

October 25, 2007

EA-03-0214

Mr. Mark B. Bezilla
Site Vice President
FirstEnergy Nuclear Operating Company
Davis-Besse Nuclear Power Station
5501 North State Route 2
Oak Harbor, OH 43449-9760

SUBJECT: DAVIS-BESSE NUCLEAR POWER STATION
NRC INTEGRATED INSPECTION REPORT 05000346/2007004

Dear Mr. Bezilla:

On September 30, 2007, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Davis-Besse Nuclear Power Station. The enclosed inspection report documents the inspection findings which were discussed on October 9, 2007, with you and other members of your staff. Additionally, this inspection report documents special inspection activities associated with your compliance with the March 8, 2004, Confirmatory Order (EA 03-214).

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.

The report documents one NRC-identified finding of very low safety significance (Green). Additionally, a licensee-identified violation, which was determined to be of very low safety significance, is listed in this report. However, because of its very low safety significance and because the issue has been entered into your corrective action program, the NRC is treating the violation as a non-cited violation (NCV) in accordance with Section VI.A.1 of the NRC Enforcement Policy.

If you contest the subject or severity of the NCV in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, D.C. 20555-0001; with copies to the Regional Administrator Region III, 2443 Warrenville Road, Suite 210, Lisle, IL 60532-4352; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, D.C. 20555-001; and the NRC Resident Inspector at Davis-Besse.

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

Sincerely,

/RA/

Bruce L. Burgess, Chief
Branch 6
Division of Reactor Projects

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

Enclosure: Inspection Report 05000346/2007004
w/Attachment: Supplemental Information

cc w/encl: The Honorable Dennis Kucinich
J. Hagan, President and Chief
Nuclear Officer - FENOC
J. Lash, Senior Vice President of
Operations and Chief Operating Officer - FENOC
Richard Anderson, Vice President,
Nuclear Support - FENOC
Manager - Site Regulatory Compliance - FENOC
D. Pace, Senior Vice President of
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J. Rinckel, Vice President, Fleet Oversight - FENOC
D. Jenkins, Attorney, FirstEnergy Corp.
Director, Fleet Regulatory Affairs - FENOC
Manager - Fleet Licensing - FENOC
Ohio State Liaison Officer
R. Owen, Administrator, Ohio Department of Health
Public Utilities Commission of Ohio
President, Lucas County Board of Commissioners
President, Ottawa County Board of Commissioners

M. Bezilla

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SUBJECT: DAVIS-BESSE NUCLEAR POWER STATION
NRC INTEGRATED INSPECTION REPORT 05000346/2007004

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U. S. NUCLEAR REGULATORY COMMISSION

REGION III

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

Report No: 05000346/2007004

Licensee: FirstEnergy Nuclear Operating Company (FENOC)

Facility: Davis-Besse Nuclear Power Station

Location: 5501 North State Route 2
Oak Harbor, OH 43449-9760

Dates: July 1, 2007, through September 30, 2007

Inspectors: J. Rutkowski, Senior Resident Inspector
R. Smith, Resident Inspector
J. Jacobson, Senior Reactor Engineer
J. Neurauter, Senior Reactor Inspector
C. Acosta Acevedo, Reactor Inspector
T. Go, Health Physicist
J. McGhee, Reactor Engineer

Approved by: B. Burgess, Chief
Branch 6
Division of Reactor Projects

Enclosure

SUMMARY OF FINDINGS

IR 05000346/2007004; 7/1/2007 - 9/30/2007; Davis-Besse Nuclear Power Station; Maintenance Risk Assessments and Emergent Work Control

This report covers a three-month period of baseline inspection. The inspection was conducted by Region III inspectors, resident inspectors, and a regional health physics inspector. One Green finding was identified. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP). Findings for which the SDP does not apply may be "Green" or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 4, dated December 2006.

A. NRC-Identified and Self-Revealing Findings

Cornerstone: Initiating Events

- Green. The inspectors identified a finding for the licensee's failure to properly design a temporary repair for a through wall pipe crack found in the circulating water system. Specifically, the inspectors identified that a stress intensification factor, used in determining the minimum required pipe wall thickness, repair plate thickness, and repair fillet weld size, was improperly calculated. Once identified, the licensee entered the issue into their corrective action program and appropriately modified the design and supporting calculations. No violation of regulatory requirements occurred.

The inspectors determined that the finding was more than minor because, if the original design was left uncorrected, a more significant safety concern could have been created. Additionally, the finding was more than minor, as shown in examples of minor issues, IMC 0612, Appendix E, example 3a, because the calculation errors were significant enough that the modification required revision. The finding was of very low safety significance because the finding did not contribute to the likelihood of a primary or secondary system loss of coolant accident initiator; did not contribute to both the likelihood of a reactor trip and the likelihood that mitigation equipment or functions would not be available; did not increase the likelihood of a fire; and did not involve degradation of a barrier specifically designed to mitigate flooding or involve the total loss of any safety function. The inspectors also determined that the cause of the finding was related to the cross-cutting area of human performance with the component of work practices (H4.(a)) in that self and peer checking did not identify calculation issues with the original design. (Section 1R13)

B. Licensee-Identified Violations

A violation of very low safety significance, which was identified by the licensee, has been reviewed by the inspectors. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program. The violation and corrective actions are listed in Section 4OA7 of this report.

REPORT DETAILS

Summary of Plant Status

At the beginning of the inspection period, the plant was operating at 100 percent power.

On September 9, 2007, the licensee reduced power to approximately 92 percent for quarterly testing of main turbine stop and control valves. Power was returned to 100 percent the same day after completion of the testing.

On September 21, 2007, the licensee commenced lowering power to about 20 percent power for a containment entry to add oil to the reactor coolant pump 2-1 motor upper oil reservoir. After completion of the activity, which included draining approximately 30 gallons of oil from the motor's spill collection system, the licensee returned power to 100 percent power on September 22, 2007. The plant operated at approximately 100 percent power for the remainder of the inspection period.

1. REACTOR SAFETY

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

1R04 Equipment Alignment (71111.04Q)

a. Inspection Scope

The inspectors performed a partial walkdown of the following systems to verify the operability of redundant or diverse trains and components when safety equipment was inoperable. The walkdown was designed to identify any discrepancies that could impact the function of the system, and therefore, potentially increase risk. The inspectors reviewed applicable operating procedures and walked down control systems components, to verify that selected breakers, valves, and support equipment were in the correct position to support system operation. The inspectors also reviewed corrective action documents to verify 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. Documents reviewed are listed in the Attachment.

- Containment spray train 1 during train 2 scheduled maintenance on July 19, 2007
- Service water pump 3 and associated equipment on July 30, 2007, while service water pump 3 was aligned as the train 1 pump during planned maintenance activities that made service water pump 1 inoperable
- Decay heat removal/low pressure injection train 1 during train 2 outage on September 11, 2007

This review represented three quarterly inspection samples of partial system walkdowns.

b. Findings

No findings of significance were identified.

1R05 Fire Protection (71111.05)

.1 Fire Protection - Tours (71111.05Q)

a. Inspection Scope

The inspectors toured the areas listed below to assess the material condition and operational status of fire protection features. The inspectors used the information from the tours to determine whether combustibles and ignition sources were controlled in accordance with the licensee's procedures; fire detection and suppression equipment was available for use; passive fire barriers were maintained in good material condition; and compensatory measures for out-of-service, degraded, or inoperable fire-protection equipment were implemented in accordance with the licensee's fire plan.

- Component cooling heat exchanger and pump room (Fire Area T, Room 328)
- Number 1 electrical penetration room (Fire Area DG, Room 402)
- Auxiliary building elevation 565 feet passageway (Fire Area G, Rooms 227, 231, 234, 235, 240, 241 and 244)
- Mechanical penetration room 2 (Fire Area A, Room 236)
- Mechanical penetration room 3 (Fire Area AB, Room 303)
- Mechanical penetration room 4 (Fire Area A, Room 314)
- Turbine building elevation 565 feet (Fire Area II, Rooms 246, 247, 248, 249, 253, 253, and 254)

This review represented seven quarterly inspection samples.

b. Findings

No findings of significance were identified.

.2 Fire Brigade Drill (71111.05A)

a. Inspection Scope

On August 20, 2007, the inspectors observed a fire brigade activation in response to a report of smoke coming from transformer LM3 located in the protected area between the low level radwaste and plant support buildings. The observation was used to determine whether protective clothing/turnout gear was properly donned; the fire area was entered in a controlled manner; response times were within licensee procedural guidelines; sufficient fire fighting equipment was brought to the scene by the fire brigade to properly perform their firefighting duties; and, the fire brigade leader's fire fighting directions were thorough, clear, and effective. The inspectors attended the fire brigade debrief of the event.

This review represented one annual sample.

b. Findings

No findings of significance were identified.

1R06 Flood Protection - Internal Flooding (71111.06)

a. Inspection Scope

The inspectors evaluated the potential for flooding the Emergency Core Cooling System (ECCS) rooms from internal factors by reviewing plant design parameters pertinent to controlling the potential for flooding from internal means. The evaluation included a review to check for deviations from the descriptions provided in the Updated Safety Analysis Report (USAR) for features intended to mitigate the potential for flooding from internal factors. The inspectors reviewed the licensee's flooding mitigation procedures and reviewed reports related to possible flood protection issues. Additionally, plant walkdowns were performed to verify design barriers were properly maintained. Penetrations between rooms, watertight doors, electrical conduit seals and covers, and room drains were inspected to verify material condition met design assumptions. As part of the evaluation, the inspectors reviewed the conditions of a feedwater or main steam line break in rooms that drain to the ECCS sumps and therefore have the potential to flood the rooms.

This review represented one inspection sample for internal flooding.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Regualification Program (71111.11Q)

a. Inspection Scope

On August 28, 2007, and September 20, 2007, the inspectors observed an operating crew during a crew simulator evaluation and attended the post-session licensee controller and crew critiques. The inspectors reviewed crew performance in the areas of:

- clarity and formality of communications;
- ability to take timely action in a safe direction;
- ability to prioritize, interpret and respond to alarms;
- procedure use;
- oversight and direction from supervisors;
- controller and crew interaction to determine if there was any apparent coaching;
- group dynamics; and
- controller and crew ability to identify areas for improvement.

Crew performance in these areas was compared to licensee management expectations and guidelines as presented in Davis-Besse operational and administrative procedures. The operational scenario in August 2007 included a total loss of the makeup system with a subsequent plant trip with a high deaerator level post-trip. The simulator evaluation conducted in September 2007 was performed in conjunction with a site emergency drill and the scenario included fuel failure with a steam generator tube rupture with subsequent failure of the associated atmospheric vent valve.

This review represented two quarterly inspection samples.

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness (71111.12)

a. Inspection Scope

The inspectors reviewed the licensee's evaluation and resolution of performance issues associated with the following systems:

- Service Water System;
- Medium Voltage Alternating Current (AC); and
- Auxiliary Building Chilled Water System

The reviews consisted of evaluating whether:

- the condition report process was used in identifying deficiencies and issues with system equipment;
- equipment performance issues were correctly categorized for reliability per the system's scoping sheet performance criteria;
- the licensee was effectively tracking key parameters and identifying system trends and monitoring for signs of component failures;
- the goals and corrective actions associated with long-term reliability were appropriate;
- the physical condition of the system was consistent with status as reflected in condition reports and open work orders;
- the licensee's corrective actions included extent of condition; and
- the maintenance rule system status classification was appropriate, with emphasis on whether current classification appeared appropriate for the equipment's recent history.

Additionally, the inspectors performed a walkdown of the systems and selectively discussed planned corrective actions with the system engineer.

This review represented three annual inspection samples.

b. Findings

No findings of significance were identified.

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

a. Inspection Scope

The inspectors reviewed the following activities to determine whether the appropriate risk assessments were performed as required by 10 CFR 50.65(a)(4), and were accurate and complete prior to removing equipment for work. The inspectors also reviewed emergent work to verify that the plant risk was promptly reassessed and managed. The inspectors also used the reviews to verify the appropriate use of the licensee risk assessment tool and risk categories in accordance with procedures, and observed licensee's personnel response to changes in planned activities. Documents reviewed are listed in the Attachment. Activities reviewed were:

- Initial and revised risk summaries for the week of July 30, 2007, and revised work schedules due to emergent issues with circulating water;
- Initial and revised risk summaries for the week of August 6, 2007, and revised work schedules due to emergent issues with electro-hydraulic control accumulators for the main turbine and high regional humidity and temperatures which elevated licensee attention to electrical grid conditions;
- Initial and revised risk summaries for the week of August 20, 2007, and revised work schedules due to a misapplication of an environmental conditioning factor in the licensee's calculation of risk and due to high regional humidity and temperature;
- Initial and revised risk summaries for the week of September 10, 2007, and revised work schedules due to emergent issues with environmental qualification of valve DH1A, train 1 low pressure injection valve; and
- Initial and revised risk summaries for the week of September 17, 2007, and work activities associated with a power reduction and containment entry for inspection and work to address upper oil reservoir leakage on reactor coolant pump motor 2-1.

This review represented five inspection samples.

b. Findings

Introduction: Section 4OA7 of this report documents a licensee-identified violation of NRC requirements for not appropriately assessing risk.

During the emergent work review, the inspectors identified a Green finding for the licensee's failure to properly design a temporary repair for a through wall pipe crack found in the circulating water system. Specifically, the inspectors identified that a stress intensification factor, used in determining the minimum required pipe wall thickness, repair plate thickness, and repair fillet weld size, was improperly calculated. No violation of regulatory requirements occurred with this Green finding.

Description: On August 1, 2007, a non-licensed operator, while on a normal in-plant tour route, identified a small leak from a 2.5 inch to a 3.5 inch through wall crack in the 102 inch diameter circulating water pipe on the outlet of the low pressure main condenser outer loop. Flooding caused by a failure of the circulating water pipe in the condenser pit, located in the lower level of the turbine building, could adversely affect the main feed pumps and the motor driven feed pump. The site's design for this area included condenser pit flooding abatement features that minimize the potential for flooding over the walls of the pit. Flooding over the condenser pit could adversely affect safety-related equipment including the auxiliary feedwater pumps.

The licensee decided that a patch placed over the crack area would ensure that any crack growth would not result in a flooding scenario prior to a upcoming scheduled refueling outage, during which the pipe internals could be inspected. The licensee developed calculation C-CSS-043.03-008 and design change ECR 07-0131-00. The design specified an A-285 type C steel plate 0.5 inch thick to cover the area of the crack and thinned pipe wall areas near the crack that had been identified by ultrasonic measurements.

Although not a safety-related system, NRC inspectors reviewed the initial approved calculations and design change package because of the potential for transient initiation and potential impact on safety-related equipment should a large break occur. The inspectors identified errors in the calculations significant enough to question the whether the plate design and fillet weld details were appropriate. The licensee, after reviewing the inspectors comments, agreed that errors had been made in the stress intensity factor calculations that negatively impacted the plate's design and installation techniques. The deficient condition was documented in CR 07-24820.

The licensee's revised design specified A-285 type C steel plate 0.75 inch thick with revisions to the thickness of the weld. The licensee installed this revised design without incident and the work order was completed on September 7, 2007. During the period of time required for the redesign, the leak rate had increased significantly, although it was still quantified as drips, and without any visual indication of growth in crack length.

Analysis: The inspectors reviewed this finding using the guidance contained in Appendix B, "Issue Disposition Screening," of Inspection Manual Chapter 0612, "Power Reactor Inspection Reports." The inspectors determined that the initial calculation error was a performance deficiency that affected the Initiating Events cornerstone and warranted a significance determination. The inspectors determined that the finding was more than minor because, if the original design was left uncorrected, a more significant safety concern could have been created. Additionally, the finding was more than minor because the calculation errors were significant enough that the modification required revision, as shown in examples of minor issues, IMC 0612, Appendix E, example 3a. The inspectors determined that the finding warranted evaluation using the SDP because the finding was associated with an increase in the likelihood of an initiating event.

The inspectors evaluated the finding using IMC 0609, Appendix A, Attachment 1, "Significance Determination of Reactor Inspection Findings for At-Power Situations." Using the Phase 1 SDP worksheet for the Initiating Events cornerstone, Transient Initiators contributor, the inspectors determined that the finding did not contribute to the

likelihood of a primary or secondary system loss of coolant accident initiator; the finding did not contribute to both the likelihood of a reactor trip and the likelihood that mitigation equipment or functions would not be available; the finding did not increase the likelihood of a fire; and the finding did not involve degradation of a barrier specifically designed to mitigate flooding or involve the total loss of any safety function. Therefore, the finding was determined to be of very low safety significance (Green). The inspectors also determined that the cause of the finding was related to the cross-cutting area of human performance with the component of work practices (H4.(a)) in that self and peer checking did not identify calculation issues with the original design.

Enforcement: The inspectors concluded that the licensee, in their original design for the circulating water line patch, did not properly apply design requirements and failed to discover those deficiencies in their design review process. Because no 10 CFR 50, Appendix B components were impacted by the finding (FIN 05000346/2007004-01), no violation of regulatory requirements occurred. The licensee entered the issue into their corrective action program as CR 07-24820.

1R15 Operability Evaluations (71111.15)

a. Inspection Scope

For the operability evaluations described in the documents listed below, the inspectors evaluated the technical adequacy of the evaluations to ensure that Technical Specification (TS) operability was properly evaluated and the subject component or system remained available such that no unrecognized increase in risk occurred. The inspectors reviewed the USAR to verify that the system or component remained available to perform its intended function. In addition, the inspectors reviewed any compensatory measures implemented to verify that the compensatory measures worked as stated and the measures were adequately controlled. The inspectors also reviewed a sampling of CRs to verify that the licensee was identifying and correcting any deficiencies associated with operability evaluations. Documents reviewed are listed in the Attachment.

- CR 07-25475 and work order 200278911 which addressed the operability of emergency ventilation system train 2 with the exhaust fan having excessive belt movement
- CR 07-22099 which addressed the design basis for service water pressure switches that divert service water to seismically qualified piping
- CR 07-24878 which addressed an apparent unexpected decrease of performance of the auxiliary feedwater pumps during quarterly performance testing
- CR 07-26285 which addressed the failure of main turbine stop valve 2 to fast close from ten percent open during quarterly surveillance testing
- DB-SP-03004, "Service Water Train 2 Design Flow Verification," and calculation C-NSA-011.01-019, which addressed proper design flow of service water for train 2
- CR 07-25993 which addressed lower than expected design flow of service water for train 1 and DB-SP-03003 Service Water Train 1 Design Flow Verification

This review represented six inspection samples.

b. Findings

Introduction: The inspectors determined that an unresolved item (URI) existed concerning the improper setting of the travel stops on Component Cooling Water Heat Exchanger 1 Service Water Outlet Valve SW-36. The setting, in the event of a safety feature system actuation, would limit service water flow to less than flows analyzed in the approved flow balance calculation. The improper setting apparently was made during a maintenance activity in August 2006 and was not discovered until flow balance testing on August 31, 2007.

Description: On August 31, 2007, the licensee was conducting flow balance testing of service water train 1 components. Because of the design of the plant systems, which incorporates a service water pump, a component cooling water pump and heat exchanger, and a containment air cooler that can be aligned to either of the two TS required service water trains, multiple flow tests were required to verify all potential combinations of equipment. The procedure was a new procedure that had been developed to allow online flow balancing instead of the previous norm of conducting the flow balancing during outages. The licensee had successfully completed online flow balancing of service water train 2.

The initial testing of the service water train 1 components had component cooling water (CCW) heat exchanger 1 aligned for train 1 testing. When the testing commenced, the personnel conducting the testing observed that the flow through the heat exchanger was approximately 1200 to 1500 gallons per minute (gpm) lower than they expected. The test was suspended and CCW train 1 was declared inoperable. The licensee entered the action statements for CCW and components cooled by CCW train 1.

The licensee, after declaring CCW train 1 inoperable, removed CCW heat exchanger 1 from service and aligned CCW heat exchanger 3 as the heat exchanger for train 1. After observing expected service water flows through heat exchanger 3, the licensee declared CCW train 1 operable. The licensee determined that the cause of the low flow was an improper setting of the open stops for valve SW36 which is the throttle valve on the service water outlet from CCW heat exchanger 1.

Valve SW36 is a 20 inch manual butterfly valve with a Limitorque manual operator. The operator contained mechanical stop limit devices consisting of nuts that ride on a stem. The nuts can be adjusted to provide both open and close stops. The position of the open stop was determined during required periodic flow balance testing that adjusted the service water system such that adequate cooling water flow was delivered to supplied components. The last flow balancing of the service water train 1 was in April 2006 during the unit's last refueling outage. The opening lock nut was positioned to set the required valve opening to approximately 40 to 45 percent open.

Investigation into the August 2007 low flow condition identified that Valve SW36 was found to have an open limit setting less than that determined necessary by the previous flow balancing. The open limit should have been set to allow the valve to be opened an additional three turns; approximately 50 turns are required to move the valve from full close to full open. With the valve limit stop adjusted and valve SW36 opened the additional three turns, flow testing on September 4, 2007, demonstrated expected flows.

Component cooling water heat exchanger 1 was declared operable on September 15, 2007.

The licensee's investigation determined that degraded actuator stop nuts for valve SW36 had been replaced in August 2006, after the flow balancing in April 2006. Licensee work orders used to perform work on the valve indicated that the replaced stop nuts were adjusted to positions consistent with those established in the April 2006 flow testing. Post maintenance testing to verify that the stop nuts were properly set was not conducted after the stop nuts had been replaced. The licensee concluded that the stop nuts had most likely been improperly set since August 2006.

The improper setting of valve SW36 stop nuts would have resulted in less than desired flow through the CCW heat exchanger 1 in the event of accidents, such as a loss of cooling accident, during periods when CCW heat exchanger 1 was aligned for train 1 service. However, the reduced flow would have provided some cooling and the throttling effect of SW36 would have caused increased flow to components cooled by service water that were in service water branch lines parallel to the CCW heat exchanger. Those components include, among other things, safety train 1 containment air coolers. At the conclusion of the inspection period, the licensee had just completed an evaluation of the capability of CCW train 1 to perform its design function with CCW heat exchanger 1 inservice. The inspectors will review that evaluation during the next inspection period. Therefore, this issue is considered an unresolved item (URI 05000346/2007004-02) pending completion of inspector review of the past operability evaluation and determination of risk significance.

1R19 Post-Maintenance Testing (71111.19)

a. Inspection Scope

The inspectors reviewed the following post-maintenance testing activities associated with scheduled and emergent work activities:

- leading edge flow meter operability on July 19, 2007, after replacement of six transducers that were observed to be degrading, including verification that the transducers and system were providing appropriate inputs to the core power calculation;
- diesel fire pump testing after replacement of valve FP46 [Diesel Fire Pump outlet check valve] on July 24, 2007;
- response time testing of steam generator differential pressure inputs to steam feed rupture control system channel 2, after differential pressure micro-switch replacement for PSD2685B, on August 14, 2007;
- testing of main turbine electro-hydraulic unit accumulators number 3, 4, and 5, on August 10, 2007, after replacement of the accumulators with new units and testing of accumulator number 4 after replacement of the nitrogen charging valve on August 17, 2007;
- testing of decay heat pump 2 on September 11, 2007, after scheduled maintenance and preventive maintenance on the pump and motor; and
- valve stroking of decay heat system DH1A on September 13, 2007, after preventative maintenance that included determination and retermination of

valve motor and replacement of limit switch fingerboard that was damaged during the work activity.

The reviews were conducted to allow the inspectors to determine if the testing was adequate for the scope of the maintenance work performed. The inspectors reviewed the acceptance criteria of the tests to ensure that the criteria was clear and that the testing demonstrated operational readiness consistent with the design and licensing basis documents. Documents reviewed during this inspection are listed in the Attachment.

This review represented six inspection samples.

b Findings

No findings of significance were identified.

1R20 Refueling and Other Outage Activities (71111.20)

.1 Polar Crane and Heavy Lift Inspection (OpESS FY2007-03)

a. Inspection Scope

On July 9, 2007, the inspector initiated the NRC's Operating Experience Smart Sample (OpESS) FY2007-03, "Crane and Heavy Lift Inspection, Supplemental Guidance for IP-71111.20," related to the reactor vessel head removal and installation during refueling operations. The inspection elements included: review of the licensee's submittals and commitments related to Generic Letters (GL) 80-113 and 81-07, "Control of Heavy Loads"; review of the licensee's polar crane preventative maintenance, testing, and inspection program; review of the licensee's calculations for polar crane rigging and special lifting devices; review of the licensee's calculations related to a postulated reactor vessel head drop; review of the licensee's procedures that remove and install the reactor vessel head during refueling operations including the heavy load safe load path; review of the licensee's procedures that control the total weight lifted by the polar crane and the polar crane rated lift capacity. Inspector follow-up activities related to the inspection are on-going.

This review represented one inspection sample which will be continued in the next quarter's inspection activities.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

The inspectors observed the surveillance test or evaluated test data to determine if the equipment tested met TS, USAR, and licensee procedural requirements, and also demonstrated that the equipment was capable of performing its intended safety functions. The inspectors used the documents listed in the Attachment to determine if the test met the TS frequency requirements; that the test was conducted in accordance with the procedures, including establishing the proper plant conditions and prerequisites;

that the test acceptance criteria was met; and that the results of the test were properly reviewed and documented. The following surveillances were evaluated:

- DB-SP-03218, high pressure train 1 pump and valve quarterly test on July 10, 2007;
- DB-MI-03013, channel functional test of reactor trip breaker D, on July 12, 2007;
- DB-ME-03046, bus D1 under voltage units monthly functional test, on July 27, 2007;
- DB-SC-04271, station blackout diesel generator monthly test, on September 13, 2007;
- DB-MI-03012, channel functional test of reactor trip breaker A, on September 14, 2007;
- DB-SP-03357, reactor coolant system water inventory balance, on September 17, 2007; and
- DB-SP-03160, auxiliary feedwater pump 2 quarterly test, on September 19, 2007

This review represented seven inspection samples of which two were quarterly inservice testing (IST) inspection samples and one was a reactor coolant system leak detection sample.

b. Findings

No findings of significance were identified.

1R23 Temporary Plant Modifications (71111.23)

a. Inspection Scope

The inspectors reviewed temporary modification TM 04-0005 [ICS/CRD Data Acquisition and Analysis Systems Temporary Installation] and the associated 10 CFR 50.59 screening, and compared each against the USAR and TS to determine if the modification affected the operability or availability of the affected systems. The inspectors walked down the modification to ensure that it was installed in accordance with the modification documents and reviewed the actual installation for impact on permanent systems.

This review represented one inspection sample.

b. Findings

No findings of significance were identified.

1EP6 Drill Evaluation (71114.06)

a. Inspection Scope:

The inspectors monitored the licensee's emergency preparedness drill conducted on August 9, 2007. The observations included licensee preparations, evaluation of drill conduct, review of the drill critique, and the identification of weaknesses and deficiencies. Specifically, the inspectors reviewed the licensee's scenario and preparations to

determine if the drill evolution was of appropriate scope to be included in the performance indicator (PI) statistics. The inspectors observed drill activities and personnel performance primarily in the simulator control room center and emergency operations facility. The inspectors evaluated the effectiveness of the licensee's communications, the accuracy of situation evaluations, and the timeliness of required reporting (simulated) of event-related information to the appropriate agencies. Finally, the inspectors reviewed the licensee's emergency operations facility drill critique to determine if weaknesses and deficiencies were acknowledged and if appropriate corrective actions were identified.

This review represented one inspection sample.

b. Findings:

No findings of significance were identified.

2. RADIATION SAFETY

Cornerstones: Occupational Radiation Safety

2OS1 Access Control to Radiologically Significant Areas (71121.01)

.1 Review of Licensee Performance Indicators for the Occupational Exposure Cornerstone

a. Inspection Scope

The inspectors reviewed the licensee's occupational exposure control cornerstone performance indicators (PIs) to determine whether or not the conditions surrounding the PIs had been evaluated, and identified problems had been entered into the corrective action program for resolution.

This review represented one inspection sample.

b. Findings

No findings of significance were identified.

.2 Plant Walkdowns and Radiation Work Permit Reviews

a. Inspection Scope

The inspectors identified three radiologically significant work areas within radiation areas, high radiation areas (HRAs), and airborne areas in the containment and auxiliary buildings. Select "As-Low-As-Is-Reasonably-Achievable" (ALARA) work packages and radiation work permits (RWPs) were reviewed to determine if radiological controls including surveys, postings, air sampling data, and barricades were acceptable. RWPs and ALARA work packages included:

- RWP 2007-2002 and ALARA Plan No. 2007-2002: RCP2-1 Oil Lift Station Inspection in the East D-Ring at Minus Twenty Percent Power, Revision 0;
- RWP 2007-2001 and ALARA Plan No. 2007-2001: Containment Entries During Modes 1 and 2: Inspections and Work Activities for All Work Groups, Revision 0; and
- RWP 2007-1010: Spent Fuel Pool Demin Resin Sluice to Spent Resin Storage Tank (SRST), Revision 07.

The inspectors reviewed select RWPs and associated radiological controls used to access these and other radiologically significant areas. Work control instructions and specified control barriers were evaluated in order to determine if the controls provided adequate worker protection. Site TS requirements for HRAs and locked high radiation areas were used as standards for the necessary barriers. Electronic dosimeter alarm set points for both integrated dose and dose rate were evaluated for conformity with survey indications and plant policy. The inspectors attended pre-job briefings to determine if instructions to workers emphasized the actions required when their electronic dosimeters noticeably malfunctioned or alarmed.

The inspectors reviewed job planning records and interviewed licensee representatives to determine if there were airborne radioactivity areas in the plant with a potential for individual worker internal exposures to exceed 50 millirem committed effective dose equivalent. Barrier integrity and engineering controls performance, such as high efficiency particulate filtration ventilation system operation, and the use of respiratory protection, was evaluated for worker protection. Work areas having a history of, or the potential for, airborne transuranic isotopes were reviewed to determine if the licensee had considered the potential for transuranic isotopes, and provided appropriate worker protection.

The adequacy of the licensee's internal dose assessment process for analyzing internal exposures that exceed 50 millirem committed effective dose equivalent was assessed to determine if affected personnel would be properly monitored utilizing calibrated equipment, that the data would be analyzed, and internal exposures would be properly assessed in accordance with licensee procedures.

The inspectors reviewed the licensee's physical and programmatic controls for highly activated and/or contaminated materials (non-fuel) stored within the spent fuel pool.

These reviews represented six inspection samples.

b. Findings

No findings of significance were identified.

.3 Problem Identification and Resolution

a. Inspection Scope

The inspectors reviewed the licensee's self-assessments, audits, Licensee Event Reports, and Special Reports related to the access control program to verify that identified problems were entered into the corrective action program for resolution.

The inspectors reviewed ten corrective action reports related to access controls and high radiation area radiological incidents (non-PIs identified by the licensee in high radiation areas <1R/hr). Staff members were interviewed and corrective action documents were reviewed to verify that follow-up activities were being conducted in an effective and timely manner commensurate with their importance to safety and risk based on the following:

- Initial problem identification, characterization, and tracking;
- Disposition of operability/reportability issues;
- Evaluation of safety significance/risk and priority for resolution;
- Identification of repetitive problems;
- Identification of contributing causes;
- Identification and implementation of effective corrective actions;
- Resolution of Non-Cited Violations (NCVs) tracked in the corrective action system; and
- Implementation/consideration of risk significant operational experience feedback.

The inspectors evaluated the licensee's process for problem identification, characterization, prioritization, and verified that problems were entered into the corrective action program and resolved. For repetitive deficiencies and/or significant individual deficiencies in problem identification and resolution, the inspectors verified that the licensee's self-assessment activities were capable of identifying and addressing these deficiencies.

The inspectors reviewed licensee documentation packages for all PI events occurring since the last inspection to determine if any of these PI events involved dose rates >25 R/hr at 30 centimeters or >500 R/hr at 1 meter. Barriers were evaluated for failure and to determine if there were any barriers left to prevent personnel access. Unintended exposures >100 millirem total effective dose equivalent (or >5 rem shallow dose equivalent or >1.5 rem lens dose equivalent), were evaluated to determine if there were any regulatory over-exposures or if there was a substantial potential for an overexposure.

These reviews represented four inspection samples

b. Findings

No findings of significance were identified.

.4 Job-In-Progress Reviews

a. Inspection Scope

The inspectors evaluated selected jobs being performed in radiation areas, potential airborne radioactivity areas, and HRAs for observation of work activities that presented the greatest radiological risk to workers and included areas where radiological gradients were present (Section 2OS1.2). This involved jobs that were estimated to result in higher collective doses.

The inspectors reviewed radiological job requirements contained in RWPs and work procedures and attended ALARA pre-job briefings. Job performance was observed with respect to these requirements to determine if radiological conditions in the work areas were adequately communicated to workers through pre-job briefings and radiological condition postings.

The inspectors also evaluated the adequacy of radiological controls including required radiation, contamination and airborne surveys for system breaches and for entry into HRAs. Radiation protection job coverage, including direct visual surveillance by RP technicians, along with the remote monitoring and teledosimetry systems and contamination control processes, was evaluated to determine if workers were adequately protected from radiological exposure.

Job preparation and execution in HRAs having significant dose rate gradients was observed to evaluate the application of dosimetry to effectively monitor exposure to personnel and to determine if licensee controls were adequate. The inspectors observed RP coverage which involved controlling worker locations based on radiation survey data and real time monitoring using telepole instruments to maintain personnel radiological exposure ALARA.

These reviews represented three inspection samples.

b. Findings

No findings of significance were identified.

.5 High Risk Significant, High Dose Rate High Radiation Area, and Very High Radiation Area Controls

a. Inspection Scope

The inspectors held discussions with the Radiation Protection Manager concerning high dose rate/high radiation area and very high radiation area controls and procedures, including procedural changes that had occurred since the last inspection, in order to verify that any procedure modifications did not substantially reduce the effectiveness and level of worker protection.

The inspectors discussed with RP supervisors the controls that were in place for special areas that had the potential to become very high radiation areas during certain plant

operations, to determine if these plant operations required communication beforehand with the RP group to allow corresponding timely actions to properly post and control the radiation hazards.

The inspectors conducted plant walkdowns to verify the posting and locking of entrances to high dose rate HRAs and very high radiation areas.

These reviews represented three inspection samples

b. Findings

No findings of significance were identified

.6 Radiation Worker Performance

a. Inspection Scope

During job performance observations, the inspectors evaluated radiation worker performance with respect to stated radiation protection work requirements and evaluated whether workers were aware of the significant radiological conditions in their workplace, the RWP controls and limits in place, and that their performance had accounted for the level of radiological hazards present.

The inspectors reviewed radiological problem reports which found that the cause of the event was due to radiation worker errors to determine if there was an observable pattern traceable to a similar cause, and to determine if this perspective matched the corrective action approach taken by the licensee to resolve the reported problems. These problems, along with planned and taken corrective actions were discussed with the Radiation Protection Manager.

These reviews represented two inspection samples

b. Findings

No findings of significance were identified.

.7 Radiation Protection Technician Proficiency

a. Inspection Scope

During job performance observations, the inspectors evaluated radiation protection technician performance with respect to radiation protection work requirements and evaluated whether they were aware of the radiological conditions in their workplace, the RWP controls and limits in place, and if their performance was consistent with their training and qualifications with respect to the radiological hazards and work activities.

The inspectors reviewed fifteen radiological problem reports which found that the cause of the event was radiation protection technician error to determine if there was an observable pattern traceable to a similar cause, and to determine if this perspective

matched the corrective action approach taken by the licensee to resolve the reported problems.

These reviews represented two inspection samples.

b. Findings

No findings of significance were identified.

2OS2 ALARA (71121.02)

.1 Declared Pregnant Workers

a. Inspection Scope

The inspectors reviewed dose records of declared pregnant workers for the current assessment period to verify that the exposure results and monitoring controls employed by the licensee complied with the requirements of 10 CFR Part 20.

This review represented one inspection sample.

b. Findings

No findings of significance were identified.

.2 Problem Identification and Resolutions

a. Inspection Scope

The inspectors reviewed the licensee's self-assessments, audits, and Special Reports related to the ALARA program since the last inspection to determine if the licensee's overall audit program's scope and frequency for all applicable areas under the Occupational Cornerstone met the requirements of 10 CFR 20.1101(c).

This review represented one inspection sample.

b. Findings

No findings of significance were identified.

Cornerstones: Public Radiation Safety

2PS1 Radioactive Gaseous and Liquid Effluent Treatment and Monitoring Systems (71122.01)

.1 Onsite Inspection

a. Inspection Scope

The inspectors reviewed the records of abnormal releases or releases made with inoperable effluent radiation monitors and reviewed the licensee's actions for these releases to ensure an adequate defense-in-depth was maintained against an unmonitored, unanticipated release of radioactive material to the environment. The inspectors observed that the licensee did not make any abnormal releases during the inspection period.

The inspectors assessed the licensee's understanding of the location and construction of underground pipes and tanks, and storage pools (spent fuel pool) that contain radioactive contaminated liquids. The inspectors evaluated the licensee's potential for unmonitored leakage of contaminated fluids to the groundwater as a result of degrading material conditions or aging of facilities. The licensee's capabilities (such as monitoring wells) of detecting spills or leaks and of identifying groundwater radiological contamination both on site and beyond the owner controlled area was reviewed along with the licensee's technical bases for its onsite groundwater monitoring program. The inspectors discussed with the licensee, its understanding of groundwater flow patterns for the site, and in the event of a spill or leak of radioactive material, if the licensee's staff had the capabilities necessary to estimate the pathway of a plume of contaminated fluid, both on site and beyond the owner controlled area.

The review represented two inspection samples.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator (PI) Verification (71151)

a. Inspection Scope

The inspectors reviewed portions of operating logs, licensee event reports (LERs), and inspection reports for consistency with the PIs reported values.

Cornerstone: Mitigating Systems

The inspectors sampled licensee submittals for the PIs listed below for the reporting period ending in the second quarter 2007. To verify the accuracy of the PI data reported during that period, PI definitions and guidance contained in NEI 99-02, "Regulatory

Assessment Indicator Guideline,” Revision 5, were used to verify the basis in reporting for each data element.

- Safety System Functional Failures starting in third quarter of 2006
- Emergency AC Power System starting in the fourth quarter of 2006
- High Pressure Injection System starting in the fourth quarter of 2006

The inspectors reviewed portions of the operating logs, LERs, and maintenance rule records. The inspectors discussed the methods of compiling and reporting the PI with cognizant licensing and maintenance rule personnel.

The review represented three samples of the PIs listed above.

Cornerstone: Occupational Radiation Safety

- Occupational Exposure Control effectiveness

The inspector reviewed the licensee’s determination of Performance Indicator (PI) for the occupational radiation safety cornerstone to verify that the licensee accurately determined these performance indicators and had identified all occurrences required by these indicators. Specifically, the inspector reviewed the licensee’s AR/CAPs for 2007 Occupational Exposure performance indicator data to ensure that there were no PI occurrences that were not identified by the licensee. Additionally, as part of plant walkdowns (Section 2OS1.2), the inspector selectively examined the adequacy of posting and controls for locked HRAs, to verify the current Occupational Exposure Control Effectiveness performance indicator. The inspector interviewed members of the licensee’s staff who were responsible for performance indicator data acquisition, verification and reporting, to verify that their review and assessment of the data was adequate.

This review represented one inspection sample of the Occupational Exposure Control Effectiveness performance indicator.

Cornerstone: Public Radiation Safety

The inspectors sampled the licensee’s PI submittals, and used PI definitions and guidance contained in Revision 5 of Nuclear Energy Institute Document 99-02, “Regulatory Assessment Performance Indicator Guideline,” to determine if the PI data was accurate. The following PI was reviewed:

- RETS/ODCM Radiological Effluent Occurrences

The inspectors reviewed data associated with the RETS/ODCM PI to determine if the indicator was accurately assessed and reported. This review included the licensee’s condition report database to identify any potential occurrences such as unmonitored, uncontrolled or improperly calculated effluent releases that may have impacted offsite dose. The inspectors also reviewed selected gaseous and liquid effluent release data and the results of associated offsite dose calculations generated over the previous four quarters. Data collection and analyses methods for PIs were discussed with licensee

representatives to determine if the process was implemented consistent with industry guidance in Revision 5 of Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline."

This review represented one inspection sample of the PI listed above.

b. Findings

No findings of significance were identified.

4OA2 Identification and Resolution of Problems (71152)

.1 Daily Review

a. Inspection Scope

The inspectors performed a daily screening of items entered into the licensee's corrective action program (CAP). This screening was accomplished by reviewing documents entered into the CAP and review of document packages prepared for the licensee's daily Management Alignment and Ownership Meetings.

b. Findings

No findings of significance were identified.

.2 Annual Sample: Review of Issues with Emergency Diesel Generator (EDG) Fuel Oil Transfer Pump

a. Inspection Scope

The inspectors reviewed CR 07-16753, "EDG1 Fuel Oil Transfer Pump Failed To Start," and the associated evaluations by the licensee. The inspectors reviewed the appropriateness of the licensee's actions to address the issues associated with the failure of the pump to start. The inspectors also reviewed CR 07-16963, "Ground fault On EDG Fuel Oil Tank Transfer Pump 1," for extent of condition and past operability. Additionally, because the licensee initially classified the issue as a condition adverse to quality requiring a full apparent cause evaluation, then downgraded the issue to a limited apparent cause evaluation, the inspectors reviewed the appropriateness of the downgrade and licensee compliance with corrective action program requirements.

This review represented one annual inspection sample.

b. Findings and Observations

On March 22, 2007, during a post maintenance test of the EDG1, the licensee identified that the fuel oil transfer pump failed to start on a low level signal from the diesel's day tank or with the local hand operating switch. The licensee investigation revealed that the power had been lost to fuel oil transfer pump. The licensee remained in TS 3.8.1.1 action 'b' for an inoperable EDG. The licensee's initial investigation revealed a blown

control power fuse for the fuel oil transfer pump supply breaker. The fuse was replaced under the licensee's one-time fuse replacement procedure; however, the fuse blew again. The issue was resolved by replacing and reworking sub-components within the pump's breaker, BE1298. Post maintenance testing of the pump on March 23, 2007 found that it performed adequately.

On March 26, 2007, intermittent alarms for electrical Bus E1 were received in the control room with no additional indications. Then EDG1 Day Tank Level High alarm was received in the control room. The alarms were caused by a ground fault on EDG fuel oil transfer pump 1 and caused the pump to start unexpectedly. Power was removed from the pump by opening its supply breaker, BE1298. The licensee entered TS 3.8.1.1 action 'b' and declared EDG1 inoperable.

The licensee established a problem solving team which developed a plan to determine the cause of the ground fault and pump start. The conclusion of the team was that the most likely cause of the issue was an intermittent short due to a degraded insulation system associated with the start circuit for the transfer pump breaker and the pump. The licensee also believed that contributing causes of the intermittent short was equipment age, environment and mechanical agitation (which occurred during unrelated I&C work at the tank area when the pump started). The cause was addressed by extensive troubleshooting and rework efforts during which contactors and auxiliary switches were replaced in the fuel oil transfer pump breaker. The hand-switch at the week tank was also replaced. The licensee verified proper insulation readings on the control cables associated with the suspect components. Additionally, the level switches for the day tank were also verified to work correctly.

The licensee declared EDG1 operable on March 28, 2007. Their review included a review for reportability. They concluded that the time from when the issue first appeared on March 22, 2007, and the time the condition was corrected on March 28, 2007, did not exceed their seven day limiting condition for operation for having an EDG out of service. Therefore no violation of TS requirements occurred as a result of the issues and no reportability criteria had been met.

The licensee initially classified the failure of the EDG1 fuel oil transfer pump as a condition adverse to quality and a full apparent cause evaluation was to be performed. When it was determined that the failure of the fuel oil pump was not a maintenance rule functional failure, the licensee downgraded the investigation requirements to a limited apparent cause evaluation. Under the licensee's program, a root cause was not required for review of an issue classified as a condition adverse to quality. The licensee did not perform an extent of condition because it was not required by their process.

The inspectors performed a limited extent of condition review by selecting for similar breakers several equivalent maintenance activities that occurred over the last ten years. Although there were other breaker issues similar to the failure addressed by CR 07-16753, the inspectors concluded that the licensee had processes in place to limit the impact of potential breaker failure on safety related equipment operations. The licensee had preventive maintenance activities to inspect, repair, or replace components in these type of breakers.

c. Conclusions

No findings of significance were identified. The licensee's program provided a means for identifying and prioritizing the failure of the fuel oil transfer pump, highlighting the item to plant management, and tracking the item until it was corrected and past operability was properly determined.

4OA3 Event Followup (71153)

.1 Loss of Reactor Protection Channel 3

a. Inspection Scope

The inspectors responded to a trip of reactor protection system (RPS) channel 3 on July 12, 2007. The loss of RPS channel 3 occurred when instrument and control technicians were performing anticipatory reactor trip system (ARTS) interchannel logic testing. During the testing, an installed jumper in the ARTS channel 3 cabinet hung over the edge of the cabinet. When the cabinet door was closed, the jumper was pinched resulting in the wire shorting. The shorting of the circuit caused the loss of the RPS channel 3 and control rod drive breaker 'D' tripping open. The plant remained stable at approximately 100 percent power. The inspectors observed licensee personnel actions in directing activities to determine the cause and recovery actions necessary to restore the RPS channel to normal. Additionally, the inspectors reviewed the licensee's response including TS entries and retesting following the RPS bus recovery.

This review represented one inspection sample.

b. Findings

No findings of significance were identified.

.2 Groundwater Protection Program Initial Sample Results

a. Inspection Scope

On July 13, 2007, the licensee advised the inspectors that the sampling of existing wells within the licensee's owner controlled area showed concentrations of tritium ranging from undetectable to 5,838 pico-curies per liter. The samples were taken to support the planning phase for development of a site groundwater monitoring program. Three of 19 reported samples had levels in excess of 2,000 pico-curies per liter. As part of the review, the inspectors reviewed literature on the Environmental Protection Agency's ground water limits for tritium of 20,000 pico-curies per liter and 30,000 pico-curies per liter.

The inspectors also reviewed the licensee's determination that the measured isotope level was reasonably attributable to one or two of the four previously reported and documented protected area spills that had occurred over the life of the plant. After review of the data, the licensee determined that they had no formal requirements for immediate notification of government or NRC officials but did plan on informally notifying various agencies. The

inspectors reviewed the available data and the licensee's rationale for not making formal notifications. Additionally the inspectors reviewed licensee's commitments associated with the industry groundwater protection initiative.

On August 15, 2007, the licensee briefed the inspectors on the results of followup sampling of onsite wells. The licensee stated that the followup results appeared consistent with the previous sampling results, even though sample results indicated tritium levels up to 7,535 pico-curies per liter. The licensee also advised the inspectors of information calls that had been made to local and state officials to advise them of the sample results.

This review represented one inspection sample.

b. Findings

No findings of significance were identified.

.3 Incorrect Input to Computer Calculation for Core Power

a. Inspection Scope

Inspection Report 05000346/2007003 reviewed a June 2007 plant event in which reactor core power was incorrectly calculated by 0.015 percent because a computer point for reactor letdown purification flow was not returned to scan status after scheduled computer work activities. On July 26, 2007, approximately two hours after completion of scheduled computer work activities, operating personnel noticed that the feedwater flow signal used in the calculation of core power did not change as expected after a small manual adjustment of reactor power. The duration of the anomaly was approximately two hours. Operations personnel, upon noticing the issue, switched to alternate feedwater flow inputs which rectified the situation. The inspectors reviewed the licensee's response to the identification and their action to prevent future core calculation issues after computer work activities.

This review represented one inspection sample.

b. Findings

No findings of significance were identified.

4OA5 Other Activities

.1 Licensee Activities and Meetings

The inspectors observed select portions of licensee activities and meetings and met with licensee personnel to discuss various topics. The activities that were sampled included:

- a. Corporate Nuclear Review meetings and activities on September 14, 2007;
- b. Davis-Besse Manager and Senior Leadership Team Integrated Performance Assessment collegial review meeting on August 6, 2007;

- c. Meeting with licensee on Aug 9, 2007, to discuss the schedule for implementation of NFPA 805, "Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants, 2001 Edition;"
- d. Meeting with licensee on August 15, 2007, to review licensee's initial contingency plans for security force augmentation if needed prior to approval of a new contract with the union representing the proprietary security force;
- e. Davis-Besse Monthly Performance Review meeting on August 17, 2007;
- f. Supervisory briefing by Davis-Besse management on August 29, 2007;
- g. Radiation Protection As-Low-as-Reasonably-Achievable brief on September 21, 2007, for containment quarterly inspection on September 22, 2007; and
- h. Davis-Besse all-hands meeting on September 28, 2007.

No items of significance were identified.

.2 Evaluation of the 2006 Independent Operations Assessment Final Report (95003)

a. Inspection Scope

The March 8, 2004, Confirmatory Order Modifying License No. NPF-3 (EA-03-0214) required, in part, that the licensee perform annual independent assessments, for a period of five years, in the areas of operations performance; organizational safety culture, including safety conscious work environment; corrective action program implementation; and engineering program effectiveness. This section of the report documents the special inspection activities associated with the operations performance assessments that were completed during this inspection period.

On August 10, 2007, the licensee submitted the "Independent Assessment Report of Operations Performance for the Davis-Besse Nuclear Power Station, Year 2007." The inspectors reviewed the report for consistency with assessment results presented at the assessment exit and debrief meetings. Additionally, the inspectors verified that the report adequately covered areas identified in the assessment plan, that conclusions were consistent with and adequately supported by information in the report, and that the licensee entered all deficiencies, identified in the report, into their corrective action program.

b. Observations and Findings

The independent assessment of Operations Performance and the final report from that assessment addressed the following topics:

- Shift turnovers
- Control manipulations
- Communications
- Interdepartmental interfaces
- Procedural use
- Housekeeping
- Awareness of plant and equipment status and workarounds
- Pre-job/post-job activity briefings
- Non-shift Operations management interface and oversight

- Shift management command and control
- Shift management's evaluation, prioritization, and disposition of maintenance activities and emergent issues
- Operations behaviors in the areas of questioning attitude and safety
- Shift handling of off-normal operations
- Observation of operator simulator training to compare crew performance, demeanor, and communication skills with actual control room operations

These topics were grouped into five general areas:

- Shift and Meeting Observations;
- Interviews;
- Condition Report Review;
- Licensed Operator Continuing Training; and
- Davis-Besse Self-Assessments.

Overall the assessment team concluded that the Operations Department performance was rated Effective. 'Effective' has the meaning that performance, programs, and processes are sufficient to obtain the desired results with consistency and effectiveness but that there may be one or several specific areas where improvement is needed and potentially other items that need additional attention.

The majority of individual items and topics reviewed by the team were assessed as 'Effective' including a majority of the licensee's actions to address areas identified in the 2006 assessment as needing attention. There were no areas identified in the 2006 assessment as requiring improvement. In the 2007 assessment, the assessment team concluded that licensee's actions were marginally effective in addressing the 2006 identified item on component mispositionings. The team also concluded that actions to date were ineffective in improving the number of licensed reactor operators that were interested in progressing to senior reactor operator positions. The team also identified that there was no corrective actions taken to address the 2006 item on parallel processes for decision making. The licensee stated that the parallel processes served different purposes and that no corrective action was necessary.

The 2007 assessment report identified no Areas For Improvement. 'Areas for Improvement' are areas that required improvement to obtain desired results with consistency and effectiveness. Since there were no issues that rose to the level of an Area For Improvement, the licensee did not include a formal corrective action plan as part of the Independent Assessment Report submittal. Minor issues addressed in the report were documented in the licensee's corrective action program.

c. Conclusions

The licensee complied with the requirement for an independent assessment of the Operations Performance in 2007, as described in the March 8, 2004, Confirmatory Order. The results of the assessment, including the overall assessment, appeared consistent with the information reviewed and documented in the final report. The overall independent assessment of Operations Performance was not inconsistent with NRC

inspection findings associated with this area of licensee performance. No findings of significance were identified.

.3 Review of Engineering Program Effectiveness Independent Assessment Implementation

a. Inspection Scope

The inspection activities were performed to verify the licensee's compliance with the requirement for independent assessments, as described in the March 8, 2004, Confirmatory Order Modifying License No. NPF-3. This was the fourth of five required annual independent assessments of the engineering program. The inspectors verified that the licensee had submitted the required inspection plan 90 days prior to the performance of the assessment and evaluated the plan as documented in NRC Inspection Report 05000346/2007003. This inspection activity observed on-site implementation of the assessment to verify plan completion and independently reviewed a sample of engineering products to verify thoroughness of the Independent Team's efforts.

b. Observations and Findings

The licensee submitted its plan (start date of September 10, 2007) in a letter to the NRC dated June 12, 2007. The inspectors reviewed the licensee's letter describing the assessment plans and verified that the individuals assigned to the Assessment Team were sufficiently independent from FENOC and that they brought the appropriate credentials and experience necessary to accomplish the assessment.

The plan included details to assess Engineering effectiveness in the following areas:

- Plant Modification Process;
- Calculation Process;
- System Engineering Programs and Practices;
- Corrective Action Program Implementation;
- Corrective actions taken in response to the seven Areas in Need of Attention identified during the 2006 Independent Assessment;
- Self assessment Effectiveness.

The scope and depth of the proposed plan appeared adequate to accomplish the objective of assessing Engineering Program performance.

The NRC inspectors observed portions of the assessment activities during the second on site week including several team interviews of plant staff. The interviews were found to be thorough and probing with very open communication between plant staff and the team. The inspectors also met with the team members to discuss implementation of the approved assessment plan, and performed independent evaluation of a sample of engineering products reviewed by the team. The inspectors found the team review of engineering products to be of sufficient depth.

The team conducted a debrief at the end of on-site activities and provided preliminary conclusions. The team's preliminary conclusion was that Davis-Besse Engineering Programs continue to be effective in both technical and organizational aspects and have

shown improved performance in the quality of engineering products. No areas requiring improvement were identified by the team, however, five areas were preliminarily identified as needing attention. Areas needing attention represent opportunities to further improve performance. The NRC inspectors found the implementation of the assessment plan to be acceptable and will review the final team report when it becomes available.

.4 Review of the Report MPR-3068 Concerning Past Operability of High Pressure Injection System Train 1 with a Gas Void in Discharge Piping

CR 07-18074 documented a licensee identified condition of a gas void in a portion of the high pressure injection train 1 downstream of the train 1 pump. This condition was reviewed by the inspectors during the previous quarter and reported in that quarter's inspection report (IR 05000346/2007003). During this quarter the licensee's formal evaluation of past operability of the system was completed and documented in MPR-3068, "Davis-Besse HPI System Past Operability Evaluation for Gas Void in Discharge Piping." That report was approved by the licensee on August 31, 2007. The inspectors reviewed the report for consistency of results with the original operability conclusions and the licensing basis. No findings of significance were identified.

.5 (Closed) VIO 0500346/2003010-01: Failure to Take Corrective Actions for a Previous NCV Concerning SW Discharge Path Swap-over Setpoints

In 2002, a Non-Cited Violation (NCV) 05000346/2002014-01v was issued to Davis-Besse Nuclear Power Station for failing to establish an appropriate basis for the service water system discharge pressure set point. This pressure set point is used as a basis to auto transfer the service water system discharge from the non-safety-related flow path to the safety-related flow path. Subsequently, a notice of violation (VIO 0500346/2003010-01), discussed with the licensee during a November 2003 exit, was issued in March 2004 due to an evaluation made by the licensee which found that the established set point was not adequate to ensure required flows to the safety-related equipment without relying on the non-safety-related discharge flow path to some extent.

The licensee's understanding of the licensing basis for the service water discharge flow paths were provided in a letter dated April 2, 2004, and their response to the NOV was provided in a letter dated April 5, 2004.

The licensee's response stated that the design and licensing basis on Davis-Besse required the consideration of two specific failures of this non-safety-related discharge flow paths complete blockage or breakage. The licensee also stated that their licensing basis did not require consideration of a partially blocked non-safety-related flow path in conjunction with a design basis accident (i.e., a loss-of-cooling-accident). In addition, the licensee completed a probability evaluation to demonstrate that partial blockage of the non-safety-related service water discharge flow path in conjunction with a loss-of-cooling-accident (LOCA) was not a credible event. In conclusion, the licensee's response stated that the pressure set point value of 50 psig provided adequate assurance that the service water system design function will be performed under credible conditions and it was acceptable under the Davis-Besse design and licensing basis.

In order to assure clear understanding of Davis-Besse licensing basis, Region III staff submitted a Task Interface Agreement (TIA) requesting that the Office of Nuclear Reactor Regulation (NRR) address a number of questions. This TIA can be found in ADAMS under ML070510087. In summary, the TIA documented:

- While a LOCA is not postulated concurrent with a seismic event, it is necessary for SSCs that are credited for accident mitigation to be nuclear safety-related, seismic Class 1 and parts of SSCs that are not safety-related, cannot be relied upon for accident mitigation.
- All failure scenarios of the non-safety-related parts of the service water system must be considered and addressed including failures that result in partial blockage, unless the licensee can demonstrate that resolution of the full blockage scenario is adequate, and bounding for partial blockage scenarios as well.
- The set point for swapping over from the non-safety-related discharge flow path to the safety-related discharge flow path must be established based upon preserving adequate flow through the service water system for all postulated accident scenarios, regardless of how much blockage exists in the non-safety-related service water system discharge flow path. As identified by the licensee's calculation, 03-014, a switch-over set point of 50 psig will not assure an adequate amount of flow through the service water system following an accident.

Therefore, the inspectors concluded that the set point of 50 psig was not adequate to ensure operability; therefore, the licensee needed to modify their corrective actions to address this issue. In March 2007 the licensee submitted additional information including an analysis which evaluated partial blockage up to 75 percent. However, this item remained open because the licensee had not evaluated the full blockage scenarios.

On June 14, 2007, the inspectors and members of NRR discussed the issue with the licensee. At the conclusion of the meeting, the licensee agreed that further actions were needed to assure operability during a design basis accident. The licensee opened condition report 07-22099, "Licensing and Design Basis for PSH-2929 and PSH-2930 Set point" to address this issue. As part of their corrective actions, the licensee realigned service water returns to the intake forebay via SW2930 and conducted analyses to determine the adequacy of the 50 psig pressure set point. In addition, procedures were revised to include steps to identify if partial blockage has occurred and require actions to maintain the systems supported by the safety-related service water within their design conditions.

Based on this review, this violation is closed.

4OA6 Meetings, Including Exit

.1 Exit Meeting Summary

On October 9, 2007, the resident inspectors presented the inspection results to Mr. M. Bezilla and other members of the licensee's staff, who acknowledged the findings.

The inspectors asked the licensee whether any of the material examined during the inspection should be considered proprietary. No proprietary information was identified.

.2 Interim Exit Meetings

Interim exit meetings were conducted for:

- Radiation monitoring instrumentation and protective equipment and barrier integrity performance indicator with Mr. John J. Grabnar, Director Site Engineering, on August 10, 2007.
- The progress of the review of service water swap-over violation with Mr. Wuokko, Regulatory Compliance, and staff on Thursday, June 14, 2007.

4OA7 Licensee-Identified Violations

The following violation of very low safety significance (Green) was identified by the licensee and was a violation of NRC requirements which meet the criteria of Section VI of the NRC Enforcement Policy, NUREG-1600, for being dispositioned as an NCV.

- 10 CFR 50.65(a)(4) required that, prior to performing maintenance activities, the licensee shall assess and manage the increase in risk that may result from the maintenance activities. Contrary to those requirements, on August 23, 2007, the licensee identified that it was not properly applying a service water temperature modifier in the licensee's computer risk program. The result was that on July 3, 2007, and August 23, 2007, and potentially other dates, the stated risk condition, which was evaluated as Green, should have been Orange for July 3, 2007, and Yellow for August 23, 2007, for select work activities. Once identified, the licensee revised the risk condition to the proper level, identified the issue in its corrective action program (CR 07-25557), and developed a standing order as initial action to preclude recurrence. The licensee also identified that the potential for improper application of the modifier was noted in a previous condition report (CR 06-02872). The finding is of very low safety significance because the systems involved in the improperly evaluated risk condition would have been able to perform their design functions with the equipment that was not removed from service.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

M. Bezilla, Site Vice President
B. Boles, Director, Maintenance
J. Grabnar, Director, Engineering
R. Hovland, Manger, Technical Services
R. Hruby, Manager, Nuclear Oversight
V. Kaminskis, Director, Plant Operation
J. Noble, Lead Radiation Protection
A. Parcival, Adv. Nuclear Specialist (Chemistry)
S. Plymale, Manager, Plant Engineering
J. Rinckel, Vice-President, Fleet Oversight
C. Price, Director, Performance Improvement
S. Trickett, Supt., Radiation Protection
D. Wuokko, Acting Manager, Regulatory Affairs
K. Zellers, Supervisor, Analysis Group and Design

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

| | | |
|---------------------|-----|--|
| 05000346/2007004-02 | URI | Reduced Flow Through Component Cooling Water 1 Heat Exchanger Because of Improper Valve Opening Limit Stop |
|---------------------|-----|--|

Opened and Closed

| | | |
|---------------------|-----|---|
| 05000346/2007004-01 | FIN | Improper Design of a Weld Patch for a Crack in Circulating Water Pipe |
|---------------------|-----|---|

Closed

| | | |
|--------------------|-----|--|
| 0500346/2003010-01 | VIO | Failure to Take Corrective Actions for a Previous NCV Concerning SW Discharge Path Swap-over Setpoints |
|--------------------|-----|--|

LIST OF DOCUMENTS REVIEWED

The following is a list of documents reviewed during the inspection. Inclusion on this list does not imply that the NRC inspectors reviewed the documents in their entirety, but rather that selected 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 stated in the body of the inspection report.

1R04 Equipment Alignment

DB-OP-06013; Containment Spray System; Revision 16
DB-OP-06261; Service Water System Operating Procedure; Revision 28
DB-OP-06012; Decay Heat and Low Pressure Injection System Operating Procedure;
Revision 28
Drawing OS-005; Containment Spray System; Revision 11
Drawing OS-020, Sheet 1; Service Water System; Revision 73
Drawing OS-004, Sheet 1; Decay Heat Removal/ Low Pressure Injection System; Revision 43

1R05 Fire Protection

CR 04-07431; RFA to Evaluate Shadow Shielding in MPR 2 for Midcycle Outage
CR 05-01379; Re-evaluate Shielding RFA CR 04-07341 For Installation Greater Than 90 Days
CR 07-25423; LM3 Transformer Disconnect Switch Flashes To Ground
CR 07-25430; Loss of Power to the PSF and LLRWF Due to Electrical Failure of Disconnect
CR 07-25460; Loss of Power to Personnel Shop Facility Impacted Operations Support Center
Davis-Besse Nuclear Power Station Fire Hazard Analysis Report
DB-0090; Fire Report for Event on August 20, 2007
DB-FP-00005; Fire Brigade; Revision 05
DB-FP-00007; Control Of Transient Combustibles; Revision 07
DB-FP-00009; Fire Protection and Fire Watch; Revision 08
DB-OP-02529; Fire Procedure; Revision 05
PFP-AB-328; Pre-Fire Plan, Component Cooling Water Heat Exchanger and Pump Room;
Revision 03
PFP-AB-402; Pre-Fire Plan, Number 1 Electrical Penetration Room; Revision 04
Drawing A-222F; Fire Protection General Floor Plan EL 565'; Revision 14
Drawing A-223F; Fire Protection General Floor Plan EL 585'; Revision 18
Drawing A-224F; Fire Protection General Floor Plan EL 603'; Revision 21
Drawing E-1501; One Line Diagram, Personnel Shop facility 480 (Unit SUBSTA. #M2)
Drawing E-2018; One Line Diagram, Site 12KV & 480V Distribution
Work Order 200185761; Re-evaluate Shielding Duration in Mechanical Penetration Room 2

1R06 Flood Protection

Calculation 58.010; Flow Rate Due to a Leak in Make-up Pump Discharge and Flood Water
Heights in Associated Rooms; Revision 3
Calculation 58.020; Flooding in the ECCS Rooms due to a FWLB; Revision 1
RA-EP-02880; Internal Flooding; Revision 3
CR 07-24837; Decay Heat Exchanger Pit (Room 113) Floor Drain Approximately 1/4 Blocked
CR 07-22619; CDBI - HPI Pump 1 - ECCS Sump Pump Flowrate
DB-OP-04162; ECCS Sump Pump Flow Check; Revision 7
USAR Section 3.6.2.7.9; Auxiliary Steam and Condensate System; Revision 19

USAR Section 3.6.2.7.10; Reactor Coolant Makeup System; Revision 12
USAR Section 3.6.2.7.14; Containment Spray System; Revision 23

1R11 Licensed Operator Requalification Program

CR 07-25824; Unintentional Simulator Failure Due to Simulator Switch Out of Position
DBBP-TRAN-0017; Conduct of Simulator Training; Revision 3
DBBP-TRAN-0502; Development and Conduct of Continuing Training Simulator Evaluations;
Revision 4
Simulator Guide ORG-EPE-S233; Forebay Level Transmitter Failure, MU System Leak, Loss of
MU and High Deaerator Level Post Trip; Revision 1

1R12 Maintenance Effectiveness

CR 04-02511; Failure Of ABDD2 To Open
CR 04-07843; NRC PI&R Inspection - Corrective Actions Adequacy for Underground Wetted
Cables
CR 05-00219; Loss Of D1 Bus During Testing
CR 05-03499; Control Room Chiller S12-2 Ruptured Lube Oil Pressure Sensing Line
CR 05-01499; NRC PI&R Log1-4635 Corrective Actions Adequacy for Underground Wetted
Cables
CR 06-01878; Failure Of Breaker AACD1 To Close To Maintain Bus D1 Energized During Testing
CR 06-02013; Breaker ACD2 Failure To Close
CR 06-02132; Maintenance Rule (A)(1) Evaluation For Medium Voltage AC Systems
CR 06-02375; Control Room Chillers 1 and 2 - Both Found Tripped
CR 06-02944; Loss of Control Room Chiller Unit 2 Related to Loss of F23A/F23B
CR 06-8151; Maintenance Rule (A)(1) Eval for Crevs due to Chiller Failures in Cycle 15
CR 07-14758; SW276 Failed Forward Flow Test IAW DB-PF-03020 Section 4.15
CR 07-23819; Technical Error In Attachment To CA 05-01499-04 - Wetted Cables
(NRC Identified)
CR 07-23972; High Particulate Levels in Service Water Pump Motor 3
DB-PF-06-0017; Preventive Maintenance Deferral for Rebuilding Service Water Pump 2;
March 29, 2006
DB-DF-06-0035; Preventive Maintenance Deferral for Valve SW401 Replacement; April 19, 2006
DB-DF-07-0017; Preventive Maintenance Deferral for Service Water Pump 1 Check Valve;
May 24, 2007
DB-ME-05309; General Electric HFA Relay Maintenance And Calibration; Revision 0
DB-ME-09104; 13.8KV And 4.16 KV Westinghouse DHP Breakers; Revision 7
DB-ME-09107; Westinghouse DHP Breaker Refurbishment; Revision 6
DB-ME-09111; Brown Boveri Models K-600S, K-800S and K-1600S Breakers Maintenance;
Revision 1
DB-PF-00003; Maintenance Rule; Revision 7
DB System Health Report, Medium Voltage AC Window; First, Second, Third, and Fourth
Quarter, 2006
DB System Health Report, Service Water Window; First Quarter, 2007
DB System Health Report, Chilled Water Window; First Quarter and Second Quarter, 2007
EPIX Generated Failure Summary Report for Davis-Besse Chilled Water; January 2003 to
September 2007
Maintenance Rule Expert Panel Minutes August 10, 2006
Maintenance Rule Expert Panel Minutes March 8, 2007
Maintenance Rule Expert Panel Minutes June 14, 2007

MRPM; Maintenance Rule Program Manual; Revision 23
MRPM 23; Maintenance Rule Scoping Sheets for Medium Voltage AC
MRPM 23; Maintenance Rule Scoping Sheets for Service Water
MRPM 23; Maintenance Rule Scoping Sheet for Chilled Water
Maintenance Rule (a)(1) Action Plan for Medium Voltage AC System
Maintenance Rule (a)(1) Action Plan for Chilled Water; December 15, 2006
NOBP-ER-3002; Plant Health Committee; Revision 3
NOBP-ER-3009; FENOC Plant Health Report Program; Revision 2
NOP-ER-1001; Continuous Equipment Performance Improvement; Revision 0
Work Order 200062578; DB-AC103:Lexan Relay Bobbin On HFA Relay 86-1/C1
Work Order 200157500; C1: Intsl Test panel IAW ECR 05-0097-01
Work Order 200188118; PM4577 Bus C2 *CAL* Prot Relays
Work Order 200203166; AD2DF7 - Floor Guide Rail Misaligned
Work Order 200232847; ECR 05-0105-00:6262, CR Ammeter CKT
Work Order 200244372; Operation 118, In Plant Training for HFA Relays

1R13 Maintenance Risk Assessment and Emergent Work Evaluation

Calculation C-CSS-043.03-008; L.P. Condenser Cross-Over Piping Repair; Revision 0 and 1
CR 06-02872; ECCS Room Cooler Work Risk Concerns
CR 07-24495; LP Condenser Circ Water Piping Leak
CR 07-24820; Errors in LP Condenser Piping Repair Calculation (C-CSS-043.03-008 Rev 0)
CR 07-25557; SW Temperature Modifier Not Properly Applied to Risk
CR 07-26402; DH1A Motor Terminations Not Rated for EQ Application
CR 07-26939; RCP Motor Drain Tank 1-1-2 Contained 30 Gallons
DBBP-OPS-0003; On-line Risk Management Process; Revision 5
ECP 07-0131-00; Repair for LP Condenser Circulating Water Cross-Over Pipe; Revision 0 and 1
Level 3 Schedule for September 21, 2007, Down-Power; Revision 2 and 3
Maintenance Risk Summaries for the Week of July 30, 2007; Revisions 0 and 1
Maintenance Risk Summary for the Week of August 6, 2007; Revisions 0
Maintenance Risk Summaries for the Week of August 20, 2007; Revisions 0, 1, 2
Maintenance Risk Summaries for the Week of September 10, 2007; Revisions 0, 1, 2
Maintenance Risk Summaries for the Week of September 17, 2007; Revisions 0, 1, 2
NOP-OP-1007; Grid Risk Determination; Revision 4
Operational Decision Making Instrument for Circulating Water Outer Loop Cross Around Piping
Through Wall Leakage; August 8, 2007
Operations Evolution Order for Work Orders 200222256 and 200253543; Place RCP Seal
Injection on Bypass
Operations Standing Order 07-006; Service Water Temperature, Ambient Air Temperature and
Increased PRA Risk; Revision 0

1R15 Operability Evaluations

Calculation C-NSA-060.05-010; Containment Vessel Analysis; Revision 6
Calculation C-NSA-032.02-006; ECCS Pump Room Heatup During Post LOCA; Revision 3
Calculation C-NSA-011.01-016; Service Water System Design Basis Flowrate Analysis and
Testing Requirements; Revision 1, Addendum 2
Calculation C-NSA-011.01-019; Analysis of Service Water System Online Flow Balance Test data
for Train 2; Revision 0 (Draft)
CR 07-22099; Licensing And Design Basis For PSH 2929 and PSH 2930 Setpoint
CR 07-24878; Discrepancy in AFP Performance During Surveillance

CR 07-25475; EVS Fan #2 Excessive Belt Movement
CR 07-25659; Foxboro M&TE Transducers Not Installed Correctly For Service Water Flow Testing
CR 07-25812; SW9815 Pressure Taps Were Found Incorrectly Installed On the FoxBoro Flow Meter
CR 07-25993; Inadequate SW Flow Through CCW Heat Exchanger #1
CR 07-26258; Main Stop Valve 2 Did Not Fast Close During the Performance of DB-SS-04150
CR 07-26283; First Stage Pressure Feedback Did Not Respond As Expected During Steam Valve Test
DB-OP-02000; RPS, SFAS, SFRCS, Trip, Or SG Tube Rupture; Revision 20
DB-OP-02533; Control Room Emergency Ventilation System Load Shedding; Revision 8
DB-OP-06505; Control Room Emergency Ventilation System Procedure; Revision 10
DB-OP-03004; Service Water Train 2 Design Flow Verification; Revision 0
DB-SS-03251; Emergency Ventilation System Train 2 Monthly Test; Revision 4
Drawing M-024C, Sheet 1; Turbine Control Diagram; Revision 9
Drawing OS-023, Sheet 1; Turbine Electrohydraulic Control System; Revision 11
Drawing OS-023, Sheet 2; Turbine Electrohydraulic Control System; Revision 25
Instrument Calibration Record for Instrument PDI-2658; August 13, 2007 and May 18, 2007
Work Order 200277510; PDI2658 - Check Calibration/Calibrate if Needed
Work Order 200278911; Fan C30-2 - Check/Replace Belts/Sheaves

1R19 Post-Maintenance Testing

CR 07-23577; Adverse Trend in LEFM Reject Rate
CR 07-23797; FP46 Leaked A Steady Stream Of water While the Diesel Fire Pump Was Running
CR 07-23975; Adverse Trend in LEFM Reject Rate
DB-MI-03204; Channel Functional Test and Calibration of SFRCS Actuation Channel 2, Steam Generator Differential Pressure Inputs PDS-2685B; Revision 8
DB-MI-03224; Response Time Test of SFRCS Channel 2, Steam Generator Differential Pressure Inputs; Revision 7
DB-OP-06407; Non Nuclear Instrumentation System Operating Procedure; Revision 8
DB-OP-06610; Station Fire Suppression water System; Revision 15
DB-SP-03137; Decay Heat Train 2 Pump and Valve Test; Revision 16
Drawing OS-12A, Sheet 2; Main Feedwater System; Revision 27
Drawing OS-23, Sheet 2; Turbine Electrohydraulic Control System; Revision 25
EDB-SUB013-01-006; Diesel fire Pump Discharge Vacuum Breaker
Operational Decision Making Issue Document for EHC Accumulator (T201-4, T201-5) Failed; July 30, 2007
Work Order 200187659; DB-PDS2685B Main Feedwater/ SG2 Pressure Differential Switch
Work Order 200238309; Replace Oil and Lubricants on Decay Heat Pump Motor 2
Work Order 200248785; Repair Decay Heat Pump Motor Leaking Bearing Oil Sightglass
Work Order 200266981; Replace Caldon System Loop 2 Path 1, 4, and 7 Flow Transducers
Work Order 200275278; FP46 leaked During DB-FP-04049
Notification 600401298; Packing Leak On FP51
Work Order 200277900; Replace N2 Charging Valve on Accumulator 4
Work Order 200275980; Remove and Replace EHC Accumulator T201-3
Work Order 200224679; PM 0294 MVDH1A "INSP" with one time scope addendum per CR06-10089
DB-PF-03272; Post Maintenance Valve Test; Revision 4

1R22 Surveillance Testing

CR 07-23377; Slight Increase in Reactor Power When Control Rods Placed in Manual
CR 07-26847; Elevated AFPT #2 Bearing Temperatures During DB-SP-03160
DB-SP-03218; HPI train 1 Pump and Valve Test; Revision 16
DB-ME-030406; D1 Bus Under Voltage Units Monthly Functional Test; Revision 14
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 16
Drawing E-34B, Sheet 14; Elementary Wiring Bus D1 Voltage & Auxiliary Relays; Revision 12
DB-SC-04271; SBODG Monthly Test; Revision 10
DB-MI-03012; Channel Functional Test of Reactor Trip Breaker A, RPS Channel 2 Reactor Trip
Module Logic, and Arts Channel 2 Output Logic; Revision 18
DB-SP-03357; RCS Water Inventory Balance; Revision 10
DB-PF-06703; Miscellaneous Operation Curves; Revision 10
DB-PF-03160; AFP2 Quarterly Test; Revision 17
NORM-ER-3303; I&C Bi-Stable Devices; Revision 2
NORM-ER3305; Indicators; Revision 0

1R23 Temporary Plant Modifications

Calculation C-CSS-099.20-32; Assessment Of Seismic Capability Of Control Room Suspended
Ceiling Components; Revision 0
Calculation C-CSS-C5761A; SQUG Evaluation For C5761A; Revision 0
Calculation C-CSS-100.00-102; Control Cabinet Room Cable Routing; Revision 0
Calculation C-CSS-83.03-022; Integrated Control System RFA/SCC 89-1348; Revision 3
CR 02-041121; SHRR: Long term Installation Of Monitoring Equipment
CR 03-10394; ICS DAAS Work Order Closed Without Followup Work Document
CR 04-05374; Engineering Evaluation Not Performed For ICS DAAS Connections
Davis-Besse Design Criteria Manual; SeismicIII/I; Revision 2
DBBP-PES-0007; Control Of Monitoring Equipment; Revision 1
Drawing M-132; Equipment Location Partial Plan control Room And Computer Room; Revision 20
EN-DP-01155; EIT Reviews; Revision 02
Maintenance Work Order SCC-89-0508; Monitor SFRCs Points With DAAS
Maintenance Work Order SCC-89-1348; Simple Configuration Change Package For Anchoring
the DAAS Cart in the Control Cabinet Room
Maintenance Work Order 1-94-0068-00; DAAS Generic Order
Maintenance Work Order 99-004527-000; DAAS Generic Order
NOBP-ER-3003; FENOC System Performance Monitoring Program; Revision 1
NOP- CC-2003; Engineering Changes; Revision 11
QA Audit AG-93-MAINT-01; QA Audit Of DAAS Installation
TM 04-0005; ICS/CRD DAAS Temporary Installation; Revision 0

1EP6 Drill Evaluation

Davis-Besse Emergency Response Integrated Drill Manual; March 16, 2007
RA-EP-01500; Emergency Classification; Revision X
CR 07-25096; EP Drill - TSC Plant Data Status Board Improvement
CR 07-25014; EP Drill: Technical Support Center (TSC) Critique Summary
CR 07-25013; EP Drill - Simulator Control Room - Opportunities for Improvements/Strengths

4OA1 Performance Indicator (PI) Verification

Performance Indicator Data Input Sheets for Safety System Functional Failures; July 2006 through July 2007

Performance Indicator Data Input Sheets for Emergency AC Power System; October 2006 through July 2007

Performance Indicator Data Input Sheets for High Pressure Injection System; October 2006 through July 2007

Davis-Besse Plant Health Report for Second Quarter 2007

Performance Indicator Data Input Sheets for Occupational Exposure Control Effectiveness; October 2006 through July 2007

Performance Indicator Data Input Sheets for RETS/ODCM Radiological Effluent Occurrence; November 2006 through July 2007

4OA2 Identification and Resolution of Problems

CR 07-16753; EDG #1 Fuel Oil Transfer Pump Failed To Start

CR 07-16792; BE1298 Installed Starter Found To Be Different Than Required By Drawing

CR 07-16963; Ground Fault On EDG Fuel Oil Tank Transfer Pump 1

CR 07-17040; Local Fuel oil Transfer pump Start/Stop Switch Miswired

CR 07-17042; NP1951 Found Unserviceable During Troubleshooting For #1 Diesel Fuel Oil Transfer

CR 07-17043; BE1298 JIC Contact (42B) Failed In Close Position

CR 07-17045; Cutler Hammer J1C Contacts And Latch Relays

CR 07-23396; L56 Contacts found Degraded In BE33B PM 2297

CR 07-23399; Degraded Contactor Found While Performing PM 2297

DB System Health Report, 480 Volt AC System; First Quarter, 2007

DB-ME-09100; Maintenance Of Motor Control Centers; Revision 05

Drawing E-64B SH-10C; Elementary Wiring Diagram Emergency Diesel Generators Diesel Oil Transfer Pumps; Revision 06

Maintenance rule (a)(1) Action Plan for 480 volt AC System

Maintenance Rule Expert Panel Minutes June 14, 2007

Notification 600381249; DB-ME-09100 Update For CR 07-17045

Work Order 200012259; 01-008135-000 Replace the 42 (F and R) Open and Close Contactors and Auxiliary Contacts

Work Order 200047994; ECR 03-0551-00, DB-BF1204

Work Order 200049115; Replace Contacts In BEF124 and Check TDR

Work Order 200065024; BEF124 High Resistance Contacts

Work Order 200072693; Replace Contactor In BE1298 With Size 1 CR 06-10143

Work Order 200094568; DB-BF2333: TSHT Excessive Chatter

Work Order 200096532; PM5438 BF1112 *TEST* Circuit BRKR

Work Order 200106020; DB-BF1258: Clean/Inspect/Repair/Replace DB-ME-09100

Work Order 200113815; BF1112 B and C Phase Contactor Heating

Work Order 200145264; PM 5063 BF1106 and Assoc. Assets RPLC

Work Order 200204356; PM 2297 BE33B *ME09100* CLN MCC33B

Work Order 200243452; EDG #2 Air Compressor Red Light Out

Work Order 200256894; EDG 1 Fuel Oil Transfer Pump P195-1

Work Order 200257286; EDG 1 Fuel Oil Transfer Pump P195-1

2PS2 Access Control to Radiologically Significant Areas

As-Low-As-Is-Reasonably-Achievable (ALARA) Planning and Controls

RWP 2007-2002, ALARA Plan 2007-2002; RCP2-1 Oil Level Inspection in the East D-Ring at Minus 20 Percent Power, May 14, 2007

RWP 2007-2001 CR-07-17124; Calibration Source Used for Calibration Radiation Element Was Decayed Improperly; March 28, 2007

CR-07-24874; Underwater Radiation Monitor Not Labeled as Required

CR-07-24876; Guidance Needed for Rigging of Items in the Spent Fuel Pool

CR-07-15601; Person Entered RCA Without Badge, PPE or Dosimetry

CR07-16901; Containment Entry Lesson Learned-Dose Estimate Accuracy

CR 07-16087; LHRA Minimum Posting Information Was Incorrect

CR-16217; Work Week 0710 Critiques-Radiation Estimate Challenges

CR-07-16091; Containment Entry Lesson Learned Associated with Dose Estimate Accuracy

CR 07-18916; The Corporate Assessment Team's Follow-up Assessment of Davis Besse Readiness Associated with RP Personnel and Radiological Worker Performance Deficiency

CR 07-07-14320; 2006 IPA Radiation Protection Supervision Area for Improvement

DB-HP-01802; Radiation Protection Procedure for Control of Shielding; Revision 7

DB-HP-01702; Transfer Handling and Storage of Radioactive Material; Revision 15

DB-HP-01102; Industrial Radiography and Densitometry; Revision 3

NOP-WM-7025; High Radiation Area Program; Revision 0

DBBP-RP-0015; Pre-Outage and Outage Tasks; Revision 1

DBBP-RP-1010; Routine Radiological Surveys; Revision 10

DBBP-RP-0009; Conduct of Operation for Radiation Protection; Revision 8

NG-DB-00240; Radiological Area Access and Work Controls; Revision 4

NG-DB-002243; Personnel Dosimetry Program; Revision 3

DB-HP-01109; High Radiation Area Access Control; Revision 23

NCP-WM-7003; Radiation Work Permits; Revision 2

DBBP-RP-1001; Radiation Area Key Authorization; Revision 5

NOP-WM-7021; Radiological Posting, Labeling, and Marking; Revision 2

NOP-WM-7001; ALARA Program; Revision 0

DB-HP-01100; Posting, Labeling and Marking; Revision 9

DB-HP-01140; Radiological Surveillance; Revision 11

Management Alignment and Owner Meeting; August 6, 2007

RWP-2007-1006; RCP Rotating Assembly Top-Hat Installation; February 22, 2007

4OA3 Event Followup

CR 07-23404; RPS CH. 3 Tripped Do To Pinched Jumper In ARTS Ch. 3

CR 07-23406; Heat Balance Input Question

CR 07-23415; DB-MI-3355 Failed Test

CR 07-24229; One of 2 CPUs Failed on the Primary SCADA Computer

CR 07-24234; Feedwater Inputs to Heat Balance Calculation Stopped Updating

CR 07-24238; Reactivity Management - Power Changes Required When Heat Balance Calculation Failed

CR 07-24278; Review of CR Response for PPC Failures

NOP-OP-1004; Reactivity Management; Revision 5

4OA5 Other Activities

CR 07-23488; Tritium Detected in Groundwater Monitoring Wells

NOBP-CC-2005; Engineering Assessment Board; Revision 0

Groundwater Flow Characteristics Report; Davis-Besse Nuclear Power Station; January 16, 2007
Groundwater Field Sampling Plan; Davis-Besse Nuclear Power Station; June 8, 2007
Industry Ground Water Protection Action Plan Development Interim Guidance Document;
June 2006
Industry Ground Water Protection Voluntary Communication Protocol Interim Guidance
Document; June 2006
CR 07-18074; HPI Train 1 Discharge Piping - Potential Air Intrusion
Calculation C-ME-040.01-004; Boric Acid Addition Tank Vortex Formation; Revision 0
Calculation C-NSA-050.03-028; Auxiliary Feedwater Minimum Performance; Revision 1
Calculation C-NSA-049.01-004; Vortex Formation with ECCS Pump Suction from the BWST;
Revision 1
Calculation 03-014; Service Water System Performance With Discharge Line Blockage; dated
March 27, 2003
Calculation C-ME-099.16-010; Check Valve Design Basis Analysis; Revision 01
Calculation C-NSA-011.01-16; Service Water System Design Basis Flow Rate Analysis and
Testing Requirements; Revision R00
ECP 02-0738-00; Woodward Governor Replacement for EDG-1 and EDG-2; February 13, 2007
ECP 06-0143-02; Alloy 600 Mitigation; Revision 0
ECP 07-0062-00; 1" CCB-19 Isolation; Revision 1
10 CFR 50.59 Screen 07-00317; Alloy 600 Mitigation; Revision 0
Root Cause Analysis Report - HPI Train 1 Potential Gas Intrusion; May 9, 2007
CR-02-07802; Basis For PSH 2929 and PSH 2930 Not Found; dated October 10, 2002
CR 03-07656; Forward Flow Rate of 10,000 GPM Not Attained For SW 19 During DB-PF-03232;
dated September 12, 2003
CR 07-22099; Licensing and Design Basis for PSH-2929 and PSH-2930 Set point; dated
June 14, 2007
FENOC Letter; Licensing Basis for Service Water System Discharge Flow Path; dated
April 2, 2004
FENOC Letter; Reply to a Notice of Violation from Davis-Besse Nuclear Power Station NRC
Inspection Report No. 50-346/03-010 (EA-04-049 and EA-04-050); dated April 5, 2004

LIST OF ACRONYMS USED

| | |
|-------|--|
| AC | Alternating Current |
| ADAMS | Agency-wide Document Access and Management System |
| AFP | Auxiliary Feedwater Pump |
| AFPT | Auxiliary Feedwater Pump Turbine |
| ALARA | As-Low-As-Reasonably-Achievable |
| CAP | Corrective Action Program |
| CCW | Component Cooling Water |
| CDBI | Component Design Bases Inspection |
| CFR | Code of Federal Regulations |
| CR | Condition Report |
| DH | Decay heat |
| DRP | Division of Reactor Projects |
| DRS | Division of Reactor Safety |
| ECCS | Emergency Core Cooling System |
| EDG | Emergency Diesel Generator |
| FENOC | FirstEnergy Nuclear Operating Company |
| FIN | Finding |
| FWLB | Feed Water Line Break |
| GL | Generic Letter |
| GPM | gallons per minute |
| HPI | High Pressure Injection |
| HRA | High Radiation Area |
| IMC | Inspection Manual Chapter |
| IP | Inspection Procedure |
| IR | Inspection Report |
| IST | Inservice Testing |
| LEFM | Leading Edge Flow Meter |
| LER | Licensee Event Report |
| LHRA | Locked High Radiation Area |
| LOCA | Loss of Coolant Accident |
| MS | Mitigating Systems |
| MSPI | Mitigating Systems Performance Index |
| NCV | Non-Cited Violation |
| NRC | Nuclear Regulatory Commission |
| NRR | Nuclear Reactor Regulation |
| ODCM | Offsite Dose Calculation Manual |
| PI | Performance Indicator |
| PSIG | Pounds per Square Inch Gauge |
| RCS | Reactor Coolant System |
| RETS | Radiological Environmental Technical Specification |
| RPS | Reactor Protection System |
| RWP | Radiation Work Permit |
| SBODG | Station Blackout Diesel Generator |
| SDP | Significance Determination Process |
| SSC | Structures, Systems, Components |
| SW | Service Water |
| TS | Technical Specification |

URI Unresolved Item
USAR Updated Safety Analysis Report
VIO Violation