June 25, 2002

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: SEABROOK STATION - NRC INSPECTION REPORT 50-443/02-03

Dear Mr. Feigenbaum:

On May 25, 2002, the NRC completed an inspection at the Seabrook nuclear power station. The enclosed report documents the inspection findings which were discussed on June 5, 2002, with Mr. G. St. Pierre and other members of your staff.

This inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

Based on the results of this inspection, the inspectors identified two findings of very low safety significance (Green). The first finding, associated with the unexpected loss of two control room annunciator panels, although not a violation of an NRC requirement, was more than minor significance in that not recognizing the impact of work on the plant and specifically the annunciator system could lead to a more significant event. The second finding, associated with an unauthorized change on a work order for the "B" emergency diesel generator, was a violation of regulatory requirements involving procedures. However, because of the very low safety significance and because the issue has been entered into your corrective actions program, the NRC is treating the issue as a Non-Cited violation, in accordance with Section VI.A of the NRC's Enforcement Policy. If you deny this Non-Cited violation, you should provide a response with the basis for your denial, within 30 days of the date of this inspection report, with the basis for your denial, within 30 days of the date of this inspection report, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, D.C. 20555-0001, with copies to the Regional Administrator, Region I, and the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, D.C. 20555-001, and the NRC Resident Inspector at the Seabrook facility.

Immediately following the terrorist attacks on the World Trade Center and the Pentagon, the NRC issued an advisory recommending that nuclear power plant licensees go to the highest level of security, and all promptly did so. With continued uncertainty about the possibility of additional terrorist activities, the Nation's nuclear power plants remain at the highest level of security and the NRC continues to monitor the situation. This advisory was followed by additional advisories, and although the specific actions are not releasable to the public, they generally include increased patrols, augmented security forces and capabilities, additional security posts, heightened coordination with law enforcement and military authorities, and more limited access of personnel and vehicles to the sites. The NRC has conducted various audits of your response to these advisories and your ability to respond to terrorist attacks with the capabilities of the current design basis threat (DBT). On February 25, 2002, the NRC issued an Order to all nuclear power plant licensees, requiring them to take certain additional interim compensatory measures to address the generalized high-level threat environment. With the issuance of the Order, we will evaluate Seabrook Station's compliance with these interim requirements.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm.html

Sincerely,

/RA/

Curtis J. Cowgill, Chief
Projects Branch 6
Division of Reactor Projects

Docket No. 50-443
License No: NPF-86

Enclosure: NRC Inspection Report No. 50-443/02-03

Attachments: Supplemental Information

cc w/encl:
B. D. Kenyon, President and Chief Executive Officer
J. M. Peschel, Manager - Regulatory Programs
G. F. St. Pierre, Station Director - Seabrook Station
D. G. Roy, Nuclear Training Manager - Seabrook Station
W. J. Quinlan, Esquire, Assistant General Counsel
D. Bliss, Director, New Hampshire Office of Emergency Management
D. McElhinney, RAC Chairman, FEMA RI, Boston, Mass
R. Backus, Esquire, Backus, Meyer and Solomon, New Hampshire
D. Brown-Couture, Director, Nuclear Safety, Massachusetts Emergency Management Agency
F. W. Getman, Jr., President and Chief Executive Office, BayCorp Holdings, LTD
R. Hallisey, Director, Dept. of Public Health, Commonwealth of Massachusetts
M. Metcalf, Seacoast Anti-Pollution League
D. Tefft, Administrator, Bureau of Radiological Health, State of New Hampshire
S. Comley, Executive Director, We the People of the United States
W. Meinert, Nuclear Engineer
S. Allen, Polestar Applied Technology, Incorporated
R. Shadis, New England Coalition Staff

Distribution w/encl: **(VIA E-MAIL)**
H. Miller, RA/J. Wiggins, DRA
H. Nieh, EDO Coordinator
S. Richards, NRR (ridsnrrdlpmlpdi)
G. Wunder, PM, NRR
V. Nerses, Backup PM, NRR
C. Cowgill, DRP
K. Jenison, DRP
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U. S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket No.:	50-443
License No.:	NPF-86
Report No.:	50-443/02-03
Licensee:	North Atlantic Energy Service Corporation
Facility:	Seabrook Generating Station, Unit 1
Location:	Post Office Box 300 Seabrook, New Hampshire 03874
Dates:	March 31, 2002 - May 25, 2002
Inspectors:	Glenn Dentel, Senior Resident Inspector Javier Brand, Resident Inspector Thomas Moslak, Health Physicist Mike Modes, Senior Reactor Inspector Steve Vias, Senior Reactor Inspector
Accompanied by:	Martha Barillas, Resident Inspector Intern
Approved by:	Curtis Cowgill, Chief Projects Branch 6 Division of Reactor Projects

SUMMARY OF FINDINGS

IR 05000443-02-03, on 3/31-5/25/02; North Atlantic Energy Service Corporation; Seabrook Station; Unit 1. Maintenance Risk Assessments and Emergent Work Control.

The inspection was conducted by resident inspectors, a regional health physicist, and two regional senior reactor inspectors. The inspection identified two Green findings, one was a Non-Cited violation. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using IMC 0609 "Significance Determination Process" (SDP). Findings for which the SDP does not apply are indicated by "no color" or by the severity level of the applicable violation. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described at its Reactor Oversight Process website at http://www.nrc.gov/NRR/OVERSIGHT/index.html

A. Inspector Identified Findings

Cornerstone: Mitigating Systems

- **GREEN.** The operators unexpectedly lost two of six hard wired annunciators in the control room due to breakdowns in the work control process including ineffective communications and insufficient review of the work document. The annunciator panels were quickly returned to service.

  The inability to recognize the impact of work on plant equipment and specifically the annunciator system could lead to a more significant event. The annunciator system provides operators important information to identify and respond to plant transients and equipment problems. Since the annunciators were lost for a short period of time and operability of mitigating equipment trains was not affected, the risk associated with this issue was determined to be of very low safety significance. The inspectors did not identify any violations of NRC requirements. (Section 1R13.1)

- **GREEN.** The licensee performed an unauthorized change to a work order associated with an addition of a diode to the motor-operated potentiometer (MOP), which is part of the electrical governor control system for the "B" emergency diesel generator (EDG). This change did not receive the required reviews. The result was a surge on the input devices to the MOP and a subsequent aborted maintenance run of the EDG. Engineers, mechanics, and management reviews did not identify an additional problem caused by surge in the system prior to the maintenance run.

  The failure to follow procedures for the control of maintenance activities was a Non-Cited Violation of Technical Specification 6.7.1.a. Inadequate control of maintenance activities on risk significant safety-related equipment could lead to a more significant event and could affect the reliability and availability of mitigating equipment. Using the shutdown operations significance determination process, the inspectors determined the finding was of very low significance. (Section 1R13.2)

B. Licensee Identified Violations

There were no violations identified by the licensee during this inspection.

Report Details

Summary of Plant Status: The plant was operating at approximately 100% power since the beginning of the period until May 3, when operators initiated a manual plant shutdown to begin the eighth refueling outage. The outage was ongoing at the completion of the period.

1. REACTOR SAFETY
Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

1R04 Equipment Alignments

.1 Full System Walkdown - Primary Component Cooling Water

a. Inspection Scope

The inspectors performed a full system walkdown of the primary component cooling water (PCCW) system, involving equipment in both trains, and associated piping and in-line components.

The inspectors used the piping and instrumentation drawings (P&ID) for the PCCW system, the system health report, and a list of system related condition reports to verify the material condition of the inspected equipment.

b. Findings

No findings of significance were identified.

.2 Partial System Walkdown - Charging High Head Safety Injection/Cooling Tower

a. Inspection Scope

The inspectors performed a partial system walkdown inspection of the “B” charging high head safety injection system prior to and after removal of the “A” train for scheduled maintenance. The inspectors reviewed the system alignment as described on the plant drawings and performed verification of major equipment alignment in the primary auxiliary building. The inspectors also examined the material condition of major equipment in the areas of inspection, and discussed specific minor material discrepancies with operators and engineers.

The inspectors performed a partial system walkdown inspection of the service water (SW) cooling tower system prior to and after the ocean SW system was secured for a planned maintenance outage. The inspectors observed the licensee inspections of the cooling tower spray header nozzles and independently performed visual inspections of all the spray nozzles. The inspectors verified that redundant systems were properly aligned in accordance with plant procedures and system drawings. The inspectors also examined the material condition of major equipment in the cooling tower building and discussed specific minor material discrepancies with the system engineer.

1R05 Fire Protection

.1 Area Walkdowns

a. Inspection Scope

The inspectors reviewed the fire protection analyses and examined the following risk significant areas:

- Cooling Tower Building- all elevations
- Emergency Feedwater Pump Room 27' elevation
- "A" and "B" Residual Heat Removal Equipment Vaults -all elevations
- "A" and "B" Emergency Diesel Rooms- all elevations

Specific fire protection conditions examined included control of transient combustibles, material condition of fire protection equipment, and the adequacy of any fire impairments and compensatory measures. As part of the control of transient combustibles, the inspectors reviewed, through interviews, examination of test data, and condition report (CR) 00-12718, the use of a floor matting in safety-related areas of the plant.

In addition, the inspectors performed a detailed documentation review of the Seabrook technical requirement fire rated dampers surveillance program. The following documents were reviewed for this inspection.

- Procedure MX0516.05, "18-Month Surveillance of Technical Requirements Fire Rated Dampers," Rev. 8
- TR11-3.7.9.5 and TR11-4.7.9.5.1 regarding fire rated assemblies
- NRC Information Notice No. 89-52, "Potential Fire Damper Operational Problems," dated June 8, 1989
- Commitment Change Request CCR 95-08, "Delete Drop Testing of Fire Dampers," dated November 5, 1995
- Engineering Evaluation No. 95-30, "Fire Damper Inspection Requirements," dated November 14, 1995
- Fire protection system health report, dated October 30, 2001
- Condition report CR 02-07935, which was issued to revise procedure MX0516.05 to agree with technical requirement TR11-3.7.9.5.

b. Findings

No findings of significance were identified.

1R06 Flood Protection Measures

a. Inspection Scope

The inspector reviewed the licensee's flood protection program and performed walkdowns of areas important to safety to assess the condition of the internal and external flood protection barriers and procedures. Station drawings and other applicable documentation were used to verify that flood protection equipment and barriers were in good condition and installed in the field where required. The inspector also reviewed several engineering evaluations, the applicable design basis document, condition reports, and the UFSAR to verify that the licensee had implemented measures to protect safety-related equipment from flooding events.

The following are areas and documents were inspected and reviewed during this inspection:

Areas Inspected:

- East and West main steam pipe chases
- "A" and "B" residual heat removal pump vaults
- PAB primary component cooling water exchangers areas
- "A" and "B" safety injection pump rooms
- "A", "B", and "C" charging pump rooms
- The electrical cable spreading room
- Service water and cooling tower pump buildings
- Emergency feedwater pump room

Documents reviewed:

- CR 02-09292 and 02-08771 issued to document minor deficiencies identified by the inspector
- UFSAR Sections 9.3.3 and 9.3.3.4, Equipment and Floor Drainage System
- Drawing, DBD-PB-01, "Plant Barriers"
- Engineering Evaluation, SS-EE-97-002, Rev.00, Plant Drainage System Guidelines
- Engineering Evaluation, 90-50, Internal Flooding Potential Through Plant Drain and Sump Systems.
- Procedure, FR-Z.2, "Response to Containment Flooding"
- Procedure, ES0802.001, "Revetment Surveillance Program"
- Procedure, RTS 97RE00325001, "5 Year Inspection of Revetments"
- Procedure, OS1200.03, "Severe Weather Conditions"

b. Findings

There were no significant findings identified during this inspection.

1R07 Heat Sink Performance

a. Inspection Scope

The inspectors reviewed the on-line monitoring and bio-fouling controls to ensure cleanliness of various plant heat exchangers in the service water system. The inspectors reviewed the chlorination management program, interviewed system engineers and chemistry personnel, and examined various data collected regarding effectiveness of the chlorination. The inspectors evaluated the data for possible degrading trends in safety related heat exchangers and particularly for the emergency diesel jacket water coolers. In addition, the inspectors performed a review of the historical performance of the chlorination program and the bio-fouling controls.

The inspectors reviewed the condition report (CR 01-04910) and corrective actions to a previously identified non-cited violation documented in NRC Inspection Report 50-443/01-07. In addition, the inspectors observed and/or reviewed work documents associated with the inspection and cleaning of the cooling tower basin and the service water bays.

b. Findings

There were no significant findings identified during this inspection.

1R12 Maintenance Rule Implementation

.1 7300 Protection/Control/Balance of Plant System

a. Inspection Scope

The inspectors evaluated the 7300 Protection/Control/Balance of Plant System or 7300 system. The 7300 system receives various system related transmitters and converts/transmits the output to various system related components (indicators, recorders, etc.) and to the solid state protection system. The 7300 systems consist of circuit boards and power supplies. The inspectors examined selected CRs associated with this system and determined whether the issues should have been classified as maintenance preventable functional failures. The system performance and scope reports were also examined and evaluated. Specific attributes reviewed included maintenance rule (MR) scoping, characterization of failed structures, systems, and components (SSCs), and maintenance risk categorization of SSCs, SSC performance criteria or goals and appropriateness of corrective actions. The inspectors interviewed the system engineer to further evaluate the technical basis for the performance criteria.

b. Findings

There were no significant findings identified during this inspection.

.2 Primary Component Cooling Water System Review

a. Inspection Scope

The inspectors evaluated the implementation of the maintenance rule, 10 CFR 50.65 as it pertained to identified performance problems with the primary component cooling water (PCCW) system. The inspectors verified that performance criteria were established commensurate with the safety significance of the system, and verified that equipment failures were properly evaluated in accordance with the maintenance rule. The inspectors examined selected CRs associated with this system and determined whether the issues should have been classified as maintenance preventable functional failures. The system performance and scope reports were also examined and evaluated. Specific attributes reviewed included MR scoping, characterization of failed SSCs, and MR risk categorization of SSCs, SSC performance criteria or goals and appropriateness of corrective actions.

b. Findings

There were no significant findings identified during this inspection.

.3 Pressurizer Pressure Transient

a. Inspection Scope

The inspectors evaluated the implementation of the maintenance rule, 10 CFR 50.65 as it pertained to a pressurizer pressure transient that occurred on March 3, while performing a time response surveillance test. The transient was caused by a malfunction of a contact relay associated with pressure transmitter PT-455. There are four independent pressurizer pressure instrument channels that provide both protection and control function for the reactor coolant system. These channels are 1RC-P-455, 456, 457, and 458. The channels are part of the 7300 protection and control system. The inspectors verified that the relay failure was properly evaluated and that adequate corrective actions were implemented. The inspectors reviewed an apparent cause evaluation documented under condition report CR 02-03633 to determine the cause of failure, and interviewed various licensee personnel, including the system engineer, and the maintenance rule coordinator. The licensee concluded that the failed contact relay was not a maintenance rule functional failure because it did not affect the operators' capability to manually control reactor coolant system pressure.

b. Findings

There were no significant findings identified during this inspection.

1R13 Maintenance Risk Assessments and Emergent Work Evaluation

.1 Unexpected Loss of Two Control Room Annunciators

a. Inspection Scope

The inspectors reviewed a repetitive task sheet (preventive maintenance) for inspection of a breaker associated with two of the six hard wired annunciator panels in the control room. The inspectors examined the work document (RTS 02RM41963001), an electronic work order (WO 02AA4339), a condition report (02-04999) associated with this work, and operator narrative logs to evaluate the unexpected loss of the annunciator panels when the work was commenced. The inspectors also reviewed the Emergency Response Manual, Section 1.1 to evaluate whether loss of the annunciators constituted an entry into an emergency action level.

b. Findings

The operators unexpectedly lost two of six hard wired annunciators in the control room due to breakdowns in the work control process including ineffective communications and insufficient review of the work document. The operators did not recognize the impact of the work on the plant and this lack of understanding could lead to a more significant event. The inspectors determined this finding was of very low safety significance (Green).

On April 11, operators unexpectedly lost annunciator panels UA 51 and 55 with alarms associated with the "B" primary component cooling water system and the "B" electrical train. The breaker was restored and the annunciators were returned to service. Operations Management Manual, Chapter 3 "Shift Operations," states that "The unit supervisor or shift manager should evaluate the necessity for establishing additional or alternate monitoring when any control room alarm is removed from service. Additional or alternate monitoring should be performed, as necessary, to ensure that abnormal or degraded conditions do not go undetected." The operator's evaluation and the establishment of additional/alternate monitoring did not occur due to the control room crew not being aware of the impact of the preventive maintenance work.

The station has various barriers in place to ensure the control room crew remains aware of the impact of work activities on plant equipment. First, in the Work Management Manual (WM), Chapter 8 "Work Control Practices," on-line maintenance reviews and assessments must be completed . . . [for] non technical specification related equipment which may provide a significant value toward mitigating plant accidents or transients [that is removed from service]. This review was not completed. Second, as part of another review, the work week manager identified that the annunciators would be affected. This information was placed on the electronic work order and not on the work order issued to the field. Third, as per the WM requirements, the work control supervisors, senior reactor operators, reviewed the field work order prior to the authorization of the work. The work control supervisors did not review the electronic work order and did not identify and/or did not communicate that the annunciators would be lost to the control room crew. Fourth, WM, Chapter 8, Section 4.11.2 "Conducting the Job Briefing" requires the maintenance supervisor to have technicians notify operators if the maintenance activity will defeat main control board alarms. The

operators were not notified during the job briefing or subsequent to commencement of the work.

The licensee documented the unexpected loss of the annunciators on CR 02-04999 and issued corrective actions to perform an on-line maintenance review for similar type items. The corrective actions did not address the multiple breakdowns in the barriers listed above. Based on the inspection, a new condition report, CR 02-09524, was generated to complete additional corrective actions.

The inability to recognize the impact of work on plant equipment and specifically the annunciator system could lead to a more significant event. The annunciator system provides operators important information to identify and respond to plant transients and equipment problems. The importance of the system is further highlighted in that loss of four of the six hard wired annunciators could result in an unusual event or alert emergency classification. Using Manual Chapter 0609, "Significance Determination Process," Appendix A, Attachment 1, the finding (**FIN 05000443/2002-003-01**) was determined to be of very low safety significance (Green) since the annunciators were lost for a short period of time (less than 15 minutes) and operability of mitigating equipment trains were not affected.

The inspectors determined this was not a violation of NRC requirements. The annunciator system, although important, is a non-safety system and therefore, the requirements for procedural adherence in 10 CFR 50, Appendix B, Criterion V "Procedures" does not apply.

.2 Control of Maintenance on an Emergency Diesel Generator

a. Inspection Scope

The inspectors reviewed the emergent work completed on the "B" emergency diesel generator (EDG) during a design change. The inspectors reviewed electrical drawings and interviewed plant engineers to determine the effect of adding a diode to the motor-operated potentiometer (MOP), which is part of the electrical governor control system for the EDG. The inspectors also reviewed the Operation Management Manual, the Maintenance Manual, and the Work Management Manual for applicable procedures and controls for changes to work orders. In addition, the inspectors reviewed standing operator order 02-008, which addressed a corrective action to have a management review prior to a run of the EDG following maintenance activities.

b. Findings

The inspectors identified a failure to follow procedures associated with the control of maintenance activity on an emergency diesel generator. The result was a surge on the input devices (fuse, control switches, etc) to the MOP and a subsequent aborted maintenance run of the EDG. The failure to follow procedures was a Non-Cited Violation and was a finding of very low significance (Green).

The licensee installed a design change during the outage to improve the human factors of a local raise/lower switch for the "B" EDG. During testing, unexpected voltage spikes occurred in the governor speed control circuitry. On May 22, 2002, system engineers and mechanics added a step in the work order to install a diode to address the voltage

spikes. This change was not reviewed by the work control supervisor as required by procedure. The diode was installed incorrectly which resulted in a current surge when the speed dial was taken to the "raise" position. The control power fuses blew and were replaced and the diode was removed. Following the work on the governor speed control circuitry, a maintenance run on the EDG was commenced. Operators manually shut down the EDG due to a high speed/frequency condition. The troubleshooting performed after the EDG shutdown identified the raise switch had welded closed and caused the high speed condition. The raise switch had welded closed during the surge caused by the diode. System engineering and mechanical personnel did not fully evaluate the condition of the governor prior to the EDG run. In addition, a required management review implemented as a corrective action to an earlier issue associated with the EDG, was not conducted.

Inadequate control of maintenance activities on risk significant safety-related equipment could lead to a more significant event and could affect the reliability and availability of mitigating equipment. The inspectors reviewed NRC Manual Chapter 0609, Appendix G, "Shutdown Operations Significance Determination Process," and determined the configuration described above did not exceed any of the criteria that would have required a Phase 2 analysis. This finding was determined to be of very low significance (Green).

Technical Specification 6.7.1.a, "Procedures and Programs," requires that written procedures be implemented covering the activities in Regulatory Guide 1.33 Revision 2 Appendix A. Regulatory Guide 1.33, Appendix A, requires procedures for performing maintenance including general procedures for the control of maintenance. Work Management Manual 8.4, Section 4.8 states the work control supervisor shall determine if a proposed change may require that an assessment be initiated and determine if a proposed scope change will require a Probabilistic Risk Assessment evaluation. Contrary to this, on May 22, 2002, a scope change to work order 0215905 added a diode to the motor-operated potentiometer for the "B" EDG without review of the work control supervisor. The diode was placed incorrectly in the circuit and resulted in a surge in the system. This is a violation of Technical Specification 6.7.1.a. However, because of the very low safety significance of the item and because the licensee has included this item in their corrective actions program (CRs 02-08717, 02-08689, and 02-08594), this is a non-cited violation (**NCV 05000443/2002-003-02**).

.3 Cooling Tower Inspection Activities

a. Inspection Scope

The inspectors reviewed the scheduling and control of maintenance activities involving a pre refueling outage diving inspection of the cooling tower basin and the cooling tower spray header nozzles, in order to evaluate the effect on plant risk. The inspectors interviewed the system engineer, the field supervisor and operators and performed a walkdown of the redundant service water system trains to assess understanding of the risk associated with the removal of the cooling tower to support the maintenance activities. The inspectors reviewed portions of the work package (WO 01C3157) for the cooling tower divers inspection, and condition report CR 02-03389 which evaluated minor debris identified by the divers.

b. Findings

There were no significant findings identified during this inspection.

1R15 Operability Evaluations

a. Inspection Scope

The inspectors reviewed several operability determinations (OD's) in order to determine that the identified conditions did not adversely affect safety system operability or plant safety. In addition, where a component was determined to be inoperable, the inspectors verified the TS limiting condition for operation implications were properly addressed. Administrative Procedure OE 4.5, "Operability Determination," and Generic Letter 91-18, "Resolution of Degraded and Nonconforming Conditions" were used to evaluate the licensee's operability determinations. The inspectors performed field walkdowns, interviewed personnel, and reviewed the following items:

- On April 17, while performing a no load maintenance run of the "A" emergency diesel generator (EDG), air was inadvertently sent through the lubricating oil system piping, causing an unexpected start of the auxiliary motor driven lubricating oil pump. The EDG was manually shutdown by operators. The licensee determined that the air was due to poor venting of the lubricating oil system prior to the EDG start, and that no damage had occurred to the engine. The inspectors reviewed the current operability evaluation of the EDG associated with this deficiency documented in CR 02-05315.

- On May 6, while performing scheduled maintenance on the start-up feedwater pump (1-FW-P-113), maintenance technicians identified partial degradation of the pump outboard trust bearing shoes. In addition, pieces of babbitt material from the bearing shoes were found around the journal bearing. The maintenance activity was performed to investigate elevated bearing temperatures that had been identified since May 1999 and documented under adverse condition report (ACR) 99-2403. The licensee determined that the degraded bearings would not have prevented the pump from performing its safety function and that the degraded condition was caused by excessive axial travel. The inspectors reviewed the past operability capability of the start-up feedwater pump due to the as found degraded condition. The inspector performed field walkdowns and visually inspected the affected components, reviewed condition reports CR 02-06572 and CR 99-09123, and interviewed the maintenance supervisor and pump component engineer.

- On May 8, during the 18 month "A" EDG maintenance test per MX0539.29, the engine started and immediately tripped. The trip occurred during the unloaded slow speed test start following an air roll evolution to ensure proper venting of the lubricating oil system. The licensee determined that the trip was due to a protective relay circuit which properly picked up on low lubricating oil pressure. The pressure was low because the auxiliary oil pump was not run for the test to prevent the relay circuit pickup. The licensee concluded that the shaft driven pump continued to provide adequate lubrication to the EDG during this evolution and that no degradation had occurred. The inspectors reviewed the operability determination associated with this deficiency documented in Condition Report (CR) 02-06872.

b. Findings

There were no significant findings identified during this inspection.

1R19 Post-Maintenance Testing

a. Inspection Scope

The inspectors reviewed several post-maintenance testing (PMTs) activities to ensure: 1) the PMT was appropriate for the scope of the maintenance work completed; 2) the acceptance criteria were clear and demonstrated operability of the component; and 3) the PMT was performed in accordance with procedures. The following PMT was reviewed:

- On April 17 and 18, OX1426.01, "DG 1A Monthly Operability Surveillance," Rev. 8, following completion of several scheduled work activities including; replacement of the temperature control valve, implementation of DCR 01-005, for partial installation of the new EDG governor wiring and magnetic pickup, and replacement of the air start filter (DG-F-172A).

- On May 17, OS1026.16, "DG 1B Maintenance Starting," Rev. 6, following completion of a scheduled work activity for installation of a design change during the outage to improve the human factors of a local raise/lower switch.

b. Findings

There were no significant findings identified during this inspection.

1R20 Refueling and Outage Activities

a. Inspection Scope

The inspectors reviewed diverse operational, maintenance and scheduling activities prior to and during the eighth refueling outage to evaluate the licensee's activities to assess and manage the outage risk. Specific activities reviewed included:

- Control of plant shutdown, plant shutdown parameters, reactor vessel disassembly and re-assembly.
- Defueling and refueling activities to verify Technical Specification requirements were met, including fuel handling, inventory and control and review of the core reload map.
- Refueling machine operation, inspection of the fuel transfer system and upender operation, spent fuel bridge assembly operation and spent fuel handling tool operation.
- EDGs status and other electrical systems to ensure electrical power systems met Technical Requirements during the outage.
- Review of the outage risk plan. Configuration management to ensure that adequate reactor process instrumentation, decay heat removal, inventory make-up, and containment systems were available to minimize plant risk.
- Reactor Coolant System (RCS) evacuation and fill (mid loop operations). Control and coordination of activities to minimize risk while in a reduced RCS inventory condition.

- Control of temporary systems and equipment, including scaffolding, to ensure that temporary installations did not adversely challenge mitigation systems.
- The identification and resolution of problems by the review of selected condition reports and corrective actions.
- Two separate and independent Containment Closeout walkdowns to ensure no debris was left in containment that would affect performance of containment sumps and to visually inspect major components and piping to identify any general condition that might degrade system operation.
- Reactivity Control via observation of partial Post Refueling Low Power Physics Testing.
- Partially completed control, validation, and verification of tags for PCCW and A and B EDGs. As necessary to ascertain the acceptability of tagout sequence performance and control authorization, the inspector interviewed licensed operators, tagging control supervisors, and designated work contact personnel.
- A visual inspection of selected engineered safety feature components that are normally inaccessible.

b. Findings

There were no significant findings identified during this inspection.

1R22 Surveillance Testing

a. Inspection Scope

The inspectors observed portions of several surveillance testing activities of safety-related systems to verify that the system and components were capable of performing their intended safety function, to verify operational readiness, and to ensure compliance with required TS and surveillance procedures.

The inspectors attended some of the pre-evolution briefings, performed system and control room walkdowns, observed operators and technicians perform test evolutions, reviewed system parameters, and interviewed the system engineers and field operators. The following surveillance procedures were reviewed.

- On April 24, OX1436.02, “Turbine Driven Emergency Feedwater Pump Quarterly and 18 Month Surveillance Test and Monthly Valve Alignment,” Rev. 8
- On April 11, IX1640.351, “FW-P-500 High Pressure Turbine Impulse Chamber Pressure Calibration,” Rev. 6. The inspectors also reviewed the adequacy of immediate actions taken in response to condition report CR 02-05089 regarding deficiencies identified during and following the surveillance test.
- On April 29, EX1804.023, “Diesel Generator Fuel Oil Transfer Pumps Flow Verification 18 Month Surveillance,” Rev. 4
- On May 21, OX1426.21, “Diesel Generator 1B 18 Month Operability and Engineered Safeguards Pump and Valve Response Time Testing Surveillance,” Rev. 2
- On May 22, OX1426.05, “DG 1B Monthly Operability Surveillance,” Rev. 8,

b. Findings

There were no significant findings identified during this inspection.

2. RADIATION SAFETY

Cornerstone: Occupational Radiation Safety

2OS2 ALARA Planning and Controls

a. Inspection Scope

During the period May 13 to 17, the inspectors conducted the following activities to determine the effectiveness of administrative, operational, and engineering controls to minimize and equalize personnel exposure for tasks conducted during the eighth refueling outage. Implementation of these controls was reviewed against the criteria contained in 10 CFR 20, applicable industry standards, and the licensee's procedures.

- The inspectors reviewed pertinent information regarding cumulative exposure history, current exposure trends, and ongoing activities in order to assess the licensee's effectiveness in establishing exposure goals and keeping actual exposure as low as is reasonably achievable (ALARA) when performing outage work activities. Radiation Safety Committee meeting minutes were reviewed to assess the licensee's preparations in addressing the outage ALARA challenges. Also, the inspectors

  reviewed were the results of the licensee's efforts to reduce plant source terms through system flushing, temporary shielding installations, and shutdown chemistry controls.

- The inspectors reviewed the exposure controls specified in radiation work permits and ALARA Reviews (AR) for specific outage work activities and compared predicted exposure with an actual accrued dose. Work activities reviewed included Reactor Disassembly/Reassembly (AR 02-01), Steam Generator (S/G) Eddy Current Testing (AR 02-02), S/G Secondary Side Preventive Maintenance (AR 02-03), In-service Inspections (AR 02-04), Cavity Decontamination (AR 02-05), Motor Operated Valve Testing (AR 02-06), Air Operated Valve Testing (AR 02-07), Fuel Handling (AR 02-10), Snubber Inspections (AR 02-11), and Reactor Coolant Pump/Motor/Seal Maintenance (AR 02-12).

- Jobs-in-progress having radiological significance were observed. The jobs observed included reactor refueling, pressurizer spray valve maintenance, "A" and "D" S/G eddy current testing, and a high activity resin transfer. For the transfer of high activity from demineralize vessel DM-2A to the Spent Resin Sluice Tank, the inspectors attended the pre-job briefing and observed implementation of the associated exposure controls, including posting of affected areas and stationing of guards. For the observed tasks, the inspectors interviewed selected workers on their knowledge of the relevant radiation work permit, electronic dosimetry set points, and job-site radiological conditions.

- Independent radiation surveys were performed in the containment building, primary auxiliary building, and waste processing building to confirm posted survey results and assess the adequacy of radiation work permits and associated controls.

- The inspectors reviewed a recent Health Physics Department self-assessment, Quality Assurance Department surveillance reports, and licensee identified findings

(relating to the control of personnel exposure and work activities) to determine if findings were entered into the corrective action program, the issues were evaluated, and corrective actions were initiated.

- Health Physics Departmental self-assessment (SA 02-0082) regarding Health Physics Pre-Outage Planning

    - Quality Assurance Surveillance Report (QASR 02-0038) regarding pre-outage readiness
    - QASR 02-0041regarding controlling entries into the fuel transfer canal
    - Condition Report Nos. 02-07192, 02-07087, 02-06973, 02-06835, 02-06630, 02-06533, 02-06306, 02-05186, 02-04079, 02-03592, 02-03434, 02-03419, and 02-02683.

Additionally, in evaluating the effectiveness of the licensee's problem identification and resolution program, the inspectors attended daily outage planning/turnover meetings and reviewed control point logs.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES [OA]

4OA1 Performance Indicator Verification

Occupational Exposure Control Effectiveness

a. Inspection Scope

The inspectors selectively examined records used by the licensee to identify occurrences involving locked high radiation areas, very high radiation areas, and unplanned personnel exposures. The information contained in these records was compared against the criteria contained in Nuclear Energy Institute (NEI) 99-02, Regulatory Assessment Performance Indicator Guideline, Revision 2, to verify that all conditions that met the NEI criteria were recognized, identified, and reported as a Performance Indicator. The records reviewed included Condition Reports and various ALARA records addressing individual and collective exposures.

b. Findings

No findings of significance were identified

4OA2 Identification and Resolution of Problems

The inspections identified work control issues associated with a change in work order on an emergency diesel generator and an unexpected loss of two control room annunciator panels. In addition to the work control issues, the inspectors identified that a corrective action for a management review was not completed prior to the EDG maintenance and corrective actions to the control room annunciator issue did not address all aspects of the problem (see Section 1R13 for details).

4OA3 Event Follow-Up

.1 (Closed) LER 50-443/01-003: "Reactor Trip due to a Dropped Rod."

The inspectors reviewed the licensee event report (LER) 50-443/01-003. The issue was discussed and a non-cited violation/green finding was issued in NRC Inspection Report 50-443/01-011. The inspectors verified that the LER accurately described the event and the significance. In addition, the inspectors verified the corrective actions in the LER were completed. The inspectors concluded that the actions were sufficient interim measures to prevent recurrence. The inspectors noted that additional actions, not described in the LER, were planned and described in the root cause evaluation to facilitate long term actions to address the root cause of particulate in the control rod drive mechanisms. These actions are being tracked under CR 01-12250.

.2 Administrative Closure of Several Open Items

The following open items were administratively closed: 05000443/2001-005-01, "Failure to Take Effective Corrective Actions on 345kv Bushing Affected Offsite Power"; 05000443/2001-005-02, "NCV - Failure to Evaluate and Correct Problems With the Turbine Driven Emergency Feedwater Pump"; and 05000443/2001-005-03, "Degrading Trend in Problem Identification & Resolution Program." The items should have been closed in NRC Inspection Report 05000443/2001-005.

4OA6 Meetings, including Exit

.1 Exit Meeting Summary

The inspectors presented the inspection results to Mr. G. St. Pierre on June 5, 2002, following the conclusion of the period. The licensee acknowledged the findings presented. The licensee did not indicate that any of the information presented at the exit meeting was proprietary.

.2 Site Management Visit

On April 29 and May 23, 2002, Mr. Curtis Cowgill, Branch Chief, Division of Reactor Projects, Branch 6, toured the site and met with Mr. Ted Feigenbaum and other members of licensee management. Mr. Brian McDermott, Senior Resident Inspector for Vermont Yankee Nuclear Plant, accompanied Mr. Cowgill on May 23, 2002.

ATTACHMENT

SUPPLEMENTAL INFORMATION

a. Key Points of Contact

Licensee:

G. St. Pierre	Station Director
B. Plummer	Operations Manager
T. Nichols	Technical Support Manager
D. Sherwin	Maintenance Manager
J. Pandolfo	Security Manager
R. Hickok	NRC Coordinator
M. O'Keefe	Regulatory Compliance Supervisor
P. Allen	Senior Health Physics Technician
J. Bufkin	Chemistry Technician
W. Cash	Health Physics Department Manager
E. Dembosky	Health Physics Technician
J. Dolan	Rad Technical Specialist, Corrective Action Program
D. Hampton	Health Physics Supervisor
C. Keon	Radiological Technical Specialist - ALARA
W. Leland	Manager, Health Physics and Chemistry
I. McCabe	Health Physics Records Supervisor
T. Pepin	Quality Assurance (Health Physics) Assessor
M. Perkins	Senior Health Physics Technician
D. Robinson	Chemistry Department Supervisor
T. Smith	Health Physics Technician
R. Sterritt	Radiological Technical Specialist, ALARA
M. Sullivan	Health Physics Technician

b. **Items Opened, Closed, and Discussed**

Opened and Closed:

05000443/2002-003-01	FIN	Inadequate Implementation of Work Controls Resulted in an Unexpected Loss of Two Annunciator Panels. (Section 1R13.1)
05000443/2002-003-02	NCV	Failure to Follow Work Control Procedures for Work Order Changes associated with an Emergency Diesel Generator. (Section 1R13.2)

Closed:

05000443/2001-003	LER	Reactor Trip due to a Dropped Rod. (Section 4OA3.1)
05000443/2001-005-01	FIN	Failure to Take Effective Corrective Actions on 345kv Bushing Affected Offsite Power (Section 4OA3.2)
05000443/2001-005-02	NCV	Failure to Evaluate and Correct Problems With the Turbine Driven Emergency Feedwater Pump (Section 4OA3.2)
0500443/2001-005-03	FIN	Degrading Trend in Problem Identification & Resolution Program (Section 4OA3.2)

c. **List of Acronyms Used**

ACR	Adverse Condition Report
ALARA	As Low As is Reasonably Achievable
AR	ALARA Reviews
CR	Condition Report
EDG	Emergency Diesel Generator
MOP	Motor-Operated Potentiometer
MR	Maintenance Rule
OD	Operability Determinations
PCCW	Primary Component Cooling System
P&ID	Piping & Instrumentation Drawings
PMT	Post Maintenance Testing
PRA	Probabilistic Risk Assessment
QASR	Quality Assurance Surveillance Report
RCS	Reactor Coolant System
SDP	Significance Determination Process
SG	Steam Generator
SSC	Structure, System, or Component
SW	Service Water
UFSAR	Updated Final Safety Analysis Report
WM	Work Management Manual

d. **Partial List of Documents Reviewed**

RP 2.1, Rev 15	General Radiation Worker Instructions and Responsibilities
RP 9.1, Rev 16	RCA Access/Egress Requirements
RP 9.2, Rev 06	Radiological Access Requirements to Containment Areas
HN0958.13, Rev 25	Generation and Control of Radiation Work Permits
HN0958.25, Rev 25	High Radiation Area Controls
HN0960.09, Rev 07	Radiological Controls for Resin Sluice and Transfer
OS1090.08, Rev 00	Miscellaneous System and Component Flushes
OS1019.13, Rev 05	Resin Sluice of the Unit I Cation and Mixed Bed Demineralizers
RWP 02-R-00025,	Primary Side-Manway & Diaphragm work, ECT, tube plugging, tent decon, Channel Head entry, intall/Remove spool pieces, support activities, Task 2 A-S/G, D-S/G ECT Cold Leg
RWP02-R-00030	Refueling Reactor, Task 1
RWP-R-00034	AOV testing and repairs, Task 3, Pressurizer Spray Valve
RWP 02-R-00047	Remote Monitoring Mobilization/De-mobilization, Task 1
RWP 02-R-00057	Resin Sluice - Primary Demin Bed

ALARA Log
Centralized Monitoring Station Log
Main Control Point Log
Temporary Shielding Request Log

Radiation Safety Committee Meeting Minutes 02-02, dated 3/26/02
Radiation Safety Committee Meeting Minutes 02-03, dated 5/01/02

ALARA Review No. 02-01, OR08 Reactor Disassembly & Reassembly
ALARA Review No.02-02, OR08 Steam Generator Eddy Current Testing & Tube Plugging
ALARA Review No. 02-03, OR08 S/G Secondary Side Preventative Maintenance & Inspection
ALARA Review No. 02-04, OR08 ISI
ALARA Review No. 02-05, OR08 Cavity Decon
ALARA Review No. 02-06, MOV Testing
ALARA Review No. 02-07, AOV Testing
ALARA Review No. 02-10, OR08 Fuel Handling
ALARA Review No. 02-11, OR08 Snubber Inspection
ALARA Review No. 02-12, RCP Motors & Seals

Primary Chemistry parameters for OR08 outage

Self-Assessment 02-0082, Health Physics Pre-Outage Planning/ALARA
Quality Assurance Surveillance Report (QASR 02-0038), Pre-Outage Readiness
Quality Assurance Surveillance Report (QASR 02-0041), Assessment of Entry into Fuel Transfer Canal