yours,	-
	HATFIELD WIRE & CABLE DIV.	
그는 그는 것이 같은 것을 많다.	BERNARD ROSS	
	Manager-Industrial Products	
	[ISA23]	

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A Division of The Franklin Institute 20th and Race Streets, Phila, Pa 19103 (215) 448-1000

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NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 497/488

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NOTE	2S:	
-	February 10, 1970	
-	Insert after Page 1	_
- 1	Hatfield - Letter of February 2, 1970	
-	13 Hours at 50 psig steam plus 7 days at 5 psig steam	
- 1	Ion-irradiated:	-
-	Tensile strength 1375 psi (original 1260 psi)	
-	Elongation 530% (original 480%)	
- 1	1×10^8 (actually 1.1 x 10 ⁸)	-
	Tensile strength 187 psi (irradiated but unsteamed sample was 228 psi)	
	Elongation 24.8% (irradiated but unsteamed sample was 26.1%)	_
0	comments: Radiation and steam test data now complete. However,	-
. t	they did not expose the steamed irradiated samples to the boric	_
8	cid solution.	
	The buind has presented	
	testing. Hurrene no data is miled on aging endusting	
1		*

Franklin Research Center A Division of The Franklin Institute 20th and Race Streets. Phila . Pa 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 487

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 89

EQUIPMENT ITEM NO. 89 ELECTRICAL CABLE LOCATED IN CONTAINMENT (C230) ANACONDA WIRE AND CABLE MODEL EPR/HYPALON REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 89 LICENSEE REFERENCE(S): 1292 FUNCTION (PLANT ID): CABLE LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 54

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY: (See Section 3 of this TER for Legend)

R, T, (21) (RT,) P, H, (CS, (A,) S, (R), M, I, UM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	la
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, 3b, 3c-3d-
System Consideration Review	4a, 4b, 4c, 4d, 4e, 4f-
Equipment Environmental Qualification Review	5a, 5b, 5c, 5d, 5e , 5f, 5g, 5h, 5i, 5j
Installed TMI Lessons Learned Implementation Equipment Summary	6a, 6b -

70, 70, 70-

Maintenance and Replacement Schedule Summary

A Division of The Franklin Institute 20th and Race Streets. Phila . Pa. 19103 (215) 448-1000	NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487488</u>	Page 1b
EQUIPMENT ENVIRONMENTAL QUALIFIC	ATION REVIEW OF EQUIPMENT ITEM	NO. 89
SUMMARY OF LICENSEE RESPONSES TO THE N	NEC SER - ONLY CHECKED THEME ADD AD	
	AND DER ONEI CHECKED ITENS ARE AP	PLICABLE
X The Licensee (has/has not) provide	ed a response to the SER concerns.	
The Licensee (has/has not) specifi qualified and/or will function whe environmental service conditions.	ically stated that the equipment is an exposed to the applicable DBE	
The Licensee has presented informa outstanding qualification deficien	ation which shows there are no ncies.	
X The Licensee (has/has not) propose item whose qualification has not b	ed a corrective action for this equ been fully established.	ipment
X Justification for interim oper Licensee for this equipment it	ation (has/has not) been provided	by the
X Corrective action specified by	the Licensee:	
Equipment replacement with Equipment modification Equipment relocation above Relocate or shield equipme Verify qualification by ad Equipment relocation to a Qualification testing of e X Other (<u>EVALUATION</u>	e submergence level ent from radiation source ditional (testing/analysis) mild environment equipment in progress	
The Licensee has provided othe that can be construed as a bas operation.	r information for this equipment it is for justification for interim	tem
The Licensee (has /has not) pro corrective action. (Schedule action	vided a schedule for the proposed for accomplishing the corrective	.)
The Licensee states that the equip and/or should be exempted from env	ment item does not require qualific ironmental qualification.	cation
DESIGNATION OF RESULTANT NRC QUALIFICA - CIRCLED ITEM ONLY: (See Section 3 o	TION EVALUATION CATEGORY BASED ON F f this TER for Legend)	REVIEW
I.a Qualified I.b Modification II.a Qualification Not Established	II.c Qualified Life Deficiency III.a Exempt III.b Not in Scope	
II.b Not Qualified	IV Documentation Not Available	2

and the stand and and

A Division of The Franklin Institute 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/488</u>

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 89

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	
Adequate Similarity Between Equipment and Test Specimen Establ	ished X
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Require	d)
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies	
(If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY

DESIGNATION: X = CATEGORY

I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	X
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life	
	or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

A Division of The Franklin Institute 20th and Race Streets. Phila.. Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 487/488

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 39

LICENSEE RESPONSE TO NRC SER

8. We have completed an extensive review of purchase orders, specifications and inspection reports for cables. This review was completed July 22, 1981. We have updated our computer printout to include the insulation jacket compounds purchased and installed at Calvert Cliffs. We have correlated this information with various FIRL and other laboratory test reports. The assessment/ evaluation activity is not expected to be complete until the end of this year.

Di 104.0	Research Center of The Franklin Institute ace Streets. Phila., Pa. 19103 (2	FRC P FRC A	Project No. (ssignment	NRC-03-79-118 C5257 No. 13 <u>487/488</u>	Pag 5f
EQUIPMENT	ENVIRONMENTAL	QUALIFICATION	REVIEW	OF EQUIPMENT ITE	M NO. 8
The Lic	ensee has not pr	esented sufficie	ent infor	mation to establi	= h
					1.11 C
equival	ence between the	cable tested an	id the in	stalled cable (se	e 52.451)
as recu	ired by DOR Guid	elines and/or T		6	
		Stands and/or a			
2.	Test Specimen - The	test specipen should	be the same	model as the	
				y be considered valid	
		cal in design and mat			
an and a star of a star star star star star	specimen. Any devia	tions should be evalu	lated as par	t of the qualifica-	
-	tion documentation ((see also Section 8.0	below).		
				이 같은 것은 것을 통해.	
		Type Test Samples. The			
-	ers. ;	jacket, binder tape, over and field splices which a	all jacket, shie	rid-	
	Lng.	and lield splices which a	PL PANNALAMINI	1VA	
	of up	te cable category being q	ualified. Tabi	e1	
	of the lists s sents	te cable category being q sizes which have been co tive of these categorie	ualified. Tabi	el	
	of the lists s senta lengti test r	the cable category being q sizes which have been or tive of these categorie he should be sufficient to eadings and evaluation	ualified. Tabi insidered repr 5. The samp permit reliab	el	
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UIPMENT E	INVIRONMENTAL QUALIFICA	TION REVIEW OF EQUIPMENT ITEM	NO. <u>8</u>
OTES :			
	qualification a	ocument PGR # 129	2.
iden	tilies The call	le as:	<i></i>
	/		
Sample	1 - Control Cable		
	7-conductor cable, 20 f	t long	
	Conductor size: No. 14	AWG - 7 wire strand	-
	Anaconda tag informatio	on: ME 299 Insulation - Individual conductors	
		MH 8100 Conductor covering	-
		MH 8100 Belt overall	·
Sample	2 - Power Cable		_
	Single conductor cable,	, 20 ft long	
	Conductor size: No. 6AV	NG - 7 wire strand	_
	Anaconda tag informatio	on: ME 299 Insulation	
1		MH 8100 Belt	
The Z	icinell discri	hes The installed	
call	le as:		
	CUMPEDENT		
	CABLE		
	ANACONDA		
	PART HUMBER		
	ЕРА/НҮР		

A Division of The Franklin Institute 20th and Race Streets, Phila., Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FFIC Project No. C5257 FRC Assignment No. 13 FRC Task No. 487

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 90

EQUIPMENT ITEM NO. 90 ELECTRICAL CABLE LOCATED IN CONTAINMENT (C230) GENERAL ELECTRIC MODEL SILICON. RUBBER/ASBESTOS BRAID REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 90 LICENSEE REFERENCE(S): NOT CITED FUNCTION (PLANT ID): CABLE LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 65

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY: (See Section 3 of this TER for Legend)

R, T, QI, RT, P, H, CS, A, S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated,)Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents

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-5a, 5b, 5c, 5d, 5a, 5f,

18

1b

2

Equipment Item Summary of Licensee Responses to the NRC SER Equipment Environmental Qualification Summary Forms Licensee Response to NRC SER System Consideration Review

Equipment Environmental Qualification Review

Installed TMI Lessons Learned Implementation Equipment Summary

Maintenance and Replacement Schedule Summary

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70, 70, 70-

-6a, 6b.

A Division of The Franklin Institute 20th and Race Streets. Phila. Pa 19103 (215; 448-1000	NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>4874488</u>	Page 1b
QUIPMENT ENVIRONMENTAL QUALIFIC	CATION REVIEW OF EQUIPMENT ITEM	NO. 90
SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APP	PLICABLE
The Licensee (has has not) provide	ed a response to the SER concerns.	
The Licensee (has/has:not) specifiqualified and/or will function when environmental service conditions.	ically stated that the equipment is en exposed to the applicable DBE	
The Licensee has presented information outstanding qualification deficient	ation which shows there are no ncies.	
The Licensee (has/has-not) propose item whose qualification has not h	ed a corrective action for this equi been fully established.	pment
X Justification for interim open Licensee for this equipment in	ration (has/ has not) been provided b tem.	y the
Corrective action specified by	y the Licensee:	
Equipment replacement with	n qualified equipment	
Equipment modification Equipment relocation above	e submergence level	
Relocate or shield equipme	ent from radiation source	
Verify qualification by ad Equipment relocation to a	ditional (testing/analysis)	
Qualification testing of e	equipment in progress	
X Other (_ EVALUATIO	DN)
The Licensee has provided other that can be construed as a bas operation.	er information for this equipment it sis for justification for interim	em
X The Licensee (mas/has not) pro corrective action. (Schedule action	ovided a schedule for the proposed for accomplishing the corrective .)
The Licensee states that the equip and/or should be exempted from env	oment item does not require qualification.	ation
ESIGNATION OF RESULTANT NRC QUALIFICA CIRCLED ITEM ONLY: (See Section 3 of	ATION EVALUATION CATEGORY BASED ON R of this TER for Legend)	EVIEW
.a Qualified .b Modification	II.c Qualified Life Deficiency III.a Exempt	
I.a Qualification Not Established	III.b Not in Scope IV Documentation Not Available	

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Franklin Research Center A Division of The Franklin Institute 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. _487/488

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X = CATEGORY

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 90

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM DESIGNATION X = DEFICIENCY NRC REQUIREMENTS × Documented Evidence of Qualification Adequate Adequate Similarity Between Equipment and Test Specimen Established Aging Degradation Evaluated Adequately Qualified Life or Replacement Schedule Established (If Required) Program Established to Identify Aging Degradation Criteria Regarding Aging Simulation Satisfied (If Required) Criteria Regarding Temperature/Pressure Exposure: o Peak Temperature Adequate o Peak Pressure Adequate o Duration Adequate o Required Profile Enveloped Adequately o Steam Exposure (If Required) Adequate Criteria Regarding Spray Satisfied Criteria Regarding Submergence Satisfied Criteria Regarding Radiation Satisfied Criteria Regarding Test Sequence Satisfied Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied Criteria Regarding Functional Testing Satisfied Criteria Regarding Instrument Accuracy Satisfied Test Duration Margin (1 hour + Function Time) Satisfied Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) DESIGNATION:

NRC QUALIFICATION CATEGORY

I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life	
	or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	-
IV	Documentation Not Made Available	

A Division of The Franklin Institute 20th and Race Streets. Phila., Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487</u>/488

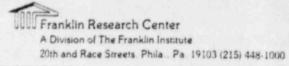
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OURMENT	ENVIRONMENTAL OUALIER	ATION REVIEW OF FOUNDUENT	4 10 9
QUIPMENT	ENVIRONMENTAL QUALIFIC	ATION REVIEW OF EQUIPMENT ITE	M NO. 70
			-
	LICENSEE RES	PONSE TO NRC SER	
	HIGHIGE THE	TOTAL TO THE DET	
	8. We have completed an extensive	e review of purchase orders,	
	specifications and inspection was completed July 22, 1981.	reports for cables. This review	
	printout to include the insul	ation jacket compounds purchased	
	. with various FIRL and other 1	aboratory test reports. The assessment/	
	evaluation activity is not ex of this year.	perted to be complete until the end	
	집 김 이 밖에서 다 가슴 감구했다.		
	바다. 신다. 노가 같아?		
		한 것을 해외에 있는 것을 가지 않는 것이다.	
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EQUIPMENT	ENVIRONMENTAL	QUALIFICA	TION REVIEW	OF EQUIPMENT ITE	M NO70
The Lic	ansaa has not nre	scantad cuf	fictore infor	mation to establi	- h
				stalled cable (se	
	ired by DOR Guide				<u>e_/e.(//</u>
as reyu	Lied by Dok Guide	stries and/	01 1222-303-7	4	
2.	Test Specimen - The 1				
	equipment being qual	ified. The ty;	te test should onl	y be considered valid_	
• • •	for equipment identic	cal in design a	ind material const	muccion to the test	•
ter millionen som attack	specimen. Any deviat	tions should be	evaluated as par	t of the qualifica-	
1	tion documentation (see also Sectio	on 8.0 below).	<u>-</u>	
		and the second se	which are representat	*****	
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NRC Contract No. NRC-03-79-118 Page Franklin Research Center FRC Project No. C5257 5g A Division of The Franklin Institute FRC Assignment No. 13 FRC Task No. _ 487/488 20th and Race Streets Phila . Pa 19103 (215) 448-1000 EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 90 NOTES: The Licinsus describes The installed able as: CUMPUNENT CABLE MANUFACTURER GENERAL CABLE PART NUMBER 31L. RUG.7458. BR. The Trained has not cited a valid Vest document



NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 487

Page

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 91

EQUIPMENT ITEM NO. 91 ELECTRICAL CABLE LOCATED IN CONTAINMENT (C230) KERITE MODEL HTK/HTKS REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 91 LICENSEE REFERENCE(S): NOT CITED FUNCTION (PLANT ID): CABLE LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 71

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY: (See Section 3 of this TER for Legend)

R, T, QI, RT, P, H, CS, A, S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents

Equipment Item

Checksheet Page No.

3a, -3b, -3c, 3d-

4a, 4b, 4c, 4d, 4e, 4E

5a, 5b, 5c, 5d, 5e, 5g, 5h, 5i, 5j

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Summary of Licensee Responses to the NRC SER 1b

Equipment Environmental Qualification Summary Forms

Licensee Response to NRC SER

System Consideration Review

Equipment Environmental Qualification Review

Installed TMI Lessons Learned Implementation Equipment Summary

Maintenance and Replacement Schedule Summary

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A Division of The Franklin Institute 20th and Race Streets. Phila Pa 19103 (215) 448-1000	NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 487 488	Page 1b
EQUIPMENT ENVIRONMENTAL QUALIFIC	ATION REVIEW OF EQUIPMENT ITEM	NO. 91
SUMMARY OF LICENSEE RESPONSES TO THE 1	NRC SER - ONLY CHECKED ITEMS ARE AP	PLICABLE
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The Licensee has presented information outstanding qualification deficier	ation which shows there are no ncies.	
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Justification for interim oper Licensee for this equipment it	ration (has/has not) been provided tem.	by the
\underline{X} Corrective action specified by	y the Licensee:	
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Equipment relocation above		
Relocate or shield equipme Verify qualification by ad	ditional (testing/analysis)	
Equipment relocation to a	mild environment	
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The Licensee states that the equip and/or should be exempted from env	ment item does not require qualific rironmental qualification.	ation
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I.a Qualified I.b Modification	II.c Qualified Life Deficiency III.a Exempt	
II.a Qualification Not Established II.b Not Qualified	III.b Not in Scope IV Documentation Not Available	

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Franklin Research Center A Division of The Franklin Institute 20th and Race Streets. Phila., Pa. 19103 (215) 448-1000

NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 1,3 FRC Task No. _487/488

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DESIGNATION: X = DEFICIENCY

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 91

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

Documented Evidence of Qualification Adequate Adequate Similarity Between Equipment and Test Specimen Established Aging Degradation Evaluated Adequately Qualified Life or Replacement Schedule Established (If Required) Program Established to Identify Aging Degradation Criteria Regarding Aging Simulation Satisfied (If Required) Criteria Regarding Temperature/Pressure Exposure: o Peak Temperature Adequate

- o Peak Pressure Adequate
- o Duration Adequate
- o Required Profile Enveloped Adequately
- o Steam Exposure (If Required) Adequate

Criteria Regarding Spray Satisfied Criteria Regarding Submergence Satisfied

Criteria Regarding Radiation Satisfied Criteria Regarding Test Sequence Satisfied

Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied

Criteria Regarding Functional Testing Satisfied Criteria Regarding Instrument Accuracy Satisfied Test Duration Margin (1 hour + Function Time) Satisfied Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)

NRC QUALIFICATION CATEGORY

I.a Equipment Qualified ×____ Equipment Qualification Pending Modification I.b Equipment Qualification Not Established II.a II.b Equipment Not Qualified Equipment Satisfies All Requirements Except Qualified Life II.c or Replacement Schedule Justified Equipment Exempt From Qualification III.a III.b Equipment Not in the Scope of the Qualification Review

Documentation Not Made Available IV

DESIGNATION: X = CATEGORY A Division of The Franklin Institute 20th and Race Streets. Phila., Pa. 19103 (215) 448-1000

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NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487/488</u>

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 91

LICENSEE RESPONSE TO NRC SER

8. We have completed an extensive review of purchase orders, specifications and inspection reports for cables. This review was completed July 22, 1981. We have updated our computer printout to include the insulation jacket compounds purchased and installed at Calvert Cliffs. We have correlated this information with various FIPL and other laboratory test reports. The assessment/ evaluation activity is not expected to be complete until the end of this year. NRC Contract No. NRC-03-79-118
FRC Project No. C5257PageA Division of The Franklin Institute
20th and Race Streets. Phila. Pa 19103 (215) 448-1000FRC Contract No. NRC-03-79-118
FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. ____487Page

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 92

EQUIPMENT ITEM NO. 92 ELECTRICAL CABLE LOCATED IN CONTAINMENT (C230) TIMES WIRE AND CABLE MODEL PVC REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 92 LICENSEE REFERENCE(S): NOT CITED FUNCTION (PLANT ID): CABLE LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 73

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY: (See Section 3 of this TER for Legend)

Checksheet Page No.

3a, 3b, 3c, 3d

59, 5h, 51, 5j-

-60, 60-

4a, 4b, 4c; 4d, 4e, 4f

-5a, 5b, 5e, 5d, 5e, 5f,

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R, T, QI', RT, P, H, CS, A, S, (R), M I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents

Equipment Item

Summary of Licensee Responses to the NRC SER Equipment Environmental Qualification Summary Forms Licensee Response to NRC SER System Consideration Review

Equipment Environmental Qualification Review

Installed TMI Lessons Learned Implementation Equipment Summary

Maintenance and Replacement Schedule Summary

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QUIPMENT ENVIRONMENTAL QUALIFIC	ATION REVIEW OF EQUIPMENT ITEN	NO. 9-
SUMMARY OF LICENSEE RESPONSES TO THE N	NRC SER - ONLY CHECKED ITEMS ARE AP	PLICABLE
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The Licensee (has/has not) specifi qualified and/or will function whe environmental service conditions.	cally stated that the equipment is an exposed to the applicable DBE	
The Licensee has presented informa outstanding qualification deficien	ation which shows there are no noises.	
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The Licensee has provided othe that can be construed as a bas operation.	r information for this equipment it is for justification for interim	tem
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II.b Not Qualified	IV Documentation Not Available	

Franklin Research Center A Division of The Franklin Institute 20th and Race Streets. Phila., Pa. 19103 (215) 448-1000

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 97

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION: X = DEFICIENCY

Documented Evidence of Qualification Adequate Adequate Similarity Between Equipment and Test Specimen Established Aging Degradation Evaluated Adequately Qualified Life or Replacement Schedule Established (If Required) Program Established to Identify Aging Degradation Criteria Regarding Aging Simulation Satisfied (If Required) Criteria Regarding Temperature/Pressure Exposure: o Peak Temperature Adequate o Peak Pressure Adequate o Duration Adequate o Required Profile Enveloped Adequately o Steam Exposure (If Required) Adequate Criteria Regarding Spray Satisfied

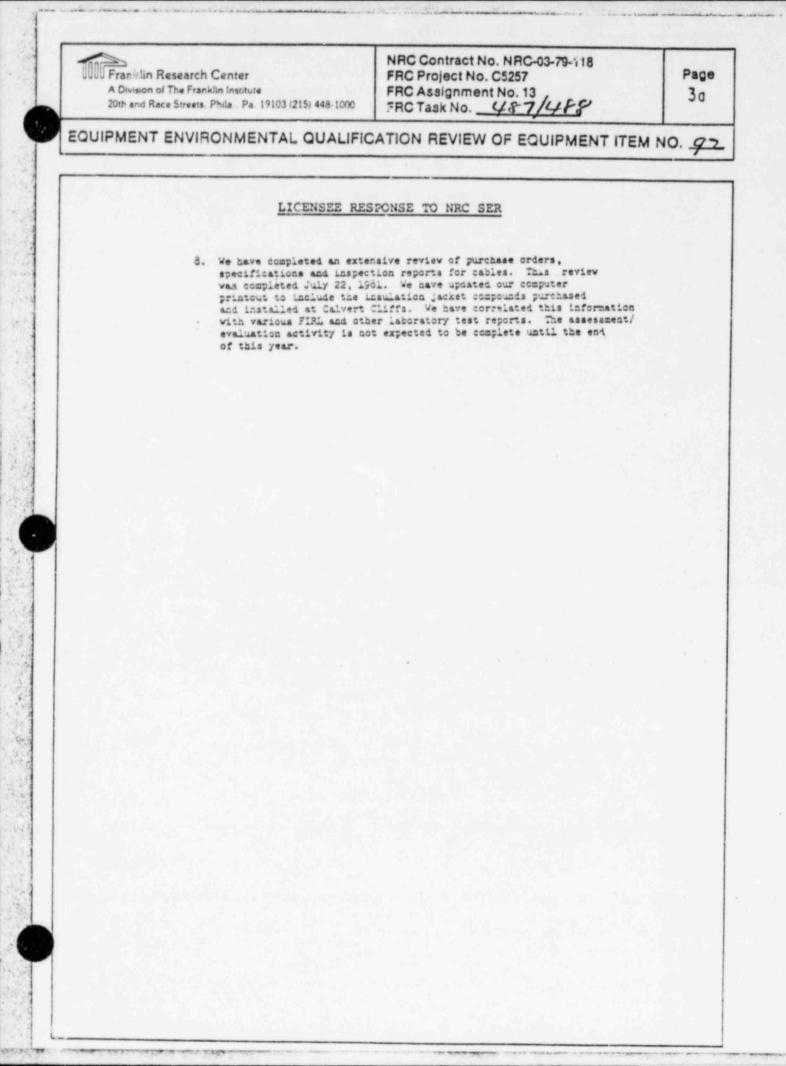
Criteria Regarding Submergence Satisfied Criteria Regarding Radiation Satisfied Criteria Regarding Test Sequence Satisfied Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied Criteria Regarding Functional Testing Satisfied

Criteria Regarding Instrument Accuracy Satisfied Test Duration Margin (1 hour + Function Time) Satisfied Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)

NRC QUALIFICATION CATEGORY

DESIGNATION: X = CATEGORY

I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life	
	or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.D	Equipment Not in the Scope of the Qualification Review	
VI	Documentation Not Made Available	



Franklin Research Center A Division of The Franklin Institute 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 4817

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 93

EQUIPMENT ITEM NO. 93 ELECTRICAL CABLE LOCATED IN CONTAINMENT (C230) CONTINENTAL WIRE MODEL SILICONE RUBBER/GLASS BRAID REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 93 LICENSEE REFERENCE(S): 2818 FUNCTION (PLANT ID): CABLE LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 77

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY: (See Section 3 of this TER for Legend)

R, T, (T, RT, P, H, CS, A, S, (R), M, I, UM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents

Equipment Item

Summary of Licensee Responses to the NRC SER

Equipment Environmental Qualification Summary Forms

Licensee Response to NRC SER

System Consideration Review

Equipment Environmental Qualification Review

Installed TMI Lessons Learned Implementation Equipment Summary

Maintenance and Replacement Schedule Summary

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Checksheet Page No.

3a, 3b, 3c, 3d 4a, 4b, 4c, 4d, 4e, 4f 5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, -5i, 5j

-6a, 6b-

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<pre>item whose qualification has not been fully established. </pre>	As not been fully established. Fin operation (has/has not) been provided by the pment item. If ied by the Licensee: Ant with qualified equipment from above submergence level equipment from radiation source on by additional (testing/analysis) on to a mild environment .ng of equipment in procress 	X The Licensee has presented inform outstanding qualification deficie	ation which shows there are no ncies.	
Licensee for this equipment item. Corrective action specified by the Licensee: Equipment replacement with qualified equipment Equipment modification Equipment relocation above submergence level Relocate or shield equipment from radiation source Verify qualification by additional (testing/analysis) Equipment relocation to a mild environment Qualification testing of equipment in process Other (<pre>ment item. fied by the Licensee: ent with qualified equipment fion on above submergence level equipment from radiation source on by additional (testing/analysis) on to a mild environment ing of equipment in progress</pre>	The Licensee (has/has not) propos item whose qualification has not	ed a corrective action for this equipeen fully established.	uipment
<pre>Equipment replacement with qualified equipment Equipment modification Equipment relocation above submergence level Relocate or shield equipment from radiation source Verify qualification by additional (testing/analysis) Bquipment relocation to a mild environment Qualification testing of equipment in procress Other (</pre>	ent with qualified equipment tion on above submergence level equipment from radiation source on by additional (testing/analysis) on to a mild environment ang of equipment in procress) Hed other information for this equipment item is a basis for justification for interim (ot) provided a schedule for the proposed thedule for accomplishing the corrective .) e equipment item does not require qualification rom environmental qualification. ALIFICATION EVALUATION CATEGORY BASED ON REVIEW ion 3 of this TER for Legend) II.c Qualified Life Deficiency III.a Exempt hed III.b Not in Scope	Justification for interim ope Licensee for this equipment i	ration (has/has not) been provided tem.	by the
Equipment modification Equipment relocation above submergence level Relocate or shield equipment from radiation source Verify qualification by additional (testing/analysis) Equipment relocation to a mild environment Qualification testing of equipment in procress Other (<pre>tion on above submergence level equipment from radiation source on by additional (testing/analysis) on to a mild environment .ng of equipment in procress) ed other information for this equipment item is a basis for justification for interim not) provided a schedule for the proposed thedule for accomplishing the corrective </pre>	Corrective action specified by	y the Licensee:	
Relocate or shield equipment from radiation source Verify qualification by additional (testing/analysis) Equipment relocation to a mild environment Qualification testing of equipment in procress Other (equipment from radiation source on by additional (testing/analysis) on to a mild environment ing of equipment in procress) ed other information for this equipment item is a basis for justification for interim not) provided a schedule for the proposed endule for accomplishing the corrective .) e equipment item does not require qualification rom environmental qualification. ALIFICATION EVALUATION CATEGORY BASED ON REVIEW ion 3 of this TER for Legend) II.c Qualified Life Deficiency III.a Exempt hed III.b Not in Scope	Equipment replacement with Equipment modification	h qualified equipment	
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Equipment relocation to a mild environment Qualification testing of equipment in process Other (<pre>in to a mild environment ing of equipment in procress) ed other information for this equipment item is a basis for justification for interim not) provided a schedule for the proposed endule for accomplishing the corrective .) e equipment item does not require qualification rom environmental qualification. ALIFICATION EVALUATION CATEGORY BASED ON REVIEW ion 3 of this TER for Legend) II.c Qualified Life Deficiency III.a Exempt hed III.b Not in Scope</pre>	Verify qualification by ac	ent from radiation source dditional (testing/analysis)	
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<pre>corrective action. (Schedule for accomplishing the corrective action The Licensee states that the equipment item does not require quality and/or should be exempted from environmental qualification. <u>DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED OF</u> <u>- CIRCLED ITEM ONLY</u>: (See Section 3 of this TER for Legend)</pre>	<pre>chedule for accomplishing the corrective .) e equipment item does not require qualification rom environmental qualification. ALIFICATION EVALUATION CATEGORY BASED ON REVIEW ion 3 of this TER for Legend) II.c Qualified Life Deficiency III.a Exempt hed III.b Not in Scope</pre>	The Licensee (has/has not) pro	ovided a schedule for the proposed	
and/or should be exempted from environmental qualification. DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED OF - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)	rom environmental qualification. <u>ALIFICATION EVALUATION CATEGORY BASED ON REVIEW</u> ion 3 of this TER for Legend) II.c Qualified Life Deficiency III.a Exempt hed III.b Not in Scope	corrective action. (Schedule	for accomplishing the corrective	•)
- CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)	ion 3 of this TER for Legend) II.c Qualified Life Deficiency III.a Exempt hed III.b Not in Scope	The Licensee states that the equip and/or should be exempted from env	pment item does not require qualifi vironmental qualification.	cation
I.a Qualified Life Deficiency	hed III.b Not in Scope	DESIGNATION OF RESULTANT NRC QUALIFICA - CIRCLED ITEM ONLY: (See Section 3 of	ATION EVALUATION CATEGORY BASED ON of this TER for Legend)	REVIEW
	hed III.b Not in Scope			
II.a Qualification Not Established III.b Not in Scope		II.a Qualification Not Established	III.b Not in Scope	
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A Division of The Franklin Institute 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487</u>

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DESIGNATION: X = DEFICIENCY

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 23

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

Documented Evidence of Qualification Adequate Adequate Similarity Between Equipment and Test Specimen Established Aging Degradation Evaluated Adequately Qualified Life or Replacement Schedule Established (If Required) Program Established to Identify Aging Degradation Criteria Regarding Aging Simulation Satisfied (If Required) Criteria Regarding Temperature/Pressure Exposure: o Peak Temperature Adequate o Peak Pressure Adequate o Duration Adequate o Required Profile Enveloped Adequately o Steam Exposure (If Required) Adequate Criteria Regarding Spray Satisfied Criteria Regarding Submergence Satisfied Criteria Regarding Radiation Satisfied Criteria Regarding Test Sequence Satisfied Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied

Criteria Regarding Functional Testing Satisfied Criteria Regarding Instrument Accuracy Satisfied Test Duration Margin (1 hour + Function Time) Satisfied Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)

NRC QUALIFICATION CATEGORY

I.a	Equipment Qualified	-
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	_
II.o	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life	
	or Replacement Schedule Justified	-
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	



DESIGNATION: X = CATEGORY

NRC Contract No. NRC-03-79-118 Franklin Research Center Page FRC Project No. C5257 A Division of The Franklin Institute FRC Assignment No. 13 . 30 20th and Race Streets. Phila . Pa. 19103 (215) 448-1000 FRC Task No. 487 40 EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 93 LICENSEE RESPONSE TO NRC SER 8. We have completed an extensive review of purchase orders; specifications and inspection reports for cables. This review was completed July 22, 1981. We have updated our computer printout to include the insulation jacket compounds purchased and installed at Calvert Cliffs. We have correlated this information with various FIRL and other laboratory test reports. The assessment/ evaluation activity is not expected to be complete until the end of this year.

NRC Contract No. NRC-03-79-118 Page Franklin Research Center FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 487 A Division of The Franklin Institute 5 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000 EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 93 Checksheets 5F and 5q have been removed due to the proprietary nature of information contained therein.

A Division of The Franklin Institute FRC	Contract No. NRC-03-79-118 Project No. C5257 Assignment No. 13 Task No487
QUIPMENT ENVIRONMENTAL QUALIFICATION	REVIEW OF EQUIPMENT ITEM NO. 94
EQUIPMENT ITEM NO. 94 ELECTRIC MOTOR LOCATED IN THE EAST PIPING P GENERAL ELECTRIC MODEL FJF REQUIRED OPERATING TIME: 9 HOURS TER CHECKSHEET NO. 94 LICENSEE REFERENCE(S): NOT CITED FUNCTION (PLANT ID): HYDROGEN PURGE REPLAC LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 261	
DESIGNATION FOR DEFICIENCY IDENTIFIED BY TH (See Section 3 of this TER for Legend) R. T. (T.) (RT. R. H. CS. (R. S. (R) M. J. (M.	
(See Section 3 of this TER for Legend) R, $(T, QT, RT, P, H, CS, A, S, (R), M, I, QM$	
(See Section 3 of this TER for Legend) R, $(T, QT, RT, P, H, CS, A, S, (R), M, I, QM$ Not stated, Not applicable	
(See Section 3 of this TER for Legend) R. T. (RT, P. H. CS, A. S, (R), M, I, (M Not stated, Not applicable LISTING OF APPLICABLE CHECKSHEETS:) RPN, EXN, SEN, QI, RPS, None,
(See Section 3 of this TER for Legend) R. T. (T. (RT, P, H, CS, A, S, (R), M, I, (M Not stated, Not applicable <u>LISTING OF APPLICABLE CHECKSHEETS</u> : <u>Contents</u>	
(See Section 3 of this TER for Legend) R. T. (RT, P, H, CS, A, S, (R), M, I, (M Not stated, Not applicable <u>LISTING OF APPLICABLE CHECKSHEETS</u> : <u>Contents</u> Equipment Item) RPN, EXN, SEN, QI, RPS, None, <u>Checksheet Page No.</u> la
(See Section 3 of this TER for Legend) R, T, T, RT, P, H, CS, A, S, (R), M, I, R Not stated, Not applicable <u>LISTING OF APPLICABLE CHECKSHEETS</u> : <u>Contents</u> Equipment Item Summary of Licensee Responses to the NRC SE) RPN, EXN, SEN, QI, RPS, None, <u>Checksheet Page No.</u> la R lb
(See Section 3 of this TER for Legend) R, T, RT, P, H, CS, A, S, (R), M, I, M Not stated, Not applicable <u>LISTING OF APPLICABLE CHECKSHEETS</u> : <u>Contents</u> Equipment Item Summary of Licensee Responses to the NRC SE Equipment Environmental Qualification Summa) RPN, EXN, SEN, QI, RPS, None, <u>Checksheet Page No.</u> la R lb ry Forms 2
(See Section 3 of this TER for Legend) R, T, RT, P, H, CS, A, S, (R), M, I, M Not stated, Not applicable <u>LISTING OF APPLICABLE CHECKSHEETS</u> : <u>Contents</u> Equipment Item Summary of Licensee Responses to the NRC SE Equipment Environmental Qualification Summa Licensee Response to NRC SER) RPN, EXN, SEN, QI, RPS, None, <u>Checksheet Page No.</u> la R lb
(See Section 3 of this TER for Legend) R. T. (RT, P, H, CS, A, S, (R), M, I, (M Not stated, Not applicable <u>LISTING OF APPLICABLE CHECKSHEETS</u> : <u>Contents</u> Equipment Item Summary of Licensee Responses to the NRC SE Equipment Environmental Qualification Summa Licensee Response to NRC SER System Consideration Review) RPN, EXN, SEN, QI, RPS, None, Checksheet Page No. la R lb ry Forms 2 3a, 3b, 3c, 3d 4a, 4b, 4a, 4d, 4c, 45
(See Section 3 of this TER for Legend) R, T, RT, P, H, CS, A, S, (R), M, I, M Not stated, Not applicable <u>LISTING OF APPLICABLE CHECKSHEETS</u> : <u>Contents</u> Equipment Item Summary of Licensee Responses to the NRC SE Equipment Environmental Qualification Summa Licensee Response to NRC SER) RPN, EXN, SEN, QI, RPS, None, Checksheet Page No. la R lb ry Forms 2 3a, 3b, 3c, 3d 4a, 4b, 4a, 4d, 4c, 45
(See Section 3 of this TER for Legend) R. T. (RT, P, H, CS, A, S, (R), M, I, (M Not stated, Not applicable <u>LISTING OF APPLICABLE CHECKSHEETS</u> : <u>Contents</u> Equipment Item Summary of Licensee Responses to the NRC SE Equipment Environmental Qualification Summa Licensee Response to NRC SER System Consideration Review) RPN, EXN, SEN, QI, RPS, None, Checksheet Page No. la R lb ry Forms 2 3a, $\frac{3b}{3c}$, $\frac{3c}{3d}$ $\frac{4a}{4b}$, $\frac{4c}{4d}$, $\frac{4c}{4c}$, $\frac{4c}{5c}$ $\frac{5a}{5b}$, $\frac{5c}{5c}$, $\frac{5d}{5c}$, $\frac{5c}{5c}$, \frac

Franklin Research Center A Division of The Franklin Institute 20th and Race Streets. Phila.. Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. _487

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 94

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

Documented Evidence of Qualification Adequate Adequate Similarity Between Equipment and Test Specimen Established Aging Degradation Evaluated Adequately Qualified Life or Replacement Schedule Established (If Required) Program Established to Identify Aging Degradation Criteria Regarding Aging Simulation Satisfied (If Required) Criteria Regarding Temperature/Pressure Exposure: o Peak Temperature Adequate

- o Peak Pressure Adequate
- o Duration Adequate
- o Required Profile Enveloped Adequately

o Steam Exposure (If Required) Adequate Criteria Regarding Spray Satisfied Criteria Regarding Submergence Satisfied Criteria Regarding Radiation Satisfied Criteria Regarding Test Sequence Satisfied

Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied

Criteria Regarding Functional Testing Satisfied Criteria Regarding Instrument Accuracy Satisfied Test Duration Margin (1 hour + Function Time) Satisfied Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)

NRC QUALIFICATION CATEGORY

DESIGNATION:

I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	×
II.b	Equipment Not Qualified	-
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.D	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	





DESIGNATION:

X = DEFICIENCY

- X = CATEGORY

A Dission of The Franklin Institute 20th and Race Streets. Phila. Pa 19103 (215) 448-1000	NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>48 7</u>	Page 1 b
UIPMENT ENVIRONMENTAL QUALIFIC	CATION REVIEW OF EQUIPMENT ITEN	NO. 94
UMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE A	PPLICABLE
(_ The Licensee (has/ has not) provid	led a response to the SER concerns.	
The Licensee (has/has,not) specif qualified and/or will function wh environmental service conditions.	ically stated that the equipment is en exposed to the applicable DBE	3
The Licensee has presented inform outstanding qualification deficie	ation which shows there are no ncies.	
The Licensee (has/ has no t) propos item whose qualification has not	ed a corrective action for this equipeen fully established.	uipment
X Justification for interim ope Licensee for this equipment i	ration (has/ hae-ne t) been provided tem.	by the
\underline{X} Corrective action specified b	y the Licensee:	
Equipment replacement with Equipment modification Equipment relocation abov Relocate or shield equipm Verify qualification by an Equipment relocation to a Qualification testing of X Other (Component assessme	e submergence level ent from radiation source dditional (testing/analysis) mild environment equipment in progress)
The Licensee has provided other that can be construed as a bas operation.	er information for this equipment i sis for justification for interim	tem
X The Licensee (nee/has not) pro corrective action. (Schedule action	ovided a schedule for the proposed for accomplishing the corrective	.)
The Licensee states that the equip and/or should be exempted from en	pment item does not require qualifi vironmental qualification.	cation
SIGNATION OF RESULTANT NRC QUALIFIC	TION EVALUATION CATEGORY BASED ON	REVIEW
CIRCLED ITEM ONLY: (See Section 3 of	of this TER for Legend)	
a Qualified	II.c Qualified Life Deficiency	
b Modification	III.a Exempt	
Qualification Not Established	III.b Not in Scope IV Documentation Not Availabl	
	av Executencation Not Availabl	e

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A Division of The Franklin Institute 20th and Race Streets. Phila. Pa 19103 (215) 448-1000	NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487</u>	Page
EQUIPMENT ENVIRONMENTAL QUALIFIC	CATION REVIEW OF EQUIPMENT ITE	M NO. 95
EQUIPMENT ITEM NO. 95 SOLENOID VALVE LOCATED IN THE WEST PE DRAGON MODEL 10222 REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 95 LICENSEE REFERENCE(S): NOT CITED FUNCTION (PLANT ID): CONTAINMENT HYD		
LICENSEE SUBMITTAL: SCEW(S) [1, 12]:		HROUGH G)

(R, T, QT, RT, P, H, CS, A, S, (R), M, I, M, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Co	-	*	-	-	+	-

Checksheet Page No.

3a, 3b, 30, 3d-

4a, 4b, 4c, 4d, 4e, 4E-

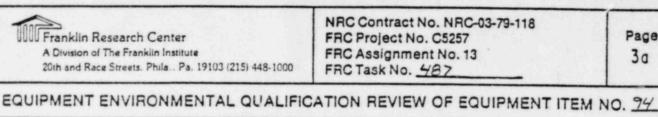
-5a, 5b, -5c, 5d, 5e, 5g, 5h, 51, 5j

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Equipment Item Summary of Licensee Responses to the NRC SER Equipment Environmental Qualification Summary Forms 2 Licensee Response to NRC SER System Consideration Review Equipment Environmental Qualification Review

Installed TMI Lessons Learned Implementation Equipment Summary

Maintenance and Replacement Schedule Summary 7a, 70, 7c-



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LICENSEE RESPONSE TO NRC SER

 These components are within the scope of our present assessment/ evaluation activity. Completion of the activity with subsequent action plan is not anticipated until the end of this year or first quarter of next.

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A Division of The Franklin Institute 20th and Race Streets. Phila.. Pa. 19103 (215) 448-1(:00) NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487</u>

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 95

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate Adequate Similarity Between Equipment and Test Specimen Establ Aging Degradation Evaluated Adequately Qualified Life or Replacement Schedule Established (If Require Program Established to Identify Aging Degradation Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure: o Peak Temperature Adequate o Peak Pressure Adequate o Duration Adequate o Required Profile Enveloped Adequately o Steam Exposure (If Required) Adequate	=
Criteria Regarding Spray Satisfied Criteria Regarding Submergence Satisfied Criteria Regarding Radiation Satisfied Criteria Regarding Test Sequence Satisfied	_
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied Criteria Regarding Functional Testing Satisfied Criteria Regarding Instrument Accuracy Satisfied Test Duration Margin (1 hour + Function Time) Satisfied Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	=

NRC QUALIFICATION CATEGORY

DESIGNATION: X = CATEGORY

I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	_X
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life	
	or Replacement Schedule Justified	-
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

A Division of The Franklin Institute 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000	NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487</u>	Page 1b
QUIPMENT ENVIRONMENTAL QUALIFI	CATION REVIEW OF EQUIPMENT ITE	M NO. 95
SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE A	PPLICABLE
X The Licensee (has/asset) provid	ded a response to the SER concerns.	
The Licensee (has/has not) specif qualified and/or will function wh environmental service conditions.	fically stated that the equipment is nen exposed to the applicable DBE	s
The Licensee has presented inform outstanding qualification deficie	mation which shows there are no encies.	
X The Licensee (has/herenot) propos item whose qualification has not	sed a corrective action for this equipment fully established.	uipment
X Justification for interim oper Licensee for this equipment i	eration (has/her not) been provided item.	by the
\underline{X} Corrective action specified b	by the Licensee:	
Z Equipment replacement wit Equipment modification		
Equipment relocation abov Relocate or shield equipm	ent from radiation source	
Verify qualification by a Equipment relocation to a	dditional (testing/analysis)	
Qualification testing of Other (equipment in progress)
The Licensee has provided oth that can be construed as a ba operation.	er information for this equipment i sis for justification for interim	ltem
X The Licensee (has/	ovided a schedule for the proposed	
corrective action. (Schedule	for accomplishing the corrective SCHEDULED OUTAGE. April, 1982	2.)
The Licensee states that the equi and/or should be exempted from en	pment item does not require qualifi vironmental qualification.	cation
DESIGNATION OF RESULTANT NRC QUALIFIC - CIRCLED ITEM ONLY: (See Section 3	ATION EVALUATION CATEGORY BASED ON of this TER for Legend)	REVIEW
I.a Qualified I.b) Modification	II.c Qualified Life Deficiency	
II.a Qualification Not Established	III.a Exempt III.b Not in Scope	
II.b Not Qualified	IV Documentation Not Availabl	e

A Division of The Franklin Institute 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487</u>

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 95

MAINTENANCE AND REPLACEMENT SCHEDULE SUMMARY

The following information regarding the maintenance and replacement schedule(s) for components, sub-components, and materials has been provided by the Licensee.

Replacement ouving mest scheduded outage; Cycle 6 in April, 1982.

Franklin Research Center A Division of The Franklin Institute 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487</u>

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 95

LICENSEE RESPONSE TO NRC SER

9. We had previously committed to replacing these solenoid valves. An order has been placed on Valcor with delivery in time for installation during our next scheduled refueling outage; Unit 1 Cycle 6 in April, 1982 and Unit 2 Cycle 5 in September, 1982. We expect to receive qualification data by the first part of 1982 with an additional three months necessary for our evaluation/assessment activity. These will be qualified to the Category I requirements of NURES 0588.

A Division of The Franklin Institute 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000	NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487</u>	Page 1b
EQUIPMENT ENVIRONMENTAL QUALIFIC	ATION REVIEW OF EQUIPMENT ITE	M NO. 94
SUMMARY OF LICENSEE RESPONSES TO THE 1	NRC SER - ONLY CHECKED ITEMS ARE	APPLICABLE
X The Licensee (has/	ed a response to the SER concerns.	
The Licensee (has/has not) specific qualified and/or will function whe environmental service conditions.	cally stated that the equipment i en exposed to the applicable DBE	is
The Licensee has presented information outstanding qualification deficient		
X The Ličensee (has/becaset) propose item whose qualification has not b	ed a corrective action for this equeen fully established.	quipment
X Justification for interim open Licensee for this equipment it	ation (has/been provided em.	by the
X Corrective action specified by	the Licensee:	
Equipment replacement with Equipment modification Equipment relocation above Relocate or shield equipme Verify qualification by ad	submergence level int from radiation source ditional (testing/analysis)	
Equipment relocation to a Qualification testing of e Other (quipment in progress)
The Licensee has provided othe that can be construed as a bas operation.	r information for this equipment is for justification for interim	item
X The Licensee (nas/Hat hot) pro corrective action. (Schedule action Replace by next schedule	for accomplishing the corrective)
The Licensee states that the equip and/or should be exempted from env	ment item does not require qualif ironmental qualification.	ication
DESIGNATION OF RESULTANT NRC QUALIFICA - CIRCLED ITEM ONLY: (See Section 3 o		REVIEW
I.a Qualified I.b Modification II.a Qualification Not Established II.b Not Qualified	II.c Qualified Life Deficiency III.a Exempt III.b Not in Scope IV Documentation Not Availab	
TALA HOC FOUTTIER	iv bocumentation Not Avallab	76

NRC Contract No. NRC-03-79-118 Franklin Research Center FRC Project No. C5257 A Division of The Franklin Institute FRC Assignment No. 13 20th and Race Streets. Phila. Pa 19103 (215) 448-1000 487 FRC Task No.

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 96

EQUIPMENT ITEM NO. 96 SOLENOID VALVE LOCATED IN CONTAINMENT (C230) DRAGON MODEL 10222 REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 96 LICENSEE REFERENCE(S): NOT CITED FUNCTION (PLANT ID): CONTAINMENT HYDROGEN ANALYZER VALVES (15V6540A THROUGH G) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 239 THROUGH 245

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY: (See Section 3 of this TER for Legend)

(R, T, QT, (RT,) P, H, (CS, (A,) S, (R), M, I, QM, (RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

C	0	n	t	e	n	t	S

Equipment Item

Summary of Licensee Responses to the NRC SER lb Equipment Environmental Qualification Summary Forms Licensee Response to NRC SER System Consideration Review

Equipment Environmental Qualification Review

Installed TMI Lessons Learned Implementation Equipment Summary

Maintenance and Replacement Schedule Summary

Checksheet Page No.

3a, -30, -30, 3d-

-59, 5h, 51, 5j

4a, 4b, 4c, 4d, 4e,

5a, 5b, 5c, 5d, 5e, 5£,

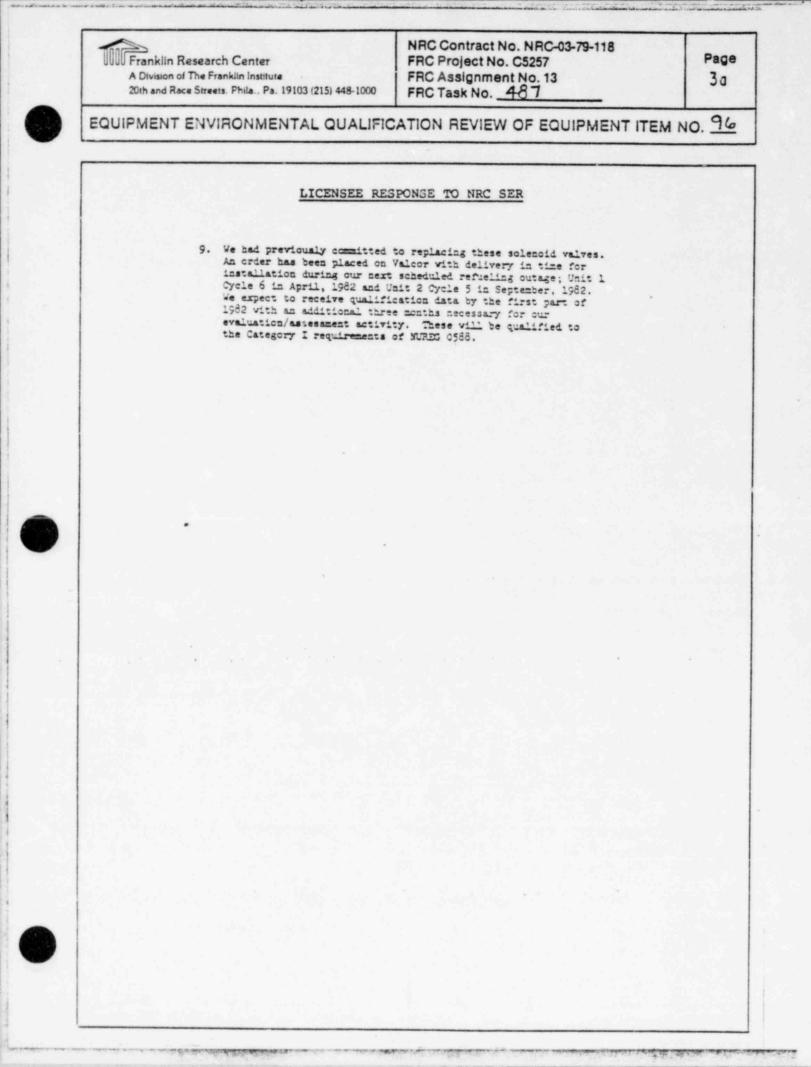
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7a, 70, 70-

60, 60





A Division of The Franklin Institute 20th and Race Streets. Phila., Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487</u>

Page 2

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 96		
NOC DECUT DEMENTE	X = DEFICIENCY	
NRC REQUIREMENTS	A - Duricibility	
Documented Evidence of Qualification A	dequate X	
Adequate Similarity Between Equipment		
Aging Degradation Evaluated Adequately		
Qualified Life or Replacement Schedule	Established (If Required)	
Program Established to Identify Aging	Degradation	
Criteria Regarding Aging Simulation Sa		
Criteria Regarding Temperature/Pressure	e Exposure:	
o Peak Temperature Adequate		
o Peak Pressure Adequate		
o Duration Adequate	ed	
o Required Profile Enveloped Adeq	uately	
o Steam Exposure (If Required) Ad	equate	
Criteria Regarding Spray Satisfied		
Criteria Regarding Submergence Satisfi	ed	
Criteria Regarding Radiation Satisfied		
Criteria Regarding Test Sequence Satis	fied	
Criteria Regarding Test Failures or Se	vere Anomalies	
(If Any) Satisfied		
Criteria Regarding Functional Testing		
Criteria Regarding Instrument Accuracy	v Satisfied	
Test Duration Margin (1 hour + Functio	In Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. 1)	
	DESIGNATION:	
NRC QUALIFICATION CATEGORY	X = CATEGORY	
The ventri ion ion chiboon		
I.a Equipment Qualified		
I.b Equipment Qualification Pendin	ng Modification X	
II.a Equipment Qualification Not Es		
II.b Equipment Not Qualified		
II.c Equipment Satisfies All Requir	ements Except Qualified Life	
or Replacement Schedule Justif	ied	

- III.a Equipment Exempt From Qualification
- III.b Equipment Not in the Scope of the Qualification Review
 IV Documentation Not Made Available

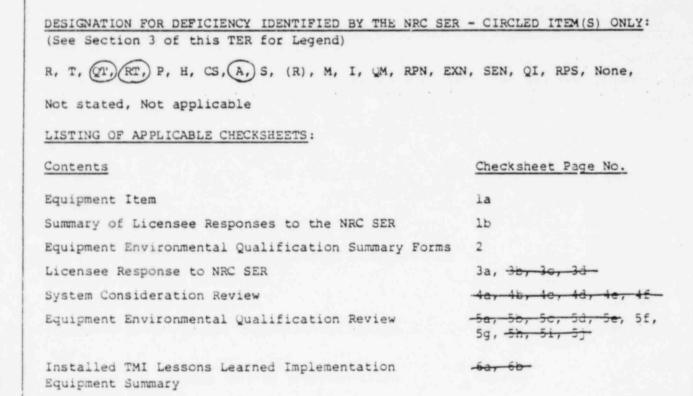
 NRC Contract No. NRC-03-79-118
 Page

 A Division of The Franklin Institute
 FRC Project No. C5257

 20th and Race Streets. Phila
 Pa. 19103 (215) 448-1000

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 97

EQUIPMENT ITEM NO. 97 ELECTRICAL CABLE LOCATED IN CONTAINMENT (C230) CERRO WIRE AND CABLE MODEL SILICONE RUBBER/ASBESTOS BRAID REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 97 LICENSEE REFERENCE(S): 4607 FUNCTION (PLANT IC): CABLE LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 70



Maintenance and Replacement Schedule Summary

70,70,70-

A Division of The Franklin Institute 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 487

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 96

MAINTENANCE AND REPLACEMENT SCHEDULE SUMMARY

The following information regarding the maintenance and replacement schedule(s) for components, sub-components, and materials has been provided by the Licensee.

Replace by next scheduled outage; April, 1982.





Franklin Research Center A Division of The Franklin Institute 20th and Race Streets. Phila., Pa. 19103 (215) 448-1000

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DESIGNATION: X = DEFICIENCY

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 97

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

Documented Evidence of Qualification Adequate Adequate Similarity Between Equipment and Test Specimen Established Aging Degradation Evaluated Adequately Qualified Life or Replacement Schedule Established (If Required) Program Established to Identify Aging Degradation Criteria Regarding Aging Simulation Satisfied (If Required) Criteria Regarding Temperature/Pressure Exposure: o Peak Temperature Adequate

- o Peak Pressure Adequate
- o Duration Adequate
- o Required Profile Enveloped Adequately o Steam Exposure (If Required) Adequate

Criteria Regarding Spray Satisfied Criteria Regarding Submergence Satisfied Criteria Regarding Radiation Satisfied

Criteria Regarding Test Sequence Satisfied Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied Criteria Regarding Functional Testing Satisfied Criteria Regarding Instrument Accuracy Satisfied

Test Duration Margin (1 hour + Function Time) Satisfied Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)

NRC QUALIFICATION CATEGORY

DESIGNATION: X = CATEGORY

I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	X
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life	
	or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.D	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	



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QUIPMENT ENVIRONMENTAL QUALIFIC	ATION REVIEW OF EQUIPMENT ITE	M NO. <u>97</u>
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The Licensee has presented informa outstanding qualification deficier	ation which shows there are no ncies.	
X The Licensee (has/has not) propose item whose qualification has not b	ed a corrective action for this eq been fully established.	uipment
X Justification for interim oper Licensee for this equipment it	ration (has/ has not) been provided tem.	by the
X Corrective action specified by	the Licensee:	
Equipment replacement with Equipment modification Equipment relocation above Relocate or shield equipme Verify qualification by ad Equipment relocation to a Qualification testing of e X Other (e submergence level ent from radiation source dditional (testing/analysis) mild environment)
The Licensee has provided othe that can be construed as a bas operation.	er information for this equipment is for justification for interim	item
X The Licensee (nas/has not) pro corrective action. (Schedule action	ovided a schedule for the proposed for accomplishing the corrective)
The Licensee states that the equip and/or should be exempted from env	oment item does not require qualificition.	ication
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Di sion of The Franklin Institute .0th and Race Streets. Phila. Pa. 19103 (215) 448-1000			NRC Contract FRC Project N FRC Assignm FRC Task No.	ent No. 13,	Page 5f
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-	specimen. Any de	eviations should be	evaluated as pa	rt of the qualifica-	
	tion documentatio	on (see also Section	n 8.0 below).		
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A Division of The Franklin Institute 20th and Race Streets. Phila., Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. <u>487</u>

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 97

LICENSEE RESPONSE TO NRC SER

8. We have completed an extensive review of purchase orders, specifications and inspection reports for cables. This review was completed July 22, 1981. We have updated our computer printout to include the insulation jacket compounds purchased and installed at Calvert Cliffs. We have correlated this information with various FIRL and other laboratory test reports. The assessment/ evaluation activity is not expected to be complete until the end of this year.





NRC Contract No. NRC-03-79-118 Page FRC Project No. C5257 Franklin Research Center 50 A Division of The Franklin Institute FRC Assignment No. 13 20th and Race Streets Phila Pa 19103 (215) 448-1000 FRC Task No. _ 487 EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 97 qualification document, PGR # 4607, NOTES: fest specimien. scylus CABLE CONSTRUCTIONS #12 7/.0305" tinned copper conductor Sample No. S-1 .060" thickness Rockbestos KS-400, methyl-vinyl silicone rubber insulation Fiberglass braid, with lacquer finish 7 conductors cabled Silicone rubber impregnated glass binder tape .045" thick asbestos braid with flame-retardant saturant Sample No. S-2 The same as above, except using G.E.'s 9025 methyl-phenyl silicone rubber insulation Sample No. S-3 The same as above, except using Dow Corning's X32330 methyl-phenyl silicone rubber insulation #12 7/.0305" tinned copper conductor . Sample No. KP .045" thickness flame retardant cross-linked polyethylene insulation 7 conductors cabled Silicone rubber impregnate: glass binder tape Glass reinforced asbestos tabe .060" thickness flame retardant neoprene jacket The Licensee describes The installed ableas: CONFORENT CABLE MALIUFACTURER CERRO (ROCXBESTUS) PART NU-BER SIL. PUS./ASR. BR.

5. CONCLUSIONS

The tabulations in Section 4.2 represent a summary of the results of the equipment environmental qualification (EEQ) assessment conducted in accordance with the methodology presented in Section 3. The evaluations are based on the available qualification documentation provided by the Licensee, complemented in several cases by other relevant technical information. The major qualification deficiencies that have been identified and the results of the evaluation are shown in the Equipment Environmental Qualification Summary Forms (Tables 4-1, 4-2, 4-3, and 4-4).

Although Sections 4.3, 4.4, and Appendix C of this report present a detailed evaluation of (1) the Licensee's qualification methodology, (2) the equipment environmental qualification of each equipment item, and (3) the Licensee's response to the NRC SER, it is appropriate to highlight for the Licensee and the NRC certain conclusions and concerns reached as a result of the review which require special attention. These concerns are summarized below.

- The Licensee has indicated various types of corrective action but has not provided a schedule for establishing qualification of existing equipment or installing qualified equipment.
- o The Licensee has referenced many qualification documents but has, in general, not provided sufficient information to establish that the installed equipment is the same as the equipment tested, particularly in the cases of electrical cables and Limitorque valve actuators.

With respect to TMI Action Plan items, the Licensee has provided the following information:

"Qualification information for installed TMI Action Plan equipment is detailed below:

 Relief Valve Position Indication - We have received a draft of the qualification test report for comment from Technology for Energy Corporation. This will be reviewed and incorporated into the report.

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b) Containment Water Level - The qualification test program for ITT Barton transmitters is scheduled for completion by September 1981. When the report is received and reviewed, the equipment will be incorporated into the report. When the remaining equipment is installed and credit is taken for the installation, we will again update the report" [12].

"This letter constitutes our response to your request (reference (a)) for information relating to certain modifications resulting from the TMI Action Plan Items. The discussion relating to specific sections of NUREG-0737, 'Clarification of TMI Action Plan Requirements,' is enclosed as an attachment.

Qualification documents are not attached for the reasons cited in reference (b).

June 2, 1982 Attachment

RESPONSE TO REQUEST FOR INFORMATION ON EQ OF TMI-RELATED EQUIPMENT

II.D.3 Post Accident Sampling Capability

This item is scheduled for completion during the current refueling outage.

II.D.3 Direct Indication of Relief and Safety Valve Position

Installation of this instrumentation was completed prior to January 1, 1981. Ten (10) copies of system components evaluation worksheets (SCEW) are enclosed:

CBL029	Brand Rex Cable
VE0001	Endevco Accelerometer
VT0001	TEC Charge Converter
CON011	Malco Connector
CON012	Trompeter Connector

II.E.1.2 Auxiliary Feedwater System Automatic Initiation and Flow Indication

System installation was completed prior to January 1, 1981. Our earlier submittal in response to I&E Bulletin 79-01B includes SCEW's for the generic process devices (FT's), terminal blocks, and cable used to satisfy requirements of this action plan item.

II.E.3.1 Emergency Power Supply for Pressurizer Heater

Equipment installation was completed prior to January 1, 1981. Our earlier submittals in response to I&E Bulletin 79-01B included SCEW's for the switchgear (SWGR 01, 02), motor control centers (MCC001), and cables used to satisfy the requirements of this action plan item.

II.E.4.1 Dedicated Hydrogen Penetrations

As stated in our letter to Mr. D. G. Eisenhut dated November 20, 1979, the system described the Calvert Cliffs Final Safety Analysis Report Section 6.8 meets short and long term requirements of NUREG-0578. This action plan item is not applicable to Calvert Cliffs.

11.E.4.2 Containment Isolation Dependability

Details on the design of the Calvert Cliffs containment purge isolation system was provided in our letter to Mr. R. W. Reid dated April 7, 1980.

II.F.2 Instrumentation for Detection of Inadequate Core Cooling

Installation of our subcooled margin monitors was completed by 1/1/81. Our earlier submittals in response to I&E Bulletin 79-01B included SCEW's for the various RTD's and cables used to satisfy the requirements of this action plan item.

II.G.1 Emergency Power for Pressurizer Equipment

No equipment changes were needed to meet the requirements of this action plan item (see our letter of January 4, 1980 from A. E. Lundvall to D. G. Eisenhut)" [36].

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6. REFERENCES

The references listed in this section of the report were used to develop the Equipment Environmental Qualification evaluation for this plant. The references have been separated into two lists: (1) Plant-Specific References and (2) Plant Generic References. All non-generic documents are listed on the "Plant-Specific References" list. All qualification documents that could be applicable to equipment installed in several plants were listed on the "Plant Generic References" list. These documents include topical reports, test reports, component and material analyses, etc. sited by the Licensee as evidence of qualification in accordance with the documentation reference instructions established by IE Bulletin 79-01B. Since these documents were compiled by a computer data base, the citation numbering was computer generated and the same document has the same generic reference number in all Technical Evaluation Reports prepared under this equipment qualification program.

Throughout the text of the report, references are designated by a bracketed number; the reference numbers are not presented in sequential order.

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APPENDIX A - ENVIRONMENTAL SERVICE CONDITIONS

The specific environmental service conditions corresponding to different plant locations that were used in this technical evaluation are stated in this appendix, based upon the information presented in Chapter 14 of the Licensee's updated FSAR.

The temperature and pressure profiles contained herein form the basis for the temperature and pressure noted by the Licensee in the "Environment Required" column on the Licensee's Equipment Qualification Report Evaluation sheets.

This appendix contains the following tables and curves:

- Table A-1. Containment Pressure Analysis Results for the Spectrum of Break Sizes (Licensee Table 14.20-15)
- Table A-2. Equipment Radiation Doses
- Figure A-1. 19.0 Sq. Ft. Hot Leg Break with Minimum Safety Injection -Containment Pressure Vs. Time (FSAR Figure 14.20-8)
- Figure A-2. 9.6 Sq. Ft. Hot Leg Break with Minimum Safety Injection -Containment Fressure Vs. Time (FSAR Figure 14.20-9)
- Figure A-3. 4.0 Sq. Ft. Hot Leg Break with Minimum Safety Injection -Containment Pressure Vs. Time (FSAR Figure 14.20-10)
- Figure A-4. 2.0 Sq. Ft. Hot Leg Break with Minimum Safety Injection -Containment Pressure Vs. Time (FSAR Figure 14.20-11)
- Figure A-5. 1.0 Sq. Ft. Hot Leg Break with Minimum Safety Injection -Containment Pressure Vs. Time (FSAR Figure 14.20-12)
- Figure A-6. Containment Atmosphere and Sump Temperatures Vs. Time (FSAR Figure 14.20-13)
- Figure A-7. 2.0 Sq. Ft. Hot Leg Break with Refill (Maximized Blowdown), Minimum Safety Injection - Long-Term Containment Vapor Temperature [14]
- Figure A-8. 2.0 Sq. Ft. Hot Leg Break with Refill (Maximized Blowdown), Minimum Safety Injection - Containment Gauge Pressure Vs. Time [14]



Based on these considerations, each equipment item was evaluated with respect to the environmental service conditions presented in this appendix.

Accident Conditions Inside Primary Containment

For PWR plants, the DOR Guidelines state that the environmental service conditions inside containment for the loss-of-coolant accident (LOCA) should be established by the Licensee based on the FSAR analysis. In addition, for plants equipped with automatic containment spray systems not subject to single component failure or delayed initiation, the Guidelines state that equipment qualified for the LOCA environment is also considered qualified for the postulated main-steam-line break accident (MSLB). The design of this plant satisfies these criteria. The Licensee has stated that equipment qualified for a LOCA environment can be considered qualified for a MSLB accident environment.

The Licensee provided the following response with respect to temperature margins applied to the primary containment accident profile [17]:

"As previously stated in reference (a), we identified the use of saturation temperature for our containment peak temperature during the postulated LOCA. We also stated that a reassessment would be made to the 20°F higher temperature. A preliminary review of the profiles for containment equipment has identified sufficient conservatism such that an equivalence analysis shows the actual test to be more severe. Therefore, we can establish qualifications of the required containment equipment to the higher peak temperature."

Table A-1. Containment Pressure Analysis Results for the Spectrum of Break Sizes (Licensee Table 14.20-15)

Table 14.20-15 .

CONTAINMENT PRESSURE ANALYSIS RESULTS FOR THE SPECTRUM OF BREAK SIZES

Assumptions: Containment design basis Safety Injection Systems performance. One Spray, two Air Coolers operating.

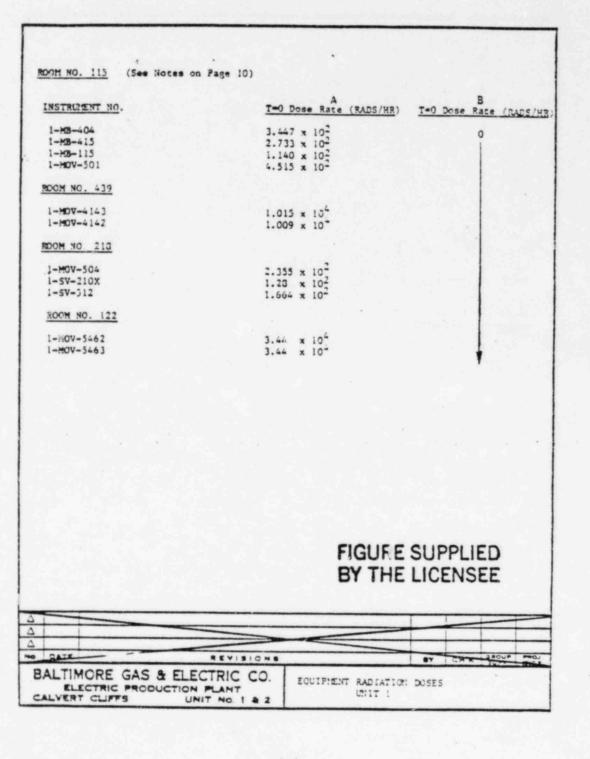
Break Area (ft ²)	19.2	9.5	4.0	2.0	1.0
Peak Pressue (psig)	41.39	42.27	46.38	47.45	45.40
Peak Temperature (°F)	255	266	25.3	274	270
Time of Peak Pressure (sec.)	7.2	10.5	23.4	45	84
Blowdown Energy Release at Time at Time of Peak Pressure (10 ⁸ Btu)	258.7	275.2	295.2	307.8	310.0
Energy Removed by Air Coolers at Time of Peak Pressure (10 ³ Btu)	0	0	0	0.851	2.166
Energy Absorbed by Heat Sinks at Time of Peak Pressure (10° Btu)	11.04	10.38	14.47	20.40	4.238

FIGURE SUPPLIED BY THE LICENSEE

14.20-52



Table A-2. Equipment Radiation Doses

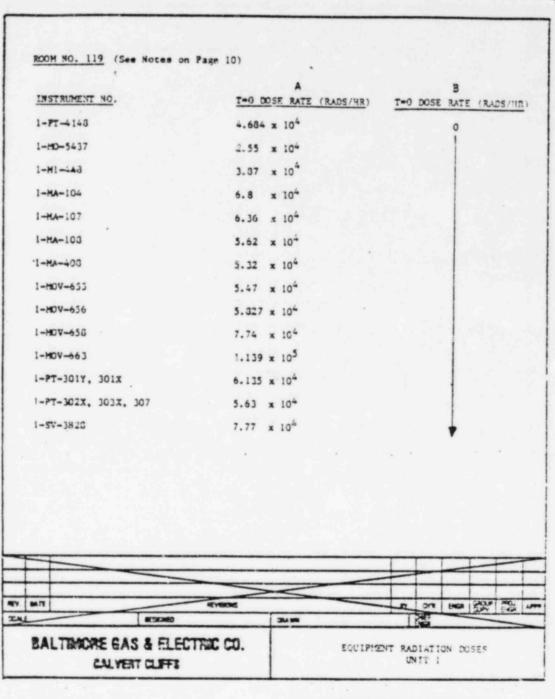


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1-110-5439		4.355	x 10 ⁴						
1-5V	-SV-3830	-3830 6.499 x 1-34							
1	-PT-302Y	× 10 ⁴							
1-PT-309 4.711 x		× 10							
1	1-PT-303Y 2.162 5		× 10 ⁻⁴						
1	-PT-301Z	4.711	x 10 ⁴						
1	-HOV-662	1.119	× 10 ⁵						
	1-11CV-660	3.120	× 10 ⁴						
	1-MOV-654	4.966	× 10 ⁴						
	1-MOV-653	4.309	x 16 ⁴						
	1-MA-110	4.175	x 16 ⁴						
	1-MA-407		× 10 ⁴						
	1-MA-404		× 10 ⁴						
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	ROOM NO. 113 (See Notes on	Page 10)							

FIGURE SUPPLIED BY THE LICENSEE

Table A-2 (Cont.)

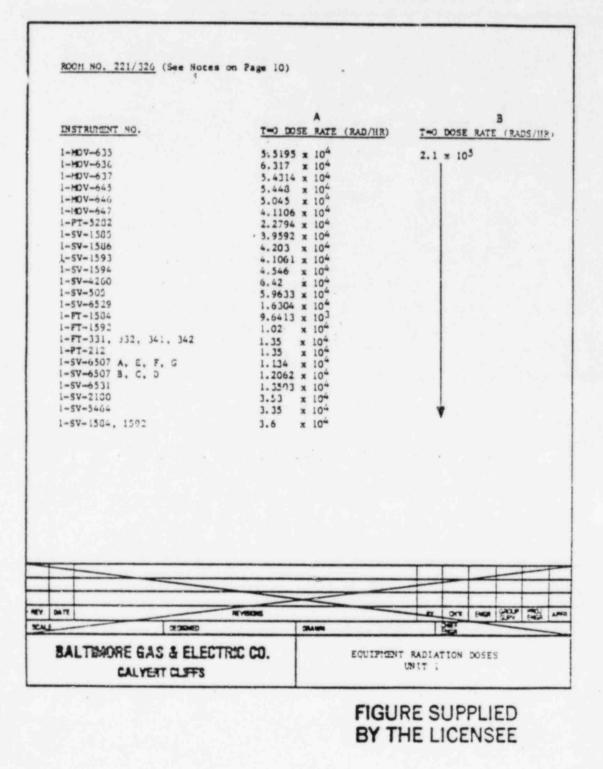


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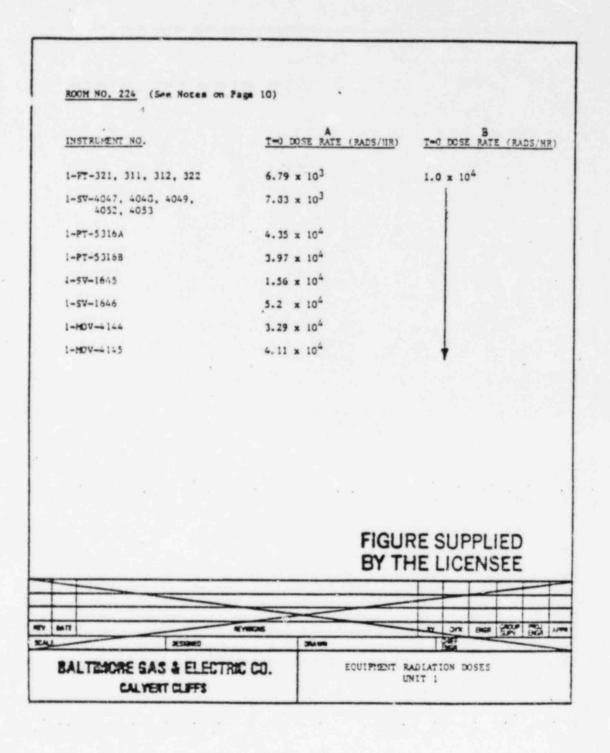
FIGURE SUPPLIED BY THE LICENSEE





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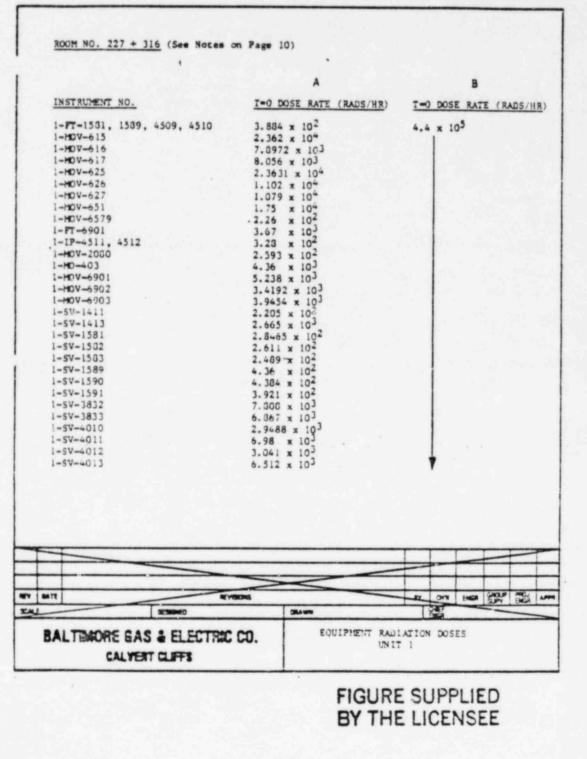


Table A-2 (Cont.)

ROOM NO. 228 (See Notes on Page 10) * a T-O DOSE RATE (RADS/HR) INSTRUMENT NO. T-O DOSE RATE (RADS/HR) 1-FT-306 2.186 x 104 0 1-IP-5206, 5208 1.026 x 104 1-M8-106 2.173 x 104 1-10-116 4.805 x 10³ 1-108-406 .1.137 x 104 1-SV-3824 4.472 x 103 1-5V-3826 4.554 x 103 1-SV-5160 1.059 x 104 1-5V-5162 4.453 x 103 1-5V-5163, 5165, 5166 4.863 x 10³ 1-5V-5208, 5200A 5.396 x 10³ 1-5V-5206, 5206A 1.446 x 104

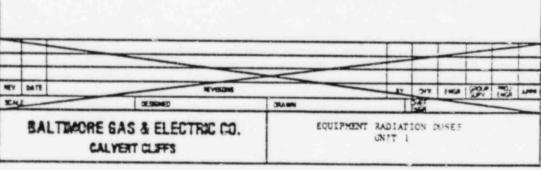


FIGURE SUPPLIED BY THE LICENSEE

A-10

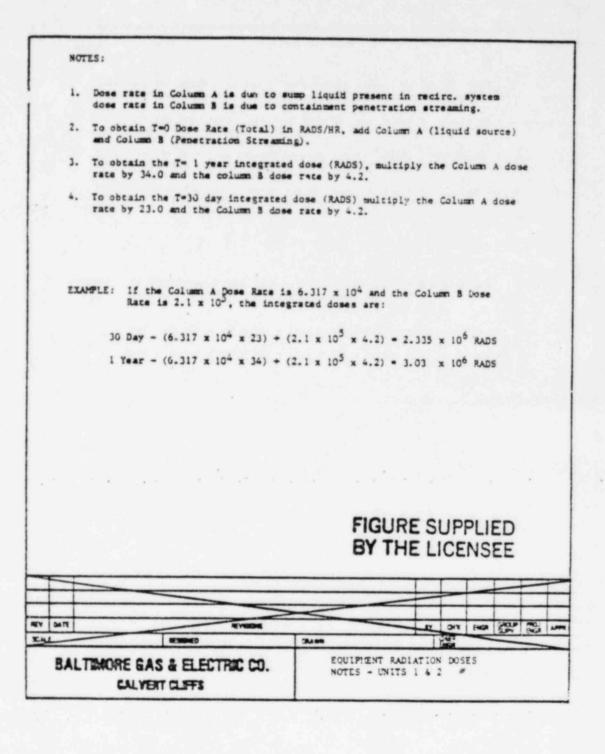
.

oom No.		Accumulated Dose (RADS)	Boom No.		Accumulated Dose (RADS)
	30 Day	1 Year		30 Dar	1 Year
100	3600	4200	419	18	21
108			421	4.27 x 103	4.47 x 103
117	9300	13,000	422	4.27 x 103	4.47 x 103
			423	1.95 x 105	1.96 × 10 ⁵
208	· · · · · ·		426		
212	1.34×10^{5}	2.72 x 10 ⁵	423	9.37 x 10 ³	9.27 x 103
217	12	14	429	1.85 x 105	1.05 x 10 ³
220	173	252	4 30	6.35 x 10 ²	6.35 x 10 ²
225	1.65 x 105	2.44 x 10			
220	2.23×10^3	2.29 x 10 ³	512	38	30
1.11			524	9370	9370
301	500	700	529		
302	600	700			
304	500	700	AUF		*
306	600	700			
315	2.96 x 105	2.97 x 105	LSPR		
317	3.32 x 10"	3.33 x 10 ⁴			
318	1.26×10^{4} 3.9×10^{3}	1.27 x 10	T601		
319	3.9 x 10"	4.55×10^{3}	T503		
323	480	840			
328	*	560	W033	. •	
405	•				
* Dose d	ue to Loca is ne	aligible	ated in the indic		
			~		
SATE		REVERONS		E ON	PHER SHOL MAL
1	25.360	MED	MAN		
BALT	CALVERT CL		Equipment Rad Units 1 and 2	iation Doses	

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Table A-2 (Cont.)



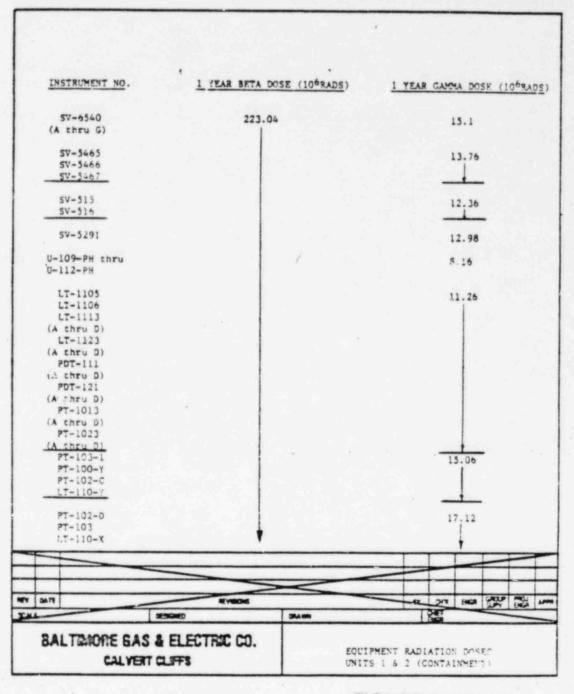


FIGURE SUPPLIED BY THE LICENSEE

Table A-2 (Cont.)

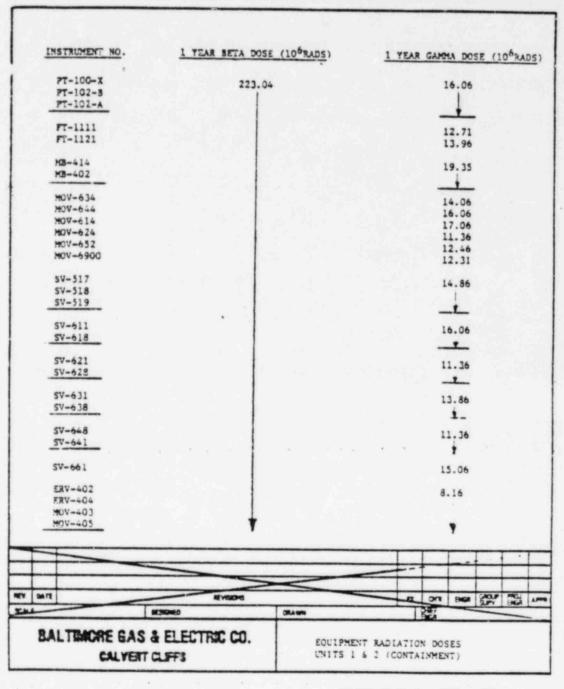
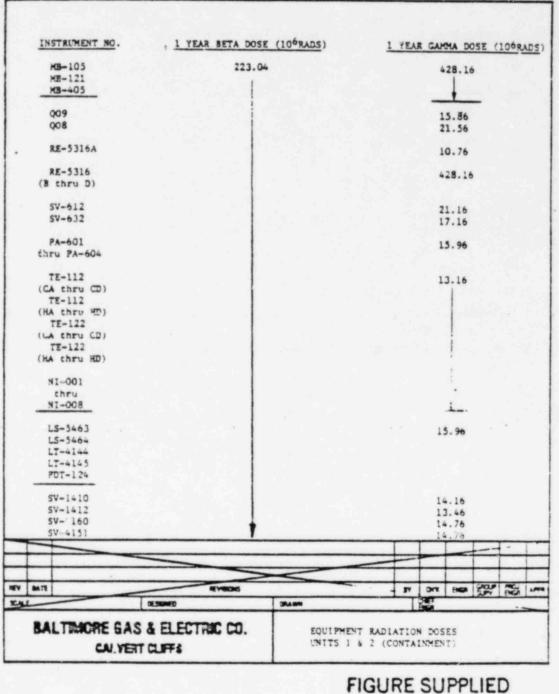


FIGURE SUPPLIED BY THE LICENSEE

Table A-2 (Cont.)

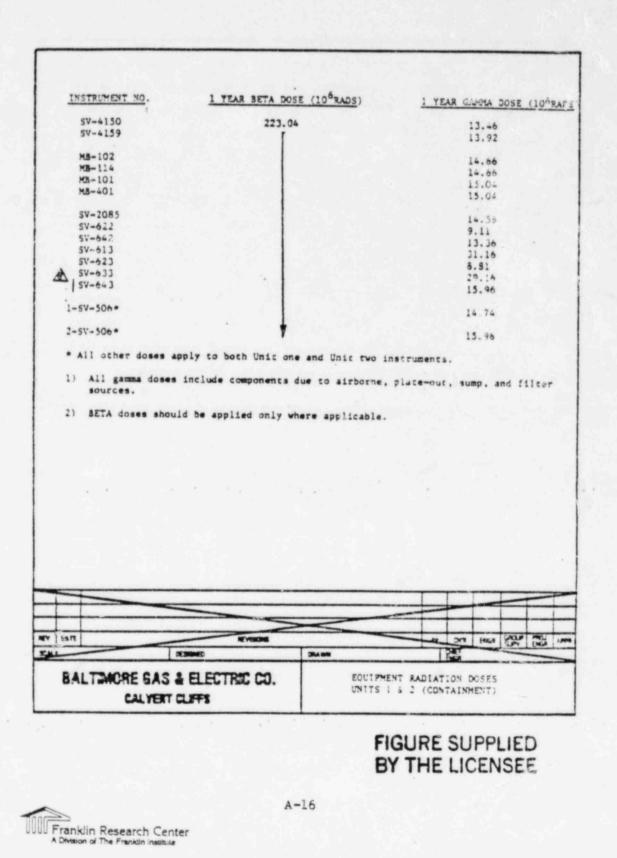


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Table A-2 (Cont.)



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Table A-2 (Cont.)

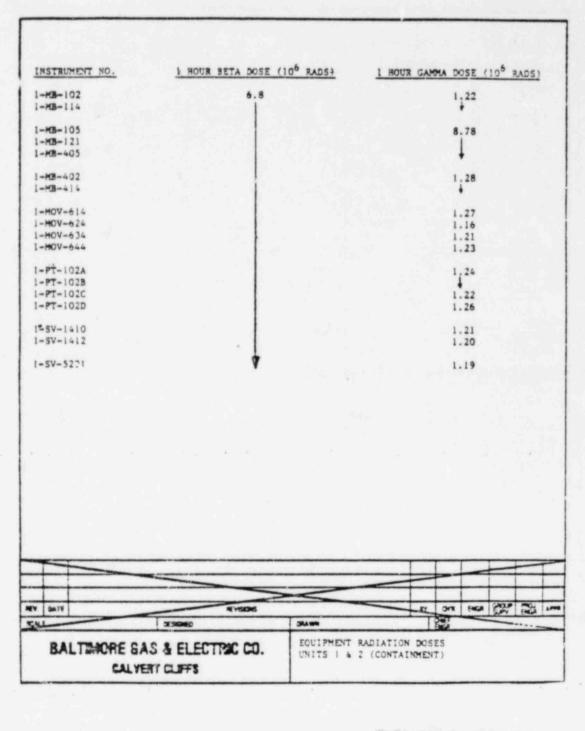
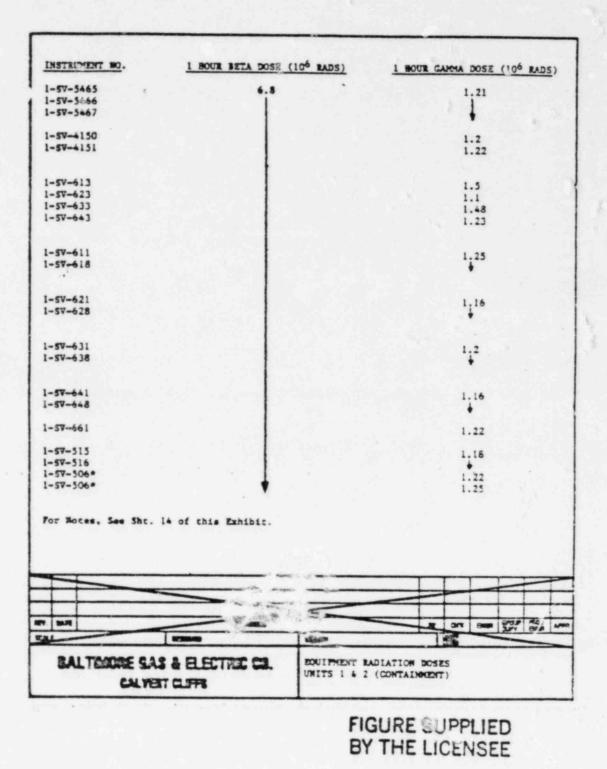


FIGURE SUPPLIED BY THE LICENSEE

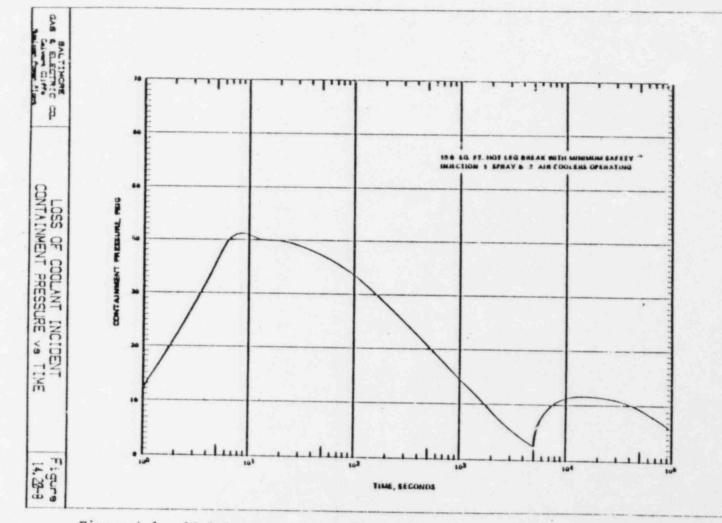
A-17

Table A-2 (Cont.)

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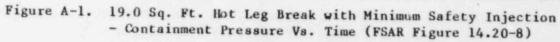


FIGURE SUPPLIED BY THE LICENSEE

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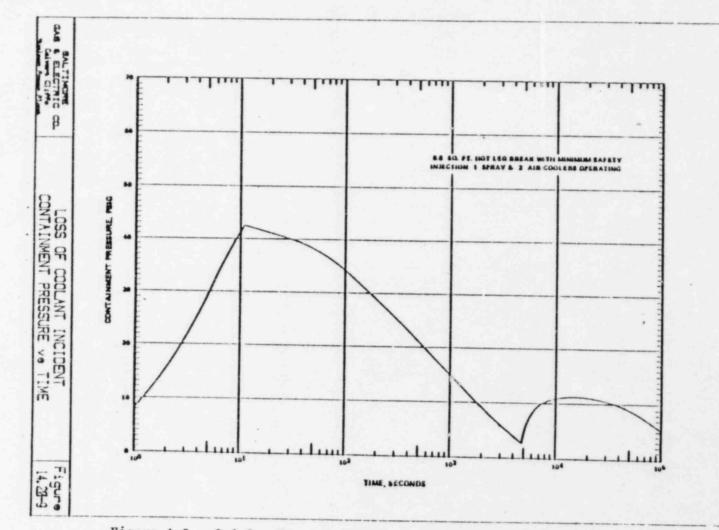
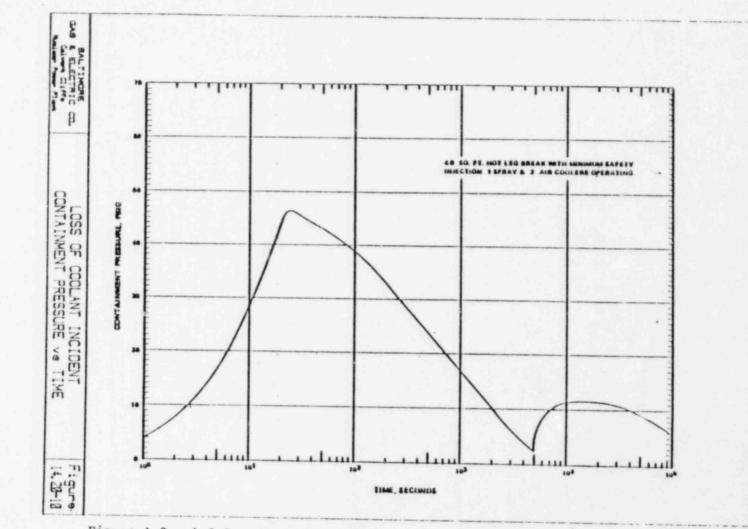


Figure A-2. 9.6 Sq. Ft. Hot Leg Break with Minimum Safety Injection -Containment Pressure Vs. Time (FSAR Figure 14.20-9)

> FIGURE SUPPLIED BY THE LICENSEE

A-20

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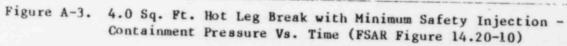
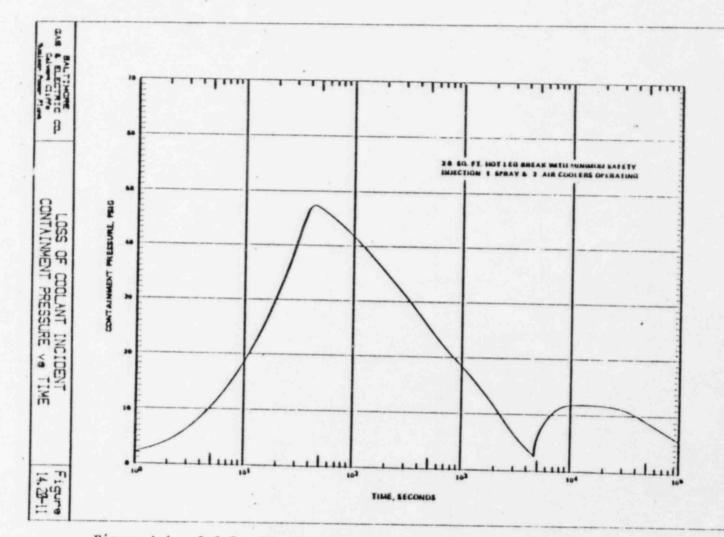


FIGURE SUPPLIED BY THE LICENSEE TER-C5257-487

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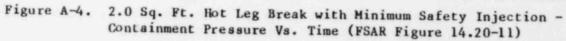
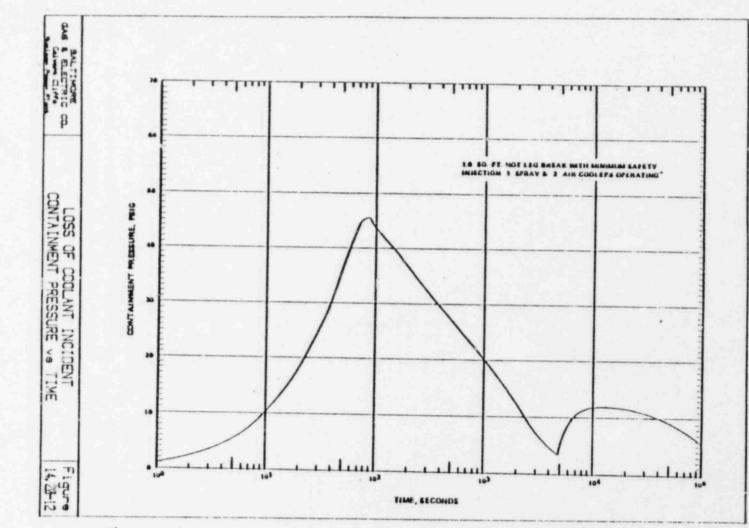


FIGURE SUPPLIED

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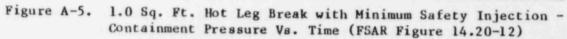
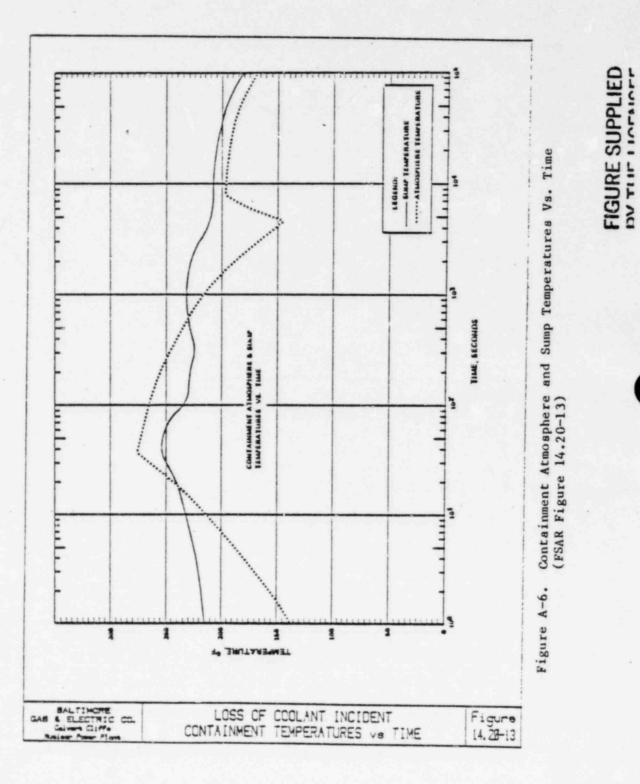


FIGURE SUPPLIED BY THE LICENSEE

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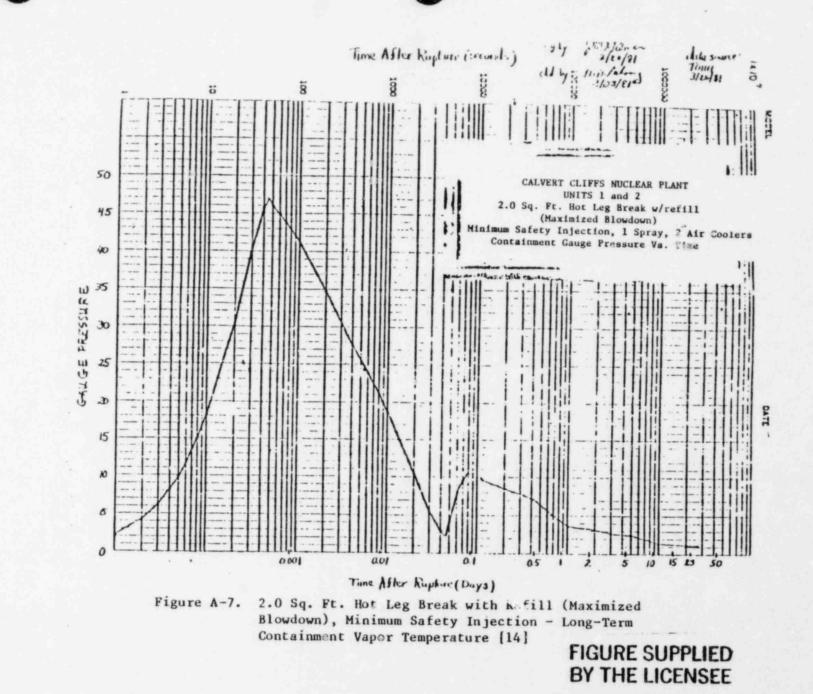
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5-0,1 31:1010 0 133 838 ö 8 5 1320. 300 296° CALVERT CLIFFS NUCLEAR PLANT Units 1 and 2 2.0 Sq. Ft. Hot Leg Break w/refill 290 (Maximized Blowdown) Minimum Safety Injection, 1 Spray, 2 Air Coolers VAPOR TEMPERATURE (.F) Long-Term Containment Vapor Temperature 260 240 220 200 20 190 160 041 120 100 ... 4.1 : (15) 0.01 11 0.5 1 5 w 15 73 .. 1 Time Aft Rupture (Days) Figure A-8. 2.0 Sq. Ft. Hot Leg Break with Refill (Maximized Blowdown), Minimum Safety Injection - Containment Gauge Pressure Vs. Time [14]

Time After Rydure (seconds)

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FIGURE SUPPLIED

A-26

APPENDIX B - LISTING OF SAFETY-RELATED ELECTRICAL EQUIPMENT

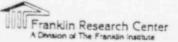
The following table lists the groupings of safety-related electrical equipment items for the Calvert Cliffs Unit 2. Equipment items provided in the table are used in the detailed equipment environmental qualification evaluation presented in Section 4.4 and summarized in Section 4.2. This table was generated from the lists of equipment provided by the Licensee [1, 12].

The Licensee identified an extensive list of safety-related electrical equipment in various locations of the plant. The equipment listed by the Licensee was analyzed, and all identical equipment located within plant areas that are exposed to the same environmental service conditions was grouped together and designated an "equipment item." In this report, the term "equipment item" refers to a specific type of electrical equipment, designated by manufacturer and model, which is representative of all identical equipment in a plant area exposed to the same environmental service conditions (e.g., Flow Transmitter, Fischer & Parter, Model 10B2496, located within containment). This analysis resulted in a reduced listing of equipment (equipment items) that formed the basis for the review. This appendix contains the cabulation of the equipment items, locations, function, plant identification numbers, required operating time, and applicable qualification documentation references.



EQUIPMENT ITEM NO. 1 SOLENOID VALVE LOCATED IN CONTAINMENT (C230) ASCO MODEL WPHTX8320A21V EQUIRED OPERATING TIME: 1 HOUR TER CHECKSHEET NO. 1 LICENSEE REFERENCE(S): 4026, 28, 27 FUNCTION (PLANT ID): RCP BLEED OFF ISOLATION 1CV506 (1SV506) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 10 FUNCTION (PLANT ID): LETDOWN LINE ISOLATION 1CV 516 & 1CV 515 (1SV 516, 1SV 515) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 9, 8 FUNCTION (PLANT ID): CONTAINMENT SPRAY HEADER ISOLATION 1CV4150 & 1CV4151 (1SV4150, 1SV4151) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 181, 182 FUNCTION (PLANT ID): SI TANK VENTS (1SV623, 1SV613, 1SV643, 1SV633) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 225, 222, 231, 228 EQUIPMENT ITEM NO. 2 SOLENOID VALVE LOCATED IN CONTAINMENT (C230) ASCO MODEL 2063813RVU REQUIRED OPERATING TIME: 1 HOUR TER CHECKSHEET NO. 2 LICENSEE REFERENCE(S): 712 FUNCTION (PLANT ID): CHECK VALVE LEAKAGE DRAIN TO RWT (1SV618, 1SV628, 1SV638, 1SV648) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 210, 211, 212, 213 EQUIPMENT ITEM NO. 3 SOLENOID VALVE LOCATED IN CONTAINMENT (C230) ASCO MODEL NF8320A175V REQUIRED OPERATING TIME: 1 HOUR TER CHECKSHEET NO. 3 LICENSEE REFERENCE(S): 712 FUNCTION (PLANT ID): RECIRCULATION RETURN LINE DRAIN (15V661) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 219 FUNCTION (PLANT ID): SI TANK FILL & DRAIN (15V621, 15V611, 15V641, 15V631) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 223, 220, 229, 226 EQUIPMENT ITEM NO. 4 SOLENOID VALVE LOCATED IN THE ECCS PUMP ROOM (A118)

ASCO MODEL HT8320 REQUIRED OPERATING TIME: 1 HOUR TER CHECKSHEET NO. 4 LICENSEE REFERENCE(S): 28 FUNCTION (PLANT ID): SHUTDOWN HX 12 DISCHARGE 1CV3830 (1SV3830) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 45 FUNCTION (PLANT ID): SHUTDOWN HX 11 DISCHARGE 1CV3828 (1SV3828) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 44



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EQUIPMENT ITEM NO. 5 SOLENOID VALVE LOCATED IN THE EAST PIPING PENETRATION ROOM (A316) ASCO MODEL 2063815RVU REQUIRED OPERATING TIME: 1 HOUR TER CHECKSHEET NO. 5 LICENSEE REFERENCE(S): 712 FUNCTION (PLANT ID): CONTAINMENT COOLER 13 SUPPLY 1CV1589 (1SV1589) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 43 FUNCTION (PLANT ID): CONTAINMENT COOLER 11 SUPPLY 1CV1581 (1SV1581) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 42 FUNCTION (PLANT ID): CONTAINMENT COOLING COIL 13 DISCHARGE 1CV1590 (1SV1590) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 41 FUNCTION (PLANT ID): CONTAINMENT COOLING COIL 13 DISCHARGE 1CV1592 (1SV1592) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 41

EQUIPMENT ITEM NO. 6 SOLENOID VALVE LOCATED IN CONTAINMENT (C230) ASCO MODEL WPHTX8320A21V REQUIRED OPERATING TIME: 9 HOURS TER CHECKSHEET NO. 6 LICENSEE REFERENCE(S): 4026, 28, 27 FUNCTION (PLANT ID): PURGE AIR SAMPLE ISCLATION 1CV5291 (1SV5291) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 250 FUNCTION (PLANT ID): DOUSING FILTER SUPPLY HEADER 1CV4159 (1SV4159) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 38 FUNCTION (PLANT ID): DOUSING FILTER SUPPLY HEADER 1CV4160 (1SV4160) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 39 FUNCTION (PLANT ID): PRESSURIZER 11 VAPOR ISOLATION 1CV5465 (1SV5465) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 180 FUNCTION (PLANT ID): PRESSURIZER 11 LIQUID ISOLATION 1CV5466 (1SV5466) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 179 FUNCTION (PLANT ID): RC HOT LEG SAMPLE ISOLATION 1CV5467 (1SV5467) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 178

EQUIPMENT ITEM NO. 7 SOLENOID VALVE LOCATED IN THE MAIN STEAM PIPING PENETRATION (A315) ASCO MODEL NP8320A187V REQUIRED OPERATING TIME: 9 HOURS TER CHECKSHEET NO. 7 LICENSZE REFERENCE(S): 712 FUNCTION (PLANT ID): FURGE AIR SAMPLE ISOLATION 1CV5292 (1SV5292) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 251



EQUIPMENT ITEM NO. 8 SOLENOID VALVE LOCATED IN THE EAST PIPING PENETRATION ROOM (A316) ASCO MODEL NP8320A187V REQUIRED OPERATING TIME: 1 HOUR TER CHECKSHEET NO. 8 LICENSEE REFERENCE(S): 712 FUNCTION (PLANT ID): STEAM GENERATOR 12 BLOWDOWN ISOLATION 1CV4012 (1SV4012) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 120 FUNCTION (PLANT ID): STEAM GENERATOR 12 BLOWDOWN ISOLATION 1CV4013 (1SV4013) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 121 FUNCTION (PLANT ID): STEAM GENERATOR 11 BLOWDOWN ISOLATION 1CV4011 (1SV4011) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 114 FUNCTION (PLANT ID): STEAM GENERATOR 11 BLOWDOWN ISOLATION 1CV4010 (1SV4010) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 113

EQUIPMENT ITEM NO. 9 SOLENOID VALVE LOCATED IN THE EAST PIPING PENETRATION ROOM (A316) ASCO MODEL 2063815RVU REQUIRED OPERATING TIME: 18 SECONDS TER CHECKSHEET NO. 9 LICENSEE REFERENCE(S): 712 FUNCTION (PLANT ID): COMPONENT COOLING TO RCP ISOLATION 1CV3832 (1SV3832) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 36 FUNCTION (PLANT ID): COMPONENT COOLING FROM RCP ISOLATION 1CV3833 (1SV3833) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 37

EQUIPMENT ITEM NO. 10 SOLENOID VALVE LOCATED IN THE PIPING AREA (A224) TELEDYNE MODEL 2111062025253 REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 10 LICENSEE REFERENCE(S): NOT CITED FUNCTION (PLANT ID): STEAM GENERATOR 12 MSIV (1SV4052, 1SV4049, 1SV4048, 1SV4053, 1SV4047) LICENSEE SUJMITTAL: SCEW(S) [1, 12]: 122 THROUGH 126 FUNCTION (PLANT ID): STEAM GENERATOR II MSIV 1CV4043 (1SV4043, 1SV4044, 1SV4045, 1SV4042, 1SV4046) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 115 THROUGH 119

EQUIPMENT ITEM NO. 11 SOLENOID VALVE LOCATED IN THE EAST PIPING PENETRATION ROOM (A316) ASCO MODEL NP8316E35V REQUIRED OPERATING TIME: 9 HOURS TER CHECKSHEET NO. 11 LICENSEE REFERENCE(S): 712 FUNCTION (PLANT ID): CONTAINMENT PURGE ISOLATION 1CV1413 (1SV1413) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 249 FUNCTION (PLANT ID): CONTAINMENT PURGE ISOLATION 1CV1411 (1SV1411) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 247

EQUIPMENT ITEM NO. 12 SOLENOID VALVE LOCATED IN CONTAINMENT (C230) ASCO MODEL NP8320A195V REQUIRED OPERATING TIME: 9 HOURS TER CHECKSHEET NO. 12 LICENSEE REFERENCE(S): 712 FUNCTION (PLANT ID): CONTAINMENT INSTRUMENT AIR HEADER 1CV2085 (1SV2085) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 12

EQUIPMENT ITEM NO. 13 SOLENOID VALVE LOCATED IN CONTAINMENT (C230) ASCO MODEL NP8316E35V REQUIRED OPERATING TIME: 9 HOURS TER CHECKSHEET NO. 13 LICENSEE REFERENCE(S): 712 FUNCTION (PLANT ID): CONTAINMENT PURGE ISOLATION 1CV1412 (1SV1412) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 248 FUNCTION (PLANT ID): CONTAINMENT PURGE ISOLATION 1CV1410 (1SV1410) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 246

EQUIPMENT ITEM NO. 14 MOTORIZED VALVE ACTUATOR LOCATED IN THE EAST PENETRATION ROOM (A227) LIMITORQUE MODEL SMB00 REQUIRED OPERATING TIME: 8 HOURS TER CHECKSHEET NO. 14 LICENSEE REFERENCE(S): 1064 FUNCTION (PLANT ID): MANUAL HPSI TO LOOP 11B 1MOV626 (1MOV626) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 199 FUNCTION (PLANT ID): MANUAL HPSI TO LOOP 11A 1MOV616 (1MOV616) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 198 FUNCTION (PLANT ID): HPSI TO LOOP 11B 1MOV627 (1MOV627) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 197

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EQUIPMENT ITEM NO. 15 MOTORIZED VALVE ACTUATOR LOCATED IN THE EAST PIPING PENETRATION ROOM (A316) PRATT MODEL TN20003 REQUIRED OPERATING TIME: 9 HOURS TER CHECKSHEET NO. 15 LICENSEE REFERENCE(S): NOT CITED FUNCTION (PLANT ID): H2 PURGE ISOLATION 1MOV6902 (1MOV6902) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 259

EQUIPMENT ITEM NO. 16 MOTORIZED VALVE ACTUATOR LOCATED IN THE EAST PIPING PENETRATION ROOM (A316) LIMITORQUE MODEL SMBOO REQUIRED OPERATING TIME: 9 HOURS TER CHECKSHEET NO. 16 LICENSEE REFERENCE(S): 706, 662, 26 FUNCTION (PLANT ID): H2 PURGE ISOLATION 1MOV6903 (1MOV6903) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 260 FUNCTION (PLANT ID): H2 PURGE ISOLATION 1MOV6901 (1MOV6901) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 258

EQUIPMENT ITEM NO. 17 MOTORIZED VALVE ACTUATOR LOCATED IN THE EAST PENETRATION ROOM (A227) LIMITORQUE MODEL SMB00 REQUIRED OPERATING TIME: 1 HOUR TER CHECKSHEET NO. 17 LICENSEE REFERENCE(S): 706, 662, 26 FUNCTION (PLANT ID): CONTAINMENT ISOLATION (1MOV6579) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 151

EQUIPMENT ITEM NO. 18 MOTORIZED VALVE ACTUATOR LOCATED IN THE EAST PIPING PENETRATION ROOM (A316) LIMITORQUE MODEL SMBOO REQUIRED OPERATING TIME: 1 HOUR TER CHECKSHEET NO. 18 LICENSEE REFERENCE(S): 662 FUNCTION (PLANT ID): INSTRUMENT AIR CONTAINMENT ISOLATION (1MOV2080) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 13

EQUIPMENT ITEM NO. 19 MOTORIZED VALVE ACTUATOR LOCATED IN THE MAIN STEAM PIPING PENETRATION (A315) LIMITORQUE MODEL SMB2 REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 19 LICENSEE REFERENCE(S): 706 FUNCTION (PLANT ID): STEAM GENERATOR 12 FEEDWATER ISOLATION 1MOV4517 (1MOV4517) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 15

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EQUIPMENT ITEM NO. 20 MOTORIZED VALVE ACTUATOR LOCATED IN THE MAIN STEAM PIPING PENETRATION (A315) LIMITORQUE MODEL SMB2 REQUIRED OPERATING TIME: 8 HOURS TER CHECKSHEET NO. 20 LICENSEE REFERENCE(S): 706 FUNCTION (PLANT ID): STEAM GENERATOR 11 FEEDWATER ISOLATION 1MOV4516 (1MOV4516) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 14

EQUIPMENT ITEM NO. 21 MOTORIZED VALVE ACTUATOR LOCATED IN THE ECCS PUMP ROOM (A119) LIMITORQUE MODEL SMB1 REQUIRED OPERATING TIME: 1 HOUR TER CHECKSHEET NO. 21 LICENSEE REFERENCI(S): NOT CITED FUNCTION (PLANT ID): MANUAL HPSI HEADER ISOLATION 1MOV656 (1MOV656) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 218

EQUIPMENT ITEM NO. 22 MOTORIZED VALVE ACTUATOR LOCATED IN CONTAINMENT RECIRCULATION PIPE TUNNEL (A122) LIMITORQUE MODEL SMB2 REQUIRED OPERATING TIME: 9 HOURS TER CHECKSHEET NO. 22 LICENSEE REFERENCE(S): 706 FUNCTION (PLANT ID): CONTAINMENT SUMP DISCHARGE (1MOV4145) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 215

EQUIPMENT ITEM NO. 23 MOTORIZED VALVE ACTUATOR LOCATED IN THE EAST PENETRATION ROOM (A227) LIMITORQUE MODEL SMBOO REQUIRED OPERATING TIME: 8 HOURS TER CHECKSHEET NO. 23 LICENSEE REFERENCE(S): 1064 FUNCTION (PLANT ID): HPSI TO LOOP 11A 1MOV617 (1MOV617) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 196

EQUIPMENT ITEM NO. 24 MOTORIZED VALVE ACTUATOR LOCATED IN THE EAST PENETRATION ROOM (A227) LIMITORQUE MODEL SMB2 REQUIRED OPERATING TIME: 9 HOURS TER CHECKSHEET NO. 24 LICENSEE REFERENCE(S): 706 FUNCTION (PLANT ID): LPSI TO LOOP 11A 1MOV615 (1MOV615) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 206

EQUIPMENT ITEM NO. 25 MOTORIZED VALVE ACTUATOR LOCATED IN THE ECCS PUMP ROOM (A118) LIMITORQUE MODEL SMBO REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 25 LICENSEE REFERENCE(S): 1620 FUNCTION (PLANT ID): HPSI HEADER ISOLATION VALVE (1MOV654) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 191

EQUIPMENT ITEM NO. 26 MOTORIZED VALVE ACTUATOR LOCATED IN CONTAINMENT (C230) LIMITORQUE MODEL SMB; SIZES 00, 3 REQUIRED OPERATING TIME: 9 HOURS TER CHECKSHEET NO. 26 LICENSEE REFERENCE(S): 706, 662 FUNCTION (PLANT ID): SI TANK 11A ISOLATION 1MOV614 (1MOV614) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 221 FUNCTION (PLANT ID): SI TANK 11B ISOLATION 1MOV624 (1MOV624) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 224 FUNCTION (PLANT ID): H2 PURGE ISOLATION 1MOV6900 (1MOV6900) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 257

EQUIPMENT ITEM NO. 27 MOTORIZED VALVE ACTUATOR LOCATED IN CONTAINMENT (C230) LIMITORQUE MODEL SMB3 REQUIRED OPERATING TIME: 9 HOURS TER CHECKSHEET NO. 27 LICENSEE REFERENCE(S): 706, 662 FUNCTION (PLANT ID): SI TANK 12A ISOLATION 1MOV634 (1MOV634) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 227 FUNCTION (PLANT ID): SI TANK 12B ISOLATION 1MOV644 (1MOV644) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 230

EQUIPMENT ITEM NO. 28 MOTORIZED VALVE ACTUATOR LOCATED IN THE ECCS PUMP ROOM (A118) LIMITORQUE MODEL SMB00 REQUIRED OPERATING TIME: 9 HOURS TER CHECKSHEET NO. 28 LICENSEE REFERENCE(S): NOT CITED FUNCTION (PLANT ID): CS & SI PUMPS RECIRCULATION (1MOV659) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 216 FUNCTION (PLANT ID): CS & SI PUMPS RECIRCULATION (1MOV660) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 217

EQUIPMENT ITEM NO. 29 MOTORIZED VALVE ACTUATOR LOCATED IN THE ECCS PUMP ROOM (A119) LIMITORQUE MODEL SMB00 REQUIRED OPERATING TIME: 9 HOURS TER CHECKSHEET NO. 29 LICENSEE REFERENCE(S): 1064 FUNCTION (PLANT ID): HPSI HEADER CROSS-CONNECT VALVE (A119) (1MOV655) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 190 FUNCTION (PLANT ID): HPSI HEADER CROSS-CONNECT VALVE (1MOV653) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 189

EQUIPMENT ITEM NO. 30 MOTORIZED VALVE ACTUATOR LOCATED IN CONTAINMENT RECIRCULATION PIPE TUNNEL (A122) LIMITORQUE MODEL SME00 REQUIRED OPERATING TIME: 9 HOURS TER CHECKSHLET MO. 30 LICENSEE REFERENCE(S): 706, 2876 FUNCTION (PLANT ID): CONTAINMENT NORMAL SUMP MAKEUP WATER RETURN ISOLATION (1MOV5463) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 265 FUNCTION (PLANT ID): CONTAINMENT NORMAL SUMP MAKEUP WATER RETURN ISOLATION (1MOV5462) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 264

EQUIPMENT ITEM NO. 31 MOTORIZED VALVE ACTUATOR LOCATED IN THE EAST PENETRATION ROOM (A227) LIMITORQUE MODEL SMB2 REQUIRED OPERATING TIME: 9 HOURS TER CHECKSHEET NO. 31 LICENSEE REFERENCE(S): 706 FUNCTION (PLANT ID): LPSI TO LOOP 11B 1MOV625 (1MOV625) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 207

EQUIPMENT ITEM NO. 32 MOTORIZED VALVE ACTUATOR LOCATED IN CONTAINMENT RECIRCULATION PIPE TUNNEL (A122) LIMITORQUE MODEL SMB2 REQUIRED OPERATING TIME: 9 HOURS TER CHECKSHEET NO. 32 LICENSEE REFERENCE(S): 706 FUNCTION (PLANT ID): CONTAINMENT SUMP DISCHARGE (1MOV4144) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 214



EQUIPMENT ITEM NO. 33 FLOW TRANSMITTER LOCATED IN THE EAST PIPING PENETRATION ROOM (A316) FISCHER AND PORTER MODEL 10B2495 (6) REQUIRED OPERATING TIME: 9 HOURS TER CHECKSHEET NO. 33 LICENSEE REFERENCE(S): 646, 1782 FUNCTION (PLANT ID): FLOW TRANSMITTER (1FT6901) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 256

EQUIPMENT ITEM NO. 34 FLOW TRANSMITTER LOCATED IN THE PIPING AREA (A224) FISCHER AND PORTER MODEL 10B2495 (6) REQUIRED OPERATING TIME: 9 HOURS TER CHECKSHEET NO. 34 LICENSEE REFERENCE(S): 646, 1782 FUNCTION (PLANT ID): LPJI FLOW TO LOOP 11B (1FT322) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 201 FUNCTION (PLANT ID): HPSI FLOW TO LOOP 11B (1FT321) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 186 FUNCTION (PLANT ID): HPSI FLOW TO LOOP 11A (1FT311) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 185 FUNCTION (PLANT ID): LPSI FLOW TO LOOP 11A (1FT312) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 185 FUNCTION (PLANT ID): LPSI FLOW TO LOOP 11A (1FT312) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 200

EQUIPMENT ITEM NO. 35 FLOW TRANSMITTER LOCATED IN THE WEST PENETRATION ROOM (A221) FISCHER AND PORTER MODEL 10B2495 (6) REQUIRED OPERATING TIME: 9 HOURS TER CHECKSHEET NO. 35 LICENSEE REFERENCE(S): 646, 1782 FUNCTION (PLANT ID): LPSI FLOW TO LOOP 12A (1FT332) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 202 FUNCTION (PLANT ID): HPSI FLOW TO LOOP 12A (1FT331) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 187 FUNCTION (PLANT ID): HPSI FLOW TO LOOP 12B (1FT341) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 188 FUNCTION (PLANT ID): LPSI FLOW TO LOOP 12B (1FT342) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 188 FUNCTION (PLANT ID): LPSI FLOW TO LOOP 12B (1FT342) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 188

EQUIPMENT ITEM NO. 36 LEVEL TRANSMITTER LOCATED IN CONTAINMENT (C230) FISCHER AND PORTER MODEL 13D2495KBAABCB REQUIRED OPERATING TIME: 8 HOURS TER CHECKSHEET NO. 36 LICENSEE REFERENCE(S): 646, 1782 FUNCTION (PLANT ID): STEAM GENERATOR 12 LEVEL (1LT1121, 1LT1106, 1LT1123D, LIT1123C, 1LT1123B, 1LT1123A) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 22 THROUGH 27 FUNCTION (PLANT ID): STEAM GENERATOR 11 LEVEL (1LT1111, 1LT1105, 1LT113D, LIT1113C, 1LT1113B, 1LT1113A) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 16 THROUGH 21

EQUIPMENT TTEM NO. 37 PRESSURE INDICATOR LOCATED IN THE AUXILIARY FEEDWATER PUMP ROOM (T603) SIGMA MODEL 9222(3) REQUIRED OPERATING TIME: 8 HOURS TER CHECKSHEET NO. 37 LICENSEE REFERENCE(S): NOT CITED FUNCTION (PLANT ID): STEAM GENERATOR 12 OUTLET PRESSURE (1PI4009) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 137 FUNCTION (PLANT ID): STEAM GENERATOR 11 OUTLET PRESSURE (1FI3992) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 135

EQUIPMENT ITEM NO. 38 PRESSURE TRANSMITTER LOCATED IN THE MAIN STEAM PIPING PENETRATION (A315) FISCHER AND PORTER MODEL 50EP1000 SERIES REQUIRED OPERATING TIME: 8 HOURS TER CHECKSHEET NO. 38 LICENSEE REFERENCE(S): 646, 1782 FUNCTION (PLANT ID): STEAM GENERATOR 12 OUTLET PRESSURE (1PT4008) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 138 FUNCTION (PLANT ID): STEAM GENERATOR 11 OUTLET PRESSURE (1PT3991) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 136

EQUIPMENT ITEM NO. 39 PRESSURE TRANSMITTER LOCATED IN CONTAINMENT (C230) FISCHER AND PORTER MODEL 50EP1000 SERIES REQUIRED OPERATING TIME: 9 HOURS TER CHECKSHEET NO. 39 LICENSEE REFERENCE(S): 646, 1782 FUNCTION (PLANT ID): PRESSURIZER 11 PRESSURE (1PT103-1) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 173 FUNCTION (PLANT ID): PRESSURIZER 11 PRESSURE (1PT103) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 172

EQUIPMENT ITEM NO. 40 RTD LOCATED IN CONTAINMENT (C230) ROSEMOUNT MODEL 104ABH REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 40 LICENSEE REFERENCE(S): NOT CITED FUNCTION (PLANT ID): REACTOR COOLANT TEMPERATURE (ITE112CD, ITE112CC, ITE112CB, ITE122CB, ITE122CD, ITE122CC, ITE122CA, ITE122HD, ITE122HC, ITE122HB, ITE122HA, ITE112CA, ITE112HD, ITE112HC, ITE112HB, ITE112HA) LICENSEE SUBNITTAL: SCEW(S) [1, 12]: 156 THROUGH 171

EQUIPMENT ITEM NO. 41 PRESSURE TRANSMITTER LOCATED IN CONTAINMENT (C230) FISCHER AND PORTER MODEL 50EP1000 SERIES REQUIRED OPERATING TIME: 8 HOURS TER CHECKSHEET NO. 41 LICENSEE REFERENCE(S): 646, 1782 FUNCTION (PLANT ID): PRESSURIZER 11 PRESSURE (1PT102A, B, C, D) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 174, 175, 176, 177 FUNCTION (PLANT ID): STEAM GENERATOR 11 PRESSURE (1PT1013A, B, C, D) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 127, 128, 129, 130 FUNCTION (PLANT ID): STEAM GENERATOR 12 PRESSURE (1PT1023A, B, C, D) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 131, 132, 133, 134

EQUIPMENT ITEM NO. 42 ELECTRICAL PENETRATION LOCATED IN CONTAINMENT (C230) AMPHENOL MODEL 205033 REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 42 LICENSEE REFERENCE(S): 21 FUNCTION (PLANT ID): CONTAINMENT PENETRATION ASSEMBLY (12EA4, 12WA6, 12WA3, 1ZEA7, 1ZWB7, 1ZWB2, 1ZWB1, 1ZEB6, 1ZEB3, 1ZEB1, 1ZEC1, 1ZEC9, 1ZEC4, 1ZEC6, 1ZWC1, 1ZWC4, 1ZWC6) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 96 THROUGH 112 FUNCTION (PLANT ID): CONTAINMENT PENETRATION ASSEMBLY (12EE4, 12EE9, 12WE3, 1ZWE9) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 50, 51, 52, 53 FUNCTION (PLANT ID): CONTAINMENT PENETRATION ASSEMBLY (12EE1, 12EE7, 12WE1, 1ZWE7) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 46, 47, 48, 49

EQUIPMENT ITEM NO. 43 ELECTRIC MOTOR LOCATED IN THE ECCS PUMP ROOM (A119) GENERAL ELECTRIC MODEL 5KB11052A108 REQUIRED OPERATING TIME: 9 HOURS TER CHECKSHEET NO. 43 LICENSEE REFERENCE(S): NOT CITED FUNCTION (PLANT ID): LPSI PUMP 11 (1MA104) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 204 FUNCTION (PLANT ID): LPSI PUMP 12 (1MA404). LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 205

EQUIPMENT ITEM NO. 44 ELECTRIC MOTOR LOCATED IN THE ECCS PUMP ROOM (A119) RELIANCE ELECTRIC MODEL P14C408NFV REQUIRED OPERATING TIME: 9 HOURS TER CHECKSHEET NO. 44 LICENSEE REFERENCE(S): NOT CITED FUNCTION (PLANT ID): EAST ECCS PUMP ROOM COOLING FANS (1M1448) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 252 FUNCTION (PLANT ID): WEST ECCS PUMP ROOM COOLING FANS (1M0448) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 262

EQUIPMENT ITEM NO. 45 ELECTRIC MOTOR LOCATED IN THE ECCS PUMP ROOM (A119) GENERAL ELECTRIC MODEL 5K811052C34 REQUIRED OPERATING TIME: 8 HOURS TER CHECKSHEET NO. 45 LICENSEE REFERENCE(S): NOT CITED FUNCTION (PLANT ID): HPSI PUMP 11 (1MA108) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 192

EQUIPMENT ITEM NO. 46 ELECTRIC MOTOR LOCATED IN CONTAINMENT (C230) RELIANCE ELECTRIC MODEL X323727A1AW REQUIRED OPERATING TIME: 8 HOURS TER CHECKSHEET NO. 46 LICENSEE REFERENCE(S): 31, 32, 33 FUNCTION (PLANT ID): CONTAINMENT COOLING FAN 12 (1MB114) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 33 FUNCTION (PLANT ID): CONTAINMENT COOLING FAN 14 (1MB414) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 35 FUNCTION (PLANT ID): CONTAINMENT COOLING FAN 13 (1MB402) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 34 FUNCTION (PLANT ID): CONTAINMENT COOLING FAN 11 (1MB102) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 32

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EQUIPMENT ITEM NO. 47 ELECTRIC MOTOR LOCATED IN THE ECCS PUMP RCOM (A119) ALLIS CHALMERS MODEL MODEL 911FR504005 REQUIRED OPERATING TIME: 8 HOURS TER CHECKSHEET NO. 47 LICENSEE REFERENCE(S): NOT CITED FUNCTION (PLANT ID): CONTAINMENT SPRAY PUMP 11 (1MA107) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 183 FUNCTION (PLANT ID); CONTAINMENT SPRAY PUMP 12 (1MA407) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 184

EQUIPMENT ITEM NO. 48 ELECTRIC MOTOR LOCATED IN THE ECCS PUMP ROOM (A118) GENERAL ELECTRIC MODEL 5K811052C34 REQUIRED OPERATING TIME: 8 HOURS TER CHECKSHEET NO. 48 LICENSEE REFERENCE(S): NOT CITED FUNCTION (PLANT ID): HIGH PRESSURE SAFETY INJECTION PUMP 12 (1MA408) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 193 FUNCTION (PLANT ID): HIGH PRESSURE SAFETY INJECTION PUMP 13 (1MA110) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 194 FUNCTION (PLANT ID): HIGH PRESSURE SAFETY INJECTION PUMP 13 (1MA110) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 194

EQUIPMENT ITEM NO. 49 ELECTRIC MOTOR LOCATED IN CONTAINMENT (C230) RELIANCE ELECTRIC MODEL X324356A6AW REQUIRED OPERATING TIME: 9 HOURS TER CHECKSHEET NO. 49 LICENSEE REFERENCE(S): 31, 32, 33 FUNCTION (PLANT ID): CONTAINMENT FILTER 11 FAN (1MB105) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 28 FUNCTION (PLANT ID): CONTAINMENT FILTER 12 FAN (1MB405) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 29 FUNCTION (PLANT ID): CONTAINMENT FILTER 13 FAN (1MB121) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 30 FUNCTION (PLANT ID): CONTAINMENT FILTER 13 FAN (1MB121) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 30 FUNCTION (PLANT ID): CONTAINMENT FILTER 13 FAN (1MB121) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 31

EQUIPMENT ITEM NO. 50 ELECTRIC MOTOR LOCATED IN THE ECCS PUMP ROOM (A119) JOHNSON CONTROLS MODEL M81ACA3 REQUIRED OPERATING TIME: 9 HOURS TER CHECKSHEET NO. 50 LICENSEE REFERENCE(S): NOT CITED FUNCTION (PLANT ID): EAST ECCS PUMP ROOM VENT DAMPER (1M05437) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 253 FUNCTION (PLANT ID): WEST, ECCS PUMP ROOM VENT DAMPER (1M05439) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 263

EQUIPMENT ITEM NO. 51 RADIATION DETECTOR LOCATED IN CONTAINMENT (C230) WESTINGHOUSE MODEL WL23796 REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 51 LICENSEE REFERENCE(S): NOT CITED FUNCTION (PLANT ID): FISSION CHAMBER 1NI004(F) (1NI004(F)) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 142 FUNCTION (PLANT ID): FISSION CHAMBER 1NI003(F) (1NI003(F)) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 141 FUNCTION (PLANT ID): FISSION CHAMBER 1NI002(F) (1NI002(F)) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 140 FUNCTION (PLANT ID): FISSION CHAMBER 1NI001(F) (1NI001(F)) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 140 FUNCTION (PLANT ID): FISSION CHAMBER 1NI001(F) (1NI001(F)) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 139

EQUIPMENT ITEM NO. 52 RADIATION MONITOR LOCATED IN CONTAINMENT (C230) WESTINGHOUSE MODEL 1101 REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 52 LICENSEE REFERENCE(S): NOT CITED FUNCTION (PLANT ID): CONTAINMENT AREA MONITORS (1PE5316A) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 152 FUNCTION (PLANT ID): CONTAINMENT AREA MONITORS (1RE5316D) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 155 FUNCTION (PLANT ID): CONTAINMENT AREA MONITORS (1RE5316C) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 155 FUNCTION (PLANT ID): CONTAINMENT AREA MONITORS (1RE5316C) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 154 FUNCTION (PLANT ID): CONTAINMENT AREA MONITORS (1RE5316B) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 153



EQUIPMENT ITEM NO. 53 RADIATION DETECTOR LOCATED IN CONTAINMENT (C230) REUTER-STOKES MODEL M2827 REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 53 LICENSEE REFERENCE(S): NOT CITED FUNCTION (PLANT ID): PROPORTIONAL COUNTER INIO04(P) (INIO04(P)) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 150 FUNCTION (PLANT ID): PROPORTIONAL COUNTER INIO03(P) (INIO03(P)) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 149 FUNCTION (PLANT ID): PROPORTIONAL COUNTER INIO02(P) (INIO02(P)) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 148 FUNCTION (PLANT ID): PROPORTIONAL COUNTER INIO02(P) (INIO02(P)) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 148 FUNCTION (PLANT ID): PROPORTIONAL COUNTER INIO01(P) (INIO01(P)) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 148

EQUIPMENT ITEM NO. 54 AMPLIFIER LOCATED IN CONTAINMENT (C230) GENERAL ATOMIC MODEL PA6A REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 54 LICENSEE REFERENCE(S): NOT CITED FUNCTION (PLANT ID): PREAMPLIFIER 1PA604 (1PA604) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 146 FUNCTION (PLANT ID): PREAMPLIFIER 1PA603 (1PA603) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 145 FUNCTION (PLANT ID): PREAMPLIFIER 1PA602 (1PA602) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 144 FUNCTION (PLANT ID): PREAMPLIFIER 1PA601 (1PA601) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 143

EQUIPMENT ITEM NO. 55 ELECTRIC HEATER LOCATED IN CONTAINMENT (C230) WESTINGHOUSE MODEL EHRS REQUIRED OPERATING TIME: 9 HOURS TER CHECKSHEET NO. 55 LICENSEE REFERENCE(S): 1571 FUNCTION (PLANT ID): HYDROGEN RECOMBINER 11 (1Q08) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 254 FUNCTION (PLANT ID): HYDROGEN COMBINER 12 (1Q09) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 255

EQUIPMENT ITEM NO. 56 ELECTRICAL CONNECTOR LOCATED IN CONTAINMENT (C230) KINGS MODEL KH5905 REQUIRED OPERATING TIME: NOT STATED TER C'ECKSHEET NO. 56 LICENSEE REFERENCE(S): NOT CITED FUNCTION (PLANT ID): CONNECTORS LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 92 FUNCTION (PLANT ID): CONNECTORS LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 93

EQUIPMENT ITEM NO. 57 ELECTRICAL CONNECTOR LOCATED IN CONTAINMENT (C230) ITT CANNON MODEL 19457 REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 57 LICENSEE REFERENCE(S): NOT CITED FUNCTION (PLANT ID): CONNECTORS LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 89

EQUIPMENT ITEM NO. 58 TERMINAL BLOCK LOCATED IN CONTAINMENT (C230) MARATHON MODEL 1600 SERIES REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 58 LICENSEE REFERENCE(S): 21 FUNCTION (PLANT ID): TERMINAL BLOCK LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 79

EQUIPMENT ITEM NO. 59 TERMINAL BLOCK LOCATED IN CONTAINMENT (C230) WESTINGHOUSE MODEL 542247 REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 59 LICENSEE REFERENCE(S): NOT CITED FUNCTION (PLANT ID): TERMINAL BLOCK LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 80

EQUIPMENT ITEM NO. 60 TERMINAL BLOCK LOCATED IN THE MAIN STEAM PIPING PENETRATION (A315) WEIDMULLER MODEL SAK REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 60 LICENSEE REFERENCE(S): 1738 FUNCTION (PLANT ID): TERMINAL BLOCK LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 82

EQUIPMENT ITEM NO. 61 TERMINAL BLOCK LOCATED IN CONTAINMENT (C230) BUCHANAN MODEL 8112 REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 61 LICENSEE REFERENCE(S): NOT CITED FUNCTION (PLANT ID): TERMINAL BLOCK LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 81

EQUIPMENT ITEM NO. 62 TERMINAL BLOCK LOCATED IN CONTAINMENT (C230) WEIDMULLER MODEL SAK REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 62 LICENSEE REFERENCE(S): 3644 FUNCTION (PLANT ID): TERMINAL BLOCK LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 83

EQUIPMENT ITEM NO. 63 JUNCTION BOX LOCATED IN CONTAINMENT (C230) HOFFMAN MODEL F8848 REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 63 LICENSEE REFERENCE(S): NOT CITED FUNCTION (PLANT ID): JUNCTION BOX LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 95

EQUIPMENT ITEM NO. 64 JUNCTION BOX LOCATED IN CONTAINMENT (C230) HOFFMAN MODEL F4424 REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 64 LICENSEE REFERENCE(S): NOT CITED FUNCTION (PLANT LD): JUNCTION BOX LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 94

EQUIPMENT ITEM NO. 65 JUNCTION BOX LOCATED IN CONTAINMENT (C230) FIELD FABRICATED, MODEL NOT STATED REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 65 LICENSEE REFERENCE(S): NOT CITED FUNCTION (PLANT ID): JUNCTION BOX LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 78

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EQUIPMENT ITEM NO. 66 TERMINAL LUG LOCATED IN CONTAINMENT (C230) AMP MODEL 34000 SERIES REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 66 LICENSEE REFERENCE(S): 21 FUNCTION (PLANT ID): TERMINAL LUG LICENSEE SUBMITTAL: SCEW(3) [1, 12]: 84

EQUIPMENT ITEM NO. 67 TERMINAL LUG LOCATED IN CONTAINMENT (@230) THOMAS AND BETTS MODEL 53000 SERIES REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 67 LICENSEE REFERENCE(S): NOT CITED FUNCTION (PLANT ID): TERMINAL LUG LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 85

EQUIPMENT ITEM NO. 68 ELECTRICAL CONNECTOR LOCATED IN CONTAINMENT (C230) BENDIX MODEL 3902-1 REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 68 LICENSEE REFERENCE(S): NOT CITED FUNCTION (PLANT ID): CONNECTORS LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 87

EQUIPMENT ITEM NO. 69 ELECTRICAL CONNECTOR LOCATED IN CONTAINMENT (C230) AMPHENOL MODEL 82-320-1004 REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 69 LICENSEE REFERENCE(S): NOT CITED FUNCTION (PLANT ID): CONNECTORS LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 91

EQUIPMENT ITEM NO. 70 ELECTRICAL CONNECTOR LOCATED IN CONTAINMENT (C230) AMPHENOL MODEL 30576-A REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 70 LICENSEE REFERENCE(S): 21 FUNCTION (PLANT ID): CONNECTORS LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 90

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EQUIPMENT ITEM NO. 71 ELECTRICAL CONNECTOR LOCATED IN CONTAINMENT (C230) AMPHENOL MODEL 279-75 REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 71 LICENSEE REFERENCE(S): NOT CITED FUNCTION (PLANT ID): CONNECTORS LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 88

EQUIPMENT ITEM NO. 72 ELECTRICAL CONNECTOR LOCATED IN CONTAINMENT (C230) AMPHENOL MODEL 53100 REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 72 LICENSEE REFERENCE(S): NOT CITED FUNCTION (PLANT ID): CONNECTORS LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 86

EQUIPMENT ITEM NO. 73 ELECTRICAL CABLE LOCATED IN CONTAINMENT (C230) ANACONDA WIRE AND CABLE MODEL EPR/CPE REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 73 LICENSEE REFERENCE(S): 3000 FUNCTION (PLANT ID): CABLE LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 55 FUNCTION (PLANT ID): CABLE LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 74

EQUIPMENT ITEM NO. 74 ELECTRICAL CABLE LOCATED IN CONTAINMENT (C230) CERRO WIRE AND CABLE MODEL XLPE/NEOPRENE REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 74 LICENSEE REFERENCE(S): 1208 FUNCTION (PLANT ID): CABLE LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 61

EQUIPMENT ITEM NO. 75 ELECTRICAL CABLE LOCATED IN CONTAINMENT (C230) CERRO WIRE AND CABLE MODEL SILICONE RUBBER/ASBESTOS BRAID REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 75 LICENSEE REFERENCE(S): NOT CITED FUNCTION (PLANT ID): CABLE LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 72



EQUIPMENT ITEM NO. 76 ELECTRICAL CAELE LOCATED IN CONTAINMENT (C230) CONTINENTAL WIRE MODEL SILICONE RUBBER/ASBESTOS BR REQUIRED OFERATING TIME: NOT STATED TER CHECKSHEET NO. 76 LICENSEE REFERENCE(S): NOT CITED FUNCTION (PLANT ID): CABLE LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 63

EQUIPMENT ITEM NO. 77 ELECTRICAL CABLE LOCATED IN CONTAINMENT (C230) RAYCHEM MODEL XLPE/XLPE REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 77 LICENSEE REFERENCE(S): 1816, 4602 FUNCTION (FLANT ID): CABLE LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 60

EQUIPMENT ITEM NO. 78 ELECTRICAL CABLE LOCATED IN CONTAINMENT (C233) RAYCHEM MODEL POLYMER AND XLPE/XLPE REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 78 LICENSEE REFERENCE(S): 4603, 4604 FUNCTION (PLANT ID): CABLE LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 57

EQUIPMENT ITEM NO. 79 ELECTRICAL CABLE LOCATED IN CONTAINMENT (C230) RAYCHEM MODEL COAXIAL/YLP REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 79 LICENSEE REFERENCE(S): NOT CITED FUNCTION (PLANT ID): CABLE LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 75

EQUIPMENT ITEM NO. 80 ELECTRICAL CABLE LOCATED IN CONTAINMENT (C230) CONTINENTAL WIRE MODEL XLPE/PVC REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 80 LICENSEE REFERENCE(S): 2818 FUNCTION (PLANT ID): CABLE LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 59 FUNCTION (PLANT ID): CABLE LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 76



EQUIPMENT ITEM NO. 81 ELECTRICAL CABLE LOCATED IN CONTAINMENT (C230) OKONITE MODEL EPR/OKOLON REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 81 LICENSEE REFERENCE(S): 4593 FUNCTION (PLANT ID): CABLE LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 56

EQUIPMENT ITEM NO. 82 ELECTRICAL CABLE LOCATED IN CONTAINMENT (C230) ROCKBESTOS MODEL SILICONE RUBBER/ASBESTOS BRAID REQUIBED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 82 LICENSEE REFERENCE(S): NOT CITED FUNCTION (PLANT ID): CABLE LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 62

EQUIPMENT ITEM NO. 83 ELECTRICAL CABLE LOCATED IN CONTAINMENT (C230) ROCKBESTOS MODEL XLPE/NEOPRENE REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 83 LICENSEE REFERENCE(S): 4607 FUNCTION (PLANT ID): CABLE LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 69

EQUIPMENT ITEM NO. 84 ELECTRICAL CABLE LOCATED IN CONTAINMENT (C230) BOSTON INSULATED WIRE MODEL INDUSTRITE - HYPALON/HYPALON REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 84 LICENSEE REFERENCE(S): 630, 4596 FUNCTION (PLANT ID): CABLE LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 67

EQUIPMENT ITEM NO. 85 ELECTRICAL CABLE LOCATED IN CONTAINMENT (C230) BOSTON INSULATED WIRE MODEL SILICONE RUBBER (EQUIVALENT)/HYPALON REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 85 LICENSEE REFERENCE(S): 4598 FUNCTION (PLANT ID): CABLE LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 68

EQUIPMENT ITEM NO. 86 ELECTRICAL CABLE LOCATED IN CONTAINMENT (C230) BOSTON INSULATED WIRE MODEL XLPE/HYPALON REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 86 LICENSEE REFERENCE(S): 3850, 4598, 4600, 4599 FUNCTION (PLANT ID): CABLE LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 58

EQUIPMENT ITEM NO. 87 ELECTRICAL CABLE LOCATED IN CONTAINMENT (C230) KERITE MODEL HTK/FR REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 87 LICENSEE REFERENCE(S): 1783 FUNCTION (PLANT ID): CABLE LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 66

EQUIPMENT ITEM NO. 88 ELECTRICAL CABLE LOCATED IN CONTAINMENT (C230) HATFIELD MODEL SILICONE RUBBER/ASBESTOS BRAID REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 88 LICENSEE REFERENCE(S): NOT CITED FUNCTION (PLANT ID): CABLE LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 64

EQUIPMENT ITEM NO. 89 ELECTRICAL CABLE LOCATED IN CONTAINMENT (C230) ANACONDA WIRE AND CABLE MODEL EPR/HYPALON REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 89 LICENSEE REFERENCE(S): 1292 FUNCTION (PLANT ID): CABLE LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 54

EQUIPMENT ITEM NO. 90 ELECTRICAL CABLE LOCATED IN CONTAINMENT (C230) GENERAL ELECTRIC MODEL SILICONE RUBBER/ASBESTOS BRAID REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 90 LICENSEE REFERENCE(S): NOT CITED FUNCTION (PLANT ID): CABLE LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 65

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EQUIPMENT ITEM NO. 91 ELECTRICAL CABLE LOCATED IN CONTAINMENT (C230) KERITE MODEL HTK/HTKS REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 91 LICENSEE REFERENCE(S): NOT CITED FUNCTION (PLANT ID): CABLE LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 71

EQUIPMENT ITEM NO. 92 ELECTRICAL CABLE LOCATED IN CONTAINMENT (C230) TIMES WIRE AND CABLE MODEL PVC REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 92 LICENSEE REFERENCE(S): NOT CITED FUNCTION (PLANT ID): CABLE LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 73

EQUIPMENT ITEM NO. 93 ELECTRICAL CABLE LOCATED IN CONTAINMENT (C230) CONTINENTAL WIRE MODEL SILICONE RUBBER/GLASS BRAID REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 93 LICENSEE REFERENCE(S): 2818 FUNCTION (PLANT ID): CABLE LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 77

EQUIPMENT ITEM NO. 94 ELECTRIC MOTOR LOCATED IN THE EAST PIPING PENETRATION ROOM (A316) GENERAL ELECTRIC MODEL FJF REQUIRED OPERATING TIME: 9 HOURS TER CHECKSHEET NO. 94 LICENSEE REFERENCE(S): NOT CITED FUNCTION (PLANT ID): HYDROGEN PURGE REPLACE AIR BLOWER (1M0403) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 261

EQUIPMENT ITEM NO. 95 SOLENOID VALVE LOCATED IN THE WEST PENETRATION ROOM (A221) DRAGON MODEL 10222 REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 95 LICENSEE REFERENCE(S): NOT CITED FUNCTION (PLANT ID): CONTAINMENT HYDROGEN ANALYZER VALVES (1SV6507A THROUGH G) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 232 THROUGH 238

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EQUIPMENT ITEM NO. 96 SOLENOID VALVE LOCATED IN CONTAINMENT (C230) DRAGON MODEL 10222 REQUIRED OFERATING TIME: NOT STATED TER CHECKSHEET NO. 96 LICENSEE REFERENCE(S): NOT CITED FUNCTION (PLANT ID): CONTAINMENT HYDROGEN ANALYZER VALVES (1SV6540A THROUGH G) LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 239 THROUGH 245

EQUIPMENT ITEM NO. 97 ELECTRICAL CABLE LOCATED IN CONTAINMENT (C230) CERRO WIRE AND CABLE MODEL SILICONE RUBBER/ASBESTOS BRAID REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 97 LICENSEE REFERENCE(S): 4607 FUNCTION (PLANT IC): CABLE LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 70

APPENDIX C - PLANT SAFETY-RELATED SYSTEMS AND DISPLAY INSTRUMENTATION

C.1 LIST OF SAFETY-RELATED SYSTEMS

In accordance with IE Bulletin 79-01B or NUREG-0588, the Licensee was required to (1) establish a list of systems and equipment required to mitigate the consequences of a loss-of-coolant accident (LOCA) and a high energy line break (HELB) and (2) identify components needed to perform the functions of safety-related display information, post-accident sampling and monitoring, and radiation monitoring.

The list of safety-related systems provided by the Licensee was reviewed by the NRC staff against a staff-developed master list. The NRC staff had developed a generic master list based upon a review of plant safety analyses and emergency procedures. The systems list was established on the basis of the functions that must be performed for accident mitigation (without regard to location of equipment relative to hostile environments). The instrumentation selected included that needed to monitor overall plant performance as well as to monitor the performance of systems on the list.

Based upon information in the Licensee's submittal, the equipment location references, and in some cases conversations with the Licensee, the NRC staff verified that the systems included in the Licensee's submittal were those required to achieve or support: (1) emergency reactor shutdown, (2) containment isolation, (3) reactor core cooling, (4) containment heat removal, (5) core residual heat removal, and (6) prevention of significant release of radioactive material to the surrounding environment. With the exception of items deferred for later review (cold-shutdown equipment and TMI Lessons-Learned modifications), the staff concluded that the systems identified by the Licensee were acceptable. The list of systems identified by the Licensee and accepted by the NRC staff is as follows:

Function

Emergency Reactor Shutdown

Containment Isolation

Reactor Core Cooling

Containment Heat Removal

Systeml

Chemical Volume and Control

Reactor Coolant

Safeguards Actuation (Part of Reactor Coolant)

Chemical and Volume Control

Compressed Air

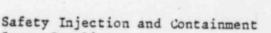
Condensate and Feedwater

Cooling Water

Main Steam

Plant Heating

Reactor Coolant and Waste Process Sample



Spray Sampling

Waste Processing

Safety Injection and Containment Spray

Safety Injection and Containment Spray

Containment Air Recirculation and Cooling

 The NRC staff recognized that there are differences in nomenclature of systems because of plant vintage and engineering design; consequently, some systems performing identical or similar functions may have different names. In those instances it was necessary to verify the function of the system(s) with the responsible IE regional reviewer and/or the licensee.





Function

A REAL OF A LOCAL STATE

Core Residual Heat Removal

System¹

(Residual Heat Removal³)

Auxiliary Feedwater²

Condensate and Feedwater

Main Steam

Cooling Water

Safety Injection and Containment Spray

Containment Air Recirculation and Cooling

Radiation Monitoring

Sampling

Electrical

Ventilation

Prevention of Significant Release of Radioactive Material to Environment

Support Systems

Covered as part of TMI-2 Lessons Learned; does not appear in systems list.
 Residual heat removal is performed by a number of systems. Some components are being addressed as part of TMI-2 Lessons Learned.

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C.2 SAFETY-RELATED INSTRUMENTATION

In Section 3.1 of the NRC SER dated May 28, 1981 [13], the NRC made the following statement:

"Display instrumentation which provides information for the reactor operators to aid them in the safe handling of the plant was not specifically identified by the licensee. A complete list of all display instrumentation mentioned in the LOCA and HELB emergency procedures must be provided. Equipment qualification information in the form of summary sheets should be provided for all components of the display instrumentation exposed to harsh environments. Instrumentation which is not considered to be safety related but which is mentioned in the emergency procedure should appear on the list. For these instruments, (1) justification should be provided for not considering the instrument safety related and (2) assurance should be provided that its subsequent failure will not mislead the operator or adversely affect the mitigation of the consequences of the accident. The environmental qualification of post-accident sampling and monitoring and radiation monitoring equipment is closely related to the review of the TMI Lessons-Learned modifications and will be performed in conjunction with that review."

In Reference 14, the Licensee provided the following response:

"A list of all display instrumentation mentioned in the LOCA and HELB procedures is provided in Attachment 1 [see Table C-1]. This attachment lists the system, equipment component, and component number in alpha-numeric sequence for Calvert Cliffs Emergency Operating Procedure-5, Loss of Reactor Coolant and Calvert Cliffs Emergency Operating Procedure-6, Steam Generator Tube Rupture. The instruments used for the Main Steam Line Rupture are the same as those for EOP-5. These instruments are located within a mild environment, i.e., one where the environment will not change under any postulated accident conditions."

Evaluation

The Licensee has satisfactorily responded to the NRC's concern in the SER. This item is considered resolved.

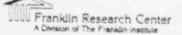


Table C-1. Safety-Related Display Instrumentation [14]

EUP-5 - LUSS I HEACTUR CUULANT

A REAL POINT OF THE PARTY OF THE PARTY OF THE PARTY	and the same of the subscription of the	the lot of the second
123501	POSTION SHITCH	VOLUME CONT TH DISCH MOV
123505	POSITION SALTCH	ACP BIEED OFF ISOL ICV505
123506	POSITION SALICH	HCP BIELD OFF ISOL ICVSUS
125508	POSITIO- 3417CH	BA TK 12 CHARG PURP SUCT
175509	- POSTIION SPITCH	BA TR II TO CHAPS PUMP SUCT
125510	PUSTITON SATICA	BA TANK 12 RECINC 104510
125511	POSITION SHITCH	BA TANK 12 RECTRC ICVSIT
125512	POSITION SAITCH	HARE OF FLOW CONTROL ICVS12
125514	POSITION SHITCH	BA PUPPS TO CHANG PUMP SUCT
123915	PUSTIUK SAITCH	LETRONN LINE ISOL ICVSIS
CUMPHESSED AIR	POSITION SNITCH	LETNOWN TINE ISUT ICV515
1252080 CONDERSTE THO	POSITION SALTCH	INSTR ALR CNTMNT ISOL
1/14504	FLOW INDICATOR	LUX FRATA FLOW 36 11
1414214	FLUM THOTESTON	AUX FANTE FLOP 36 12
-n.rc11134	LEVEL INDICATOR	STEAN GENERATOR II LEVEL
161611138	LEVEL INDICATOR	STEAR GENERATUR II LEVEL
HICTTISC	CEVEL INDICATOR	STEAM GENERATOR 11 LEVEL
TETETTIO	LEVEL INDICATOR	STENA SENERATOR IL LEVEL
111017238	LEVEC TROICATOR	STEAN GENERATOR 12 LEVEL
101011238	LEVEL INUICATOR	STEAM GENENATOR 12 LEVEL
101011230	CEVEL TADICATOR	STEIN GENERATOR 12 LEVEL
COULING MATER	LEVEL INDICATOR	STEXH GENERATOR 12 LEVEL
1251502	POSITION SHITCH	CNIWNI CLG COIL 11 DIS ICVISAZ
1251545	POSITION SALTCH	CNIMN CLG COIL 12 DIS ICVISAS
1251590	POSITION SAITCH	CNTWN' CLG COIL 13 DIS ICV1590
1251593	POSITION SMITCH	CHINN CLE COIL IN DIS ICHISOS

FIGURE SUPPLIED BY THE LICENSEE

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FIGURE SUPPLIED BY THE LICENSEE

1231596	POSITION SHITCH	SPEHT FUEL CLH 11 DIS 1041596
1231547	POSITION SALICH	SPENT FUEL CLA 11 SUP ICVISOT
1251590	PUSITION SAITCH	TIRA ALDG SHUTOFF 1CT1600
1251637	POSITION SWITCH	TURA LOLENC CLA ISOL IEVISIT
1231630	POSITION SMITCH	TUNA BLUG SHUTOFF ICVISS
1231634	POSTITON SAITCH	FURA TOLEHE CER TEVIST
1733828	POSITION SAITCH	SAUTONAN HTER IT OTERH ICVS628
112228311	PUSITION SAITCH	SHUTOMAN HIEX 12 OISCH ICY3830
1233837	POSITION SAITCH	COMP POOL TO ACP TAOL ICUSASS
	POSITION SAITCH	COOL PROP HCP TSOL ICY3033
1253844	POSITION SAITCH	CUMP PLG TO MASTE EYAP ISOL
1233845	POSITION SALICH	CORP PLE TO MASTE EVAP 150L
1255154	POSITION SHITCH	SERV WTR HTEX 11 1645150
1155153	POSITION SAITCH	SENV HIR HTEX 12 ICVS153
-1255160	POSITION SHITCH	SA THEET HTEX 11
1735182	POSITION SHITCH	SH THLET HIEX 12
1222193	PO311104 3+11CH	SA MUTLET HIEX 12
1235165	POSITION SAITCH	COHP CLG HTEX 12 SH DISCH
1255206	POSITION SHITCH	SH OUTLET HTEX 11
1259207	POSITION SALICH	SERV STR HIEX 11 1045204
1235213	POSITION SHITCH	SEAU HIR HIER 11 ICUSEIO
-1259212	POSITION SAITCH	SERV HIP HIER TE ICVS212
1255210	POSITION SHITCH	SERV MYR HILK 12 ICV5214
1255250	POSITION SUITCH	SA YO CIRC HTR PUMP AM COOLERS
1235251	PUSITION SALTCH	SH TO CIRC HTR FULP AN COOLERS
1011	FLUR INDICATOR	SG 11 STM/FUNTE FLORATE
1541421	FLOW INDICATOR	SE 12 STM/FOATR FLORATE
1+110154	PRESS INDICATUR	STEAM GENERATOR 11

Table C-1 (Cont.)

1751504 ----- -- ---







FIGURE SUPPLIED BY THE LICENSEE

PPESS INDICATOR	STEAM GENEWATOR 11
PHESS TROICTION	STEAM GENERLIOR 11
PRESS THOICATUR	SIEAN GENERATOR 12
PRESS INDICATOR	STEAM GENERATOR 12
PRESS TROICATON	STEIN GENERATOR 12
PRESS THOICATOR	STEIN GENERATOR 12
POSTTION SAITCH	SGIT ALON ISOL ICVADIO
POSITION SALICH	SGIT PLON ISOL ICYADII
POSITION SHITCH	3612 *LON 130L 1CV0012
POSITION SAITCH	SGIP MLON ISOL ICVACIS
POSITION SMITCH	PEN RM FILTER 11 OUTLET DAMPS
POSITION SHITCH	PEN RM FILTER 12 OUTLET DAMPES
POSITION SALTCH	ENTENT ISOL
HADIATION INDICATOR	CNTWHI HI RANGE RAD IND
PADIATION INDICATOR	CNINNE HI RANGE RAD IND
LEVEL TROICATOR	PRESSURTTER LEVEL INDICATOR
PRESSURE THOICATOF	PHENSURIZE: IT
PRESSURE INDICATOR	PRESSURTZEN II
PRESSURF INDICATOR	PRE*\$11#12E# 11
PRESSURE INDICATOR	PRE*SUR12ER TI
FLOD INDICATOR	HUST FLOW TO LOOP 114
FLOW INDICATOR	LPST FLOW TO LOOP 11A
FLOW INUICATOR	HPSI FLOW TO LOOP 115
FLOW INVICATOR	LPSI PLOW TO LOOP 118
FLON INVICATOR	HPST FLOW TO LOOP 124
FLOR INDICATOR	LPSI FLOW TO LOOP 124
	PRESS TADICATOR POSITION SATTCH PACIATION INDICATOR

C-7

Table C-1 (Cont.)

C-8

FIGURE SUPPLIED BY THE LICENSEE

And they day they be added

171342		LPST FLOW TO LOOP 125
111115	LEVIL TAULCATOR	REFILLING WIR TANK II LEVEL
1014143	LEVEC INDICATOR	BEFILEI, ING MTA TANK IS LEVEL
1110140	LEVEL INDICATOR	CONTATAPENT SUMP LEVEL
1614145	LEVEL INDICATOR	CONTATHMENT SUMP LEVEL
1254144	POSTI ION SHITCH	CATONT BUND DISCH
1734135	POSTTION SHITCH	CHTONT BULP DISCH
1234150	PUSTITO - SALICH	CATUNI SPRAY HOH ISUL ICV4150
1259151	POSITION SNITCH	CNTUNE SPRAY HOR ISOL ICVAISI
123614	POSTITON SALTCH	31 TANK TIA TSOL IMOVAIA
123015	PUSTITUM SHITCH	LPST TO LOOP 114 CONT INDVOIS
175515	POSITION SAITCH	HAN HEST TO LOOP ILA INOVELE
125617	POSITION SNITCH	
123618	POSTITON SMITCH	CHECK VALVE LKG DAN TU ANT
173824		ST TANK 118 130L 1HOV624
123625	POSITION SHITCH	LPST TO LOOP 118 CONT 1404625
125526	POSITION SAITCH	MAN HASI TO LOOP 118 1404526
173428	POSTI ION SHITCH	CHECK VALVE LKG DRN TO ANT
125554	POSITION SAITCH	SI TANK IZA ISOL IMOVASH
145035	PUSITION SHITCH	LPST TO LOOP 124 CONT 140Y635
123635	POSITION SAITCH	HAN HPST TO LOOP 124 THOYAS
125637	POSITION SALTCH	
17163*	POSITINA SMITCH	CHERK VALVE LKG DAN TO ANT
125541	PUSITION SALTCH	51 TANK T28 150L INUV644
175645	POSITION SWITCH	LPST TO LOOP 124 CONT 1407645
173846	PUSITION SALTCH	HAN HEST TO LONP 128 INDUNA
123647	PUSITION SATICH	HPST TO LOOP 128 CONT 1404647
173526	POSITION SHITCH	CHECK VALVE LKG DAN TO RAT
125050	POSITIOI SALTEN	MANITAL HPST HOR ISOL 1404858
123459	POSITION SALTCH	CS & AL PUMPS RECIRC

Table C-1 (Cont.)

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FIGURE SUPPLIED BY THE LICENSEE

		-
1#11752	PAULATION INDICATOR	CONNENSER VIC PP DISCH RID HON
1414014	REDITION INDICATOR	SG ALMACOAN TANK RAD HON
1814042	RADITION INDICATOR	BLANNA TON FECHA DISCH RAD HON
IRTSata	REPTRITION INDICATOR	HATH VENT PARTICULATE BAD SON
STEAM GENERATON	BLUAHON RECOVERY	MAIN VENT GASEDUS RAD MON
1254015	POSITION SHITCH	BLONAN REEDY SYS TO CIRC
11230.48	POSITION SMITCH	BLUMAN ALENY TO CONDA YLY
-1234097	POSITION SHITCH	BLOOM FEED TO HISC ASTE YLY

SAFETY [IJECTIO	H AND CONTAINMENT SRPAY	HECTRE RETURN LINE GRAIN
122051	PUSITION SAITCH	HPST TO LOOP 118 CONT 140462
VENILLATION	PRESSURE INDICATOR	CTHUT PRESS
1915347	PRESSURE INDICATOR	CTMUT PRESS
1P153#8	PRESSURE INDICATOR	CTNMT PRESS
1231410	POSITION SHITCH	CNTANT PURGE ISOL ICVIALO
1251-11	POSTIUM SALICH	CNTWNF PURGE ISOL 1CV1411
1251412	PUSITION SAITCH	CHTWNI PURGE ISOL ICVIAI2
1/51413	POSIIION SALICH	CHIMNI PURGE ISOL ICVIAIS
1255285 .	POSILION SALTCH	PEN AM FILTER 11 ISUL DAMPER
1255207	PUSITION SAITCH	PEN RM FILTER 12 ISOL DAMPER
1255291	POSTIUN SALICH	PURGE AIR SAMPLE ISOL ICYS291
1255292 MASTE PERCESSING	POSITION SHITCH	PURCE AIR SAMPLE ISOL 1045245
11255150	PUSITINA SAITCH	CNIGHT VENT ISUL 12V2180
1252181	POSITION SWITCH	CATURT VENT ISOL ICVEIDI
1254260	POSITION SHITCH	RC 089 18 94 11 1040260
1255462	PUSITION SATION	CHT NT NORM SUMP MART
1259483	POSITION SWITCH	CNINAL NORM SUMP HART
1235484 UP-0 - 318 AM GENE	POSITION SWITCH	#C 14#PLE CONT 1300 1095464

Table C-1 (Cont.)

123hoo POSITION SMITCH CS . 11 PUMPS RECIPC

APPENDIX D - REVIEW OF LICENSEE'S RESPONSE TO NRC EEQ SER CONCERNING JUSTIFICATION FOR INTERIM OPERATION

1. BACKGROUND

The NRC Safety Evaluation Report (SER) concerning equipment environmental qualification (EEQ) states [13]:

"Subsection 4.2 identified deficiencies that must be resolved to establish the qualification of the equipment; the staff requires that the information lacking in this category be provided within 90 days of receipt of this SER. Within this period, the licensee should either provide documentation of the missing qualification information which demonstrates that such equipment meets the DOR guidelines or NUREG-0588 or commit to a corrective action (requalification, replacement, relocation, and so forth) consistent with the requirements to establish qualification by June 30, 1982. If the latter option is chosen, the licensee must provide justification for operation until such corrective action is complete."

On January 19, 1982, FRC representatives met with NRC Division of Licensing personnel at NRC offices to discuss the potential for FRC to assist the staff in the technical review of licensees' statements regarding justification for interim plant operation submitted in response to outstanding qualification deficiencies in the NRC EEQ SERs. The results of the meeting were as follows: (1) FRC was requested to proceed immediately with the technical review of licensees' justification for interim operation, (2) the format was established, and (3) the criteria for the review were established. These criteria are presented in Section 2 of this appendix.

On January 21, 1982, the NRC provided the following modification to Final Assignment 13 concerning this subject:

"The FRC review will consist of:

 Review the licensee's justification of interim operation and provide FRC independent analysis which shows whether or not licensee provided technically sound rationale as a basis for justification for continued plant operation.

o On January 27, 1982, FRC shall provide a list of those power reactors that have provided technically sound justification for continued operation. FRC shall also provide a list of those power reactors which have not provided technically sound justification for continued operation. In addition to the lists, FRC may provide any additional information which in FRC's judgment is necessary to support the conclusions regarding justification for continued operation."

On January 25, 1982, the NRC was provided with the completed review of the licensees' statements presented as a basis for justification for interim operation in response to the NRC EEQ SER.* On February 5, 1982, at the NRC's request, the NRC was provided with actual examples of licensees' responses to the NRC EEQ SER that provide adequate rationale as a basis for justification for interim operation.**

2. GENERAL DISCUSSION

In general, licensee-submitted justifications for interim operation are based on systems considerations, equipment operability evaluations, or failure-modes-and-effects analyses.

Systems considerations often involve the availability of backup equipment capable of performing the particular safety function of concern. The backup squipment is either environmentally qualified, unqualified but not exposed to a harsh environment at the same time as the primary equipment, or located so that it is unlikely that both the primary and backup equipment would be simultaneously exposed to a severe environment. In general, these systems discussions should consider (1) the possibility of a single-active failure

* C. J. Crane Letter to R. A. Clark, NRC. Subject: Transmittal of FRC Review of Licensees' Responses to NRC EEQ SER Concerning Justification for Interim Operation FRC, 25-Jan-82

** C. J. Crane Letter to R. A. Clark, NRC. Subject: Transmittal of Actual Examples of Licensees' Responses to NRC EEQ SER Which Provide Adequate Rationale as a Basis for Justification of Interim Operation FRC, 5-Feb-82

disabling the backup equipment, (2) any major differences in the characteristics of the primary and backup equipment (unless it is obvious that the equipment is essentially identical), (3) the possibility of electrical failure of the primary equipment causing an adverse effect on other safety-related equipment or power supplies, and (4) in the case of display instrumentation, the possibility of an operator being misled by the failed primary equipment. Where equipment has not been demonstrated to be qualified, some justifications discuss administrative procedures or revised operating procedures in effect. Depending upon the specific equipment involved, each of the above considerations need not be discussed in every instance, but, in general, a complete systems discussion would consider the above points.

Where equipment qualification evaluations were used, licensees generally (1) received additional information from manufacturers, (2) applied engineering judgment, (3) performed material analysis, and/or (4) used partial test data in support of the original qualification documentation. Where these evaluations were performed, the licensees determined that, although full qualification was not documented, there was sufficient evidence to suggest that the equipment would perform its intended safety function, thereby justifying interim operation until qualified equipment is installed.

Some licensees provided detailed failure-modes-and-effects analyses of electrical circuitry to demonstrate that, under all identified failure modes, the safety function of the equipment could still be accomplished.

Other justifications involved a combination of qualification information and systems information. For example, if a licensee has qualification information (such as a generic test report or other partial qualification documentation) that tends to confirm the ability of the equipment to remain operable for a specified period of time, justification for interim operation often was based upon a discussion of the required safety function being performed prior to the potential failure. This type of discussion often applies to equipment which performs a short-term trip or isolation function in the early stages of an accident.

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3. PLANT-SPECIFIC REVIEW

As a result of the review, this plant was evaluated and the results documented on the "Summary of Review of Licensee's 90-Day Response" form reproduced below:

"EQUIPMENT ENVIRONMENTAL QUALIFICATION (EEQ) Review of Licensees' Resolution of Outstanding Issues From NRC Equipment Environmental Qualification Safety Evaluation Reports

SUMMARY OF REVIEW OF LICENSEE 90-DAY RESPONSE

Utility: Baltimore Gas & Electric Company Plant Name: Calvert Cliffs Unit 1 NRC Docket No. 50-317 NRC TAC No. 42494 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 487

References:

- a. A. E. Lundvall, Jr. Letter to B. H. Grier (NRC) Subject: Response to Safety Evaluation Report for IE Bulletin 79-01B for Calvert Cliffs Nuclear Power Pleat Units 1 and 2 Baltimore Gas & Electric Co., 01-Sep-81
- b. Office of Nuclear Reactor Regulation Safety Evaluation Report for Calvert Cliffs Units 1 & 2 Environmental Qualification of Safety-Related Electrical Equipment NRC, 28-May-81

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The Licensee has submitted technical information in Reference a in response to the NRC SER [b] on environmental qualification. FRC has reviewed these documents [a, b]. As a result of this review, FRC concludes that the Licensee has provided responses to the concerns expressed in the SER with the exception that justifications for interim operation based on a technically sound rationale have not been provided for electrical equipment identified as deficient in the SER. Specifically, the Licensee provided the following general statement with regard to interim operation:

'IV. JUSTIFICATION FOR CONTINUED OPERATION

The environmental qualification documentation for each safety-related item located in a potentially harsh environment has been evaluated and all remaining problems are the result of insufficient documentation. Our past submittals and this response indicate the effort Baltimore Gas & Electric Company is exerting to ensure full qualification of safety related electrical equipment in hazardous as well as the mild environments. In our earlier letter, Reference (d) we indicated that some of the purchasing activity resulting from our evaluation/assessment may not be initiated until the first quarter of 1982. It is likely that equipment deliveries as well as sufficient qualification reports may not be realized until 1983 because of equipment lead times and qualification testing schedules.

We have also shown that our approach to the evaluation/assessment of the qualification of equipment, the subsequent action plan and the final installation is within the scope and intent of the DOR Guidelines and NUREG 0588.

Based on these considerations we conclude that there is reasonable assurance of continued safe operation of Calvert Cliffs Units 1 and 2 pending completion of our qualification program to bring us in compliance with the DOR Guidelines and NUREG 0588.'

FRC does not consider the above approach responsive to the SER. It is recommended that the Licensee specifically reevaluate the justification for continued operation for each equipment item in light of the stated qualification deficiencies."

4. SUBSEQUENT REVIEW

As a result of FRC's review of the Licensee's 90-day response, described in Section 3 above, a meeting was held between the NRC staff and Licensee

personnel. Following the meeting, the Licensee submitted Reference 17, in which additional information justifying interim operation was submitted for each equipment item not documented as environmentally qualifed at the time Reference 17 was submitted.

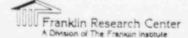
Evaluation

An evaluation has been conducted of the information provided by the Licensee in Reference 17, regarding justification for interim operation. After reviewing the technical basis of the Licensee's justification for continued operation for each item, it is concluded that the Licensee has provided sufficient technical basis to support justification for interim operation.

APPENDIX E - REQUEST FOR ADDITIONAL INFORMATION

This appendix contains the Request for Additional Information (RAI) that was developed during the course of the review and issued to the NRC for forwarding to the Licensee. The RAI was revised throughout the review to reflect the Licensee's response(s) to the initial RAI.

The reader is cautioned that the numbers in brackets refer to citations found in the list of references at the end of this appendix and not to the citations listed in Section 6, References, of the TER.





REQUEST FOR ADDITIONAL INFORMATION

EQUIPMENT ENVIRONMENTAL QUALIFICATION (EEQ) REVIEW OF LICENSEES' RESOLUTION OF OUTSTANDING ISSUES FROM NRC EQUIPMENT ENVIRONMENTAL QUALIFICATION SAFETY EVALUATION REPORTS (SER) AND TMI ACTION PLAN INSTALLED EQUIPMENT

Baltimore Gas & Electric Company Calvert Cliffs Unit 1

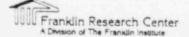
NRC Docket No. 50-317

NRC TAC No. 42494

December 10, 1981

Rev. 1, February 26, 1982 Rev. 2, May 20, 1982 Rev. 3, June 28, 1982 Rev. 4, July 13, 1982 Rev. 5, August 12, 1982





BACKGROUND

Franklin Research Center (FRC) of Philadelphia, Pa. is providing assistance to the U.S. Nuclear Regulatory Commission (NRC) for the equipment environmental qualification (EEQ) review of operating reactors. FRC will perform an EEQ review of the Licensee's 90-day response to outstanding issues from the NRC Equipment Environmental Qualification Safety Evaluation Report (SER) and the installed TMI Action Plan equipment. The review will be limited to safety-related equipment potentially exposed to a harsh environment. The results will be presented in the form of a technical evaluation report for each plant.

This request for additional information (RAI) is the result of an evaluation of the information provided by letters dated May 27, 1980 [1] and September 1, 1981 [2].* FRC previously requested TMI Action Plan information by a telephone memorandum dated August 20, 1981 [3].

By letter dated February 9, 1982 [7], Baltimore Gas and Electric Company (BG&E) transmitted a response to the RAI in which they declined to supply the information requested. The Licensee stated:

"This information is contained in our central file, and as such is available for your inspection at any time. To release this material from our custody would place us in violation of our technical specifications. We are also concerned because the reports and references requested do not conclusively document qualification; rather, they address only some of the environmental parameters pertinent to the various pieces of equipment. Erroneous conclusions concerning the adequacy of qualification review could be drawn unless other reports and correspondence are considered. Documents addressing the remainder of the relevant EQ issues are available in our EQ central file. We would welcome the opportunity to show your contractor the appropriate documentation in our files and to explain its specific applicability and the extent of qualification supported."(1)**

On March 2, 1982, FRC received Reference 8 which stated that the following information was attached:

*Numbers in brackets refer to citations found in the list of references. **Throughout the text, superscript numbers in parentheses indicate the revision in which the underlined material preceding the superscript was added.

a. <u>Discussions of specific equipment requiring supplemental information</u>
b. Updated SCEW sheets for Units 1 and 2.

The submittal received contained only the cover letter and SCEW sheets.

By letter dated April 6, 1982 [9], Baltimore Gas and Electric submitted the documents requested in Section A with a clarification of those not applicable.⁽²⁾

On June 2, 1982, Baltimore Gas and Electric transmitted the information requested in Section B with the exception of the associated qualification information. The Licensee has previously stated their position [7] on submitting these documents (see page 1 of this RAI) [10].⁽³⁾

RAI Section B.3 and a typographical error in B.1.e. (4)

By letter dated July 27, 1982 [12], Baltimore Gas and Electric reiterated its position on submitting the requested gualification documents in Section A. (5)

A. FRC REVIEW OF THE LICENSEE'S 90-DAY RESPONSE TO THE NRC EEQ SER

INFORMATION REQUESTED

DATE RECEIVED BY FRC***

- In reference to the Licensee's 90-day response [2] to the NRC SER [4], a legible single copy of each of the following qualification documents is requested in order that the FRC evaluation may proceed:
 - a. Masoneilan Simulation LOCA Test Report

b. American Air Filter Co. Test Report

Received 3/12/82 for Task 466⁽²⁾

4/8/82 [9](2)

4/8/82 [9](2)

c. Amphenol Sams Test Report No. 123-1252, 6-74

***This column will be completed by FRC as the requested information is received.

Franklin Research Center

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		DATE RECEIVED BY FRC***
d.	Okonite Summary of FIRL Test Report 5-77	4/8/82 [9](2)
e.	ETD Report No. 16024	4/8/82 [9](2)
£.	Hatfield Report 2-70	4/8/82 [9](2)
g.	GULF Test Report E115-138 12-71 and c of e 10-4-71	4/8/82 [9](2)
h.	Bechtel Letter 5-22-73; Velan c of c 5-2-73	4/8/82 [9](2)
i.	Seismic Calculation 12-18-69	4/8/82 [9](2)
j.	G. E. Performance Data 7-8-69	4/8/82 [9](2)
k.	Correspondence with TATE Engineering 4-29-80, 5-19-80 (Radiation = 200E + 6)	4/8/82 [9](2)
1	Mechanical Calculation 8-2-5, Temperature = 120°F	4/8/82 [9](2)
ш.	Correspondence with ASCO dated 7/1/80	4/8/82 [9](2)
n.	Cerro test NP-01	4/8/82 [9](2)
۰.	BIW Test Report Nos. 8808 B901 9286	4/8/82 [9](2)
	8921	
	73C212 9299 11-72	
p.	Raychem Tests EM688, EM691, EM644,	4/8/82 [9](2)

EM517A, EM523E

104 [7]



B. FRC REVIEW OF INSTALLED TMI ACTION PLAN ITEMS

INFORMATION REQUESTED

DATE RECEIVED BY FRC***

1. Reference 5 does not provide adequate detail with respect to identification of TMI Action Plan equipment installed as of 1/1/81.

- a. Identification of all TMI Action Plan equipment installed as of 1/1/81 is requested.
- b. Identification of TMI Action Plan equipment installed with implementation dates after 1/1/81 is requested.
- c. The correlation of these equipment items with the specific sections of NUREG-0737 [6] presented below (as applicable) is requested.

IIE1.2, IIE4.2, IIE3.1, IIG1, IIF2. IID3, IIK3.12(Wx), IIK3.9(Wx), IIK2.10(B&W), IIB3, IIE4.1.

[The correlation is needed to ensure that all items are included in the review, e.g., if a transmitter is identified as a TMI Action Plan item, are the cable and terminal blocks associated with the device also identified?]

- d. For all installed TMI Action Plan equipment identified, a System Component Evaluation Worksheet (SCEW) (in accordance with 79-01B format) is requested.
- e. The approximate installation date for the TMI Action Plan equipment items is requested so that the appropriate qualification criteria (NUREG-0588 or DOR Guidelines) can be used in the EEO evaluation.
- 2. The qualification documents, e.g., the actual test reports and associated correspondence cited as evidence of qualification listed on the SCEW sheets, for all identified TMI

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6/11/82 [10](3)

6/11/82 [10](3)

6/11/82 [10](3)

6/11/82 [11](3)

6/11/82 [11](3)

Action Plan equipment are requested. [The identification of those reports considered to be proprietary is requested so that proper control of documents can be maintained.]

NA

- 3. Where the Licensee has a standard Owners' Group position with respect to a NUREG-0737 technical area or has requested extensions of implementation dates, this information is requested in order to incorporate it into the review.
- C. INSTRUCTIONS FOR TRANSMITTING INFORMATION REQUESTED
- The schedule for completion of the FRC assignment requires that the Licensee provide the requested information within 3 weeks of the date of the RAI.
- 2. The Licensee may transmit the requested information as follows:
 - o complete package directly to the NRC project manager
 - or
 - o copy of cover letter to NRC project manager and complete package to FRC.



REFERENCES

- A. E. Lundvall, Jr. Letter to B. H. Grier (NRC) Subject: Calvert Cliffs Nuclear Power Plant Units 1 and 2 - IE Bulletin 79-01B, with attachment dated May 23, 1980 Baltimore Gas & Electric Co., 27-May-80
- 2. A. E. Lundvall, Jr. Letter to B. H. Grier (NRC) Subject: Response to Safety Evaluation Report for IE Bulletin 79-01B for Calvert Cliffs Nuclear Power Plant Units 1 and 2 Baltimore Gas & Electric Co., 01-Sep-81
- 3. C. J. Crane, W. Steigelmann, K. Iepson, D. Schmitz (FRC) Telecon with N. B. Le, M. Connor (NRG), and K. Sebra (BGE, Calvert Cliffs) Subject: Request for Information on FEQ Review and TMI Action Plan Items 20-Aug-81
- 4. Office of Nuclear Reactor Regulation Safety Evaluation Report for Calvert Cliffs Units 1 & 2 Environmental Qualification of Safety-Related Electrical Equipment NRC, 28-May-81
- 5. A. E. Lundvall, Jr. Letter to B. H. Grier (NRC) Subject: Calvert Cliffs Nuclear Power Plant Units 1 and 2 Response to IE Bulletin 79-01B Baltimore Gas & Electric, 03-Feb-81
- NUREG-0737, "Clarification of TMI Action Plan Requirements" NRC, November 1980
- 7. A. E. Lundvall, Jr. Letter to R. A. Clark, NRC. Subject: Calvert Cliffs Nuclear Power Plant Unit Nos. 1 & 2; Response to IE Bulletin 79-01B Baltimore Gas & Electric, 09-Feb-82.(1)
- 8. A. E. Lundvall, Jr. Letterr to T. Novak, NRC. Subject: Calvert Cliffs Nuclear Power Plant Units Nos. 1 and 2; Response to I&E Bulletin 79-01B Baltimore Gas & Electric, 26-Feb-82(2)

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a to

Letter to C. Crane, FRC. Subject: Calvert Cliffs Nuclear Power Plant Units 1 and 2; Environmental Qualification of Safety-Related Electrical Equipment Request for Information Baltimore Gas & Electric, 06-Apr-82⁽²⁾

- 10. A. E. Lundvall, Jr. Letter to C. J. Crane, FRC. Subject: Calvert Cliffs Nuclear Power Plant, Units 1 and 2; Review of Environmental Qualification of Certain TMI Action Plan Equipment Baltimore Gas & Electric, 02-Jun-82(3)
- 11. Calvert Cliffs Nuclear Power Plant: Summary Report of Class 1E Electrical Equipment Daltimore Gas & Electric, 19-May-82(2)
- 12. A. E. Lundvall, Jr. Letter to D. G. Eisenhut, NRC. Subject: Environmental Qualification Documentation Baltimore Gas & Electric, 27-Jul-82(5)

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