

## Seabrook 1

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### Initiating Events

**Significance:**  Dec 29, 2001

Identified By: NRC

Item Type: NCV NonCited Violation

#### **NCV - Failure to Implement Effective Corrective Actions to Prior Control Rod Drops of Several Steps Resulted in a Reactor Trip**

The NRC identified that the licensee failed to implement effective corrective actions to prevent a control rod drop and subsequent reactor trip in October 2001. From May 2000 through August 2001, the licensee experienced control rods dropping several steps. The root cause performed in December 2000 was incorrect, corrective actions taken were narrowly focused, and subsequent actions were ineffective in preventing the reactor trip. The reactor trip, a transient on the plant, was a credible impact on safety. The finding was determined to be of very low safety significance (GREEN) since only the initiating event cornerstone was affected and the finding had no impact on mitigating systems. The failure to implement effective corrective actions was a Non-Cited Violation of 10 CFR 50 Appendix "B" Criterion XVI "Corrective Action."

Inspection Report# : [2001011\(pdf\)](#)

**Significance:**  Mar 23, 2001

Identified By: NRC

Item Type: FIN Finding

#### **Failure to take Effective Corrective Actions on 345Kv Bushing Affected Offsite Power**

Failure to take appropriate actions to address a 1997 event involving the 345 KV bushing arcing and preclude a similar event from occurring in March 2001. Although not associated with safety-related equipment, the failure led to a plant trip. The licensee entered this deficiency into the corrective action system as CR 01-02115.

Inspection Report# : [2001005\(pdf\)](#)

**Significance:**  Sep 30, 2000

Identified By: Self Disclosing

Item Type: NCV NonCited Violation

#### **Operator and Maintenance Technician Errors During Restoration of the "B" RAT.**

The "B" reserve auxiliary transformer (RAT) grounding devices were not removed prior to the restoration of Bus 2 due to the improper make-up of the device operating linkage and the failure to verify removal of the devices. The licensee's event team identified several causal factors related to this problem. This event increased the potential for a loss of off-site power (LOOP) transient but did not impact the performance of any mitigation systems. The inspector evaluated the event using Phase 1 of the significance determination process (SDP) and determined that the event was of very low significance (Green Finding) since no mitigation systems were affected. Operations procedure, OS1046.04, "345KV Operations," required visual verification that the grounds had been removed prior to the restoration of Bus 2. Technical Specification (TS) 6.7.1, requires, in part, that written procedures be established and implemented for activities covered by Appendix A of Regulatory Guide 1.33. Appendix A of Regulatory Guide 1.33 requires that procedures be developed for operation of the electrical system. Contrary to the above, the licensee failed to properly implement operations procedure OS1046.04. This is a violation of TS 6.7.1. This violation is being treated as a non-cited violation consistent with the NRC enforcement policy.

Inspection Report# : [2000007\(pdf\)](#)

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## Mitigating Systems

**Significance:**  May 25, 2002

Identified By: NRC

Item Type: FIN Finding

### **Inadequate Implementation of Work Controls Resulted in an Unexpected Loss of Two Annunciator Panels**

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)

Inspection Report# : [2002003\(pdf\)](#)

**Significance:**  May 25, 2002

Identified By: NRC

Item Type: NCV NonCited Violation

### **NCV - Failure to Follow Work Control Procedures for Work Order Changes Associated With an Emergency Diesel Generator**

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)

Inspection Report# : [2002003\(pdf\)](#)

**Significance:**  Apr 17, 2002

Identified By: NRC

Item Type: NCV NonCited Violation

### **NCV - Inadequate Corrective Actions Resulted in Air Intrusion in the "A" Emergency Diesel Generator Lubrication Oil System**

On April 17, 2002, following maintenance activities, the licensee experienced an air intrusion event into the "A" emergency diesel generator (EDG) lubrication oil system. The inspectors identified that the licensee had inadequate corrective actions to prevent reoccurrence of air intrusion in the EDG lubrication oil system. A prior air intrusion event caused the December 2000 failure of the "B" EDG. This finding affected the mitigating systems cornerstone because it

increased the probability for disrupting oil flow to the "A" EDG main bearings which could have resulted in failure of the EDG, impacting the reliability of the "A" EDG. The finding was determined to be of very low safety significance (GREEN), since the implementation of corrective actions for the "B" EDG failure, mitigated the overall consequence of the air intrusion into the "A" EDG lubrication oil system, and no actual damage to the "A" EDG occurred. The failure to implement effective corrective actions was a Non-Cited Violation of 10 CFR 50, Appendix "B", Criterion XVI, "Corrective Action." (Section 40A2)

Inspection Report# : [2002004\(pdf\)](#)

**Significance:**  Nov 27, 2001

Identified By: NRC

Item Type: NCV NonCited Violation

**NCV - Failure to Implement Appropriate Measures to Prevent Damage to the "B" Emergency Diesel Generator during Maintenance**

The NRC identified a Non-Cited Violation of Technical Specification 6.7, "Procedures and Programs," and station maintenance procedure, MA 3.3, "Housekeeping and Plant Material Condition," for the failure to implement appropriate caution to prevent damage to susceptible equipment important to safety during maintenance on the "B" emergency diesel generator on September 19, 2001. This resulted in a failure of a coupling on the diesel lube oil system and additional unavailability time for the associated emergency diesel generator. This finding had a credible impact on safety because the design of the lube oil coupling does not prevent failure from excessive pipe movement that can result from workers stepping or climbing on the associated pipe and no appropriate restrictions were developed to prevent such activity. Since routine work is done in the area associated with this piping at times when the diesel is maintained in an operable, standby condition, the failure of the lube oil coupling could have prevented the diesel from operating in response to emergency conditions. Although this finding affected the availability of the "B" emergency diesel generator, the inspectors determined that this finding was of very low safety significance because the diesel generator was already out-of-service for maintenance and work was in progress at the time and necessary repairs were made to the failed lube oil coupling within the allowed outage time in the facility technical specifications. Because this finding is of very low safety significance and it was captured in the licensee's corrective action program, this finding is being treated as a Non-Cited Violation consistent with Section VI.A.1 of the NRC Enforcement Policy.

Inspection Report# : [2001010\(pdf\)](#)

**Significance:**  Sep 28, 2001

Identified By: NRC

Item Type: NCV NonCited Violation

**NCV - Failure to Determine the Cause of Material Deficiencies associated with the "A" RHR Pump Motor Leads and Identify and Take Corrective Actions to Preclude Recurrence**

A non-cited violation of 10CFR50 Appendix B, Criterion XVI was issued regarding the failure to determine the cause of material deficiencies associated with the "A" Residual Heat Removal (RHR) pump motor leads, and identify and take corrective actions to preclude recurrence. These material deficiencies included a normally torqued lug found to be finger tight and about half the strands to a motor lead found to be severed. The finding was determined to be of very low safety significance (Green) since these material deficiencies did not result in the loss of RHR train safety function, the "A" RHR pump continued to meet periodic surveillance test requirements, and the team did not identify other similar conditions on safety related motors.

Inspection Report# : [2001012\(pdf\)](#)

**Significance:**  Jun 30, 2001

Identified By: NRC

Item Type: NCV NonCited Violation

**NCV - failure to establish procedures to monitor and correct debris levels in the service water bays.**

The NRC identified a Non-Cited Violation for failure to establish appropriate procedural controls to monitor and correct debris levels in the service water bays. The results from an intake structure inspection during the seventh refueling outage found that the debris levels in both service water (SW) bays in proximity to the pumps were 2½ to 3½ feet above the SW pump suction bells. The substantial debris accumulation in the SW pump bay was viewed as a precursor to a significant event with a reasonable potential for common cause failure of all SW pumps. Since there was no actual loss of SW system function, the risk associated with this issue was determined to be of very low safety significance by the significance determination process.

Inspection Report# : [2001007\(pdf\)](#)



**Significance:** Jun 30, 2001

Identified By: NRC

Item Type: NCV NonCited Violation

**NCV - failure to promptly identify and correct degraded EFW pump oil bubblers.**

The NRC identified a Non-Cited Violation for failure to promptly identify and correct degraded emergency feedwater pump oil bubblers. This failure to adequately evaluate available industry experience and maintenance identified problems could have affected operability of both emergency feedwater pumps. The safety significance of this finding was very low because the degraded condition did not completely block oil flow and the pumps had not experienced any active lubricating oil leaks in the past two years. Therefore, the pumps would have been capable of performing their safety function.

Inspection Report# : [2001007\(pdf\)](#)



**Significance:** Apr 25, 2001

Identified By: NRC

Item Type: NCV NonCited Violation

**NCV - Design Control Failure Associated with Inputs in RWST Level Calculation**

The NRC identified two design input errors in engineering calculations which led to non-conservative results associated with a plant design change and an instrument setpoint. A design input error for refueling water storage tank (RWST) level used in a pump performance calculation resulted in the use of non-conservative emergency core cooling system pump flow rates to support design change DCR 00-013, "Manual Transfer to Cold Leg Recirculation." Also, the failure to include a loop uncertainty allowance for the RWST contained volume water level instrument resulted in a non-conservative alarm setpoint. These design input errors were a violation of 10 CFR 50, Appendix B, Criterion III, Design Control. The issue was a non-cited violation and was entered into the licensee's corrective action program. The conditions associated with this violation were determined to be of very low safety significance since compensating margins existed and, when applied to the calculation results, provided assurance of system functionality.

Inspection Report# : [2001004\(pdf\)](#)



**Significance:** Mar 23, 2001


Identified By: NRC

Item Type: NCV NonCited Violation

**NCV - Failure to Evaluate and Correct Problems With the Turbine Driven Emergency Feedwater Pump**

An apparent violation of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," associated with the failure to evaluate significant conditions adverse to quality involving the turbine driven emergency feedwater pump was identified. The failure of the pump to function when called upon degrades the mitigating function of the emergency feedwater system. The licensee entered this issue into the corrective action system as CR 01-02120. This violation is being treated as a non-cited violation consistent with Section VI.A.1 of the NRC Enforcement Policy, issued May 1, 2000

Inspection Report# : [2001005\(pdf\)](#)

**Significance:**  Feb 17, 2001

Identified By: Licensee

Item Type: NCV NonCited Violation

**Failure to properly develop an adequate operating procedure for pressurization of the standby shutdown cooling train**

The NRC identified a failure to properly develop an adequate operating procedure for pressurization of the standby shutdown cooling train, and failure to properly implement the maintenance procedure for adjusting the ring setting on safety-related relief valves. These findings of very low significance were identified by the licensee and are violations of NRC requirements which meet the criteria of Section VI of the NRC Enforcement Policy, NUREG-1600.

Inspection Report# : [2001002\(pdf\)](#)

**Significance:**  Jan 18, 2001

Identified By: NRC

Item Type: VIO Violation

**Inadequate Corrective Actions Related to Degraded Conditions of Cylinder Liners to DG-1B**

White. An apparent violation of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," was identified by the inspectors associated with the failure to evaluate significant conditions adverse to quality involving degraded components in emergency diesel generator DG-1B. Failure to adequately evaluate industry operating experience, identify and evaluate equipment problems, and correct deficiencies resulted in degraded component conditions of the emergency diesel generators that were potential causes that led to the DG-1B diesel engine failure on November 1, 2000. These issues represented a failure by NAESCo to implement effective corrective actions for degraded components which had safety significance. This issue has a low to moderate safety significance, based on the results of the phase 3 SDP analysis, because emergency diesel generators are an important mitigating system during a loss of off-site power event. This apparent violation was subsequently converted into violation 50-443/00-011-01. Also contributing to the White finding was an apparent violation of 10 CFR 50, Appendix B, Criterion V, "Instructions Procedures, and Drawings." NAESCO failed to establish appropriate quantitative or qualitative acceptance criteria for boroscopic inspections of the diesel generator cylinder liners. A supplemental inspection (Inspection Report No. 50-443/00-013) was performed by the NRC to assess the licensee's evaluation associated with the inoperability of the "B" emergency diesel generator, which occurred on November 1, 2000. In NRC Special Inspection Report No. 50-443/00-011, and in a letter to Seabrook from Mr. Hubert Miller, dated June 29, 2001, the NRC identified a violation involving the licensee's failure to promptly identify and correct conditions adverse to quality that resulted in the "B" diesel generator failure. This performance issue was characterized as having low to moderate risk significance ("White") in the referenced letter. During this supplemental inspection performed in accordance with Inspection Procedure 95001, the inspectors determined that the licensee performed a comprehensive evaluation of the inoperable diesel, including a subsequent failure of the engine No. 5 main bearing, which occurred on December 3, 2000. This additional failure had not been previously reviewed during the NRC Special Inspection. The inoperable diesel was identified by the licensee during the conduct of a surveillance test involving an endurance run of 24 hours. The licensee's evaluation identified that the cause of the No. 7 piston liner failure was uneven thermal expansion causing the piston liner to piston skirt tolerance to diminish to the point that scoring on the liner occurred. This resulted in the failure of the No. 7 cylinder and the crankcase explosion. Relative to the No. 5 main bearing failure, the licensee determined that the most probable causes were either inadequate bearing crush during bearing installation, or a loss of bearing lubricant film during post-repair engine break-in runs. Relative to the performance issue identified by the NRC, the licensee determined that the primary root cause (which can be attributed to the inoperable "B" EDG) was that identified degraded conditions were not properly evaluated for cause, corrective action, and extent of condition. This issue was not limited to the diesel generator and the licensee has taken corrective actions to ensure that identified problems are documented in their corrective action program so that they will be properly evaluated to prevent recurrence. Due to the licensee's overall

acceptable performance in addressing the inoperable diesel generator, the White finding associated with this issue will only be considered in assessing plant performance for a total of four quarters in accordance with the guidance in IMC 0305, "Operating Reactor Assessment Program." Based on the adequacy of the licensee's evaluations, corrective actions taken and planned, and the information contained in the licensee's letter dated July 27, 2001, Notice of Violation (NOV) 50-443/00-011-01 associated with the "B" emergency diesel generator failure has been closed.

Inspection Report# : [2000011\(pdf\)](#)

G

**Significance:** Nov 18, 2000

Identified By: NRC

Item Type: NCV NonCited Violation

**Failure to Develop an Adequate 10 CFR 50.59 Safety Evaluation Prior to Removing the "A" EDG From Service while the "B" EDG was Inoperable**

The "A" emergency diesel generator (EDG) was removed from service while the "B" EDG was inoperable to perform a maintenance outage. The licensee's 10 CFR 50.59 evaluation did not properly consider whether this activity increased the likelihood of the occurrence of malfunction of the emergency power supply to the spent fuel pool cooling system. This activity was considered to be of very low risk since all fuel was located in the spent fuel pool and the time to boil following a loss of cooling was over twelve hours, temporary EDGs and non-electric powered inventory sources were available and the licensee implemented appropriate measures to control the risk while the plant was in this configuration. The inspector reviewed NRC Manual Chapter 0609, Appendix G, "Shutdown Operations Significance Determination Process," and determined that the configuration described above did not exceed any of the criteria that would have required a Phase 2 analysis. Therefore, this finding was determined to be of very low significance (Green). The failure to properly evaluate this activity was considered to be a violation of 10 CFR 50.59 and entered into the licensee's corrective action program. This low risk, violation is being treated as a non-cited violation consistent with the NRC's enforcement policy (NCV 00-08-01) (Section R13).

Inspection Report# : [2000008\(pdf\)](#)

G

**Significance:** Aug 19, 2000

Identified By: NRC

Item Type: NCV NonCited Violation

**Inadequate Post-Maintenance Testing Following ADSV Maintenance.**

The NRC identified, during post-maintenance testing on the 'C' atmospheric steam dump valve (ASDV), that the reactor operator failed to identify that the valve operated faster than specified. The emergency operating procedures required that the ASDVs operate properly to isolate a faulted steam generator (closed direction) and to provide a method for conducting a primary plant cooldown (open direction). The licensee attributed the valve operating problem to the improper positioning of the ASDV control switch and determined that the test procedure did not provide adequate guidance for performing this activity. The test procedure deficiency had the potential to mask a degraded valve operating condition. The ASDV operated properly during follow-up testing. This issue was considered green in the significance determination process since the actual valve operation was not affected by the test procedure problem.

Inspection Report# : [2000006\(pdf\)](#)

G

**Significance:** Jul 01, 2000

Identified By: NRC

Item Type: FIN Finding

**Inadequate Test Program For Monitoring The Safety Related Control Building Air Conditioning System Performance**

A formal test program had not been developed to ensure that the control building air conditioning (CBA) system would remain capable of performing its design safety function during plant operation. Criterion XI, "Test Control," of

Appendix B to 10 CFR 50, requires, in part, that written test procedures be established to demonstrate that components will perform satisfactorily in-service. The failure to develop an adequate test program for monitoring the CBA system performance was not considered a violation since the system had been recently installed and the NUREG 1431 specified test periodicity had not been exceeded. The NRC used the significance determination process to evaluate the risk significance of not developing an adequate test program for the CBA system. This issue was considered a green finding in the significance determination process since it did not affect the immediate operability of the system.

Inspection Report# : [2000005\(pdf\)](#)

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## Barrier Integrity

**Significance:**  May 19, 2001

Identified By: Licensee

Item Type: NCV NonCited Violation

### **NCV - Failure to Properly Implement Refueling Procedures Resulted in a Thimble Plug not Installed in the Reactor Core**

Technical Specification 6.7.1.a requires that written procedures shall be implemented covering the activities described in Appendix A of Regulatory Guide 1.33, Rev.2. Regulatory Guide 1.33 requires procedures for refueling and core alternations. Contrary to the above, on November 28,2000, the refueling senior reactor operator failed to properly verify the component type (thimble plug) in fuel assembly J53 and therefore failed to implement Procedure RS0721, "Refueling Administrative Control," rev.2, Chg.4. This failure resulted in a thimble plug not installed in the reactor core as required during the last refueling outage. Licensee Identified Non-cited Violation

Inspection Report# : [2001006\(pdf\)](#)

**Significance:**  Dec 30, 2000

Identified By: NRC

Item Type: NCV NonCited Violation

### **Failure to Properly Install Components Inside the Containment per the Applicable Drawing**

One finding was identified involving the installation of permanent structures inside the containment that did not meet the required separation distance to the containment liner as specified in structural drawing 101417. This specification required a separation of 0.5 inch be maintained between the containment liner and permanently installed structures located inside the containment. The inspector evaluated this finding using Appendix A (Phase 1) of the significance determination process and determined that the event was of very low significance (Green) since the issue did not involve an actual open pathway in the physical integrity of the containment. Criteria X of Appendix B, to 10 CFR 50, requires, in part, that a program for the inspection of activities affecting quality be established and executed to verify conformance with documented instructions, procedures and drawings. Contrary to the above, the licensee failed to ensure that structural components located inside the containment were properly installed per structural drawing 101417. This is a violation of 10 CFR 50, Appendix B. This low risk violation has been entered into the licensee's corrective action program under condition report 00-13771 and is being treated as a non-cited violation consistent with the NRC enforcement policy. (Section R20) (NCV 00-09-01)

Inspection Report# : [2000009\(pdf\)](#)

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## Emergency Preparedness

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## Occupational Radiation Safety

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## Public Radiation Safety

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## Physical Protection

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## Miscellaneous

**Significance:** N/A Sep 28, 2001

Identified By: NRC

Item Type: FIN Finding

### **Adequate Identification and Resolution of Problems but Areas for Improvement Identified**

The NRC concluded that, based on the samples reviewed, the overall implementation of the corrective action program at Seabrook Station was acceptable. The licensee was identifying problems at an appropriate level and entering them into their corrective action program. The backlog of corrective actions appeared to be appropriately managed, and the actions taken for the identified problems were generally adequate to correct the problem and prevent recurrence. The licensee's evaluation of problems were generally of adequate depth to identify the causes and appropriately broad to address the extent of conditions. However, some examples were identified in which problems were not thoroughly evaluated to determine the cause or appropriately broad to address the extent of condition. One example, involving residual heat removal motor material deficiencies, was determined to be a Green finding. Additionally, as identified during NRC Special Inspections 50-443/00-011 and 01-005, the failures to evaluate problems in sufficient detail contributed to the failures of the B emergency diesel generator and turbine driven emergency feed pump.

Inspection Report# : [2001012\(pdf\)](#)

**Significance:** N/A Mar 23, 2001

Identified By: NRC

Item Type: FIN Finding

### **Degrading Trend in Problem Identification & Resolution Program**

Problem identification and resolution issues were identified in both the initiating event and mitigating system cornerstones. The root causes associated with the partial loss of the offsite lines and the failure of the turbine driven emergency feedwater pump stemmed from inadequacies in the corrective action process and untimely incorporation of vendor technical information into plant procedures. In another event in November 2000, failure of emergency diesel generator "B" was a result of deficiencies in the corrective action process as well as failure to incorporate industry operating experience into the testing program

Inspection Report# : [2001005\(pdf\)](#)

**Significance:** N/A Sep 15, 2000

Identified By: NRC

Item Type: FIN Finding

### **PIR Team Summary**

The NRC concluded that significant conditions adverse to safety were properly identified and captured in the condition



report program. A recently implemented electronic condition reporting system along with additional computer workstations provided for use by the non-office staff, promoted easy access for the reporting of safety issues. Appropriate significance and priority of problems was assigned by a team representing all major departments. The formal root cause analyses reviewed were found to be appropriate. Lower significance issue cause evaluation were generally effective. A management review team, representing all departments, reviewed and approved all root cause evaluations and effectively screened the closure of condition reports that were significant conditions adverse to quality. Corrective actions for identified issues were commensurate with the safety significance of the issues. The corrections were sensitive to the necessity for reliable equipment performance. The extent of condition, generic applicability for significant conditions adverse to safety were properly considered and implemented. Corrective actions were generally effective in preventing recurrence. However, Seabrook has identified several repetitive and lingering minor problems for which corrective actions have not been fully effective. For example, human performance issues included tagging errors and unannounced emergency drill attendance. Seabrook maintained a separate engineering staff overseen by Nuclear Oversight that provided a broad review of both internal and external industry events. Appropriate awareness of significant industry operating experience was evident. Operating experience information was distributed and utilized by appropriate departments. An effective nuclear oversight audit and plant performance assessment program was complimented by a large number of departmental self-assessments of good quality. Assignment of departmental self-assessments was generally well focused. The NRC did not identify any indications of staff reluctance to bring forward safety issues.

Inspection Report# : [2000010\(pdf\)](#)

Last modified : August 29, 2002