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TECHNICAL EVALUATION REPORT

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

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

NRC DOCKET NO. 50-317

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FRC ASSIGNMENT 13

FRC TASK 487

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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.

1. INTRODUCTION

1.1 PURPOSE OF THE EVALUATION

The purpose of this report is to:

- o 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.

- o 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.

With respect to TMI Action Plan Implementation, the scope of this report is limited to those sections of NUREG-0737 [11] applicable to equipment having 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.

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
- o 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

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

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 safety-related 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

licensing criteria. The subject of electrical equipment environmental qualification (SEP Topic III-12) was selected 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

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 obtaining 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 safety-related 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 IE Bulletin 79-01B, and the task leader was assigned responsibility for the overall coordination of the review effort with NRC staff to assure overall consistency. The regional reviewers held meetings with the licensees in their respective regions, which resulted in staff positions being issued in a supplement to IE Bulletin 79-01B 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 must 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 licensees to achieve full compliance with the DOR Guidelines or NUREG-0588 must be completed no later than June 30, 1982. The Memorandum and Order established the DOR Guidelines and NUREG-0588 as acceptable interpretations of the General

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 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 Fe[illegible]29, 1980; and the second and third supplements to IE Bulletin 79-[illegible]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 audit was to be extended. The plants included within this assignment were 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. (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 licensing 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 TMI 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 safety-related 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 January 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 and 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 NUREG-0588, provided the qualification program commenced within 90 days after the effective date of the rule.
- 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

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

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 1E 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),

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
DOR GUIDELINES	CP SER Before 7/1/74	CP SER After 7/1/74	
USE NUREG-0588 AS NECESSARY	NUREG-0588 (CAT. II)	NUREG-0588 (CAT. I)	NUREG-0588 (CAT. I) or NEW RULE WHEN IN EFFECT

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 TMI 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:

a. 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 (DOR 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.
>
> 1. If the test has been completed without aging in sequence, justification for such a deviation must be submitted.
> 2. 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	
	NUREG-0578 (100/50/1 in RCS)	

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

Gamma equivalents may be used when consideration 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 acceptable gamma radiation source for environmental qualification of safety-related equipment. Cesium 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 activities[1] 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:

- o 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.

[1] Such 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:

1. 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.

2. 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.

4. 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 outside containment?

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 4×10^7 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'."

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

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

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' resolutions 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

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 Nuclear 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.
- 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.
- 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 environmental 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:

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

Topics not within the scope of the evaluation are:

- completeness of the Licensee's listing of safety-related equipment
- 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 safety-related 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 (TER) 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 Onofre 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,

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 1a, reproduced here as Figure 3-1.

The checksheets contain the following information:

- 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 Checksheet No. 1
  Reference 59, Section 4.5.2.6
  Licensee Submittal: Page 9 [62]; Table 3, Page 1 [1]; SCEW 1

- Qualification deficiencies identified in the SER (see Figure 3-1)
- Licensee's response to the SER
- Licensee's statements and rationale for qualification
- Licensee's corrective action and replacement schedule
- Evaluation of qualification including identification of all deficiencies
- 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, QM, RPN, ZXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	1a
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
Maintenance and Replacement Schedule Summary	7a, 7b, 7c

Figure 3-1. Sample Checksheet Page 1a

"Equipment Item"

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

- 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.

- 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

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. ___

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.b	Equipment Not in the Scope of the Qualification Review	____
IV	Documentation Not Made Available	____

Figure 3-2. Sample Checksheet Page 2

"Equipment Environmental Qualification Summary Form"

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.

- 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.

- 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

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.]

- 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 mislead the operator or degrade the ability of qualified equipment to perform its required safety-related function.

- 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 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 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.

- 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.

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

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

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 CATEGORY	CATEGORY DESCRIPTION	NUMBER OF EQUIPMENT ITEMS
I.A	EQUIPMENT QUALIFIED [EQUIPMENT ITEM NO(S).: 2, 3, 5, 7, 8, 9, 11, 12, 13, 60, 62]	11
I.B	EQUIPMENT QUALIFICATION PENDING MODIFICATION [EQUIPMENT ITEM NO(S).: 10, 36, 39, 40, 41, 95, 96, 96]	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]	65
II.B	EQUIPMENT NOT QUALIFIED	0
II.C	EQUIPMENT SATISFIES ALL REQUIREMENTS EXCEPT QUALIFIED LIFE OR REPLACEMENT SCHEDULE JUSTIFIED [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 [EQUIPMENT ITEM NO(S).: 63, 64, 65]	3
IV	DOCUMENTATION NOT MADE AVAILABLE	0
	TOTAL	97

TABLE 4-2

QUALIFICATION DEFICIENCY SUMMARY

NRC REQUIREMENT	NUMBER OF DEFICIENT EQUIPMENT ITEMS
1. DOCUMENTED EVIDENCE OF QUALIFICATION ADEQUATE	36
[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]	
2. ADEQUATE SIMILARITY BETWEEN EQUIPMENT AND TEST SPECIMEN ESTABLISHED	34
[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]	
3. AGING DEGRADATION EVALUATED ADEQUATELY	27
[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, 38, 42, 46, 49, 88]	
4. QUALIFIED LIFE OR REPLACEMENT SCHEDULE ESTABLISHED (IF REQUIRED)	27
[EQUIPMENT ITEM [illegible] 1, 4, 6, 14, 15, 16, 17, 18, 19, [illegible]3, 24, 25, 26, 27, 28, 29, 30, 31, [illegible].6, 49, 88]	
5. PROGRAM ESTABLISHED TO IDENTIFY AGING DEGRADATION	4
[EQUIPMENT ITEM NO(S).: 1, 4, 6, 42]	
6. CRITERIA REGARDING AGING SIMULATION (IF REQUIRED)	3
[EQUIPMENT ITEM NO(S).: 1, 4, 6]	
7. CRITERIA REGARDING TEMPERATURE/PRESSURE EXPOSURE:	
A. - PEAK TEMPERATURE ADEQUATE	3
[EQUIPMENT ITEM NO(S).: 26, 27, 42]	
B. - PEAK PRESSURE ADEQUATE	3
[EQUIPMENT ITEM NO(S).: 26, 27, 42]	

Table 4-2 (Cont.)

QUALIFICATION DEFICIENCY SUMMARY

NRC REQUIREMENT	NUMBER OF DEFICIENT EQUIPMENT ITEMS
C. - DURATION ADEQUATE---------- [EQUIPMENT ITEM NO(S).: 42]	1
D. - REQUIRED PROFILE ENVELOPED ADEQUATELY---------- [EQUIPMENT ITEM NO(S).: 26, 27]	2
E. - STEAM EXPOSURE (IF REQUIRED) ADEQUATE---------- [EQUIPMENT ITEM NO(S).: 36, 39, 41]	3
8. CRITERIA REGARDING SPRAY SATISFIED---------- [EQUIPMENT ITEM NO(S).: 42, 46, 49, 88]	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---------- [EQUIPMENT ITEM NO(S).: 36, 39, 41, 42]	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

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	0
7. QUALIFICATION TESTING OF EQUIPMENT IN PROGRESS [EQUIPMENT ITEM NO(S).: 73]	1
8. OTHER (FOR DETAILED DESCRIPTION SEE SPECIFIC EQUIPMENT ITEMS) [EQUIPMENT ITEM NO(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, 84, 85, 86, 87, 88, 89, 90, 91, 92, 94, 97]	41
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

Table 4-4

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS (DESIGNATION: X = DEFICIENCY)	FRC EQUIPMENT ITEM NUMBERS																	
	1001	1002	1003	1004	1005	1006	1007	1008	1009	1010	1011	1012	1013	1014	1015
1. DOCUMENTED EVIDENCE OF QUALIFICATION ADEQUATE				X						X					X
2. ADEQUATE SIMILARITY BETWEEN EQUIPMENT AND TEST SPECIMEN ESTABLISHED														X	
3. AGING DEGRADATION EVALUATED ADEQUATELY	X			X		X								X	X
4. QUALIFIED LIFE OR REPLACEMENT SCHEDULE ESTABLISHED (IF REQUIRED)	X			X		X								X	X
5. PROGRAM ESTABLISHED TO IDENTIFY AGING DEGRADATION	X			X		X									
6. CRITERIA REGARDING AGING SIMULATION SATISFIED (IF REQUIRED)	X			X		X									
7. CRITERIA REGARDING TEMPERATURE/PRESSURE EXPOSURE:															
A. - PEAK TEMPERATURE ADEQUATE															
B. - PEAK PRESSURE ADEQUATE															
C. - DURATION ADEQUATE															
D. - REQUIRED PROFILE ENVELOPED ADEQUATELY															
E. - STEAM EXPOSURE (IF REQUIRED) ADEQUATE															
8. CRITERIA REGARDING SPRAY SATISFIED															
9. CRITERIA REGARDING SUBMERGENCE SATISFIED															
10. CRITERIA REGARDING RADIATION SATISFIED	X					X									
11. CRITERIA REGARDING TEST SEQUENCE SATISFIED															
12. CRITERIA REGARDING TEST FAILURES OR SEVERE ANOMALIES (IF ANY) SATISFIED															
13. CRITERIA REGARDING FUNCTIONAL TESTING SATISFIED	X					X									
14. CRITERIA REGARDING INSTRUMENT ACCURACY SATISFIED															
15. TEST DURATION MARGIN (1 HOUR + FUNCTION TIME) SATISFIED															
16. CRITERIA REGARDING MARGINS SATISFIED (NUREG-0588, CAT. 1)															
NRC QUALIFICATION CATEGORY (DESIGNATION: X = CATEGORY)															
I.A EQUIPMENT QUALIFIED		X		X			X			X		X		X	
I.B EQUIPMENT QUALIFICATION PENDING MODIFICATION											X				
II.A EQUIPMENT QUALIFICATION NOT ESTABLISHED	X				X		X							X	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 REVIEW															
IV DOCUMENTATION NOT MADE AVAILABLE															
CORRECTIVE ACTION SPECIFIED (DESIGNATION: X = ACTION SPECIFIED)															
1. EQUIPMENT REPLACEMENT WITH QUALIFIED EQUIPMENT															
2. EQUIPMENT MODIFICATION															
3. EQUIPMENT RELOCATION ABOVE THE SUBMERGENCE LEVEL															
4. RELOCATE OR SHIELD EQUIPMENT FROM RADIATION SOURCE															
5. VERIFY QUALIFICATION BY ADDITIONAL TESTING/ANALYSIS															
6. EQUIPMENT RELOCATION TO A MILD ENVIRONMENT															
7. QUALIFICATION TESTING OF EQUIPMENT IN PROGRESS															
8. OTHER (___SEE SPECIFIC EQUIPMENT ITEM IF CHECKED___)										X					
SCHEDULE FOR COMPLETION OF CORRECTIVE ACTION(S) HAS BEEN PROVIDED															

Table 4-4 (Cont.)

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS (DESIGNATION: X = DEFICIENCY)	FRC EQUIPMENT ITEM NUMBERS																				
	016	017	018	019	020	021	022	023	024	025	026	027	028	029	030						
1. DOCUMENTED EVIDENCE OF QUALIFICATION ADEQUATE						X					X	X									
2. ADEQUATE SIMILARITY BETWEEN EQUIPMENT AND TEST SPECIMEN ESTABLISHED	X	X	X	X	X		X		X	X	X	X	X	X	X						
3. AGING DEGRADATION EVALUATED ADEQUATELY	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X						
4. QUALIFIED LIFE OR REPLACEMENT SCHEDULE ESTABLISHED (IF REQUIRED)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X						
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											X	X									
B. - PEAK PRESSURE ADEQUATE											X	X									
C. - DURATION ADEQUATE																					
D. - REQUIRED PROFILE ENVELOPED ADEQUATELY											X	X									
E. - STEAM EXPOSURE (IF REQUIRED) ADEQUATE																					
8. CRITERIA REGARDING SPRAY SATISFIED																					
9. CRITERIA REGARDING SUBMERGENCE SATISFIED																					
10. CRITERIA REGARDING RADIATION SATISFIED																					
11. CRITERIA REGARDING TEST SEQUENCE SATISFIED											X	X									
12. CRITERIA REGARDING TEST FAILURES OR SEVERE ANOMALIES (IF ANY) SATISFIED																					
13. CRITERIA REGARDING FUNCTIONAL TESTING SATISFIED																					
14. CRITERIA REGARDING INSTRUMENT ACCURACY SATISFIED																					
15. TEST DURATION MARGIN (1 HOUR + FUNCTION TIME) SATISFIED																					
16. CRITERIA REGARDING MARGINS SATISFIED (NUREG-0588, CAT. 1)																					
NRC QUALIFICATION CATEGORY (DESIGNATION: X = CATEGORY)																					
I.A EQUIPMENT QUALIFIED																					
I.B EQUIPMENT QUALIFICATION PENDING MODIFICATION																					
II.A EQUIPMENT QUALIFICATION NOT ESTABLISHED	X	X	X	X	X	X	X	X	X	X	X	X	X	X	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 REVIEW																					
IV DOCUMENTATION NOT MADE AVAILABLE																					
CORRECTIVE ACTION SPECIFIED (DESIGNATION: X = ACTION SPECIFIED)																					
1. EQUIPMENT REPLACEMENT WITH QUALIFIED EQUIPMENT																					
2. EQUIPMENT MODIFICATION																					
3. EQUIPMENT RELOCATION ABOVE THE SUBMERGENCE LEVEL																					
4. RELOCATE OR SHIELD EQUIPMENT FROM RADIATION SOURCE																					
5. VERIFY QUALIFICATION BY ADDITIONAL TESTING/ANALYSIS																					
6. EQUIPMENT RELOCATION TO A MILD ENVIRONMENT																					
7. QUALIFICATION TESTING OF EQUIPMENT IN PROGRESS																					
8. OTHER (___SEE SPECIFIC EQUIPMENT ITEM IF CHECKED___)																					
SCHEDULE FOR COMPLETION OF CORRECTIVE ACTION(S) HAS BEEN PROVIDED																					

Table 4-4 (Cont.)

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS (DESIGNATION: X = DEFICIENCY)	FRC EQUIPMENT ITEM NUMBERS																			
	031	032	033	034	035	036	037	038	039	040	041	042	043	044	045					
1. DOCUMENTED EVIDENCE OF QUALIFICATION ADEQUATE							X			X			X		X					
2. ADEQUATE SIMILARITY BETWEEN EQUIPMENT AND TEST SPECIMEN ESTABLISHED	X	X	X	X	X															
3. AGING DEGRADATION EVALUATED ADEQUATELY	X	X						X				X								
4. QUALIFIED LIFE OR REPLACEMENT SCHEDULE ESTABLISHED (IF REQUIRED)	X	X						X				X								
5. PROGRAM ESTABLISHED TO IDENTIFY AGING DEGRADATION												X								
6. CRITERIA REGARDING AGING SIMULATION SATISFIED (IF REQUIRED)																				
7. CRITERIA REGARDING TEMPERATURE/PRESSURE EXPOSURE:																				
A. - PEAK TEMPERATURE ADEQUATE												X								
B. - PEAK PRESSURE ADEQUATE												X								
C. - DURATION ADEQUATE												X								
D. - REQUIRED PROFILE ENVELOPED ADEQUATELY																				
E. - STEAM EXPOSURE (IF REQUIRED) ADEQUATE						X			X		X									
8. CRITERIA REGARDING SPRAY SATISFIED												X								
9. CRITERIA REGARDING SUBMERGENCE SATISFIED																				
10. CRITERIA REGARDING RADIATION SATISFIED												X								
11. CRITERIA REGARDING TEST SEQUENCE SATISFIED																				
12. CRITERIA REGARDING TEST FAILURES OR SEVERE ANOMALIES (IF ANY) SATISFIED						X			X		X		X							
13. CRITERIA REGARDING FUNCTIONAL TESTING SATISFIED																				
14. CRITERIA REGARDING INSTRUMENT ACCURACY SATISFIED																				
15. TEST DURATION MARGIN (1 HOUR + FUNCTION TIME) SATISFIED																				
16. CRITERIA REGARDING MARGINS SATISFIED (NUREG-0588, CAT. 1)																				
NRC QUALIFICATION CATEGORY (DESIGNATION: X = CATEGORY)																				
I.A EQUIPMENT QUALIFIED																				
I.B EQUIPMENT QUALIFICATION PENDING MODIFICATION						X			X	X	X									
II.A EQUIPMENT QUALIFICATION NOT ESTABLISHED	X	X	X	X	X		X					X	X	X	X					
II.B EQUIPMENT NOT QUALIFIED																				
II.C EQUIPMENT SATISFIES ALL REQUIREMENTS EXCEPT QUALIFIED LIFE OR REPLACEMENT SCHEDULE JUSTIFIED								X												
III.A EQUIPMENT EXEMPT FROM QUALIFICATION																				
III.B EQUIPMENT NOT IN THE SCOPE OF THE REVIEW																				
IV DOCUMENTATION NOT MADE AVAILABLE																				
CORRECTIVE ACTION SPECIFIED (DESIGNATION: X = ACTION SPECIFIED)																				
1. EQUIPMENT REPLACEMENT WITH QUALIFIED EQUIPMENT									X	X	X									
2. EQUIPMENT MODIFICATION																				
3. EQUIPMENT RELOCATION ABOVE THE SUBMERGENCE LEVEL																				
4. RELOCATE OR SHIELD EQUIPMENT FROM RADIATION SOURCE																				
5. VERIFY QUALIFICATION BY ADDITIONAL TESTING/ANALYSIS																				
6. EQUIPMENT RELOCATION TO A MILD ENVIRONMENT																				
7. QUALIFICATION TESTING OF EQUIPMENT IN PROGRESS																				
8. OTHER (___SEE SPECIFIC EQUIPMENT ITEM IF CHECKED___)			X							X		X	X	X	X					
SCHEDULE FOR COMPLETION OF CORRECTIVE ACTION(S) HAS BEEN PROVIDED																				

Table 4-4 (Cont.)

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS (DESIGNATION: X = DEFICIENCY)	FRC EQUIPMENT ITEM NUMBERS																			
	1046	1047	1048	1049	1050	1051	1052	1053	1054	1055	1056	1057	1058	1059	1060					
1. DOCUMENTED EVIDENCE OF QUALIFICATION ADEQUATE		X		X			X			X				X		X				
2. ADEQUATE SIMILARITY BETWEEN EQUIPMENT AND TEST SPECIMEN ESTABLISHED																				
3. AGING DEGRADATION EVALUATED ADEQUATELY	X				X															
4. QUALIFIED LIFE OR REPLACEMENT SCHEDULE ESTABLISHED (IF REQUIRED)	X				X															
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																				
B. - PEAK PRESSURE ADEQUATE																				
C. - DURATION ADEQUATE																				
D. - REQUIRED PROFILE ENVELOPED ADEQUATELY																				
E. - STEAM EXPOSURE (IF REQUIRED) ADEQUATE																				
8. CRITERIA REGARDING SPRAY SATISFIED	X				X															
9. CRITERIA REGARDING SUBMERGENCE SATISFIED																				
10. CRITERIA REGARDING RADIATION SATISFIED	X				X															
11. CRITERIA REGARDING TEST SEQUENCE SATISFIED																				
12. CRITERIA REGARDING TEST FAILURES OR SEVERE ANOMALIES (IF ANY) SATISFIED																				
13. CRITERIA REGARDING FUNCTIONAL TESTING SATISFIED																				
14. CRITERIA REGARDING INSTRUMENT ACCURACY SATISFIED																				
15. TEST DURATION MARGIN (1 HOUR + FUNCTION TIME) SATISFIED																				
16. CRITERIA REGARDING MARGINS SATISFIED (NUREG-0588, CAT. 1)																				
NRC QUALIFICATION CATEGORY (DESIGNATION: X = CATEGORY)																				
I.A EQUIPMENT QUALIFIED																X				
I.B EQUIPMENT QUALIFICATION PENDING MODIFICATION																				
II.A EQUIPMENT QUALIFICATION NOT ESTABLISHED	X	X	X	X	X	X		X		X			X	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						X		X	X		X	X								
III.B EQUIPMENT NOT IN THE SCOPE OF THE REVIEW																				
IV DOCUMENTATION NOT MADE AVAILABLE																				
CORRECTIVE ACTION SPECIFIED (DESIGNATION: X = ACTION SPECIFIED)																				
1. EQUIPMENT REPLACEMENT WITH QUALIFIED EQUIPMENT							X													
2. EQUIPMENT MODIFICATION																				
3. EQUIPMENT RELOCATION ABOVE THE SUBMERGENCE LEVEL																				
4. RELOCATE OR SHIELD EQUIPMENT FROM RADIATION SOURCE																				
5. VERIFY QUALIFICATION BY ADDITIONAL TESTING/ANALYSIS							X													
6. EQUIPMENT RELOCATION TO A MILD ENVIRONMENT																				
7. QUALIFICATION TESTING OF EQUIPMENT IN PROGRESS																				
8. OTHER (___SEE SPECIFIC EQUIPMENT ITEM IF CHECKED___)	X	X	X	X	X	X				X			X	X						
SCHEDULE FOR COMPLETION OF CORRECTIVE ACTION(S) HAS BEEN PROVIDED							X													

Table 4-4 (Cont.)

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS (DESIGNATION: X = DEFICIENCY)	FRC EQUIPMENT ITEM NUMBERS																			
	1061	1062	1063	1064	1065	1066	1067	1068	1069	1070	1071	1072	1073	1074	1075					
1. DOCUMENTED EVIDENCE OF QUALIFICATION ADEQUATE	X					X		X								X				
2. ADEQUATE SIMILARITY BETWEEN EQUIPMENT AND TEST SPECIMEN ESTABLISHED													X	X						
3. AGING DEGRADATION EVALUATED ADEQUATELY																				
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																				
B. - PEAK PRESSURE ADEQUATE																				
C. - DURATION ADEQUATE																				
D. - REQUIRED PROFILE ENVELOPED ADEQUATELY																				
E. - STEAM EXPOSURE (IF REQUIRED) ADEQUATE																				
8. CRITERIA REGARDING SPRAY SATISFIED																				
9. CRITERIA REGARDING SUBMERGENCE SATISFIED																				
10. CRITERIA REGARDING RADIATION SATISFIED																				
11. CRITERIA REGARDING TEST SEQUENCE SATISFIED																				
12. CRITERIA REGARDING TEST FAILURES OR SEVERE ANOMALIES (IF ANY) SATISFIED																				
13. CRITERIA REGARDING FUNCTIONAL TESTING SATISFIED																				
14. CRITERIA REGARDING INSTRUMENT ACCURACY SATISFIED																				
15. TEST DURATION MARGIN (1 HOUR + FUNCTION TIME) SATISFIED																				
16. CRITERIA REGARDING MARGINS SATISFIED (NUREG- 588, CAT. 1)																				
NRC QUALIFICATION CATEGORY (DESIGNATION: X = CATEGORY)																				
I.A EQUIPMENT QUALIFIED		X																		
I.B EQUIPMENT QUALIFICATION PENDING MODIFICATION																				
II.A EQUIPMENT QUALIFICATION NOT ESTABLISHED	X					X		X					X	X	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								X		X		X		X						
III.B EQUIPMENT NOT IN THE SCOPE OF THE REVIEW			X		X		X													
IV DOCUMENTATION NOT MADE AVAILABLE																				
CORRECTIVE ACTION SPECIFIED (DESIGNATION: X = ACTION SPECIFIED)																				
1. EQUIPMENT REPLACEMENT WITH QUALIFIED EQUIPMENT																				
2. EQUIPMENT MODIFICATION																				
3. EQUIPMENT RELOCATION ABOVE THE SUBMERGENCE LEVEL																				
4. RELOCATE OR SHIELD EQUIPMENT FROM RADIATION SOURCE																				
5. VERIFY QUALIFICATION BY ADDITIONAL TESTING/ANALYSIS														X						
6. EQUIPMENT RELOCATION TO A MILD ENVIRONMENT																				
7. QUALIFICATION TESTING OF EQUIPMENT IN PROGRESS													X							
8. OTHER (___SEE SPECIFIC EQUIPMENT ITEM IF CHECKED___)	X					X	X	X	X		X				X					
SCHEDULE FOR COMPLETION OF CORRECTIVE ACTION(S) HAS BEEN PROVIDED																				

Table 4-4 (Cont.)

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS (DESIGNATION: X = DEFICIENCY)	FRC EQUIPMENT ITEM NUMBERS																							
	1076	1077	1078	1079	1080	1081	1082	1083	1084	1085	1086	1087	1088	1089	1090									
1. DOCUMENTED EVIDENCE OF QUALIFICATION ADEQUATE	X	X	X	X	X				X	X	X			X										
2. ADEQUATE SIMILARITY BETWEEN EQUIPMENT AND TEST SPECIMEN ESTABLISHED		X	X		X	X	X		X	X	X	X	X	X	X									
3. AGING DEGRADATION EVALUATED ADEQUATELY												X												
4. QUALIFIED LIFE OR REPLACEMENT SCHEDULE ESTABLISHED (IF REQUIRED)												X												
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																								
B. - PEAK PRESSURE ADEQUATE																								
C. - DURATION ADEQUATE																								
D. - REQUIRED PROFILE ENVELOPED ADEQUATELY																								
F. - STEAM EXPOSURE (IF REQUIRED) ADEQUATE																								
8. CRITERIA REGARDING SPRAY SATISFIED													X											
9. CRITERIA REGARDING SUBMERGENCE SATISFIED																								
10. CRITERIA REGARDING RADIATION SATISFIED																								
11. CRITERIA REGARDING TEST SEQUENCE SATISFIED																								
12. CRITERIA REGARDING TEST FAILURES OR SEVERE ANOMALIES (IF ANY) SATISFIED																								
13. CRITERIA REGARDING FUNCTIONAL TESTING SATISFIED																								
14. CRITERIA REGARDING INSTRUMENT ACCURACY SATISFIED													X											
15. TEST DURATION MARGIN (1 HOUR + FUNCTION TIME) SATISFIED																								
16. CRITERIA REGARDING MARGINS SATISFIED (NUREG-0588, CAT. 1)																								
NRC QUALIFICATION CATEGORY (DESIGNATION: X = CATEGORY)																								
I.A EQUIPMENT QUALIFIED																								
I.B EQUIPMENT QUALIFICATION PENDING MODIFICATION																								
II.A EQUIPMENT QUALIFICATION NOT ESTABLISHED	X	X	X	X	X	X	X	X	X	X	X	X	X	X	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 REVIEW																								
IV DOCUMENTATION NOT MADE AVAILABLE																								
CORRECTIVE ACTION SPECIFIED (DESIGNATION: X = ACTION SPECIFIED)																								
1. EQUIPMENT REPLACEMENT WITH QUALIFIED EQUIPMENT																								
2. EQUIPMENT MODIFICATION																								
3. EQUIPMENT RELOCATION ABOVE THE SUBMERGENCE LEVEL																								
4. RELOCATE OR SHIELD EQUIPMENT FROM RADIATION SOURCE																								
5. VERIFY QUALIFICATION BY ADDITIONAL TESTING/ANALYSIS																								
6. EQUIPMENT RELOCATION TO A MILD ENVIRONMENT					X																			
7. QUALIFICATION TESTING OF EQUIPMENT IN PROGRESS																								
8. OTHER (___SEE SPECIFIC EQUIPMENT ITEM IF CHECKED___)	X	X	X	X	X			X	X	X	X	X	X	X	X									
SCHEDULE FOR COMPLETION OF CORRECTIVE ACTION(S) HAS BEEN PROVIDED																								

Table 4-4 (Cont.)

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS (DESIGNATION: X = DEFICIENCY)	FRC EQUIPMENT ITEM NUMBERS							
	0911	0921	0931	0941	0951	0961	0971	
1. DOCUMENTED EVIDENCE OF QUALIFICATION ADEQUATE	X	X		X	X	X		
2. ADEQUATE SIMILARITY BETWEEN EQUIPMENT AND TEST SPECIMEN ESTABLISHED			X				X	
3. AGING DEGRADATION EVALUATED ADEQUATELY								
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								
B. - PEAK PRESSURE ADEQUATE								
C. - DURATION ADEQUATE								
D. - REQUIRED PROFILE ENVELOPED ADEQUATELY								
E. - STEAM EXPOSURE (IF REQUIRED) ADEQUATE								
8. CRITERIA REGARDING SPRAY SATISFIED								
9. CRITERIA REGARDING SUBMERGENCE SATISFIED								
10. CRITERIA REGARDING RADIATION SATISFIED								
11. CRITERIA REGARDING TEST SEQUENCE SATISFIED								
12. CRITERIA REGARDING TEST FAILURES OR SEVERE ANOMALIES (IF ANY) SATISFIED								
13. CRITERIA REGARDING FUNCTIONAL TESTING SATISFIED								
14. CRITERIA REGARDING INSTRUMENT ACCURACY SATISFIED								
15. TEST DURATION MARGIN (1 HOUR + FUNCTION TIME) SATISFIED								
16. CRITERIA REGARDING MARGINS SATISFIED (NUREG-0588, CAT. 1)								
NRC QUALIFICATION CATEGORY (DESIGNATION: X = CATEGORY)								
I.A EQUIPMENT QUALIFIED								
I.B EQUIPMENT QUALIFICATION PENDING MODIFICATION					X	X		
II.A EQUIPMENT QUALIFICATION NOT ESTABLISHED	X	X	X	X			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 REVIEW								
IV DOCUMENTATION NOT MADE AVAILABLE								
CORRECTIVE ACTION SPECIFIED (DESIGNATION: X = ACTION SPECIFIED)								
1. EQUIPMENT REPLACEMENT WITH QUALIFIED EQUIPMENT					X	X		
2. EQUIPMENT MODIFICATION								
3. EQUIPMENT RELOCATION ABOVE THE SUBMERGENCE LEVEL								
4. RELOCATE OR SHIELD EQUIPMENT FROM RADIATION SOURCE								
5. VERIFY QUALIFICATION BY ADDITIONAL TESTING/ANALYSIS								
6. EQUIPMENT RELOCATION TO A MILD ENVIRONMENT								
7. QUALIFICATION TESTING OF EQUIPMENT IN PROGRESS								
8. OTHER (___SEE SPECIFIC EQUIPMENT ITEM IF CHECKED___)	X	X		X			X	
SCHEDULE FOR COMPLETION OF CORRECTIVE ACTION(S) HAS BEEN PROVIDED					X	X		

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:

"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.

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-line-break (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 concern, 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 (A119)
(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."

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. This 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.

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 solenoid 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:

1. 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.

2. Establish an ongoing program to review surveillance and maintenance records to identify potential age related degradations.

3. 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.

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.

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.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
EQUIPMENT ITEM CHECKSHEET INDEX
CALVERT CLIFFS 1

FRC ITEM NO.	COMPONENT	MANUFACTURER	MODEL NUMBER	LOCATION
1	SOLENOID VALVE	ASCO	WPHTX8320A21V	CONTAINMENT, (C230)
2	SOLENOID VALVE	ASCO	2063R13RVU	CONTAINMENT, (C230)
3	SOLENOID VALVE	ASCO	NP8320A175V	CONTAINMENT, (C230)
4	SOLENOID VALVE	ASCO	HT8320	ECCS PUMP ROOM, (A118)
5	SOLENOID VALVE	ASCO	2063815RVU	EAST PIPING PENETRATION ROOM, (A316
6	SOLENOID VALVE	ASCO	WPHTX8320A21V	CONTAINMENT, (C230)
7	SOLENOID VALVE	ASCO	NP8320A187V	MAIN STEAM PIPING PENETRATION, (A31
8	SOLENOID VALVE	ASCO	NP8320A187V	EAST PIPING PENETRATION ROOM, (A316
9	SOLENOID VALVE	ASCO	2063815RVU	EAST PIPING PENETRATION ROOM, (A316
10	SOLENOID VALVE	TELEDYNE	2111062025253	PIPING AREA (A224)
11	SOLENOID VALVE	ASCO	NP8316E35V	EAST PIPING PENETRATION ROOM, (A316
12	SOLENOID VALVE	ASCO	NP8320A195V	CONTAINMENT (C230)
13	SOLENOID VALVE	ASCO	NP8316E35V	CONTAINMENT (C230)
14	MOTORIZED VALVE ACTUATOR	LIMITORQUE	SMB00	EAST PENETRATION ROOM, (A227)
15	MOTORIZED VALVE ACTUATOR	PRATT	TN20003	EAST PIPING PENETRATION ROOM, (A316
16	MOTORIZED VALVE ACTUATOR	LIMITORQUE	SMB00	EAST PIPING PENETRATION ROOM, (A316
17	MOTORIZED VALVE ACTUATOR	LIMITORQUE	SMB00	EAST PENETRATION ROOM, (A227)
18	MOTORIZED VALVE ACTUATOR	LIMITORQUE	SMB00	EAST PIPING PENETRATION ROOM, (A316
19	MOTORIZED VALVE ACTUATOR	LIMITORQUE	SMB2	MAIN STEAM PIPING PENETRATION, (A31
20	MOTORIZED VALVE ACTUATOR	LIMITORQUE	SMB2	MAIN STEAM PIPING PENETRATION, (A31
21	MOTORIZED VALVE ACTUATOR	LIMITORQUE	SMB1	ECCS PUMP ROOM, (A119)
22	MOTORIZED VALVE ACTUATOR	LIMITORQUE	SMB2	CONTAINMENT RECIRCULATION PIPE TUNN
23	MOTORIZED VALVE ACTUATOR	LIMITORQUE	SMB00	EAST PENETRATION ROOM, (A227)
24	MOTORIZED VALVE ACTUATOR	LIMITORQUE	SMB2	EAST PENETRATION ROOM, (A227)
25	MOTORIZED VALVE ACTUATOR	LIMITORQUE	SMB0	ECCS PUMP ROOM, (A118)
26	MOTORIZED VALVE ACTUATOR	LIMITORQUE	SMB; SIZES 00, 1	CONTAINMENT, (C230)
27	MOTORIZED VALVE ACTUATOR	LIMITORQUE	SMB3	CONTAINMENT, (C230)
28	MOTORIZED VALVE ACTUATOR	LIMITORQUE	SMB00	ECCS PUMP ROOM, (A118)
29	MOTORIZED VALVE ACTUATOR	LIMITORQUE	SMB00	ECCS PUMP ROOM, (A118)
30	MOTORIZED VALVE ACTUATOR	LIMITORQUE	SMB00	CONTAINMENT RECIRCULATION PIPE TUNN
31	MOTORIZED VALVE ACTUATOR	LIMITORQUE	SMB2	EAST PENETRATION ROOM, ( )
32	MOTORIZED VALVE ACTUATOR	LIMITORQUE	SMB2	CONTAINMENT RECIRCULATION PIPE TUNN
33	FLOW TRANSMITTER	FISCHER AND PORTER	10B2495(6)	EAST PIPING PENETRATION ROOM, (A316
34	FLOW TRANSMITTER	FISCHER AND PORTER	10B2495(6)	PIPING AREA, (A224)
35	FLOW TRANSMITTER	FISCHER AND PORTER	10B2495(6)	WEST PENETRATION ROOM, (A221)
36	LEVEL TRANSMITTER	FISCHER AND PORTER	13D2495KBAABCB	CONTAINMENT, (C230)
37	PRESSURE INDICATOR	SIGMA	9222(3)	AUXILIARY FEEDWATER PUMP ROOM, (T60
38	PRESSURE TRANSMITTER	FISCHER AND PORTER	50EP1000 SERIES	MAIN STEAM PIPING PENETRATION, (A31
39	PRESSURE TRANSMITTER	FISCHER AND PORTER	50EP1000 SERIES	CONTAINMENT, (C230)
40	RTD	ROSEMOUNT	104ARH	CONTAINMENT, (C230)
41	PRESSURE TRANSMITTER	FISCHER AND PORTER	50EP1000 SERIES	CONTAINMENT, (C230)
42	ELECTRICAL PENETRATION	AMPHENOL	205033	CONTAINMENT, (C230)
43	ELECTRIC MOTOR	GENERAL ELECTRIC	5KH11052A108	ECCS PUMP ROOM, (A118)
44	ELECTRIC MOTOR	RELIANCE ELECTRIC	P14G408NFV	ECCS PUMP ROOM, (A119)
45	ELECTRIC MOTOR	GENERAL ELECTRIC	5KH11052C34	ECCS PUMP ROOM, (A119)
46	ELECTRIC MOTOR	RELIANCE ELECTRIC	X323727A1AN	CONTAINMENT, (C230)
47	ELECTRIC MOTOR	ALLIS CHALMERS	911, FR50A005	ECCS PUMP ROOM, (A118)
48	ELECTRIC MOTOR	GENERAL ELECTRIC	5KH11052C34	ECCS PUMP ROOM, (A118)
49	ELECTRIC MOTOR	RELIANCE ELECTRIC	X324356A6AN	CONTAINMENT, (C230)

EQUIPMENT ENVIRONMENTAL QUALIFICATION
EQUIPMENT ITEM CHECKSHEET INDEX
CALVERT CLIFFS

FRC ITEM NO.	COMPONENT	MANUFACTURER	MODEL NUMBER	LOCATION
50	ELECTRIC MOTOR	JOHNSON CONTROLS	KP5ACA3	ECCS PUMP ROOM, (A119)
51	RADIATION DETECTOR	WESTINGHOUSE	WL23796	CONTAINMENT, (C230)
52	RADIATION MONITOR	WESTINGHOUSE	1101	CONTAINMENT, (C230)
53	RADIATION DETECTOR	REUTER-STOKES	R2827	CONTAINMENT, (C230)
54	AMPLIFIER	GENERAL ATOMIC	PA6A	CONTAINMENT, (C230)
55	ELECTRIC HEATER	WESTINGHOUSE	EHR5	CONTAINMENT, (C230)
56	ELECTRICAL CONNECTOR	KINGS	KH5905	CONTAINMENT, (C230)
57	ELECTRICAL CONNECTOR	ITT CANNON	19457	CONTAINMENT, (C230)
58	TERMINAL BLOCK	MARATHON	1600 SERIES	CONTAINMENT, (C230)
59	TERMINAL BLOCK	WESTINGHOUSE	542247	CONTAINMENT, (C230)
60	TERMINAL BLOCK	WEIDMULLER	SAK	MAIN STEAM PIPING PENETRATION, (A31
61	TERMINAL BLOCK	BUCHANAN	8112	CONTAINMENT, (C230)
62	TERMINAL BLOCK	WEIDMULLER	SAK	CONTAINMENT, (C230)
63	TERMINAL BLOCK	HOFFMAN	F6848	CONTAINMENT, (C230)
64	TERMINAL BLOCK	HOFFMAN	[illegible]4424	CONTAINMENT, (C230)
65	TERMINAL BLOCK	FIELD	ND	CONTAINMENT, (C230)
66	TERMINAL LUG	AMP	34000 SERIES	CONTAINMENT, (C230)
67	TERMINAL LUG	THOMAS AND BETTS	53000 SERIES	CONTAINMENT, (C230)
68	ELECTRICAL CONNECTOR	BENDIX	39021	CONTAINMENT, (C230)
69	ELECTRICAL CONNECTOR	AMPHENOL	823201004	CONTAINMENT, (C230)
70	ELECTRICAL CONNECTOR	AMPHENOL	80576A	CONTAINMENT, (C230)
71	ELECTRICAL CONNECTOR	AMPHENOL	27975	CONTAINMENT, (C230)
72	ELECTRICAL CONNECTOR	AMPHENOL	53100	CONTAINMENT, (C230)
73	ELECTRICAL CABLE	ANACONDA WIRE AND CABLE	EPR/CPE	CONTAINMENT, (C230)
74	ELECTRICAL CABLE	CERRO WIRE AND CABLE	XLPE/NEOPRENE	CONTAINMENT, (C230)
75	ELECTRICAL CABLE	CERRO WIRE AND CABLE	SILICONE RUBBER/ASBESTOS BR,	CONTAINMENT, (C230)
76	ELECTRICAL CABLE	CONTINENTAL WIRE	SILICONE RUBBER/ASBESTOS BR,	CONTAINMENT, (C230)
77	ELECTRICAL CABLE	BOSTON INSULATED WIRE	XLPE/XLPE	CONTAINMENT, (C230)
78	ELECTRICAL CABLE	RAYCHEM	POLYMER AND XLPE/XLPE	CONTAINMENT, (C230)
79	ELECTRICAL CABLE	RAYCHEM	COAXIAL/XLP	CONTAINMENT, (C230)
80	ELECTRICAL CABLE	CONTINENTAL WIRE	XLPE/PVC	CONTAINMENT, (C230)
81	ELECTRICAL CABLE	OKONITE	EPR/OKOLON	CONTAINMENT, (C230)
82	ELECTRICAL CABLE	ROCKBESTOS	SILICONE RUBBER/ASBESTOS BR,	CONTAINMENT, (C230)
83	ELECTRICAL CABLE	ROCKBESTOS	XLPE/NEOPRENE	CONTAINMENT, (C230)
84	ELECTRICAL CABLE	BOSTON INSULATED WIRE	INDUSTRITE - HYPALON/HYPALON	CONTAINMENT, (C230)
85	ELECTRICAL CABLE	BOSTON INSULATED WIRE	SILICONE RUBBER (EQUIVILENT)/H	CONTAINMENT, (C230)
86	ELECTRICAL CABLE	BOSTON INSULATED WIRE	XLPE/HYP	CONTAINMENT, (C230)
87	ELECTRICAL CABLE	FERRITE	HTK/FR	CONTAINMENT, (C230)
88	ELECTRICAL CABLE	PISCOBACH HATFIELD	SILICONE RUBBER/ASBESTOS BR,	CONTAINMENT, (C230)
89	ELECTRICAL CABLE	ANACONDA WIRE AND CABLE	EPR/HYPALON	CONTAINMENT, (C230)
90	ELECTRICAL CABLE	GENERAL ELECTRIC	SILICONE RUBBER/ASBESTOS BR,	CONTAINMENT, (C230)
91	ELECTRICAL CABLE	KERITE	HTK/HTFS	CONTAINMENT, (C230)
92	ELECTRICAL CABLE	OKONITE WIRE AND CABLE	PVC	CONTAINMENT, (C230)
93	ELECTRICAL CABLE	CONTINENTAL WIRE	SILICONE RUBBER/GLASS BR,	CONTAINMENT, (C230)
94	ELECTRIC MOTOR	GENERAL ELECTRIC	FJF	EAST PIPING PENETRATION ROOM, (A316
95	SOLENOID VALVE	DRACON	10222	WEST PENETRATION ROOM, (A224)
96	SOLENOID VALVE	DRACON	10222	CONTAINMENT, (C230)
97	ELECTRICAL CABLE	CERRO WIRE AND CABLE	SILICONE RUBBER/ASBESTOS BR,	CONTAINMENT, (C230)

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 1

EQUIPMENT 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, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 1

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

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.

X The Licensee has presented information which shows there are no outstanding qualification deficiencies.

X 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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 1

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	X
Qualified Life or Replacement Schedule Established (If Required)	X
Program Established to Identify Aging Degradation	X
Criteria Regarding Aging Simulation Satisfied (If Required)	X
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	X
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	X
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	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 1

LICENSEE RESPONSE TO NRC SER

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

3. 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.

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 1

NOTES:

References 27 and 28 are letters from ASCO and Tate Engineering, Inc., containing information regarding solenoid valve coil radiation resistance. The letters state that ASCO has irradiated class A, F and H coils up to 200 Mrd. through testing by outside laboratories. The following statement was made by ASCO in reference 27:

" 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."

It is noted that no test data was presented for review.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 1

NOTES:

Reference 4026 is a summary report of testing performed by Macmillan International Ones. on ASCO solenoid valves (model no's. WPHTX8320A21V and WPHT8300B61YF) and NAMCO limit switches (model no's. SL3 and EA-740).

The equipment was subjected to steam chemical spray exposure (310°F; 65 psig; 6% boric acid solution) for 23 hours. The solenoid valves were actuated and found to operate properly during testing although steam leaks were noted.

The equipment tested was not thermal or radiation aged and test data was not recorded throughout the test (ie. environmental parameters and equipment performance) or presented in the report.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 2

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

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:

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 2

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

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.

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
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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 2

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	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	
IV	Documentation Not Made Available	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 2

LICENSEE RESPONSE TO NRC SER

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

2. 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 2600 ppm.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 2

Checksheets 5a thru 5f have been removed due to the proprietary nature of information contained therein.

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

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	1a
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~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 3

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

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.

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 (nas/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
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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 3

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	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	
IV	Documentation Not Made Available	

See equipment item no. 2 for detailed evaluation.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 3

LICENSEE RESPONSE TO NRC SER

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

2. 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 2600 ppm.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 4

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

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	1a
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~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 4

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

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.

___ 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
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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 4

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

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

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.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 4

NOTES:

References 27 and 28 are letters from ASCO and Tate Engineering, Inc. containing information regarding solenoid valve coil radiation resistance. The letters state that ASCO has irradiated class A, F and H coils up to 200 Mrd. through testing by outside laboratories. The following statement was made by ASCO in reference 27:

"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."

It is noted that no test data was presented for review.

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)

(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	1a
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~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 5

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

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.

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 (nas/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
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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 5

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	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	____
IV	Documentation Not Made Available	____

See equipment item no. 2 for detailed evaluation.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 5

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.

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, 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	1a
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~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 6

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

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.

X The Licensee has presented information which shows there are no outstanding qualification deficiencies.

X 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 (nas/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
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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 6

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	X
Qualified Life or Replacement Schedule Established (If Required)	X
Program Established to Identify Aging Degradation	X
Criteria Regarding Aging Simulation Satisfied (If Required)	X
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	X
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	X
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	

See item 1 for evaluation

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 6

LICENSEE RESPONSE TO NRC SER

SV 4159, SV4160:

3. 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.

SV5465, SV5466, 5467:

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

SV 5291:

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 7

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
LICENSEE REFERENCE(S): 712
FUNCTION (PLANT ID): PURGE AIR SAMPLE ISOLATION 1CV5292 (1SV5292)
LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 251

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:

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 7

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

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.

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 (nas/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
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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 7

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	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	
IV	Documentation Not Made Available	

See equipment item no. 2 for detailed evaluation.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 7

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.

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]: 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), (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	1a
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~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 8

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

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.

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 (nas/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
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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 8

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	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	____
IV	Documentation Not Made Available	____

See equipment item no. 2 for detailed evaluation.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 8

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.

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), (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:

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 9

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

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.

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

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	
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.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. 10

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), (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:

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 10

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X Tne 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.

X The Licensee (has/~~has not~~) proposed a corrective actior for this equipment item whose qualification has not been fully establishei.

X Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.

X 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
X Other (Obtain further information or replace.)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

X 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
(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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 10

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
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	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	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 10

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.

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

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:

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 11

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

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.

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
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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 11

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	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	
IV	Documentation Not Made Available	

See equipment item no. 2 for detailed evaluation

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 11

LICENSEE RESPONSE TO NRC SER

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

2. 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 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, 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	1a
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~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 12

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

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.

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
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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 12

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	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	
IV	Documentation Not Made Available	

See equipment item no. 2 for detailed evaluation.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 12

LICENSEE RESPONSE TO NRC SER

1. The qualification test report referenced in the computer print-out specifies a demonstrated life of 4.4 years.

2. 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 REVIEW OF EQUIPMENT ITEM NO. 13

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

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	1a
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~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 13

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

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.

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 (nas/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
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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 13

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	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	
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, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
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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~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 14

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X 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
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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 14

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	
Adequate Similarity Between Equipment and Test Specimen Established	X
Aging Degradation Evaluated Adequately	X
Qualified Life or Replacement Schedule Established (If Required)	X
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	

See Evaluation on Page 5f.

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.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 14

NOTES: "X" DENOTES APPROPRIATE NOTES

X 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)

X 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 Licensee 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.

X 6. The Licensee has not identified the manufacturer of the motor-brake assembly (if applicable).

X 7. 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).

X 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:

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 14

NOTES:

A. In the licensee's response to the SER [12], it is stated that a "generic" test report will be available which identifies the non-metallic materials used within the MOV's and more directly provides bases for correlation to existing qualification test reports." This would translate into adequate similarity between the installed equipment and the test specimen being inadequate.

B. The licensee has also cited a correspondence with Limitorque dated 5-12-80 and 10-10-80, but these were not submitted for review. It is unknown whether they could provide the evidence necessary to establish similarity

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 1MOV6902 (1MOV6902)
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:

Contents	Checksheet Page No.
Equipment Item	1a
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~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 15

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X 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.

X The Licensee (~~has~~/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

X 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 (nas/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
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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 15

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	X
Adequate Similarity Between Equipment and Test Specimen Established	
Aging Degradation Evaluated Adequately	X
Qualified Life or Replacement Schedule Established (If Required)	X
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	

See Evaluation on Page 5f.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 15

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.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 15

NOTES: "X" DENOTES APPROPRIATE NOTES

X 1. 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.

X 3. The Licensee has not identified whether or not this motorized valve actuator incorporates a motor-brake assembly.

X 4. The Licensee 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.

X 6. The Licensee has not identified the manufacturer of the motor-brake assembly (if applicable).

X 7. 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).

X 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:

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 15

NOTES:

A. The licensee has identified qualification temperature as an outstanding item. Though a corrective action has not been specifically identified, the licensee has cited a letter to Bechtel dated 3-26-80 the contents of which are unknown since this letter was not submitted for review. This letter may be the initial phase in a search for additional information.

B. It is uncertain how applicable the response to the SER provided by the licensee is for this equipment item.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 16

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 1MOV6903 (1MOV6903)
LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 260
FUNCTION (PLANT ID): H2 PURGE ISOLATION 1MOV6901 (1MOV6901)
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:

Contents	Checksheet Page No.
Equipment Item	1a
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~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 16

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X 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 (nas/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
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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 16

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	
Adequate Similarity Between Equipment and Test Specimen Established	X
Aging Degradation Evaluated Adequately	X
Qualified Life or Replacement Schedule Established (If Required)	X
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	

See Evaluation on Page 5f.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 16

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.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 16

NOTES: "X" DENOTES APPROPRIATE NOTES

X 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)

X 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 Licensee 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.

X 6. The Licensee has not identified the manufacturer of the motor-brake assembly (if applicable).

X 7. 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).

X 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:

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 16

NOTES:

A. The licensee has cited correspondence with the manufacturer, however, this document was unavailable for review. The licensee's response to the SER (see pg 3a) would indicate that adequate similarity has not been established between the installed and tested equipment.

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 - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, (QT), 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	1a
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~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 17

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X 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/nas 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 (nas/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
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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 17

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	___
Adequate Similarity Between Equipment and Test Specimen Established	X
Aging Degradation Evaluated Adequately	X
Qualified Life or Replacement Schedule Established (If Required)	X
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	___

See Evaluation on Page 5f.

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.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 17

NOTES: "X" DENOTES APPROPRIATE NOTES

X 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)

X 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 Licensee 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.

X 6. The Licensee has not identified the manufacturer of the motor-brake assembly (if applicable).

X 7. 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).

X 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:

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 17

NOTES:

A. The licensee has cited correspondence with the manufacturer, however, this document was unavailable for review. The licensee's response to the SER (see pg. 3a would indicate that adequate similarity has not been established between the installed and tested equipment.

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 SMB00
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:

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 18

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X 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.

___ 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
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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 18

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	
Adequate Similarity Between Equipment and Test Specimen Established	X
Aging Degradation Evaluated Adequately	X
Qualified Life or Replacement Schedule Established (If Required)	X
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	

See Evaluation on Page 5f.

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.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 18

NOTES: "X" DENOTES APPROPRIATE NOTES

X 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)

X 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 Licensee 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.

X 6. The Licensee has not identified the manufacturer of the motor-brake assembly (if applicable).

X 7. 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).

X 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:

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 18

NOTES:

A. The licensee has cited correspondence with the manufacturer, however, these documents were unavailable for review. The licensee's response to the SER (see pg. 3a) would indicate that adequate similarity has not been established between the installed and tested equipment.

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, (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	1a
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~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 19

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X 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 (nas/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
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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 17

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	
Adequate Similarity Between Equipment and Test Specimen Established	X
Aging Degradation Evaluated Adequately	X
Qualified Life or Replacement Schedule Established (If Required)	X
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	

See Evaluation on PAGE 5f.

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-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.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 19

NOTES: "X" DENOTES APPROPRIATE NOTES

X 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).

X 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 Licensee 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.

X 6. The Licensee has not identified the manufacturer of the motor-brake assembly (if applicable).

X 7. 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).

X 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:

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 20

EQUIPMENT ITEM NO. 20
MOTORIZED VALVE 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

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	1a
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~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 20

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X Tne Licensee (has/~~has not~~) provided a response to the SER concerns.

X 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 (nas/nas 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
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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 20

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	
Adequate Similarity Between Equipment and Test Specimen Established	X
Aging Degradation Evaluated Adequately	X
Qualified Life or Replacement Schedule Established (If Required)	X
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	

See Evaluation on Page 5f.

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 outstanding items by the end of this year.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 20

NOTES: "X" DENOTES APPROPRIATE NOTES

X 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).

X 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 Licensee 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.

X 6. The Licensee has not identified the manufacturer of the motor-brake assembly (if applicable).

X 7. 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).

X 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:

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, (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	1a
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~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 21

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X Tne Licensee (has/~~has not~~) provided a response to the SER concerns.

X 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 (nas/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 (nas/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
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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 21

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	X
Adequate Similarity Between Equipment and Test Specimen Established	
Aging Degradation Evaluated Adequately	X
Qualified Life or Replacement Schedule Established (If Required)	X
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	

See Evaluation on Page 5f.

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.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 21

NOTES: "X" DENOTES APPROPRIATE 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.

X 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 Licensee 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.

X 6. The Licensee has not identified the manufacturer of the motor-brake assembly (if applicable).

X 7. 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).

X 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:

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 22

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

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	1a
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~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 22

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X 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 (nas/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
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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 22

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	
Adequate Similarity Between Equipment and Test Specimen Established	X
Aging Degradation Evaluated Adequately	X
Qualified Life or Replacement Schedule Established (If Required)	X
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	

See Evaluation on Page 5f.

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.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 22

NOTES: "X" DENOTES APPROPRIATE NOTES

X 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).

X 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 Licensee 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.

X 6. The Licensee has not identified the manufacturer of the motor-brake assembly (if applicable).

X 7. 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).

X 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:

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, (QM), RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 23

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X 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 (nas/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
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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 23

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	
Adequate Similarity Between Equipment and Test Specimen Established	X
Aging Degradation Evaluated Adequately	X
Qualified Life or Replacement Schedule Established (If Required)	X
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	

See Evaluation on Page 5f.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 23

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.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 23

NOTES: "X" DENOTES APPROPRIATE NOTES

X 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)

X 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 Licensee 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.

X 6. The Licensee has not identified the manufacturer of the motor-brake assembly (if applicable).

X 7. 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).

X 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:

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 23

NOTES:

A. The licensee has cited correspondence with Limitorque dated 5-12-80 & 10-10-80, however, this information was not submitted for review. Also, the licensee has stated that this is equipment was qualified by engineering analysis but has not provided this document for review

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, (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:

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 24

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X 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 (nas/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
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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 24

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	
Adequate Similarity Between Equipment and Test Specimen Established	X
Aging Degradation Evaluated Adequately	X
Qualified Life or Replacement Schedule Established (If Required)	X
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	

See Evaluation on Page 5f.

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.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 24

NOTES: "X" DENOTES APPROPRIATE NOTES

X 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).

X 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 Licensee 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.

X 6. The Licensee has not identified the manufacturer of the motor-brake assembly (if applicable).

X 7. 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).

X 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:

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 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

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:

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 25

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X 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
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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 25

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	
Adequate Similarity Between Equipment and Test Specimen Established	X
Aging Degradation Evaluated Adequately	X
Qualified Life or Replacement Schedule Established (If Required)	X
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	

See Evaluation on Page 5f.

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.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 25

NOTES: "X" DENOTES APPROPRIATE NOTES

X 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)

X 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 Licensee 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.

X 6. The Licensee has not identified the manufacturer of the motor-brake assembly (if applicable).

X 7. 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).

X 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:

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 25

NOTES:

A. The Licensee has cited correspondence with Limitorque but this information was not submitted for review. Also, the Licensee has stated that this equipment was qualified by engineering analysis, but this document has not been provided for review.

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, (QM), RPN, EXN, SEN, QI, RPS, None,
Not stated, Not applicable

This deficiency for 1MOV6900 only

LISTING OF APPLICABLE CHECKSHEETS:

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 26

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X 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.

___ 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
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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 26

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

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

See Evaluation on Page 5f.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 26

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.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 26

NOTES: "X" DENOTES APPROPRIATE NOTES

X 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)

X 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 Licensee 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.

X 6. The Licensee has not identified the manufacturer of the motor-brake assembly (if applicable).

X 7. 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).

X 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:

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 26

NOTES:

A. The licensee has also cited correspondence with Limitorque which may establish similarity between the installed equipment and the test specimens, however, this information was not available for review. In addition, a review of the licensee's System Component Evaluation Worksheet (SCEW) indicates that a multitude of deficiencies exist if the similarity is established. These deficiencies are: temperature, pressure, radiation & aging. The licensee has not identified these as outstanding items, nor have they proposed a corrective action other than that stated on Page 3A.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 27

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

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:

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 27

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X 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.

___ 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 (nas/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
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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 27

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

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

NP.	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	

See Evaluation on Page 5f.

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.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 27

NOTES: "X" DENOTES APPROPRIATE NOTES

X 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)

X 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 Licensee 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.

X 6. The Licensee has not identified the manufacturer of the motor-brake assembly (if applicable).

X 7. 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).

X 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:

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 27

NOTES:

A. The licensee has also cited correspondence with Limitorque which may establish similarity between the installed and tested equipment, however, this information was not submitted for review. In addition, a review of the licensee's System Component Evaluation Worksheet (SCEW) indicates that a multitude of deficiencies exist if the similarity is established. These deficiencies are: temperature, pressure, radiation & aging. The licensee has not identified these as outstanding items, nor have they proposed a corrective action other than that stated on page 3A.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 28

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

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:

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 28

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X 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 (nas/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
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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 28

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	
Adequate Similarity Between Equipment and Test Specimen Established	X
Aging Degradation Evaluated Adequately	X
Qualified Life or Replacement Schedule Established (If Required)	X
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	

See Evaluation on Page 5f.

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.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 28

NOTES: "X" DENOTES APPROPRIATE NOTES

X 1. The Licensee has not provided documentation from the manufacturer which establishes qualification. (NOTE A, B)

X 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 Licensee 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.

X 6. The Licensee has not identified the manufacturer of the motor-brake assembly (if applicable).

X 7. 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).

X 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:

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 28

NOTES:

A. The licensee has cited correspondence with Limitorque which may provided additional information concerning this equipment item, however, this information was not submitted for review.

B. The licensee has stated that this item is a,

"similar operator to MOV004"

MOV004 references PGR # 706 & # 662, but no similarity has been established

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

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	1a
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~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 29

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X 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.

___ 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 (nas/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
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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 29

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	
Adequate Similarity Between Equipment and Test Specimen Established	X
Aging Degradation Evaluated Adequately	X
Qualified Life or Replacement Schedule Established (If Required)	X
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	

See Evaluation on Page 5f.

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 materials used within their MOV's and more directly provides basis 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.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 29

NOTES: "X" DENOTES APPROPRIATE NOTES

X 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)

X 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 Licensee 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.

X 6. The Licensee has not identified the manufacturer of the motor-brake assembly (if applicable).

X 7. 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).

X 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:

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 29

NOTES:

A. The licensee has cited correspondence with Limitorque which may establish similarity between the installed and tested Equipment, however, this information was not submitted for review.

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, (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:

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 30

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X 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
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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 30

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	
Adequate Similarity Between Equipment and Test Specimen Established	X
Aging Degradation Evaluated Adequately	X
Qualified Life or Replacement Schedule Established (If Required)	X
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	

See Evaluation on Page 5f.

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.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 30

NOTES: "X" DENOTES APPROPRIATE NOTES

X 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)

X 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 Licensee 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.

X 6. The Licensee has not identified the manufacturer of the motor-brake assembly (if applicable).

X 7. 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).

X 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:

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 30

NOTES:

A. The Licensee has cited correspondence with Limitorque which may establish similarity between the installed and tested equipment, however, this information was not submitted for review.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 31

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

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	1a
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~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 31

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X 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 (nas/nas 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
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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 31

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	
Adequate Similarity Between Equipment and Test Specimen Established	X
Aging Degradation Evaluated Adequately	X
Qualified Life or Replacement Schedule Established (If Required)	X
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	

See Evaluation on Page 5f.

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.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 31

NOTES: "X" DENOTES APPROPRIATE NOTES

X 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)

X 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 Licensee 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.

X 6. The Licensee has not identified the manufacturer of the motor-brake assembly (if applicable).

X 7. 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).

X 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. 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.

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, (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	1a
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~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 32

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X 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
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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 32

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	
Adequate Similarity Between Equipment and Test Specimen Established	X
Aging Degradation Evaluated Adequately	X
Qualified Life or Replacement Schedule Established (If Required)	X
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	

See Evaluation on Page 5f.

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.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 32

NOTES: "X" DENOTES APPROPRIATE NOTES

X 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)

X 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 Licensee 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.

X 6. The Licensee has not identified the manufacturer of the motor-brake assembly (if applicable).

X 7. 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).

X 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:

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 32

NOTES:

A. 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.

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, (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	1a
Summary of Licensee Responses to the NRC SER	1b
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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~~
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 33

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X 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.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

X Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.

X 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
X Other (evaluate)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

X 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
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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 33

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	
Adequate Similarity Between Equipment and Test Specimen 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 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	

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.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 33

NOTES:

The licensee SCEW sheet describes the installed equipment as

EQUIPMENT DESCRIPTION

COMPONENT NUMBER
1FT322

COMPONENT
FLOW XMTR

MANUFACTURER
FISCHER PORTER

PART NUMBER
1052495(5)

the F&P report 2204-51-B-006 does not contain any information on radiation

Report F-C 2815 describes the tested equipment as follows

2. DESCRIPTION OF TEST

The test was initiated with three electronic force balance transmitter units, consisting of (1) an oscillator-amplifier module, (2) a detector coil assembly, and (3) a force motor. These transmitters are used on pressure transmitter models 1032GSO, 50EP1000, 50EN1000 and 50ER1000. To conserve space, the measuring 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.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 33

NOTES:

The Licensee has not established similarity between installed and tested equipment

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]: 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

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, 5i, 5j~~
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 34

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

___ Tne 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.

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
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

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	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)	—

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	—

Refer to pages 5f, 5g of item 33

EQUIPMENT 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
LICENSE 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

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	1a
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~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 35

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

___ 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.

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 (nas/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
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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 35

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	
Adequate Similarity Between Equipment and Test Specimen 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 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	

Refer to page 5 of 8 5-9 of Item 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, 1LT1123C, 1LT1123B, 1LT1123A)
LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 22 THROUGH 27
FUNCTION (PLANT ID): STEAM GENERATOR 11 LEVEL (1LT1111, 1LT1105, 1LT1113D, 1LT1113C, 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, (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.
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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	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 36

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X 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.

X The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.

X Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.

X Corrective action specified by the Licensee:

- X 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
(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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 36

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	X
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	X
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	

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.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 36

NOTES:

Qualification for steam-high temperature and pressure exposure has not been established. It appears that Report 2204-5L-B006 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 letter, Westinghouse has responded to NRC questions relative to Topical Report (WCAP-9157). Westinghouse has stated that Fischer & Porter transmitter type 10B2496 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.

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

LISTING OF APPLICABLE CHECKSHEETS:

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 37

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

___ 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.

X 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 (nas/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
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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 37

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
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	

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

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	1a
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~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 38

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

___ 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.

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
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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 38

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	X
Qualified Life or Replacement Schedule Established (If Required)	X
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	X
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

The licensee has not addressed aging or maintenance schedules for this item which has materials which are degradable.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 39

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

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:

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 39

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

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.

X The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.

- X Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.
- X Corrective action specified by the Licensee:
  - X 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.
- X 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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 39

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	X
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	X
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	

See Page 5+ item 36 for Evaluation

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.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 40

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 (1TE112CD, 1TE112CC, 1TE112CB, 1TE122CB, 1TE122CD, 1TE122CC, 1TE122CA, 1TE122HD, 1TE122HC, 1TE122HB, 1TE122HA, 1TE112CA, 1TE112HD, 1TE112HC, 1TE112HB, 1TE112HA)
LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 156 THROUGH 171

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:

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 40

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

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.

X The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

X Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

X Corrective action specified by the Licensee:

X 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.

X The Licensee (has/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action NEXT SCHEDULED OUTAGE.)

___ 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
(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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 40

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
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	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	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 40

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.

The Licensee's SCEW indicates that this equipment will be replaced during the "next scheduled outage".

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, (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:

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 41

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

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.

X The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.

X Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

- X 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.

X 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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 41

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	X
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	X
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	

Refer to page 5 of item 36 for evaluation

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.

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 PENETRATION ASSEMBLY (1ZEA4, 1ZWA6, 1ZWA3, 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 (1ZEE4, 1ZEE9, 1ZWE3, 1ZWE9)
LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 50, 51, 52, 53
FUNCTION (PLANT ID): CONTAINMENT PENETRATION ASSEMBLY (1ZEE1, 1ZEE7, 1ZWE1, 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)

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:

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 42

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

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.

X The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.

X Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.

X 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
X Other (evaluate.)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

X 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
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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 48

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	X
Qualified Life or Replacement Schedule Established (If Required)	X
Program Established to Identify Aging Degradation	X
Criteria Regarding Aging Simulation Satisfied (If Required)	—
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	X
o Peak Pressure Adequate	X
o Duration Adequate	X
o Required Profile Enveloped Adequately	—
o Steam Exposure (If Required) Adequate	—
Criteria Regarding Spray Satisfied	X
Criteria Regarding Submergence Satisfied	—
Criteria Regarding Radiation Satisfied	X
Criteria Regarding Test Sequence Satisfied	—
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	X
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	—

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 42

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.

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 WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO.)
EQUIPMENT DESCRIPTION			
Equipment Type	Electrical Penetration	Electrical Penetration	
Manufacturer's Name (5.2.2/-/-)	Amphenol	Amphenol	
Model Number (5.2.2/-/-)	Type 263	Type II and III	
Serial Number	N/A	Not Stated.	
Features/Mounting (5.2.6/-/-)	IN SHELL of Containment	Containment Penetration	
Connections/Interfaces (5.2.6/-/-)	Not Stated	not stated	
Location/Elevation	Containment/ VARIOUS	test chamber	
Equipment ID No.	see p-1a	N/A	
QUALIFICATION REPORT (8.0/5.0/5.0)			
Report ID Number	123-1252	123-1252	
Report Date	6/74	April 16, 1974	
Issued by	Amphenol	Amphenol	
Prepared for	Not Stated	Calvert Cliffs	
Referenced Reports		Not Stated	
Qualification Method (5.1, 5.3/2.1, 2.4/2.1, 2.4)		Test.	
QUALIFICATION TEST PROGRAM			
Functional Test Description (5.2.5/2.2.9/2.2.9)		maintain current & load	
Operating Conditions (-/2.2.10/2.2.10) Load/Cycles/Voltage/ Current/Freq.	Various	various	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 42

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0589-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO.)
Acceptance Criteria (5.2.5/2.2.1/2.2.1)	N/A	maintain electrical integrity & be leak free	
Accuracy (5.2.5/-/-)		Not stated	
Number of Specimens		2 to 6.	
Test Instruments Calibrated		Yes	
Safety Function (Active/ Passive) (-/2.1.3/2.1.3)	Not stated	Not Stated	
Test Duration (5.2.1/-/-)	N/A	~24 hrs	X Note 1
Accident Duration (Envir. Above Normal) (5.2.1/-/-)	5 to 7 days	N/A	
Required Function Time	Not stated	Not applicable	
Test Sequence (General) (5.2.3/2.3.1/2.3.1)	N/A	LOCA & radiation	Note 2.
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 (5.2.4, 7.0/4.0/4.0) Thermal Aging/Basis	Not Stated	Not Stated	X Note 3
Material Aging Evaluation (7.0/-/-)		Not performed	
Materials Susceptible (Thermal) (5.2.4, 7.0/-/-)			
Radiation Aging, Type			

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 42

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO.)
Radiation Aging, Dose (rd)	Not stated	See accident dose	
Radiation Aging, Dose Rate	↓	1.	
Radiation Aging, Method	N/A	Test	
Materials Susceptible (Radiation) (5.2.4, 7.0/-/-)	Not stated	none identified	
Operational Aging (-/4.2/-)	Not stated	fault current	
Other Age Conditioning (-/4.2/-)	N/A	Not stated	
Qualified Life Claimed/ Established (5.2.4/4.10/-)	Not stated	Not stated	X Note 3
Normal Ambient Temperature	Not stated	75°F	
Normal Ambient Radiation		Not stated	
Normal Ambient Humidity	↓	↓	
On-Going Surveillance and Preventive Maintenance (7.0/-/-)	Calvert Cliffs Program	N/A	
On-Going Analysis of Failures and Degradation (7.0/-/-)	↓	↓	
Margin (General) (6.0/3.0/3.0)	Not Stated	Not Stated	
Margin (NUREG-0588, Cat. I) (-/3.2/-)	↓	↓	
1. Temperature (+15°F)			
2. Pressure (+10%, 10 psig max)			
3. Radiation (not required)			
4. Time (+10%, +1 hour + function time minimum)			

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 42

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	
Radiation Type	Gamma	Gamma.	
Radiation Dose (rd) (4.1.2/1.4/1.4)	1×10^8	$6.122 + 01.03 \times 10^8$ Roentgen	X see Note 4
Radiation Dose Rate (rd/hr) Radiation Qual. Method (5.3.1/-/-)	Not Stated	Not stated Test	
Proximity to Concentrated Radiation (4.1.2/1.4.6/1.4.6)		N/A	
Equipment Susceptible to Beta Radiation (4.1.2/-/-)			
Radiation Dose (Normal + Accident) (4.1.2/-/-)			
Plateout Dose Considered (-/1.48/1.48)			
Gamma + Beta Dose (rd) (4.1.2/1.4.7/1.4.7)			

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 43

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	Not stated		
Peak: °F/psig/RH/Time	296/50/100/2h.	278-286/32-40/NO/15m.	X
Decrease To: °F/psig/RH/Time	195/10/100/N/h	260-270/22-25/NO/45m	Note 5
Decrease To: °F/psig/RH/Time	decrease to 140°F in 2d.	250-260/16-22/NO/23 h	
Decrease To: °F/psig/RH/Time	120 F in 2d.		
Equipment Surface Temperature (MSLB) (-/1.2.5.C, 2.2.6/1.2.5.C, 2.2.6)	N/A.	yes.	
Spray Qualification Method (5.3.2/1.3, 2.2.8/1.3, 2.2.8)	N/A	None	X Note 6
Spray Composition (4.1.4/1.3, 2.2.8/1.3, 2.2.8)	0.2% boric acid	None	X Note 6
Spray Density (gpm/ft^2)	none	None	
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)			

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 43

NOTES:

1. The test duration does not envelop the accident duration and no evaluation of the discrepancy was provided.

2. The test report indicates the following sequence.

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TABLE VI

TEST SEQUENCE

TEST	MODULE M NO.										
Individual Modules	II	III	IV	V	VI	VII	VIII	IX	X	XI	XI
Weight & Dimensions	X	X	X	X	X	X	X	X	X	X	X
He Leak Test	X	X	X	X	X	X	X	X	X	X	X
Dielectric	X	X	X	X	X	X	X	X	X	X	X
IR	X	X	X	X	X	X	X	X	X	X	X
Continuity	X	X	X	X	X	X	X	X	X	X	X
Radiation	X	X	X	X	X	X					
Weight & Dimensions	X	X	X	X	X	X					
He Leak Test	X	X	X	X	X	X					
Dielectric	X	X	X	X	X	X					
IR	X	X	X	X	X	X					
Continuity	X	X	X	X	X	X					
Assembled As Complete Penetration											
He Leak Test	X	X	X	X	X	X	X	X	X	X	X
Dielectric	X	X	X	X	X	X	X	X	X	X	X
IR	X	X	X	X	X	X	X	X	X	X	X
Continuity	X	X	X	X	X	X	X	X	X	X	X
Contact Resistance	X	X	X	X	X	X	X		X	X	X
N_2 Over Pressure	X	X	X	X	X	X	X		X	X	X
Environmental	X	X	X	X	X	X	X		X	X	X
IR (During Env.Test)	X	X	X	X	X	X	X		X	X	X
IR(After Env.Test)	X	X	X	X	X	X	X		X	X	X
Dielectric	X	X	X	X	X	X	X		X	X	X
Continuity	X	X	X	X	X	X	X		X	X	X
He Leak Test	X	X		X			X		X	X	X
Short Circuit	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
Continuity	X	X		X			X		X	X	X

* Failed He Leak Test - Pits on Sealing Surface
Replaced in Assembly with Bla..k.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 42

NOTES:

3. although the penetrations contain materials which are subject to age related degradation (see table 2 below) no preaging or aging evaluation has been conducted and no qualified life estimate has been established.

TABLE II

IRRADIATION SAMPLES

ITEM NO.	PART DESCRIPTION	Nominal Elevation from Bottom of Cannister (Inches)	Nominal Radiation Dose Rate (R/Hr x 10^6)	Nominal Total RAD Dose (R x 10^8) (Roentgens) [4]
1	Polyurethane O-ring (on H.B. Module II	4.94	2.20	1.034
2	Omniseal C-Seal w/spring (on HB Module III))	2.81	2.12	0.996
3.	Ethylene Propolene O-ring (on HB Module IV)	7.06	1.94	0.912
4.	Molydisulphide C-seal w/o-ring (on HB Module V)	9.19	1.51	0.710
5.	Tech seal C-seal w/spring (on HB Module VII	0.69	1.30	0.611
6.	Silicone O-ring (Module size)	UNK	0.26	0.122
7.	Ethylene Propolene O-ring (Module size)	UNK	0.26	0.122
8	Silicone O-ring(12" Hdr. Plt. size)	17	0.26	0.122
9.	Ethylene Propolene O-ring(12" Hdr. Plt. size)	17	0.26	0.122
10.	Module Grommet (LOFT 2 5/16"x 1 1/8")	16	0.30	0.141
11.	Silicone Rubber Boot	UNK	0.26	0.122
12.	AWG # 1/0 Copper Contact	1.5	1.74	0.818
13.	Cad Plated Bolt	1.5	1.74	0.818
14.	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
20.	Araldite 6005 epoxy, 9130 hardner with Novacite #1250 Filler	UNK	0.26	0.122
21	Tensile Specimens	6.0	1.94	0.987

*Where actual location of sample in Test cannister was not recorded, "UNK" is indicated and the minimum RAD dose is specified although a considerably higher RAD dose may have been encountered ** (See Table I)

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 43

NOTES:

Note 4: as can be seen from the information contained in Table II (reproduced on pg 5-9) most of the parts did not receive the same dose. furthermore the dose was given in Roentgens not Rads and the licensee has not converted the dose information

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 1.03×10^8 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.

Note 5. the peak temperature and peak pressure were not enveloped and the test duration is not adequate to envelop the accident condition. No justification was provided by the licensee

Note 6. Boric acid was mixed & boiled to make steam. No spray was used.

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

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	1a
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~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 43

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

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.

X The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.

- X Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.
- X 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
  - X Other (Equipment assessment/evaluation)
- ___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
- X 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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 43

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
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	

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.

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 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:

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 44

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

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.

X The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.

- X Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.
- X 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
  - X Other (equipment assessment/evaluation)
- ___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
- X 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
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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 44

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
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	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 44

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.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 45

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

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	1a
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~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 45

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

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.

X The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.

- X Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.
- X 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
  - X Other (equipment assessment/evaluation)
- ___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
- X 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
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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 45

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
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	

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.

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, (VT) (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	1a
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~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 46

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

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.

X The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.

X Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.

X 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
X Other (equipment assessment/evaluation)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

X 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
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

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	X
Qualified Life or Replacement Schedule Established (If Required)	X
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	X
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	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 46

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.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 46

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW

Criteria: DOR Guidelines X ; NUREG-0588, Cat. I ___ ; NUREG-0588, Cat. II ___.

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO.)
EQUIPMENT DESCRIPTION			
Equipment Type	Electric motor	Electric motor	
Manufacturer's Name (5.2.2/-/-)	Reliance	Reliance	
Model Number (5.2.2/-/-)	X32727A1AW	Frame 5005,	
Serial Number	N.D	not stated	
Features/Mounting (5.2.6/-/-)	↓	150/75 Hp	
Connections/Interfaces (5.2.6/-/-)	↓	not stated	
Location/Elevation	Containment		
Equipment ID No.	(1,2)MB-114 -414 -402 -102		
QUALIFICATION REPORT (8.0/5.0/5.0)			
Report ID Number	PSR31, 32, 33	Rep 288	
Report Date	4/7/73	April 7, 1973	
Issued by	American Air Filter Co.	American Air Filter Company	
Prepared for	not stated	Bechtel Assoc.	
Referenced Reports	not stated	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.D	motor operation during environmental test	
Operating Conditions (-/2.2.10/2.2.10) Load/Cycles/Voltage/ Current/Freq.	↓	N.D.	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 46

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO.)
Acceptance Criteria (5.2.5/2.2.1/2.2.1)	N/A	not stated	
Accuracy (5.2.5/-/-)		N.D.	
Number of Specimens		1	
Test Instruments Calibrated		not stated	
Safety Function (Active/ Passive) (-/2.1.3/2.1.3)	Active	Active	
Test Duration (5.2.1/-/-)	15 hrs.	3hr/4-24hr/1 week	
Accident Duration (Envir. Above Normal) (5.2.1/-/-)	27 hrs.		
Required Function Time	8 hrs.		
Test Sequence (General) (5.2.3/2.3.1/2.3.1)		preage (separate tests) DBE	
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 (5.2.4, 7.0/4.0/4.0) Thermal Aging/Basis	N.D.	IEEE Guide NEG/ICS/SC-2-A	X Note 1
Material Aging Evaluation (7.0/-/-)		not stated	
Materials Susceptible (Thermal) (5.2.4, 7.0/-/-)		not stated	
Radiation Aging, Type	N.D.	γ, β (Analysis)	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 46

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO.)
Radiation Aging, Dose (rd)	100E6	1.9×10^8 R (Analysis)	X Note 2
Radiation Aging, Dose Rate	N.D.		
Radiation Aging, Method	N.D.	Analysis	
Materials Susceptible (Radiation) (5.2.4, 7.0/-/-)	not stated	all non-metallics	
Operational Aging (-/4.2/-)	N.D.	7 days at 10 psig/200°F	
Other Age Conditioning (-/4.2/-)		not stated	
Qualified Life Claimed/ Established (5.2.4/4.10/-)	None	not stated	
Normal Ambient Temperature Normal Ambient Radiation Normal Ambient Humidity			
On-Going Surveillance and Preventive Maintenance (7.0/-/-)	N.D		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) 2. Pressure (+10%, 10 psig max) 3. Radiation (not required) 4. Time (+10%, +1 hour + function time minimum)			

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 46

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	γ	see aging	
Radiation Dose (rd) (4.1.2/1.4/1.4)	100 E06R	↓	
Radiation Dose Rate (rd/hr) Radiation Qual. Method (5.3.1/-/-)	not stated ↓	↓	
Proximity to Concentrated Radiation (4.1.2/1.4.6/1.4.6)		not stated	
Equipment Susceptible to Beta Radiation (4.1.2/-/-)		not stated	
Radiation Dose (Normal + Accident) (4.1.2/-/-)	100E06R	1.9×10^8R (analysis)	X Note 2
Plateout Dose Considered (-/1.48/1.48)		NO	
Gamma + Beta Dose (rd) (4.1.2/1.4.7/1.4.7)	100E06R	1.9×10^8R (analysis)	X Note 2

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 46

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/42psig ~~[illegible]~~	not stated	
Peak: °F/psig/RH/Time	275/46/100/37sec	300/75/100%/3hr and 4-2hr.	
Decrease To: °F/psig/RH/Time	RT/4/13.9hrs		
~~Decrease~~ Rise To: °F/psig/RH/Time	190°F/13psig/100%/16.7hrs.		
Decrease To: °F/psig/RH/Time	RT/4/27hrs.		
Equipment Surface Temperature (MSLB) (-/1.2.5.C, 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 (4.1.4/1.3, 2.2.8/1.3, 2.2.8)	.28% (Composition?)	not stated	X Note
Spray Density (gpm/ft^2)	N.D	not	
Spray Duration	N.D	not stated	
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)			

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 46

NOTES:

Three motors require qualification for steam/pressure, chemical spray and radiation exposure in addition to aging (thermal).

Note 1: PSR #32 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 does it determine a qualified life based on the test. In addition the submitted report stated that after 48 hours of "no load" operation during the aging cycle "an increase in noise and vibration level was noted." The report stated that this was caused by a "loss of lubricant". 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 or the bearing grease. In addition it is not clear if the motor to lead splice materials were addressed.

Note 3: No replacement schedules were given for components with expected lives less than the estimated plant life. (motor grease etc.)

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 46

NOTES:

Note 4: The composition and duration of the chemical spray was not stated. It is noted that the test was designed around the referenced IEEE Guide although the composition was not specifically stated.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 47

EQUIPMENT ITEM NO. 47
ELECTRIC MOTOR LOCATED IN THE ECCS PUMP 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, 11]: 183
FUNCTION (PLANT ID): CONTAINMENT SPRAY PUMP 12 (1MA407)
LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 184

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:

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 47

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

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.

X The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.

X Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.

X 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
X Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

X The Licensee (~~has~~/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action Equipment assessment/evaluation.)

___ 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
I.b Modification
(I.c) Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 47

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
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	

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.

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]: 195

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:

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 48

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

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.

X The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.

- X Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.
- X 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
  - X Other (equipment assessment/evaluation)
- ___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
- X 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
(I.c) Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 48

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
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 Fnveloped 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	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 48

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.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 49

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]: 31

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	1a
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~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

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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. 49

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

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.

X The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.

- X Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.
- X 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
  - X Other (Equipment assessment/evaluation)
- ___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
- X 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
(I.a) Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 49

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	X
Qualified Life or Replacement Schedule Established (If Required)	X
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	X
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	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 49

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.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 49

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW

Criteria: DOR Guidelines X ; NUREG-0588, Cat. I___; NUREG-0588, Cat. II ___.

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO.)
EQUIPMENT DESCRIPTION			
Equipment Type	Electric motor	Electric motor	
Manufacturer's Name (5.2.2/-/-)	Reliance	Reliance	
Model Number (5.2.2/-/-)	X323727A1AW	Frame 5005,	
Serial Number	N.D	not stated	
Features/Mounting (5.2.6/-/-)	↓	150/75 Hp	
Connections/Interfaces (5.2.6/-/-)	↓	not stated	
Location/Elevation	Containment		
Equipment ID No.	(1,2)MB-105 -405 -121 -121		
QUALIFICATION REPORT (8.0/5.0/5.0)			
Report ID Number	PSR31,32,33	Rep 288	
Report Date	4/7/72	April 7, 1973	
Issued by	American Air Filter Co.	American Air Filter Company	
Prepared for	not stated	Bechtel Assoc.	
Referenced Reports	not stated	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.D	Motor operation during environmental test	
Operating Conditions (-/2.2.10/2.2.10) Load/Cycles/Voltage/ Current/Freq.	↓	N. D.	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 49

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO.)
Acceptance Criteria (5.2.5/2.2.1/2.2.1)	N/A	not stated	
Accuracy (5.2.5/-/-)		N.D.	
Number of Specimens		1	
Test Instruments Calibrated		not stated	
Safety Function (Active/ Passive) (-/2.1.3/2.1.3)	Active	Active	
Test Duration (5.2.1/-/-)	15 hrs.	3hr/4-2hr/1 week	
Accident Duration (Envir. Above Normal) (5.2.1/-/-)	27 hrs.		
Required Function Time	8 hrs.		
Test Sequence (General) (5.2.3/2.3.1/2.3.1)		preage (separate tests) DBE	
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 (5.2.4, 7.0/4.0/4.0) Thermal Aging/Basis	N.D.	IEEE Guide N660/ICS/SC-2-A	X Note 1
Material Aging Evaluation (7.0/-/-)		not stated	
Materials Susceptible (Thermal) (5.2.4, 7.0/-/-)		not stated	
Radiation Aging, Type	N.D.	γ, β (Analysis)	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 49

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO.)
Radiation Aging, Dose (rd)	100E6	1.9×10^8 R (Analysis)	X Note 2
Radiation Aging, Dose Rate	N.D.		
Radiation Aging, Method	N.D.	Analysis	
Materials Susceptible (Radiation) (5.2.4, 7.0/-/-)	not stated	all non-metallics	
Operational Aging (-/4.2/-)	N.D.	7 days at 10 psig/200°F	
Other Age Conditioning (-/4.2/-)		not stated	
Qualified Life Claimed/ Established (5.2.4/4.10/-)	None	not stated	
Normal Ambient Temperature Normal Ambient Radiation Normal Ambient Humidity			
On-Going Surveillance and Preventive Maintenance (7.0/-/-)	N.D		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) 2. Pressure (+10%, 10 psig max) 3. Radiation (not required) 4. Time (+10%, +1 hour + function time minimum)			

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 49

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	γ	see aging	
Radiation Dose (rd) (4.1.2/1.4/1.4)	100 E06R	↓	
Radiation Dose Rate (rd/hr)	not stated		
Radiation Qual. Method (5.3.1/-/-)	↓	↓	
Proximity to Concentrated Radiation (4.1.2/1.4.6/1.4.6)		not stated	
Equipment Susceptible to Beta Radiation (4.1.2/-/-)		not stated	
Radiation Dose (Normal + Accident) (4.1.2/-/-)	100E06R	1.9×10^9R (analysis)	X Note 2
Plateout Dose Considered (-/1.48/1.48)		NO	
Gamma + Beta Dose (rd) (4.1.2/1.4.7/1.4.7)	100E06R	1.9×10^9R (analysis)	X Note 2

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 4

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/42psig ~~[illegible]~~	not stated	
Peak: °F/psig/RH/Time	275/46/100/37sec	300/75/100%/3hr and 4-2hr.	
Decrease To: °F/psig/RH/Time	RT/4/13.9hrs		
~~Decrease~~ Rise To: °F/psig/RH/Time	190°F/13psig/100%/16.7hrs.		
Decrease To: °F/psig/RH/Time	RT/4/27hrs.		
Equipment Surface Temperature (MSLB) (-/1.2.5.C, 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 (4.1.4/1.3, 2.2.8/1.3, 2.2.8)	28% (Composition?)	not stated	x Note
Spray Density (gpm/ft^2)	N.D	not	
Spray Duration	N.D	not stated	
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)			

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 42

NOTES:

Three motors require qualification for steam/pressure, chemical spray and radiation exposure in addition to aging (thermal).

Note 1: PSR #32 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 does it determine a qualified life based on the test. In addition the submitted report stated that after 49 hours of "no load" operation during the aging cycle "an increase in noise and vibration level was noted." The report stated that this was caused by a "loss of lubricant". 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 or the bearing grease. In addition it is not clear if the motor to lead splice materials were addressed.

Note 3: No replacement schedules were given for components with expected lives less than the estimated plant life. (motor grease etc.)

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 49

NOTES:

Note 4: The composition and duration of the chemical spray was not stated. It is noted that the test was designed around the referenced IEEE Guide although the composition was not specifically stated.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 50

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

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:

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 50

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

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.

X The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.

X Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.

X 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
X Other (equipment assessment/evaluation)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

X 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
I.b Modification
(I.c) Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 50

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
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	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 50

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.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 51

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 CHANBER 1NI001(F) (1NI001(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, (QT), (RT), P, (H), (CS), (A), S, (R), M, I, (M), RPN, EXN, SEN, QI, RPS, ~~One~~,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	1a
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~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 51

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

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.

___ 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 _____.)

X 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
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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 51

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	X
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

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.

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 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 has been exempted by NRC.

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 (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

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	1a
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~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 52

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X 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.

X The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.

X Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.

X 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
X 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.

X The Licensee (nas/~~has not~~) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action Completion by first QUARTER of 1982 (UNIT 1).)

___ 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
~~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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 52

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
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 Developed Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Specimen Qualified	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequences 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 + Extension 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	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 52

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. 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 NUREG 0588 requirements. This system extends the containment radiation monitoring capability over a range of 10^0 to 10^3 R/hr. The existing Westinghouse containment monitors are being assessed/ evaluated for normal containment conditions as initially intended in the FSAR.

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 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 safety-related 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.

This plant is a PWR X, BWR ____.
The NSSS Vendor is Westinghouse (W) ____, Babcox & Wilcox (B&W) ____,
Combustion Engineering (CE) X, General Electric (GE) ____.

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 Guidelines) 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.

X 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

X II.F.1.3 Hi range radiation monitor.

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 1NI004(P) (1NI004(P))
LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 150
FUNCTION (PLANT ID): PROPORTIONAL COUNTER 1NI003(P) (1NI003(P))
LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 149
FUNCTION (PLANT ID): PROPORTIONAL COUNTER 1NI002(P) (1NI002(P))
LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 148
FUNCTION (PLANT ID): PROPORTIONAL COUNTER 1NI001(P) (1NI001(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, (QM), RPN, EXN, SEN, QI, RAS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	1a
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~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 53

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

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.

___ 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 _____.)

X 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
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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 553

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	X
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

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.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 53

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.

This equipment has been exempted by NRC

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), (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	1a
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~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 54

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

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.

___ 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 _____.)

X 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
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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 54

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	X
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

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.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 54

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.

The equipment has been exempted by NRC

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 (1Q08)
LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 254
FUNCTION (PLANT ID): HYDROGEN COMBINER 12 (1Q09)
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:

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 55

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

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.

X The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.

X Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.

X 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
X Other (equipment assessment/evaluation)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

X 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
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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 55

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
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	

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.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 55

NOTES:

These heaters require qualification for steam/pressure radiation and chemical spray exposure in addition to thermal aging. The licensee has referenced WCAP-7709-L as evidence of qualification. This report does not however contain any discussions or data of environmental testing of these devices and cannot be construed as evidence of qualification. These items are therefore categorized IIa. Qualification not established.

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), (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:

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 5a

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

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.

X 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 (nas/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
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

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 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	

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.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 56

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.

This equipment (nuclear instrumentation) has been exempted from qualification by NRC and This has been noted by The Licensee in PSR # [18].

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 57

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

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

(R), (T), (VT), (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	1a
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~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 57

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

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.

X 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 (nas/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
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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 57

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	X
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 57

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.

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-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.

This equipment (nuclear instrumentation) has been exempted by the NRC from qualification and this has been noted by the Licensee in PSR # [18].

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, (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	1a
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~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 58

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X 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.

X The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.

X Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.

X 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
X Other (evaluation)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

X 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
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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. [redacted]

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
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	

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.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM 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.

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:

Contents	Checksheet Page No.
Equipment Item	1a
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~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 59

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

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.

X The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.

X Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.

X 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
X Other (evaluate.)

___ 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
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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 59

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
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	

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.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 60

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

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	1a
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~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 62

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

___ 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.

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)
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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 60

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	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	____
IV	Documentation Not Made Available	____

The environmental parameters are enveloped by the test by a wide margin.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 60

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	GAMMA	GAMMA	
Radiation Dose (rd) (4.1.2/1.4/1.4)	2.97×10^5	200 Mrd.	
Radiation Dose Rate (rd/hr) Radiation Qual. Method (5.3.1/-/-)	NOT STATED	0.62 Mrd/h	
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/-/-)	2.97×10^5		
Plateout Dose Considered (-/1.48/1.48)	-		
Gamma + Beta Dose (rd) (4.1.2/1.4.7/1.4.7)	-		

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 60

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	160/2.6/ND	SLB/LOCA GROUP I PROFILE	
Peak: °F/psig/RH/Time		475*/75/100/2 MIN.	
Decrease To: °F/psig/RH/Time		375/70/100/4 MIN.	
Decrease To: °F/psig/RH/Time		350/115/100/2.6 HR	
Decrease To: °F/psig/RH/Time		340/85/100/9 HR	
		300/70/100/12 HR	
		* 425 FOR GROUP II PROFILE	
Equipment Surface Temperature (MSLB) (-/1.2.5.C, 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 (4.1.3/1.3, 2.2.8/1.3, 2.2.8)	NA	0.28 m H_3BO_3 (3000 ppm boron)	
Spray Density (gpm/ft^2)	—	0.064m $Na_2S_2O_4$ NaOH pH = 10.5	
Spray Duration	NOT STATED	0.15 gpm/sq ft.	
Submergence Duration (4.1.3/2.2.5/2.2.5)	NA	~24 hr.	
In-Leakage Considered (5.2.6, 5.3.2/-/-)	—	—	
Time to Submergence	—	—	
Dust Environment (-/2.2.11/2.2.11)	—	—	

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 (PLANT 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, (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	1a
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~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 61

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X 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.

X The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.

X Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.

X 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
X Other (evaluate)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/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
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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 61

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
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	

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 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.

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:

Contents	Checksheet Page No.
Equipment Item	1a
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Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	~~3a, 3b, 3c, 3i~~
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~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 62

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

___ 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.

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 nsee 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)
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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 62

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	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	
IV	Documentation Not Made Available	

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 WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO.)
EQUIPMENT DESCRIPTION Equipment Type	TERMINAL BLOCK	TERMINAL BLOCK	
Manufacturer's Name (5.2.2/-/-)	WEIDMULLER	WEIDMULLER	
Model Number (5.2.2/-/-)	SAK	SAK 4 SAK 6N SAK 10	
Serial Number			
Features/Mounting (5.2.6/-/-)	NOT STATED	HOFFMAN NEMA-4 ENCLOSURE	
Connections/Interfaces (5.2.6/-/-)	NOT STATED	G.E. XLPE VULKENE type XHHW S1580531 #12AWG, 600V	
Location/Elevation	INSIDE CONTAINMENT		
Equipment ID No.			
QUALIFICATION REPORT (8.0/5.0/5.0) Report ID Number	F-C5205-3	F-C5205-3	
Report Date		OCTOBER 1979	
Issued by	FIRL	FIRL	
Prepared for		WEIDMULLER TERMINATIONS INC.	
Referenced Reports			
Qualification Method (5.1, 5.3/2.1, 2.4/2.1, 2.4)		TEST	
QUALIFICATION TEST PROGRAM Functional Test Description (5.2.5/2.2.9/2.2.9)		I.R. MEASUREMENTS (1MIN., 500 VDC)	
Operating Conditions (-/2.2.10/2.2.10) Load/Cycles/Voltage/ Current/Freq.		600 VAC; 150 VAC during spray exposure due to excessive leakage current	NOTE 1

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 62

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-1/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO.)
Acceptance Criteria (5.2.5/2.2.1/2.2.1)	N/A	MAINTAIN 600V potential 20A current without exceeding 1.0A leakag current	
Accuracy (5.2.5/-/-)			
Number of Specimens		5 ASSEMBLIES EACH CONTAININ 5 TERMINAL BLOCKS	
Test Instruments Calibrated		yes	
Safety Function (Active/ Passive) (-/2.1.3/2.1.3)	CABLE TERMINATION		
Test Duration (5.2.1/-/-)	N/A	~29 HR.	
Accident Duration (Envir. Above Normal) (5.2.1/-/-)	~24 HR.		
Required Function Time	Not stated		
Test Sequence (General) (5.2.3/2.3.1/2.3.1)	N/A	TA/RAD/SEIS/STM+CHSP	
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 (5.2.4, 7.0/4.0/4.0) Thermal Aging/Basis	40 years	7 days @ 140°C 40 yr @ 70°C	
Material Aging Evaluation (7.0/-/-)			
Materials Susceptible (Thermal) (5.2.4, 7.0/-/-)			
Radiation Aging, Type		GAMMA	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 62

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO.)
Radiation Aging, Dose (rd)	Not stated	See Accident Dose	
Radiation Aging, Dose Rate	↓		
Radiation Aging, Method			
Materials Susceptible (Radiation) (5.2.4, 7.0/-/-)			
Operational Aging (-/4.2/-)			
Other Age Conditioning (-/4.2/-)		Vibration Aging & Seismic Testing	
Qualified Life Claimed/ Established (5.2.4/4.10/-)	40 years	40 YEARS AT 70 °C	
Normal Ambient Temperature	Not stated		
Normal Ambient Radiation	↓		
Normal Ambient Humidity			
On-Going Surveillance and Preventive Maintenance (7.0/-/-)	Calvert Cliffs Program		
On-Going Analysis of Failures and Degradation (7.0/-/-)	↓		
Margin (General) (6.0/3.0/3.0)	N/A	Not stated	
Margin (NUREG-0588, Cat. I) (-/3.2/-) 1. Temperature (+15°F) 2. Pressure (+10%, 10 psig max) 3. Radiation (not required) 4. Time (+10%, +1 hour + function time minimum)	↓	↓	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 62

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0586-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	
Radiation Dose (rd) (4.1.2/1.4/1.4)	1.0×10^8	200 Mrd.	
Radiation Dose Rate (rd/hr) Radiation Qual. Method (5.3.1/-/-)	NOT STATED	0.62 Mrd/h	
Proximity to Concentrated Radiation (4.1.2/1.4.6/1.4.6)		N/A	
Equipment Susceptible to Beta Radiation (4.1.2/-/-)			
Radiation Dose (Normal + Accident) (4.1.2/-/-)	1.0×10^8 rd.		
Plateout Dose Considered (-/1.48/1.48)	-		
Gamma + Beta Dose (rd) (4.1.2/1.4.7/1.4.7)	-		

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 62

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		SLB/LOCA GROUP I PROFILE	
Peak: °F/psig/RH/Time	296/50/100/2H	475*/75/100/2 MIN.	
Decrease To: °F/psig/RH/Time	195/14/100/10H	375/70/100/4 MIN.	
Decrease To: °F/psig/RH/Time	decrease to 7.140 in 5 day	350/110/100/2.6 HR	
Decrease To: °F/psig/RH/Time	120 in 7 days	340/85/100/9 HR	
		300/70/100/12 HR	
		* 425 FOR GROUP II PROFILE	
Equipment Surface Temperature (MSLB) (-/1.2.5.C, 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 (4.1.4/1.3, 2.2.8/1.3, 2.2.8)	0.28% Boric acid	0.28 m H_3BO_3 (3000 ppm boron) 0.064m $Na_2S_2O_4$ NaOH pH = 10.5	
Spray Density (gpm/ft^2)	—	0.15 gpm/sq ft.	
Spray Duration	NOT STATED	~24 hr.	
Submergence Duration (4.1.3/2.2.5/2.2.5)	NA —		
In-Leakage Considered (5.2.6, 5.3.2/-/-)	—	—	
Time to Submergence	—	—	
Dust Environment (-/2.2.11/2.2.11)	—	—	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 62

NOTES:

1. The report made the following statement with respect to the anomaly noted:

"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 XL2E-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 80°F (27°C)) and the prevailing vessel conditions of approximately 300°F (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°F (93°C)). Because many of the heat-shrinkable tubings were cracked, it is believed that the splice performance was contributing to the large leakage currents, but the healing mechanism is not presently understood."

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 63

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

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:

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 63

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

___ 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.

_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
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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 63

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	___
II..a	Equipment Exempt From Qualification	___
III.b	Equipment Not in the Scope of the Qualification Review	X
IV	Documentation Not Made Available	___

This item is merely an enclosure for electrical equipment which is evaluated elsewhere in this TER

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:

Contents	Checksheet Page No.
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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	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 64

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

___ 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.

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
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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 64

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.b	Equipment Not in the Scope of the Qualification Review	X
IV	Documentation Not Made Available	

This equipment is only an enclosure for equipment evaluated elsewhere in this TER.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 65

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

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	1a
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~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 65

SUMMARY OF LICENSEE RESPONSES TO THE NRC SEP - ONLY CHECKED ITEMS ARE APPLICABLE:

___ 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.

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
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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 65

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.b	Equipment Not in the Scope of the Qualification Review	X
IV	Documentation Not Made Available	

This equipment is the enclosure for electrical equipment which is evaluated elsewhere in this task.

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, (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	1a
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~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 66

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X 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.

X The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.

- X Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.
- X 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
  - X Other (evaluation)
- ___ 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
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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 66

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
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	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 66

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.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 66

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.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 67

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, (QM), RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	1a
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~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 67

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

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.

X The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.

X Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.

X 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
X Other (Evaluation)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/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
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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 67

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
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	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 67

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.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 68

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

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	1a
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~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 68

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

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.

X The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.

X Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.

X 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
X Other (EVALUATION)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

X 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
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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 68

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	X
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

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.

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

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.

This equipment item (nuclear instrumentation) has been exempted from qualification by NRC and has been noted by The Licensee in PSR # [18].

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 - 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	1a
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~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 69

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

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.

X The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.

- X Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.
- X 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
  - X Other Tion
- ___ The Licensee ... ded other information for this equipment item that can be co...ed as a basis for justification for interim operation.
- X 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
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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 69

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	X
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

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.

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)

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).

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM 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 SUBMITTAL: 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	1a
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~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 78

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

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.

___ 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 (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

X 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
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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 70

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	X
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 70

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.

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 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 has been exempted by NRC.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 20

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.

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), (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	1a
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~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 71

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X Tne 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.

X The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.

X Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.

X Correcti 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
X Other (EVALUATION)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

X The Licensee (~~has/has not~~ 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
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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 71

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	X
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 71

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.

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

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.

This equipment item (nuclear instrumentation) has been exempt by NRC ~~and has~~ from qualification and has been noted by the Licensee in PSR # (18).

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 72

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

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	1a
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~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 72

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

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.

X The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.

X Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.

X 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
X Other (EVALUATION)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

X The Licensee (~~has/has not~~ 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
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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 72

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	X
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

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.

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-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.

This equipment item (nuclear instrumentation) was exempt by NRC from qualification and has been noted by The Licensee in PSR # 18.

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	1a
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~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 73

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X 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.

X The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.

X Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.

X 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
X 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.

X The Licensee (has/~~has not~~) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action END of 1981 - NO Specific DATE.)

___ 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
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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 73

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	X
Adequate Similarity Between Equipment and Test Specimen 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 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	

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.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 73

The Licensee has not presented sufficient information to establish equivalence between the cable tested and the installed cable (see 5g.&5f) as required by DOR Guidelines and/or IEEE-383-74

2. Test Specimen - The test specimen should be the same model as the equipment being qualified. The type test should only be considered valid for equipment identical in design and material construction to the test specimen. Any deviations should be evaluated as part of the qualification documentation (see also Section 8.0 below).

2.2 Type Test Samples. The samples tested should contain the conductor, insulation, fillers, jacket, binder tape, overall jacket, shielding, and field splices which are representative of the cable category being qualified. Table 1 lists sizes which have been considered representative of these categories. The sample lengths should be sufficient to permit reliable test readings and evaluation consistent with good testing practice.

ELECTRIC CABLES, FIELD SPLICES, AND CONNECTIONS — IEEE Std 383-1974

Table 1
Representative Cables for Type Tests

Type	Test	Section	Size
Up to 1000 V multiconductor control cable or Shielded multiconductor metal cable (see list below for use of metal sheath or shield) or Single conductor power cable	Temperature and moisture resistance	2.3.1	1/C — 14 or 12 AWG
	Thermal and radiation exposure	2.3.3	1/C or 3/C — 14 or 12 AWG
	Design basis event simulation	2.4	1/C or 3/C — 14 or 12 AWG
	Vertical flame test (see also Section 3.5.6)	2.5.5	1/C — 6, 4 or 2 AWG. 1/C — 14 or 12 AWG
	Vertical tray flame test	2.5.4	7/C — 10, 14 or 12 AWG
One or two twin, triple or quad (more than two) multiconductor signal cable	Temperature and moisture resistance	2.3.1	1 pair shielded 18 AWG or actual cable
	Thermal and radiation exposure	2.3.3	
	Design basis event simulation	2.4	
	Vertical flame test	2.5.5	
Coaxial, triaxial or special low-level signal cable	Temperature and moisture resistance	2.3.1	actual size
	Thermal and radiation exposure	2.3.3	
	Design basis event simulation	2.4	
	Vertical flame test (see also Section 3.5.6 for cable assembly)	2.5.5	
Single pair thermocouple extension cable	Temperature and moisture resistance	2.3.1	2/C — 20 AWG or actual size of extension
	Thermal and radiation exposure	2.3.3	
	Design basis event simulation	2.4	
	Vertical tray flame test	2.5.4	
	Vertical flame test (single from cable assembly)	2.5.5	
2001 — 5 000 V power cable 1/C	Vertical tray flame test	2.5.4	4 AWG (2.08 kV) 1/C or 4/C or

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 superheated-steam 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-potential-withstand tests.

The program was conducted by The Franklin Institute Research Laboratories (FIRL) during the period from October 1977 through January 1978.

1. 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.
2. IEEE Std 323-1974, IEEE Standard for Qualifying Class IE Equipment for Nuclear Power Generating Stations, The Institute of Electrical and Electronics Engineers, Inc., New York, NY, 1974.
3. Simulated SLB and LOCA exposure requirements were selected by the client. See Section 3.3.

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:

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 74

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X 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.

X The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.

X Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.

X 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
X 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.

X The Licensee (has/~~has not~~) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action END of 1981 - NO SPECIFIC DATE.)

___ 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
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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 74

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	
Adequate Similarity Between Equipment and Test Specimen 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 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	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 74

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.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 74

The Licensee has not presented sufficient information to establish equivalence between the cable tested and the installed cable (see 5g.&5f) as required by DOR Guidelines and/or IEEE-383-74

2. Test Specimen - The test specimen should be the same model as the equipment being qualified. The type test should only be considered valid for equipment identical in design and material construction to the test specimen. Any deviations should be evaluated as part of the qualification documentation (see also Section 6.0 below).

2.2 Type Test Samples. The samples tested should contain the conductor, insulation, fillers, jacket, binder tape, overall jacket, shielding, and field splices which are representative of the cable category being qualified. Table 1 lists sizes which have been considered representative of these categories. The sample lengths should be sufficient to permit reliable test readings and evaluation consistent with good testing practice.

ELECTRIC CABLES, FIELD SPLICES, AND CONNECTIONS — IEEE Std 383-1974

Table 1
Representative Cables for Type Tests

Type	Test	Section	Size
Up to 1000 V multiconductor control cable or insulated individual conductor (metal cable jacket not below for individual components) or single conductor power cable	Temperature and moisture resistance	2.3.1	1/C — 14 or 12 AWG
	Thermal and radiation resistance	2.3.3	1/C or M/C — 14 or 12 AWG
	Design basis event simulation	2.4	1/C or M/C — 14 or 12 AWG
	Vertical flame test	2.5.5	1/C — 8, 4 or 2 AWG. 1/C — 14 or 12 AWG
	Vertical tray flame test	2.5.4	7/C — 10, 14 or 12 AWG
Duplex jacket, cable or triad triple conductor power cable	Temperature and moisture resistance	2.3.1	1 pair, 14 AWG 18 AWG or actual cable
	Thermal and radiation resistance	2.3.3	
	Design basis event simulation	2.4	
	Vertical flame test	2.5.5	
Coaxial, triaxial or special shielded cable	Temperature and moisture resistance	2.3.1	actual size
	Thermal and radiation resistance	2.3.3	
	Design basis event simulation	2.4	
	Vertical flame test (within 25% of cable weight)	2.5.5	
Shielded jacket instrumentation cable	Temperature and moisture resistance	2.3.1	2/C — 12 AWG or actual size if smaller
	Thermal and radiation resistance	2.3.3	
	Design basis event simulation	2.4	
	Vertical tray flame test	2.5.4	
	Vertical flame test (weight	2.5.5	
2000 V — 5 kV V power cable 1/C	Vertical tray flame test	2.5.4	6 AWG (3 kV)

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.

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 No.
Equipment Item	1a
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~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 25

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

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.

X The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.

X Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.

X 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
X Other (Alternate documentation applicable)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

X 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
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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 75

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
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	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 25

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.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 76

EQUIPMENT ITEM NO. 76
ELECTRICAL CABLE LOCATED IN CONTAINMENT (C230)
CONTINENTAL WIRE MODEL SILICONE RUBBER/ASBESTOS BR
REQUIRED OPERATING TIME: NOT STATED
TER CHECKSHEET NO. 76
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): CABLE
LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 63

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	1a
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~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 76

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

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.

X The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.

X Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.

X 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
X Other (Determine applicable documentation)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

X 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
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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 76

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
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	

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.

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:

Contents	Checksheet Page No.
Equipment Item	1a
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~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 7

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X 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.

X The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.

X Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.

X 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
X Other (evaluation.)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

X 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
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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 77

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	X
Adequate Similarity Between Equipment and Test Specimen 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 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	

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.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 27

The Licensee has not presented sufficient information to establish equivalence between the cable tested and the installed cable (see 5g &5i) as required by DOR Guidelines and/or IEEE-383-74

2. Test Specimen - The test specimen should be the same model as the equipment being qualified. The type test should only be considered valid for equipment identical in design and material construction to the test specimen. Any deviations should be evaluated as part of the qualification documentation (see also Section 8.0 below).

2.2 Type Test Samples. The samples tested should contain the conductor, insulation, fillers, jacket, binder tape, overall jacket, shielding, and field splices which are representative of the cable category being qualified. Table 1 lists sizes which have been considered representative of these categories. The sample lengths should be sufficient to permit reliable test readings and evaluation consistent with good testing practice.

ELECTRIC CABLES, FIELD SPLICES, AND CONNECTIONS — IEEE Std 383-1974

Table 1
Representative Cables for Type Tests

Type	Test	Section	Size
Up to 2000 V multiconductor control cable or Shielded multiconductor signal cable (see list below for individual components) or Single conductor power cable	temperature and moisture resistance	2.3.1	1/C — 14 or 12 AWG
	thermal and radiation exposure	2.3.3	1/C or M/C — 14 or 12 AWG
	design basis event simulation	2.4	1/C or M/C — 14 or 12 AWG; 1/C — 6, 4 or 2 AWG
	vertical flame test angles from cable assembly	2.5.6	1/C — 14 or 12 AWG
	vertical tray flame test	2.5.4	7/C — 16, 14 or 12 AWG
Shielded pairs, triple or quad from multiconductor signal cable	temperature and moisture resistance	2.3.1	1 pair shielded 18 AWG or actual cable
	thermal and radiation exposure	2.3.3	
	design basis event simulation	2.4	
	vertical flame test	2.5.6	
Coaxial, triaxial or special unshielded cable	temperature and moisture resistance	2.3.1	actual size
	thermal and radiation exposure	2.3.3	
	design basis event simulation	2.4	
	vertical flame test angles from cable assembly	2.5.6	
Single pair thermocouple extension cable	temperature and moisture resistance	2.3.1	2/C — 20 AWG or actual size if smaller
	thermal and radiation exposure	2.3.3	
	design basis event simulation	2.4	
	vertical tray flame test	2.5.4	
	vertical flame test angles from cable assembly	2.5.6	
2001–15 000 V power cable 1/C unshielded and multiconductor	vertical tray flame test	2.5.4	6 AWG (2-5kV) 2/0 or 4/0 or 4/0 (2-15kV)

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 21

NOTES:

The SCEW sheet Describes the installed cable as

SYSTEM: ELECTRICAL
SUBSYSTEM: MISC
EQUIPMENT: CABLE

EQUIPMENT DESCRIPTION

COMPONENT NUMBER
CHLxxx

COMPONENT
CABLE

MANUFACTURER
RAYCHEM

PART NUMBER
XLPE/XLPE

ACCURACY
NA

LOCATION
C230
CONTAINMENT

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 77

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.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 77

NOTES: The cable described in the referenced reports are

SUBJECT The Effects of Radiation and Aging on Flamtrol™ 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
O.D.=.181"; I.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. Previous work on AWG 12 Flamtrol insulated wire was reported in Test Report EM #5238.

Material:

Flamtrol, 6000511-14, CA14-005
Flamtrol, 6000811-10, P7-2-29-72-4

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, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 28

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X 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.

X The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.

X Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.

X 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
X Other (evaluation)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

X 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
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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 78

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	X
Adequate Similarity Between Equipment and Test Specimen 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 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	

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 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.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 78

The Licensee has not presented sufficient information to establish equivalence between the cable tested and the installed cable (see 5g,5f), as required by DOR Guidelines and/or IEEE-383-74

2. Test Specimen - The test specimen should be the same model as the equipment being qualified. The type test should only be considered valid for equipment identical in design and material construction to the test specimen. Any deviations should be evaluated as part of the qualification documentation (see also Section 8.0 below).

2.2 Type Test Samples. The samples tested should contain the conductor, insulation, fillers, jacket, binder tape, overall jacket, shielding, and field splices which are representative of the cable category being qualified. Table 1 lists sizes which have been considered representative of these categories. The sample lengths should be sufficient to permit reliable test readings and evaluation consistent with good testing practice.

ELECTRIC CABLES, FIELD SPLICES, AND CONNECTIONS — IEEE Std 383-1974

Table 1
Representative Cables for Type Tests

Type	Test	Section	Size
Up to 1000 V multiconductor control cable or Shielded multiconductor signal cable (see list below for individual components) or Single conductor power cable	Temperature and moisture resistance	2.3.1	1/C — 14 or 12 AWG
	Thermal and radiation exposure	2.3.2	1/C or M/C — 14 or 12 AWG
	Design basis event simulation	2.4	1/C or M/C — 14 or 12 AWG
	Vertical flame test single cable assembly	2.5.5	1/C — 8, 4 or 2 AWG. 1/C — 14 or 12 AWG
	Vertical tray flame test	2.5.4	7/C — 10, 14 or 12 AWG
Shielded pairs, triple or quad from multiconductor signal cable	Temperature and moisture resistance	2.3.1	1 pair shielded 18 AWG or actual cable
	Thermal and radiation exposure	2.3.2	
	Design basis event simulation	2.4	
	Vertical flame test	2.5.5	
Coaxial, triaxial or special unshielded cable	Temperature and moisture resistance	2.3.1	actual size
	Thermal and radiation exposure	2.3.2	
	Design basis event simulation	2.4	
	Vertical flame test single cable assembly	2.5.5	
Single pair thermocouple extension cable	Temperature and moisture resistance	2.3.1	1/C — 20 AWG or actual size if smaller
	Thermal and radiation exposure	2.3.2	
	Design basis event simulation	2.4	
	Vertical tray flame test	2.5.4	
	Vertical flame test single cable assembly	2.5.5	
2001 — 15 000 V power cable 1/C (shielded)	Vertical tray flame test	2.5.4	5 AWG (2.5 kV) 1/C or 4/0 —

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 7

NOTES:

SYSTEM: ELECTRICAL
SUBSYSTEM: MISC
EQUIPMENT: CABLE

EQUIPMENT DESCRIPTION

COMPONENT NUMBER
CHLXXX

COMPONENT
CABLE

MANUFACTURER
RAYCHEM

PART NUMBER
POLYMER & XLPE/XLPE

ACCURACY
NA

LOCATION
C230
CONTAINMENT

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 78

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.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 78

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.

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 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.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 79

EQUIPMENT ITEM NO. 79
ELECTRICAL CABLE LOCATED IN CONTAINMENT (C230)
RAYCHEM MODEL COAXIAL/XLP
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

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	1a
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~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 79

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

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 DPE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

X The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.

- X Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.
- X 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
  - X Other (evaluation)
- ___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
- X 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
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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 79

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
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	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 79

NOTES:

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.

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, (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	1a
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~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 80

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X 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.

X The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.

X Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.

X 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
X 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.

X The Licensee (has/~~has not~~) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action END of 1981 - NO SPECIFIC DATE.)

___ 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
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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 80

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	
Adequate Similarity Between Equipment and Test Specimen 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 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	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 80

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.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 80

Checksheets 5f and 5g have been removed due to the proprietary nature of information contained therein.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 81

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

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	1a
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~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 81

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X 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.

X The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.

X Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.

X 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
X Other (evaluation)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

X 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
I.b Modification
(III.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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 81

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	
Adequate Similarity Between Equipment and Test Specimen 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 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	

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.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 81

The Licensee has not presented sufficient information to establish equivalence between the cable tested and the installed cable (see 5g) as required by DOR Guidelines and/or IEEE-383-74

2. Test Specimen - The test specimen should be the same model as the equipment being qualified. The type test should only be considered valid for equipment identical in design and material construction to the test specimen. Any deviations should be evaluated as part of the qualification documentation (see also Section 8.0 below).

2.2 Type Test Samples. The samples tested should contain the conductor, insulation, fillers, jacket, binder tape, overall jacket, shielding, and field splices which are representative of the cable category being qualified. Table 1 lists sizes which have been considered representative of these categories. The sample lengths should be sufficient to permit reliable test readings and evaluation consistent with good testing practice.

ELECTRIC CABLES, FIELD SPLICES, AND CONNECTIONS — IEEE Std 383-1974

Table 1
Representative Cables for Type Tests

Type	Test	Section	Size
Up to 2000 V multiconductor control cable or Shielded multiconductor metal cable (see list below for individual components) or Single conductor power cable	Temperature and moisture resistance	2.3.1	1/C — 14 or 12 AWG
	Thermal and radiation exposure	2.3.3	1/C or M/C — 14 or 12 AWG
	Design basis event simulation	2.4	1/C or M/C — 14 or 12 AWG
	Vertical flame test single cable vertical assembly	2.5.5	1/C — 8, 4 or 2 AWG. 1/C — 14 or 12 AWG
	Vertical tray flame test	2.5.4	7/C — 10, 14 or 12 AWG
Shielded pairs, triple or quad from multiconductor signal cable	Temperature and moisture resistance	2.3.1	1 pair shielded 18 AWG or actual cable
	Thermal and radiation exposure	2.3.3	
	Design basis event simulation	2.4	
	Vertical flame test	2.5.5	
Coaxial, triaxial or special shielded cable	Temperature and moisture resistance	2.3.1	actual size
	Thermal and radiation exposure	2.3.3	
	Design basis event simulation	2.4	
	Vertical flame test single cable vertical assembly	2.5.5	
Single pair thermocouple extension cable	Temperature and moisture resistance	2.3.1	2/C — 20 AWG or actual size of cable
	Thermal and radiation exposure	2.3.3	
	Design basis event simulation	2.4	
	Vertical tray flame test	2.5.4	
	Vertical flame test single vertical cable assembly	2.5.5	
2000 thru 5000 V power cable 1/C shielded and multiconductor	Vertical tray flame test	2.5.4	5 AWG (5 kV) 2/C or 4/0 or

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 8

NOTES:

The SCEW sheet describes the Installed Cable as

SYSTEM: ELECTRICAL
SUBSYSTEM: MISC
EQUIPMENT: CABLE

EQUIPMENT DESCRIPTION

COMPONENT NUMBER
CBLXXX

COMPONENT
CABLE

MANUFACTURER
OKONITE

PART NUMBER
EPR/OKOLON

ACCURACY
NA

LOCATION
C230
CONTAINMENT

The test report description is:

During 1974 The Okonite Company employed the services of the Franklin Institute Research Laboratories to perform a series of tests in conjunction with our engineering and research efforts. This was followed by additional "LOCA" simulation tests performed to obtain qualification test data to comply with the IEEE 383-1974 Standard. The following test procedure and results were obtained during the latest program.

Test Specimens

1/C #12 7x coated copper, .030" Okonite insulation -
1/C #6 7x coated copper, .055" Okonite insulation, -
.030" Okolon jacket

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 82

EQUIPMENT ITEM NO. 82
ELECTRICAL CABLE LOCATED IN CONTAINMENT (C230)
ROCKBESTOS MODEL SILICONE RUBBER/ASBESTOS BRAID
REQUIRED OPERATING TIME: NOT STATED
TER CHECKSHEET NO. 82
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): CABLE
LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 62

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	1a
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~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 82

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

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.

X The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.

X Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.

X 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
X Other (determine applicable documentation)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

X 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
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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 82

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
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	

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.

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, (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.
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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~~
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 83

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X Tne Licensee (has/~~has not~~) provided a response to the SER concerns.

X 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.

X The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.

X Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.

X 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
X Other (evaluation)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

X 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
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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 83

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	X
Adequate Similarity Between Equipment and Test Specimen 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 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	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 83

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 FIRI and other laboratory test reports. The assessment/evaluation activity is not expected to be complete until the end of this year.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 83

The Licensee has not presented sufficient information to establish equivalence between the cable tested and the installed cable (see 5g.(5)h) as required by DOR Guidelines and/or IEEE-383-74

2. Test Specimen - The test specimen should be the same model as the equipment being qualified. The type test should only be considered valid for equipment identical in design and material construction to the test specimen. Any deviations should be evaluated as part of the qualification documentation (see also Section 6.0 below).

2.2 Type Test Samples. The samples tested should contain the conductor, insulation, fillers, jacket, binder tape, overall jacket, shielding, and field splices which are representative of the cable category being qualified. Table 1 lists sizes which have been considered representative of these categories. The sample lengths should be sufficient to permit reliable test readings and evaluation consistent with good testing practice.

ELECTRIC CABLES, FIELD SPLICES, AND CONNECTIONS — IEEE Std 383-1974

Table 1
Representative Cables for Type Tests

Type	Test	Section	Size
Up to 1000 V multiconductor control cable or shielded multiconductor signal cable (use for below for individual components) or single conductor power cable	Temperature and moisture resistance	2.3.1	1/C — 14 or 12 AWG
	Thermal and radiation exposure	2.3.3	1/C or M/C — 14 or 12 AWG
	Design basis event simulation	2.4	1/C or M/C — 14 or 12 AWG; 1/C — 6, 4 or 2 AWG.
	Vertical flame test (weight from cable assembly)	2.5.5	1/C — 14 or 12 AWG
	Vertical tray flame test	2.5.4	7/C — 14, 14 or 12 AWG
Shielded twisted pair or triad from multiconductor signal cable	Temperature and moisture resistance	2.3.1	1 pair shielded 18 AWG or actual cable
	Thermal and radiation exposure	2.3.3	
	Design basis event simulation	2.4	
	Vertical flame test	2.5.5	
Coaxial, triaxial or special low current signal cable	Temperature and moisture resistance	2.3.1	actual size
	Thermal and radiation exposure	2.3.3	
	Design basis event simulation	2.4	
	Vertical flame test (weight from cable assembly)	2.5.5	
Thermocouple or instrumentation cable	Temperature and moisture resistance	2.3.1	2/C — 20 AWG or actual size if smaller
	Thermal and radiation exposure	2.3.3	
	Design basis event simulation	2.4	
	Vertical tray flame test	2.5.4	
	Vertical flame test (weight from cable assembly)	2.5.5	
2001 — 5,000 V power cable 1/C unshielded and multiconductor	Vertical tray flame test	2.5.4	8 AWG (8.5kV) 2/0 — 4/0 or

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. E3

NOTES:

The installed Cable is

SYSTEM: ELECTRICAL
SUBSYSTEM: MISC
EQUIPMENT: CABLE

EQUIPMENT DESCRIPTION

COMPONENT NUMBER
CBLXXX

COMPONENT
CABLE

MANUFACTURER
ROCKBESTOS

PART NUMBER
XLPE/NEO

ACCURACY
NA

LOCATION
C230
CONTAINMENT

The cable in the referenced report is

CABLE CONSTRUCTIONS

Sample No. S-1	#12 7/.0305" tinned copper conductor .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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 83

NOTES:

Sample No. KP

#12 7/.0305" tinned copper conductor
.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

Furthermore the referenced report [4607] is a specification for an environmental test which does not envelop the peak temperature. However, there is no data to evaluate whether the cable was tested.

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	Checksheet Page No.
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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~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 84

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X 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.

X The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.

X Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.

X 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
X Other (evaluation)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

X 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
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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 84

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	
Adequate Similarity Between Equipment and Test Specimen 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 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	

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.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 84

The Licensee has not presented sufficient information to establish equivalence between the cable tested and the installed cable (see Se[illegible] as required by DOR Guidelines and/or IEEE-383-74

2. Test Specimen - The test specimen should be the same model as the equipment being qualified. The type test should only be considered valid for equipment identical in design and material construction to the test specimen. Any deviations should be evaluated as part of the qualification documentation (see also Section 8.0 below).

2.2 Type Test Samples. The samples tested should contain the conductor, insulation, fillers, jacket, binder tape, overall jacket, shielding, and field splices which are representative of the cable category being qualified. Table 1 lists sizes which have been considered representative of these categories. The sample lengths should be sufficient to permit reliable test readings and evaluation consistent with good testing practice.

ELECTRIC CABLES, FIELD SPLICES, AND CONNECTIONS — IEEE Std 383-1974

Table 1
Representative Cables for Type Tests

Type	Test	Section	Size
Up to 1000 V multiconductor control cable or control multiconductor metal cable (see list below for electrical requirements) or single conductor power cable	Temperature and moisture resistance	2.3.1	1/C — 14 or 12 AWG
	Thermal and radiation exposure	2.3.2	1/C or M/C — 14 or 12 AWG
	Design basis event simulation	2.4	1/C or M/C — 14 or 12 AWG 1/C — 8, 4 or 2 AWG.
	Vertical flame test (applies to all cable assembly)	2.3.5	1/C — 14 or 12 AWG
	Vertical tray flame test	2.3.4	7/C — 16, 14 or 12 AWG
Shielded pair, triple or quad from multiconductor metal cable	Temperature and moisture resistance	2.3.1	1 pair shielded 18 AWG or actual cable
	Thermal and radiation exposure	2.3.2	
	Design basis event simulation	2.4	
	Vertical flame test	2.3.5	
Coaxial, triaxial or special purpose electrical cable	Temperature and moisture resistance	2.3.1	Actual size
	Thermal and radiation exposure	2.3.2	
	Design basis event simulation	2.4	
	Vertical flame test (applies to all cable assembly)	2.3.5	
Shielded pair (thermocouple extension) cable	Temperature and moisture resistance	2.3.1	2/C — 20 AWG or actual size of cable
	Thermal and radiation exposure	2.3.2	
	Design basis event simulation	2.4	
	Vertical tray flame test	2.3.4	
	Vertical flame test (applies to all cable assembly)	2.3.5	
2001 — 15 000 V power cable 1/C unshielded and multiconductor	Vertical tray flame test	2.3.4	8 AWG (2.5 kV) 2/0 or 4/0 or

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 64

NOTES:

The Installed cable is Described as:

SYSTEM: ELECTRICAL
SUBSYSTEM: MISC
EQUIPMENT: CABLE

EQUIPMENT DESCRIPTION

COMPONENT NUMBER
CHLXXX

COMPONENT
CABLE

MANUFACTURER
BOSTON INS. WIRE

PART NUMBER
INDUSTRITE-HYP/HYP

ACCURACY
NA

LOCATION
C230
CONTAINMENT

The referenced report describes the tested cable as follows:

Insulation resistance readings were taken periodically during the test under temperatures and pressures specified.

Insulation resistance values were read at 500 V DC.

BIW Part No. 7244-H-002 — Single Pair Inside Containment Cable — BOSTRAD[7]

BIW Part No. B7244-H-002 — Single Pair Inside Containment Cable — BOSTRAD[75]

Results are plotted on a curve in which temperature, pressure and time are indicated. See pages 13 and 14.

Effect of Irradiation

In order to provide information with respect to the effect of exposure of radiation on the behavior of the cable under this containment environmental condition, a sample of the two-pair instrument cable, BIW Part No. 7245-H-004, was submitted to the containment environmental test after exposure of 5.5×10^7 integrated rads dose of radiation.

[630]

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 84

NOTES:

	BTW PART NO. 8738-H-002 CONSTRUCTION			
2/C #16 AWG	solid copper and constantan			
600 volt				
Shield -- aluminum foil covered by	copper	braid for 100%	coverage	
Proprietary flame retardant	binding tape			

[4596]

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, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	1a
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~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 85

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X 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.

X The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.

X Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.

X 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
X Other (Evaluation)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

X 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
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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 85

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	X
Adequate Similarity Between Equipment and Test Specimen 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 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	

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.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 25

The Licensee has not presented sufficient information to establish equivalence between the cable tested and the installed cable (see 5g(5)i) as required by DOR Guidelines and/or IEEE-383-74

2. Test Specimen - The test specimen should be the same model as the equipment being qualified. The type test should only be considered valid for equipment identical in design and material construction to the test specimen. Any deviations should be evaluated as part of the qualification documentation (see also Section 8.0 below).

2.2 Type Test Samples. The samples tested should contain the conductor, insulation, fillers, jacket, binder tape, overall jacket, shielding, and field splices which are representative of the cable category being qualified. Table 1 lists sizes which have been considered representative of these categories. The sample lengths should be sufficient to permit reliable test readings and evaluation consistent with good testing practice.

ELECTRIC CABLES, FIELD SPLICES, AND CONNECTIONS — IEEE Std 383-1974

Table 1
Representative Cables for Type Tests

Type	Test	Section	Size
Up to 1000 V multiconductor control, single or shielded multiconductor	Temperature and moisture resistance	2.3.1	1/C or 3/C — 14 or 12 AWG
	Thermal and radiation resistance	2.3.2	1/C or 3/C — 14 or 12 AWG
	Simulated design events	2.4	1/C or 3/C — 14 or 12 AWG; 1/C — 8, 4 or 2 AWG
	Vertical flame test (single cable vertical assembly)	2.3.5	1/C — 14 or 12 AWG
	Horizontal flame test	2.3.4	3/C — 10, 14 or 12 AWG
Shielded pairs, triples or quads (more than one conductor per metal sheath)	Temperature and moisture resistance	2.3.1	1 pair shielded 16 AWG or actual cable
	Thermal and radiation resistance	2.3.2	
	Simulated design events	2.4	
	Vertical flame test	2.3.5	
Coaxial, triaxial or special shielded cable	Temperature and moisture resistance	2.3.1	Actual size
	Thermal and radiation resistance	2.3.2	
	Simulated design events	2.4	
	Vertical flame test (single cable vertical assembly)	2.3.5	
Single pair thermocouple extension cable	Temperature and moisture resistance	2.3.1	2/C — 20 AWG or actual size if smaller
	Thermal and radiation resistance	2.3.2	
	Simulated design events	2.4	
	Horizontal flame test	2.3.4	
	Vertical flame test (single cable vertical assembly)	2.3.5	
2000 V to 5000 V power cable 1/C uninsulated and insulated shielded	Vertical flame test	2.3.5	8 AWG (2.31 V) 2/0 — 4/0 or

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 8

NOTES:

The SCEW describe the cable as

SYSTEM: ELECTRICAL
SUBSYSTEM: MISC
EQUIPMENT: CABLE

EQUIPMENT DESCRIPTION

COMPONENT NUMBER
CBLxxx

COMPONENT
CABLE

MANUFACTURER
BOSTON, INSUL. WIRE

PART NUMBER
SIL. RUB. EQUIV/HYP

ACCURACY
NA

LOCATION
C230
CONTAINMENT

The test report describe the cable as

DATE: 3/29/72
LAB. TEST NO.: (T8807)
CUSTOMER: Baltimore Gas & Electric
PURCHASE ORDER NO.: 5693
BIW P/N: 8694-C-024
CALBE TYPE: Coax
CONTRACT NO.: 6750-P-99
SPECIFICATION NO.: BIW
ITEM NO.: 1
BILL OF MATERIAL NO.:

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 86

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

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	1a
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~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 86

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X 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.

X The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.

X Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.

X 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
X Other (replacement)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

X 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
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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 86

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	
Adequate Similarity Between Equipment and Test Specimen 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 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	

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.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 86

The Licensee has not presented sufficient information to establish equivalence between the cable tested and the installed cable (see 5e &5f) as required by DOR Guidelines and/or IEEE-383-74

2. Test Specimen - The test specimen should be the same model as the equipment being qualified. The type test should only be considered valid for equipment identical in design and material construction to the test specimen. Any deviations should be evaluated as part of the qualification documentation (see also Section 6.0 below).

2.2 Type Test Samples. The samples tested should contain the conductor, insulation, fillers, jacket, binder tape, overall jacket, shielding, and field splices which are representative of the cable category being qualified. Table 1 lists sizes which have been considered representative of these categories. The sample lengths should be sufficient to permit reliable test readings and evaluation consistent with good testing practice.

ELECTRIC CABLES, FIELD SPLICES, AND CONNECTIONS — IEEE Std 383-1974

Table 1
Representative Cables for Type Tests

Type	Test	Section	Size
Up to 1000 V multiconductor control cable or Shielded multiconductor metal cable (all but one for mechanical requirements) or Single conductor power cable	Temperature and moisture resistance	2.3.1	1/C — 14 or 12 AWG
	Thermal and radiation resistance	2.3.3	1/C or M/C — 14 or 12 AWG
	Design basis event simulation	2.4	1/C or M/C — 14 or 12 AWG; 1/C — 6, 4 or 2 AWG.
	Vertical flame test (single or three cable assembly)	2.5.5	1/C — 14 or 12 AWG
	Vertical tray flame test	2.5.4	7/C — 16, 14 or 12 AWG
Shielded pairs, triads or quads from multiconductor metal cable	Temperature and moisture resistance	2.3.1	1 pair, triad or quad 16 AWG or actual cable
	Thermal and radiation resistance	2.3.3	
	Design basis event simulation	2.4	
	Vertical flame test	2.5.5	
Coaxial, triaxial or special shielded cable	Temperature and moisture resistance	2.3.1	actual size
	Thermal and radiation resistance	2.3.3	
	Design basis event simulation	2.4	
	Vertical flame test (all five cable assembly)	2.5.5	
Single pair thermocouple extension cable	Temperature and moisture resistance	2.3.1	2/C — 20 AWG or actual size of conductor
	Thermal and radiation resistance	2.3.3	
	Design basis event simulation	2.4	
	Vertical tray flame test	2.5.4	
	Vertical flame test (single cable assembly)	2.5.5	
2001 — 15 000 V power cable 1/C unshielded and multiconductor	Vertical tray flame test	2.5.4	8 AWG (8.5kV) 2/C or 4/C or

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 8

NOTES:

The SCE w sheet states

SYSTEM: ELECTRICAL
SUBSYSTEM: MISC
EQUIPMENT: CABLE

EQUIPMENT DESCRIPTION

COMPONENT NUMBER
CHLXXX

COMPONENT
CABLE

MANUFACTURER
BOSTON INSUL. WIRE

PART NUMBER
XLPE/HYP

ACCURACY
NA

LOCATION
C231
CONTAINMENT

The testreports identify the cable tested as.

CABLE CONSTRUCTION

2/c #14 AWG TC
XLP INSULATION
ALUM./MYLAR SHIELD & DRAIN WIRE
FLAME BARRIER TAPES
NEOPRENE JACKET

[3850]

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 85

NOTES:

DATE: 3/29/72

LAB. TEST NO.: 1 8907

CUSTOMER: Baltimore Gas & Electric

PURCHASE ORDER NO.: 5557

BTW P/N: 8694-C-024

CALBE TYPE: Coax

CONTRACT NO.: 6750-E-99

SPECIFICATION NO.: BTW

ITEM NO.: 1

BILL OF MATERIAL NO.:

[4598]

LSS-1725 Construction - Coaxial Cable

(This cable is on 70 59°/U alternate)

Conductor - 424 AWG 7/32 tinned copper covered steel, Flame tape over conductor

Insulation - cross linked polyethylene, 40 mil wall, Flame tape over insulation

036 AWG bare copper braided shield

Bostrad 7 CSPE (Hypalon) jacket, 30 mil wall

[4600]

[illegible]

[4599]

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 87

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

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:

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 87

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

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.

X The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.

X Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.

X 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
X Other (EVALUATION)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

X 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
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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 87

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	
Adequate Similarity Between Equipment and Test Specimen 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 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	

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 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.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 87

The Licensee has not presented sufficient information to establish equivalence between the cable tested and the installed cable (see 5e.(1)) as required by DOR Guidelines and/or IEEE-383-74

2. Test Specimen - The test specimen should be the same model as the equipment being qualified. The type test should only be considered valid for equipment identical in design and material construction to the test specimen. Any deviations should be evaluated as part of the qualification documentation (see also Section 8.0 below).

2.2 Type Test Samples. The samples tested should contain the conductor, insulation, fillers, jacket, binder tape, overall jacket, shielding, and field splices which are representative of the cable category being qualified. Table 1 lists sizes which have been considered representative of these categories. The sample lengths should be sufficient to permit reliable test readings and evaluation consistent with good testing practice.

ELECTRIC CABLES, FIELD SPLICES, AND CONNECTIONS IEEE Std 383-1974

Table 1
Representative Cables for Type Tests

Type	Test	Section	Size
Up to 2000 V multiconductor control or low or Shielded multiconductor signal cable (see (a) below for low-level instrument) or Single conductor power cable	Temperature and moisture resistance	2.3.1	1/C — 14 or 12 AWG
	Thermal and radiation exposure	2.3.2	1/C or 1/C — 14 or 12 AWG
	design basis event simulation	2.4	1/C or all/C — 14 or 12 AWG
	Vertical flame test single (base value assembly	2.5.6	1/C — 8, 4 or 2 AWG. 1/C — 14 or 12 AWG
	Vertical tray flame test	2.5.4	7/C — 10, 14 or 12 AWG
Duplex pairs, triads or quads from multiconductor signal cable	Temperature and moisture resistance	2.3.1	1 pair, triad or quad 16 AWG or actual cable
	Thermal and radiation exposure	2.3.2	
	design basis event simulation	2.4	
	Vertical flame test	2.5.6	
Coaxial, triaxial or special shielded cable	Temperature and moisture resistance	2.3.1	Actual size
	Thermal and radiation exposure	2.3.2	
	design basis event simulation	2.4	
	Vertical flame test single (base cable assembly	2.5.6	
Series pair thermocouple extension cable	Temperature and moisture resistance	2.3.1	2/C — 20 AWG or actual size of conductor
	Thermal and radiation exposure	2.3.2	
	design basis event simulation	2.4	
	Vertical tray flame test	2.5.4	
	Vertical flame test single (base cable assembly	2.5.5	
2000 thru 5000 V power cable 1/C unshielded and multiconductor	Vertical tray flame test	2.5.4	6 AWG (2.8kV) 2/0 — 4/0 or

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 87

NOTES:

PGR # 1783 describes the Kerite cables as:

"Two cables were tested:

(1) Power Cable, 3/c No. 12(7) AWG, FR Insulation, FR Jacket

(2) Control Cable, 7/c No. 12 (7) AWG, FR Insulation, FR Jacket"

The licensee describes the installed cables as:

"COMPONENT CABLE

MANUFACTURER KERITE

PART NUMBER HTK/FR"

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, (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	1a
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~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 8

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X 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.

X The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.

X Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.

X 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
X Other (evaluation)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

X 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
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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 88

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	X
Qualified Life or Replacement Schedule Established (If Required)	X
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 (If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	X
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	

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.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 88

NOTES:

February 5, 1970

Mr. E. F. Magic, Senior Buyer
BECHTEL CORPORATION
Post Office Box 607
Gaithersburg, Maryland 20760

Dear Mr. Magic:

Subject ... Bid #6750-E-14, 6750-E-15, 6750-E-16
Calvert Cliffs Nuclear Power Plant

Please refer to my letter of February 3rd which transmitted to you the supplementary test data report of February 2nd. In order to clarify that test report, this is to inform you that the cable was subjected to the following temperatures:

13 Hours at 290° F (143°C)

7 Days (168 Hours) at 227°F (108°C)

Very truly yours,

HATFIELD WIRE & CABLE DIV.

BERNARD ROSS
Manager-Industrial Products

[Esa 23]

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 88

NOTES:

February 10, 1970

Insert after Page 1

Hatfield - Letter of February 2, 1970

13 Hours at 50 psig steam
plus 7 days at 5 psig steam

Non-irradiated:

Tensile strength 1375 psi (original 1260 psi)

Elongation 530% (original 480%)

1×10^8 (actually 1.1×10^8)

Tensile strength 187 psi (irradiated but unsteamed sample was 228 psi)

Elongation 24.8% (irradiated but unsteamed sample was 26.1%)

Comments: Radiation and steam test data now complete. However, they did not expose the steamed irradiated samples to the boric acid solution.

The licensee has presented information on steam and radiation testing. However as data is provided on aging evaluation, functional testing or chemical spray

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, (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.
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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~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 89

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

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.

X The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

- X Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.
- X 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
  - X Other (EVALUATION)
- ___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
- X 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
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

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 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 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	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 89

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.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 89

The Licensee has not presented sufficient information to establish equivalence between the cable tested and the installed cable (see 5g.&5i) as required by DOR Guidelines and/or IEEE-383-74

2. Test Specimen - The test specimen should be the same model as the equipment being qualified. The type test should only be considered valid for equipment identical in design and material construction to the test specimen. Any deviations should be evaluated as part of the qualification documentation (see also Section 8.0 below).

2.2 Type Test Samples. The samples tested should contain the conductor, insulation, fillers, jacket, binder tape, overall jacket, shielding, and field splices which are representative of the cable category being qualified. Table 1 lists sizes which have been considered representative of these categories. The sample lengths should be sufficient to permit reliable test readings and evaluation consistent with good testing practice.

Table 1
Representative Cables for Type Tests

Type	Test	Section	Size
Up to 1000 V multiconductor control cable or Shielded multiconductor signal cable (see list below for individual requirements) or Single conductor power cable	Temperature and moisture resistance	2.3.1	1/C or 3/C — 14 or 12 AWG
	Thermal and radiation exposure	2.3.2	1/C or 3/C — 14 or 12 AWG
	Design basis event simulation	2.4	1/C or 3/C — 14 or 12 AWG 1/C — 6, 4 or 2 AWG.
	Vertical flame test applies from cable assembly	2.5.6	1/C — 14 or 12 AWG
	Vertical tray flame test	2.5.4	3/C — 10, 14 or 12 AWG
Shielded pairs, triads or quads (with or without overall jacket) multiconductor signal cable	Temperature and moisture resistance	2.3.1	1 pair shielded 16 AWG or actual cable
	Thermal and radiation exposure	2.3.2	
	Design basis event simulation	2.4	
	Vertical flame test	2.5.6	
Coaxial, triaxial or special shielded cable	Temperature and moisture resistance	2.3.1	Actual size
	Thermal and radiation exposure	2.3.2	
	Design basis event simulation	2.4	
	Vertical flame test applies from cable assembly	2.5.6	
Single pair thermocouple extension cable	Temperature and moisture resistance	2.3.1	2/C — 20 AWG or actual size if smaller
	Thermal and radiation exposure	2.3.2	
	Design basis event simulation	2.4	
	Vertical tray flame test	2.5.4	
	Vertical flame test applies from cable assembly	2.5.6	
2501 — 15 000 V power cable 1/C unshielded and multiconductor	Vertical tray flame test	2.5.4	8 AWG (2 kV) 2/0 or 4/0 or

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 89

NOTES:

The qualification document, PGR # 1292, identifies the cable as:

Sample 1 - Control Cable

7-conductor cable, 20 ft long
Conductor size: No. 14AWG - 7 wire strand
Anaconda tag information: 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. 6AWG - 7 wire strand
Anaconda tag information: ME 299 Insulation
MH 8100 Belt

The licensee describes the installed cable as:

COMPONENT CABLE

MANUFACTURER ANACONDA

PART NUMBER EPR/HYP

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 90

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

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.
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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~~
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 90

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

___ 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.

X The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.

X Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.

X 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
X Other (EVALUATION)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

X 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
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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 90

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
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	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 90

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.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 70

The Licensee has not presented sufficient information to establish equivalence between the cable tested and the installed cable (see 5g &5f) as required by DOR Guidelines and/or IEEE-383-74

2. Test Specimen - The test specimen should be the same model as the equipment being qualified. The type test should only be considered valid for equipment identical in design and material construction to the test specimen. Any deviations should be evaluated as part of the qualification documentation (see also Section 8.0 below).

2.2 Type Test Samples. The samples tested should contain the conductor, insulation, fillers, jacket, binder tape, overall jacket, shielding, and field splices which are representative of the cable category being qualified. Table 1 lists sizes which have been considered representative of these categories. The sample lengths should be sufficient to permit reliable test readings and evaluation consistent with good testing practice.

ELECTRIC CABLES, FIELD SPLICES, AND CONNECTIONS — IEEE Std 383-1974

Table 1
Representative Cables for Type Tests

Type	Test	Section	Size
Up to 1000 V multiconductor control cable or Shielded multiconductor signal cable (see list below for individual components) or Single conductor power cable	temperature and moisture resistance	2.3.1	1/C or 3/C — 14 or 12 AWG
	thermal and radiation exposure	2.3.3	1/C or 3/C — 14 or 12 AWG
	design basis event simulation	2.4	1/C or 3/C — 14 or 12 AWG 1/C — 6, 4 or 2 AWG
	vertical flame test singles from cable assembly	2.5.6	1/C — 14 or 12 AWG
	vertical tray flame test	2.5.4	7/C — 16, 14 or 12 AWG
Overlaid jacket, single or triad from multiconductor signal cable	temperature and moisture resistance	2.3.1	1 pair shielded 18 AWG or actual cable
	thermal and radiation exposure	2.3.3	
	design basis event simulation	2.4	
	vertical flame test	2.5.6	
Coaxial, triaxial or special instrument cable	temperature and moisture resistance	2.3.1	actual size
	thermal and radiation exposure	2.3.3	
	design basis event simulation	2.4	
	vertical flame test singles from cable assembly	2.5.6	
Single pair thermocouple extension cable	temperature and moisture resistance	2.3.1	2/C — 20 AWG or actual size if smaller
	thermal and radiation exposure	2.3.3	
	design basis event simulation	2.4	
	vertical tray flame test	2.5.4	
	vertical flame test singles from cable assembly	2.5.6	
2501 — 5 000 V power cable 1/C unshielded and multiconductor	vertical tray flame test	2.5.4	6 AWG (5 kV) 2/0 — 4/0 or

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 90

NOTES:

The Licensee describes the installed cable as:

COMPONENT
CABLE

MANUFACTURER
GENERAL CABLE

PART NUMBER
SIL. RUB. 7ASB. BR.

The Licensee has not cited a valid test document

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, (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	1a
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~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 91

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

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.

X 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.

X 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
X Other (Resolve outstanding items with manufacturer.)

___ 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
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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 91

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
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	

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 FIRL and other laboratory test reports. The assessment/evaluation activity is not expected to be complete until the end of this year.

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)

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	1a
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~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 93

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

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.

X The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.

X Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.

X 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
X Other (Determine applicable documentation)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

X 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
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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 97

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
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	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 92

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.

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, (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	1a
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~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 93

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

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.

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
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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 93

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	
Adequate Similarity Between Equipment and Test Specimen 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 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	

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.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 93

Checksheets 5F and 5g have been removed due to the proprietary nature of information contained therein.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 94

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

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:

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 94

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
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	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 94

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

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.

X The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.

X Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.

X 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
X Other (Equipment assessment/evaluation)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

X 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
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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 95

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

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	1a
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~~
Maintenance and Replacement Schedule Summary	7a, ~~7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 94

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.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 95

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
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	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	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 95

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

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.

X The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.

X Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.

X Corrective action specified by the Licensee:

- X 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.

X The Licensee (has/~~has not~~) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action REPLACE BY NEXT SCHEDULED OUTAGE. April, 1982.)

___ 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
(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

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 during next scheduled outage; Cycle 6 in April, 1982.

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 NUREG 0588.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 96

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

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.

X The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.

X Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.

X Corrective action specified by the Licensee:

X 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.

X The Licensee (has/~~has not~~) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action Replace by next scheduled outage ; April ; 1982 .)

___ 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
(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

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 (1SV6540A 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:

Contents	Checksheet Page No.
Equipment Item	1a
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~~
Maintenance and Replacement Schedule Summary	7a, ~~7b, 7c~~

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 NUREG 0588.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 96

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
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	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	

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

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	1a
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~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

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.

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	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)	

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	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 97

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

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.

X The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.

X Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.

X 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
X Other (EVALUATION)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

X 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
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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 97

The Licensee has not presented sufficient information to establish equivalence between the cable tested and the installed cable (see 5g,5f) as required by DOR Guidelines and/or IEEE-383-74

2. Test Specimen - The test specimen should be the same model as the equipment being qualified. The type test should only be considered valid for equipment identical in design and material construction to the test specimen. Any deviations should be evaluated as part of the qualification documentation (see also Section 6.0 below).

2.2 Type Test Samples. The samples tested should contain the conductor, insulation, fillers, jacket, binder tape, overall jacket, shielding, and field splices which are representative of the cable category being qualified. Table 1 lists sizes which have been considered representative of these categories. The sample lengths should be sufficient to permit reliable test readings and evaluation consistent with good testing practice.

ELECTRIC CABLES, FIELD SPLICES, AND CONNECTIONS — IEEE Std 383-1974

Table 1
Representative Cables for Type Tests

Type	Test	Section	Size
Up to 1000 V multiconductor control cable or Shielded multiconductor metal cable (see list below for use of metal components) or Single conductor power cable	Temperature and moisture resistance	2.3.1	1/C or 14 or 12 AWG
	Thermal and radiation exposure	2.3.3	1/C or M/C — 14 or 12 AWG
	Design basis event simulation	2.4	1/C or M/C — 14 or 12 AWG 1/C — 6, 4 or 2 AWG.
	Vertical flame test (single from cable assembly	2.5.6	1/C — 14 or 12 AWG
	Vertical tray flame test	2.5.4	7/C — 10, 14 or 12 AWG
Shielded pair, triple or quad from multiconductor metal cable	Temperature and moisture resistance	2.3.1	1 pair shielded 18 AWG or actual cable
	Thermal and radiation exposure	2.3.3	
	Design basis event simulation	2.4	
	Vertical flame test	2.5.6	
Coaxial, triaxial or special unshielded cable	Temperature and moisture resistance	2.3.1	actual size
	Thermal and radiation exposure	2.3.3	
	Design basis event simulation	2.4	
	Vertical flame test (single from cable assembly	2.5.6	
Shielded pair (thermocouple extension) cable	Temperature and moisture resistance	2.3.1	2/C — 20 AWG or actual size of conductor
	Thermal and radiation exposure	2.3.3	
	Design basis event simulation	2.4	
	Vertical tray flame test	2.5.4	
	Vertical flame test (single from cable assembly	2.5.6	
2001 — 15 000 V power cable 1/C Unshielded and multiconductor	Vertical tray flame test	2.5.4	6 AWG (2.5kV) 2/0 or 4/0 or

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.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 97

NOTES:

The qualification document, PGR # 4607, describes the test specimens as:

CABLE CONSTRUCTIONS

Sample No. S-1
#12 7/.0305" tinned copper conductor
.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

Sample No. KP
#12 7/.0305" tinned copper conductor
.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

The licensee describes the installed cables as:

COMPONENT
CABLE

MANUFACTURER
CERRO (ROCKBESTOS)

PART NUMBER
SIL. RUB./ASB. 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.
- 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:

a) 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.

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.

II.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].

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. cited 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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4604. E. J. McGowan
Memo to H. M. Robinson. Subject: Insulation Resistance Tests on Cable at Elevated Temperature and Pressure
Raychem Corp., 27-Nov-72
EM 644

4605. E. J. McGowan
Memo to H. M. Robinson. Subject: Insulation Resistance Tests on Cable at Elevated Temperature and Pressure
Raychem Corp., 08-Jan-73
EM 668

4607. J. G. Stone and L. S. Chapman
Test of Electrical Cables After Simulated Post Accident Reactor Containment Service
Cerro Wire & Cable Co., 00-Mar-70
NP-01

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 Pressure 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	9.6	4.0	2.0	1.0
Peak Pressue (psig)	41.39	42.27	46.36	47.45	45.40
Peak Temperature (^oF)	[illegible]	266	[illegible]	274	270
Time of Peak Pressure (sec.)	7.2	10.6	23.4	45	84
Blowdown Energy Release at Time at Time of Peak Pressure (10^6 Btu)	268.7	275.2	295.2	307.8	310.0
Energy Removed by Air Coolers at Time of Peak Pressure (10^6 Btu)	0	0	0	0.851	2.166
Energy Absorbed by Heat Sinks at Time of Peak Pressure (10^6 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

ROOM NO. 115 (See Notes on Page 10)

INSTRUMENT NO.	A T=0 Dose Rate (RADS/HR)	B T=0 Dose Rate (RADS/HR)
1-MB-404	3.447×10^{2}	0
1-MB-415	2.733×10^{2}	
1-MB-115	1.140×10^{2}	
1-MOV-501	4.515×10^{2}	
ROOM NO. 439		
1-MOV-4143	1.015×10^{4}	
1-MOV-4142	1.009×10^{4}	
ROOM NO 213		
1-MOV-504	2.355×10^{2}	
1-SV-210X	1.28×10^{2}	
1-SV-312	1.664×10^{2}	
ROOM NO. 122		
1-MOV-5462	3.44×10^{4}	
1-MOV-5463	3.44×10^{4}	

FIGURE SUPPLIED BY THE LICENSEE

NO	DATE	REVISIONS	BY	CHK	GROUP	PROJ
△						
△						
△						

BALTIMORE GAS & ELECTRIC CO.
ELECTRIC PRODUCTION PLANT
CALVERT CLIFFS UNIT NO. 1 & 2

EQUIPMENT RADIATION DOSES
UNIT 1

Table A-2 (Cont.)

ROOM NO. 110 (See Notes on Page 10)

INSTRUMENT NO.	A T=0 DOSE RATE (RADS/HR)	B T=0 DOSE RATE (RADS/HR)
1-FT-4149	3.321×10^4	0
1-MO-440	4.616×10^4	
1-MA-404	3.435×10^4	
1-MA-407	4.13×10^4	
1-MA-110	4.175×10^4	
1-MOV-653	4.809×10^4	
1-MOV-654	4.966×10^4	
1-MOV-660	3.120×10^4	
1-MOV-662	1.119×10^5	
1-PT-301Z	4.711×10^4	
1-PT-303Y	2.102×10^4	
1-PT-309	4.711×10^4	
1-PT-302Y	4.711×10^4	
1-SV-3030	6.499×10^4	
1-MO-5439	4.353×10^4	
1-MOV-659	3.257×10^4	

REV	DATE	REVISIONS	BY	CHK	ENGR	GROUP SUPV	PROJ ENGR	APPR
SCALE		DESIGNED	DRAWN	CHIEF ENGR				

BALTIMORE GAS & ELECTRIC CO.
CALVERT CLIFFS

EQUIPMENT RADIATION DOSES
UNIT 1

FIGURE SUPPLIED BY THE LICENSEE

Table A-2 (Cont.)

ROOM NO. 119 (See Notes on Page 10)

INSTRUMENT NO.	A T=0 DOSE RATE (RADS/HR)	B T=0 DOSE RATE (RADS/HR)
1-PT-4148	4.684×10^4	0
1-MO-5437	2.55×10^4	
1-MI-4A8	3.87×10^4	
1-MA-104	6.8×10^4	
1-MA-107	6.36×10^4	
1-MA-103	5.62×10^4	
1-MA-400	5.32×10^4	
1-MOV-653	5.47×10^4	
1-MOV-656	5.027×10^4	
1-MOV-658	7.74×10^4	
1-MOV-663	1.139×10^5	
1-PT-301Y, 301X	6.135×10^4	
1-PT-302X, 303X, 307	5.63×10^4	
1-SV-3820	7.77×10^4	

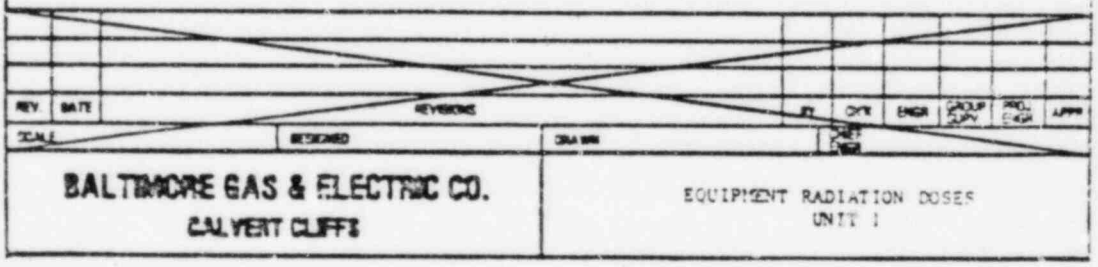

FIGURE SUPPLIED BY THE LICENSEE

Table A-2 (Cont.)

ROOM NO. 221/320 (See Notes on Page 10)

INSTRUMENT NO.	A T=0 DOSE RATE (RAD/HR)	B T=0 DOSE RATE (RADS/HR)
1-MOV-635	5.5195×10^4	2.1×10^5
1-MOV-636	6.317×10^4	
1-MOV-637	5.4314×10^4	
1-MOV-645	5.448×10^4	
1-MOV-646	5.045×10^4	
1-MOV-647	4.1106×10^4	
1-PT-5202	2.2794×10^4	
1-SV-1505	3.9592×10^4	
1-SV-1506	4.203×10^4	
1-SV-1593	4.1061×10^4	
1-SV-1594	4.546×10^4	
1-SV-4200	6.42×10^4	
1-SV-505	5.9633×10^4	
1-SV-6529	1.6304×10^4	
1-FT-1504	9.6413×10^3	
1-FT-1592	1.02×10^4	
1-FT-331, 332, 341, 342	1.35×10^4	
1-PT-212	1.35×10^4	
1-SV-6507 A, E, F, G	1.134×10^4	
1-SV-6507 B, C, D	1.2062×10^4	
1-SV-6531	1.3503×10^4	
1-SV-2100	3.53×10^4	
1-SV-5464	3.35×10^4	
1-SV-1504, 1592	3.6×10^4	

REV	DATE	REVISIONS	BY	CHK	ENGR	GROUP SUPV	PROJ ENGR	APPD
SCALE		DESIGNED	DRAWN	CHIEF ENGR				

BALTIMORE GAS & ELECTRIC CO.
CALVERT CLIFFS

EQUIPMENT RADIATION DOSES
UNIT 1

FIGURE SUPPLIED BY THE LICENSEE

Table A-2 (Cont.)

ROOM NO. 224 (See Notes on Page 10)

INSTRUMENT NO.	A T=0 DOSE RATE (RADS/HR)	B T=0 DOSE RATE (RADS/HR)
1-FT-321, 311, 312, 322	6.79×10^3	1.0×10^4
1-SV-4047, 4048, 4049, 4052, 4053	7.33×10^3	
1-PT-5316A	4.35×10^4	
1-PT-5316B	3.97×10^4	
1-SV-1645	1.56×10^4	
1-SV-1646	5.2×10^4	
1-MOV-4144	3.29×10^4	
1-MOV-4145	4.11×10^4	

FIGURE SUPPLIED BY THE LICENSEE

REV	DATE	REVISIONS	BY	CHK	ENGR	GROUP SUPV	PROJ ENGR	APPR

SCALE | DESIGNED | DRAWN | CHIEF ENGR

BALTIMORE GAS & ELECTRIC CO.
CALVERT CLIFFS

EQUIPMENT RADIATION DOSES
UNIT 1

Table A-2 (Cont.)

ROOM NO. 227 + 316 (See Notes on Page 10)

INSTRUMENT NO.	A T=0 DOSE RATE (RADS/HR)	B T=0 DOSE RATE (RADS/HR)
1-FT-1581, 1589, 4509, 4510	3.884×10^2	4.4×10^5
1-MOV-615	2.362×10^4	
1-MOV-616	7.0972×10^3	
1-MOV-617	8.056×10^3	
1-MOV-625	2.3631×10^4	
1-MOV-626	1.102×10^4	
1-MOV-627	1.079×10^4	
1-MOV-651	1.75×10^4	
1-MOV-6579	2.26×10^2	
1-FT-6901	3.67×10^3	
1-IP-4511, 4512	3.28×10^2	
1-MOV-2000	2.593×10^2	
1-MO-403	4.36×10^3	
1-MOV-6901	5.238×10^3	
1-MOV-6902	3.4192×10^3	
1-MOV-6903	3.9454×10^3	
1-SV-1411	2.205×10^3	
1-SV-1413	2.665×10^3	
1-SV-1581	2.8465×10^2	
1-SV-1582	2.611×10^2	
1-SV-1583	2.489×10^2	
1-SV-1589	4.36×10^2	
1-SV-1590	4.384×10^2	
1-SV-1591	3.921×10^2	
1-SV-3832	7.000×10^3	
1-SV-3833	6.867×10^3	
1-SV-4010	2.9488×10^3	
1-SV-4011	6.98×10^3	
1-SV-4012	3.041×10^3	
1-SV-4013	6.512×10^3	

REV	DATE	REVISIONS	BY	CHK	ENGR	GROUP SUPV	PROJ ENGR	APPR
SCALE		DESIGNED	DRAWN	CHIEF ENGR				

BALTIMORE GAS & ELECTRIC CO.
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EQUIPMENT RADIATION DOSES
UNIT 1

FIGURE SUPPLIED BY THE LICENSEE

Table A-2 (Cont.)

ROOM NO. 228 (See Notes on Page 10)

INSTRUMENT NO.	A T=0 DOSE RATE (RADS/HR)	B T=0 DOSE RATE (RADS/HR)
1-FT-306	2.186×10^4	0
1-IP-5206, 5208	1.026×10^4	
1-MB-106	2.178×10^4	
1-MB-116	4.805×10^3	
1-MB-406	1.137×10^4	
1-SV-3824	4.472×10^3	
1-SV-3826	4.554×10^3	
1-SV-5160	1.059×10^4	
1-SV-5162	4.458×10^3	
1-SV-5163, 5165, 5166	4.863×10^3	
1-SV-5208, 5208A	5.396×10^3	
1-SV-5206, 5206A	1.446×10^4	

REV | DATE | REVISIONS | BY | CHK | ENGR | GROUP SUPV | PROJ ENGR | APPD

SCALE | DESIGNED | DRAWN | DATE

BALTIMORE GAS & ELECTRIC CO.
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EQUIPMENT RADIATION DOSES
UNIT 1

FIGURE SUPPLIED BY THE LICENSEE

Table A-2 (Cont.)

Doses in Rooms With Safety Related Equipment

Room No.	Accumulated Dose (RADS)		Room No.	Accumulated Dose (RADS)	
	30 Day	1 Year		30 Day	1 Year
100	3600	4200	419	18	21
108	*	*	421	4.27×10^3	4.47×10^3
117	9300	13,000	422	4.27×10^3	4.47×10^3
			423	1.95×10^5	1.96×10^5
208	*	*	426	*	*
212	1.04×10^5	2.72×10^5	428	9.37×10^3	9.27×10^3
217	12	14	429	1.85×10^5	1.85×10^5
220	173	252	430	6.85×10^2	6.85×10^2
225	1.65×10^5	2.44×10^5			
226	2.23×10^3	2.29×10^3	512	38	38
			524	9370	9370
301	600	700	529	*	*
302	600	700			
304	600	700	ARF	*	*
306	600	700			
313	2.96×10^5	2.97×10^5	ISFR	*	*
317	3.32×10^4	3.33×10^4			
318	1.26×10^4	1.27×10^4	T601	*	*
319	3.9×10^3	4.55×10^3	T603	*	*
320	*	*			
325	480	560	W033	*	*
328	*	*			
403	*	*			

Doses can be applied to all equipment located in the indicated rooms.

* Dose due to Loca is negligible
Note--Doses apply to corresponding Unit 2 room where applicable

REV	DATE	REVISIONS	BY	CHK	ENGR	GROUP SUPV	PROJ ENGR	APPR
SCALE		DESIGNED	DRAWN	CHIEF DESIGN				

BALTIMORE GAS & ELECTRIC CO.
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Equipment Radiation Doses
Units 1 and 2

FIGURE SUPPLIED BY THE LICENSEE

Table A-2 (Cont.)

NOTES:

1. Dose rate in Column A is due to sump liquid present in recirc. system dose rate in Column B is due to containment penetration streaming.
2. To obtain T=0 Dose Rate (Total) in RADS/HR, add Column A (liquid source) and Column B (Penetration Streaming).
3. To obtain the T= 1 year integrated dose (RADS), multiply the Column A dose rate by 34.0 and the column B dose rate by 4.2.
4. To obtain the T=30 day integrated dose (RADS) multiply the Column A dose rate by 23.0 and the Column B dose rate by 4.2.

EXAMPLE: If the Column A Dose Rate is 6.317×10^4 and the Column B Dose Rate is 2.1×10^5, the integrated doses are:

30 Day - $(6.317 \times 10^4 \times 23) + (2.1 \times 10^5 \times 4.2) = 2.335 \times 10^6$ RADS

1 Year - $(6.317 \times 10^4 \times 34) + (2.1 \times 10^5 \times 4.2) = 3.03 \times 10^6$ RADS

FIGURE SUPPLIED BY THE LICENSEE

REV	DATE	REVISIONS	BY	CHK	ENGR	GROUP SUPV	PROJ ENGR	APPR
SCALE		DESIGNED	DRAWN					

BALTIMORE GAS & ELECTRIC CO. CALVERT CLIFFS	EQUIPMENT RADIATION DOSES NOTES - UNITS 1 & 2

Table A-2 (Cont.)

INSTRUMENT NO.	1 YEAR BETA DOSE (10^6RADS)	1 YEAR GAMMA DOSE (10^6RADS)
SV-6540 (A thru G)	223.04	15.1
SV-5465		13.76
SV-5466		
SV-5467		
SV-515		12.36
SV-516		
SV-5291		12.98
U-109-PH thru U-112-PH		8.16
LT-1105		11.26
LT-1106		
LT-1113 (A thru D)		
LT-1123 (A thru D)		
PDT-111 (A thru D)		
PDT-121 (A thru D)		
PT-1013 (A thru D)		
PT-1023 (A thru D)		
PT-103-1		15.06
PT-100-Y		
PT-102-C		
LT-110-Y		
PT-102-D		17.12
PT-103		
LT-110-X		

REV | DATE | REVISIONS | BY | CHK | ENGR | GROUP SUPV | PROJ ENGR | APPR

DESIGNED | DRAWN | CHIEF ENGR

BALTIMORE GAS & ELECTRIC CO.
CALVERT CLIFFS

EQUIPMENT RADIATION DOSES
UNITS 1 & 2 (CONTAINMENT)

FIGURE SUPPLIED BY THE LICENSEE

Table A-2 (Cont.)

INSTRUMENT NO.	1 YEAR BETA DOSE (10^6RADS)	1 YEAR GAMMA DOSE (10^6RADS)
PT-100-X PT-102-B PT-101-A	223.04	16.06
FT-1111		12.71
FT-1121		13.96
MB-414		19.35
MB-402		
MOV-634		14.06
MOV-644		16.06
MOV-614		17.06
MOV-624		11.36
MOV-652		12.46
MOV-6900		12.31
SV-517		14.86
SV-518		
SV-519		
SV-611		16.06
SV-618		
SV-621		11.36
SV-628		
SV-631		13.86
SV-638		
SV-648		11.36
SV-641		
SV-661		15.06
ERV-402		8.16
ERV-404		
MOV-403		
MOV-405		

REV	DATE	REVISIONS	BY	CHK	ENGR	GROUP SUPV	PROJ ENGR	APPR

SCALE	DESIGNED	DRAWN	CHIEF ENGR

BALTIMORE GAS & ELECTRIC CO. CALVERT CLIFFS	EQUIPMENT RADIATION DOSES UNITS 1 & 2 (CONTAINMENT)

FIGURE SUPPLIED BY THE LICENSEE

Table A-2 (Cont.)

INSTRUMENT NO.	1 YEAR BETA DOSE (10^6RADS)	1 YEAR GAMMA DOSE (10^6RADS)
MB-105	223.04	428.16
MB-121		
MB-405		
Q09		15.86
Q08		21.56
RE-5316A		10.76
RE-5316 (B thru D)		428.16
SV-612		21.16
SV-632		17.16
PA-601 thru PA-604		15.96
TE-112 (CA thru CD)		13.16
TE-112 (HA thru HD)		
TE-122 (CA thru CD)		
TE-122 (HA thru HD)		
NI-001 thru NI-008		
LS-5463		15.96
LS-5464		
LT-4144		
LT-4145		
PDT-124		
SV-1410		14.16
SV-1412		13.46
SV-4160		14.76
SV-4151		14.76

REV	DATE	REVISIONS	BY	CHK	ENGR	GROUP SUPV	PROJ ENGR	APPR
SCALE		DESIGNED	DRAWN	CHIEF ENGR				

BALTIMORE GAS & ELECTRIC CO.
CALVERT CLIFFS

EQUIPMENT RADIATION DOSES
UNITS 1 & 2 (CONTAINMENT)

FIGURE SUPPLIED BY THE LICENSEE

Table A-2 (Cont.)

INSTRUMENT NO.	1 YEAR BETA DOSE (10^6RADS)	1 YEAR GAMMA DOSE (10^6RADS)
SV-4150	223.04	13.46
SV-4159		13.92
MB-102		14.66
MB-114		14.66
MB-101		15.04
MB-401		15.04
SV-2085		14.38
SV-622		9.11
SV-642		13.36
SV-613		31.16
SV-623		8.81
SV-633		29.14
SV-643		15.96
1-SV-506*		14.74
2-SV-506*		15.96

* All other doses apply to both Unit one and Unit two instruments.

1) All gamma doses include components due to airborne, plate-out, sump, and filter sources.

2) BETA doses should be applied only where applicable.

REV	DATE	REVISIONS	BY	CHK'D	ENGR	GROUP LDR	PROJ ENGR	APPR
SCALE		DESIGNED	DRAWN		SHEET SIZE			

BALTIMORE GAS & ELECTRIC CO.
CALVERT CLIFFS

EQUIPMENT RADIATION DOSES
UNITS 1 & 2 (CONTAINMENT)

FIGURE SUPPLIED BY THE LICENSEE

Table A-2 (Cont.)

INSTRUMENT NO.	1 HOUR BETA DOSE (10^6 RADS)	1 HOUR GAMMA DOSE (10^6 RADS)
1-MB-102	6.8	1.22
1-MB-114	↓	↓
1-MB-105		8.78
1-MB-121		↓
1-MB-405		
1-MB-402		1.28
1-MB-414		↓
1-MOV-614		1.27
1-MOV-624		1.16
1-MOV-634		1.21
1-MOV-644		1.23
1-PT-102A		1.24
1-PT-102B		↓
1-PT-102C		1.22
1-PT-102D		1.26
1-SV-1410		1.21
1-SV-1412		1.20
1-SV-5221	↓	1.19

REV	DATE	REVISIONS	BY	CHK'D	ENGR	GROUP SUPV	PROJ ENGR	APPD
SCALE		DESIGNED	DRAWN					

BALTIMORE GAS & ELECTRIC CO.
CALVERT CLIFFS

EQUIPMENT RADIATION DOSES
UNITS 1 & 2 (CONTAINMENT)

FIGURE SUPPLIED BY THE LICENSEE

Table A-2 (Cont.)

INSTRUMENT NO.	1 HOUR BETA DOSE (10^6 RADS)	1 HOUR GAMMA DOSE (10^6 RADS)
1-SV-5465	6.8	1.21
1-SV-5466	↓	↓
1-SV-5467	↓	↓
1-SV-4150	↓	1.2
1-SV-4151	↓	1.22
1-SV-613	↓	1.5
1-SV-623	↓	1.1
1-SV-633	↓	1.48
1-SV-643	↓	1.23
1-SV-611	↓	1.25
1-SV-618	↓	↓
1-SV-621	↓	1.16
1-SV-628	↓	↓
1-SV-631	↓	1.2
1-SV-638	↓	↓
1-SV-641	↓	1.16
1-SV-648	↓	↓
1-SV-661	↓	1.22
1-SV-515	↓	1.18
1-SV-516	↓	↓
1-SV-506*	↓	1.22
1-SV-506*	↓	1.25

For Notes, See Sht. 14 of this Exhibit.

BALTIMORE GAS & ELECTRIC CO.
CALVERT CLIFFS

EQUIPMENT RADIATION DOSES
UNITS 1 & 2 (CONTAINMENT)

FIGURE SUPPLIED
BY THE LICENSEE

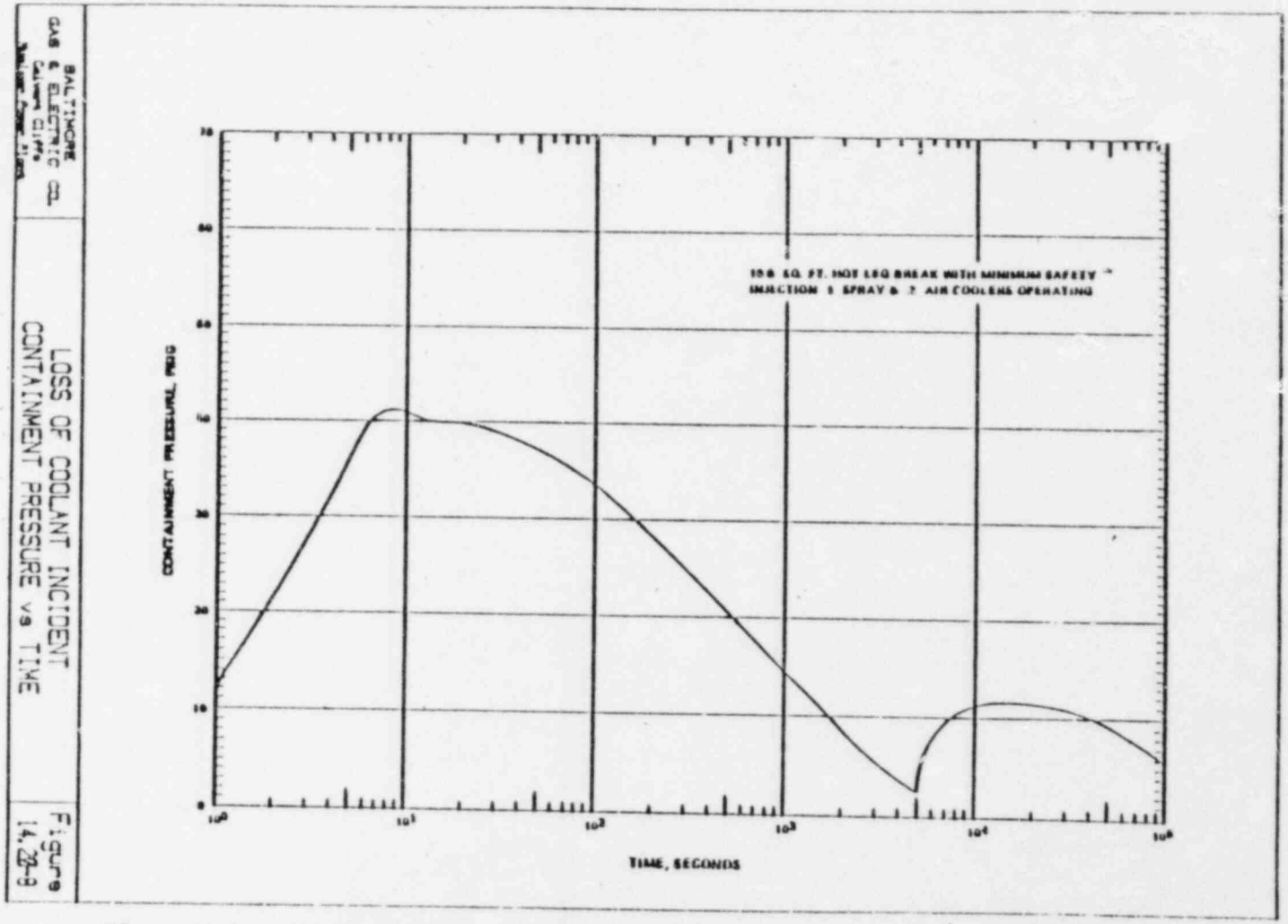

Figure A-1. 19.0 Sq. Ft. Hot Leg Break with Minimum Safety Injection - Containment Pressure Vs. Time (FSAR Figure 14.20-8)

FIGURE SUPPLIED BY THE LICENSEE

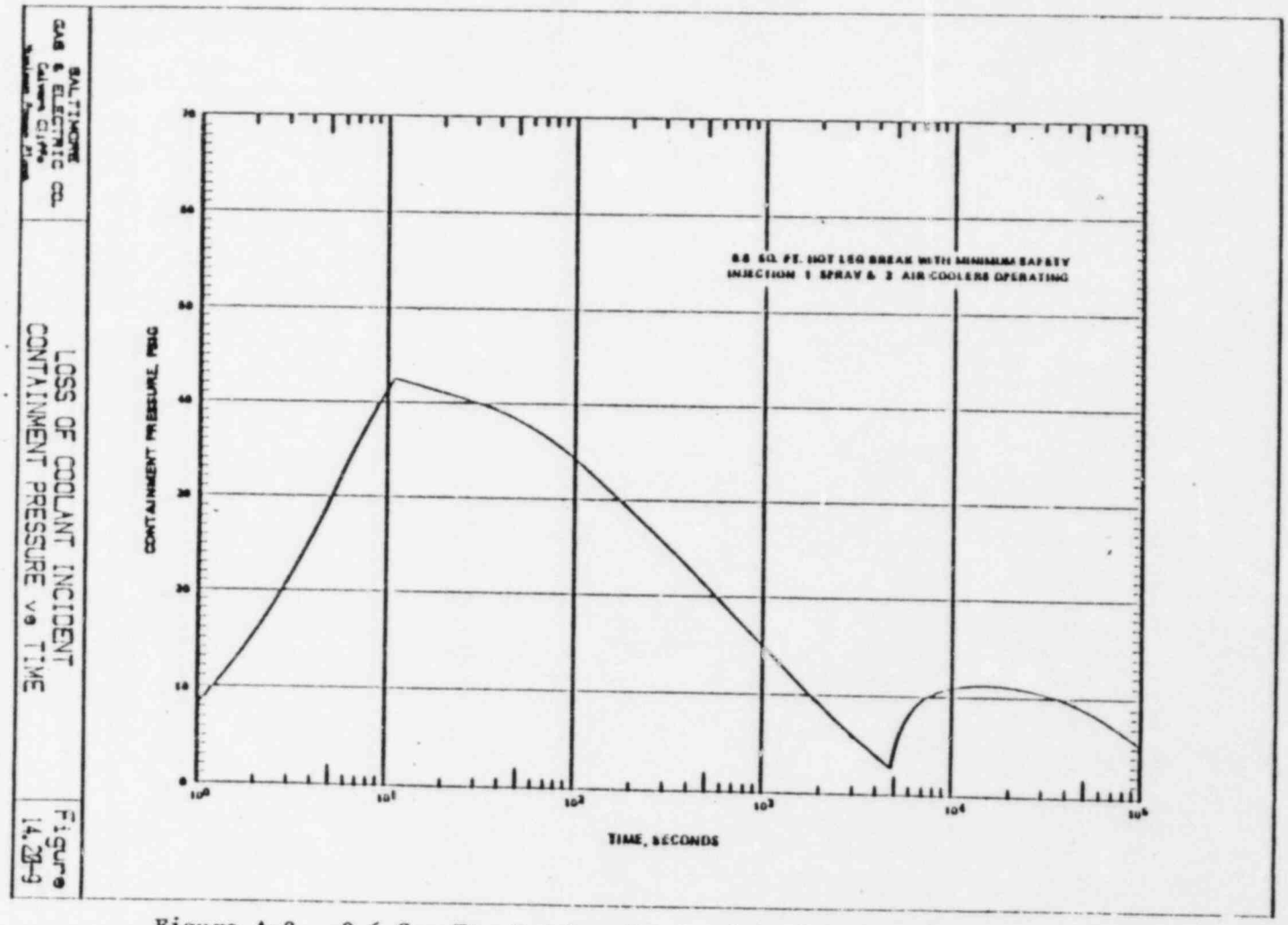

Figure A-2. 9.6 Sq. Ft. Hot Leg Break with Minimum Safety Injection - Containment Pressure Vs. Time (FSAR Figure 14.20-9)

FIGURE SUPPLIED BY THE LICENSEE

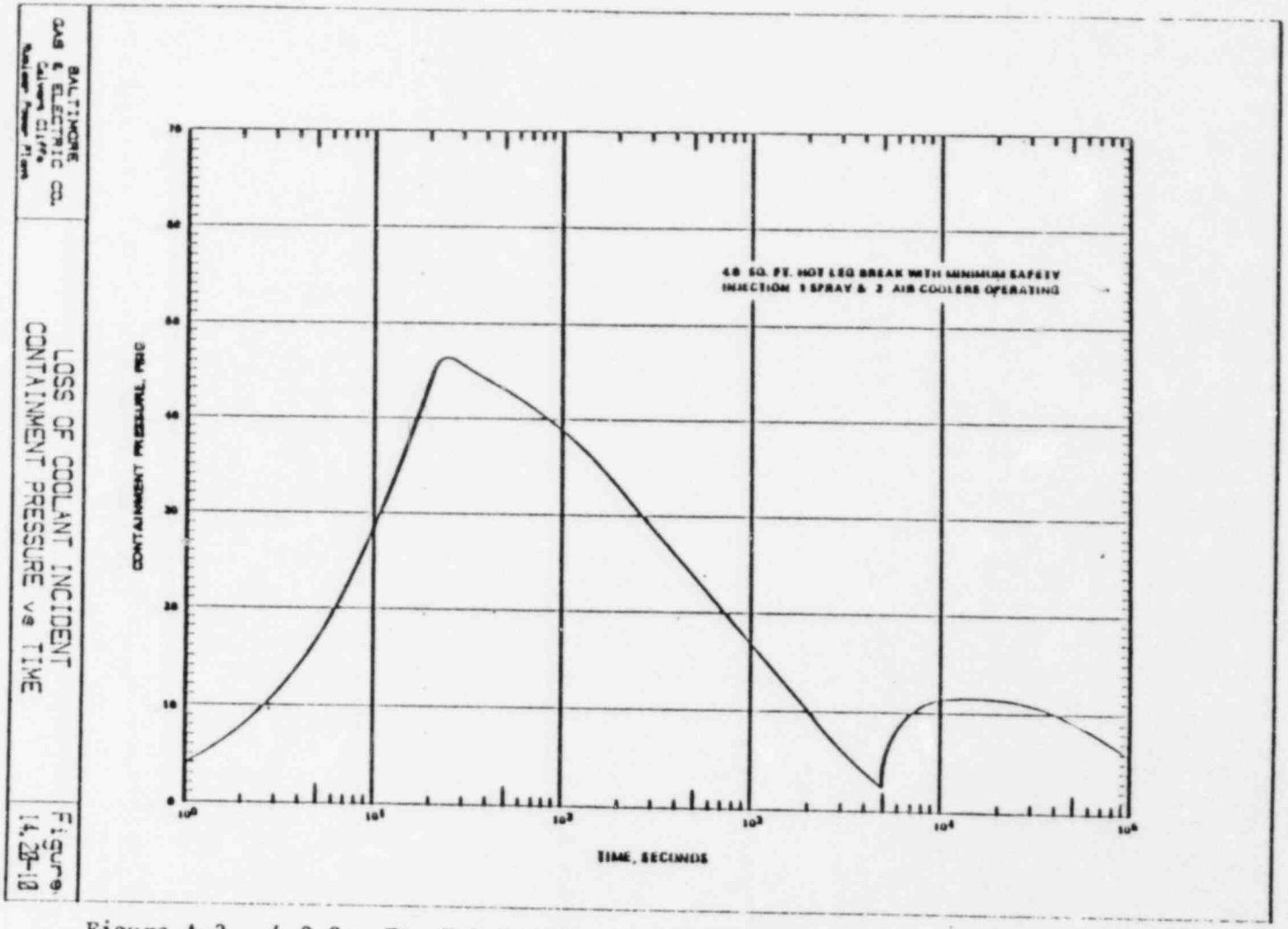

Figure A-3. 4.0 Sq. Ft. Hot Leg Break with Minimum Safety Injection - Containment Pressure Vs. Time (FSAR Figure 14.20-10)

FIGURE SUPPLIED BY THE LICENSEE

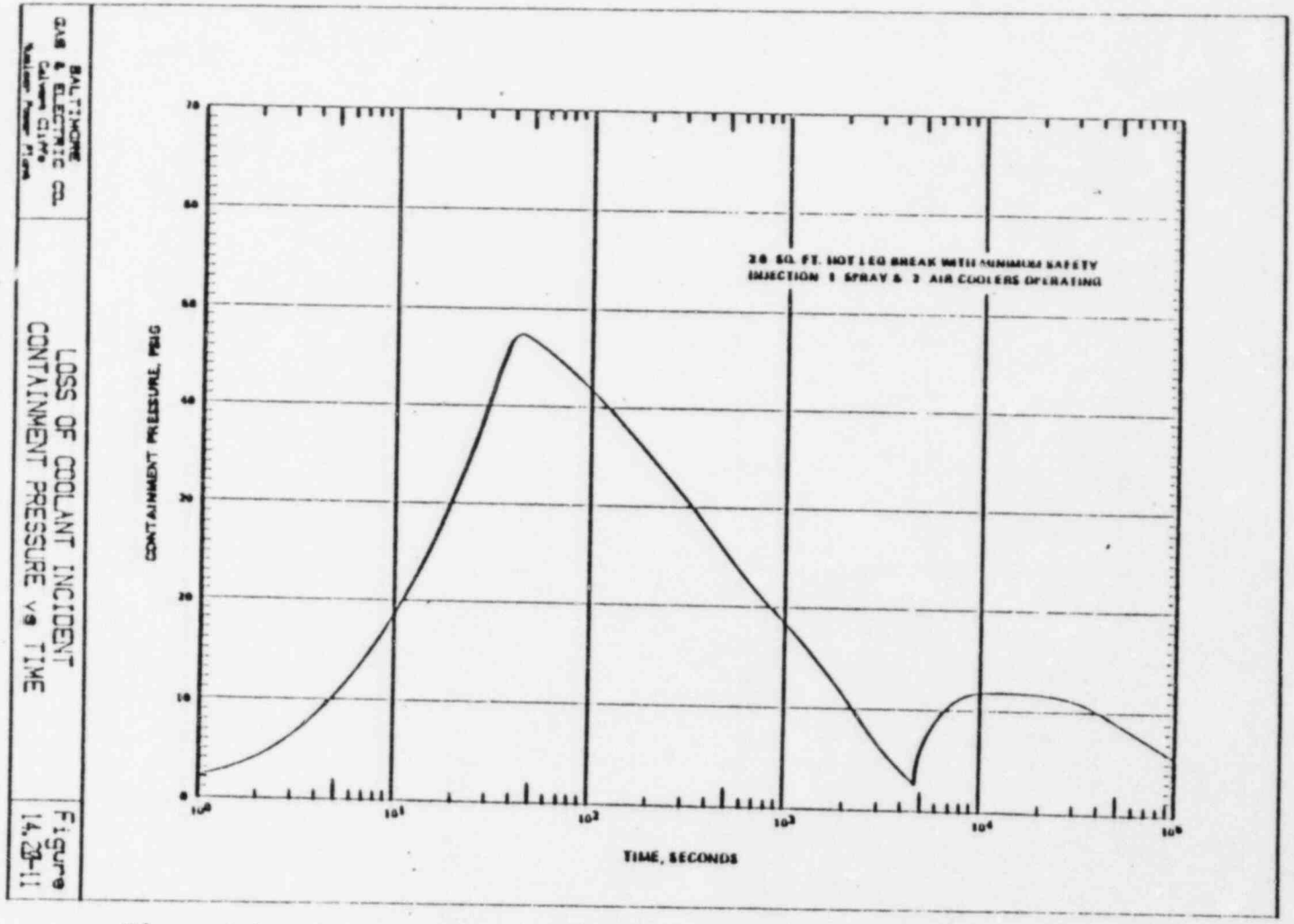

Figure A-4. 2.0 Sq. Ft. Hot Leg Break with Minimum Safety Injection - Containment Pressure Vs. Time (FSAR Figure 14.20-11)

FIGURE SUPPLIED BY THE LICENSEE

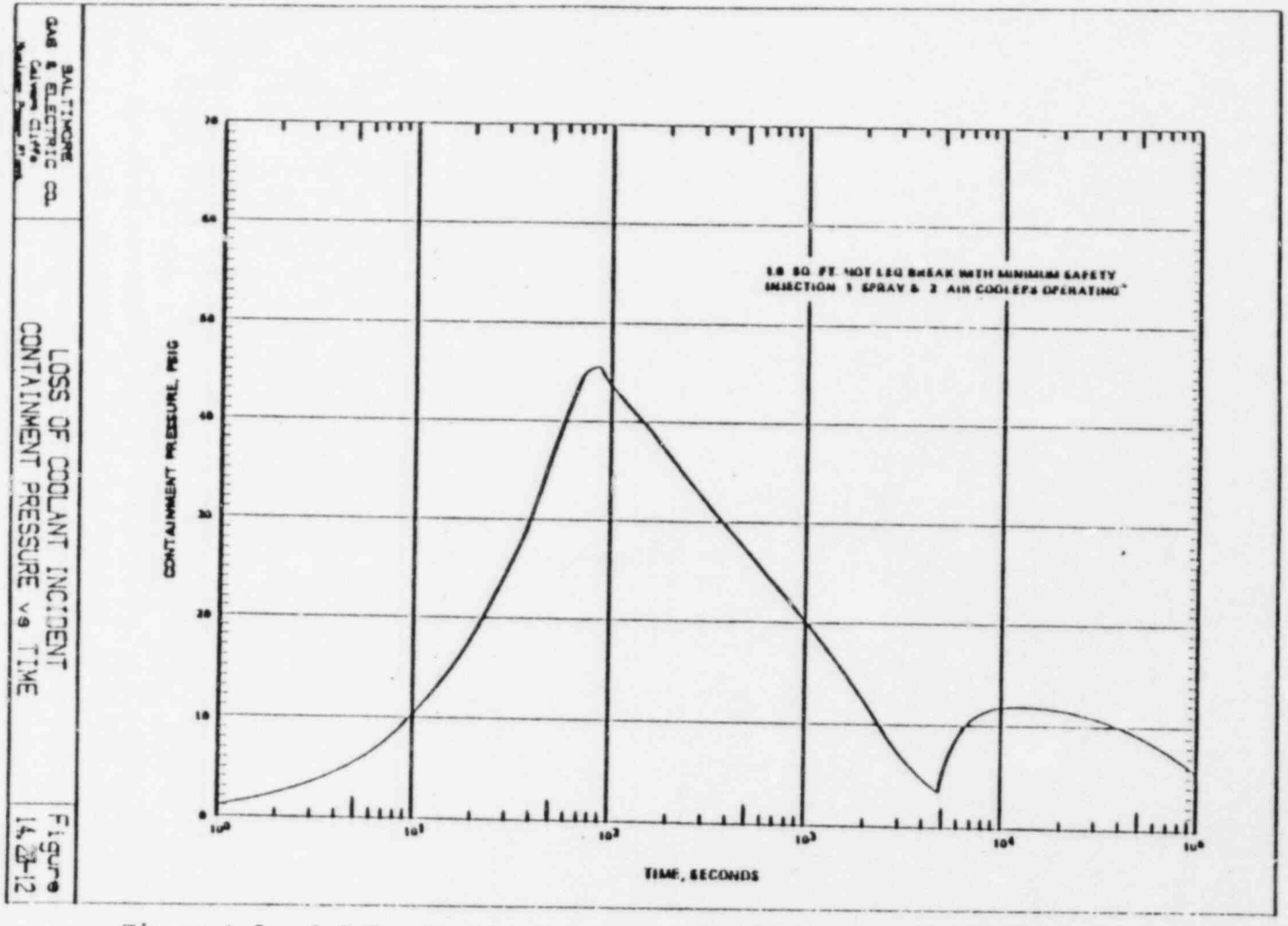

Figure A-5. 1.0 Sq. Ft. Hot Leg Break with Minimum Safety Injection - Containment Pressure Vs. Time (FSAR Figure 14.20-12)

FIGURE SUPPLIED BY THE LICENSEE

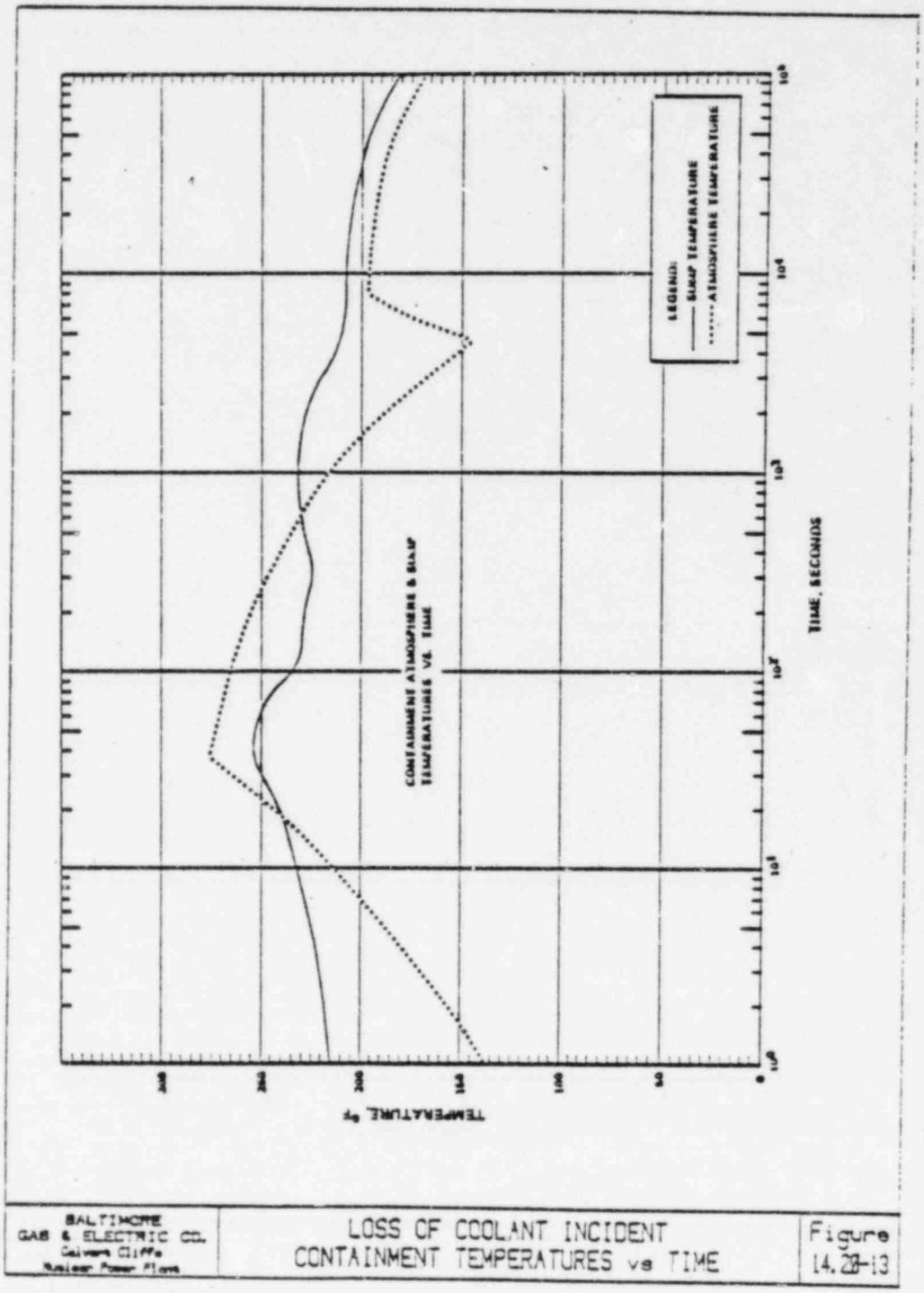

FIGURE SUPPLIED BY THE LICENSEE

Figure A-6. Containment Atmosphere and Sump Temperatures Vs. Time (FSAR Figure 14.20-13)

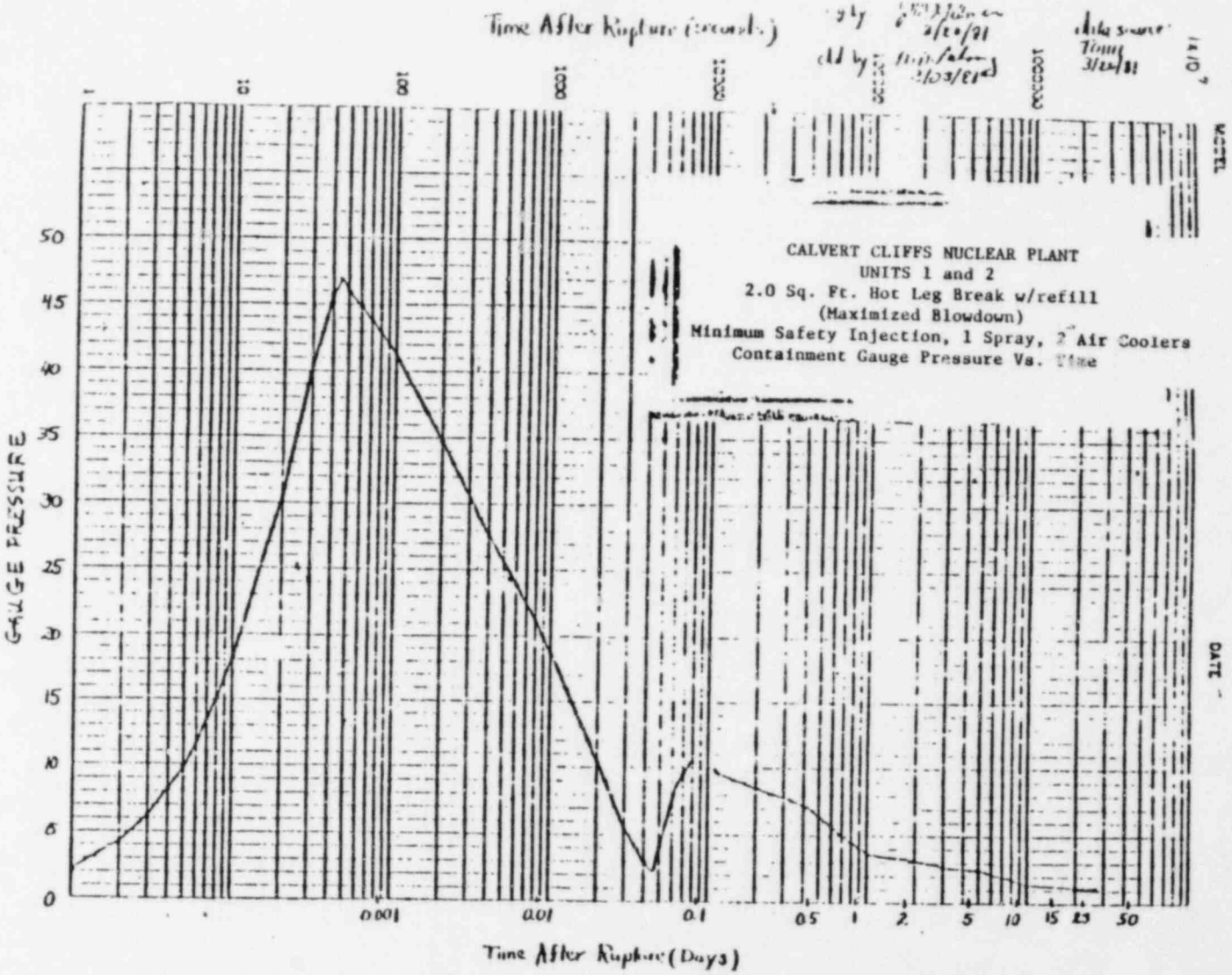

Figure A-7. 2.0 Sq. Ft. Hot Leg Break with Refill (Maximized Blowdown), Minimum Safety Injection - Long-Term Containment Vapor Temperature [14]

FIGURE SUPPLIED BY THE LICENSEE

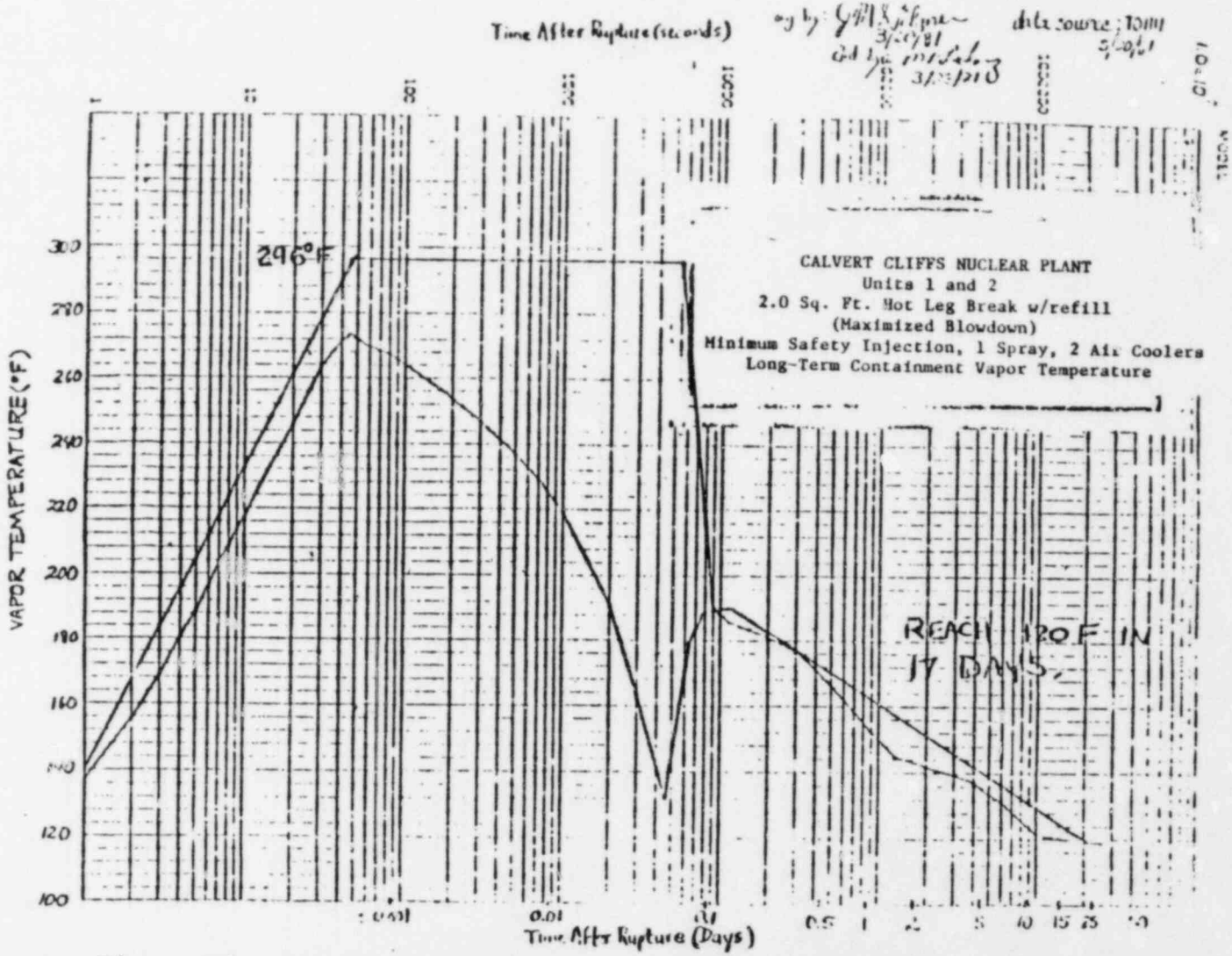

Figure A-8. 2.0 Sq. Ft. Hot Leg Break with Refill (Maximized Blowdown), Minimum Safety Injection - Containment Gauge Pressure Vs. Time [14]

FIGURE SUPPLIED

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 & Porter, 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 tabulation 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
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

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 (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

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

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

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

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
LICENSEE REFERENCE(S): 712
FUNCTION (PLANT ID): PURGE 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 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

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

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 SMB00
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 SMB00
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

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 REFERENCE(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 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

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 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

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 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

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): 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]: 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]: 203

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, 1LT1123C, 1LT1123B, 1LT1123A)
LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 22 THROUGH 27
FUNCTION (PLANT ID): STEAM GENERATOR 11 LEVEL (1LT1111, 1LT1105, 1LT1113D, 1LT1113C, 1LT1113B, 1LT1113A)
LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 16 THROUGH 21

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

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 (1TE112CD, 1TE112CC, 1TE112CB, 1TE122CB, 1TE122CD, 1TE122CC, 1TE122CA, 1TE122HD, 1TE122HC, 1TE122HB, 1TE122HA, 1TE112CA, 1TE112HD, 1TE112HC, 1TE112HB, 1TE112HA)
LICENSEE SUBMITTAL: 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 (1ZEA4, 1ZWA6, 1ZWA3, 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 (1ZEE4, 1ZEE9, 1ZWE3, 1ZWE9)
LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 50, 51, 52, 53
FUNCTION (PLANT ID): CONTAINMENT PENETRATION ASSEMBLY (1ZEE1, 1ZEE7, 1ZWE1, 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 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

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

EQUIPMENT ITEM NO. 47
ELECTRIC MOTOR LOCATED IN THE ECCS PUMP ROOM (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]: 195

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]: 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 (1MO5437)
LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 253
FUNCTION (PLANT ID): WEST ECCS PUMP ROOM VENT DAMPER (1MO5439)
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 CHANBER 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]: 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 1NI004(P) (1NI004(P))
LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 150
FUNCTION (PLANT ID): PROPORTIONAL COUNTER 1NI003(P) (1NI003(P))
LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 149
FUNCTION (PLANT ID): PROPORTIONAL COUNTER 1NI002(P) (1NI002(P))
LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 148
FUNCTION (PLANT ID): PROPORTIONAL COUNTER 1NI001(P) (1NI001(P))
LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 147

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 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

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 ID): 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

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

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

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

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 CABLE LOCATED IN CONTAINMENT (C230)
CONTINENTAL WIRE MODEL SILICONE RUBBER/ASBESTOS BR
REQUIRED OPERATING 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 (PLANT ID): CABLE
LICENSEE SUBMITTAL: SCEW(S) [1, 12]: 60

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

EQUIPMENT ITEM NO. 79
ELECTRICAL CABLE LOCATED IN CONTAINMENT (C230)
RAYCHEM MODEL COAXIAL/XLP
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
REQUIRED 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

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 (1MO403)
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

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 (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	System[1]
Emergency Reactor Shutdown	Chemical Volume and Control
	Reactor Coolant
	Safeguards Actuation (Part of Reactor Coolant)
Containment Isolation	Chemical and Volume Control
	Compressed Air
	Condensate and Feedwater
	Cooling Water
	Main Steam
	Plant Heating
	Reactor Coolant and Waste Process Sample
	Safety Injection and Containment Spray Sampling
	Waste Processing
Reactor Core Cooling	Safety Injection and Containment Spray
Containment Heat Removal	Safety Injection and Containment Spray
	Containment Air Recirculation and Cooling

1. 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	System[1]
Core Residual Heat Removal	(Residual Heat Removal[3])
	Auxiliary Feedwater[2]
	Condensate and Feedwater
	Main Steam
	Cooling Water
	Safety Injection and Containment Spray
Prevention of Significant Release of Radioactive Material to Environment	Containment Air Recirculation and Cooling
	Radiation Monitoring
	Sampling
Support Systems	Electrical
	Ventilation

2. Covered as part of TMI-2 Lessons Learned; does not appear in systems list.
3. Residual heat removal is performed by a number of systems. Some components are being addressed as part of TMI-2 Lessons Learned.

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 - LOSS OF REACTOR COOLANT		
1Z5501	POSITION SWITCH	VOLUME CONT TK DISCH MOV
1Z5505	POSITION SWITCH	RCP BLEED OFF ISOL ICV505
1Z5506	POSITION SWITCH	RCP BLEED OFF ISOL ICV506
1Z5508	POSITION SWITCH	BA TK 12 CHARG PUMP SUCT
1Z5509	POSITION SWITCH	BA TK 11 TO CHARG PUMP SUCT
1Z5510	POSITION SWITCH	BA TANK 12 RECIRC ICV510
1Z5511	POSITION SWITCH	BA TANK 12 RECIRC ICV511
1Z5512	POSITION SWITCH	MAKE UP FLOW CONTROL ICV512
1Z5514	POSITION SWITCH	BA PUMPS TO CHARG PUMP SUCT
1Z5515	POSITION SWITCH	LETDOWN LINE ISOL ICV515
1Z5516	POSITION SWITCH	LETDOWN LINE ISOL ICV516
COMPRESSED AIR		
1Z52080	POSITION SWITCH	INSTR AIR CNTMNT ISOL
CONDENSATE AND FEEDWATER		
1F14509	FLOW INDICATOR	AUX FDWTR FLOW SG 11
1F14511	FLOW INDICATOR	AUX FDWTR FLOW SG 12
1L1C1113A	LEVEL INDICATOR	STEAM GENERATOR 11 LEVEL
1L1C1113B	LEVEL INDICATOR	STEAM GENERATOR 11 LEVEL
1L1C1113C	LEVEL INDICATOR	STEAM GENERATOR 11 LEVEL
1L1C1113D	LEVEL INDICATOR	STEAM GENERATOR 11 LEVEL
1L1C1123A	LEVEL INDICATOR	STEAM GENERATOR 12 LEVEL
1L1C1123B	LEVEL INDICATOR	STEAM GENERATOR 12 LEVEL
1L1C1123C	LEVEL INDICATOR	STEAM GENERATOR 12 LEVEL
1L1C1123D	LEVEL INDICATOR	STEAM GENERATOR 12 LEVEL
COOLING WATER		
1Z51582	POSITION SWITCH	CNTMNT CLG COIL 11 DIS ICV1582
1Z51585	POSITION SWITCH	CNTMNT CLG COIL 12 DIS ICV1585
1Z51590	POSITION SWITCH	CNTMNT CLG COIL 13 DIS ICV1590
1Z51593	POSITION SWITCH	CNTMNT CLG COIL 14 DIS ICV1593

FIGURE SUPPLIED BY THE LICENSEE

Table C-1 (Cont.)

1Z31596	POSITION SWITCH	SPENT FUEL CLR 11 DIS ICV1596
1Z31597	POSITION SWITCH	SPENT FUEL CLR 11 SUP ICV1597
1Z31630	POSITION SWITCH	TURB BLDG SHUTOFF ICV1630
1Z31637	POSITION SWITCH	TURB LUBEHC CLR ISOL ICV1637
1Z31638	POSITION SWITCH	TURB BLDG SHUTOFF ICV1638
1Z31639	POSITION SWITCH	TURB LUBEHC CLR ICV1639
1Z33828	POSITION SWITCH	SHUTDOWN HTEX 11 DISCH ICV3828
1Z33830	POSITION SWITCH	SHUTDOWN HTEX 12 DISCH ICV3830
1Z33832	POSITION SWITCH	COMP POOL TO RCP ISOL ICV3832
1Z33833	POSITION SWITCH	COOL FROM RCP ISOL ICV3833
1Z33840	POSITION SWITCH	COMP CLG TO WASTE EVAP ISOL
1Z33842	POSITION SWITCH	COMP CLG TO WASTE EVAP ISOL
1Z35150	POSITION SWITCH	SERV WTR HTEX 11 ICV5150
1Z35153	POSITION SWITCH	SERV WTR HTEX 12 ICV5153
1Z35160	POSITION SWITCH	SW INLET HTEX 11
1Z35162	POSITION SWITCH	SW INLET HTEX 12
1Z35163	POSITION SWITCH	SW OUTLET HTEX 12
1Z35165	POSITION SWITCH	COMP CLG HTEX 12 SW DISCH
1Z35206	POSITION SWITCH	SW OUTLET HTEX 11
1Z35209	POSITION SWITCH	SERV WTR HTEX 11 ICV5209
1Z35210	POSITION SWITCH	SERV WTR HTEX 11 ICV5210
1Z35212	POSITION SWITCH	SERV WTR HTEX 12 ICV5212
1Z35214	POSITION SWITCH	SERV WTR HTEX 12 ICV5214
1Z35250	POSITION SWITCH	SW TO CIRC WTR PUMP AM COOLERS
1Z35251	POSITION SWITCH	SW TO CIRC WTR PUMP AM COOLERS
MAIN STEAM		
1FR1011	FLOW INDICATOR	SG 11 STM/FDWTR FLORATE
1FR1021	FLOW INDICATOR	SG 12 STM/FDWTR FLORATE
1PI10134	PRESS INDICATOR	STEAM GENERATOR 11
1PI10138	PRESS INDICATOR	STEAM GENERATOR 11

FIGURE SUPPLIED
BY THE LICENSEE

Table C-1 (Cont.)

1P11013C	PRESS INDICATOR	STEAM GENERATOR 11
1P11013D	PRESS INDICATOR	STEAM GENERATOR 11
1P11023A	PRESS INDICATOR	STEAM GENERATOR 12
1P11023B	PRESS INDICATOR	STEAM GENERATOR 12
1P11023C	PRESS INDICATOR	STEAM GENERATOR 12
1P11023D	PRESS INDICATOR	STEAM GENERATOR 12
1Z54010	POSITION SWITCH	SG11 BLDN ISOL ICV4010
1Z54011	POSITION SWITCH	SG11 BLDN ISOL ICV4011
1Z54012	POSITION SWITCH	SG12 BLDN ISOL ICV4012
1Z54013	POSITION SWITCH	SG12 BLDN ISOL ICV4013
PENETRATION ROOM VENTILATION		
1Z35286	POSITION SWITCH	PEN RM FILTER 11 OUTLET DAMPER
1Z35288	POSITION SWITCH	PEN RM FILTER 12 OUTLET DAMPER
PLANT HEATING		
1Z56574	POSITION SWITCH	CNTMNT ISOL
RADIATION MONITORING		
1R15317A	RADIATION INDICATOR	CNTMNT HI RANGE RAD IND
1R15317B	RADIATION INDICATOR	CNTMNT HI RANGE RAD IND
REACTOR COOLANT		
1L1103	LEVEL INDICATOR	PRESSURIZER LEVEL INDICATOR
1P1102A	PRESSURE INDICATOR	PRESSURIZER 11
1P1102B	PRESSURE INDICATOR	PRESSURIZER 11
1P1102C	PRESSURE INDICATOR	PRESSURIZER 11
1P1102D	PRESSURE INDICATOR	PRESSURIZER 11
SAFETY INJECTION AND CONTAINMENT SPRAY		
1F1311	FLOW INDICATOR	HPSI FLOW TO LOOP 11A
1F1312	FLOW INDICATOR	LPSI FLOW TO LOOP 11A
1F1321	FLOW INDICATOR	HPSI FLOW TO LOOP 11B
1F1322	FLOW INDICATOR	LPSI FLOW TO LOOP 11B
1F1331	FLOW INDICATOR	HPSI FLOW TO LOOP 12A
1F1332	FLOW INDICATOR	LPSI FLOW TO LOOP 12A
1F1341	FLOW INDICATOR	HPSI FLOW TO LOOP 12B

FIGURE SUPPLIED BY THE LICENSEE

Table C-1 (Cont.)

[illegible]	FLOW INDICATOR	LPSI FLOW TO LOOP 12B
[illegible]	LEVEL INDICATOR	REFUELING WTR TANK 11 LEVEL
[illegible]	LEVEL INDICATOR	REFUELING WTR TANK 11 LEVEL
[illegible]	LEVEL INDICATOR	CONTAINMENT SUMP LEVEL
[illegible]	LEVEL INDICATOR	CONTAINMENT SUMP LEVEL
[illegible]	POSITION SWITCH	CNTMNT SUMP DISCH
[illegible]	POSITION SWITCH	CNTMNT SUMP DISCH
[illegible]	POSITION SWITCH	CNTMNT SPRAY HDR ISOL ICV4150
[illegible]	POSITION SWITCH	CNTMNT SPRAY HDR ISOL ICV4151
[illegible]	POSITION SWITCH	SI TANK 11A ISOL 1MOV614
[illegible]	POSITION SWITCH	LPSI TO LOOP 11A CONT 1MOV615
[illegible]	POSITION SWITCH	MAN HPSI TO LOOP 11A 1MOV616
[illegible]	POSITION SWITCH	HPSI TO LOOP 11A CONT 1MOV617
[illegible]	POSITION SWITCH	CHECK VALVE LKG DRN TO RWT
[illegible]	POSITION SWITCH	SI TANK 11B ISOL 1MOV624
[illegible]	POSITION SWITCH	LPSI TO LOOP 11B CONT 1MOV625
[illegible]	POSITION SWITCH	MAN HPSI TO LOOP 11B 1MOV626
[illegible]	POSITION SWITCH	CHECK VALVE LKG DRN TO RWT
[illegible]	POSITION SWITCH	SI TANK 12A ISOL 1MOV634
[illegible]	POSITION SWITCH	LPSI TO LOOP 12A CONT 1MOV635
[illegible]	POSITION SWITCH	MAN HPSI TO LOOP 12A 1MOV636
[illegible]	POSITION SWITCH	HPSI TO LOOP 12A CONT 1MOV637
[illegible]	POSITION SWITCH	CHECK VALVE LKG DRN TO RWT
[illegible]	POSITION SWITCH	SI TANK 12B ISOL 1MOV644
[illegible]	POSITION SWITCH	LPSI TO LOOP 12B CONT 1MOV645
[illegible]	POSITION SWITCH	MAN HPSI TO LOOP 12B 1MOV646
[illegible]	POSITION SWITCH	HPSI TO LOOP 12B CONT 1MOV647
[illegible]	POSITION SWITCH	CHECK VALVE LKG DRN TO RWT
[illegible]	POSITION SWITCH	MANUAL HPSI HDR ISOL 1MOV656
[illegible]	POSITION SWITCH	CS & RI PUMPS RECIRC

FIGURE SUPPLIED BY THE LICENSEE

Table C-1 (Cont.)

1Z3A60	POSITION SWITCH	CS & SI PUMPS RECIRC
1Z5A61	POSITION SWITCH	RECIRC RETURN LINE DRAIN
SAFETY INJECTION AND CONTAINMENT SPRAY		
1Z5A27	POSITION SWITCH	HPSI TO LOOP 11B CONT 1MOV627
VENTILATION		
1P15316	PRESSURE INDICATOR	CTMNT PRESS
VENTILATION		
1P15347	PRESSURE INDICATOR	CTMNT PRESS
1P15348	PRESSURE INDICATOR	CTMNT PRESS
1Z31410	POSITION SWITCH	CNTMNT PURGE ISOL 1CV1410
1Z31411	POSITION SWITCH	CNTMNT PURGE ISOL 1CV1411
1Z31412	POSITION SWITCH	CNTMNT PURGE ISOL 1CV1412
1Z31413	POSITION SWITCH	CNTMNT PURGE ISOL 1CV1413
1Z55285	POSITION SWITCH	PEN RM FILTER 11 ISOL DAMPER
1Z55287	POSITION SWITCH	PEN RM FILTER 12 ISOL DAMPER
1Z55291	POSITION SWITCH	PURGE AIR SAMPLE ISOL 1CV5291
1Z55292	POSITION SWITCH	PURGE AIR SAMPLE ISOL 1CV5292
WASTE PROCESSING		
1Z52180	POSITION SWITCH	CNTMNT VENT ISOL 1CV2180
1Z52181	POSITION SWITCH	CNTMNT VENT ISOL 1CV2181
1Z54260	POSITION SWITCH	RC DRN TK PP 11 1CV8260
1Z55482	POSITION SWITCH	CNTMNT NORM SUMP HVAT
1Z55483	POSITION SWITCH	CNTMNT NORM SUMP HVAT
1Z55484	POSITION SWITCH	RC SAMPLE CONT ISOL 1CV5484
EUP-6 - STEAM GENERATOR LINE RUPTURE		
1R11752	RADIATION INDICATOR	CONDENSER VAC PP DISCH RAD MON
1R14014	RADIATION INDICATOR	SG BLOWDOWN TANK RAD MON
1R14095	RADIATION INDICATOR	BLOWDOWN ION EXCHR DISCH RAD MON
1R15414	RADIATION INDICATOR	MAIN VENT PARTICULATE RAD MON
1R15415	RADIATION INDICATOR	MAIN VENT GASEOUS RAD MON
STEAM GENERATOR BLOWDOWN RECOVERY		
1Z34015	POSITION SWITCH	BLODWN RECOV SYS TO CIRC
1Z34096	POSITION SWITCH	BLOWDN RECOV TO CONDR VLV
1Z34097	POSITION SWITCH	BLOWDN RECOV TO MISC WSTE VLV

FIGURE SUPPLIED BY THE LICENSEE

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.

- 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 equipment 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

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* 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.

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 Plant 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

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

December 10, 1981

NRC TAC No. 42494

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. Discussions of specific equipment requiring supplemental information

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)

Revision 4 is based on NRC comment with regard to the applicability of 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 qualification 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***
1.	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	Received 3/12/82 for Task 466(2)
	b. American Air Filter Co. Test Report 4-7-73	4/8/82 [9](2)
	c. Amphenol Sams Test Report No. 123-1252, 6-74	4/8/82 [9](2)

***This column will be completed by FRC as the requested information is received.

		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)
f.	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)
l.	Mechanical Calculation 8-2-5, Temperature = 120°F	4/8/82 [9](2)
m.	Correspondence with ASCO dated 7/1/80	4/8/82 [9](2)
n.	Cerro test NP-01	4/8/82 [9](2)
o.	BIW Test Report Nos. 8808 B901 9286 8921 73C212 9299 11-72	4/8/82 [9](2)
p.	Raychem Tests EM688, EM691, EM644, EM517A, EM523E	4/8/82 [9](2)

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.	6/11/82 [10](3)
b. Identification of TMI Action Plan equipment installed with implementation dates after 1/1/81 is requested.	6/11/82 [10](3)
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?]	6/11/82 [10](3)
d. For all installed TMI Action Plan equipment identified, a System Component Evaluation Worksheet (SCEW) (in accordance with 79-01B format) is requested.	6/11/82 [11](3)
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 EEQ evaluation.	6/11/82 [11](3)
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	

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.]

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. NA

C. INSTRUCTIONS FOR TRANSMITTING INFORMATION REQUESTED

1. 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

1. 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 (NRC), and K. Sebra (BGE, Calvert Cliffs)
Subject: Request for Information on EEQ 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

6. 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)

9. A. Marion
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
Baltimore Gas & Electric, 19-May-82(?)

12. A. E. Lundvall, Jr.
Letter to D. G. Eisenhut, NRC. Subject: Environmental Qualification Documentation
Baltimore Gas & Electric, 27-Jul-82(5)