U. S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket No.:	50-443
License No.:	NPF-86
Report No.:	50-443/99-05
Licensee:	North Atlantic Energy Service Corporation
Facility:	Seabrook Generating Station, Unit 1
Location:	Post Office Box 300 Seabrook, New Hampshire 03874
Dates:	June 21- August 1, 1999
Inspectors:	Ray K. Lorson, Senior Resident Inspector Javier Brand, Resident Inspector Antone C. Cerne, Senior Resident Inspector, Millstone Paul Cataldo, Resident Inspector, Millstone
Approved by:	Clifford Anderson, Chief Projects Branch 5 Division of Reactor Projects

EXECUTIVE SUMMARY

Seabrook Generating Station, Unit 1
NRC Inspection Report 50-443/99-05

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

Operations:

- The Unit Shift Supervisor (USS) demonstrated a good questioning attitude by challenging a request to initiate a 3% power reduction to support a planned reactor protection system surveillance test. The request to initiate the power reduction indicated that test personnel did not fully understand the surveillance requirements (Section O1.1).

- The licensee's actions for an elevated steam chase temperature condition were appropriate, however, this condition may have been precluded by examination and cleaning of the ventilation intake screens in response to a previously NRC identified elevated temperature condition (Section O2.1).

- The emergency feedwater (EFW) turbine driven pump surveillance test activities were performed well. The corrective actions for previous oscillations in the indicated pump discharge pressure appeared successful (Section O4.1).

- Operational activities to support the service water cooling tower line-up and subsequent operation were generally performed well however, procedural and job planning weaknesses contributed to a failure to maintain the cooling tower basin conditions within the Technical Specification (TS) limits. The licensee appropriately declared the cooling tower inoperable and restored the basin conditions within the TS allowed outage time. The licensee's self-assessment appeared to identify the contributing factors for this event (Section O4.2).

- The inspector accompanied a nuclear system operator (NSO) during a normal shift tour, and observed that the NSO reviewed the required plant parameters, and demonstrated a good questioning attitude (Section O4.3).

- The inspector did not identify any specific safety concerns associated with a planned control room staffing change, and noted that the change was consistent with TS requirements (Section O8.1).

Maintenance:

- The 'D" SW pump mechanical maintenance replacement activities were performed well (Section M1.1).

- The licensee's plans and analysis to perform a leak sealant repair of an extraction steam valve were performed well (Section M1.2).

- The licensee identified thirty-three components were not properly tested as required by the ASME Code and TS Section 4.0.5. This Severity Level IV violation of TS 4.0.5 is being treated as a Non-cited Violation consistent with Appendix C, of the Enforcement Policy (Section M8.1). This violation was entered in Seabrook's corrective action program as ACR 99-0087 **(NCV 99-05-01)**

Engineering

- An engineering design deficiency introduced during relocation of the emergency diesel generator (EDG) starting air compressor outlet check valve did not adversely affect the EDG operability. The licensee initiated an adverse condition report to review this issue (Section E1.1).

- The licensee's actions in response to an emergency feedwater motor operated valve test problem were appropriate to ensure operability of the valve and to establish the extent of condition (Section E2.1).

Plant Support:

- Routine radiological activities were performed well (Section R1.1).

- The licensee's efforts to resolve the recent test failures of the Post Accident Sample System have been comprehensive. In addition, while the root cause has yet to be identified, the Event Team continues to methodically review this issue (Section R2.1).

- The licensee responded properly to a small contamination control posting issue identified by the inspector (Section R8.1).

- The licensee responded properly to a follow-up fitness for duty (FFD) test failure that occurred during the period. The licensee responded promptly to restrict the individual's access in accordance with the FFD program requirements, and to determine the scope of the individual's work activities. The inspector had no further questions regarding this issue (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.

The Unit Shift Supervisor (USS) demonstrated a questioning attitude by challenging a request to initiate a 3% power reduction to support a planned reactor protection system wide-range temperature surveillance. Upon subsequent review the licensee determined that the power reduction was not a test pre-requisite. The request to reduce power indicated that test personnel did not fully understand the surveillance requirements.

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.

b. Observations and Findings

The inspectors found that the plant conditions were acceptable, but identified some minor material deficiencies that were appropriately addressed by the licensee. A nuclear system operator (NSO) identified an elevated temperature condition in the west side main steam pipe chase. The licensee investigated this issue and found that the ventilation intake screens to the steam chase were obstructed by debris. The licensee

removed the debris from the screens and the steam chase temperature returned to normal. The inspector noted that the licensee's previous actions for a similar condition (discussed in Inspection Report 99-04) did not include examination of the ventilation intake screens. Examination of the screens at that time may have prevented this subsequent temperature condition.

c. Conclusion

The licensee's actions for an elevated steam chase temperature condition were appropriate, however, this condition may have been precluded by examination and cleaning of the ventilation intake screens in response to a previously NRC identified elevated temperature condition.

O4 Operator Knowledge and Performance

O4.1 Turbine Driven Emergency Feedwater (TDEFW) Pump Surveillance Testing

a. Inspection Scope

On July 23, the inspector observed the turbine driven emergency feedwater (EFW) pump quarterly surveillance test. The inspector reviewed the surveillance procedure and performed a walkdown of available piping and system components.

b. Observations and Findings

The surveillance procedure was performed satisfactorily and the TS acceptance criteria were met. Control room operators and field personnel communicated and coordinated the test activities well. The required system test parameters such as flow, turbine speed, pump suction and discharge pressure were satisfied.

The inspector's walkdown of system components and piping did not identify any discrepancies. The inspector noted that lubricating oil samples were promptly obtained in accordance with the licensee's lubricating oil program. Additionally, the inspector noted that the pump discharge pressure indicators were not oscillating, indicating that the corrective actions for previous oscillation problems appeared successful.

c. Conclusions

The emergency feedwater (EFW) turbine driven pump surveillance test activities were performed well. The corrective actions for previous pump discharge pressure oscillations appeared successful.

O4.2 Emergency Cooling Tower Operation

a. Inspection Scope

The inspector observed selected portions of cooling tower operations on July 21 and 22. Additionally, the inspector reviewed plant data, interviewed personnel, performed service water (SW) system field walkdowns, and reviewed the operations self-assessment following an unexpected heat-up of the cooling tower basin on July 24 that rendered the cooling tower inoperable.

b. Observations and Findings:

The SW system contains six pumps; four of the pumps take their suction directly from the ocean, while the remaining two pumps are supplied from the SW cooling tower basin. The SW cooling tower is installed to ensure that the SW system can perform its design safety function following an event (i.e. seismic) that removes the ocean SW pumps from service. The ocean SW pumps provide for removal of plant heat loads during normal, and emergency operation. The licensee elected to transfer the operating plant heat loads to the SW cooling tower to support replacement of the "D" SW pump (Section M1.1).

Technical Specifications (TS 4.7.4.3.a, and TS 4.7.4.3.b) establish minimum basin water level (42.15 feet), and maximum basin temperature (70°F) limits to ensure that the SW cooling tower can perform its required safety function. The operational activities performed to support transfer of the plant heat load to the SW cooling tower were generally performed well, however, both of these TS limits were exceeded during the evolution due to procedural and job planning weaknesses.

Prior to the transfer, the operators used the basin inventory to flush the system piping to prevent the introduction of seawater into the cooling tower. The flushing procedure lowered the basin inventory below the TS minimum limit. The licensee properly entered the applicable TS action statement and restored the level to within the TS limits. While the follow-up actions were appropriate, the inspector noted that the flush could have been completed without exceeding the TS basin limit. The licensee agreed with this observation, and initiated an ACR to review this activity.

The operators estimated that the SW cooling tower basin would heat-up at approximately 1°F/hour while supplying the plant heat load, and cooled the basin temperature to 57.5°F prior to the transfer. Several hours into the pump replacement evolution, the operators noted a larger than expected heat-up rate (the basin temperature had risen to 68.6°F), and properly suspended the work activities, and transferred the plant heat load back to the ocean SW pumps. Subsequent monitoring of the cooling tower basin temperature indicated that on July 24, the bulk average temperature had increased to 73.1°F, and the cooling tower was declared inoperable. This placed the Station into a 72 hour TS shutdown action statement. The licensee installed a temporary chiller unit, and successfully lowered the basin temperature to within TS limits prior to expiration of the

cooling tower allowed outage time. The inspector reviewed the safety evaluation for the installation of the chiller unit and found it to be acceptable.

The licensee initiated a self-assessment to review this event. The evaluation identified weaknesses associated with procedural requirements, job planning and execution, and a knowledge deficiency of the actual cooling basin heat-up rate as contributing factors to this event. The inspector found that the licensee's self-assessment was generally adequate, but also noted that a long-standing material deficiency associated with the cooling tower basin temperature monitor (computer point C-6025) challenged the operator's ability to effectively monitor the basin temperature during the evolution. Additionally, the inspector noted that the operators were not procedurally required to verify the cooling tower basin temperature prior to the transfer. The licensee agreed with the inspectors observations, and initiated a procedure change to require the operators to measure the cooling tower basin prior to pump operation.

c. Conclusion:

Operational activities to support the service water cooling tower line-up and subsequent operation were generally performed well however, procedural and job planning weaknesses contributed to a failure to maintain the cooling tower basin conditions within the Technical Specification (TS) limits. The licensee appropriately declared the cooling tower inoperable and restored the basin conditions to the TS limits within the allowed outage time. The licensee performed a self-assessment that appeared to identify the contributing factors for this event.

O4.3 Nuclear System Operator Observation

The inspector accompanied a nuclear system operator (NSO) during a normal shift tour, and observed that the NSO reviewed the required plant parameters. In addition, the NSO appropriately questioned the control room operators regarding the status of a staged annulus draindown hose identified during the tour. No significant deficiencies were identified by the inspector during the tour. A minor housekeeping issue regarding items left at the contaminated boundary surrounding the containment personnel hatch was promptly addressed by the licensee.

O8 Miscellaneous Operations Issues

O8.1 Change Management Plan Review

The inspector reviewed the change management plan developed to support the elimination of the Supervisory Control Operator (SCRO) position, and the addition of a lead control room operator position (LCRO). This change would not reduce the number of licensed operators in the control room, and the SCRO functions would primarily be transferred to the LCRO. The licensee self-identified the need to ensure that the emergency response plan duties currently performed by the SCRO were properly reviewed, and transferred prior to implementing the change. The inspector did not

identify any specific safety concerns with this change, and noted that the control room staffing levels would remain consistent with TS requirements.

O8.2 (Closed) Violation 50-443/98-09-01: this violation involved the failure to properly enter the applicable TS action statement upon the removal of service water (SW-V-4) from service. The licensee's completed corrective actions included coaching of the individuals as well as training of the other operating personnel regarding this event. The inspector found the licensee's actions to be reasonable and complete. This violation is closed.

II. Maintenance

M1 Conduct of Maintenance

M1.1 Service Water Pump Replacement

a. Inspection Scope (61726/62707)

On July 29, the inspector observed portions of the mechanical maintenance activities during replacement of the 'D' service water (SW) pump.

b. Observations and Findings:

The 'D' service water pump was replaced due to an engineering evaluation that determined the pump to be inoperable. The investigation was part of a root cause analysis in response to repetitive SW pump failures (discussed in NRC Inspection Report 99-04). Engineering subsequently determined that the pump performance was questionable based on the length of time that it had been exposed to a seawater environment.

To support this evolution the licensee transferred the plant cooling loads to the SW cooling tower (discussed in Section O4.2). The inspector noted that the pump replacement activities were completed satisfactorily. Proper controls and coordination, including adequate system engineering involvement and management oversight were observed during the work activities.

The inspector found that the management decision to replace this pump was conservative since the pump operating parameters were satisfactory. A subsequent inspection performed on the pump components determined that no pump degradation existed.

c. Conclusion:

Mechanical maintenance activities were performed well during replacement of the 'D" SW pump.

M1.2 Seal Injection to Repair Extraction Steam Pipe Steam Leak

a. Inspection Scope

On July 22, the inspector observed licensee activities in preparation to repair minor non-isolable steam leaks on the extraction steam supply line from the high pressure turbine to feedwater heater 1-CO-E-25B. The inspector performed field walkdowns of the proposed seal injection in the turbine building prior to implementation, reviewed work package which included a safety evaluation per 10 CFR 50.59, applicable procedures and the temporary modification package. The inspector also interviewed personnel, and observed portions of the work.

b. Observations and Findings

The extraction steam system is non-safety related, and the valve and piping are located in a non-seismic area. The first steam leak was identified on July 9th by operations personnel on the upstream side of the EX-V-7 valve body. Operators and technical department personnel commenced monitoring the leak daily, and determined that the leak was stable. A second leak was identified on July 23rd, but on the opposite side (downstream side) of the valve. The inspector noted that the licensee recognized that the initial valve inspections did not identify this leak. This required a new clamp to be fabricated and delayed completion of the repair activities.

On July 26, the licensee performed ultrasonic testing (UT), and confirmed that adequate valve integrity existed. The licensee believed that the leak may have been caused by porosity problems introduced during the casting process, and not by erosion or corrosion. The valve had been in-service for only a short period of time, and the licensee initiated an adverse condition report to determine the cause for this leakage.

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 implement a permanent repair during the next refueling outage.

c. Conclusion

The licensee's plans and analysis for the leak sealant repair of an extraction steam valve were performed well.

M8 Miscellaneous Maintenance Issues

M8.1 (Closed) LER 50-443/98-13: this LER discussed a licensee identified issue involving thirty-three valves that were not included within the scope of the Inservice Test (IST) program. The licensee tested each valve during refueling outage six (May 1999). The inspector performed an onsite review of this event and noted that all valves operated properly when tested except for seat leakage past the check valves used to isolate the lines to the primary component cooling water radiation monitors. This seat leakage was not significant since the licensee determined that the affected section of piping was structurally adequate. The licensee initiated adverse condition report 99-0087 to further review the IST program to ensure that all other components were properly tested.

Technical Specification 4.0.5 requires that IST of ASME Class 1,2, and 3 pumps and valves be performed in accordance with Section XI of the ASME Boiler and Pressure Vessel Code. Contrary to the above, the licensee identified that thirty-three components were not included within the scope of the IST program as required by the ASME Code and TS Section 4.0.5. This is a Severity Level IV violation of TS 4.0.5. This licensee identified and corrected violation is being treated as a Non-cited Violation consistent with Appendix C, of the Enforcement Policy. This violation was entered in Seabrook's corrective action program as ACR 99-0087. **(NCV 99-05-01)**

III. Engineering

E1 Conduct of Engineering

E1.1 Design Change Request (DCR 97-0045) Review

a. Inspection Scope

The inspector reviewed an engineering design deficiency identified during post-modification testing for DCR 97-0045.

b. Observations and Findings

Design change 97-0045 was implemented to relocate the emergency diesel generator (EDG) starting air compressor outlet check valve. This valve has failed in the past due to the vibration levels caused by the EDG starting air compressor during operation.

The licensee identified during post-modification testing that the check valve was relocated to a position in the EDG starting air system that allowed it to be bypassed. Therefore the check valve was unable to perform its intended function to prevent backflow into the EDG starting air compressors. The inspector reviewed this condition, and determined that although this condition could potentially affect the long-term reliability of the EDG starting air compressors it did not adversely impact EDG operability since the starting air flasks were isolated from the starting air compressors by a safety-related check valve. The inspector also noted that a back-up compressor was available

to provide make-up air during EDG operation in the event that the starting air compressors would fail.

The licensee initiated an adverse condition report to review this event, and planned to relocate the check valve to a more suitable location.

c. Conclusions

The inspector concluded that an engineering design deficiency introduced during relocation of the emergency diesel generator (EDG) starting air compressor outlet check valve did not adversely affect EDG operability. The licensee initiated an adverse condition report to review this issue.

E2 Engineering Support of Facilities and Equipment

E2.1 Emergency Feedwater (FW-V-347) Valve Problem (37551)

a. Inspection Scope

The inspector reviewed the licensee's actions in response to the thermal overload devices tripping during a close direction motor driven emergency feedwater valve (FW-V-347) surveillance test.

b. Observations and Findings

Valve FW-V-347 provides a recirculation flowpath around the motor driven emergency feedwater pump, and has a safety function to shut to prevent bypass of the emergency feedwater flow. The licensee reviewed this event to determine why the torque switch did not stop the valve motor, whether the event damaged the valve, and to assess the extent of condition.

The licensee disassembled the motor actuator, and performed a detailed inspection of the internal components and did not identify any damage. The inspector also inspected these components and did not identify any damage. The licensee replaced the components most susceptible to damage from this condition (i.e the worm, and worm shaft) as a conservative action. The valve was re-assembled and tested satisfactorily. The inspector concluded that the licensee's actions were adequate to ensure that continued operability of this valve.

Troubleshooting revealed that the valve torque switch set screws were loose and also that an improperly sized torque switch limiter plate had been installed. Both of these issues were attributed to poor workmanship during the refueling outage. The licensee considered this to be an isolated event based upon a review of documentation for the other valves worked during the outage, and a lack of historical problems associated with loose torque switch set screws. The inspector reviewed the licensee's results and did not identify any specific disagreements with the licensee's findings. The inspector spot checked an additional motor operated valve during a maintenance activity

and noted that the torque switch set screws were tight.

c. Conclusions

The licensee's actions in response to a motor operated valve test problem were appropriate to ensure operability of the valve and to establish the extent of condition.

E8 Miscellaneous Engineering Issues

E8.1 (Closed) LER 50-443/97-009, Revision 1: degraded fuel rods identified in Westinghouse fuel assemblies. The inspector performed an onsite review of this event and documented the results in Inspection Report 97-03. However, some additional information regarding the root cause analysis were identified during the licensee's subsequent analysis. Specifically, at the time, the licensee's initial evaluation reported that the preliminary cause for the degraded fuel was a combination of four factors; power history, operational strategy, crud deposition and core design. Based on the additional inspections and analyses on the damaged rods and on other selected non-leaking fuel rods, Westinghouse concluded that localized corrosion was the primary failure mechanism, and that factors contributing to the localized cladding corrosion included crud deposition, high cycle average rod power, and local flow effects. The inspector found that the LER adequately described the event, and corrective actions to prevent recurrence appeared reasonable, and that additional information obtained during the subsequent investigation was properly addressed.

IV. Plant Support

R1 Radiological Protection and Chemistry Controls

R1.1 General Comments (71750)

During the period the inspectors frequently toured the radiologically controlled area (RCA) and observed radiological controls practices. The radiological controls technicians were observed to be attentive, and provided high quality assistance to plant workers. Plant workers were observed to be following proper radiological work practices including the use of dosimetry and protective equipment.

R2 Status of RP&C Facilities and Equipment

R2.1 Post-Accident Sampling System Event Team Review

a. Inspection Scope (71750)

The inspector observed a Post-Accident Sampling System (PASS) sample during the Event Team investigation into previous PASS problems involving the hydrogen and boron sample results.

b. Observations and Findings

The licensee has experienced recent PASS test failures due to unacceptable hydrogen and boron sample results. An Event Team was initiated to address the test problems. The licensee's analysis identified three major elements that could potentially impact the PASS effectiveness. The elements included: (1) PASS panel variables, such as sample bomb volumes or piping and valve issues, (2) Laboratory variables, such as sample analysis methodology, and (3) Human performance variables, such as PASS panel valve manipulations or laboratory analysis practices.

On July 8, 1999, the inspector observed an Event Team PASS sample that was performed in accordance with CS0925.01, "Reactor Coolant Post Accident Sampling." The evolution was well-coordinated with good communications between the procedure reader and the PASS panel operator. The sample team demonstrated adequate sensitivity to the operation of a containment isolation valve as directed by the procedure. The sample results, however, did not meet the applicable hydrogen and boron specification limits.

The licensee's corrective actions to improve the PASS sample results were continuing at the conclusion of the period. The inspector determined that the actions to date including attempts to minimize the human sampling variability were appropriate. The inspector observed an Event Team update that was presented to licensee management, and noted that contained adequate information regarding the event Team findings.

c. Conclusion

The inspector concluded that the licensee's efforts to resolve the recent failures regarding the Post Accident Sample System have been comprehensive. In addition, while the root cause has yet to be identified, the Event Team continues to review this issue.

R8 Miscellaneous RP&C Issues

R8.1 Labeling of Contaminated Areas

On July 20, the inspector questioned whether the area surrounding crystalized boron accumulation on the 'A' charging pump discharge pressure instrumentation tubing should have been posted as a contaminated area. The boron accumulation was from a small fitting leak that had been identified by the licensee over twelve months ago. In response to the inspector's question, the licensee sampled the area, and determined that the area should have been posted as a contaminated area.

The licensee wrote an adverse condition report, and determined that the existing program did not require that the health physics department be informed of leaks from potentially contaminated systems. The licensee indicated that the planned corrective actions for this event would include revision of the material deficiency reporting requirements to require notification to the health physics department regarding

potentially contaminated leaks. The inspector concluded that the radiological consequences of this event were minor, and the planned corrective actions appropriate.

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 responded properly to a follow-up fitness for duty (FFD) test failure that occurred during the period. The licensee responded promptly to restrict the individual's access in accordance with the FFD program requirements, and to determine the scope of the individual's work activities. The inspector had no further questions regarding this issue.

V. Management Meetings

X1 Exit Meeting Summary

The inspectors presented the inspection results to members of licensee management, following the conclusion of the inspection period, on August 13. 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

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 92700:	Onsite Followup of Written Reports of Nonroutine Events at Power Reactor Facilities

ITEMS OPENED, CLOSED, AND DISCUSSED

Closed: Violation 98-09-01, Failure to properly enter a Technical Specification Action Statement
LER 98-013, Inservice Test Program Deficiencies
LER 97-09-01, Follow-up to Degraded Fuel Rods

Opened/Closed: Non-cited Violation 99-05-01, Failure to Include Multiple Valves Within the Scope of the Inservice Test Program.

LIST OF ACRONYMS USED

ACR	Adverse Condition Report
CAS	Central Alarm Station
CBS	Containment Building Spray
EDG	Emergency Diesel Generator
EFW	Emergency Feedwater
FME	Foreign Material Exclusion
gpd	gallons per day
gpm	gallons per minute
LCO	Limiting Condition for Operation
MOV	Motor operated valve
NSARC	Nuclear Safety and Audit Review Committee
psig	pounds per square inch gauge
RHR	Residual Heat Removal
SG	Steam generator
SORC	Station Operations Review Committee
SUFP	Startup Feedwater Pump
SW	Service Water
TDEFW	Turbine Driven Emergency Feedwater Pump
TS	Technical Specifications
UFSAR	Updated Final Safety Analysis Report
WR	Work request