January 13, 2000

Mr. Ted C. Feigenbaum
Executive Vice President and Chief Nuclear Officer
Seabrook Station
North Atlantic Energy Service Corporation
c/o Mr. James M. Peschel
P.O. Box 300
Seabrook, NH 03874

SUBJECT: NRC INTEGRATED INSPECTION REPORT NO. 05000443/99008

Dear Mr. Feigenbaum:

This refers to the inspection completed on December 5, 1999 at the Seabrook Nuclear Power Station. The enclosed report presents the results of this inspection.

The plant was operated safely during the period. The licensed operator training program was reviewed and found to provide good support to plant operations. Maintenance activities were performed well. The engineering organization typically performed well, however, two examples were noted where the quality of engineering reviews could have been improved. These examples included the development of sampling criteria for potentially degraded electrical connectors, and the review of small voids located in the residual heat removal system piping. Radiological controls were effective in minimizing doses and limiting the spread of contamination when performing tasks during power operations.

Based on the results of this inspection, the NRC has also determined that one level IV violation of NRC requirements occurred. This violation is being treated as a Non-Cited Violation (NCV), consistent with Section VII.B.1.a of the Enforcement Policy. This NCV is described in the subject inspection report and pertained to the failure to establish adequate controls for an ultrasonic test activity that was being used to demonstrate operability of the emergency core cooling systems. If you contest the violation or severity level of this NCV, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington DC 20555-0001, with copies to the Regional Administrator, Region I, and the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001.

In accordance with 10 CFR 2.790 of the NRC "Rules of Practice," a copy of this letter and its enclosure will be placed in the NRC Public Document Room.

Sincerely,

Original Signed by:

Clifford J. Anderson, Chief
Projects Branch 5
Division of Reactor Projects

Docket No. 05000443
License No: NPF-86

Enclosure: NRC Inspection Report No. 05000443/99008

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REGION I

Docket No.:	05000443
License No.:	N.F.-86
Report No.:	05000443/99008
Licensee:	North Atlantic Energy Service Corporation
Facility:	Seabrook Generating Station, Unit 1
Location:	Post Office Box 300 Seabrook, New Hampshire 03874
Dates:	October 25 - December 5, 1999
Inspectors	Ray K. Lorson, Senior Resident Inspector Javier Brand, Resident Inspector Leonard J. Prividy, Senior Reactor Engineer Joseph M. D'Antonio, Operations Engineer Steven Dennis, Operations Engineer Thomas A. Moslak, Health Physicist
Approved by:	Clifford Anderson, Chief Projects Branch 5 Division of Reactor Projects

EXECUTIVE SUMMARY

Seabrook Generating Station, Unit 1
NRC Inspection Report 05000443/99008

This integrated inspection included aspects of licensee operations, engineering, maintenance, and plant support. The report covers a 6-week period of resident and specialist inspection.

Operations:

- Routine operations were performed well (Section O1).
- No significant operational errors or operating difficulties were identified which could be attributed to ineffective training (Section O5).
- Although there were some performance errors, the crews performed acceptably overall in all four examination scenarios. The facility evaluators identified all performance deficiencies from both the JPMs and the scenarios. Post-scenario evaluations were exceptionally thorough and comprehensive. Detailed trending of crew and individual simulator competency scores was considered a program strength (Section O5).
- The facility utilized effective methods for obtaining trainee feedback and for evaluating these comments, as well as plant and industry events, for revision of the training curriculum (Section O5).
- Remediation and reexamination practices were appropriate. The facility monitored attendance and ensured that missed training was made up (Section O5).
- The licensee was found to be meeting the regulatory requirements associated with the licensed operators that were reviewed (Section O5).
- North Atlantic Energy Services Corporation's response to Generic Letter (GL) 98-02, "Loss of Reactor Coolant Inventory and Associated Loss of Emergency Mitigation Functions While in a Shutdown Condition," was appropriate. (Section O7.1)

Maintenance:

- The licensee evaluated and performed a temporary leak seal repair of the main turbine #2 control valve (1MS-CV-2) well. The licensee properly recognized that this type of leak was repetitive and initiated a cause and failure analysis to prevent recurrence (Section M1.1).
- The licensee responded well to investigate an event involving a failure of the "A" control building air compressor to start due to a broken electrical connector. The licensee's initial sampling criteria to ensure that the remaining station electrical connectors were in good condition did not appear consistent with the guidance in draft regulatory guide

(DG) 1070. The licensee planned to review their sampling methodology to address this concern (Section M1.2).

Engineering

- The licensee's evaluation and corrective actions to address an elevated lubricating oil temperature on the 'A' emergency diesel generator (EDG) lubricating oil heat exchanger were adequate. A previous elevated temperature condition had not been reported to the system engineer. The licensee initiated a condition report to address this issue (Section E2.1).

- The licensee did not implement adequate controls to assure proper functioning of the ultrasonic test device during surveillance testing such as checking or calibrating the instrument at the end of each examination, and ensuring that the instrument use was consistent with the vendor guidelines. This was considered a non-cited violation (NCV 99-08-01) (Section E2.2).

- The licensee concluded that two small voids detected in the residual heat removal system piping did not render the system inoperable. The inspectors noted a weakness in that the licensee's original evaluation did not consider the potential for water hammer. The licensee reviewed this issue and concluded that the potential for a water hammer event was low due to the small void size (Section E2.2).

Plant Support:

- Radiological controls were effective in minimizing the dose and limiting the spread of contamination when performing tasks during power operations. Comprehensive planning and integration of various ALARA measures into the work control process were observed. (Section R1.1)

- Radiological controls were effectively implemented. The program included a trained and experienced staff, detailed procedures to minimize external and internal exposure, appropriate monitoring of personnel, detailed radiation work permits, and proper control of access to radiologically controlled areas (Section R1.2).

- The licensee implemented effective management controls including quality assurance surveillances, departmental self-assessments, and job observations over the radiation protection program. Worker practices, and procedural compliance were adequately monitored, and prompt actions were taken to evaluate and correct factors that could degrade performance (Section R1.7).

- Routine security controls were properly implemented. The licensee responded well to investigate an issue involving two damaged door locks inside the protected area (Section S1.1).

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ATTACHMENTS

Report Details

Summary of Plant Status

Seabrook Station operated at approximately 100% power for the duration of the inspection period.

I. Operations

O1 Conduct of Operations

O1.1 General Comments (71707)

Using Inspection Procedure 71707, the inspectors conducted frequent reviews of ongoing plant operations. In general, routine operations were performed in accordance with station procedures and plant evolutions were completed in a deliberate manner with clear communications and effective oversight by shift supervision. Control room logs accurately reflected plant activities and observed shift turnovers were comprehensive and thoroughly addressed questions posed by the oncoming crew. Control room operators displayed good questioning perspectives prior to releasing work activities for field implementation. The inspectors found that operators were knowledgeable of plant and system status.

O2 Operational Status of Facilities and Equipment

a. Inspection Scope (71707, 62707)

The inspectors routinely conducted independent plant tours and walkdowns of selected portions of safety-related systems during the inspection report period. These activities consisted of the verification that system configurations, power supplies, process parameters, support system availability, and current system operational status were consistent with Technical Specification (TS) requirements and UFSAR descriptions. Additionally, system, component, and general area material conditions and housekeeping status were noted. The inspectors found that the plant conditions were acceptable, but identified some minor material deficiencies that were appropriately addressed by the licensee.

O5 Operator Training and Qualifications

a. Inspection Scope (71001)

The inspectors reviewed the Seabrook licensed operator requalification program (LORT) using Inspection Procedure 71001 during the week of November 15-19, 1999. The following areas were evaluated: LORT program content including facility operating history; written and operating test content; operating test administration; training feedback program effectiveness; and conformance with license conditions.

b. Observations and Findings

b.1 LORT Program Content

The inspectors reviewed training material and plant operating history to assess the facility's evaluation of plant and industry events for presentation in training. No significant recent operating events were noted that could be attributed to training deficiencies. The inspectors found that plant and industry events had been incorporated into lesson materials for reduced inventory operations, electrical safety, and tagging, and that these materials had been updated within the past year or were being updated at the time of the inspection.

b.2 Written and Operating Test Content and Administration

The written, job performance measures (JPM), and simulator examinations were all of good quality and met the criteria of the examiners' standards. At the time of this inspection, the facility practice was to administer a written examination annually rather than biennially. Overlap from week to week of examinations administered the prior year was reviewed, and was minimal at approximately 15%. The inspectors noted a potential problem in that the operator briefing for each JPM includes a "task standard." In one alternate path JPM, the wording of this task standard could potentially cue the alert examinee that an equipment fault would be encountered. The facility committed to revise this particular task standard and to review the use of such standards.

The inspectors observed the administration of a total of four scenarios to two different crews and the facility critique for two of these scenarios. Crew performance was acceptable in all scenarios. Some performance deficiencies occurred which were noted and evaluated by the facility evaluators. Facility grading was appropriate. Scenario critiques were extensive, thorough, and detailed with individual and crew performance in each competency discussed. The facility makes good use of critique results by maintaining a database of competency scores for each crew and individual in each watch position in which the individual is observed. These scores and comments are trended to detect declines in performance or focus areas for individual and crew training.

The inspectors observed half of the JPM examinations administered in the plant and in the simulator. Some difficulties were noted in interpreting task standards in some JPMs which resulted in discussions among the three instructors in the simulator - the inspectors concurred with the outcome of these discussions regarding grading of the candidates. One instance of potential cuing occurred with a JPM that required DC load shedding in accordance with an ECA-0.0 attachment. In this instance, the operator chose to shed loads based on location, rather than in the order listed in the attachment. This was acceptable by the EOP rules of usage, however, the evaluator told the operator to perform the steps in order for examination purposes. This precluded the possibility of the candidate failing to go back to a skipped step if allowed to proceed as he originally intended. Facility management agreed that this was inappropriate. The overall results of the examinations were that one senior reactor operator (SRO) failed his JPM examination as a result of failing two simulator JPMs; one involving emergency operating procedure (EOP) immediate actions and one involving emergency plan notifications.

b.3 Use of Risk Insights

The facility has just begun to incorporate risk insights in training. The Reliability Engineering provided the training department six equipment “out of service” scenarios of particularly high risk. Formal training was conducted on one of these scenarios, and the operators have received training on the Equipment Out of Service software which calculates a risk achievement worth and core damage frequency for specified equipment configurations. The user’s guide for this software contained criteria for evaluating the acceptability of emergent work based on the risk calculation output of this program.

b.4 Remediation Practices

The inspectors reviewed facility remediation practices and examples of evaluation and remediation for five individuals who had failed or achieved low grades in some aspect of requalification evaluation in the preceding two years. In all cases reviewed, these individuals had been evaluated and remediated appropriately in accordance with the facility program.

b.5 Use of Feedback

The inspectors interviewed shift operations personnel and reviewed training material to assess the facility's response to trainee identified problems. In interviews, operators cited specific examples of comments to which the training department had responded and believed the training department was responsive to their needs and comments. The inspectors also reviewed minutes of curriculum advisory committee meetings and noted that feedback items were discussed and incorporated in training activities. The operators also stated that the overall quality of training and knowledge level of the instructors has increased over the past five years. They attributed this, in part, to the facility practice of rotating trainers through operations, and to instructor experience.

b.6 Compliance with License Conditions

A review of records and discussions with licensee personnel found that the licensee was meeting the requirements of:

10 CFR 55.53 for conditions of operator licenses.
10 CFR 55.21 for medical examinations of operators.
10 CFR 55.49 for licensed operator examination integrity.

c. Conclusions

No significant operational errors or operating difficulties were identified which could be attributed to ineffective training.

Although there were some performance errors, the crews performed acceptably overall in all four examination scenarios. The facility evaluators identified all performance deficiencies from both the JPMs and the scenarios. Post-scenario evaluations were

exceptionally thorough and comprehensive. Detailed trending of crew and individual simulator competency scores was considered a program strength.

The facility utilizes effective methods for obtaining trainee feedback and for evaluating these comments, as well as plant and industry events, for revision of the training curriculum.

Remediation and reexamination practices are appropriate. The facility monitors attendance and ensures missed training is made up.

The licensee was found to be meeting the regulatory requirements associated with licensed operators that were reviewed.

O7 Quality Assurance in Operations

O7.1 Response to Generic Letter 98-02

a. Inspection Scope (T/I 2515/142)

The inspector reviewed North Atlantic Energy Services Corporation's (NAESCO) efforts to determine if a potential drain down path could be created by operator or equipment error, similar to the occurrence at Wolf Creek as discussed in Generic Letter (GL) 98-02, "Loss of Reactor Coolant Inventory and Associated Loss of Emergency Mitigation Functions While in a Shutdown Condition." Where susceptibility to the Wolf Creek event existed, the inspector reviewed the measures being taken by NAESCO to prevent such occurrences.

b. Findings and Observations

In their letter NYN-98132, dated November 23, 1998, NAESCO concluded that the Seabrook Station emergency core cooling systems were potentially susceptible to potential drain down paths similar to the Wolf Creek event. The inspector reviewed this response plus a licensing department memorandum (Lic# 980532 dated November 23, 1998) and other plant records that supported it. The Seabrook Station design aspect that made it potentially susceptible to a common cause failure similar to the Wolf Creek event involved the residual heat removal (RHR) system. A drain down line between the RHR train A-to-train B crossover line isolation valves exists at Seabrook Station. This line, which contains a normally locked closed valve RH-V33, is primarily used at the end of refueling outages to drain the refueling cavity to the refueling water storage tank (RWST). The two separate RWST lines supplying flow to the RHR, safety injection (SI), and containment building spray (CBS) pumps are connected to a common header inside the RWST to form a chamber for the mixing of chemical spray additive tank and RWST fluids. NAESCO noted that an inadvertent opening of RH-V33 during Hot Shutdown (Mode 4) could adversely impact the operability of both trains of RHR, SI and CBS due to the common header connecting these systems inside the RWST.

NAESCO reviewed the Seabrook Station procedures and determined that RH-V33 is not operated with the plant in Mode 4 when the RHR system would be aligned to the reactor coolant system (RCS). With the knowledge that the plant procedures and administrative

configuration controls properly configured RH-V33, NAESCO concluded that it was unlikely that an event similar to the Wolf Creek event could occur at Seabrook Station. To further caution plant operators regarding operation of RH-V33 during Hot Shutdown, NAESCO added the following statement to several procedures which operate this valve, "Operation of RH-V33 in Mode 4 requires Station Operations Review Committee (SORC) approval."

The inspector observed the following:

In 1995, as part of their operating experience program, NAESCO reviewed, for applicability to Seabrook Station, the Wolf Creek event as published in NRC Information Notice 95-03. A corrective action was to train operations personnel regarding this event. The inspector verified that appropriate operator training was conducted prior to refueling outages in 1995 and 1997 to alert plant personnel of the Wolf Creek event and to apply any lessons learned.

The absence of significant RCS drain down events at Seabrook Station indicated that plant procedures and administrative controls were working reasonably well to adequately configure the plant to prevent this type of event.

The inspector verified that certain procedures were modified with a caution note requiring SORC approval for operating RH-V33 in Mode 4. For example, procedures OS1006.02, "Fill and Vent of CBS and RHR System Train A," and EX1804.063, "Centrifugal Charging Pump Flow Balance," were changed.

c. Conclusions

The inspector concluded that NAESCO's response to GL 98-02 was appropriate which enabled closure of the NRC review of this generic letter.

II. Maintenance

M1 Conduct of Maintenance

M1.1 Seal Injection to Repair Steam Leak on The Main Turbine #2 Control Valve (1MS-CV-2)

a. Inspection Scope

On November 3, the inspector observed the licensee activities to repair a minor body to bonnet steam leak on the main turbine #2 control valve (1MS-CV-2). The inspector performed a field walkdown of the proposed seal injection in the turbine building prior to implementation, and reviewed the work package, 10 CFR 50.59 safety evaluation, applicable procedures, and the temporary modification package. The inspector also interviewed personnel, and observed portions of the work activities.

b. Observations and Findings

The main turbine is provided with four independent control valves to modulate the steam flow to the high pressure turbine. These hydraulically operated valves are non-safety related and are located in a non-seismic area. Operators and technical department personnel monitored the leak daily, and determined it was stable, however, the licensee decided to stop the leak using a leak sealant injection method. The licensee identified that this type of leak was repetitive and initiated a cause and failure analysis to prevent recurrence. This analysis was scheduled for completion during the next refueling outage per condition report (CR) 99-4388.

The inspector used inspection guidance contained in NRC inspection manual chapter 9900 to review applicable documents for the sealing activities, and concluded that the licensee had implemented adequate engineering controls and analyses to implement the seal injection repair. The briefings conducted by the mechanical supervisor prior to performing the seal injection activities were excellent. The work package properly included precautions and contingencies to prevent or mitigate the consequences of a seal failure. Additionally, the inspector noted that the licensee properly considered the seal injection a temporary modification, and planned to perform a permanent repair during the next refueling outage.

c. Conclusion

The licensee evaluated and performed a temporary leak seal repair of the main turbine #2 control valve (1MS-CV-2) well. The licensee properly recognized that this type of leak was repetitive and initiated a cause and failure analysis to prevent recurrence.

M2 Maintenance and Material Condition of Facilities and Equipment

M2.1 Control Building Air Conditioning (CBA) System Electrical Connector Failure

a. Inspection Scope

The inspector reviewed the licensee's investigation into the failure of the "A" CBA compressor to start during a surveillance test on November 5,1999.

b. Observations and Findings

The licensee performed troubleshooting and attributed the start failure to a broken electrical connector (lug #8) in the "A" CBA compressor control circuit. The licensee replaced the broken connector, inspected the remaining connectors attached to the terminal board, and satisfactorily tested the "A" CBA compressor. The licensee also inspected the nine electrical connectors attached to the associated terminal board in the "B" CBA control circuit.

The licensee noted wear indications on several of the connectors, but did not identify any additional broken lugs. The licensee attributed the wear indications to contact between the installation tool, and the connector during the attachment of the connector to the terminal block. The system engineer indicated that the lug failure may have been caused by the stresses introduced to the connector during multiple installation and

removal activities. The licensee planned to develop improved maintenance guidance for the removal and re-landing of connectors to terminal blocks.

The licensee randomly selected and inspected a larger sample (59) of similar model connectors installed in "high risk" applications. The licensee did not identify any significant deficiencies during these inspections. The inspector questioned whether the licensee's sampling process (size and scope) met the intent of draft regulatory guide (DG) 1070. Specifically, based on the initial connector failure, it appeared that the sample size should have been expanded to include at least 90 connectors per the DG 1070 guidance. The inspectors also noted that the licensee did not determine whether the any of the connectors inspected had been previously removed and re-landed similar to the failed connector.

The Director of Engineering indicated that the licensee was developing a plan to address the sampling concerns. The inspector concluded that the licensee's response to CBA compressor start failure was reasonable and complete.

c. Conclusions

The licensee responded well to investigate an event involving a failure of the "A" control building air compressor to start due to a broken electrical connector. The licensee's initial sampling criteria to ensure that the remaining station electrical connectors were in good condition did not appear consistent with the guidance contained in draft regulatory guide (DG) 1070. The licensee planned to review their sampling methodology to address this concern.

III. Engineering

E2 Engineering Support of Facilities and Equipment

E2.1 'A' EDG Lubricating Oil Cooler Inlet Temperature

a. Inspection Scope (37551)

The inspector evaluated the licensee's response to an elevated lubricating oil cooler inlet temperature on the 'A' emergency diesel generator (EDG). The elevated temperature condition (163°F) was identified by the licensee on November 3, during the monthly surveillance test. The expected temperature for this component was approximately 157°F. The inspector observed portions of the test, reviewed applicable documentation and interviewed personnel.

b. Observations and Findings

Each of the two EDG's at Seabrook, is provided with a lubricating oil system which includes in part a lubricating oil pump; a thermostatic valve; and a lubricating oil cooler or heat exchanger. Lubricating oil flow from the pump discharge is directed to the

thermostatic valve and then to the lubricating oil cooler to maintain the lubricating oil temperature returning to the engine between 125°F and 142°F. A high engine outlet lubricating oil temperature switch and trip mechanism set at 167°F is provided for engine protection. This trip mechanism is automatically by-passed during a safety injection signal.

The system engineer determined that no immediate operability concern existed based on the overall engine performance and other EDG engine parameters such as vibration and electrical output. However, the licensee noted that a previously identified elevated temperature condition, identified during the October EDG test run, had not been reported to the system engineer. The licensee initiated a condition report to address this issue.

The licensee initiated a cause and failure analysis under condition report (CR 99-4473) to determine the cause and correct the elevated temperature condition. The corrective actions included: trouble shooting, evaluation of new and existing EDG test data, bearing crank case and strainer inspections, performance of field adjustments, additional EDG test runs, replacement of the thermostatic valve, and calibration of temperature instruments. The lubricating oil temperature decreased slightly following these action (to 160 °F). The system engineer evaluated the redundant 'B' EDG for similar concerns. The 'B' EDG lubricating oil temperature to the lubricating oil cooler was also slightly higher than expected (approximately 160 °F). The licensee is continuing to investigate this issue.

The inspector questioned whether the high lubricating oil temperature condition would lead to an undesirable EDG trip during a loss of off-site power (LOOP) event. The licensee indicated that this should not be a problem since the temperature data, although elevated, was stable and also since the LOOP loading requirements were less than the test condition and safety injection loading requirements.

c. Conclusion

The licensee's evaluation and corrective actions to an address elevated lubricating oil temperature on the 'A' emergency diesel generator (EDG) lubricating oil heat exchanger were adequate. A previous elevated temperature condition had not been reported to the system engineer. The licensee initiated a condition report to address this issue.

E2.2 Ultrasonic Testing of Emergency Core Cooling System Piping

a. Inspection Scope (37551)

On November 8, the inspector reviewed the implementation of a new technique involving the use of an ultrasonic (UT) instrument to demonstrate that the emergency core cooling system (ECCS) piping was full of water. Technical specification (TS) surveillance requirement 4.5.2.b requires this test to be performed every 31 days. Previously this test was performed by venting through accessible system high point vent paths.

b. Observations and Findings

The safety-related ECCS system consists of multiple pumps and equipment that are necessary for removal of the reactor decay heat following a plant accident. With the exception of the centrifugal charging pumps, the remaining ECCS pumps are normally in a standby or non-operating mode. This could result in the undetected buildup of voids in the system piping which could lead to undesirable system problems such as reduced flow, pump vibration, and water hammer. The UT inspection was performed at approximately 47 ECCS pipe locations to detect any void formations.

The licensee procured a portable UT instrument (Model 50) to perform this testing, and developed two independent methods for using this instrument. The test methods included a pulse-echo technique which placed a single transducer on the top of the pipe, and a thorough-pass technique which required a transducer to be located on the top and bottom of the pipe. The initial testing was performed by a qualified Level III non-destructive examination (NDE) technician, however, the licensee planned to eventually turn over the test responsibilities to plant operators. The operators were trained to use the two transducer test method since it was considered to be more reliable.

During the testing the inspector questioned the calibration of the UT device, after noting that a calibration sticker was not affixed to the instrument. The NDE technician responded that the UT instrument did not require a formal calibration for this application since it was only being used to provide a “go”/”no go” response. The NDE technician also indicated that this instrument was very accurate, and would not produce an output response if any voids were present. The inspector subsequently observed a test demonstration which used this instrument in the through-pass mode. The UT instrument consistently displayed an output response on the test assembly which was approximately half full of air.

The NDE technician did not understand the reason for the anomalous reading, and elected to complete the surveillance testing using a different type of UT instrument. During the testing two small air pockets were detected in the ‘B’ RHR pump suction piping. The licensee performed an engineering evaluation and concluded that the air pockets would not affect the system operability. The inspectors noted that the engineering evaluation and station operation review committee (SORC) did not address the potential for a water hammer event. The licensee reviewed this concern and concluded that the potential for a water hammer event was low due to the small size of

the air voids. Technical specialists from Region I, and the NRC Headquarters also reviewed the licensee's evaluation and did not identify any additional concerns.

The licensee initiated condition report CR 99-4553 to evaluate the Model 50 instrument problem discussed above. The NDE technician subsequently informed the inspectors that the UT vendor attributed the output indication to electrical noise. The NDE technician also indicated that the vendor recommended the use of a different model UT instrument for performing through-pass measurements. The licensee was using two independent methods for performing the surveillance testing and may have been able to detect the voids discussed above by operating the Model 50 instrument in the pulse-echo mode. The inspectors considered it a deficiency, however, that the licensee implemented a UT technique that utilized the instrument in a manner that did not appear to be endorsed by the vendor.

The inspector had an additional concern regarding the UT technique in that the licensee's procedure did not require a post-test instrument functionality check. General UT examination practices and accepted industry UT standards as described in the ASME Code, Section V require that UT instruments be check prior to and following use. The licensee was unable to identify any formal industry standard that did not require the performance of a post-use functionality test. The licensee subsequently revised the test procedure to require a post-use instrument test.

Appendix B to 10 CFR 50, Criteria IX, "Control of Special Processes", requires, in part that "measures shall be established to assure that special processes including non-destructive testing are controlled using qualified procedures in accordance with applicable standards and special requirements". Contrary to the above the licensee failed to implement adequate controls to assure that UT surveillance testing met applicable industry and vendor standards. Specifically, the Model 50 UT instrument was used during surveillance testing in a manner that was not consistent with vendor guidance, and the licensee did not intend to perform a post-test instrument test as required by standard industry UT practices. This is a violation of 10 CFR 50, Appendix B, Criterion IX. The licensee has implemented corrective actions to address the identified deficiencies, and has entered this item in the corrective action program (CR 99-4553). This violation is being treated as a Non-cited violation consistent with Section VII.B.1.a of the enforcement policy **(NCV 99-08001).**

c. Conclusion

The licensee did not implement adequate controls to assure the proper functioning of the ultrasonic test device during surveillance testing such as checking or calibrating the equipment at the end of each examination, and ensuring that the instrument use was consistent with the vendor recommendations. This was considered a non-cited violation (NCV 99-08-01).

The licensee concluded that two small voids detected in the residual heat removal system piping did not render the system inoperable. The inspectors noted a weakness in that the licensee's original evaluation did not consider the potential for water hammer.

The licensee reviewed this issue and concluded that the potential for a water hammer event was low due to the small void size.

IV. Plant Support

R1 Radiological Protection and Chemistry Controls

R1.1 Exposure Reduction Efforts

a. Inspection Scope (83750)

The implementation of the ALARA program, relative to planning and controlling work conducted during power operations, was reviewed during the period October 25 - 29, 1999. The inspection included evaluation of performance related to implementing radiological controls as contained in Radiation Work Permits (RWPs), job-specific ALARA reviews, and associated procedures. The inspector interviewed staff and selected workers and directly observed radiological controls established for tasks performed in the containment building, primary auxiliary building, and other radiologically controlled areas. Tasks observed included worker preparations for performing instrument calibrations in the containment building and ground water mitigation activities in various plant areas.

Performance was evaluated relative to the applicable requirements contained in 10 CFR 20 and related licensee procedures.

b. Observations and Findings

The overall planning and preparations to minimize dose when performing tasks during power operations was effective as evidenced by a cumulative personnel exposure of about 8.2 person-rem (as of October 26, 1999), that is below the projected dose to date of 11.6 person-rem. The accumulated exposure was on target for the licensee to meet the planned exposure annual goal of 14 person-rem. No worker received any internal dose for activities conducted to date during 1999.

The integration of dose reduction measures into jobs during the 12 week work planning process and the oversight of dose intensive tasks provided by the Radiation Safety Committee and Outage Review Board has contributed to reduced personnel exposure. System flushes, use of temporary shielding, and relocating certain maintenance activities to areas of lower dose rates; e.g., crane inspections, were effective ALARA measures.

Controls for instrument calibrations conducted in the containment building, a locked high radiation area, were effectively implemented. The Health Physics Department staff provided the appropriate oversight by implementing a detailed Radiation Work Permit, conducting an in-depth pre-job briefing, and assuring that workers minimized the dose to the extent practical. The calibrations were completed with a maximum personnel exposure of two millirem.

Actions taken to mitigate groundwater in-leakage were being carried out in a manner to minimize dose and limit the spread of contamination. The detailed guidance contained in ALARA Review No. 99-14 was being effectively implemented including the rescheduling of work in the RHR vaults/mechanical penetration area to take advantage of radioactive decay, installation of temporary shielding, and coordination of scaffolding installation/removal.

c. Conclusion

Radiological controls were effective in minimizing the dose and limiting the spread of contamination when performing tasks during power operations. Comprehensive planning and integration of various ALARA measures into the work control process were observed.

R1.2 Applied Radiological Controls

a. Inspection Scope (83750)

At various times, the inspector accompanied the Health Physics Department Manager and staff, and independently toured site areas, including the Primary Auxiliary Building, the Residual Heat Removal System vaults, the Mechanical Penetration Area, and the Waste Processing Building to observe radiological practices, postings, access controls, and confirm radiation survey measurements. Technicians and workers were interviewed to assess their knowledge of radiological controls applied to their job and work area conditions.

Performance was evaluated relative to the requirements contained in 10 CFR 20 and applicable licensee procedures.

b. Observations and Findings

Radiologically controlled areas (RCAs) were properly posted and access appropriately controlled. Locked high radiation areas (LHRAs) were properly posted, physical barriers were in place and doors were secured. Keys to LHRAs were accounted for and inventories were accurate.

Daily source checks of survey instruments were performed and all inspected instruments were operable.

Dosimetry was properly worn by personnel working in the RCAs. Neutron dosimetry and multi-badging were appropriately designated for tasks commensurate with the radiological conditions in the work area, such as entries into the containment building during power operations. Dosimetry records were current. Whole body counting was performed when appropriate.

Radiation work permits (RWP) were complete. The RWPs referenced current survey data, and specified appropriate dosimetry and protective clothing requirements. Personnel were knowledgeable of RWP requirements and current radiological and plant conditions.

High standards of housekeeping were maintained within the RCAs. Boundary controls to limit the spread of contamination were conscientiously implemented.

Through record review and interviews with selected Health Physics technicians, the inspector determined that training requirements were met and the individuals were qualified to perform their assigned tasks.

c. Conclusions

Radiological controls were effectively implemented. The program included a trained and experienced staff, detailed procedures to minimize external and internal exposure, appropriate monitoring of personnel, detailed radiation work permits, and proper control of access to radiologically controlled areas.

R7 Quality Assurance in RP&C Activities

a. Inspection Scope (83750)

A sample of recent Quality Assurance surveillance reports (QASR), a Health Physics Group self-assessment documentation report (SADR), and relevant adverse condition reports (ACR) and related cause evaluations, were reviewed to determine the adequacy of identifying, evaluating, and correcting deficiencies regarding implementation of the radiation protection program.

b. Observations and Findings

The inspector reviewed selected QASRs, and found that the reports adequately evaluated the station's readiness to implement the outage ALARA program. ACRs were appropriately initiated for identified deficiencies, issues were elevated to the proper management level, and broad based corrective actions were developed.

The licensee performed a comprehensive assessment (SADR HP-99-08) of radiological protection ACRs written during the refueling outage, and identified adverse trends regarding administrative controls for LHRAs, and diverse issues regarding electronic dosimeters. These deficiencies were subsequently evaluated through a structured causal analyses and appropriate corrective actions were taken.

Health Physics Department management routinely observed in-progress work activities. Management conducted formal interviews to evaluate the worker's knowledge of job radiological controls, took prompt action to resolve any apparent discrepancies and reinforce management expectations.

c. Conclusions

The licensee implemented effective management controls including quality assurance surveillances, departmental self-assessments, and job observations over the radiation protection program. Worker practices, and procedural compliance were adequately monitored, and prompt actions were taken to evaluate and correct factors that could degrade performance.

S1 Conduct of Security and Safeguards Activities

S1.1 General Comment (71707, 71750)

The inspectors observed security force performance during inspection activities. Protected area access controls were found to be properly implemented during random observations. Proper escort control of visitors was observed. Security officers were alert and attentive to their duties.

The licensee properly investigated an issue involving damage to the locks on two doors located inside the maintenance building (inside the protected area), but outside of the plant area. The licensee promptly entered the tampering procedure, and investigated the event. The licensee also confirmed that there were no problems associated with any vital area door locks. The licensee's investigation did not identify how the maintenance building locks became damaged. The inspector concluded that the licensee responded appropriately to this event.

X1 Exit Meeting Summary

The inspectors presented the inspection results to members of licensee management, following the conclusion of the inspection period, on December 16, 1999. The licensee acknowledged the findings presented.

ATTACHMENT 1

PARTIAL LIST OF PERSONS CONTACTED

Licensee

W. Diprofio, Unit Director
J. Grillo, Assistant Station Director
J. Hill, Operations Supervisor
G. StPierre, Operations Manager
B. Seymour, Security Manager
T. Nichols, Technical Support Manager
D. Sherwin, Maintenance Manager
J. Connolly, Regulatory Compliance Engineer
M.DeBay, Assistant Operations Manager
M. Ossing, Licensing Engineer
T. Schulz, Engineering
J. Vargas, Director of Engineering

INSPECTION PROCEDURES USED

IP 37551:	Onsite Engineering
IP 61726:	Surveillance Observation
IP 62707:	Maintenance Observation
IP 71707:	Plant Operations
IP 71750:	Plant Support Activities
IP 83750:	Occupational Exposure

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened/Closed:	99-08-01, (NCV), Failure to Implement Adequate Controls for an Ultrasonic Test Activitiy.

Partial List of Acronyms Used

ASME	American Society of Mechanical Engineers
CR	Condition Report
CBS	Containment Building Spray
EDG	Emergency Diesel Generator
EFW	Emergency Feedwater
FME	Foreign Material Exclusion
GL	Generic Letter
gpd	gallons per day
gpm	gallons per minute
IN	Information Notices
JPM	job performance measures
LCO	Limiting Condition for Operation
MOV	Motor operated valve
MPCS	Main Plant Computer System
NRC	Nuclear Regulatory Commission
NSARC	Nuclear Safety and Audit Review Committee
OE	Operating Experience
psig	pounds per square inch gauge
RHR	Residual Heat Removal
RWST	Refueling Water Storage Tank
SG	Steam generator
SORC	Station Operations Review Committee
SUFP	Startup Feedwater Pump
TLD	Thermoluminescent Dosimeter
TS	Technical Specifications
UFSAR	Updated Final Safety Analysis Report
WR	Work request