UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
612 EAST LAMAR BLVD, SUITE 400
ARLINGTON, TEXAS 76011-4125

April 30, 2009

Stewart B. Minahan, Vice
President-Nuclear and CNO
Nebraska Public Power District
72676 648A Avenue
Brownville, NE 68321

Subject: COOPER NUCLEAR STATION - NRC INTEGRATED INSPECTION REPORT 05000298/2009002

Dear Mr. Minahan:

On March 24, 2009, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Cooper Nuclear Station. The enclosed integrated inspection report documents the inspection findings, which were discussed on April 13, 2009, with Mr. B. O'Grady, Site Vice President, and other members of your staff.

The inspections 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.

This report documents five NRC-identified and self-revealing findings of very low safety significance (Green). All five of these findings were determined to involve violations of NRC requirements. However, because of their very low safety significance and because they are entered into your corrective action program, the NRC is treating these findings as noncited violations, consistent with Section VI.A.1 of the NRC Enforcement Policy. If you contest the violations or the significance of the noncited violations, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, D.C. 20555-0001, with copies to the Regional Administrator, U.S. Nuclear Regulatory Commission, Region IV, 612 E. Lamar Blvd, Suite 400, Arlington, Texas, 76011-4125; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555-0001; and the NRC Resident Inspector at Cooper Nuclear Station. In addition, if you disagree with the characterization of any finding in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region IV, and the NRC Resident Inspector at Cooper Nuclear Station. The information you provide will be considered in accordance with Inspection Manual Chapter 0305.

In accordance with 10 CFR 2.390 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 component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

***/RA/***

Geoffrey B. Miller, Chief
Project Branch C
Division of Reactor Projects

Docket: 50-298
License: DPR-46

Enclosure:
NRC Inspection Report 05000298/2009002
w/Attachment: Supplemental Information

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|---|---|---|---|---|---|
| SUNSI Rev Compl. | ☒Yes ☐ No | ADAMS | ☒Yes ☐ No | Reviewer Initials | GBM |
| Publicly Avail | ☒Yes ☐ No | Sensitive | ☐ Yes ☒No | Sens. Type Initials | GBM |

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**U.S. NUCLEAR REGULATORY COMMISSION**

**REGION IV**

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|---|---|
| Docket: | 05000298 |
| License: | DPR-46 |
| Report: | 05000298/2009002 |
| Licensee: | Nebraska Public Power District |
| Facility: | Cooper Nuclear Station |
| Location: | 72676 648A Avenue<br>Brownville, NE 68321 |
| Dates: | January 1 through March 24, 2009 |
| Inspectors: | N. Taylor, Senior Resident Inspector<br>M. Chambers, Resident Inspector<br>M. Bloodgood, Reactor Inspector |
| Approved By: | Geoffrey B. Miller, Chief, Project Branch C<br>Division of Reactor Projects |

## SUMMARY OF FINDINGS

IR 05000298/2009002; 01/01/2009 – 03/24/2009; Cooper Nuclear Station, Integrated Resident and Regional Report; Maintenance Risk Assessments and Emergent Work Control, Plant Modifications, Identification and Resolution of Problems, and Event Follow-up.

The report covered a 3-month period of inspection by resident inspectors and an announced baseline inspection by a regional based inspector. Five Green noncited violations of very low safety significance were identified. The significance of most findings is indicated by their color (Green, White, Yellow, or Red) using Inspection Manual Chapter 0609, "Significance Determination Process." Findings for which the significance determination process does not apply may be Green or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 4, dated December 2006.

### A. NRC-Identified Findings and Self-Revealing Findings

Cornerstone: Initiating Events

- Green. The inspectors identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," when maintenance personnel exceeded the specified leak injection pressure by 900 psig. Specifically, on March 7, 2009, contract maintenance personnel failed to follow Temporary Configuration Change 4686707, "Leak Repair of RF-V-747 with Sealant," instructions by using an injection pressure of 4000 psig, instead of the specified injection pressure of 3100 psig for the leak injection repair of RF-V-747, the Reactor Feed Line B drywell vent shutoff valve. The licensee entered this issue into the corrective action program as Condition Report CR-CNS-2009-01874.

  The finding was more than minor because if left uncorrected the performance deficiency could have the potential to lead to a more significant safety concern. In accordance with NRC Inspection Manual Chapter 0609, Appendix G, Attachment 1, "Shutdown Operations Significance Determination Process Phase 1 Operational Checklists for Both PWRs [Pressurized Water Reactors] and BWRs [Boiling Water Reactors]," the inspectors evaluated the significance of this finding. The inspectors determined that Checklist 7, "BWR Refueling Operation with Reactor Coolant System Level > 23 Feet," was applicable. The finding was determined to have very low safety significance (Green) because it did not increase the likelihood of a loss of reactor coolant system inventory, did not affect the licensee's ability to terminate a leak path or add inventory to the reactor coolant system, or degrade the licensee's ability to recover decay heat removal in the event it was lost. The cause of this finding was related to the human performance aspect of work practices because the licensee failed to ensure adequate supervisory oversight of contractors such that nuclear safety was supported [H.4(c)] (Section 1R18).

Cornerstone: Mitigating Systems

- Green. The inspectors identified a noncited violation of 10 CFR 50.65.a(4) for the licensee's failure to assess and manage the risk of planned maintenance activities. Specifically, the licensee failed to include planned heavy equipment operations in the vicinity of the 345 kV transmission lines from the main power transformers in their risk assessment on January 29, 2009. The licensee entered this issue into their corrective action program as Condition Report CR-CNS-2009-00734.

  The finding was more than minor because licensee's risk assessment failed to consider maintenance activities that could increase the likelihood of initiating events. The inspectors determined that Manual Chapter 0609, Appendix K, "Maintenance Risk Assessment and Risk Management Significance Determination Process," could not be used due to the inability to quantify the increase in risk associated with the heavy equipment activity. The inspectors utilized Manual Chapter 0609, Appendix M, "Significance Determination Process Using Qualitative Criteria," to determine that the finding was of very low safety significance because the both qualified sources of offsite power were unaffected by this performance deficiency and provided sufficient remaining defense in depth in the event of a unit trip. The cause of this finding was related to the problem identification and resolution crosscutting component of corrective action program because the immediate corrective actions for a similar occurrence on November 26, 2008 were not effective in addressing the safety issue in a timely manner [P.1(d)] (Section 1R13).

- Green. The inspectors identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," regarding the licensee's failure to assure that appropriate quality standards are specified and included in design documents and that deviations from such standards are controlled. Specifically, the licensee failed to ensure that parts associated with the diesel fuel oil flow transmitter were compatible with the fuel oil system, leading to the failure of Diesel Generator 1 on October 30, 2008. The licensee documented the inspectors' observations in Condition Report CR-CNS-2009-02237.

  The finding was more than minor because it is associated with the mitigating systems cornerstone attribute of design control and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e. core damage). Using Manual Chapter 0609.04, "Phase 1 - Initial Screening and Characterization of Findings," the inspectors determined that the finding has very low safety significance because it did not result in the loss of any system safety function. The inspectors determined that identification of a crosscutting aspect was not appropriate for this finding as the cause of the finding was not indicative of current performance (Section 1R18).

- Green. The NRC identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," regarding the licensee's failure to follow procedural requirements for tracking operator work arounds, operator burdens, or control room deficiencies. On January 14, 2009 during a review of control room deficiencies, the inspectors identified that many deficiencies tagged in the control room were not being tracked as required by Conduct of Operations Procedure 2.0.12, "Operator Challenges." This failure to maintain the database of current deficiencies in the plant prevents the licensee from accurately monitoring the aggregate impact on the

operators' ability to operate plant equipment. The licensee entered this issue into the corrective action program as Condition Report CR-CNS-2009-00527.

The finding was greater than minor because it is associated with the mitigating systems cornerstone attribute of equipment performance and affects the associated cornerstone objective to ensure the availability, reliability and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Using Manual Chapter 0609.04, "Phase 1 - Initial Screening and Characterization of Findings," the finding is determined to have very low safety significance because it did not represent the loss of a safety function of a single train for greater than its Technical Specification allowed outage time. This finding had a crosscutting aspect in the area of human performance in that the licensee did not ensure maintenance backlogs were low enough to support safety. Specifically, the licensee did not provide adequate resources for identifying and screening the backlog of control room deficiencies and the resultant aggregate impact to the plant operators' ability to operate plant equipment [H.2(a)] (Section 4OA2).

Cornerstone: Barrier Integrity

- Green. A self-revealing noncited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," occurred regarding the licensee's failure to follow the requirements of Administrative Procedure 0.16, "Control of Doors," when Door H200, both a fire door and a control room emergency filter system boundary door, was found open. The door had been left ajar when a security officer passed through the door and failed to self-check that it closed behind him. A plant operator found the door open when passing through 29 minutes later. Failure of the door to close resulted in the inoperability of the control room emergency filter system and a loss of safety function. The licensee entered this issue into their corrective action program as Condition Report CR-CNS-2008-08695.

  The finding was more than minor because it affected the configuration control attribute of the barrier integrity cornerstone to maintain radiological barrier functionality of the control room, and affected the cornerstone objective to ensure adequate protection of public health and safety from exposure to radioactive materials. This control room emergency filter system failure raised the possibility of control room personnel exceeding federal dose limits outlined in 10 CFR 50.67 or 10 CFR Part 50, Appendix A, General Design Criteria 19, if a release had occurred. Using Manual Chapter 0609.04, "Phase 1 - Initial Screening and Characterization of Findings," the finding is determined to have very low safety significance because it only represented a degradation of the radiological barrier function provided for the control room and no release or exposure occurred during the loss of the control room envelope. The cause of this finding was related to the human performance crosscutting component of work practices because licensee failed to adequately communicate human error prevention techniques such as self checking door closure when passing through [H.4(a)] (Section 4OA3).

## B. Licensee-Identified Violations

None

## REPORT DETAILS

### Summary of Plant Status

Cooper Nuclear Station began the inspection period at full power and remained there until February 1, 2009, when power was reduced to approximately 60 percent for the performance of suppression testing to locate a leaking fuel assembly. The licensee returned to full power on February 6, and remained there until March 6, when the plant was shut down for a planned mid-cycle outage. The plant started up on March 12 and reached full power on March 18, where it remained through the end of the inspection period.

### 1. REACTOR SAFETY

**Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity, and Emergency Preparedness**

### 1R04 Equipment Alignments (71111.04)

.1 Partial Walkdown

a. Inspection Scope

The inspectors performed partial system walkdowns of the following risk-significant systems:

- February 1, 2009, Diesel Generator 2 during unavailability of Diesel Generator 1
- February 11, 2009, Reactor core isolation cooling system

The inspectors selected these systems based on their risk significance relative to the reactor safety cornerstones at the time they were inspected. The inspectors attempted to identify any discrepancies that could affect the function of the system, and, therefore, potentially increase risk. The inspectors reviewed applicable operating procedures, system diagrams, Updated Final Safety Analysis Report, Technical Specification requirements, administrative Technical Specifications, outstanding work orders, condition reports, and the impact of ongoing work activities on redundant trains of equipment in order to identify conditions that could have rendered the systems incapable of performing their intended functions. The inspectors also walked down accessible portions of the systems to verify system components and support equipment were aligned correctly and operable. The inspectors examined the material condition of the components and observed operating parameters of equipment to verify that there were no obvious deficiencies. The inspectors also verified that the licensee had properly identified and resolved equipment alignment problems that could cause initiating events or impact the capability of mitigating systems or barriers and entered them into the corrective action program with the appropriate significance characterization. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of two partial system walkdown samples as defined in Inspection Procedure 71111.04-05.

b. Findings

No findings of significance were identified.

.2 Complete Walkdown

a. Inspection Scope

On February 11, 2009, the inspectors performed a complete system alignment inspection of the core spray system to verify the functional capability of the system. The inspectors selected this system because it was considered both safety-significant and risk-significant in the licensee's probabilistic risk assessment. The inspectors walked down the system to review mechanical and electrical equipment line-ups, electrical power availability, system pressure and temperature indications, as appropriate, component labeling, component lubrication, component and equipment cooling, hangers and supports, operability of support systems, and to ensure that ancillary equipment or debris did not interfere with equipment operation. The inspectors reviewed a sample of past and outstanding work orders to determine whether any deficiencies significantly affected the system function. In addition, the inspectors reviewed the corrective action program database to ensure that system equipment-alignment problems were being identified and appropriately resolved. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of one complete system walkdown sample as defined in Inspection Procedure 71111.04-05.

b. Findings

No findings of significance were identified.

**1R05 Fire Protection (71111.05)**

Quarterly Fire Inspection Tours

a. Inspection Scope

The inspectors conducted fire protection walkdowns that were focused on availability, accessibility, and the condition of firefighting equipment in the following risk-significant plant areas:

- February 5, 2009, Fire Zone 3C, Reactor equipment cooling heat exchanger and pump room
- February 25, 2009, Fire Zone 1D, Residual heat removal pump Room B & D
- February 25, 2009, Fire Zone 1E, High pressure coolant injection system room
- March 24, 2009, Fire Zone 8E, Battery Room 1A
- March 24, 2009, Fire Zone 8F, Battery Room 1B

The inspectors reviewed areas to assess if licensee personnel had implemented a fire protection program that adequately controlled combustibles and ignition sources within the plant; effectively maintained fire detection and suppression capability; maintained passive fire protection features in good material condition; and had implemented adequate compensatory measures for out of service, degraded or inoperable fire protection equipment, systems, or features, in accordance with the licensee's fire plan. The inspectors selected fire areas based

on their overall contribution to internal fire risk as documented in the plant's Individual Plant Examination of External Events with later additional insights, their potential to affect equipment that could initiate or mitigate a plant transient, or their impact on the plant's ability to respond to a security event. Using the documents listed in the attachment, the inspectors verified that fire hoses and extinguishers were in their designated locations and available for immediate use; that fire detectors and sprinklers were unobstructed, that transient material loading was within the analyzed limits; and fire doors, dampers, and penetration seals appeared to be in satisfactory condition. The inspectors also verified that minor issues identified during the inspection were entered into the licensee's corrective action program.

These activities constitute completion of five quarterly fire-protection inspection samples as defined in Inspection Procedure 71111.05-05.

b. Findings

No findings of significance were identified.

**1R11 Licensed Operator Requalification Program (71111.11)**

a. Inspection Scope

On January 15, 2009, the inspectors observed a crew of licensed operators in the plant's simulator to verify that operator performance was adequate, evaluators were identifying and documenting crew performance problems, and training was being conducted in accordance with licensee procedures. The inspectors evaluated the following areas:

- Licensed operator performance
- Crew's clarity and formality of communications
- Crew's ability to take timely actions in the conservative direction
- Crew's prioritization, interpretation, and verification of annunciator alarms
- Crew's correct use and implementation of abnormal and emergency procedures
- Control board manipulations
- Oversight and direction from supervisors
- Crew's ability to identify and implement appropriate Technical Specification actions and emergency plan actions and notifications

The inspectors compared the crew's performance in these areas to pre-established operator action expectations and successful critical task completion requirements. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of one quarterly licensed-operator requalification program sample as defined in Inspection Procedure 71111.11.

b. Findings

No findings of significance were identified.

**1R12 Maintenance Effectiveness (71111.12)**

a. Inspection Scope

The inspectors evaluated degraded performance issues involving the following risk significant systems:

- January 17, 2009, Failure of Diesel Generator 1 lubricating oil piping
- January 31, 2009, Failure of Diesel Generator 1 amphenol connection
- February 9, 2009, Failure of Diesel Generator 2 amphenol connection
- March 3, 2009, SW-V-119 stuck closed

The inspectors reviewed events such as where ineffective equipment maintenance has resulted in valid or invalid automatic actuations of engineered safeguards systems and independently verified the licensee's actions to address system performance or condition problems in terms of the following:

- Implementing appropriate work practices
- Identifying and addressing common cause failures
- Scoping of systems in accordance with 10 CFR 50.65(b)
- Characterizing system reliability issues for performance
- Charging unavailability for performance
- Trending key parameters for condition monitoring
- Ensuring proper classification in accordance with 10 CFR 50.65(a)(1) or (a)(2)
- Verifying appropriate performance criteria for structures, systems, and components classified as having an adequate demonstration of performance through preventive maintenance, as described in 10 CFR 50.65(a)(2), or as requiring the establishment of appropriate and adequate goals and corrective actions for systems classified as not having adequate performance, as described in 10 CFR 50.65(a)(1)

The inspectors assessed performance issues with respect to the reliability, availability, and condition monitoring of the system. In addition, the inspectors verified maintenance effectiveness issues were entered into the corrective action program with the appropriate significance characterization. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of four quarterly maintenance effectiveness samples as defined in Inspection Procedure 71111.12-05.

b. Findings

No findings of significance were identified.

**1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13)**

a. Inspection Scope

The inspectors reviewed licensee personnel's evaluation and management of plant risk for the maintenance and emergent work activities affecting risk-significant and safety-related equipment listed below to verify that the appropriate risk assessments were performed prior to removing equipment for work:

- January 27, 2009, Diesel Generator 1 lubricating oil system failure
- January 29, 2009, Heavy equipment operation near transmission towers in the protected area during Diesel Generator 1 maintenance window
- February 19, 2009, CRD-LS-234B failed surveillance test resulting in plant operation with one-half scram signal
- March 3, 2009, Discovery of degraded K-1 relay on Diesel Generator 1

The inspectors selected these activities based on potential risk significance relative to the reactor safety cornerstones. As applicable for each activity, the inspectors verified that licensee personnel performed risk assessments as required by 10 CFR 50.65(a)(4) and that the assessments were accurate and complete. When licensee personnel performed emergent work, the inspectors verified that the licensee personnel promptly assessed and managed plant risk. The inspectors reviewed the scope of maintenance work, discussed the results of the assessment with the licensee's probabilistic risk analyst or shift technical advisor, and verified plant conditions were consistent with the risk assessment. The inspectors also reviewed the Technical Specification requirements and inspected portions of redundant safety systems, when applicable, to verify risk analysis assumptions were valid and applicable requirements were met. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of four maintenance risk assessments and emergent work control inspection samples as defined in Inspection Procedure 71111.13-05.

b. Findings

Introduction. The inspectors identified a Green noncited violation of 10 CFR 50.65.a(4) for the licensee's failure to assess and manage the risk of planned maintenance activities. Specifically, the licensee failed to include planned heavy equipment operations in the vicinity of the 345 kV transmission lines from the main power transformers in their risk assessment on January 29, 2009.

Description. On January 29, 2009, the licensee was in a yellow risk configuration due to ongoing repairs to Diesel Generator 1. During plant status activities, inspectors questioned control room staff to determine if any heavy equipment operations were anticipated in the vicinity of the transmission line towers in the protected area during the elevated risk condition. The control room staff expressed that no such operations were anticipated. Later that shift, the inspectors noted a water drilling truck operating in the vicinity of the transmission towers.

This truck was performing water drilling activities in support of the independent spent fuel installation project inside the protected area. The inspectors noted that in maneuvering the drilling truck to unload its contents, the driver pulled the truck to within one foot of an unprotected leg of the 345 kV transmission tower that provides the first support for the transmission lines coming from the unit main power transformers. The inspectors alerted station personnel, who redirected the truck activity to an alternate route away from the towers. The inspectors promptly informed the control room staff to allow them to properly assess and manage the risk of the ongoing truck activity in the vicinity of the transmission towers.

The inspectors had previously identified a noncited violation in NRC Inspection Report 05000298/2008005 for a nearly identical circumstance. In the previous inspection finding, the inspectors had noted heavy equipment operating within a few feet of the 161 kV tower leading to the startup transformer during an elevated risk window. In response to this event on November 26, 2008, the licensee had put in place two immediate corrective actions: (1) installation of jersey barriers at the base of the electrical tower leg supports on all four legs of the 161 kV tower and the two legs on the 345 kV tower, and (2) reinforced the requirement for projects department attendance at the 6:30 am production meeting.

The inspectors determined that the first immediate corrective action was inadequate in that it did not protect all accessible points on the 345 kV tower. Specifically, the two support legs on the north side of the 345 kV tower were determined to be inaccessible and were not protected, and on January 29, 2009 a contractor pulled a large water drilling truck within one foot of striking one of those legs on the tower. The inspectors determined that the second immediate corrective action was also inadequate, in that projects department representatives routinely attend the 6:30 am production meeting, but are rarely informed of planned independent spent fuel installation project -related heavy equipment operations. Additionally, Friday, January 29, 2009, was a regularly scheduled “day off” on which no morning production meeting occurred. As a result, there was no opportunity that day for projects department representatives to communicate planned activities to the operations shift manager. Lastly, the inspectors noted that projects department does not routinely upload planned construction activities to the work week schedule. As a result of this lack of communication, the control room staff is unable to meet the requirements of 10 CFR 50.65.a(4) to assess and manage the increase in risk of proposed construction activities.

The inspectors noted that as a result of the previously identified noncited violation, the licensee has assigned corrective actions to identify equipment in need of protection and post appropriate signage. These actions were still being developed at the time of the inspection. The inspectors noted, however, that given the inadequate nature of the immediate corrective actions, no barrier existed to further repeat occurrences prior to inspector engagement on January 29, 2009. The licensee documented this performance deficiency in Condition Report CR-CNS-2009-00734.

Analysis. The performance deficiency associated with this finding involved the licensee’s failure to assess and manage the risk of planned maintenance activities. Specifically, the licensee failed to include planned heavy equipment operations in the vicinity of the 345 kV tower in the protected area in their risk assessment on January 29, 2009. The finding was more than minor because licensee’s risk assessment failed to consider maintenance activities that could increase the likelihood of initiating events. The inspectors determined that Manual Chapter 0609, Appendix K, “Maintenance Risk Assessment and Risk Management Significance Determination Process,” could not be used due to the inability to quantify the increase in risk associated with the heavy equipment activity. The inspectors utilized Manual Chapter 0609, Appendix M, “Significance Determination Process Using Qualitative Criteria,” to determine that the finding was of very low safety significance (Green) because the both

qualified sources of offsite power were unaffected by this performance deficiency and provided sufficient remaining defense in depth in the event of a unit trip. The cause of this finding was related to the problem identification and resolution crosscutting component of corrective action program because the immediate corrective actions for a similar occurrence on November 26, 2008 were not effective in addressing the safety issue in a timely manner [P.1(d)].

Enforcement. Title 10 of the Code of Federal Regulations Part 50.65.a(4) requires, in part, that prior to performing maintenance activities, the licensee shall assess and manage the increase in risk that may result from the proposed maintenance activities. Contrary to this requirement, on January 29, 2009, the licensee conducted heavy equipment operations in the immediate vicinity of the 345 kV tower in the protected area during a yellow risk window without considering the increased likelihood of a plant trip. Because the finding is of very low safety significance and has been entered into the licensee's corrective action program as Condition Report CR-CNS-2009-00734, this violation is being treated as a noncited violation consistent with Section VI.A of the Enforcement Policy: NCV 05000298/2009002-01, "Repeat Failure to Assess and Manage the Risk of Heavy Equipment Operations."

## 1R15 Operability Evaluations (71111.15)

a. Inspection Scope

The inspectors reviewed the following issues:

- January 20, 2009, Repeated failures of Door R409
- January 22, 2009, Drywell scaffolding documentation discrepancies
- January 28, 2009, Diesel Generator 1 common mode failure evaluation for amphenol configuration issue
- February 19, 2009, Diesel Generators 1 and 2 turbocharger missing foundation bolts

The inspectors selected these potential operability issues based on the risk-significance of the associated components and systems. The inspectors evaluated the technical adequacy of the evaluations to ensure that Technical Specification operability was properly justified and the subject component or system remained available such that no unrecognized increase in risk occurred. The inspectors compared the operability and design criteria in the appropriate sections of the Technical Specifications and Updated Safety Analysis Report to the licensee's evaluations, to determine whether the components or systems were operable. Where compensatory measures were required to maintain operability, the inspectors determined whether the measures in place would function as intended and were properly controlled. The inspectors determined, where appropriate, compliance with bounding limitations associated with the evaluations. Additionally, the inspectors also reviewed a sampling of corrective action documents to verify that the licensee was identifying and correcting any deficiencies associated with operability evaluations. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of four operability evaluation inspection samples as defined in Inspection Procedure 71111.15-04.

b. Findings

No findings of significance were identified.

**1R18 Plant Modifications (71111.18)**

a. Inspection Scope

The inspectors reviewed the following temporary/permanent modifications to verify that the safety functions of important safety systems were not degraded:

- Temporary Configuration Change 4686707, Leak Repair of RF-V-747, March 7, 2009
- Temporary Configuration Change 4686902, Digital Electric Hydraulic Control Bypass Valve Solenoid Bypass Jumper, March 8, 2009
- Design Change 89-107, Diesel Generator Day Tank Flow Meter, March 6, 1990

The inspectors reviewed the temporary modification and the associated safety evaluation screening against the system design bases documentation, including the Updated Final Safety Analysis Report and the Technical Specifications, and verified that the modification did not adversely affect the system operability/availability. The inspectors also verified that the installation and restoration were consistent with the modification documents and that configuration control was adequate. Additionally, the inspectors verified that the temporary modification was identified on control room drawings, appropriate tags were placed on the affected equipment, and licensee personnel evaluated the combined effects on mitigating systems and the integrity of radiological barriers. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of two samples for temporary plant modifications and one sample for permanent plant modifications as defined in Inspection Procedure 71111.18-05

b. Findings

1. Incompatible Materials Installed in Diesel Fuel Oil System

Introduction. The inspectors identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion III, “Design Control,” regarding the licensee's failure to assure that appropriate quality standards are specified and included in design documents and that deviations from such standards are controlled. Specifically, the licensee failed to ensure that parts associated with the diesel fuel oil flow transmitter were compatible with the fuel oil system, leading to the failure of Diesel Generator 1 on October 30, 2008.

Description. On August 27, 2008 the licensee replaced DGDO-FI-DT1, the Diesel Generator 1 fuel flow transmitter, under Preventive Maintenance Order 4600486. During a scheduled surveillance test of Diesel Generator 1 on October 30, 2008, the engine failed due to being starved of an adequate fuel supply from the fuel oil transfer system. The licensee performed a root cause analysis in Condition Report CR-CNS-2008-08017, and documented that the loss of fuel flow had been caused by the accumulation of foreign material in the fuel oil day tank inlet float valve. The source of the foreign material was determined to have been the inlet gasket from the recently replaced fuel flow transmitter, which was caused by the degradation of the gasket in the fuel oil environment. The licensee determined that the new gasket had been made from a material that was incompatible with fuel oil, and as such had

slowly degraded and introduced foreign material into the fuel system. The licensee further documented that the supplier had changed the gasket's material properties unbeknownst to the station personnel. The root cause of the October 30, 2008, failure of Diesel Generator 1 was determined to be that, "the use of the non-essential procurement process could not ensure that the elastomer material that was provided by the vendor met the design requirements of the diesel fuel oil system."

The inspectors reviewed the procurement history associated with the replaced flow transmitter. The failed elastomer was received under Purchase Order 4500085599 on February 14, 2008, as a non-essential procurement. The elastomer was supplied with a pipe fitting that was ordered to support the flow transmitter replacement. These elastomers and fittings had been purchased in this way from the same supplier since the flow transmitter was originally installed in 1990. Given the nature of the non-essential procurement process, the licensee was unable to detect the fact that the supplier began shipping gasket material with the fittings that was incompatible with an oil environment.

The inspectors reviewed Design Change 89-107, "Diesel Generator Day Tank Flow Meter," March 6, 1990, in order to understand the rationale for procuring these parts through the non-essential procurement path. In the safety evaluation portion of the design change, there was conflicting information about what the safety classification of the new components should be (i.e., essential versus non-essential). The design change made it clear that the newly installed piping and isolation valves should be classified as essential, whereas the flow transmitter should be classified as non-essential. The package was silent, however, on the proper classification of the pipe fittings and gasket materials. The inspectors identified the following assertions in the safety evaluation that supported the essential procurement of these parts:

> Paragraph C.3.a: "…This Design Change will have no affect on any other system performance or reliability."
>
> Paragraph C.3.k: "Materials specified were equivalent to the original in function and material properties. All new piping, fitting, clamps, valves and miscellaneous material purchased for this Design Change will be classified as essential. The flow transmitter will be classified non-essential."
>
> Paragraph C.5: "The implementation of this Design Change will not increase the probability of the occurrence or the consequence of an accident, or malfunction of equipment important to safety as previously evaluated…."

Contrary to these assumptions in the safety evaluation, the failure of the flow transmitter elastomers did increase the probability of a diesel generator failure and did have an affect on the diesel generator's reliability. Additionally, the guidance in Paragraph C.3.k suggested, specifically, that all such components were to have been purchased as essential.

Additionally, the inspectors determined that the Instrument Component Data Sheet included in Appendix B of the design change was in error. This data sheet was used to document the justification for the classification assigned to the new flow transmitter. In doing so, the Data Sheet asked four questions, each requiring a "yes" or "no" answer. If any of the four questions were answered "yes," the component was to have been classified as essential. Question 3 on the data sheet read as follows:

> "Would the failure or maloperation of the component have the potential to prevent or inhibit the achievement of a safety function?"

This question was answered “no.” The October 30, 2008, failure of Diesel Generator 1, however, demonstrates that the failure of the flow indicating transmitter could cause the failure of the diesel engine. Had the preparer of the data sheet anticipated the potential failure modes of the flow transmitter, these parts would have been classified and procured as essential. Had the parts been appropriately classified and procured, the licensee would have been able to detect the change in materials that led to the failure of Diesel Generator 1 on October 30, 2008. The licensee documented the inspectors’ observations in Condition Report CR-CNS-2009-02237.

Analysis. The performance deficiency associated with this finding involved the licensee's failure to comply with 10 CFR Part 50, Appendix B, Criterion III, “Design Control.” Specifically, the licensee failed to ensure that parts associated with the diesel fuel oil flow transmitter were compatible with the fuel oil system, leading to the failure of Diesel Generator 1 on October 30, 2008. The finding was more than minor because it is associated with the mitigating systems cornerstone attribute of design control and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Using Manual Chapter 0609.04, “Phase 1 - Initial Screening and Characterization of Findings,” the inspectors determined that the finding has very low safety significance (Green) because it did not result in the loss of any system safety function. The inspectors determined that identification of a crosscutting aspect was not appropriate for this finding as the cause of the finding was not indicative of current performance.

Enforcement. Title 10 of the Code of Federal Regulations Part 50, Appendix B, Criterion III, “Design Control,” requires, in part, that appropriate quality standards are specified and included in design documents and that deviations from such standards are controlled. Contrary to the above, from March 6, 1990, until present, the licensee failed to ensure that parts associated with the diesel fuel oil flow transmitter were compatible with the fuel oil system. As a result, incompatible gaskets were installed in the Diesel Generator 1 flow transmitter on August 27, 2008, leading to the failure of Diesel Generator 1 on October 30, 2008. Because this issue was of very low safety significance (Green) and the licensee has entered this issue into their corrective action program in Condition Report CR-CNS-2009-02237, this violation is being treated as a noncited violation consistent with Section VI.A.1 of the Enforcement Policy: NCV 05000298/2009002-02, "Incompatible Materials Installed in Diesel Fuel Oil System."

2. Procedure Violation Results in Exceeding Allowed Injection Pressure

Introduction. The inspectors identified a noncited violation of 10 CFR 50, Appendix B, Criterion V, “Instructions, Procedures, and Drawings,” when maintenance personnel exceeded the specified leak injection pressure by 900 psig. Specifically, on March 7, 2009, contract maintenance personnel failed to follow Temporary Configuration Change 4686707, "Leak Repair of RF-V-747 with Sealant," instructions by using an injection pressure of 4000 psig, instead of the specified injection pressure of 3100 psig for the leak injection repair of RF-V-747, the Reactor Feed Line B drywell vent shutoff valve.

Description. On March 6, 2009, the licensee commenced a plant shutdown to perform a number of urgent repairs. One of the required repairs was related to leakage from Valve RF-V-747 in containment. This valve had been the cause of drywell leakage during the previous operating cycle. The source of the leak was a pinhole in a seal welded plug on the discharge side of the valve. The repair for the leak involved the injection of sealant into the internal

volume of the valve as described in Temporary Configuration Change 4686707, "Leak Repair of RF-V-747 with Sealant."

The initial injection of sealant into RF-V-747 was unsuccessful in that the leakage continued following the repair. Temporary Configuration Change 4686707 allowed for a second injection in the event that the first injection was not successful. The contractors performed this second injection and succeeded in stopping the leak.

During a post-repair paperwork review, the inspectors discovered that the contractors who had performed the work had exceeded the allowed injection pressure during the second injection by 900 psig. Temporary Configuration Change 4686707 authorized an injection pressure of 3100 psig. During the injection process, the contractors had applied a final injection pressure of 4000 psig. The inspectors determined that the licensee had provided oversight of the first injection activity, but that the contractors had been sent into containment for the second injection without oversight, and as such an opportunity was missed to prevent the overpressure condition.

The licensee entered this issue into the corrective action program as Condition Report CR-CNS-2009-01874 and performed an evaluation to determine if any sealant had traveled into the reactor feed system and if the pressure had exceeded the design pressure of Valve RF-V-747. The sealant injection pressure needs to exceed the system operating pressure to ensure the sealant travels into the void at the leak site. During this leak injection the system pressure was low with the plant cooled down for the maintenance outage. Therefore, the over-pressurization of RF-V-747 and associated feedwater piping did not degrade the components. The inspectors reviewed the results of the licensee's analysis and determined that no damage to RF-V-747 had occurred and that no sealant had been introduced into the reactor feed system beyond RF-V-747.

Analysis. The performance deficiency associated with this finding involved the licensee's failure to comply with 10 CFR Part 50, Appendix B, Criterion V, “Instructions, Procedures, and Drawings.” Specifically, contract maintenance personnel failed to follow Temporary Configuration Change 4686707, "Leak Repair of RF-V-747 with Sealant," instructions by using an injection pressure of 4000 psig, instead of the specified injection pressure of 3100 psig for the leak injection repair of RF-V-747, the Reactor Feed Line B drywell vent shutoff valve. The finding was more than minor because if left uncorrected the performance deficiency could have the potential to lead to a more significant safety concern. In accordance with NRC Inspection Manual Chapter 0609, Appendix G, Attachment 1, “Shutdown Operations Significance Determination Process Phase 1 Operational Checklists for Both PWRs [Pressurized Water Reactors] and BWRs [Boiling Water Reactors],” the inspectors evaluated the significance of this finding. The inspectors determined that Checklist 7, “BWR Refueling Operation with Reactor Coolant System Level > 23 Feet,” was applicable. The finding was determined to have very low safety significance (Green) because it did not increase the likelihood of a loss of reactor coolant system inventory, did not affect the licensee’s ability to terminate a leak path or add inventory to the reactor coolant system, or degrade the licensee’s ability to recover decay heat removal in the event it was lost. The cause of this finding was related to the human performance aspect of work practices because the licensee failed to ensure adequate supervisory oversight of contractors such that nuclear safety was supported [H.4(c)].

Enforcement. Title10 of the Code of Federal Regulations Part 50, Appendix B, Criterion V, “Instructions, Procedures, and Drawings,” requires, in part, that activities affecting quality shall be prescribed by documented procedures of a type appropriate to the circumstances and shall

be accomplished in accordance with these procedures. Contrary to the above, on March 7, 2009, contract maintenance personnel failed to follow Temporary Configuration

Change 4686707, "Leak Repair of RF-V-747 with Sealant," instructions by using an injection pressure of 4000 psig, instead of the specified injection pressure of 3100 psig for the leak injection repair of RF-V-747, the Reactor Feed Line B drywell vent shutoff valve. Because this issue was of very low safety significance (Green) and the licensee has entered this issue into their corrective action program in Condition Report CR-CNS-2009-01874, this violation is being treated as a noncited violation consistent with Section VI.A.1 of the Enforcement Policy: NCV 05000298/2009002-03, "Procedure Violation Results in Exceeding Allowed Injection Pressure."

## 1R19 Postmaintenance Testing (71111.19)

a. Inspection Scope

The inspectors reviewed the following postmaintenance activities to verify that procedures and test activities were adequate to ensure system operability and functional capability:

- March 5, 2009, Work Order 4617971, Replace DG-1 Motor Operated Potentiometer
- March 5, 2009, Work Order 4686332, Replace DG-1 K4 Relay
- March 5, 2009, Work Order 4686186, Replace DG-1 K1 Relay

The inspectors selected these activities based upon the structure, system, or component's ability to affect risk. The inspectors evaluated these activities for the following (as applicable):

- The effect of testing on the plant had been adequately addressed; testing was adequate for the maintenance performed
- Acceptance criteria were clear and demonstrated operational readiness; test instrumentation was appropriate

The inspectors evaluated the activities against the technical specifications, the Updated Final Safety Analysis Report, 10 CFR Part 50 requirements, licensee procedures, and various NRC generic communications to ensure that the test results adequately ensured that the equipment met the licensing basis and design requirements. In addition, the inspectors reviewed corrective action documents associated with postmaintenance tests to determine whether the licensee was identifying problems and entering them in the corrective action program and that the problems were being corrected commensurate with their importance to safety. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of three postmaintenance testing inspection samples as defined in Inspection Procedure 71111.19-05.

b. Findings

No findings of significance were identified.

## 1R20 Refueling and Other Outage Activities (71111.20)

a. Inspection Scope

The inspectors reviewed the outage safety plan and contingency plans for a planned mid-cycle outage, conducted March 6 through March 12, 2009, to confirm that licensee personnel had appropriately considered risk, industry experience, and previous site-specific problems in developing and implementing a plan that assured maintenance of defense-in-depth. During the refueling outage, the inspectors observed portions of the shutdown and cooldown processes and monitored licensee controls over the outage activities listed below.

- Configuration management, including maintenance of defense-in-depth, is commensurate with the outage safety plan for key safety functions and compliance with the applicable Technical Specifications when taking equipment out of service.
- Installation and configuration of reactor coolant pressure, level, and temperature instruments to provide accurate indication, accounting for instrument error.
- Monitoring of decay heat removal processes, systems, and components.
- Controls over activities that could affect reactivity.
- Maintenance of secondary containment as required by the Technical Specifications.
- Startup and ascension to full power operation, tracking of startup prerequisites, walkdown of the drywell (primary containment) to verify that debris had not been left which could block emergency core cooling system suction strainers, and reactor physics testing.
- Licensee identification and resolution of problems related to refueling outage activities.

Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of one outage inspection sample as defined in Inspection Procedure 71111.20-05.

b. Findings

No findings of significance were identified.

## 1R22 Surveillance Testing (71111.22)

a. Inspection Scope

The inspectors reviewed the Updated Final Safety Analysis Report, procedure requirements, and Technical Specifications to ensure that the three surveillance activities listed below demonstrated that the systems, structures, and/or components tested were capable of performing their intended safety functions. The inspectors either witnessed or reviewed test data to verify that the significant surveillance test attributes were adequate to address the following:

- Preconditioning

- Evaluation of testing impact on the plant
- Acceptance criteria
- Test equipment
- Procedures
- Jumper/lifted lead controls
- Test data
- Testing frequency and method demonstrated Technical Specification operability
- Test equipment removal
- Restoration of plant systems
- Fulfillment of ASME Code requirements
- Updating of performance indicator data
- Engineering evaluations, root causes, and bases for returning tested systems, structures, and components not meeting the test acceptance criteria were correct
- Reference setting data
- Annunciators and alarms setpoints

The inspectors also verified that licensee personnel identified and implemented any needed corrective actions associated with the surveillance testing.

- January 22, 2009, Diesel generator fuel oil storage tank samples
- January 27, 2009, Diesel generator monthly surveillance test
- February 11, 2009, Service water pump in-service test

Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of three surveillance testing inspection samples as defined in Inspection Procedure 71111.22-05.

b. Findings

No findings of significance were identified.

**1EP6 Drill Evaluation (71114.06)**

.1 Emergency Preparedness Drill Observation

a. Inspection Scope

The inspectors evaluated the conduct of a routine licensee emergency drill on February 24, 2009, to identify any weaknesses and deficiencies in classification, notification, and protective action recommendation development activities. The inspectors observed emergency

response operations in the Emergency Operations Facility to determine whether the event classification, notifications, and protective action recommendations were performed in accordance with procedures. The inspectors also attended the licensee drill critique to compare any inspector-observed weakness with those identified by the licensee staff in order to evaluate the critique and to verify whether the licensee staff was properly identifying weaknesses and entering them into the corrective action program. As part of the inspection, the inspectors reviewed the drill package and other documents listed in the attachment.

These activities constitute completion of one sample as defined in Inspection Procedure 71114.06-05.

b. Findings

No findings of significance were identified.

## 4. OTHER ACTIVITIES

## 4OA1 Performance Indicator Verification (71151)

.1 Data Submission Issue

a. Inspection Scope

The inspectors performed a review of the data submitted by the licensee for the fourth Quarter 2008 performance indicators for any obvious inconsistencies prior to its public release in accordance with Inspection Manual Chapter 0608, “Performance Indicator Program.”

This review was performed as part of the inspectors’ normal plant status activities and, as such, did not constitute a separate inspection sample.

b. Findings

No findings of significance were identified.

.2 Unplanned Scrams per 7000 Critical Hours

a. Inspection Scope

The inspectors sampled licensee submittals for the Unplanned Scrams per 7000 Critical Hours performance indicator for the period from the first quarter 2008 through the fourth quarter 2008. To determine the accuracy of the performance indicator data reported during those periods, performance indicator definitions and guidance contained in NEI Document 99-02, “Regulatory Assessment Performance Indicator Guideline,” Revision 5, was used. The inspectors reviewed the licensee’s operator narrative logs, issue reports, event reports and NRC integrated inspection reports for the period from the first quarter 2008 through the fourth quarter 2008 to validate the accuracy of the submittals. The inspectors also reviewed the licensee’s issue report database to determine if any problems had been identified with the performance indicator data collected or transmitted for this indicator and none were identified.

These activities constitute completion of one unplanned scrams per 7000 critical hours sample as defined in Inspection Procedure 71151-05.

b. Findings

No findings of significance were identified.

.3 Unplanned Power Changes per 7000 Critical Hours

a. Inspection Scope

The inspectors sampled licensee submittals for the Unplanned Power Changes per 7000 Critical Hours performance indicator for the period from the first quarter 2008 through the fourth quarter 2008. To determine the accuracy of the performance indicator data reported during those periods, performance indicator definitions and guidance contained in NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 5, was used. The inspectors reviewed the licensee's operator narrative logs, issue reports, maintenance rule records, event reports and NRC integrated inspection reports for the period from the first quarter 2008 through the fourth quarter 2008. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the performance indicator data collected or transmitted for this indicator and none were identified. Specific documents reviewed are described in the attachment to this report.

These activities constitute completion of one unplanned transients per 7000 critical hours sample as defined in Inspection Procedure 71151-05.

b. Findings

No findings of significance were identified.

## 4OA2 Identification and Resolution of Problems (71152)

**Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity, Emergency Preparedness, Public Radiation Safety, Occupational Radiation Safety, and Physical Protection**

.1 Routine Review of Identification and Resolution of Problems

a. Inspection Scope

As part of the various baseline inspection procedures discussed in previous sections of this report, the inspectors routinely reviewed issues during baseline inspection activities and plant status reviews to verify that they were being entered into the licensee's corrective action program at an appropriate threshold, that adequate attention was being given to timely corrective actions, and that adverse trends were identified and addressed. The inspectors reviewed attributes that included: the complete and accurate identification of the problem; the timely correction, commensurate with the safety significance; the evaluation and disposition of performance issues, generic implications, common causes, contributing factors, root causes, extent of condition reviews, and previous occurrences reviews; and the classification, prioritization, focus, and timeliness of corrective actions.

These routine reviews for the identification and resolution of problems did not constitute any additional inspection samples. Instead, by procedure, they were considered an integral part of the inspections performed during the quarter and documented in Section 1 of this report.

b. Findings

No findings of significance were identified.

.2 Daily Corrective Action Program Reviews

a. Inspection Scope

In order to assist with the identification of repetitive equipment failures and specific human performance issues for follow-up, the inspectors performed a daily screening of items entered into the licensee's corrective action program. The inspectors accomplished this through review of the station's daily corrective action documents.

The inspectors performed these daily reviews as part of their daily plant status monitoring activities and, as such, did not constitute any separate inspection samples.

b. Findings

No findings of significance were identified.

.3 Selected Issue Follow-up Inspection

a. Inspection Scope

During a review of items entered in the licensee's corrective action program, the inspectors recognized a corrective action item documenting a fatigue failure of the engine-driven lubricating oil pump discharge piping on Diesel Generator 1.

These activities constitute completion of one in-depth problem identification and resolution sample as defined in Inspection Procedure 71152-05.

b. Findings

No findings of significance were identified.

.4 In-depth Review of Operator Workarounds

a. Inspection Scope

The inspectors performed a review of control room deficiencies to ensure that the licensee is identifying operator workaround problems at an appropriate threshold and entering them in the corrective action program, and has proposed or implemented appropriate corrective actions.

b. Findings

Introduction. The NRC identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," regarding the licensee's failure to follow procedural requirements for tracking operator work arounds, operator burdens or control room deficiencies. On January 14, 2009, during a review of control room deficiencies, the inspectors identified that many deficiencies tagged in the control room were not being tracked as required by Conduct of Operations Procedure 2.0.12, "Operator Challenges." This failure to maintain the database of current deficiencies in the plant prevents the licensee from

accurately monitoring the aggregate impact on the operators' ability to operate plant equipment.

Description. On January 14, 2009, during an in depth review of operator work arounds, the inspectors identified that many control room deficiencies were not recorded in the licensee's Control Room Deficiencies database. The inspector's sample of the Control Room front panels noted 16 items that were tagged on the control room front panels but not documented in the Control Room Deficiencies database.

Of these 16 items, three of four checked at random were found to be classified as Control Room Deficiencies by Conduct of Operations Procedure 2.0.12, "Operator Challenges," though not tracked by the database. These three included Tag 12776 for Service Water Booster Pump 'A' PMIS computer point erratic, Tag12817 and 12764 on Reactor Feed indicators, RF_PI_2A and RF-PI-2B, meter banding indicating normal operating parameters had not been updated following the Appendix K power up-rate. This resulted in normal plant indications outside of the green band used as an operator aid in monitoring normal plant operation. As a result of this sample the licensee performed an extensive audit resulting in finding many other work items that were not recorded in their database.

Conduct of Operations Procedure 2.0.12, "Operator Challenges," provides instructions in Attachment 2, "Operator Challenge Screen," that appropriate databases are to be updated to reflect classifications. These classifications include Operator Work Arounds, Operator Burdens, Additional Operator Tour Checks, and Control Room Deficiencies. This database of plant deficiencies is used to determine the Operations Aggregate Impact Index which is a calculation of current deficiencies in the plant that affect the operators' ability to operate plant equipment. This information is also used to determine the priority of resolving equipment issues that potentially challenge plant operations.

Following the inspectors' discovery that the Operations Aggregate Impact Index was under-reporting the challenge faced by operators, the licensee determined that several aspects of their program were not meeting expectations. First, the inspectors identified that no formal review was required to ensure that all identified control room deficiencies were being tracked in the database. In CR-CNS-2009-00527, the licensee addressed this shortcoming by adding a periodic audit to Operations Instruction 25, "Operations Routine Duties." Second, the inspectors identified that the normal screening process for operator challenges was not being done in a timely manner. Procedure 2.0.12 requires a daily screening of operator challenges be performed by work control personnel, but the screening meeting had not been reviewing all condition reports in a timely manner. The licensee documented this error in CR-CNS-2009-00526. As a result, the licensee provided the work control staff more detailed guidance for conducting the daily screening meetings.

As the licensee implemented these actions, the actual level of challenges faced by operators became apparent. At the time that the inspectors performed the review, the Reported Operations Online Aggregate Impact Index was being reported as 0.559 ("green" on the licensee's internal performance indicator). In the weeks following the inspectors observations, the newly established routine walkdowns and daily screening meetings resulted in many more operator challenges being added to the database. The indicator peaked at a value 1.858 approximately six weeks after the inspection ("red" on the licensee's indicator). As a result, the licensee increased the emphasis on correcting the deficiencies, including a daily discussion of every online control room deficiency during morning production meetings. The net result was that many operator challenges were corrected and the indicator returned to the "green" band.

Analysis. The performance deficiency associated with this finding involved the licensee's failure to properly control Operator Deficiencies as required by plant procedures. The finding is greater than minor because it is associated with the Mitigating Systems cornerstone attribute of equipment performance and affects the associated cornerstone objective to ensure the availability, reliability and capability of systems that respond to initiating events to prevent undesirable consequences (i.e. core damage). Using the Manual Chapter 0609, "Significance Determination Process," Phase 1 Worksheet, the finding is determined to have very low safety significance (Green) because it did not represent the loss of a safety function of a single train for greater than its TS allowed outage time. This finding has a cross-cutting aspect in the area of human performance in that the licensee did not ensure maintenance backlogs were low enough to support safety. Specifically, the licensee did not provide adequate resources for identifying and screening the backlog of control room deficiencies and the resultant aggregate impact to the plant operators' ability to operate plant equipment [H.2(a)].

Enforcement. Title 10 of the Code of Federal Regulations Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," requires, in part, that activities affecting quality shall be prescribed by documented procedures of a type appropriate to the circumstances and shall be accomplished in accordance with these procedures. Conduct of Operations Procedure 2.0.12, "Operator Challenges," Revision 8, provides instructions in Attachment 2, "Operator Challenge Screen," that appropriate databases have been updated to reflect classifications. Contrary to this requirement a January 14, 2009, walkdown of control room deficiencies found many control room deficiencies that were not recorded in the control room deficiencies database. Because the finding is of very low safety significance and has been entered into the licensee's corrective action program as Condition Report CR-CNS-2009-00527, this violation is being treated as a noncited violation consistent with Section VI.A.1 of the Enforcement Policy: NCV 05000298/2009002-04, "Failure to Implement Procedural Requirements for Tracking Control Room Deficiencies."

## 4OA3 Event Follow-up (71153)

.1 (Closed) Licensee Event Report 05000298/2008-002-00, Technical Specification Prohibited Condition Due to Safety Relief Valve Test Failure

a. Inspection Scope

The licensee initiated this licensee event report due to the failure of one of eight Target Rock safety relief valve pilot valve assemblies to pass surveillance testing on July 7, 2008. The valve lifted at 1165 psig, versus its Technical Specification required lift set point of 1100 +/- 33.0 psig. The licensee determined that the cause of this test failure was corrosion bonding and that the failure was similar in nature to that reported in previous licensee event reports 2007-002-00, 2005-002-00, and 2003-002-00. The licensee documented this event with CR-CNS-2008-05389. The inspectors reviewed all aspects of the event, including performance of control room staff, evaluation and mitigation of station risk, troubleshooting plans, performance of corrective maintenance, treatment in the corrective action program, evaluation of the root cause investigation and corrective actions to prevent recurrence. This review found that a violation of NRC requirements occurred in that the licensee did not initially submit this event report as required by 10 CFR 50.73. The enforcement aspects of this event are discussed in NRC Integrated Inspection Report 05000298/2008004. This licensee event report is closed.

b. Findings

No findings of significance were identified.

.2 (Closed) Licensee Event Report 05000298/2008-003-00, Control Room Envelope Door Found Open Results in Loss of Safety Function

a. Inspection Scope

The licensee initiated this licensee event report due to the inoperability of the Control Room Emergency Filtration System on November 30, 2008. The licensee documented this event with Condition Report CR-CNS-2008-08695. The inspectors reviewed all aspects of the event, including performance of control room staff, evaluation and mitigation of station risk, troubleshooting plans, performance of corrective maintenance, treatment in the corrective action program, evaluation of the root cause investigation and corrective actions to prevent recurrence. This review found that a violation of NRC requirements occurred as described below. This licensee event report is closed.

b. Findings

Introduction. A self-revealing noncited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," occurred regarding the licensee's failure to follow the requirements of Administrative Procedure 0.16, "Control of Doors," when Door H200, both a fire door and a control room emergency filter system boundary door, was found open. The door had been left ajar when a security officer passed through the door and failed to self-check that it closed behind him. A plant operator found the door open when passing through 29 minutes later. Failure of the door to close resulted in the inoperability of the control room emergency filter system.

Description. On November 30, 2008, the turbine building station operator observed that building Door H200 was partially open. He reported this to the control room. Additional observations by the turbine building station operator found that a piece of steel was protruding from the bottom of the door which prevented the door from fully closing. As a result, the control room emergency filtration system was declared inoperable.

Door H200 is located in the cable spreading room and is designated as a fire door and a control room envelope door. A security officer had passed though the door less than 29 minutes prior and failed to self-check that the door closed and latched behind him. Maintenance troubleshooting discovered the mechanical cause of the door not closing was two metal plates that had been inside the door had fallen though a gap in the bottom of the door, obstructing the door from closing. These metal plates were removed from the door and identified by the manufacturer as spot weld calibration test pieces that had been inadvertently left in the door during assembly prior to original plant construction. The root cause of the door being left unlatched was that the expectation to self-check door closure was not communicated and reinforced adequately to station personnel.

Administrative Procedure 0.16, "Control of Doors," Revision 37, has requirements that fire doors shall be closed upon personnel leaving the area and that personnel are responsible for complying with the procedure. The procedure also identifies the control room envelope doors as normally closed doors and if left open the control room emergency filter system shall be declared inoperable.

The inspectors reviewed the licensee's root cause report in Condition Report CR-CNS-2008-08695 and its corrective actions. The licensee determined that the root cause was that the expectation to self-check door closure was not communicated and reinforced. In addition to inspecting doors for degraded conditions, the licensee is implementing a management change plan to establish the expectation for self checking of door closure after passing through the doors into the site culture.

Analysis. The performance deficiency associated with this finding involved the licensee's failure to follow the requirements of Administrative Procedure 0.16, "Control of Doors," to maintain fire doors and control room envelope doors closed when Door H200 was found open. The finding was more than minor because it affected the configuration control attribute of the barrier integrity cornerstone to maintain radiological barrier functionality of the control room, and affected the cornerstone objective to ensure adequate protection of public health and safety from exposure to radioactive materials. This control room emergency filter system failure raised the possibility of control room personnel exceeding federal dose limits outlined in 10 CFR 50.67 or 10 CFR Part 50 Appendix A, General Design Criteria 19 if a release had occurred. Using Manual Chapter 0609.04, "Phase 1 - Initial Screening and Characterization of Findings," the finding is determined to have very low safety significance because it only represented a degradation of the radiological barrier function provided for the control room and no release or exposure occurred during the loss of the control room envelope. The cause of this finding was related to the human performance crosscutting component of work practices because licensee failed to adequately communicate human error prevention techniques such as self checking door closure when passing through [H.4(a)].

Enforcement. Title 10 of the Code of Federal Regulations Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," requires, in part, that activities affecting quality shall be prescribed by documented instructions or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions or drawings. On November 30, 2008, Door H200, a fire door and part of the control room emergency filter system boundary door was left open contrary to the requirements of Administrative Procedure 0.16, "Control of Doors." Because the finding is of very low safety significance and has been entered into the licensee's corrective action program as Condition Report CR-CNS-2008-08695, this violation is being treated as a noncited violation consistent with Section VI.A of the Enforcement Policy: NCV 05000298/2009002-05, "Control Room Envelope Door Left Open Results in Loss of Safety Function."

## 4OA5 Other Activities

.1 Quarterly Resident Inspector Observations of Security Personnel and Activities

a. Inspection Scope

During the inspection period, the inspectors performed observations of security force personnel and activities to ensure that the activities were consistent with Cooper Nuclear Station's security procedures and regulatory requirements relating to nuclear plant security. These observations took place during both normal and off-normal plant working hours.

These quarterly resident inspector observations of security force personnel and activities did not constitute any additional inspection samples. Rather, they were considered an integral part of the inspectors' normal plant status review and inspection activities.

b. Findings

No findings of significance were identified.

## 4OA6 Meetings

Exit Meeting Summary

On April 13, 2009, the inspectors presented the inspection results to Mr. B. O'Grady, and other members of the licensee staff. The licensee acknowledged the issues presented. The inspector asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

## SUPPLEMENTAL INFORMATION

### KEY POINTS OF CONTACT

Licensee Personnel

J. Austin, Manager, Emergency Preparedness
B. Beilke, Manager, Chemistry
M. Boyce, Manager, Projects
T. Carson, Manager, Maintenance
R. Estrada, Manager, Corrective Action and Assessments
J. Furr, Manager, Quality Assurance
A. Kleckinger, Construction Superintendent, Nuclear Projects
G. Kline, Director, Engineering
E. McCutchen, Senior Licensing Engineer
B. O'Grady, Site Vice President
D. Oshlo, Manager, Radiation Protection
R. Penfield, Manager, Operations
D. Sealock, Manager, Training
D. VanDerKamp, Manager, Licensing
D. Willis, Manager, Plant Operations
A. Zaremba, Director, Nuclear Safety Assurance

NRC Personnel

R. Franovich, Branch Chief, Performance Assessment Branch, NRR
D. Rudland, Senior Materials Engineer
J. Thompson, MSPI Program Lead, Performance Assessment Branch, NRR

### LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

| | | |
|---|---|---|
| 05000298/2009002-01 | NCV | Repeat Failure to Assess and Manage the Risk of Heavy Equipment Operations (Section 1R13) |
| 05000298/2009002-02 | NCV | Incompatible Materials Installed in Diesel Fuel Oil System (Section 1R18) |
| 05000298/2009002-03 | NCV | Procedure Violation Results in Exceeding Allowed Injection Pressure (Section 1R18) |
| 05000298/2009002-04 | NCV | Failure to Implement Procedural Requirements for Tracking Control Room Deficiencies (Section 4OA2) |
| 05000298/2009002-05 | NCV | Control Room Envelope Door Left Open Results in Loss of Safety Function (Section 40A3) |

Closed

| | | |
|---|---|---|
| 05000298/2008-002-00 | LER | Technical Specification Prohibited Condition Due to Safety Relief Valve Test Failure (Section 4OA3) |
| 05000298/2008-003-00 | LER | Control Room Envelope Door Found Open Results in Loss of Safety Function (Section 4OA3) |

## LIST OF DOCUMENTS REVIEWED

### 1R04: Equipment Alignments

CONDITION REPORTS

CR-CNS-2009-613

STANDARD OPERATING PROCEDURES

| | | |
|---|---|---|
| 2.2.67A | Reactor Core Isolation Cooling System Component Checklist | Revision 20 |
| 2.2A.CS.DIV | Core Spray Component Checklist (Div 1) | Revision 1 |
| 2.2A.CS.DIV2 | Core Spray Component Checklist (Div 1) | Revision 1 |

### 1R05: Fire Protection

MISCELLANEOUS

| | |
|---|---|
| Cooper Nuclear Station Fire SER | May 23, 1979 |
| Cooper Nuclear Station Fire Hazards | February 28, 2003 |
| CNS-FP-224CNS Fire Pre-plans | Revision 2 |
| Engineering Analysis 86-2, Vent Duct (Pipe) Through Cable Spreading Room Floor at 918' Elevation of Control Room | April 16, 1986 |

### 1R11: Licensed Operator Requalification Program

LESSONS

| | | |
|---|---|---|
| INT0080312 | Steam Leak in Steam Tunnel/Stuck Open Safety Valve/DW Spray Failure/Exceed PSP/EOP-3A, 2A, and 1A | Revision 2 |

### 1R12: Maintenance Effectiveness

CONDITION REPORTS

CR-CNS-2009-1037

WORK ORDERS

4682876

FUNCTIONAL FAILURE EVALUATION NOTIFICATIONS

| | |
|---|---|
| 10640421 | January 27, 2009 |
| 10547575 | October 9, 2007 |
| 10641284 | February 23, 2009 |

**1R13: Maintenance Risk Assessments and Emergent Work Control**

CONDITION REPORTS

| | | |
|---|---|---|
| CR-CNS-2008-08789 | CR-CNS-2009-00613 | CR-CNS-2009-00655 |
| CR-CNS-2009-00683 | CR-CNS-2009-00734 | CR-CNS-2009-01295 |

**1R15: Operability Evaluations**

CONDITION REPORTS

| | | |
|---|---|---|
| CR-CNS-2009-00323 | CR-CNS-2009-00467 | CR-CNS-2009-01279 |
| CR-CNS-2009-01281 | CR-CNS-2009-01282 | |

**1R18: Plant Modifications**

CONDITON REPORTS

| | |
|---|---|
| CR-CNS-2009-02237 | CR-CNS-2008-08017 |

WORK ORDERS

| | |
|---|---|
| 4600486 | 4686576 |

DRAWINGS

| | | |
|---|---|---|
| 3D16217 | Analog System/BWR Governor OPC & Civ. Status Outputs | Revision 1 |
| 3D16213 | Analog System/BWR Governor Ref. Voltages & Status Monitor | Revision 1 |
| 3D16212, | Analog System/BWR Governor OPC Protection Control | Revision 1 |
| 3257 Sheet 47 | Cooper Nuclear Station local Racks & Panels Connection Wiring Diagram | Revision N23 |
| 3761 Sheet 1 | Cooper Nuclear Station Annunciator Loop Diagram ANN-MUX-11 | Revision N05 |
| 3255 Sheet 56B | Cooper Nuclear Station Control Room-Control Panels Connection Wiring Diagram | Revision N08 |

PROCEDURES

| | | |
|---|---|---|
| Administrative Procedure 0.8 | 10CFR50.59 Reviews | Revision 17 |
| Alarm Procedure 2.3_B-1 | Panel B – Annunciator B-1 | Revision 25 |
| General Operating Procedure 2.1.1 | Startup Procedure | Revision 149 |
| General Operating Procedure 2.1.4 | Normal Shutdown | Revision 119 |
| General Operating Procedure 2.1.5 | Reactor Scram | Revision 58 |
| General Operating Procedure 2.1.9 | Low Power Operation for Maintenance Activities (Hot Standby Conditions | Revision 52 |
| IAC Procedure 14.17.13DG-1 | Fuel Oil Transfer Pump Flowmeter Replacement | Revision 4 |
| Standard Operating Procedure 2.2.77 | Turbine Generator | Revision 92 |
| System Operating Procedure 2.2.77A | Turbine Generator System Component Checklist | Revision 6 |

TEMPORARY CONFIGURATION CHANGES

| | | |
|---|---|---|
| 4686707 | Leak Repair of RF-V-747 | March 7, 2009 |
| 4686902 | White Paper | |
| 4686902 | DEH Bypass Valve Solenoid Bypass Jumper | March 8,2009 |

MISCELLANEOUS

| | | |
|---|---|---|
| Design Change 89-107 | Diesel Generator Day Tank Flow Meter | March 6, 1990 |
| Purchase Order 4500085599 | | |
| Work Order 4686758 | Implement temporary configuration change for DEH Jumper | March 9, 2009 |

**1R19 Postmaintenance Testing (71111.19)**

WORK ORDERS

WO 4617971
WO 4618971
WO 4686186
WO 4686332

DRAWINGS

| | | |
|---|---|---|
| Drawing SKF-DG-305 | Cooper Nuclear Station Diesel Generator Voltage Regulator & Field Circuit Breaker | Revision 3 |

MISCELLANEOUS

| | | |
|---|---|---|
| Part Evaluation TE-10582187 | Emergency Diesel Generator Voltage Regulator MOP Replacement | Revision 0 |

Surveillance Procedure 6.1DG.101,"Diesel Generator 31," March 5, 2009

**1R20: Refueling and Other Outage Activities**

CONDITION REPORTS

| | | |
|---|---|---|
| CR-CNS-2009-01765 | CR-CNS-2009-01861 | CR-CNS-2009-01914 |
| CR-CNS-2009-01778 | CR-CNS-2009-01862 | |
| CR-CNS-2009-01840 | CR-CNS-2009-01871 | |

PROCEDURES

| | | |
|---|---|---|
| Administrative Procedure 0.3 | Station Operations Review Committee | Revision 37 |
| Conduct of Operations Procedure 2.0.6 | Operational Event Response and Review | Revision 30 |

MISCELLANEOUS

| | |
|---|---|
| Event Report for Manual Scram, Schedule Maintenance Outage 09-01 | March 8, 2009 |
| Station Operations Review Committee Agenda | March 8, 2009 |

DRAWINGS

Jelco Incorporated Drawing 2841-2, Revision 4

**1R22 Surveillance Testing**

WORK ORDERS

WO-4602901

SURVEILLANCE PROCEDURES

| | | |
|---|---|---|
| 6.DG.604 | Diesel Fuel Oil Storage Tank, Bunker A & B, Quality test | Revision15 |
| 6.1DG.101 | Diesel Generator 31 Day Operability Test (IST) Div 1 | Revision 59 |
| 6.2SW.101 | Service Water Surveillance Operation (Div 2) (IST) | Revision 30 |

**1EP6: Drill Evaluation**

PROCEDURES

| | | |
|---|---|---|
| EPIP Procedure 5.7.6 | Notification | Revision 48 |
| Emergency Procedure 5.1 | Quake | Revision 8 |
| EPIP Procedure 5.7.1 | Emergency Classification | Revision 38 |

MISCELLANEOUS

| | |
|---|---|
| SKL054-01-04 | Scenario Modification Overview |