UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
2443 WARRENVILLE ROAD, SUITE 210
LISLE, IL 60532-4352

April 22, 2013

Mr. Raymond Lieb
Site Vice President
FirstEnergy Nuclear Generation, LLC
Davis-Besse Nuclear Power Station
5501 North State Route 2
Oak Harbor, OH 43449-9760

SUBJECT: DAVIS-BESSE NUCLEAR POWER STATION INTEGRATED INSPECTION REPORT 05000346/2013002

Dear Mr. Lieb:

On March 31, 2013, the U.S. Nuclear Regulatory Commission (NRC) completed an integrated inspection at your Davis-Besse Nuclear Power Station. The enclosed report documents the results of this inspection, which were discussed on April 9, 2013, with you and other members of your staff.

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

Based on the results of this inspection, one NRC-identified finding and one self-revealed finding of very low safety significance were identified. One of the findings also involved a violation of NRC requirements. Additionally, two licensee-identified violations are listed in Section 4OA7 of this report. However, because of the very low safety significance, and because the violations were entered into your corrective action program, the NRC is treating these violations as non-cited violations (NCVs) in accordance with Section 2.3.2 of the NRC Enforcement Policy.

If you contest the subject or severity of any of these NCVs, 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, DC 20555-0001, with a copy to the Regional Administrator, U.S. Nuclear Regulatory Commission - Region III, 2443 Warrenville Road, Suite 210, Lisle, IL 60532-4352; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspectors' Office at the Davis-Besse Nuclear Power Station. In addition, if you disagree with the cross-cutting aspect assigned to 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 III, and the NRC Resident Inspectors' Office at the Davis-Besse Nuclear Power Station.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records System (PARS) component of NRC's Agencywide Documents Access and Management System (ADAMS), accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

/RA/

Jamnes L. Cameron, Chief
Branch 6
Division of Reactor Projects

Docket No. 50-346
License No. NPF-3

Enclosure: Inspection Report 05000346/2013002
w/Attachment: Supplemental Information

cc w/encl: Distribution via ListServ

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket No:	50-346
License No:	NPF-3
Report No:	05000346/2013002
Licensee:	FirstEnergy Nuclear Generation, LLC
Facility:	Davis-Besse Nuclear Power Station
Location:	Oak Harbor, OH
Dates:	January 1, 2013, through March 31, 2013
Inspectors:	D. Kimble, Senior Resident Inspector T. Briley, Resident Inspector A. Wilson, Resident Inspector S. Bell, Health Physicist R. Langstaff, Senior Engineering Inspector D. Reeser, Senior Operations Licensing Examiner E. Sanchez Santiago, Engineering Inspector R. Winter, Engineering Inspector
Approved by:	Jamnes L. Cameron, Chief Branch 6 Division of Reactor Projects

Enclosure

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SUMMARY OF FINDINGS

Inspection Report (IR) 05000346/2013002; 1/1/2013-3/31/2013; Davis-Besse Nuclear Power Station; Flooding; and Maintenance Risk Assessments and Emergent Work Control.

This report covers a 3-month period of inspection by resident inspectors and announced inspections by regional inspectors. Two Green findings were identified. One finding was also considered a non-cited violation (NCV) of NRC regulations. The significance of inspection findings are indicated by their color (i.e., greater than Green, or Green, White, Yellow, Red) and determined using NRC Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" dated June 2, 2011. Cross-cutting aspects are determined using IMC 0310, "Components Within the Cross Cutting Areas," dated October 28, 2011. All violations of NRC requirements are dispositioned in accordance with the NRC's Enforcement Policy dated January 28, 2013. 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 and Self-Revealed Findings

Cornerstone: Mitigating Systems

- Green. The inspectors identified a finding of very low safety significance for the licensee's failure to maintain normally energized medium voltage cables BPGD302C, C1, D, and D1 in an environment consistent with the cable design. The cables, which are output cables for the station blackout diesel generator (SBODG), were not designed for long-term water submergence, and were in an electrical manhole that was flooded for a period of several months, perhaps as long as a year or more. Continuous water submergence of energized medium voltage cables not designed for water submergence can accelerate deterioration of such cables and potentially affect the ability of the cables to withstand electrical transients. The licensee's procedures and programs for medium voltage cables did recognize the issue and provided a sump pump to address water intrusion into the electrical manhole, but did not provide for any preventative maintenance (PM) or operational checks of the sump pump to ensure its capability to meet its intended function. In response to the finding the licensee increased the frequency of monitoring for water in the manhole. No violation of NRC requirements was identified.

  The finding was determined to be more than minor because the finding was associated with the Mitigating Systems Cornerstone attribute of equipment performance and affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the SBODG was to provide electrical power to emergency core cooling systems in the event of a loss of all alternating current power. The inspectors determined that the finding was of very low safety significance because it was not a deficiency affecting the design or qualification of the SBODG and there was no loss of any system or function due to the flooded conditions of the cables. The finding was determined to have a cross-cutting aspect in the area of Human Performance, Work Control Component, because the licensee failed to appropriately coordinate the impact of changes to the work scope or activity on the plant. Specifically, although the licensee's intent was to address potential water submergence of energized medium voltage risk-significant cables to reduce the risk of early cable failure through the

installation of a permanent sump pump, the licensee failed to schedule and coordinate the appropriate PM for the pump when it was installed. (H.3(b)) (Section 1R06.2)

Cornerstone: Barrier Integrity

- Green. A self-revealed finding of very low safety significance and associated NCV of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, Drawings," were identified for the licensee's failure to properly implement the procedure for the Hydrogen Dilution System Train 1 quarterly surveillance test. Specifically, a non-licensed operator inadvertently repositioned the incorrect motor-operated valve (MOV) and caused an unplanned entry into Technical Specifications (TS) Limiting Condition for Operation (LCO) 3.6.3, Condition A, for an inoperable component cooling water (CCW) containment isolation valve (CIV). Upon identification, the valve was tested and returned to operable status within the TS allowable time.

  The finding was determined to be more than minor because, if left uncorrected, the failure to follow plant procedures and the mispositioning of plant equipment would have the potential to lead to a more significant safety concern. This finding was associated with the Barrier Integrity Cornerstone because a CIV forms part of the containment pressure boundary that provides reasonable assurance that the physical design barriers protect the public from radionuclide releases caused by accident or events. The inspectors evaluated the finding using IMC 0609, Appendix A, "The Significance Determination Process for Findings At-Power." The inspectors used Exhibit 3 – "Barrier Integrity Screening Questions" for the reactor containment. The finding screened as very low safety significance (Green) because there was no actual open pathway in the physical integrity of reactor containment, containment isolation system, or heat removal components; and there was no impact on the hydrogen control function in containment. This finding had a cross-cutting aspect in the area of Human Performance, Work Practices Component, because personnel failed to use human error prevention techniques to ensure that work was performed safely. (H.4(a)) (Section 1R13.1)

B. Licensee-Identified Violations

Violations of very low safety significance that were identified by the licensee have been reviewed by inspectors. Corrective actions planned or taken by the licensee have been entered into the licensee's corrective action program (CAP). These violations and corrective action tracking numbers are listed in Section 4OA7 of this report.

REPORT DETAILS

Summary of Plant Status

The unit began the inspection period operating at full power and, with the exception of several small power maneuvers (e.g., reductions of 10 percent power or less) to facilitate planned testing evolutions, remained operating at or near full power for the entire inspection period.

1. REACTOR SAFETY

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

1R04 Equipment Alignment (71111.04)

.1 Quarterly Partial System Alignment Verifications

a. Inspection Scope

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

- Auxiliary Feedwater (AFW) Train 2 when Train 1 was unavailable for testing and maintenance during the week ending January 12, 2013;
- Decay Heat (DH) Train 2 when Train 1 was unavailable for testing and maintenance during the week ending January 19, 2013;
- AFW Train 1 when Train 2 was unavailable for testing and maintenance during the week ending February 2, 2013; and
- The Station Blackout Diesel Generator (SBODG) with Emergency Diesel Generator (EDG) No. 1 out-of-service for a planned maintenance work window during the week ending March 9, 2013.

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 impact the function of the system and, therefore, potentially increase risk. The inspectors reviewed applicable operating procedures, system diagrams, Updated Safety Analysis Report (USAR), Technical Specification (TS) requirements, outstanding work orders (WOs), condition reports (CRs), 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 (CAP) with the appropriate significance characterization. Documents reviewed are listed in the Attachment to this report.

These activities constituted four quarterly partial system alignment verification inspection samples as defined in Inspection Procedure (IP) 71111.04-05.

b. Findings

No findings were identified.

.2 Semi-Annual Complete System Alignment Verification

a. Inspection Scope

During the period of February 18 through March 15, 2013, the inspectors performed a complete system alignment inspection of the component cooling water (CCW) system to verify the functional capability of the system. This system was selected 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 lineups; 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. A review of a sample of past and outstanding WOs was performed to determine whether any deficiencies significantly affected the system function. In addition, the inspectors reviewed the licensee's CAP database to ensure that system equipment alignment problems were being identified and appropriately resolved. Documents reviewed are listed in the Attachment to this report.

These activities constituted a single annual complete system alignment verification inspection sample as defined in IP 71111.04-05.

b. Findings

No findings were identified.

1R05 Fire Protection (71111.05)

.1 Quarterly Fire Protection Zone Inspections

a. Inspection Scope

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

- No. 1 and No. 2 Main Steam Line Rooms (Rooms 601 and 602; Fire Area DH);
- Condenser Pit, Heater Drains Valve Room, Lube Oil Storage Tank Room, and Condensate Pump Pit (Rooms 246, 247, 249, 252, and 253, Fire Area II);
- Control Room (Rooms 502 and 505; Fire Area FF); and
- Makeup Pump Room and Auxiliary Building 565' Elevation Passage (Rooms 225 and 227; Fire Areas AB and G).

The inspectors reviewed areas to assess if the licensee 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 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 (IPEEE) with later additional insights, their potential to impact equipment which could initiate or mitigate a plant transient, or their impact on the plant's ability to respond to a security event. 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 CAP. Documents reviewed are listed in the Attachment to this report.

These activities constituted four quarterly fire protection zone inspection tour samples as defined in IP 71111.05-05.

b. Findings

No findings were identified.

.2 Annual Fire Protection Drill Observation

a. Inspection Scope

On March 12, 2013, the inspectors observed the licensee's fire brigade respond to a simulated fire in the CCW pump room. Based on their observations, the inspectors evaluated the readiness of the plant fire brigade to fight fires. The inspectors verified that the licensee staff identified deficiencies; openly discussed them in a self-critical manner during the drill debrief, and took appropriate corrective actions. Specific attributes evaluated were:

- The proper wearing of turnout gear and self-contained breathing apparatus (SCBA);
- The proper use and layout of fire hoses;
- The employment of appropriate fire fighting techniques;
- That sufficient firefighting equipment was brought to the scene;
- The effectiveness of fire brigade leader communications, command, and control;
- The search for victims and propagation of the fire into other plant areas;
- Smoke removal operations;
- The utilization of pre-planned strategies;
- The adherence to the pre-planned drill scenario; and
- The satisfactory completion of the drill objectives.

Documents reviewed are listed in the Attachment to this report.

These activities constituted a single annual fire protection drill inspection sample as defined in IP 71111.05-05.

b. Findings

No findings were identified.

1R06 Flooding (71111.06)

.1 Internal Flooding

a. Inspection Scope

During the period of February 25 – March 8, 2013, the inspectors conducted an internal flooding review for the main turbine building, with specific emphasis on the follow-up of a degraded condition the licensee had identified on the Loop No. 2 high pressure condenser outlet expansion joint. The inspectors reviewed flood analyses and design documents, including the USAR, engineering calculations, and abnormal operating procedures to identify licensee commitments. In addition, the inspectors reviewed licensee drawings to identify areas and equipment that may be affected by internal flooding caused by the failure or misalignment of nearby sources of water, such as the fire suppression or the circulating water systems. The inspectors also reviewed the licensee's corrective action documents with respect to past flood-related items identified in the CAP to verify the adequacy of the corrective actions. The inspectors performed a walkdown of the east and west main condenser pit areas to assess the adequacy of watertight boundaries/barriers and verify drains and sumps were clear of debris and were operable, and that the licensee had complied with applicable commitments. In addition, the inspectors visually inspected the degraded condition previously identified by the licensee on the Loop No. 2 high pressure condenser outlet expansion joint to verify that it was minor in nature and did not represent a significant increased risk for internal flooding from the circulating water system. Specific documents reviewed during this inspection are listed in the Attachment to this report.

The inspectors' review constituted a single internal flooding inspection sample as defined in IP 71111.06-05.

b. Findings

No findings were identified.

.2 Underground Bunkers/Manholes

a. Inspection Scope

During the period of January 7 – March 15, 2013, the inspectors conducted a review of underground bunkers/manholes subject to flooding that contained electrical cables. The inspectors' reviews included the following underground bunkers/manholes subject to flooding:

- Electrical Manhole 3040;
- Electrical Manhole 3044;
- Electrical Manhole 3045; and
- Electrical Manhole 3046.

The inspectors checked for submerged cables, that splices were intact, and that appropriate cable support structures were in place. In those areas where dewatering devices were used, such as sump pumps, the inspectors verified that the devices were functional and that any level alarm circuits were set appropriately to ensure that the

cables would not be submerged. In those areas without dewatering devices, the inspectors verified that drainage of the area was available, or that the cables were qualified for submergence conditions. The inspectors also reviewed the licensee's corrective action documents with respect to past submerged cable issues to verify the adequacy of the corrective actions. Specific documents reviewed during this inspection are listed in the Attachment to this report.

The inspectors' reviews of these underground bunkers/manholes constituted a single inspection sample as defined in IP 71111.06-05.

b. Findings

Failure to Maintain Station Blackout Diesel Generator Output Cables in an Environment Consistent with Design

Introduction

A finding of very low safety significance (Green) was identified by the inspectors for the licensee's failure to maintain normally energized medium voltage cables BPGD302C, C1, D, and D1 in an environment consistent with the cable design. Specifically, the cables, which were not designed for long-term water submergence, were in an electrical manhole that the inspectors had determined had been continuously flooded for several months.

Industry experience has shown that normally energized medium voltage cables, not designed for continuous water submergence, can experience accelerated deterioration in a water submerged state. The licensee's procedures and program for medium voltage cables had recognized the issue, and the licensee had installed a sump pump in electrical manhole MH3045 in April of 2011 to address the issue. However, due to a series of licensee errors within their preventative maintenance (PM) programs, the sump pump and electrical manhole went without inspection for a period of over 20 months, and the cables became completely submerged for an extended period when the sump pump failed at some point during this period. No violation of NRC requirements was identified.

Description

On January 11, 2013, the inspectors observed that electrical manholes MH3044, MH3045, and MH3046 were significantly flooded (to within approximately 3 to 4 feet of the top of each vault) when each was opened for a routine periodic maintenance inspection. The cables in each electrical manhole were completely submerged by several feet of water. The inspectors had previously determined that none of the manholes contained any safety-related medium voltage cables, but that electrical manhole MH3045 did contain medium voltage cables that were normally energized for delivering the 4160 Volts Alternating Current (Vac) output of the SBODG to Station Bus D2. Further, the inspectors also had previously established that electrical manhole MH3045 communicated via underground conduits with electrical manholes MH3044 and MH3046 by design, and that the sump pump installed in electrical manhole MH3045 was intended to remove water from all three electrical manholes. From January 11, 2013, to January 29, 2013, during a period of moderate rainfall and snow melt, the licensee measured the rise of water level accumulation in electrical manhole MH3045 to be approximately 2 inches. Based on this information and the considerable total volume of water that had accumulated in electrical manholes MH3044, MH 3045, and MH3046 by

the time of the inspectors' observation on January 11, 2013, the inspectors concluded that the installed sump pump in electrical manhole MH3045 had been nonoperational for several months, perhaps longer than a year.

Electrical manholes MH3044, MH3045, and MH 3046 were originally not provided with sump pump capability. On November 5, 2009, NRC inspectors observed that electrical manhole MH3045 was significantly flooded and issued a finding for the licensee's failure to maintain the SBODG output cables in an environment consistent with their design (FIN 05000346/2010002-01; ADAMS Accession No. ML101170741). As part of the response to this issue, the licensee installed a temporary sump pump in electrical manhole MH3045, and eventually performed a permanent modification to the facility to install a permanent sump pump (DB-P190) in April of 2011. While the temporary sump pump was installed, the licensee had been verifying its function on a quarterly basis via their PM program. However, when the permanent sump pump (DB-P190) was installed in April of 2011, the licensee failed to create any PM tasks for the new component, despite the fact that both the licensee's permanent modification package (ECP10-0299) and the pump's vendor manual (M-077-00102-02 for P190) both called for the establishment of regular PM on the component. Around the same time, during the period from May to June of 2011, the licensee made several changes to their PM programmatic inspections of the electrical manholes, some meant to comply with the licensee's license renewal aging management program. During these changes the periodic inspection frequency for the manholes was altered, such that no inspections were performed on electrical manholes MH3044, MH3045, and MH 3046 from the time DB-P190 was installed on April 15, 2011, until the inspectors observed that the manholes were significantly flooded on January 11, 2013.

The SBODG and its associated output cables were designated as "Augmented Quality" components by the licensee. "Augmented Quality" components were to have applied all nuclear quality assurance (QA) program requirements except as specifically exempted. Under the NRC's Maintenance Rule, the SBODG and its associated support systems were classified as risk significant and whose failure could prevent safety-related systems, structures, and components (SSCs) from fulfilling their safety-related functions. In NORM-ER-3112, "Cable Monitoring," dated January 18, 2012, the licensee noted that plant sites are implementing engineering programs to ensure the proper function of the electrical manholes, including those with cabling addressed by the Maintenance Rule. The document continued that "any leakage of groundwater or rainwater has been addressed to prevent the accumulation of water in the manhole by effectively pumping the water out of it via the installation of sump pumps."

The inspectors noted that the cables for the output of the SBODG were in the station's medium voltage wetted cable replacement program, and that the existing cables were installed in 1991. Manufacturer certification records indicated that the cables were manufactured before 1982 by Okonite with Okoguard (ethylene-propylene rubber) insulation with an Okolon (vulcanized chlorosulfonated polyethylene) jacket. Licensee documents indicated that the cables were intended for potentially wet environments but were not designed as water-submerged cables. Industry experience has yielded that cables of this construction have shown susceptibility to accelerated deterioration when energized in a water-submerged environment. The inspectors' visual observation of the cables in the electrical manholes on January 11, 2013, did not yield any evidence that would call into question present cable operability. A review of licensee records by the inspectors indicated that the cables were last tested to detect cable damage pointing to

a shortened life expectancy using a method known as Tan-Delta testing (an Alternating Current (ac) dielectric test of insulation that measures the ratio of resistive leakage current to the capacitive current across the insulation) on November 30, 2011, and that results showed that the cables were in good condition at that time.

The licensee entered the issue in their CAP as CR 2013-00468. Planned corrective actions included, but were not limited to: 1) repair or replacement of the permanent sump pump (DB-P190); 2) installation of inspection ports on the electrical manhole covers to facilitate more frequent visual inspections; and 3) establishment of appropriate PM for the permanent sump pump (DB-P190).

Analysis

The inspectors determined that the licensee's failure to establish and implement appropriate PM activities to ensure the functionality of the electrical manhole MH3045 permanent sump pump (DB-P190) was contrary to licensee's stated intent in NORM-ER-3112 of addressing water accumulation in electrical manholes via the installation of sump pumps, and constituted a licensee performance deficiency.

The finding was determined to be more than minor significance because the finding was associated with the Mitigating Systems Cornerstone attribute of equipment performance and affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the SBODG was installed to provide an additional source of electrical power to emergency systems in the event of a loss of all alternating current power. Water submergence of energized medium voltage cables, not specifically designed and intended for water submergence, can accelerate deterioration of such cables, potentially having an adverse effect on their reliability.

The inspectors determined the finding could be evaluated using the Significance Determination Process (SDP) in accordance with IMC 0609, "Significance Determination Process," Attachment 0609.04, "Initial Characterization of Findings," and Appendix A, "The SDP for Findings At-Power," since the SBODG was designed to provide alternate emergency power for mitigating systems. The inspectors determined that the finding was of very low safety significance (Green) because:

- It was not a deficiency affecting the design or qualification of the SBODG;
- It did not represent a loss of system or function;
- It did not represent the loss of function for any TS system, train, or component beyond the allowed TS outage time; and
- It did not represent an actual loss of function of any non-TS trains of equipment designated as high safety-significant in accordance with the licensee's maintenance rule program.

This finding was determined to have a cross-cutting aspect in the area of Human Performance, Work Control Component, because the licensee failed to appropriately coordinate the impact of changes to the work scope or activity on the plant. Specifically, although the licensee's intent was to address potential water submergence of energized medium voltage risk-significant cables to reduce the risk of early cable failure through the installation of a permanent sump pump in electrical manhole MH3045, the licensee

failed to schedule and coordinate the appropriate PM for the pump when it was installed. (H.3(b))

Enforcement

Although the SBODG and its associated components are considered to be "Augmented Quality," they do not fall under the scope of the requirements set forth in 10 CFR Part 50, Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants." As a result, this finding does not involve any violations of regulatory requirements. (FIN 05000346/2013002-01)

1R07 Annual Heat Sink Performance (71111.07)

.1 Heat Sink Performance

a. Inspection Scope

The inspectors reviewed the licensee's testing of control room emergency temperature control system heat exchangers to verify that potential deficiencies did not mask the licensee's ability to detect degraded performance, to identify any common cause issues that had the potential to increase risk, and to ensure that the licensee was adequately addressing problems that could result in initiating events that would cause an increase in risk. The inspectors reviewed the licensee's observations as compared against acceptance criteria, the correlation of scheduled testing and the frequency of testing, and the impact of instrument inaccuracies on test results. Inspectors also verified that test acceptance criteria considered differences between test conditions, design conditions, and testing conditions. Documents reviewed for this inspection are listed in the Attachment to this document.

This annual heat sink performance inspection constituted one sample as defined in IP 71111.07-05.

b. Findings

No findings were identified.

1R11 Licensed Operator Requalification Program (71111.11)

.1 Resident Inspector Quarterly Review of Licensed Operator Simulator Training

a. Inspection Scope

On February 5, 2013, the inspectors observed a crew of licensed operators in the plant's simulator during a periodic graded simulator scenario. The inspectors verified that operator performance was adequate, evaluators were identifying and documenting crew performance problems, and that training was being conducted in accordance with licensee procedures. In addition, the inspectors verified that the licensee's personnel were observing NRC examination security protocols to ensure that the integrity of the graded scenario was being protected from being compromised. The inspectors evaluated the following areas:

- Licensed operator performance;
- The clarity and formality of communications;
- The ability of the crew to take timely and conservative actions;
- The crew's prioritization, interpretation, and verification of annunciator alarms;
- The correct use and implementation of abnormal and emergency procedures by the crew;
- Control board manipulations;
- The oversight and direction provided by licensed senior reactor operators (SROs); and
- The ability of the crew to identify and implement appropriate TS actions and Emergency Plan actions and notifications.

The crew's performance in these areas was compared to pre-established operator action expectations and successful critical task completion requirements. Documents reviewed are listed in the Attachment to this report.

These observations and activities by the inspectors constituted a single quarterly licensed operator requalification program simulator training inspection sample as defined in IP 71111.11-05.

b. Findings

No findings were identified.

.2 Resident Inspector Quarterly Observation of Control Room Activities

a. Inspection Scope

During the course of the inspection period, the inspectors performed numerous observations of licensed operator performance in the plant's control room to verify that operator performance was adequate and that plant evolutions were being conducted in accordance with approved plant procedures. Specific activities observed that involved a heightened tempo of activities or periods of elevated risk included, but were not limited to:

- Steam and Feedwater Rupture Control System (SFRCS) periodic testing during the week ending January 5, 2013;
- Operations response to frazil ice conditions at the lake intake crib during the week ending January 5, 2013;
- Reactor Trip Breaker 'D' testing and associated power maneuvers during the week ending January 19, 2013;
- Breaker manipulations and electrical switchgear alignment operations during the week ending January 19, 2013;
- Reactor Trip Breaker 'B' testing and associated power maneuvers during the week ending February 9, 2013; and
- Reactor Trip Breaker 'C' replacement, testing, and associated power maneuvers during the week ending March 2, 2013.

The inspectors evaluated the following areas during the course of the control room observations:

- Licensed operator performance;
- The clarity and formality of communications;
- The ability of the crew to take timely and conservative actions;
- The crew's prioritization, interpretation, and verification of annunciator alarms;
- The correct use and implementation of normal operating, annunciator alarm response, and abnormal operating procedures by the crew;
- Control board manipulations;
- The oversight and direction provided by on-watch SROs and plant management personnel; and
- The ability of the crew to identify and implement appropriate TS actions and notifications.

The crew's performance in these areas was compared to pre-established operator action expectations and successful critical task completion requirements. Documents reviewed are listed in the Attachment to this report.

These observation activities by the inspectors of operator performance in the station's control room constituted a single quarterly inspection sample as defined in IP 71111.11-05.

b. Findings

No findings were identified.

.3 Biennial Review

a. Inspection Scope

During the week of March 11, 2013, the inspectors completed activities associated with the problem identification and resolution (PI&R) element of the biennial review of the Licensed Operator Requalification Program; (10 CFR 55.59(c); SAT Element 5, as defined in 10 CFR 55.4). The inspectors completed the assessment, which had begun during the biennial review conducted during the week of November 26, 2012. (Reference NRC Inspection Report No. 05000346/2012005; ADAMS Accession No. ML13025A126)

The inspectors reviewed the apparent cause evaluation and corrective action documentation associated with CR 2012-16833, "After Placing Rod Control Panel Into Manual an Unexpected Power Rise Was Observed by the ATC RO," to assess the licensee's ability to identify, evaluate, and resolve problems associated with licensed operator performance (a measure of the effectiveness of the Licensed Operator Requalification Program and their ability to implement appropriate corrective actions to maintain the Licensed Operator Requalification Program up to date). The documents reviewed are listed in the Attachment to this report.

The inspectors' reviews, coupled with the inspections conducted during the week of November 26, 2012, completes one biennial Licensed Operator Requalification Program inspection sample as defined in IP 71111.11-05.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12)

.1 Routine Quarterly Evaluations

a. Inspection Scope

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

- 125/250V Direct Current (DC) System; and
- Station and Instrument Air System.

The inspectors reviewed events such as where ineffective equipment maintenance had resulted or could have 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) of the maintenance rule;
- Characterizing system reliability issues for performance;
- Charging unavailability for performance;
- Trending key parameters for condition monitoring;
- Ensuring 10 CFR 50.65(a)(1) or (a)(2) classification or re-classification; and
- Verifying appropriate performance criteria for systems, structures and components (SSCs)/functions classified as (a)(2), or appropriate and adequate goals and corrective actions for systems classified as (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 CAP with the appropriate significance characterization. Documents reviewed are listed in the Attachment to this report.

The inspectors' reviews constituted two quarterly maintenance effectiveness inspection samples as defined in IP 71111.12-05.

b. Findings

No findings were identified.

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

.1 Maintenance Risk Assessments and Emergent Work Control

a. Inspection Scope

The inspectors reviewed the licensee'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:

- Planned activities during the week ending February 2, 2013, associated with an AFW Train 2 maintenance outage that included modifications to the AFW lube oil cooling water system;
- Emergent activities during the week ending February 2, 2013, associated with troubleshooting low service water (SW) flow conditions on Emergency Core Cooling System (ECCS) Room Cooler No. 1;
- Emergent activities during the week ending February 9, 2013, after a non-licensed operator inadvertently repositioned a containment isolation valve (CIV) CC-1567B, the CCW to control rod drive (CRD) cooler isolation valve; and
- Planned activities during the week ending February 2, 2013, associated with removing the Lemoyne 345 kV transmission line from service.

These activities were selected based on their potential risk significance relative to the Reactor Safety Cornerstones. As applicable for each activity, the inspectors verified that risk assessments were performed as required by 10 CFR 50.65(a)(4) and were accurate and complete. When emergent work was performed, the inspectors verified that the plant risk was promptly reassessed and managed. 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 TS requirements and walked down 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 to this report.

The inspectors' reviews of these maintenance risk assessments and emergent work control activities constituted four inspection samples as defined in IP 71111.13-05.

b. Findings

Containment Isolation Valve Rendered Inoperable by "Wrong Component" Operator Error

Introduction

A self-revealed finding of very low safety significance (Green) and associated non-cited violation (NCV) of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, Drawings," were identified for the licensee's failure to properly implement the procedure for the Hydrogen Dilution System Train 1 quarterly surveillance test. Specifically, a non-licensed operator inadvertently repositioned the incorrect motor-operated valve

(MOV) and caused an unplanned entry into TS Limiting Condition for Operation (LCO) 3.6.3, Condition A, for an inoperable CCW CIV.

Description

On February 8, 2013, during performance of the Hydrogen Dilution System Train 1 quarterly test, an equipment operator inadvertently declutched and closed the normally open CCW to CRD cooler CIV. The MOV was throttled to a position that reduced CCW flow to the CRD stators and resulted in an automatic start of the standby CRD booster pump. CRD stator temperatures increased by 6 degrees Fahrenheit (F) to approximately 105 F. If CRD stator temperature would have approached 180 F, a manual reactor trip would have been required by procedure.

Operators in the control room entered the abnormal operating system procedure for CCW malfunctions and subsequently entered TS LCO 3.6.3, Condition A, for an inoperable CIV at 9:20 p.m. following receipt of control room annunciators and notification from the equipment operator at the valve. TS LCO 3.6.3, Condition A, required the licensee to restore to operable status or isolate the affected valve within four hours. The operating crew performed actions to restore the CIV to operable status by re-engaging the clutch mechanism and subsequent valve stroke testing. LCO 3.6.3, Condition A, was exited at 10:43 p.m. when the CIV was returned to operable status.

The Hydrogen Dilution System Train 1 quarterly test procedure directed the equipment operator to throttle closed the Hydrogen Dilution System Train 1 CIV, which is located on a catwalk approximately six feet above the ground. The equipment operator correctly identified the valve listed in the procedure from the ground level. The equipment operator then put away the procedure to climb up a ladder to the catwalk where several MOVs that look similar are co-located. Once on the catwalk, the equipment operator failed to utilize several available human performance tools to verify the location of the valve listed in the procedure. The equipment operator then proceeded to throttle closed an incorrect CCW valve that was not associated with the procedure. The equipment operator heard water flow sounds after throttling the incorrect valve (as opposed to expected air sounds) and subsequently restored the valve to its original position.

Analysis

The inspectors reviewed this finding using the guidance contained in Appendix B, “Issue Screening,” of IMC 0612, “Power Reactor Inspection Reports.” The inspectors determined that the licensee’s failure to properly implement the procedure for the Hydrogen Dilution System Train 1 quarterly surveillance test was a performance deficiency that was reasonably within the licensee’s ability to foresee and correct and should have been prevented. This finding was associated with the Barrier Integrity Cornerstone because a CIV forms part of the containment pressure boundary that provides reasonable assurance that the physical design barriers protect the public from radionuclide releases caused by accident or events. The inspectors determined that this finding was of more than minor significance because, if left uncorrected, the failure to follow plant procedures and the mispositioning of plant equipment would have the potential to lead to a more significant safety concern.

The inspectors evaluated the finding using IMC 0609, Appendix A, “The Significance Determination Process for Findings At-Power.” The inspectors used Exhibit 3 – “Barrier Integrity Screening Questions” for the reactor containment. The finding screened as

very low safety significance (Green) because there was no actual open pathway in the physical integrity of reactor containment, containment isolation system, or heat removal components; and there was no impact on the hydrogen control function in containment.

This finding had a cross-cutting aspect in the area of Human Performance, Work Practices Component, because personnel failed to use human error prevention techniques to ensure that work was performed safely. (H.4(a))

Enforcement

Appendix B of 10 CFR Part 50, Criterion V, "Instructions, Procedures, and Drawings," states, in part, that activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, and shall be accomplished in accordance with these instructions, procedures, and drawings. Contrary to this requirement, on February 8, 2013, the licensee failed to correctly perform approved procedure DB-SP-03320, "Hydrogen Dilution System Train 1 Quarterly Test," which directed the equipment operator to throttle the Hydrogen Dilution System Train 1 CIV, using the local handwheel. Instead, the equipment operator inadvertently throttled an incorrect valve not associated with the procedure, which reduced CCW flow to the CRD stators and caused an unplanned entry into TS LCO 3.6.3, Condition A. The licensee included this issue in their CAP as CR 2013-02017. Because this violation was of very low safety significance and had been entered into the licensee's CAP, it is being treated as an NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy.
(NCV 05000346/2013002-02)

1R15 Operability Determinations and Functionality Assessments (71111.15)

.1 Operability Evaluations

a. Inspection Scope

The inspectors reviewed the following issues:

- Operability of the supported ECCS components when low SW flow was identified during ECCS Room Cooler No. 1 testing, as documented in CR 2013-00146 during the week ending January 12, 2013;
- Operability of the supported structure (the main steam line room within the auxiliary building) with one main steam line room roof hatch broken, as documented in CR 2013-00855 during the week ending January 26, 2013; and
- Operability SW Pump No. 1 when high stator winding temperatures were observed during normal operations, as documented in CR 2013-03901 during the week ending March 23, 2013.

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 TS 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 TS and USAR 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 reviewed a sampling of corrective action documents to verify that the licensee was identifying and correcting any deficiencies associated with operability evaluations. Documents reviewed are listed in the Attachment to this report.

The inspectors' reviews of these operability evaluations constituted three inspection samples as defined in IP 71111.15-05.

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19)

.1 Quarterly Resident Inspector Observation and Review of Post-Maintenance Testing Activities

a. Inspection Scope

The inspectors reviewed the following post-maintenance testing (PMT) activities to verify that procedures and test activities were adequate to ensure system operability and functional capability:

- DH Train 1 PMT pump run and review of test results following a planned maintenance outage during the week ending January 19, 2013;
- Observation of AFW Train No. 2 PMT pump runs and review of test results following a planned maintenance outage during the week ending February 2, 2013;
- Reactor Trip Breaker 'B' replacement and testing during the week ending February 9, 2013; and
- Testing of EDG No. 1 following a planned maintenance work window during the week ending March 9, 2013.

These activities were selected based upon the system, structure or component's ability to impact 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; tests were performed as written in accordance with properly reviewed and approved procedures; equipment was returned to its operational status following testing (temporary modifications or jumpers required for test performance were properly removed after test completion); and test documentation was properly evaluated. The inspectors evaluated the activities against TSs, the USAR, 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 the PMTs to determine whether the licensee was identifying problems and entering them in the CAP and that the problems were being corrected commensurate with their importance to safety. Documents reviewed are listed in the Attachment to this report.

The inspectors' reviews of these activities constituted four PMT inspection samples as defined in IP 71111.19-05.

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22)

.1 Surveillance Testing

a. Inspection Scope

The inspectors reviewed the test results for the following activities to determine whether risk-significant systems and equipment were capable of performing their intended safety function and to verify testing was conducted in accordance with applicable procedural and TS requirements:

- DB-SC-03071; "Emergency Diesel Generator 2 Monthly Test," during the week ending January 5, 2013 (routine);
- DB-ME-03045; "C1 Bus Under Voltage Units Monthly Functional Test," during the week ending February 16, 2013 (routine);
- DB-PF-03153; "Auxiliary Feed Pump 1 Check Valve Tests," during the week ending March 16, 2013 (routine);
- DB-OP-01101; "Containment Entry," during the week ending March 16, 2013 (routine);
- DB-SP-04150; "Auxiliary Feedwater Pump 1 Monthly Test," during the week ending March 16, 2013 (routine);
- DB-SP-03136; "Decay Heat Train 1 Pump and Valve Test," PMT pump run and review of test results following a planned maintenance outage during the week ending January 19, 2013 (Inservice Testing (IST)); and
- DB-SP-03357; "RCS Water Inventory Balance," conducted during the week ending February 9, 2013 (RCS).

The inspectors observed in-plant activities and reviewed procedures and associated records to determine the following:

- Did preconditioning occur;
- The effects of the testing were adequately addressed by control room personnel or engineers prior to the commencement of the testing;
- Acceptance criteria were clearly stated, demonstrated operational readiness, and consistent with the system design basis;
- Plant equipment calibration was correct, accurate, and properly documented;
- As-left setpoints were within required ranges; and the calibration frequency was in accordance with TSs, the USAR, procedures, and applicable commitments;
- Measuring and test equipment calibration was current;
- Test equipment was used within the required range and accuracy; applicable prerequisites described in the test procedures were satisfied;
- Test frequencies met TS requirements to demonstrate operability and reliability; tests were performed in accordance with the test procedures and other

applicable procedures; jumpers and lifted leads were controlled and restored where used;
- Test data and results were accurate, complete, within limits, and valid;
- Test equipment was removed after testing;
- Where applicable for IST activities, testing was performed in accordance with the applicable version of Section XI, American Society of Mechanical Engineers (ASME) code, and reference values were consistent with the system design basis;
- Where applicable, test results not meeting acceptance criteria were addressed with an adequate operability evaluation or the system or component was declared inoperable;
- Where applicable, actual conditions encountering high resistance electrical contacts were such that the intended safety function could still be accomplished;
- Prior procedure changes had not provided an opportunity to identify problems encountered during the performance of the surveillance or calibration test;
- Equipment was returned to a position or status required to support the performance of its safety functions; and
- All problems identified during the testing were appropriately documented and dispositioned in the CAP.

Documents reviewed are listed in the Attachment to this report.

The inspectors' reviews of these activities constituted five routine surveillance testing inspection samples, one inservice testing inspection sample, and one RCS leakage inspection sample as defined in IP 71111.22, Sections -02 and -05.

b. Findings

No findings 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 March 5, 2013, to identify any weaknesses and deficiencies in classification, notification, and protective action recommendation development activities. The inspectors observed emergency response operations in the control room simulator and technical support center 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 to this report.

This emergency preparedness drill observation constituted a single inspection sample as defined in IP 71114.06-05.

b. Findings

No findings were identified.

2. RADIATION SAFETY

Cornerstones: Occupational Radiation Safety and Public Radiation Safety

2RS3 In-Plant Airborne Radioactivity Control and Mitigation (71124.03)

The inspectors' activities that follow constituted a single complete inspection sample as defined in IP 71124.03-05.

.1 Inspection Planning (02.01)

a. Inspection Scope

The inspectors reviewed the plant USAR to identify areas of the plant designed as potential airborne radiation areas and any associated ventilation systems or airborne monitoring instrumentation. Instrumentation review included continuous air monitors (continuous air monitors and particulate-iodine-noble-gas-type instruments) used to identify changing airborne radiological conditions such that actions to prevent an overexposure may be taken. The review included an overview of the respiratory protection program and a description of the types of devices used. The inspectors reviewed the USAR, TS, and emergency planning documents to identify location and quantity of respiratory protection devices stored for emergency use.

Inspectors reviewed the licensee's procedures for maintenance, inspection, and use of respiratory protection equipment including SCBA, as well as procedures for air quality maintenance.

The inspectors reviewed reported performance indicators (PIs) to identify any related to unintended dose resulting from intakes of radioactive material.

b. Findings

No findings were identified.

.2 Engineering Controls (02.02)

a. Inspection Scope

The inspectors reviewed the licensee's use of permanent and temporary ventilation to determine whether the licensee uses ventilation systems as part of its engineering controls (in lieu of respiratory protection devices) to control airborne radioactivity. The inspectors reviewed procedural guidance for use of installed plant systems, such as containment purge, spent fuel pool ventilation, and auxiliary building ventilation, and assessed whether the systems are used, to the extent practicable, during high-risk activities (e.g., using containment purge during cavity floodup).

The inspectors selected installed ventilation systems used to mitigate the potential for airborne radioactivity, and evaluated whether the ventilation airflow capacity, flow path

(including the alignment of the suction and discharges), and filter/charcoal unit efficiencies, as appropriate, were consistent with maintaining concentrations of airborne radioactivity in work areas below the concentrations of an airborne area to the extent practicable.

The inspectors selected temporary ventilation system setups (high-efficiency particulate air/charcoal negative pressure units, down draft tables, tents, metal "Kelly buildings," and other enclosures) used to support work in contaminated areas. The inspectors assessed whether the use of these systems is consistent with licensee procedural guidance and as-low-as-is-reasonably-achievable (ALARA) concept.

The inspectors reviewed airborne monitoring protocols by selecting installed systems used to monitor and warn of changing airborne concentrations in the plant and evaluated whether the alarms and setpoints were sufficient to prompt licensee/worker action to ensure that doses are maintained within the limits of 10 CFR Part 20 and the ALARA concept.

The inspectors assessed whether the licensee had established trigger points (e.g., the Electric Power Research Institute's "Alpha Monitoring Guidelines for Operating Nuclear Power Stations") for evaluating levels of airborne beta-emitting (e.g., plutonium-241) and alpha-emitting radionuclides.

b. Findings

No findings were identified.

.3 Use of Respiratory Protection Devices (02.03)

a. Inspection Scope

For those situations where it is impractical to employ engineering controls to minimize airborne radioactivity, the inspectors assessed whether the licensee provided respiratory protective devices such that occupational doses are ALARA. The inspectors selected work activities where respiratory protection devices were used to limit the intake of radioactive materials, and assessed whether the licensee performed an evaluation concluding that further engineering controls were not practical and that the use of respirators is ALARA. The inspectors also evaluated whether the licensee had established means (such as routine bioassay) to determine if the level of protection (protection factor) provided by the respiratory protection devices during use was at least as good as that assumed in the licensee's work controls and dose assessment.

The inspectors assessed whether respiratory protection devices used to limit the intake of radioactive materials were certified by the National Institute for Occupational Safety and Health/Mine Safety and Health Administration or have been approved by the NRC per 10 CFR 20.1703(b). The inspectors selected work activities where respiratory protection devices were used. The inspectors evaluated whether the devices were used consistent with their National Institute for Occupational Safety and Health/Mine Safety and Health Administration certification or any conditions of their NRC approval.

The inspectors reviewed records of air testing for supplied-air devices and SCBA bottles to assess whether the air used in these devices meets or exceeds Grade D quality. The

inspectors reviewed plant breathing air supply systems to determine whether they meet the minimum pressure and airflow requirements for the devices in use.

The inspectors selected several individuals qualified to use respiratory protection devices, and assessed whether they have been deemed fit to use the devices by a physician.

The inspectors selected several individuals assigned to wear a respiratory protection device and observed them donning, doffing, and functionally checking the device as appropriate. Through interviews with these individuals, the inspectors evaluated whether they knew how to safely use the device and how to properly respond to any device malfunction or unusual occurrence (loss of power, loss of air, etc.).

The inspectors chose multiple respiratory protection devices staged and ready for use in the plant or stocked for issuance for use. The inspectors assessed the physical condition of the device components (mask or hood, harnesses, airlines, regulators, air bottles, etc.) and reviewed records of routine inspection for each. The inspectors selected several of the devices and reviewed records of maintenance on the vital components (e.g., pressure regulators, inhalation/exhalation valves, hose couplings).

The inspectors reviewed the respirator vital components maintenance program to ensure onsite personnel assigned to repair the vital components have received the appropriate manufacturer-approved training.

b. Findings

No findings were identified.

.4 Self-Contained Breathing Apparatus for Emergency Use (02.04)

a. Inspection Scope

Based on the USAR, TS, and emergency operating procedure requirements, the inspectors reviewed the status and surveillance records of self-contained breathing apparatuses staged in-plant for use during emergencies. The inspectors reviewed the licensee's capability for refilling and transporting SCBA air bottles to and from the control room and operations support center during emergency conditions.

The inspectors selected several individuals on control room shift crews and from designated departments currently assigned emergency duties (e.g., onsite search and rescue duties) to assess whether control room operators and other emergency response and radiation protection (RP) personnel (assigned in-plant search and rescue duties or as required by emergency operating procedures or the emergency plan) were trained and qualified in the use of SCBAs (including personal bottle change-out). The inspectors evaluated whether personnel assigned to refill bottles were trained and qualified for that task.

The inspectors determined whether appropriate mask sizes and types are available for use (i.e., in-field mask size and type match what was used in fit-testing). The inspectors determined whether on-shift operators had no facial hair that would interfere with the sealing of the mask to the face and whether vision correction (e.g., glasses inserts or corrected lenses) was available as appropriate.

The inspectors reviewed the past two years of maintenance records for select SCBA units used to support operator activities during accident conditions and designated as "ready for service" to assess whether any maintenance or repairs on any SCBA unit's vital components were performed by an individual, or individuals, certified by the manufacturer of the device to perform the work. The vital components typically are the pressure-demand air regulator and the low-pressure alarm. The inspectors reviewed the onsite maintenance procedures governing vital component work to determine any inconsistencies with the SCBA manufacturer's recommended practices. For those SCBAs designated as "ready for service," the inspectors determined whether the required, periodic air cylinder hydrostatic testing was documented and up to date, and the retest air cylinder markings required by the U.S. Department of Transportation were in place.

b. Findings

No findings were identified.

.5 Problem Identification and Resolution (02.05)

a. Inspection Scope

The inspectors evaluated whether problems associated with the control and mitigation of in-plant airborne radioactivity were being identified by the licensee at an appropriate threshold and were properly addressed for resolution in the licensee CAP. The inspectors assessed whether the corrective actions were appropriate for a selected sample of problems involving airborne radioactivity and were appropriately documented by the licensee.

b. Findings

No findings were identified.

2RS4 Occupational Dose Assessment (71124.04)

The inspectors' activities that follow constituted a single complete inspection sample as defined in IP 71124.04-05.

.1 Inspection Planning (02.01)

a. Inspection Scope

The inspectors reviewed the results of RP program audits related to internal and external dosimetry (e.g., licensee QA audits, self-assessments, or other independent audits) to gain insights into overall licensee performance in the area of dose assessment and focus the inspection activities consistent with the principle of "smart sampling".

The inspectors reviewed the most recent National Voluntary Laboratory Accreditation Program accreditation report on the vendor's most recent results to determine the status of the contractor's accreditation.

A review was conducted of the licensee procedures associated with dosimetry operations, including issuance/use of external dosimetry (routine, multi-badging,

extremity, neutron, etc.), assessment of internal dose (operation of whole body counter, assignment of dose based on derived air concentration-hours, urinalysis, etc.), and evaluation of and dose assessment for radiological incidents (distributed contamination, hot particles, loss of dosimetry, etc.).

The inspectors evaluated whether the licensee had established procedural requirements for determining when external and internal dosimetry is required.

b. Findings

No findings were identified.

.2 External Dosimetry (02.02)

a. Inspection Scope

The inspectors evaluated whether the licensee's dosimetry vendor is National Voluntary Laboratory Accreditation Program accredited and if the approved irradiation test categories for each type of personnel dosimeter used are consistent with the types and energies of the radiation present and the way the dosimeter is being used (e.g., to measure deep dose equivalent, shallow dose equivalent, or lens dose equivalent).

The inspectors evaluated the onsite storage of dosimeters before their issuance, during use, and before processing/reading. The inspectors also reviewed the guidance provided to radiation workers with respect to care and storage of dosimeters.

The licensee does not use non-National Voluntary Laboratory Accreditation Program accredited passive dosimeters.

The inspectors assessed the use of active dosimeters (electronic personal dosimeters) to determine if the licensee uses a "correction factor" to address the response of the electronic personal dosimeter as compared to the passive dosimeter for situations when the electronic personal dosimeter must be used to assign dose. The inspectors also assessed whether the correction factor is based on sound technical principles.

The inspectors reviewed dosimetry occurrence reports or CAP documents for adverse trends related to electronic personal dosimeters, such as interference from electromagnetic frequency, dropping or bumping, failure to hear alarms, etc. The inspectors assessed whether the licensee had identified any trends and implemented appropriate corrective actions.

b. Findings

No findings were identified.

.3 Internal Dosimetry (02.03)

a. Routine Bioassay (In Vivo)

(1) Inspection Scope

The inspectors reviewed procedures used to assess the dose from internally deposited nuclides using whole body counting equipment. The inspectors evaluated whether the procedures addressed methods for differentiating between internal and external contamination, the release of contaminated individuals, the route of intake and the assignment of dose.

The inspectors reviewed the whole body count (WBC) process to determine if the frequency of measurements was consistent with the biological half-life of the nuclides available for intake.

The inspectors reviewed the licensee's evaluation for use of its portal radiation monitors as a passive monitoring system to determine if instrument minimum detectable activities were adequate to determine the potential for internally deposited radionuclides sufficient to prompt additional investigation.

The inspectors selected several WBCs and evaluated whether the counting system used had sufficient counting time/low background to ensure appropriate sensitivity for the potential radionuclides of interest. The inspectors reviewed the radionuclide library used for the count system to determine its appropriateness. The inspectors evaluated whether any anomalous count peaks/nuclides indicated in each output spectra received appropriate disposition. The inspectors reviewed the licensee's 10 CFR Part 61 data analyses to determine whether the nuclide libraries included appropriate gamma-emitting nuclides. The inspectors evaluated how the licensee accounts for hard-to-detect nuclides in the dose assessment.

(2) Findings

No findings were identified.

b. Special Bioassay (In Vitro)

(1) Inspection Scope

There were no internal dose assessments obtained using in vitro monitoring for the inspectors to review. The inspectors reviewed and assessed the adequacy of the licensee’s program for in vitro monitoring (i.e., urinalysis and fecal analysis) of radionuclides (tritium, fission products, and activation products), including collection and storage of samples.

The inspectors reviewed the vendor laboratory QA program and assessed whether the laboratory participated in an industry recognized cross-check program including whether out-of-tolerance results were resolved appropriately.

(2) Findings

No findings were identified.

c. Internal Dose Assessment – Airborne Monitoring

(1) Inspection Scope

The inspectors reviewed the licensee's program for airborne radioactivity assessment and dose assessment, as applicable, based on airborne monitoring and calculations of derived air concentration. The inspectors determined whether flow rates and collection times for air sampling equipment were adequate to allow lower limits of detection to be obtained. The inspectors also reviewed the adequacy of procedural guidance to assess internal dose if respiratory protection was used. The licensee had not performed dose assessments using airborne/derived air concentration monitoring since the last inspection.

(2) Findings

No findings were identified.

d. Internal Dose Assessment – Whole Body Count Analyses

(1) Inspection Scope

The inspectors reviewed several dose assessments performed by the licensee using the results of WBC analyses. The inspectors determined whether affected personnel were properly monitored with calibrated equipment and that internal exposures were assessed consistent with the licensee's procedures.

(2) Findings

No findings were identified.

.4 Special Dosimetric Situations (02.04)

a. Declared Pregnant Workers

(1) Inspection Scope

The inspectors assessed whether the licensee informs workers, as appropriate, of the risks of radiation exposure to the embryo/fetus, the regulatory aspects of declaring a pregnancy, and the specific process to be used for (voluntarily) declaring a pregnancy.

The inspectors selected individuals who had declared pregnancy during the current assessment period and evaluated whether the licensee’s radiological monitoring program (internal and external) for declared pregnant workers is technically adequate to assess the dose to the embryo/fetus. The inspectors reviewed exposure results and monitoring controls employed by the licensee and with respect to the requirements of 10 CFR Part 20.

(2) Findings

No findings were identified.

b. Dosimeter Placement and Assessment of Effective Dose Equivalent for External Exposures

(1) Inspection Scope

The inspectors reviewed the licensee's methodology for monitoring external dose in non-uniform radiation fields or where large dose gradients exist. The inspectors evaluated the licensee's criteria for determining when alternate monitoring, such as use of multi-badging, was to be implemented.

The inspectors reviewed dose assessments performed using multi-badging to evaluate whether the assessment was performed consistently with licensee procedures and dosimetric standards.

(2) Findings

No findings were identified.

c. Shallow Dose Equivalent

(1) Inspection Scope

The inspectors reviewed shallow dose equivalent dose assessments for adequacy. The inspectors evaluated the licensee's method (e.g., VARSKIN or similar code) for calculating shallow dose equivalent from distributed skin contamination or discrete radioactive particles.

(2) Findings

No findings were identified.

d. Neutron Dose Assessment

(1) Inspection Scope

The inspectors evaluated the licensee's neutron dosimetry program, including dosimeter types and/or survey instrumentation.

The inspectors reviewed neutron exposure situations (e.g., independent spent fuel storage installation operations or at-power containment entries) and assessed whether (a) dosimetry and/or instrumentation was appropriate for the expected neutron spectra, (b) there was sufficient sensitivity for low dose and/or dose rate measurement, and (c) neutron dosimetry was properly calibrated. The inspectors also assessed whether interference by gamma radiation had been accounted for in the calibration and whether time and motion evaluations were representative of actual neutron exposure events, as applicable.

(2) Findings

No findings were identified.

e. Assigning Dose of Record

(1) Inspection Scope

For the special dosimetric situations reviewed in this section, the inspectors assessed how the licensee assigns dose of record for total effective dose equivalent, shallow dose equivalent, and lens dose equivalent. This included an assessment of external and internal monitoring results, supplementary information on Individual exposures (e.g., radiation incident investigation reports and skin contamination reports), and radiation surveys and/or air monitoring results when dosimetry was based on these techniques.

(2) Findings

No findings were identified.

.5 Problem Identification and Resolution (02.05)

a. Inspection Scope

The inspectors assessed whether problems associated with occupational dose assessment are being identified by the licensee at an appropriate threshold and are properly addressed for resolution in the licensee CAP. The inspectors assessed the appropriateness of the corrective actions for a selected sample of problems documented by the licensee involving occupational dose assessment.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

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

4OA1 Performance Indicator Verification (71151)

.1 Unplanned Scrams per 7000 Critical Hours

a. Inspection Scope

The inspectors sampled licensee submittals for the Unplanned Scrams per 7000 Critical Hours PI for the period from January 2012 to December 2012. To determine the accuracy of the PI data reported during those periods, PI definitions and guidance contained in the Nuclear Energy Institute (NEI) Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6, dated October 2009, were used. The inspectors reviewed the licensee's operations narrative logs, CRs, event reports and NRC integrated inspection reports for the period to validate the accuracy of the submittals. The inspectors also reviewed the licensee's CAP to determine if any problems had been identified with the PI data collected or transmitted for this indicator. Documents reviewed are listed in the Attachment to this report.

This inspection constituted one Unplanned Scrams per 7000 Critical Hours sample as defined in IP 71151-05.

b. Findings

No findings were identified.

.2 Unplanned Scrams with Complications

a. Inspection Scope

The inspectors sampled licensee submittals for the Unplanned Scrams with Complications PI for the period from January 2012 to December 2012. To determine the accuracy of the PI data reported during those periods, PI definitions and guidance contained in the NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6, dated October 2009, were used. The inspectors reviewed the licensee's operator narrative logs, CRs, event reports and NRC integrated inspection reports for the period to validate the accuracy of the submittals. The inspectors also reviewed the licensee's CAP to determine if any problems had been identified with the PI data collected or transmitted for this indicator. Documents reviewed are listed in the Attachment to this report.

This inspection constituted one Unplanned Scrams with Complications sample as defined in IP 71151-05.

b. Findings

No findings were identified.

.3 Unplanned Transients per 7000 Critical Hours

a. Inspection Scope

The inspectors sampled licensee submittals for the Unplanned Transients per 7000 Critical Hours PI for the period from January 2012 through December 2012. To determine the accuracy of the PI data reported during those periods, PI definitions and guidance contained in the NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6, dated October 2009, were used. The inspectors reviewed the licensee's operator narrative logs, CRs, maintenance rule records, event reports and NRC integrated inspection reports for the period to validate the accuracy of the submittals. The inspectors also reviewed the licensee's CAP to determine if any problems had been identified with the PI data collected or transmitted for this indicator. Documents reviewed are listed in the Attachment to this report.

This inspection constituted one unplanned transients per 7000 critical hours sample as defined in IP 71151-05.

b. Findings

No findings were identified.

4OA2 Identification and Resolution of Problems (71152)

.1 Routine Review of Items Entered into the Corrective Action Program

a. Inspection Scope

As part of the various baseline IPs 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 CAP at an appropriate threshold, that adequate attention was being given to timely corrective actions, and that adverse trends were identified and addressed. Attributes reviewed included: identification of the problem was complete and accurate; timeliness was commensurate with the safety significance; evaluation and disposition of performance issues, generic implications, common causes, contributing factors, root causes, extent-of-condition reviews, and previous occurrences reviews were proper and adequate; and that the classification, prioritization, focus, and timeliness of corrective actions were commensurate with safety and sufficient to prevent recurrence of the issue. Minor issues entered into the licensee's CAP as a result of the inspectors' observations are included in the Attachment to this report.

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 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 CAP. This review was accomplished through inspection of the station's daily condition report packages.

These daily reviews were performed by procedure as part of the inspectors' daily plant status monitoring activities and, as such, did not constitute any separate inspection samples.

b. Findings

No findings were identified.

.3 Annual Follow-Up Sample for In-Depth Review: Review of Licensee Corrective Actions for Decay Heat Pump Cyclone Separators Incorrectly Installed

(Closed) Unresolved Item 05000346/2012005-02: Decay Heat Pump Cyclone Separators Incorrectly Installed

a. Inspection Scope

On December 3, 2012, while servicing the No. 2 DH pump mechanical seal, the licensee identified that the cyclone separator had been installed upside down during a past maintenance activity dating back to May 12, 2012. Additionally, on December 6, 2012, while correcting the orientation of the cyclone separator, licensee mechanical maintenance personnel discovered that spacers were also missing from the inlet and dirty drain lines of the cyclone separator. The spacers are intended to fill unused space between the body of the separator and the tube fittings that connect the tubing. Empty spaces in these areas could collect debris under accident conditions and prevent cooling flow to the mechanical seal. An extent of condition inspection was performed on the No. 1 DH pump on December 14, 2012, which identified the spacers were also missing from the cyclone separators. The most recent maintenance activity on the No. 1 DH pump cyclone separators occurred during the last quarter of 2011, during a mid-cycle outage to replace the reactor vessel closure head.

On December 14, 2012, the licensee made a voluntary report to the NRC via telephone regarding the potential impact to the past operability of both DH pumps. A subsequent investigation by the licensee determined the condition did not render the DH pumps inoperable. However, a considerable amount of engineering analysis/judgment was used to predict the consequences of running the DH pumps without seal cooling from the cyclone separators and achieve this conclusion. Based on the expected pump operating conditions during an accident, the licensee's analyses concluded that breakage of the seal faces would not occur. As such, leakage out from the pump seals would remain below the allowable leakage rate determined by the licensee's design basis calculations. An update was made to the voluntary report to the NRC reflecting this position.

The cyclone separator condition was immediately corrected for each pump upon discovery. The licensee entered the conditions into their CAP and assigned a root cause analysis to CR 2012-18831. Because the licensee's root cause analysis was still in progress at the end of the fourth quarter 2012 inspection period, the issue was treated as an unresolved item (URI) pending the inspectors' review of the licensee's root cause report and completion of the inspectors' review of the licensee's evaluation into the past operability of the DH pumps. This in-depth identification and resolution of problems inspection sample completes the inspectors' reviews of the licensee's evaluation into the past operability of the DH pumps, root cause analysis, and corrective actions for the identified issues. This URI is closed.

The documents listed in the Attachment were reviewed to accomplish the objectives associated with this inspection sample. This review constituted one annual follow-up inspection sample for in-depth review as defined in IP 71152-05.

b. Observations

The inspectors completed a review of the licensee's evaluation into the past operability of the DH pumps with assistance from NRC Region III mechanical engineering and operations licensing personnel, as well as a Region III senior reactor analyst. The inspectors determined that the licensee's evaluation and conclusions regarding DH pump past operability were reasonable.

A review of the licensee's root cause analysis was also completed by the inspectors. Fundamentally, the licensee's causal evaluation concluded that the maintenance and WO instructions provided to the craft mechanics to perform planned and scheduled DH pump cyclone separator periodic replacements did not contain instructions that were sufficiently detailed to ensure the successful completion of the task. Detailed engineering information regarding the operation of the DH pump cyclone separators was not provided to WO planners and maintenance personnel, such that the replacement of the cyclone separators was viewed as a simple and routine task – a skill-of-the-craft activity that comprised nothing more than the simple disconnecting and connecting three Swagelok fittings. The inspectors determined that the licensee's identified root and contributing causes were reasonable.

In response to the issue, the licensee established 33 separate corrective actions. All 33 actions, those completed and those still with tasks pending, were reviewed by the inspectors and found to be reasonable. In addition, the inspectors determined that the collective actions as a whole, if properly implemented, should be sufficient to prevent recurrence of the issue. The licensee's initial schedule for completion had all actions being completed by May 30, 2013. Given factors such as the safety significance of the issue, the complexity of the proposed actions, and the licensee resources involved, the inspectors found this schedule to be reasonable.

c. Findings

No findings were identified. During the course of the inspectors' review one licensee-identified violation of very low safety significance was noted. This violation is documented in Section 4OA7 of this report.

4OA3 Follow-Up of Events and Notices of Enforcement Discretion (71153)

.1 (Closed) License Event Report 05000346/2011-004-01: Direct Current System Design Issues

a. Inspection Scope

During a 2007 Component Design Basis Inspection, the inspectors opened URI 05000346/2007007-05 related to the design and current configuration of the station's 125/250 Vdc safety-related distribution system. Resolution to this issue required support from the Office of Nuclear Reactor Regulation (NRR). On July 26, 2011, the NRR staff issued the final response to Task Interface Agreement (TIA) 2011-001, "Davis Besse Nuclear Power Station Safety-Related Batteries Electrical Separation Design and Licensing Bases" (ADAMS Accession No. ML11193A203). The results of this TIA response were provided to the licensee on the same day.

The licensee entered this issue into their CAP as CR 2011-98223 and took immediate actions for the two issues involved. The first issue involved non-essential, non-environmentally qualified, equipment powered by the DC system and located in containment that could challenge the adequacy of the electrical separation between potentially grounded equipment and the station's safety-related batteries. The second issue involved automatic transfer switches supplying power to non-essential instrumentation that could transfer a fault to the redundant power source, potentially impacting both safety-related DC power trains.

On September 26, 2011, Licensee Event Report (LER) 05000346/2011-004-00, "Direct Current System Design Issues," was submitted to the NRC in accordance with the requirements of 10 CFR 50.73 (ADAMS Accession No. ML11271A007). The inspectors reviewed the licensee's actions, as described in the LER, and issued a finding with an associated NCV for the electrical design nonconforming conditions. The results of the inspection, description of the finding and associated NCV, as well as the closure of LER 05000346/2011-004-00, were documented in NRC Inspection Report 05000346/2012002 (ADAMS Accession No. ML12116A209).

On March 6, 2012, the licensee submitted a revision to their initial Licensee Event Report (LER 05000346/2011-004-01; ADAMS Accession No. ML12072A034) to document the results of their causal analysis for the issue. In December of 2012, the licensee completed their final corrective actions related to the issue, which involved a combination of both physical electrical modifications and revisions to DC system calculations, and closed the associated formal operability evaluation. Following a review of the licensee's causal analysis and final corrective actions for the condition, the inspectors determined that the issue had been adequately addressed and that LER 05000346/2011-004-01could be closed.

Documents reviewed are listed in the Attachment to this report. This event follow-up review by the inspectors constituted a single inspection sample as defined in IP 71153-05.

b. Findings

No findings were identified.

4OA5 Other Activities

.1 (Closed) Temporary Instruction - 2515/182: Review of the Industry Initiative to Control Degradation of Underground Piping and Tanks

a. Inspection Scope

Leakage from buried and underground pipes has resulted in ground water contamination incidents with associated heightened NRC and public interest. The industry issued a guidance document, NEI 09-14, "Guideline for the Management of Buried Piping Integrity," (ADAMS Accession No. ML1030901420) to describe the goals and required actions (commitments made by the licensee) resulting from this underground piping and tank initiative. On December 31, 2010, NEI issued Revision 1 to NEI 09-14, "Guidance for the Management of Underground Piping and Tank Integrity," (ADAMS Accession No. ML110700122) with an expanded scope of components which included underground piping that was not in direct contact with the soil and underground tanks. On

November 17, 2011, the NRC issued Temporary Instruction (TI)-2515/182, "Review of the Industry Initiative to Control Degradation of Underground Piping and Tanks," to gather information related to the industry's implementation of this initiative.

From January 28, 2013 through February 1, 2013, the inspectors conducted a review of records and procedures related to the licensee's program for buried pipe, underground pipe, and tanks in accordance with Phase II of TI-2515/182. This review was done to confirm that the licensee's program contained attributes consistent with Sections 3.3 A and 3.3 B of NEI 09-14, and to confirm that these attributes were scheduled and/or completed by the NEI 09-14, Revision 1, deadlines. To determine whether the program attribute was accomplished in a manner which reflected good or poor practices in program management, the inspectors interviewed licensee staff responsible for the buried pipe program. Additionally, the inspectors performed a field inspection of rectifiers used for the operation and maintenance of the station's cathodic protection system.

Based upon the scope of the review described above, Phase II of TI-2515/182 was completed. Completion of Phase I of TI-2515/182 was documented in IR 05000346/2012002. This completes the Region III inspection requirements for this TI and this plant.

b. Observations

The licensee's buried piping, underground piping and tanks program was inspected in accordance with Paragraph 03.02.a of TI-2515/182 and it was confirmed that activities which correspond to completion dates specified in the program that have passed since the Phase I inspection was conducted have been completed. Additionally, the licensee's buried piping, underground piping and tanks program was inspected in accordance with Paragraph 03.02.b of TI-2515/182 and responses to specific NRR questions were submitted to the NRC Headquarters staff.

c. Findings

No findings were identified.

4OA6 Management Meetings

.1 Exit Meeting Summary

On April 9, 2013, the inspectors presented the inspection results to the Site Vice President, Mr. Raymond Lieb, and other members of the licensee staff. The licensee acknowledged the issues presented. The inspectors confirmed that none of the potential report input discussed was considered proprietary.

.2 Interim Exit Meetings

Interim exits were conducted for:

- The review of the industry initiative to control degradation of underground piping and tanks (TI-2515/182) with the Site Vice President, Mr. Raymond Lieb, and other members of the licensee staff on February 1, 2013;

- The inspection results for the areas of in-plant airborne radioactivity control and mitigation; and occupational dose assessment with R. Lieb, Site Vice President, on March 1, 2013;
- The preliminary inspection results from the licensed operator requalification training program biennial review with Mr. Jeff Cuff, Nuclear Training Manager, and other members of the licensee staff on March 14, 2013; and
- The final inspection results from the licensed operator requalification training program biennial review with Mr. Jeff Cuff, Nuclear Training Manager, via telephone on March 19, 2013.

The inspectors confirmed that none of the potential report input discussed was considered proprietary. Any proprietary material received during the inspection was returned to the licensee.

4OA7 Licensee-Identified Violations

The following violations of very low safety significance (Green) were identified by the licensee and are violations of NRC requirements that meet the criteria of Section 2.3.2 of the NRC Enforcement Policy for being dispositioned as Non-Cited Violations:

.1 Inadequate Maintenance Rule Risk Assessment

The requirements of the NRC Maintenance Rule, 10 CFR 50.65(a)(4) state, in part, that "the licensee shall assess and manage the increase in risk that may result from the proposed maintenance activities."

Contrary to this requirement, on January 28, 2013, the licensee's probabilistic risk assessment did not accurately reflect the increase in online probabilistic risk associated with startup transformer X01 being unavailable during planned maintenance. Specifically, while removing the 345 kV Lemoyne transmission line from service for planned maintenance, startup transformer X01 unavailability during switchyard manipulations was inadvertently omitted from the station's risk assessment. Re-performance of the risk assessment after the switchyard manipulations were already completed indicated that an elevated "yellow" risk category that required additional work controls had actually existed for approximately 16 minutes during the switchyard manipulations. Licensee personnel initiated CR 2013-01309 to document the issue.

The objective of the Mitigating Systems Cornerstone of Reactor Safety is to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). A key attribute of this objective is equipment performance and availability. Using IMC 0609, Appendix K, "Maintenance Risk Assessment and Risk Management Significance Determination Process," the inspectors determined that the violation was of very low safety significance since the incremental core damage probability deficit calculated for the issue was less than 1E-6.

.2 Decay Heat Pump Reliability Reduced by Inadequate Maintenance Work Instructions

Technical Specification 5.4.1(a) requires the licensee to establish, implement, and maintain applicable written procedures for the safety-related systems and activities recommended in Regulatory Guide (RG) 1.33, Revision 2, Appendix A. Section 9(a), "Procedures for Performing Maintenance," of RG 1.33, Revision 2, Appendix A, further states, in part, that: "Maintenance that can affect the performance of safety-related

equipment should be properly preplanned and performed in accordance with written procedures, documented instructions, or drawings appropriate to the circumstances."

Contrary to this requirement, during the 17th midcycle outage in the fall of 2011 for DH Train 1 and the 17th refuel outage in the spring of 2012 for DH Train 2, the licensee's instructions for replacing the DH pump mechanical seal flow cyclone separators failed to provide sufficient details to ensure that required internal spacers were installed as required. The omission of the spacers subjected the DH pump mechanical seal flow cyclone separators to potential debris-induced clogging, thereby reducing the reliability of the DH pumps themselves.

The objective of the Mitigating Systems Cornerstone of Reactor Safety is to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). A key attribute of this objective is human performance, and specifically, procedure quality. In accordance with IMC 0609, "Significance Determination Process," Attachment 0609.04, "Initial Characterization of Findings," and Appendix A, "The SDP for Findings At-Power," the inspectors determined that the violation was of more than minor significance in that it had a direct impact on this cornerstone objective. The licensee's failure to provide adequately detailed written procedures and instructions for the replacement of the DH pump mechanical seal flow cyclone separators adversely impacted the reliability of each DH pump, as discussed in the paragraph above. The licensee had entered this issue into their CAP as CR 2012-18831. Corrective actions planned or completed by the licensee included revisions to the applicable drawings and work instructions associated with this activity.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

R. Lieb, Site Vice President
B. Boles, Director, Site Operations
K. Byrd, Director, Site Engineering
G. Cramer, Manager, Site Protection
J. Cuff, Manager, Training
A. Dawson, Manager, Chemistry
J. Dominy, Director, Site Maintenance
S. Gatter; Backup Buried Pipe Program Owner
D. Hartnett, Superintendent, Operations Training
J. Hook, Manager, Design Engineering
D. Imlay, Director, Site Performance Improvement
G. Kendrick, Manager, Site Outage Management
B. Kremer, Manager, Plant Engineering
P. McCloskey, Manager, Site Regulatory Compliance
D. Noble, Manager, Radiation Protection
W. O'Malley, Manager, Nuclear Oversight
R. Oesterle, Superintendent, Nuclear Operations
R. Patrick, Manager, Site Work Management
D. Petro, Manager, Steam Generator Replacement Project
M. Roelant, Manager, Site Projects
L. Rushing, Director, Special Projects
C. Sacha, Radiation Protection General Supervisor
D. Saltz, Manager, Site Maintenance
C. Steenbergen, Superintendent, Operations Training
J. Sturdavant, Regulatory Compliance
T. Summers, Manager, Site Operations
L. Thomas, Manager, Nuclear Supply Chain
M. Travis, Superintendent, Radiation Protection
J. Vetter, Manager, Emergency Response
A. Wise, Manager, Technical Services
G. Wolf, Supervisor, Regulatory Compliance
K. Zellers, Supervisor, Reactor Engineering
F. Zurvalec, Buried Pipe Program Owner

LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

Opened

05000346/2013002-01	FIN	Failure to Maintain Station Blackout Diesel Generator Output Cables in an Environment Consistent with Design (Section 1R06.2)
05000346/2013002-02	NCV	Containment Isolation Valve Rendered Inoperable by "Wrong Component" Operator Error (Section 1R13.1)

Closed

05000346/2013002-01	FIN	Failure to Maintain Station Blackout Diesel Generator Output Cables in an Environment Consistent with Design (Section 1R06.2)
05000346/2013002-02	NCV	Containment Isolation Valve Rendered Inoperable by "Wrong Component" Operator Error (Section 1R13.1)
05000346/2012005-02	URI	Decay Heat Pump Cyclone Separators Incorrectly Installed (Sections 4OA2.3 and 4OA7.2)
05000346/2011-004-01	LER	Direct Current System Design Issues (Section 4OA3.1)
2515/182:	TI	Review of the Industry Initiative to Control Degradation of Underground Piping and Tanks

LIST OF DOCUMENTS REVIEWED

The following is a partial list of documents reviewed during the inspection. Inclusion on this list does not imply that the NRC inspector reviewed the documents in their entirety, but rather that selected sections or portions of the documents were evaluated as part of the overall inspection effort. Inclusion of a document on this list does not imply NRC acceptance of the document or any part of it, unless this is stated in the body of the inspection report.

1R04 Equipment Alignment

Condition Reports:
- 2013-01449; Steam Trap ST131 Installed Backwards; 1/30/2013

Procedures:
- DB-OP-06233; Auxiliary Feedwater System Operating Procedure; Revision 34
- DB-OP-06012; Decay Heat and Low Pressure Injection System Operating Procedure; Revision 56
- DB-SP-03153; Auxiliary Feedwater Train 1 Monthly Valve Verification; Revision 11
- DB-OP-06334; Station Blackout Diesel Generator Operating Procedure; Revision 20
- DB-OP-06262; Component Cooling Water System Procedure; Revision 29
- DB-SP-03063; Component Cooling Water Train 1 Valve Verification Monthly Test; Revision 8
- DB-SP-03064; Component Cooling Water Train 2 Valve Verification Monthly Test; Revision 7

Drawings:
- M-003C; Piping & Instrument Diagram Decay Heat Train 2; Revision 27
- M-0060; Piping & Instrument Diagram Auxiliary Feedwater System; Revision 55
- OS-004, Sheet 1; Operation Schematic Decay Heat Removal / Low Pressure Injection System; Revision 50
- OS-004, Sheet 2; Operation Schematic Decay Heat Removal / Low Pressure Injection System; Revision 7
- OS-017A, Sheet 1; Operational Schematic Auxiliary Feedwater System; Revision 26
- OS-017B, Sheet 1; Operational Schematic Auxiliary Feedwater Pumps and Turbines; Revision 25
- M-236A; Piping Isometric Component Cooling System Auxiliary Building El. 545’-0”; Revision 17
- M-236B; Piping Isometric Component Cooling System Auxiliary Building El. 565’-0”; Revision 16
- M-236C; Piping Isometric Component Cooling System Heat Exchangers Inlets El. 585’-0”; Revision 24
- M-236D; Piping Isometric Component Cooling System Heat Exhangers Outlet Piping El. 585’-0”; Revision 22
- M-036A; Piping and Instrument Diagram Component Cooling Water System; Revision 29
- M-036B; Piping and Instrument Diagram Component Cooling Water System; Revision 37
- M-036C; Piping and Instrument Diagram Component Cooling Water System; Revision 32
- OS-021, Sheet 1; Operational Schematic Component Cooling Water System; Revision 35
- OS-021, Sheet 2; Operational Schematic Component Cooling Water System; Revision 29
- OS-021, Sheet 3; Operational Schematic Component Cooling Water System; Revision 12

1R05 Fire Protection

Condition Reports:
- 2012-06357; Missing Fireproofing on Structural Beam 565' level of the Auxiliary Building

Procedures:
- PFP-AB-225; Makeup Pump Room and Vestibule, Rooms 225 and 226A, Fire Area AB; Revision 4
- PFP-AB-227; Passage, Room 227, Fire Area G; Revision 4
- PFP-AB-241; Passage, Room 241, Fire Area G; Revision 4
- PFP-AB-601E; No. 1 Main Steam Line Area, Room 601E, Fire Area DH; Revision 3
- PFP-AB-601W; No. 1 Main Steam Line Area and Purge Inlet Equipment Room, Rooms 600 and 601W, Fire Area DH; Revision 4
- PFP-AB-602; No. 2 Main Steam Line Area, Room 602, Fire Area DH; Revision 4
- PFP-TB-246; Condenser Pit, Room 246, Fire Area II; Revision 5
- PFP-TB-247; Heater Drains Valve Room, Room 247, Fire Area II; Revision 5
- PFP-TB-249; Lube Oil Storage Tank Room, Room 249, Fire Area II; Revision 5
- PFP-TB-252; Main Feedwater Pump Room, Room 252, Fire Area II; Revision 5
- PFP-TB-253; Condensate Pump Pit, Room 253, Fire Area II; Revision 5
- PFP-AB-505; Control Room and Adjacent Support Rooms; Rooms 502, 503, 504, 505, 506, 507, 510, 511, 512, and 513; Fire Area FF; Revision 7

Drawings:
- A-0222F; Fire Protection General Floor Plan El. 565’-0”; Revision 15
- A-0226F; Fire Protection General Floor Plan El. 643’-0”; Revision 13
- A-0225F; Fire Protection General Floor Plan El. 623’-0”; Revision 18

Other:
- Fire Hazard Analysis Report

1R06 Flood Protection Measures

Condition Reports:
- 2013-01114; Water in Manholes Over Cables
- 2013-01122; Water in Manholes
- 2013-02286; Reoccurring Water Issues in Electrical Manholes
- 2013-03818; Water in Manholes

Procedures:
- RA-EP-02830; Flooding; Revision 2
- RA-EP-02880; Internal Flooding; Revision 3

Reference Manuals:
- NORM-ER-3112; Cable Monitoring; Revisions 1 and 2

Work Order:
- 200416813; Inspect Electrical Manholes MH3040, MH3044, MH3045, and MH3046

Calculation:
- C-NSA-042.01.001; Condenser Pit Level Sensor Location; Revision 0

1R07 Heat Sink Performance

Condition Reports:
- 2013-02266; Grout found on CREVS train 2 air-cooled condenser air intake screens

Procedures:
- DB-SS-03042; Control Room Emergency Ventilation System Train 2 Monthly Test; Revision 15

Work Orders:
- 200438061; PM 2170 S33-2 *INSP* CTRM EVS#2

1R11 Licensed Operator Requalification Program and Licensed Operator Performance

Condition Reports:
- 2011-06611, ULD Auto Operations While Transferring Other Hand/Auto Stations to Manual
- 2012-01015; Spurious Trip of RPS Channel 4 "Over Power" and "Power/Imbalance/Flow" Bistables
- 2012-02544, ICS/ULD Generated Megawatt Signal Does Not Match Original Design
- 2012-16833, Unexpected Power Rise after Placing Rod Control Panel to Manual (including the Full Apparent Cause Evaluation and Corrective Actions)
- 2013-02520; RPS Channel 4 Is Bypassed During CRD Breaker Testing of the Other 3 RPS Channels

Procedures:
- NT-OT-7001; Training and Qualification of Operations Personnel; Revision 13
- NOP-TR-1008; FENOC Simulator Configuration Management; Revision 0
- NOP-TR-1010; Licensed Operator Requalification Exam Development; Revision 1
- NOP-OP-1013, Control of Time Critical Operator Actions, Revision 1
- DB-OP-02526; Primary to Secondary Heat Transfer Upset; Revision 3
- DB-OP-06401; Integrated Control System Operating Procedure; Revision 19
- DB-OP-06902; Power Operations; Revisions 39 & 40
- DB-MI-03013; Channel Functional Test of Reactor Trip Breaker D, RPS Channel 3 Reactor Trip Module Logic, and ARTS Channel 3 Output Logic; Revision 29

Business Practices:
- DBBP-TRAN-0014; License Requirements for Licensed Operators; Revision 9
- DBBP-TRAN-0021; Simulator Configuration Control; Revision 3
- DBBP-TRAN-0502; Development of Continuing Training Simulator Evaluation; Revision 7
- NOBP-TR-1112; FENOC Conduct of Simulator Training and Evaluation; Revision 2
- DBBP-OPS-1013; Control of Time Critical Operator Actions; Revision 2

Operations Initial Training Lesson Plans
- OPS-SYS-I512, Integrated Control System Overview; Revision 8
- OPS-SYS-I513, Integrated Control System Drawings, Hardware, and Power Supplies; Revision 4
- OPS-SYS-I514, Integrated Control System – Unit Load Demand; Revision 4
- OPS-SYS-I515, Integrated Control System – Integrated Master; Revision 3
- OPS-SYS-I516, Integrated Control System – Feedwater Subsystem; Revision 1
- OPS-SYS I517, Integrated Control System – Reactor Control; Revision 1

Operations Continuing Training Lesson Plans
- OTLC-201203-DBI100, Integrated Control System – Feedwater Subsystem; 10/19/2012
- OTLC-201204-DBI100, Integrated Control System – Unit Load Demand Refresher Training, Revision 0
- OTLC-201301-DBI100, Integrated Control System – Reactor Control; 01/14/2013
- OTLC-201301-DBS107, Integrated Control System – Demonstrations; 01/15/2013

1R12 Maintenance Effectiveness

Condition Reports:
- 2004-07150; DC Latent Issues Review – Potential for Multiple DC Grounds Due to Harsh Environment
- 2004-07150; DC Latent Issues Review – Independence Between Load Groups
- 2011-01902; Extent of Condition Concerns from CR 11-98233
- 2011-98223; DC System Issues from NRC CDBI
- 2012-02460; 2012 CDBI Self Assessment: Expected Life of Essential Batteries
- 2012-07944; Improvements For Essential Battery Testing
- 2012-08338; NRC-NCV: Failure to Maintain Safety-Related DC Systems Design Control
- 2012-12528; High Millivolt Reading Across 1P Battery Shunt
- 2012-17232; Difficulty Maintaining Battery Room B Temperature Above Tech Spec Minimum
- 2013-04173; PA-DB-13-01: Station and Instrument Air Long-Standing Equipment Issues
- 2013-03669; Station and Instrument Air System Recommended Improvements Tracking
- 2013-03022; Instrument Air Dryer 1/2 Moisture Switch (MS10015) Requires Replacement

Procedures:
- DB-OP-06251; Station and Instrument Air System Operating Procedure; Revision 24
- DB-MM-09156; Joy Reciprocating Air Compressor Maintenance; Revision 6
- DB-SS-04011; Emergency Instrument Air Compressor Backup System Check; Revision 8
- DB-SS-04012; Station Air Compressor No. 1 Performance Check; Revision 5

Drawings:
- E-7; 250/125V DC and Instrument AC One Line Diagram; Revision 45
- E-2013H; Station 125VDC Distribution System Failure Analysis Manual; Revision 2

Calculations:
- C-EE-002.01-017; 125/250 Volt DC System Failure Analysis; Revision 0

Other:
- System Health Report 2012-4; System 02-01; 125/250 VDC & HV/AC
- System Health Report 2012-4; System 18-01; Station and Instrument Air
- Standing Order No. 13-004; Engineering Recommendations for Station/Instrument Air System Operations; Revision 0
- EDR-H-016; Cooper Turbocompressor Turbo Air 2000 Centrifugal Compressor Handbook; Revision 1
- G-CS-00313-03; Pall Pneumatic Products Corporation Instruction Manual for Model 25HA1-0000G Air Dryer
- M-079AN-00009-08; Operator's Manual for Air-Pac Compressor Class WNAPOL-112

1R13 Maintenance Risk Assessments and Emergent Work Control

Condition Reports:
- 2010-69758; AF68 Check Valve Failure
- 2013-00146; ECCS Room Cooler 1, E42-1, Failed its Quarterly Monitoring Test, DB-PF-04736
- 2013-02017; Misposition of CC1567B, CCW to CRD Cooler Containment Isolation\
- 2013-01309; Unexpected Elevation in PRA During Lemoyne Line Removal From Service and Makeup Pump 2 Unavailable

Procedures:
- DB-SP-03320; H2 Dilution System Train 1 Quarterly Test; Revision 11
- DBBP-OPS-0003; On-line Risk Management Process; Revision 11
- NOPL-AD-0010; Integrated Risk Management; Revision 0
- NOP-OP-1007; Risk Management; Revision 16

Work Orders:
- 200491554; AF68, AF4980 Remove Valves ECP 11-0104-02
- 200545457; Troubleshoot ECCS Room Cooler 1
- 600809957; Troubleshoot ECCS Room Cooler 1
- 600810059; Justification for Opening SW87

Drawings:
- OS-17A, Sheet 1; Operations Schematic Auxiliary Feedwater System; Revision 26

Other:
- ECP 10-0200-00; Rerate Auxiliary Feedwater Oil Cooling Water Components to Sustain Worst Case Service Water Pressure; Revision 0
- ECP 11-0104-002; Remove AF4980 and Remove AF68 Internals; Revision 1
- NOBP-TR-1122; Operating Crew Performance Critique Form, Mis-position of CC1567B, CCW to CRD Cooler CTMT Isolation; Revision 0

1R15 Operability Determinations and Functionality Assessments

Condition Reports:
- 2012-03201; ECCS Cooler 1 Has Low Flow
- 2012-04622; Greater than Expected Nodule Growth was Identified in the New 3-Inch ECCS Room Cooler 1 Supply and Return Piping
- 2013-00146; ECCS Room Cooler 1, E42-1, Failed Its Quarterly Monitoring Test, DB-PF-04736
- 2013-00855; Main Steam Line Room Roof Hatch Found Broken
- 2013-03901; Service Water Pump 1 Stator Temperature, T921, in Alarm

Procedures:
- DB-PF-04736; ECCS Room Cooler Monitoring Test; Revision 5

Operations Standing Orders:
- 13-002; Emergency Core Cooling System Room Cooler 1 (E42-1) Non-Functional; Revision 0

1R19 Post Maintenance Testing

Condition Reports:
- 2013-00747; Decay Heat Procedure Step Performed When not Required

- 2013-00725; Poor RP Worker Practices could have Resulted in Spreading Contamination
- 2013-03239; Over Speed Trip Test
- 2013-03256; EDG 1 Low Air Start Receiver Pressure
- 2013-03251; Unable to Complete Corrective Order No. 200437204, EDG No. 1 Oil Drain Sleeve Replacement

Procedures:
- DB-SP-03161; AFW Train 2 Level Control, Interlock, and Flow Transmitter Test; Revision 29
- DB-SP-04159; AFP 2 Monthly Test; Revision 16
- DB-SP-03136; Decay Heat Train 1 Pump and Valve Test; Revision 33
- DB-PF-06704; Pump Performance Curves; Revision 30
- DB-MI-03011; Channel Functional Test of Reactor Trip Breaker B, RPS Channel 1 Reactor Trip Module Logic, and ARTS Channel 1 Output Logic; Revision 28
- DB-ME-03020; Reactor Trip Breaker Response Time Test; Revision 4
- DB-OP-01000; Operation of Station Breakers; Revision 27
- DB-ME-09101; Reactor Trip Breaker Maintenance and Testing; Revision 3
- DB-MM-09345; Emergency and Station Blackout Diesel Engine 6-Year Maintenance; Revision 2
- DB-MM-09320; Emergency and Station Blackout Diesel Engine Maintenance; Revision 29
- DB-OP-06316; Diesel Generator Operating Procedure; Revision 54
- DB-SC-03070; Emergency Diesel Generator 1 Monthly Test; Revision 31
- DB-SC-03080; Emergency Diesel Generator 1 Overspeed Trip Test; Revision 9

Work Orders:
- 200452376; PM 2162, Inspect AFP No. 2 Breaker (BF1177)
- 200442875; PM 9206, Calibrate PSL4931X2
- 200442831; PM 1702, AFW No. 2 Turbine Lube and Check TTV
- 200448946; PM 7442, Inspect/Rebuild Steam Traps AFW Train 2
- 200491554; AF68, AF4980 Remove Valves ECP 11-0104-02
- 200422145; PM 0300; MVDH1B Inspect (BE1106)
- 200468092; PM 0286; P42-1 Lube Decay Heat Pump / Motor
- 200448352; PM 0371; Reactor Trip Breaker B Logic Functional
- 200437204; EDG No. 1 Oil Drain Sleeve Replacement
- 200535562; EDG No. 1 6-Year PM Per DB-MM-09345

Drawings:
- OS-17A, Sheet 1; Operations Schematic Auxiliary Feedwater System; Revision 26
- M-003C; Piping & Instrument Diagram Decay Heat Train 2; Revision 27
- OS-004, Sheet 1; Operation Schematic Decay Heat Removal / Low Pressure Injection System; Revision 50
- OS-004, Sheet 2; Operation Schematic Decay Heat Removal / Low Pressure Injection System; Revision 7

Other:
- ISTB3; Pump and Valve Basis Document, Volume III, Stroke Time Basis; Revision 46

1R22 Surveillance Testing

Condition Reports:
- 2013-00101; EDG 2 Minor Air Box Leaks at Test Cock Seals;

- 2013-00747; Decay Heat Procedure Step Performed When not Required; 1/17/2013
- 2013-01784; RCS Unidentified Leakage – 9 Consecutive Excedences [sic] of the Baseline Leakage Mean
- 2013-02361; Performing DB-SP-03151, AFP 1 Quarterly, Prior to Performing DB-PF-03153, AFW Train 1 Check Valve Test, May Results in Unacceptable Preconditioning
- 2009-67988; Failed AF63 Closure Test
- 2012-18405; AF63 Failed Reverse Flow Test
- 2013-03739; Two (2) Neutron Dose Alarms Received While Performing Containment Entry Walkdown/Inspection at 100 Percent Power Operations
- 2013-03744; March 2013 Quarterly Containment inspection, Oil Noted on Floor of 585' Elevation
- 2013-03747; March 2013 Quarterly Containment Inspection, Oil on floor 603' Elevation
- 2013-03748; March 2013 Quarterly Containment Inspection. Green Dust in Containment
- 2013-03751; March 2013 Quarterly Containment inspection, White Dust in Containment

Procedures:
- DB-SC-03071; Emergency Diesel Generator 2 Monthly Test; Revision 29
- DB-SP-03136; Decay Heat Train 1 Pump and Valve Test; Revision 33
- DB-SP-04150; Auxiliary Feedwater Pump 1 Monthly Test; Revision 14
- DB-PF-06704; Pump Performance Curves; Revision 30
- DB-ME-03045; C1 Bus Under Voltage Units Monthly Functional Test; Revision 18
- DB-OP-01200; Reactor Coolant System Leakage Management; Revision12
- DB-SP-03357; RCS Water Inventory Balance; Revision 18
- DB-OP-02522; Small RCS Leaks, Revision 11
- DB-PF-06703; Miscellaneous Operation Curves; Revision 19
- NG-EN-00327; RCS Integrated Leakage Program; Revision 2
- DB-SP-03151; Auxiliary Feed Pump 1 Quarterly Test; Revision 34
- DB-SP-03153; Auxiliary Feed Pump 1 Check Valve Tests; Revision 17
- NORM-ER-2001; Preconditioning Systems, Structures, and Components; Revision 1
- DB-OP-01101; Containment Entry; Revision 11

Work Orders:
- 200422145; PM 0300; MVDH1B Inspect (BE1106)
- 200468092; PM 0286; P42-1 Lube Decay Heat Pump / Motor
- 200448797; PF3153-001 AF63 Forward Flow Test
- 200448798; PF3153-002 AF63 Reverse Flow Test
- 200448799; PF3153-003 AF19 Reverse Flow Test

Drawings:
- M-003C; Piping & Instrument Diagram Decay Heat Train 2; Revision 27
- OS-004, Sheet 1; Operation Schematic Decay Heat Removal / Low Pressure Injection System; Revision 50
- OS-004, Sheet 2; Operation Schematic Decay Heat Removal / Low Pressure Injection System; Revision 7
- M-006D; Piping and Instrument Diagram Auxiliary Feedwater System
- Calculations:
- C-ME-099.16-010; Check Valve Design Basis Analysis; Revision 1

Other:
- ISTB1; Pump and Valve Basis Document, Volume 1, Valve Basis; Revision 14

- ISTB3; Pump and Valve Basis Document, Volume III, Stroke Time Basis; Revision 46
- ALARA Plan #2013-2001; Containment Quarterly Entry at Power to Perform Material Condition Inspection for elevations 603', 585', and 565'; Revision 0

1EP6 Drill Evaluation

Condition Reports:
- 2013-03403; PA-DB-13-01: ERO March 2013 Integrated Drill OSCs Procedure Use
- 2013-03351; EP DRILL - Limitations of Plant UHF Portable Radio System
- 2013-03438; PA-DB-13-01: Procedure Placekeeping During Drill Not Always Performed
- 2013-03441; PA-DB-13-01: Three Part Communication Not Always Being Performed During Drill Activities
- 2013-03294; PA-DB-13-01: Emergency Response Integrated Drill 3/5/13 Technical Support Center
- 2013-03541; EP Drill - Site Protection
- 2013-03420; PA-DB-13-01: Communication Cue Initiated in the Emergency Preparedness Drill Was Not Answered in the Simulated Control Room
- 2013-03371; EP Drill - Initial Notification Form Not Completed Correctly Following a Change in Protective Action Recommendations
- 2013-03302; PA-DB-13-01: Emergency Response Drill 3/5/13 Technical Support Center
- 2013-03246; Site Protection Needs Emergency Preparedness Procedural Guidance and Training in How and When to Request the Invoke 10 CFR 50.54(x)

Other:
- Emergency Preparedness Integrated Drill Manual, March 5, 2013; Revision 0

2RS3 In-Plant Airborne Radioactivity Control and Mitigation

Condition Reports:
- 2011-96988; INPO 2011: Radiation Protection: Control of Alpha Contamination – Performance Deficiency
- 2012-08729; Powered Air Purifying Respirator (PAPR) Part Omitted causing void in National Institute of Occupational Safety and Health (NIOSH) certification
- 2012-08836; AREVA Mirrored Condition Report: Lower than Normal Amount of Breathing Air for Steam Generator Nozzle Day Workers
- 2012-07284: Optimair TL Powered Air Purifying Respirator (PAPR) Failed in Containment
- 2011-00360; MS-C-11-08-03: Respirator Air Compressor Maintenance Issues
- 2011-00234; MS-C-11-08-03: Annual Respirator and Respiratory Equipment not Performed

Procedures:
- DB-HP-01312; Testing of Portable HEPA Filtered Equipment; Revision 2
- NOP-OP-4703; Determination of Alpha Monitoring Levels; Revision 2
- DB-SS3252-001; EVS Train 1 Refuel/Spec Test; January 2013
- DB-SS3146-001; CREVS Train 2 CTRM EVS Refuel/Spec Test; September 2012

Other:
- Alpha Area Level Assessment; February 2013
- Air Sample Records; Various Records
- Grade D Air Quality Analysis; 2011-2012

2RS4 Occupational Dose Assessment

Condition Reports:
- 2011-03141; Worker Receives Accumulated Dose Alarm
- 2011-03200; Insulator Receives Dose Rate Alarm while Working in East D-Ring 565'
- 2011-03661; WSI Worker Receives Dose Rate Alarm
- 2011-04171; NPS Radworker Receives Dose Alarm While Working in #2 Emergency Core Cooling Room (ECCS)
- 2012-08966; Worker Receives Dose Rate Alarm

Procedures:
- NOP-OP-4201; Routine External Exposure Monitoring; Revision 0
- NOP-OP-4204; Special External Exposure Monitoring; Revision 6
- NOP-OP-4202; Declared Pregnant Workers; Revision 0
- NOP-OP-4206; Bioassay Program; Revision 0

Other:
- Declared Pregnant Worker Records; 2012 Records
- Effective Dose Equivalent Dose Determination Record; February 2012
- Fastscan Whole Body Calibration; October 10, 2012
- Neutron Radiation Exposure Tracking; Various Records
- TLD/DRD Deviation Investigation Reports; 2011-2012
- SPM-906; Sensitivity to Internal Contamination; October 10, 2007

4OA1 Performance Indicator Verification

Other:
- NOBP-LP-4012-44; Initiating Events Cornerstone Indicators; Completed Forms for January 2012 through December 2012
- NEI 99-02; Regulatory Assessment Performance Indicator Guideline; Revision 6
- Select Operator Logs covering the period of January 2012 through December 2012

4OA2 Problem Identification and Resolution

Condition Reports:
- 2003-02439; Clearances in Cyclone Separator of Decay Heat/Low Pressure Injection Pumps
- 2012-18831; Cyclone Separator Installed Upside Down
- 2012-18912; S442A and S442B Cyclone Separator Spacers Were Not Installed As Designed
- 2012-18987; DH115B Installed In The Wrong Direction
- 2012-19003; Improvement Regarding DH Pump Cyclone Separators
- 2012-19429: No Spacers Found During Extent Of Condition Inspection For Cyclone Separator S441A
- 2012-19430; No Spacers Found During Extent Of Condition Inspection For Cyclone Separator S441B

Engineering Change Package:
- 03-0263; Decay Heat Removal Pumps (P42-1and P42-2) Mechanical Seal Water Supply Cyclone Separator Replacement; Revision 3

Drawings:
- P & ID M-033A; High Pressure Injection; Revision 44

- P & ID M-033B; Decay Heat Train 1; Revision 55
- P & ID M-033C; Decay Heat Train 2; Revision 27
- P & ID M-034; Emergency Core Cooling System – Containment Spray and Core Flooding Systems; Revision 67

Calculations:
- C-NSA-059.01-019; Water Level Inside Containment Post LOCA; Revision 5

Other:
- Reactor Plant Event Notification Worksheet, Voluntary Report; 12/14/2012
- Vendor Manual M-517-00024; Decay Heat Removal Pump Instruction Book; Revision 7

4OA3 Follow-up of Events and Notices of Enforcement Discretion

Condition Reports:
- 2011-01902; Extent of Condition Concerns from CR 11-98223
- 2011-02447; Non Safety DC Load in Containment
- 2011-02622; NRC Discussion Relating to POD 2011-04 (CR 11-1902)
- 2011-98223; DC System Issues from NRC CDBI
- 2011-98349; ODMI on Operations of YAU/YBU and Other Loaded Based Upon NRR TIA 11-01
- 2012-08388; NRC-NCV: Failure to Maintain Safety-Related DC Systems Design Control

4OA5 Other Activities

Condition Reports:
- 2010-83147; Underground Piping and Tanks Initiative
- 2012-00465; NRC Observations on Buried Pipe Program Basis Document During NEI 09-14 Inspection
- 2012-00471; NRC Observations on NOP-ER-2007 and Buried Pipe Database During NEI 09-14 Inspection
- 2013-01064; Buried Pipe Phase 2 Inspection Observation – Phase 1 Recommendation Not Properly Implemented
- 2013-01609; NRC Inspector Observations Communicated During TI-2515/182 Buried Pipe Phase II Inspection Technical Debrief

Procedures:
- NOP-ER-2007; Underground Piping and Tanks Integrity Program; Revision 4
- NOP-WM-4007; Excavation and Trenching Controls; Revision 2
- DB-PF-05015; Ultrasonic Thickness Examination Using the Panametric 36DL Plus or 37DL Plus; Revision 6
- NA-QC-05560; Visual Examination Procedure for VT-1, VT-3 and General Visual Examinations; Revision 10
- NOP-ER-2101; Engineering Program Management; Revision 7

Work Order:
- 200378699; Cathodic Protection Lean, Inspect and Survey; July 9, 2012

Various Reports:
- SN-SA-2011-0177; Implementation of NEI 09-14 Guidance for the Management of Underground Piping and Tank Integrity; May 30, 2012

- 17-VT-400; Visual Examination System Leakage; May 22, 2012
- 17-VT-328; Visual Examination System Leakage; January 31, 2012
- 17-VT-044; Visual Examination System Leakage; August 10, 2011
- FBS-JN-0103; Long-Range Guided Wave Inspection Report; April 14, 2009
- BOP-UT-10-053; UT Erosion/Corrosion Examination; October 12, 2010
- CSI Report No. 3202.100-01; Davis-Besse Nuclear Power Station Buried Piping Program Basis Document; June 12, 2009
- Eawus830LINS080919-1; External Corrosion Direct Assessment Indirect Survey, Direct Examination and Post Assessment Davis Besse Nuclear Station DFO-1 and DFO-2 Pipelines; February 18, 2009
- Eawus832ANGEL090129-1; External Corrosion Direct Assessment Indirect Inspection Step 3-inch Stainless Steel Radwaste Water Discharge Line; February 13, 2009
- FO-SA-2012-008; 2012 Buried Pipe Focused Self Assessment; August 20, 2012

Drawings:
- C-0053-3; Yard Utilities Plan Sheet 7; Revision 39
- C-0053-17; Yard Utilities Plan Sheet 7; Revision 39
- C-0051-1; Yard Utilities Plan Sheet 5; Revision 29
- C-0053-16; Yard Utilities Plan Sheet 7, Revision 39
- C-0053-16; Yard Utilities Plan Sheet 7; Revision 39

Other:
- FSK-M-HBC-T153-1; Trim for Emergency Diesel Generator Fuel Oil Storage Tank T153-1; Revision 3
- SUS 007-01; Cathodic Protection System Monitoring Plan
- Buried Piping Program Health Report 2012-1
- Underground Piping and Tanks Integrity Initiative NEI 09-14 Buried Piping Inspection Plan; December 10, 2012
- Notification 600727104; Add Sec Plant Outage Drain to BP scope; January 3, 2012

4OA7 Licensee-Identified Violations

Condition Reports:
- 2003-02439; Clearances in Cyclone Separator of Decay Heat/Low Pressure Injection Pumps
- 2012-18831; Cyclone Separator Installed Upside Down
- 2012-18912; S442A and S442B Cyclone Separator Spacers Were Not Installed As Designed
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- P & ID M-033C; Decay Heat Train 2; Revision 27
- P & ID M-034; Emergency Core Cooling System – Containment Spray and Core Flooding Systems; Revision 67

Calculations:
- C-NSA-059.01-019; Water Level Inside Containment Post LOCA; Revision 5

Other:
- Reactor Plant Event Notification Worksheet, Voluntary Report; 12/14/2012
- Vendor Manual M-517-00024; Decay Heat Removal Pump Instruction Book; Revision 7

LIST OF ACRONYMS USED

ac	Alternating Current
ADAMS	Agencywide Document Access Management System
AFW	Auxiliary Feedwater
ALARA	As-Low-As-Is-Reasonably-Achievable
ASME	American Society of Mechanical Engineers
CAP	Corrective Action Program
CCW	Component Cooling Water
CFR	Code of Federal Regulations
CIV	Containment Isolation Valve
CR	Condition Report
CRD	Control Rod Drive
DC	Direct Current
DH	Decay Heat
DRP	Division of Reactor Projects
ECCS	Emergency Core Cooling System
EDG	Emergency Diesel Generator
EP	Emergency Preparedness
IMC	Inspection Manual Chapter
INPO	Institute of Nuclear Power Operations
IP	Inspection Procedure
IPEEE	Individual Plant Examination of External Events
IR	Inspection Report
IST	Inservice Testing
LCO	Limiting Condition for Operation
LER	Licensee Event Report
LLC	Limited Liability Corporation
LOCA	Loss of Coolant Accident
MOV	Motor-Operated Valve
NCV	Non-Cited Violation
NEI	Nuclear Energy Institute
NRC	U.S. Nuclear Regulatory Commission
NRR	Nuclear Reactor Regulation
PARS	Publicly Available Records System
PI	Performance Indicator
PI&R	Problem Identification and Resolution
PM	Preventative Maintenance
PMT	Post-Maintenance Testing
QA	Quality Assurance
RP	Radiation Protection
RPS	Reactor Protection System
SBODG	Station Blackout Diesel Generator
SCBA	Self-Contained Breathing Apparatus
SDP	Significance Determination Process
SFRCS	Steam and Feedwater Rupture Control System
SRO	Senior Reactor Operator
SSC	Systems, Structures, and Components
SW	Service Water

TIA	Task Interface Agreement
TLD	Thermoluminescent Dosimeters
TS	Technical Specification
USAR	Updated Safety Analysis Report
URI	Unresolved Item
Vac	Volts Alternating Current
Vdc	Volts Direct Current
WBC	Whole Body Count
WO	Work Order

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Sincerely,

/RA/

Jamnes L. Cameron, Chief
Branch 6
Division of Reactor Projects

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Letter to R. Lieb from J. Cameron dated April 22, 2013.

SUBJECT: DAVIS-BESSE NUCLEAR POWER STATION INTEGRATED INSPECTION REPORT 05000346/2013002

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