January 30, 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 05000346/2006005

Dear Mr. Bezilla:

On December 31, 2006, 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 January 4, 2007, with 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 two findings of very low safety significance (Green), one of which was determined to involve a violation of NRC requirements. 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 made 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/

Eric R. Duncan, Chief
Branch 6
Division of Reactor Projects

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

Enclosure: Inspection Report 05000346/2006005
w/Attachment: Supplemental Information

cc w/encl: The Honorable Dennis Kucinich
G. Leidich, President and Chief
Nuclear Officer - FENOC
J. Hagan, Senior Vice President of
Operations and Chief Operating Officer
Richard Anderson, Vice President, Nuclear Support
Manager - Site Regulatory Compliance
D. Pace, Senior Vice President of
of Fleet Engineering
J. Rinckel, Vice President, Fleet Oversight
D. Jenkins, Attorney, FirstEnergy
Director, Fleet Regulatory Affairs
Manager - Fleet Licensing
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

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be made 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,

Eric R. Duncan, Chief
Branch 6
Division of Reactor Projects

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

Enclosure: Inspection Report 05000346/2006005
w/Attachment: Supplemental Information

cc w/encl: The Honorable Dennis Kucinich
G. Leidich, President and Chief
Nuclear Officer - FENOC
J. Hagan, Senior Vice President of
Operations and Chief Operating Officer
Richard Anderson, Vice President, Nuclear Support
Manager - Site Regulatory Compliance
D. Pace, Senior Vice President of
of Fleet Engineering
J. Rinckel, Vice President, Fleet Oversight
D. Jenkins, Attorney, FirstEnergy
Director, Fleet Regulatory Affairs
Manager - Fleet Licensing
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

DOCUMENT NAME: C:\FileNet\ML070310182.wpd
To receive a copy of this document, indicate in the box: "C" = Copy without attachment/enclosure "E" = Copy with attachment/enclosure "N" = No copy

OFFICE	RIII	RIII	
NAME	RRuiz:dtp	EDuncan	
DATE	1/30/07	1/30/07	

OFFICIAL RECORD COPY

DISTRIBUTION:
DXC1
TEB
SPS1
TJW2
RidsNrrDirsIrib
GEG
KGO
GLS
JER7
CAA1
LSL (electronic IR's only)
C. Pederson, DRS (hard copy - IR's only)
DRPIII
DRSIII
PLB1
TXN
ROPreports@nrc.gov (inspection reports, final SDP letters, any letter with an IR number)

U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket No:	50-346
License No:	NPF-3
Report No:	05000346/2006005
Licensee:	FirstEnergy Nuclear Operating Company (FENOC)
Facility:	Davis-Besse Nuclear Power Station
Location:	5501 North State Route 2 Oak Harbor, OH 43449-9760
Dates:	October 1, 2006, through December 31, 2006
Inspectors:	J. Rutkowski, Senior Resident Inspector R. Smith, Resident Inspector R. Morris, Senior Resident Inspector, Fermi M. Phalen, Health Physicist T. Go, Health Physicist G. O'Dwyer, Reactor Inspector N. Valos, Senior Operations Engineer K. Walton, Operations Engineer J. Jacobson, Senior Reactor Inspector G. Wright, Project Engineer
Approved by:	E. Duncan, Chief Branch 6 Division of Reactor Projects

Enclosure

SUMMARY OF FINDINGS

IR 05000346/2006005; 10/1/2006 - 12/31/2006; Davis-Besse Nuclear Power Station; Maintenance Risk Assessments and Emergent Work Control, As-Low-As-Reasonably-Achievable (ALARA) Planning and Controls

This report covers a 3-month period of baseline inspection. The inspection was conducted by Region III inspectors and resident inspectors. The inspection identified two findings of very low safety significance, one of which involved a Non-Cited Violation (NCV) of NRC requirements. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter 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 3, dated July 2000.

A. NRC-Identified and Self-Revealing Findings

Cornerstone: Mitigating Systems

- Green. A finding of very low safety significance and an associated NCV of 10 CFR 50.65(a)(4) was identified by the inspectors when the licensee failed to properly evaluate plant risk during station blackout diesel generator (SBODG) maintenance activities during the week of October 8, 2006. Probability risk assessment engineers were aware in December 2005 that the risk associated with the unavailability of an emergency diesel generator (EDG) or an SBODG had been revised from Green to Yellow. However, licensee personnel failed to update the probabilistic risk assessment model or risk profile program used for risk determination to reflect the revised risk level for the SBODG, although the risk program had been updated for other components. Consequently, during SBODG maintenance activities during the week of October 8, 2006, plant risk was treated as Green when it was actually Yellow and compensatory actions to address this increase in risk were not implemented, as required. As part of the licensee’s immediate corrective actions, licensee personnel updated the risk profile to properly reflect the risk associated with the unavailability of an EDG and SBODG.

  The finding was more than minor because the finding was related to a licensee risk assessment that contained incorrect assumptions that had the potential to change the outcome of the assessment. The finding was determined to be of very low safety significance because, although the SBODG was unavailable, the remaining EDGs could have performed their safety function in the event of a loss of offsite power. The inspectors also determined that the cause of the finding was related to the cross-cutting area of human performance because licensee personnel failed to communicate decisions and the basis for decisions to personnel who had a need to know that information in a timely manner. (Section 1R13)

Cornerstone: Occupational Radiation Safety

- Green. A finding of very low safety significance was identified by the inspectors when licensee personnel failed to adequately implement radiological dose controls as a result of ineffective radiological/ALARA planning and controls during Refueling Outage 14 (RFO14). The collective occupational radiation dose received by individuals for some work activities significantly exceeded the planned or intended dose that the licensee determined was ALARA for those work activities.

  The finding was more than minor because the finding was associated with the Occupational Radiation Safety Cornerstone attribute of ALARA planning/dose projection, and affected the cornerstone objective of ensuring adequate protection of worker health and safety from exposure to radiation. The finding was determined to be of very low safety significance because, although the finding involved ALARA planning and controls, the 3-year rolling average exposure for Davis-Besse was less than the SDP Green-to-White threshold of 135 person-rem for pressurized water reactors, and the finding did not involve an overexposure, a substantial potential for an overexposure, or an impaired ability to assess dose. As part of the licensee's corrective actions to address this issue, additional rigor in outage planning was planned. The inspectors also determined that the cause of the finding was related to the cross-cutting area of human performance because licensee personnel failed to effectively plan work activities to adequately implement radiological dose controls. (Section 2OS2.1)

B. Licensee-Identified Findings

None.

REPORT DETAILS

Summary of Plant Status

The plant entered the reporting period at full rated thermal power and remained at full power until November 18, 2006, when the plant was shut down, cooled down, and depressurized to replace the reactor coolant system (RCS) pilot-operated relief valve (PORV) and the two RCS safety valves. The plant had experienced higher than normal and slowly increasing RCS leakage through the seats of those valves and, although the leakage was well below Technical Specification (TS) limits, the licensee decided to shut down and replace the valves. The plant returned to full power on November 25, 2006.

1. REACTOR SAFETY

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

1R01 Adverse Weather Protection (71111.01)

a. Inspection Scope

The inspectors reviewed the licensee's preparations for cold weather operations with particular emphasis on the readiness of the service water system for cold weather. This included walkdowns and a review of the requirements and work orders for installing plywood over all four sides of the intake structure south ventilation penthouse, and heat tracing associated with the service water pump room sprinkler. Additionally, the inspectors conducted walkdowns to determine whether the licensee had obtained the high capacity trash pumps and suction and discharge piping necessary to support operations during frazil ice conditions as required by the cold weather operations procedure. The inspectors also reviewed the seasonal plant preparation checklist and interviewed operations personnel concerning the completion of cold weather preparations.

This review represented one inspection sample of a review of the cold weather preparations associated with a risk significant system.

b. Findings

No findings of significance were identified.

1R04 Equipment Alignment (71111.04Q)

a. Inspection Scope

The inspectors conducted partial walkdowns of the systems and trains listed below to determine whether the systems were correctly aligned to perform their designed safety function. The inspectors used licensee system valve line-up documents and system drawings during the walkdowns. The walkdowns included selected switch and valve position checks, and verification of electrical power to critical components. Finally, the inspectors evaluated other elements of system readiness, such as material condition, housekeeping, and component labeling. The documents used for the walkdowns are listed in the Attachment to this report. The inspectors reviewed:

- low pressure injection/decay heat train 1 on October 17, 2006, during a planned outage of low pressure injection/decay heat train 2; and
- containment spray train 1 on November 7, 2006, during a planned outage of containment spray train 2.

This review represented two quarterly inspection samples.

b. Findings

No findings of significance were identified.

1R05 Fire Protection (71111.05Q)

a. Inspection Scope

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

- high voltage switchgear room B (Fire Area Q, Room 323);
- turbine building floor elevation 565' (Fire Area II, Rooms 246, 247, 248, 249,252, 253 and 254);
- auxiliary building hallway elevation 603' including containment personnel air lock (Fire Area DD, Rooms 411 and 426);
- main control room (Fire Area FF, Rooms 502, 503, 504, 505, 508, 509, 510, 511, and 512);
- containment elevation 565' (Fire Area D, Rooms 216, 217, 218, and 220);
- spent fuel pool corridor, hot instrument shop, and storage room for fuel handling (Fire Area V, Rooms 400, 404 and 405); and
- radwaste exhaust equipment and main station exhaust fan room (Fire Area EE, Room 501).

This review represented seven inspection samples.

b. Findings

No findings of significance were identified.

1R06 Flood Protection Measures (71111.06)

a. Inspection Scope

The inspectors evaluated the licensee's preparations to mitigate the consequences of a large circulating water system rupture in the main condenser pit area. This inspection included a review of assessments which supported the Individual Plant Examination of External Events for the Davis-Besse Nuclear Station associated with internal flooding, and a review of licensee procedures and equipment used to mitigate the consequences of a large circulating water system break in the condenser pit area. This internal flooding scenario was selected due to its high likelihood as a plant trip initiator and due to the potential to impact risk significant equipment.

This review represented one inspection sample of internal flooding.

b. Findings

No findings of significance were identified.

1R07 Heat Sink Performance (71111.07B)

.1 Biennial Review of Heat Sink Performance

a. Inspection Scope

The inspectors reviewed heat sink performance associated with the Control Room Emergency Ventilation (CREV) system train 1 condenser and the Auxiliary Feedwater (AFW) system train 2 outboard bearing oil cooler. These heat exchangers were selected based on the following factors: 1) high risk significance as identified in the licensee's probabilistic safety analysis; 2) important mitigating system support functions, 3) the equipment had not previously been sampled; and 4) relatively low performance margins. While onsite, the inspectors verified that inspection, engineering, and maintenance activities were adequately conducted to ensure proper heat transfer. This was accomplished through independent heat transfer capability calculations, a review of the methods used to inspect the heat exchangers, a verification that the as-found results were appropriately dispositioned, and personnel interviews. Through a review of procedures, test results, and interviews, the inspectors verified that the chemical treatments, ultrasonic tests, and other methods used to monitor and control biotic fouling corrosion and macro-fouling were sufficient to ensure continued satisfactory heat exchanger performance.

The inspectors verified that the condition and operation of these heat exchangers was consistent with design assumptions in heat transfer calculations through a review of related procedures and surveillance tests. This was performed through a review of heat exchanger inspection and cleaning work orders, calculations, and completed surveillance tests.

The inspectors also verified three attributes of the ultimate heat sink (UHS) as required by IP 71111-07B, Section 2.02, items d.1, d.2 and d.6. This included a visual inspection of accessible portions of the UHS system, including a verification of proper rip-rap installation on the above-water safety-related portions of the UHS and a verification that nearby vegetation was properly maintained. The inspectors verified proper maintenance of inaccessible below-water portions of the UHS system through a review of the methodology and results of underwater diving inspection documentation that demonstrated UHS capability. This included ensuring UHS capacity by monitoring and removing sediment intrusion as necessary and ensuring structural integrity of underwater UHS structures, weirs, and excavations by inspection, and repairs as necessary. The inspectors reviewed associated calculations to ensure safety function capability during various operating extremes. This review also confirmed that the calculation and inspection methodologies were consistent with accepted NRC and industry practices. The inspectors also verified that appropriate controls were in place to ensure availability of the UHS under adverse operating conditions, such as during weather susceptible to frazil ice formation.

Corrective action documents concerning heat exchanger or heat sink performance issues were reviewed to verify that the licensee had an appropriate threshold for identifying issues. This review included an evaluation of the effectiveness of corrective actions for identified issues and the engineering justifications for operability.

This review represented two inspection samples.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification Program (71111.11)

.1 Resident Inspector Quarterly Review

a. Inspection Scope

On October 30, 2006, the inspectors observed an operating crew during a crew simulator training evolution to assess operator performance and to verify that evaluators were identifying and documenting crew performance problems, and that training was being conducted in accordance with approved procedures. The inspectors also attended the post-session licensee controller critique. The inspectors observed a shift crew respond to scenario ORQ-SIM-S181, “Steam Generator Tube Rupture, Makeup Loss, Bus C1 and C2 Loss, Steam Generator Startup and AFW Level Fail,” Revision 0.

This review represented one quarterly inspection sample.

b. Findings

No findings of significance were identified.

.2 Facility Operating History Biennial Review

a. Inspection Scope

The inspectors reviewed the plant's operating history from October 2004 through October 2006 to identify operating experience that was expected to be addressed by the Licensed Operator Requalification Training (LORT) program. The inspectors also verified that the identified operating experience had been addressed by the facility licensee in accordance with the station's approved Systems Approach to Training (SAT) program to satisfy the requirements of 10 CFR 55.59(c), "Requalification."

b. Findings

No findings of significance were identified.

.3 Licensee Requalification Examinations Biennial Review

a. Inspection Scope

The inspectors performed a biennial inspection of the licensee's LORT test/examination program for compliance with the station's SAT program and the requirements of 10 CFR 55.59(c)(4), "Evaluation." The operating examination material reviewed consisted of five operating tests, each containing approximately two dynamic simulator scenarios and approximately six job performance measures (JPMs). Three written examinations were reviewed, each containing approximately 40 questions. The inspectors reviewed the annual requalification operating test and biennial written examination material to evaluate general quality, construction, and difficulty level. The inspectors assessed the level of examination material duplication from week-to-week during the current year operating test and written examinations. The inspectors reviewed the methodology for developing the examinations, including the LORT program 2-year sample plan, probabilistic risk assessment (PRA) insights, previously identified operator performance deficiencies, and plant modifications.

b. Findings

No findings of significance were identified.

.4 Licensee Administration of Requalification Examinations Biennial Review

a. Inspection Scope

The inspectors observed the administration of a requalification operating test to assess the licensee's effectiveness in conducting the test to ensure compliance with 10 CFR 55.59(c)(4), "Evaluation." The inspectors evaluated the performance of two crews in parallel with the facility evaluators during two dynamic simulator scenarios and evaluated various licensed crew members concurrently with facility evaluators during the administration of several JPMs. The inspectors assessed the facility evaluators' ability to determine adequate crew and individual performance using objective, measurable standards. The inspectors observed the training staff personnel administer the operating test, including conducting pre-examination briefings, evaluations of operator performance, and individual and crew evaluations upon completion of the operating test. The inspectors evaluated the ability of the simulator to support the examinations. A specific evaluation of simulator performance was conducted and is documented in Section 1R11.9, "Conformance With Simulator Requirements Specified in 10 CFR 55.46," of this report.

b. Findings

No findings of significance were identified.

.5 Examination Security Biennial Review

a. Inspection Scope

The inspectors observed and reviewed the licensee's overall licensed operator requalification examination security program related to examination physical security (e.g., access restrictions and simulator considerations) and integrity (e.g., predictability and bias) to verify compliance with 10 CFR 55.49, "Integrity of Examinations and Tests." The inspectors also reviewed the licensee's examination security procedure, any corrective actions related to past or present examination security problems, and the implementation of security and integrity measures (e.g., security agreements, sampling criteria, bank use, and test item repetition) throughout the examination process.

b. Findings

No findings of significance were identified.

.6 Licensee Training Feedback System Biennial Review

a. Inspection Scope

The inspectors assessed the methods and effectiveness of the licensee's processes for revising and maintaining the LORT program up to date, including the use of feedback from plant events and industry experience information. The inspectors reviewed the licensee's quality assurance oversight activities, including licensee training department self-assessment reports. The inspectors evaluated the licensee's ability to assess the effectiveness of the LORT program and the ability to implement appropriate corrective actions. This evaluation was performed to verify compliance with 10 CFR 55.59(c), "Requalification" and the licensee's SAT program.

b. Findings

No findings of significance were identified.

.7 Licensee Remedial Training Program Biennial Review

a. Inspection Scope

The inspectors assessed the adequacy and effectiveness of the remedial training conducted since the previous biennial requalification examinations and the training from the current examination cycle to determine whether weaknesses in licensed operator or crew performance identified during training and plant operations were adequately addressed. The inspectors reviewed remedial training procedures and individual remedial training plans. This evaluation was performed in accordance with 10 CFR 55.59(c), “Requalification,” and with respect to the licensee’s SAT program.

b. Findings

No findings of significance were identified.

.8 Conformance With Operator License Conditions Biennial Review

a. Inspection Scope

The inspectors reviewed the facility and individual operator licensee conformance with the requirements of 10 CFR Part 55. The inspectors reviewed the licensee's program for maintaining active operator licenses to assess compliance with 10 CFR 55.53(e) and (f). The inspectors reviewed the procedural guidance and the process associated with monitoring on-shift hours and granting watchstanding credit to licensed operators for maintaining active operator licenses. The inspectors reviewed the licensee's LORT program to assess compliance with the requalification program requirements prescribed in 10 CFR 55.59(c). Additionally, medical records for six licensed operators were reviewed for compliance with 10 CFR 55.53(I).

b. Findings

No findings of significance were identified.

.9 Conformance With Simulator Requirements Specified in 10 CFR 55.46 Biennial Review

a. Inspection Scope

The inspectors assessed the adequacy of the licensee’s simulation facility (simulator) for use in operator licensing examinations and for satisfying experience requirements as prescribed in 10 CFR 55.46, “Simulation Facilities.” The inspectors also reviewed a sample of simulator performance test records (i.e., transient tests, malfunction tests, and core performance tests), simulator discrepancies, and the process for ensuring continued assurance of simulator fidelity in accordance with 10 CFR 55.46. The inspectors reviewed and evaluated the discrepancy process to ensure that simulator fidelity was maintained. Open simulator discrepancies were reviewed for importance relative to the impact on 10 CFR 55.45 and 55.59 operator actions, as well as on nuclear and thermal hydraulic operating characteristics. The inspectors conducted interviews with members of the licensee's simulator staff regarding the configuration control process and completed the IP 71111.11, Appendix C checklist, to determine whether the licensee's simulator was operating as required by 10 CFR 55.46(c) and (d).

b. Findings

One Unresolved Item (URI) was identified.

Introduction: The inspectors identified a URI involving the adequacy of the performance testing being performed on the simulator to meet the requirements of 10 CFR 55.46(d)(1). Specifically, the inspectors identified that the current testing being performed to satisfy the requirement to conduct a "Generator Trip" test may not meet the requirements of ANSI/ANS-3.5-1998, Section 3.1.4, "Malfunctions."

Description: In accordance with 10 CFR 55.46(d)(1), the licensee was required to periodically conduct simulator performance testing throughout the life of the simulator. The licensee was committed to ANSI/ANS-3.5-1998 in conducting these simulator performance tests. The ANSI/ANS-3.5-1998 standard required periodic testing prescribed by Section 3.1.4, "Malfunctions." Section 3.1.4 required that the licensee perform testing associated with Item 16, "Generator Trip."

The inspectors identified that the licensee's simulator testing procedure associated with Section 3.1.4, Item 16, "Generator Trip," may not meet the requirements of 10 CFR 50.46(d)(1) to provide continued assurance of simulator fidelity. In particular, although the "Generator Trip" test procedure, "Davis-Besse Nuclear Power Station Simulator Training Certification Test T16, Generator/Turbine Trip," established a simulated plant condition that resulted in a turbine trip as an initiating event, with the simulator stopped immediately after the turbine trip, the test procedure did not provide a simulation of a generator trip as an initiating event.

Following identification of this issue, the licensee entered the issue into their corrective action program as condition report (CR) 06-10403. This issue is unresolved pending further NRC review of the licensee's simulator performance testing.
(URI 05000346/2006005-01)

.10 Annual Operating Test Results and Biennial Written Examination Results Biennial Review

a. Inspection Scope

The inspectors reviewed the pass/fail results of the individual biennial written tests administered by the licensee during calender year 2006. The inspectors also reviewed the operating and simulator tests (required to be given annually per 10 CFR 55.59(a)(2)) administered by the licensee during calender year 2006. The overall written examination and operating test results were compared with the SDP in accordance with IMC 0609, Appendix I, "Operator Requalification Human Performance SDP."

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 three systems:

- Radiation Monitoring System
- 480 Volt Alternating Current (VAC) System
- Freeze Protection Heat Trace System

During these reviews, the inspectors determined whether:

- the CR process was properly used to identify deficiencies and issues with equipment performance;
- equipment performance issues were correctly categorized for reliability in accordance with system performance criteria;
- the licensee had effectively monitored key parameters and identified system trends and monitored for signs of component failures;
- appropriate goals and corrective actions to address long-term reliability issues had been established;
- the physical condition of the system appeared consistent with the system status as reflected in CRs and open work orders;
- the licensee's corrective actions included extent of condition; and
- maintenance rule system status classification was appropriate and whether re-classification was appropriate when compared to recent equipment performance history.

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

This review represented three quarterly 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 licensee's response to risk-significant activities. These activities were selected based on the potential impact on overall plant risk. The inspections were conducted to determine whether the planning, control, and performance of the work was accomplished in a manner to minimize overall plant risk and to determine whether contingency plans were in place, where appropriate. The licensee's daily configuration risk assessments, shift turnover meeting observations, daily plant status meeting observations, and the documents listed in the Attachment to this report were used by the inspectors to determine if the equipment configurations had been properly listed, if protected equipment had been identified and was being controlled where appropriate, whether significant aspects of plant risk were communicated to the necessary personnel, and whether existing work plans were adequately revised to reflect changes in planned equipment operability. The inspectors evaluated the following activities:

- initial risk summaries for the week of October 8, 2006, and revised schedules due to the change in the risk status of the station blackout diesel generator (SBODG) during a planned maintenance outage; and
- shutdown risk associated with the cycle 15 maintenance outage that started on November 18, 2006.

This review represented two inspection samples.

b. Findings

Introduction: A finding of very low safety significance and an associated Non-Cited Violation (NCV) of 10 CFR 50.65(a)(4) was identified by the inspectors when the licensee failed to properly evaluate plant risk during SBODG maintenance activities during the week of October 8, 2006. Specifically, the inspectors identified that licensee personnel non-conservatively evaluated the on-line risk associated with the unavailability of the SBODG as Green instead of Yellow, and failed to implement appropriate compensatory actions.

Description: On October 10, 2006, while reviewing information concerning the Mitigating System Performance Index (MSPI) with licensee Probalistic Risk Assessment (PRA) engineers, the inspectors identified that as a result of recent changes to the PRA assumptions, the risk associated with the unavailability of emergency diesel generators (EDGs) and the SBODGs had been elevated from Green to Yellow. The scenarios in which assumptions were updated and resulted in the change in risk included a station blackout with battery depletion in both direct current (DC) divisions and the inability of operators to take manual actions to operate the AFW system locally. After further questioning of the PRA engineers, the inspectors determined that although this information was available in December 2005, actions to update the PRA analysis and the Safety Monitor online risk profile generator were not scheduled to be completed until the end of December 2006 although the risk program for other components had been updated.

The inspectors reviewed the online risk assessment for the ongoing SBODG maintenance activities at the time of this inspection and determined that the online risk was being treated as a Green risk activity. The inspectors questioned the Operations Manager about the Green risk associated with the SBODG unavailability. After conference calls with site management and the PRA engineers, licensee personnel determined that the Safety Monitor computer program underestimated the importance of the EDGs and SBODGs. The updated data regarding SBODG unavailability increased baseline risk by a factor of about 4.5. This resulted in a revised PRA risk of 3.14 E-5 core damage frequency per reactor year, which translated into a Yellow risk level. Operators subsequently entered Yellow risk and implemented oversight requirements and compensatory measures delineated in plant procedures for a Yellow risk condition.

The inspectors also determined that licensee personnel missed a prior opportunity to update the online risk process when the risk profile process was revised earlier in 2006 to remove unnecessary conservatism that overestimated the risk significance of various components. The conservatism had been in use for an extended period of time. The revision to the process, while removing this unnecessary conservatism, failed to address the increase in the risk associated with the unavailability of an EDG or an SBODG.

Analysis: The inspectors determined that the failure to update the risk profile program to properly analyze plant risk was a performance deficiency that warranted a significance evaluation. The inspectors reviewed this issue using the guidance contained in Appendix B, "Issue Screening," of IMC 0612, "Power Reactor Inspection Reports." The inspectors determined that the failure to update the risk profile program to properly analyze plant risk was a performance deficiency that affected the Mitigating Systems cornerstone. The finding was more than minor in accordance with IMC 0612, Appendix B, Section 3.(5)(h), because the risk assessment contained incorrect assumptions that had the potential to change the outcome of the assessment. The finding was determined to be of very low safety significance (Green) because, although the SBODG was unavailable, the remaining EDGs could have performed their safety function in the event of a loss of offsite power. The inspectors also determined that the cause of the finding was related to the cross-cutting area of human performance because licensee personnel failed to communicate decisions and the basis for decisions to personnel who had a need to know that information in a timely manner.

Enforcement: 10 CFR 50.65(a)(4) requires, in part, that prior to the performance of maintenance activities, including but not limited to surveillances, post-maintenance testing, and corrective and preventive maintenance, the licensee shall assess and manage the increase in risk that may result from the proposed maintenance activity. Contrary to the above, licensee personnel failed to perform an adequate risk assessment when the SBODG was made unavailable for maintenance on October 9, 2006. The failure to perform an adequate risk assessment resulted in the licensee inappropriately assigning an overall Green risk condition for the plant when actual plant conditions warranted a Yellow risk condition and additional oversight and compensatory actions. However, since the failure to adequately assess on-line risk was of very low safety significance and the licensee has entered this issue into their corrective action program (CR 06-7688), this violation is being treated as an NCV, consistent with Section VI.A.1 of the NRC Enforcement Policy (NCV 05000346/2006005-02).

1R15 Operability Evaluations (71111.15)

a. Inspection Scope

The inspectors selected CRs that identified potential operability issues associated with risk-significant components or systems. These CRs and applicable licensee operability evaluations were reviewed to determine if the operability of the components or systems was appropriately supported. The inspectors compared the operability and design criteria in the appropriate sections of the Updated Safety Analysis Report (USAR) to the licensee's evaluation of the issues to determine if the components or systems were operable. Where compensatory measures were necessary to maintain operability, the inspectors determined whether compensatory measures were in place, would work as intended, and were properly controlled.

The following issues were evaluated:

- CR 06-8948 and CR 06-7551, which addressed issues associated with valve CC1467, "Component Cooling Water (CCW) Solenoid Valve Outlet on Decay Heat Cooler 1;"

- CR 06-9924, which addressed the operability of containment purge supply and exhaust valves in the absence of as-found leak testing prior to use; and

- CR 06-11027 and CR 06-11062, which addressed the operability of the main feedwater line to steam generator 1, following the discovery that hot expansion piston settings for two seismic snubbers were outside of acceptance limits.

This review represented three inspection samples.

b. Findings

No findings of significance were identified.

1R19 Post-Maintenance Testing (71111.19)

a. Inspection Scope

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

- low pressure injection/decay heat pump two quarterly inservice test and inspection on October 17, 2006, after the system was drained to install a vent valve and conduct pump motor preventive maintenance activities;

- steam feed rupture control system (SFRCS) channel 1 following relay replacement on October 23, 2006;

- emergency ventilation system (EVS) train 2 filter and charcoal absorber testing on November 8, 2006, following replacement of the filter upstream charcoal absorber trays; and

- PORV post-maintenance testing after the PORV was replaced during a plant shutdown, including a walkdown of the PORV in containment at pressure on November 21 and 22, 2006.

These reviews were conducted 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 testing demonstrated operational readiness consistent with design and licensing basis documents. The specific documents reviewed during this inspection are listed in the Attachment to this report.

This review represented four inspection samples.

b. Findings

No findings of significance were identified.

1R20 Refueling and Other Outage Activities (71111.20)

a. Inspection Scope

The inspectors observed activities associated with a short duration planned outage that commenced on November 18, 2006, and ended on November 25, 2006. The major purpose of the outage was to replace the RCS safety valves and the pressurizer PORV that exhibited indications of increased seat leakage. The inspectors reviewed RCS cooldown and heatup, configuration management, clearance activities, reduced RCS inventory operations, shutdown risk management, conformance to applicable procedures, and compliance with TS. Select portions of the following major activities were also observed:

- containment initial inspection and subsequent closeout activities;
- reactor approach to criticality and achievement of criticality;
- main electrical generator output synchronization with the utility grid; and
- the restart readiness review meeting.

This review represented one inspection sample.

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

The inspectors observed the surveillance tests listed below and/or evaluated surveillance test data to determine whether the equipment tested met TS, USAR, and licensee procedural requirements, and demonstrated that the equipment was capable of performing its intended safety function. The inspectors used the documents listed in the Attachment to this report to determine whether the testing frequency satisfied TS requirements; whether the test was conducted in accordance with the procedures, including establishing the proper plant conditions and prerequisites; whether the test acceptance criteria were satisfied; and whether the results of the test were properly reviewed and documented. The following surveillance was evaluated:

- DB-PF-03030, service water pump three quarterly testing performed on October 22, 2006

This review represented one inservice testing (IST) 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 November 2, 2006. The observations included licensee preparations, evaluation of drill conduct, review of the drill critiques, 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 Operations Support Center. The inspectors evaluated the effectiveness of the licensee's communications, the accuracy of situation evaluations, and the timeliness of assembling teams to respond to simulated conditions. Finally, the inspectors reviewed the licensee's Operations Support Center 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

Cornerstone: Occupational Radiation Safety

2OS2 As-Low-As-Reasonably-Achievable (ALARA) Planning and Controls (71121.02)

.1 Radiological Work Planning

a. Inspection Scope

The inspectors compared the exposure results achieved for the RFO14, including the actual to anticipated dose rates, and person-rem expended with the original dose projected in the licensee's ALARA planning for approximately 20 Radiation Work Permits (RWPs) and their associated work activities. The inspectors also reviewed any inconsistencies between the planned and actual work activity. Reasons for inconsistencies between projected and actual work activity doses were evaluated to determine if the activities were planned reasonably well and to ensure the licensee identified any work interface/planning deficiencies.

The extension of ALARA requirements into work procedures and/or RWP documents was also evaluated to verify that the licensee's radiological job planning was integrated into the work process.

The licensee's work in progress reports were reviewed for selected outage jobs that accrued a collective dose of 75 percent of what was projected for RWPs estimated to accumulate greater than 100 millirem (mrem) to verify that the licensee could identify problems and address them as work progressed. Post outage reports for RFO13 and RFO14 were also reviewed. RWP jobs from RFO14 that accrued greater than 1 rem and exceeded 100 percent of the projected dose were also reviewed to ensure that work was adequately evaluated and suspended if warranted, and that identified problems were entered into the licensee's corrective action program consistent with licensee procedures.

This review represented three inspection samples.

b. Findings

One finding of very low safety significance was identified.

Introduction: One NRC-Identified finding of very low safety significance (Green) was identified when licensee personnel failed to adequately implement radiological dose controls as a result of ineffective radiological/ALARA planning and control during RFO14. The collective dose for four work activities resulted in actual doses in excess of 5 person-rem and also exceeded initial planned dose estimates by more than 50 percent.

Description: The initial dose estimates for the RWPs were primarily based on historical dose rates for the same or similar work activities, benchmarks to industry norms, and resource requirement estimates provided by the maintenance groups responsible for the individual activities. The initial RWP dose estimates were reviewed by station management. The ALARA in-progress reviews, post-job reviews, CRs, and personnel interviews conducted at the station did not fully explain the differences between the initially projected and actual doses received. Most documents attributed the estimated-to-actual dose discrepancies to elevated general area dose rates following reactor shutdown (post crud burst). The inspectors provided allowances for some additional exposure relative to increases in ambient dose rates in these work locations, but still could only reconcile minimal dose differences that could be attributed to the chemically controlled shutdown protocol of crud burst and cleanup. Neither the inspectors nor the licensee identified any significant changes to the originally planned work scope to these RWPs to adequately explain the ongoing changes made to the RWP dose estimates during the outage. Additionally, post-outage reviews and reports failed to explain or document in sufficient detail the reasons that the dose actually incurred performing these work activities exceeded original dose estimates by greater than 50 percent.

This condition was assessed by the inspectors as a single performance deficiency for the failure to adequately implement radiological dose controls as a result of ineffective radiological work planning. This single performance deficiency was manifested in several jobs throughout the outage. Those jobs that met the regulatory threshold of actual doses being greater than 5 person-rem and greater than 50 percent of their initial estimated dose included the following:

Example 1: Reactor Coolant Pump (RCP) 2-1 and 2-2 motor and repair work activities, as identified in RWPs 5401and 5403, had an initial dose estimate of 42.541 person-rem with an actual accrued dose of 65.836 person-rem. Data available through the ALARA in-progress and post-job reviews, CRs, and through personnel interviews attributed some of the additional exposure to planning weaknesses such as:

- ineffective use of radiation shielding by using shielded boxes that were placed lower than the workers’ shoulders and by not using leaded glass or the leaded glass viewing window, which contributed to the whole body dose;

- ineffective planning on welding RCP assemblies that required additional removal of the assembly or assemblies out of the shielded work boxes;

- ineffective job planning/preparation that resulted in multiple attempts to install a “belly band” on an RCP pump rotating assembly;

- common dose reduction techniques such as hydrolazing of the head vent line of the RCP was not performed; and

- operations venting the pressurizer to the quench tank thereby creating a large radiation source at contact, at 30 centimeters from the piping and in the general work area, without being properly evaluated for radiological impact prior to initiation.

Additionally, the licensee's recognition of, and response to, the increased dose rates in the RCP work area were determined to be less than timely.

Example 2: Refueling work activities, as identified in RWPs 5107, 5108, 5109, and 5114, had an initial dose estimate of 7.010 person-rem with an actual accrued dose of 12.846 person-rem. Data available through the ALARA in-progress and post-job reviews, CRs, and through personnel interviews attributed some of the additional exposure to planning weaknesses such as inaccurate refueling hours (actual to projected); fuel bundles taking longer to insert than originally planned resulting in a high dose rate on the refueling bridge; additional dose expended because of poor engineering modification of the refueling bridge mast; and ineffective decontamination and removal of the instacote that lined the refueling canal.

Example 3: Reactor head disassembly/reassembly work activities, as identified in RWPs 5104, 5105, and 5106, had an initial dose estimate of 16.368 person-rem with an actual accrued dose of 32.751 person-rem. Data available through the ALARA in-progress and post-job reviews, CRs, and through personnel interviews attributed some of the additional exposure to planning weaknesses such as ineffective shielding analysis contributing to collective dose increases during reactor service activities; unanticipated higher general area dose rates on the top of the Control Rod Drive Mechanism service structure; and an unexpected adverse impact on the collective dose of the reactor service activities due to design changes on the debris covers. The inspector evaluated these issues and concluded that the licensee could have reasonably anticipated these conditions and initiated appropriate dose mitigation strategies.

Example 4: The Boric Acid Corrosion Control (BACC) Program work activities, as identified in RWPs 5001, 5002, 5003, 5008, and 5400, had an initial dose estimate of 3.0 person-rem with an actual accrued dose of 7.275 person-rem. Data available through the ALARA in-progress and post-job reviews, CRs, and through personnel interviews attributed some of the additional exposure to planning weaknesses such as the dose for the job activities was underestimated because the outage BACC work scope was based on past similar activities and not RFO14 specific activities, and the current work scope was more extensive including inspection activities of the higher dose rate areas which were unanticipated; the licensee did not anticipate the differing job skills and knowledge of the workers during the BACC work planning stage in the inspection, decontamination, and cleaning of valves that may have added to the collective person-rem; and poor planning and less detailed work order documentation also may have contributed to the additional collective dose.

Analysis: In the four examples, the failure to adequately implement radiological dose controls as a result of ineffective radiological/ALARA work planning represented a single performance deficiency as defined in IMC 0612, "Power Reactor Inspection Reports," Appendix B, "Issue Screening," which warranted a significance determination. The inspectors determined that the issue was associated with the Occupational Radiation Safety Cornerstone attribute of ALARA planning/dose projection, and affected the cornerstone objective of ensuring adequate protection of worker health and safety from exposure to radiation. Therefore, the issue was more than minor and represented a finding which was evaluated using the SDP.

Since this finding involved radiological controls and ALARA planning, the inspectors utilized IMC 0609, Appendix C, "Occupational Radiation Safety SDP," to assess the significance. The inspectors determined that the finding involved ALARA planning and work controls. However, since the licensee's current 3-year rolling collective dose average was not greater than 135 person-rem, the inspectors concluded that the SDP assessment for this finding was of very low safety significance (Green).

As part of the licensee's corrective actions to address this issue, additional rigor in outage planning was planned. Additionally, the inspectors identified this issue as having a cross-cutting aspect in the area of human performance because licensee personnel failed to effectively plan work activities to adequately implement radiological dose controls.

Enforcement: The failure to adequately implement radiological dose controls was a performance deficiency. However, no violation of regulatory requirements occurred. This issue was considered a finding of very low safety significance and was entered into the licensee's corrective action program as CR 06-01697, CR 06-01674, CR 06-02611, and CR 06-08338. As part of the licensee's corrective actions to address this issue, additional rigor in outage planning was planned (FIN 05000346/2006005-03).

.2 Verification of Dose Estimates and Exposure Tracking Systems

a. Inspection Scope

The inspectors reviewed the licensee's assumptions and basis for the collective outage exposure estimate, and evaluated the methodology and practices for estimating specific work activity exposure. The inspectors evaluated both dose rate and time/labor estimates for adequacy, and compared those estimates to historical station specific or industry data.

The inspectors reviewed the licensee's process for adjusting outage exposure estimates when unexpected changes in scope, emergent work, or other unanticipated problems were encountered that significantly impacted worker exposure. This included determining whether adjustments to estimated exposure (intended dose) were based on sound radiation protection and ALARA principles or were made to account for failures to plan or control the work. The frequency of these adjustments was reviewed to evaluate the adequacy of the original ALARA planning.

The licensee's exposure tracking system was evaluated to determine whether the level of exposure tracking detail, exposure report timeliness, and exposure report distribution was sufficient to support the control of collective exposure. RWPs were reviewed to determine if they covered too many work activities to allow work activity specific exposure trends to be detected and controlled. During the conduct of exposure-significant work, the inspectors evaluated if licensee management was aware of the exposure status of the work and would intervene if exposure trends increased beyond exposure estimates. Additionally, the inspectors reviewed station ALARA Committee meeting notes to assess the degree of oversight in outage dose management.

This review represented three inspection samples.

b. Findings

One finding of very low safety significance, which is documented in Section 2OS2.1 of this report, was identified concerning the failure to adequately implement radiological dose controls as a result of ineffective radiological/ALARA planning and controls.

.3 Problem Identification and Resolution

a. Inspection Scope

The inspectors assessed the adequacy of the licensee's problem identification processes and verified that identified problems were entered into the corrective action program for resolution. This included post-outage ALARA critiques/lessons learned for exposure performance from the licensee's previous RFO13.

Corrective action reports generated since the end of the licensee's recent RFO14 that related to the ALARA program were selectively reviewed, and staff members were interviewed to verify that follow-up activities were being conducted in a timely manner commensurate with their importance to safety and risk using the following criteria:

- 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; and
- identification and implementation of effective corrective actions.

The licensee's corrective action program was also reviewed to determine if repetitive deficiencies in problem identification and resolution were being addressed.

This review represented three inspection samples.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA1 PI Verification (71151)

Cornerstones: Occupational and Public Radiation Safety

.1 Radiation Safety Strategic Performance Area

a. Inspection Scope

The inspectors sampled the licensee's PI submittals for the periods listed below. The inspectors used PI definitions and guidance contained in Revision 4 of Nuclear Energy Institute Document 99-02, "Regulatory Assessment PI Guideline," to verify the accuracy of the PI data. The following PI was reviewed:

- Occupational Exposure Control Effectiveness

The inspectors reviewed the licensee's assessment of the PI for occupational radiation safety to determine if indicator-related data was adequately assessed and reported during the previous 4 quarters. The inspectors compared the licensee's PI data with the CR database, reviewed radiological restricted area exit electronic dosimetry transaction records, and conducted random walkdowns of accessible locked high radiation area entrances to verify the adequacy of controls in place for these areas. Data collection and analysis methods for the PI were discussed with licensee personnel to determine if there were any unaccounted for occurrences in the Occupational Radiation Safety PIs defined in Revision 4 of Nuclear Energy Institute 99-02.

This review represented one inspection sample.

- Radiological Environmental TS/Offsite Dose Calculation Manual (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 CR database for the previous 4 quarters, to identify any potential occurrences such as unmonitored, uncontrolled, or improperly calculated effluent releases that may have impacted offsite dose. The inspectors also selectively reviewed gaseous and liquid effluent release data and the results of associated offsite dose calculations and quarterly PI verification records generated over the previous 4 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 4 of Nuclear Energy Institute Document 99-02.

This review represented one inspection sample.

b. Findings

No findings of significance were identified

4OA2 Identification and Resolution of Problems (71152)

.1 Daily Review

a. Inspection Scope

As required by Inspection Procedure 71152, “Identification and Resolution of Problems,” and to identify repetitive equipment deficiencies or specific human performance issues for follow-up, the inspectors performed a daily screening of items entered into the licensee’s corrective action program. This screening was accomplished by reviewing documents entered into the corrective action program and a review of document packages prepared for the licensee’s daily Management Alignment and Ownership Meetings.

b. Findings

No findings of significance were identified.

.2 Semi-Annual Review to Identify Trends

a. Inspection Scope

As required by Inspection Procedure 71152, "Identification and Resolution of Problems," the inspectors performed a review of the licensee’s corrective action program and associated documents to identify trends that could indicate the existence of a more significant safety issue. The review was focused on repetitive equipment issues, but also considered the results of daily corrective action program item screening discussed in Section 4OA2.1 above, licensee trending efforts, and licensee human performance results. The review included the 6-month period of June 2006 through November 2006; the Davis-Besse Oversight Assessment Reports (2nd quarter 2006 and 3rd quarter 2006); and issues documented in the licensee’s system health reports, maintenance rule monthly minutes for 2006, and other documents prepared for the daily management meeting.

This review represented one semiannual trend review sample.

b. Assessment and Observations

No findings of significance were identified. The inspectors determined that the implementation of trending was adequate. The inspectors compared the licensee’s process results with the results of the inspectors’ daily screening and did not identify any discrepancies or potential trends that were not currently captured in the corrective action program or other licensee generated documents.

.3 Annual Sample: Review of Issues

a. Inspection Scope

The inspectors reviewed CR 06-03013, “Service Water Pump Two Quarterly Test Failure,” and the associated evaluations by the licensee. The inspectors reviewed the appropriateness of the licensee’s actions to address the issues associated with the initial difficulty in identifying the correct cause of the apparent failure. Additionally, because the licensee initially classified the issue as a significant condition adverse to quality, but then downgraded the issue to a condition adverse to quality, 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 July 22, 2006, the quarterly surveillance testing results of service water pump 2 indicated degrading pump conditions although the pump was a new pump that had been installed about 3 months prior to the test. Licensee personnel suspected that the cause of the identified degradation was either instrumentation problems during this test or during the baseline test that was conducted after the new pump was installed. After receiving assurances from instrumentation personnel that the instrumentation functioned properly, the licensee investigated pump margins and pump degradation mechanisms. For the July 22, 2006 test, engineering personnel determined that the pump test results satisfied required flow and pressure parameters, but was degraded and was required to be tested more frequently than quarterly.

On August 11, 2006, two additional surveillance tests determined that the measured flow and pressure of service water pump 2 did not meet test acceptance criteria, and the pump was declared inoperable. Operations and Instrumentation personnel checked valve alignment and the performance of test instrumentation and concluded that there were no issues with system alignment or test instrumentation. The pump was declared inoperable and a problem solving team developed action plans to identify the cause of the issue.

After activities to test for valve leakage did not identify leakage sufficient to cause the surveillance test failure, service water pump 2 was disassembled and replaced with another pump. Examination of the disassembled pump did not identify any degradation sufficient to cause the surveillance test failure.

Following examination by a licensee offsite test shop, licensee personnel determined that the apparent pump performance degradation was not due to actual pump degradation, but was caused by inaccurate flow readings due to inadequate venting of the test flow instruments. The licensee determined that the test flow instruments had been installed using standard skill-of-the-craft qualifications and the installers had not reviewed or followed recommendations in the flow test equipment technical manual. The licensee also determined that the test equipment was used without a redundant indication to identify flow measurement issues. As a corrective action, licensee personnel planned to develop guidance on installing the flow test equipment and train personnel on that guidance.

The licensee initially classified the surveillance test failure as a significant condition adverse to quality since initial indications were that the installed service water pump 2 had degraded to a condition outside of the surveillance acceptance criteria. As such, the licensee's corrective action program required that a root cause evaluation be conducted. When it was determined that the pump had not degraded and would have provided, if necessary, the required design flow, the licensee downgraded the issue to a condition adverse to quality. Under the licensee's program, a root cause was not required to review an issue classified as a condition adverse to quality. The licensee performed a full apparent cause evaluation, which was reviewed by the licensee's Corrective Action Review Board.

c. Conclusions

No findings of significance were identified. The licensee evaluated potential scenarios in an effort to determine the root cause of the issue. Initial assurances that the test instrumentation was functioning properly were incorrect and caused the licensee to take additional actions to address the issue. Due to the redundancy in the service water system and the licensee's continued efforts to find the cause of the issue, no violation of regulatory requirements was identified. Licensee personnel stated that they would address the problem of not being able to initially identify that the flow measuring instruments were not properly vented through specific guidance and training on the proper configuration of the flow instruments when used in the service water system.

4OA3 Event Followup (71153)

.1 (Closed) Licensee Event Report (LER) 05000346/2006-003-00: Degraded Condenser Pressure Due to Failed Drain Line Results in Manual Reactor Trip

On September 6, 2006, with the plant operating at 100 percent power, condenser vacuum began to degrade unexpectedly. The licensee entered abnormal operating procedure DB-OP-02518, "High Condenser Pressure," and reduced reactor power. When load was reduced to less than 280 MWe and condenser pressure was greater than 5 inches of mercury-absolute (HgA), licensee personnel manually tripped the reactor in accordance with their procedures. Licensee personnel investigated the cause of the transient and identified that the low pressure turbine bearing 4 "slop drain" line had failed inside the condenser, which caused air in-leakage into the condenser. The "slop drain" was an original turbine design to allow draining water and oil leakage from low pressure turbine bearing housings. This plant trip was discussed in NRC Inspection Report 05000346/2006004, issued October 18, 2006. This event was further reviewed by inspectors during the problem identification and resolution inspection documented in NRC Inspection Report 05000346/2006007. The LER did not identify any additional issues. This LER is closed.

This review represented one inspection sample.

.2 (Closed) URI 05000346/2005301-02: Use of Device to Pin Safety Features Actuation System (SFAS) Switch

On July 18, 2005, the inspectors observed Initial Operator License applicants perform a JPM (2005 NRC JPM C) in the simulator during the NRC initial license examination. Although not referenced by procedure DB-OP-06014, Section 5.2, "Emergency Closure of CFT 2 Isolation Valve CF1A," the inspectors observed that applicants used a banana plug device to pin and hold the spring return SFA-REACTOR COOLANT (OPER-TEST) test switch in the TEST position to bypass the 800 pounds per square inch gauge (psig) reactor coolant pressure automatic isolation valve open function for the Core Flood Tank.

Although no procedural direction was provided, applicants inserted the banana plug in a SFAS panel hole located next to the spring return switch to hold it in the TEST position. The inspectors noted that all four SFAS panels had holes drilled next to the respective spring return switches. After performing Steps 5.2.4 through 5.2.6 to close CFT 2 isolation valve CF1A, applicants removed the banana plug and restored the SFAS channel to normal operation. The licensee identified that this same device was also used to pin the switch during the monthly SFAS functional test. The licensee was not able to immediately identify any basis documentation for the holes in the SFAS panel or the use of the device to hold the spring return switch in place. The inspectors questioned whether the use of the banana plug device to pin and hold the spring return SFAS panel switch in the TEST position was consistent with the design and operation of the SFAS system. The inspectors noted that the device was not referenced by the procedure, and there was no identified accountability for the device. The licensee documented the issue in their corrective action program as CR 05-04057 and CR 05-05279.

The licensee determined from discussion with Operations personnel that it appeared that the holes used to pin the switch in the TEST position were added to the plant after the initial installation and were not part of the original design. The inspectors concluded that this event was a performance deficiency since the licensee failed to adhere to the modification design process as required by 10 CFR Part 50, Appendix B, Criteria III, "Design Control." This failure to comply with 10 CFR Part 50, Appendix B, Criteria III represented a violation of minor significance that was not subject to enforcement action in accordance with Section IV of the NRC's enforcement policy. Also, since operations procedure DB-OP-06014, Section 5.2, did not specify the use of the pin device and there was no known use of the pin device during the performance of this procedure, no violation of 10 CFR 50.59 occurred. The use of the pin device in the monthly SFAS functional test was a maintenance activity performed while the SFAS channel was declared inoperable and was not subject to 10 CFR 50.59. This URI is closed.

4OA5 Other Activities

.1 Licensee Activities and Meetings

The inspectors observed select portions of licensee activities and meetings. The activities that were observed included:

- Corporate Nuclear Review Board meetings and activities on October 11, 2006, and October 13, 2006;
- Site Leadership Team Weekly Meeting - Review of OID IN 2005-019; Effect of Plant Configuration Changes on the Emergency Plan on November 6, 2006;
- Corrective Action Review Committee meeting on November 13, 2006; and
- Plant Health Committee meeting on December 1, 2006.

No items of significance were identified.

.2 Evaluation of the Independent Engineering Assessment Report

a. Inspection Scope

As part of the inspection activities performed to verify the licensee's compliance with the requirements for independent assessments as described in the March 8, 2004, Confirmatory Order Modifying License No. NPF-3, the inspectors reviewed the final report of the Confirmatory Order required, "Independent Assessment of the Engineering Programs Effectiveness at the Davis-Besse Nuclear Power Station," dated November 13, 2006. As part of the Order related inspection activities, the inspectors reviewed the report to ensure that it provided an overall assessment of Engineering performance and that the independent assessment team's inspection activities supported the report conclusions.

b. Observations and Findings

The third annual Davis-Besse Independent Engineering Assessment required by the Order was performed from September 11, 2006, to September 22, 2006. The inspectors reviewed and documented their evaluation of the Independent Assessment Plan and implementation in IR 05000346/2006004. During the time period that the assessment team was on site, the inspectors observed many of the assessment activities in progress. On November 16, 2006, the licensee submitted the final report of the "Independent Assessment of the Engineering Programs Effectiveness at the Davis-Besse Nuclear Power Station" to the NRC. This report documented the findings of that assessment, the most significant of which are summarized below.

- The Plant Modification Process was rated by the independent assessment team as Effective. This was based on the quality of Engineering Change Packages, interviews with engineers and managers, Engineering Assessment Board PI trends, and the emphasis on work quality voiced by all engineers interviewed.

- The Calculation Process was rated by the independent assessment team as Effective. This was based on the quality of work performed and progress made since the last independent assessment. Work still remained to reduce the backlog of calculations.

- System Engineering Programs and Practices were rated by the independent assessment team as Effective. System Engineering was found to be responsive to plant problems and supportive to operations and maintenance. The overall health of the Maintenance Rule systems at the time of the assessment was White. This was unchanged from the 2005 independent assessment results. However, the completion of work identified in system health recovery plans since the last assessment was markedly greater than in the period prior to the 2005 assessment.

- Corrective Action Program implementation was rated by the independent assessment team as Effective. Progress continued to be made on the reduction in the corrective action backlog. The implementation of the corrective action program in the Engineering area was identified to be very good to excellent. CRs were found to be promptly initiated as appropriate.

- The implementation of the self assessment process in the Engineering area was rated by the independent assessment team as Effective. Engineering program self-assessments were found to be consistently executed, intrusive, adding value, and of high quality. Overall, management appeared to be aggressively addressing the CRs generated by self-assessments.

The independent assessment team reviewed engineering products in a number of areas and did not identify any discrepancies that were considered significant in terms of the validity of the work product, or indicative of a systematic deficiency in engineering work performance or management. The independent assessment team identified two “areas of strength” and seven “areas in need of attention.” An area in need of attention was defined as an identified performance, program, or process element within an area of assessment that, although sufficient to meet its basic intent, management attention was required to achieve full effectiveness and consistency. These “areas in need of attention” were not required to be addressed by formal Action Plans submitted to the NRC, but were considered for entry into the corrective action program by the licensee. The independent assessment team also reviewed the licensee’s response to areas in need of attention identified during the 2005 independent assessment.

Overall, the effectiveness of engineering programs was rated as Effective. The following observations were noted in the final report:

- The technical quality of engineering work products and support was generally good to excellent with a continuing trend to improvement.

- Engineering’s focus had been appropriately aimed at quality/effectiveness, backlog reduction, post-restart work execution, and process standardization.

- The independent assessment team noted an ongoing transition from post-recovery/restart to more normal tasks and workloads.

The two “areas of strength” identified by the independent assessment team related to the Design Interface Reviews and Evaluations (DIE) Process and the Margin Management Program. These areas were considered strengths based on the following observations in the final report:

- The DIE Process was identified as a positive noteworthy item in the 2004 Independent Assessment. The process had been beneficial in identifying additional inputs, requirements, and impacts for calculations.

- The DIE Process was flexible as a common process for use with modifications, calculations, and other engineering products. The process had potential for use wherever critical communications and design information needed to be passed between departments and organizations.

- The independent assessment team review of Engineering Change Packages and calculations found that the DIE Process resulted in a thorough and well documented exchange of engineering information across section and departmental boundaries.

- The independent assessment team concluded that the DIE Process was a good communication tool. The process initiated an exchange of information that sparked both formal and informal discussions of ideas related to the task and resulted in a better final product.

- Margin improvement efforts had resulted in a significant reduction in the number of Tier 1 calculations with low margin.

- The program was appropriately focused on high risk-ranked systems.

- Improved calculation techniques and/or physical plant changes were considered to address low margin.

- Davis-Besse management had demonstrated a commitment to achieving improved design margins.

c. Conclusions

The inspectors determined that the independent inspection team inspection activities were in accordance with the Inspection Plan and were of sufficient depth and scope to develop an adequate assessment of Engineering performance.

.3 Mitigating Systems Performance Index (MSPI) Verification
(Temporary Instruction (TI)I 2515/169)

a. Inspection Scope

On June 12, 2006, the NRC issued Regulatory Issue Summary (RIS) 2006-07, "Changes to the Safety System Unavailability PIs." The purpose of this RIS was to inform licensees that beginning on April 1, 2006, the agency replaced the Safety System Unavailability (SSU) PI with the MSPI. The RIS and Nuclear Energy Institute (NEI) 99-02, "Regulatory Assessment PI Guideline," provided guidance for calculating and submitting MSPI data to the NRC. The NRC inspection program is implemented within the framework of the ROP. The PIs and inspection findings provide the two major inputs into the assessment of licensee performance under the ROP. The MSPI monitors the unavailability and the unreliability of the same four safety systems that comprised the SSU. It also monitors the cooling water support systems for those four safety systems. For pressurized water reactors, these systems include:

- Emergency Alternating Current (EAC) Power Systems
- High Pressure Injection (HPI)
- AFW
- Residual Heat Removal (RHR)
- Cooling Water Support (Service Water and CCW)

The objective of TI 2515/169, "MSPI Verification," was to validate the unavailability and unreliability input data and to verify the accuracy of the first reporting results for the 2006 2nd quarter. During the 3rd and 4th quarters of 2006, the inspectors reviewed the licensee's MSPI data and supporting documentation. The results of the inspectors' review included documenting observations and conclusions in response to the questions identified in TI 2515/169.

b. Observations

Summary

The inspectors did not identify any significant discrepancies based upon validation of the unavailability and unreliability input data, and verification of the accuracy of the 2006 2nd quarter MSPI results.

Evaluation of Inspection Requirements

In accordance with the requirements of TI 2515/169, the inspectors evaluated and answered the following questions:

1. For the sample selected, did the licensee accurately document the baseline planned unavailability hours for the MSPI systems?

   Yes. The licensee documented the baseline planned unavailability hours for the MSPI systems in accordance with the prescribed method outlined in NEI 99-02, Revision 4. The inspectors determined that there was one error associated with critical hours used to determine baseline hours for the AFW system. This did not cause the MSPI for the AFW system to cross a threshold. The licensee identified this issue in CR 06-07887 and planned to update their baseline data by March 30, 2007.

2. For the sample selected, did the licensee accurately document the actual unavailability hours for the MSPI systems?

   Yes. The licensee accurately documented the actual unavailability hours for the MSPI systems in accordance with the prescribed method outlined in NEI 99-02, Revision 4.

3. For the sample selected, did the licensee accurately document the actual unreliability information for each MSPI monitored component?

   Yes. The licensee accurately documented the actual unreliability information for each MSPI monitored component in accordance with the guidance outlined in NEI 99-02, Revision 4. However, the inspectors determined that two active CCW valves in the decay heat system boundary were incorrectly listed in the basis document as being normally open and therefore not requiring monitoring. The licensee corrected their MSPI data for these valves. This resulted in the identification of an additional opening failure for one of the valves. This did not cause the MSPI for the decay heat system to cross a threshold. The licensee identified this issue in CR 06-08192 and planned to correct the NRC input by March 30, 2007.

4. Did the inspectors identify significant errors in the reported data, which resulted in a change to the indicated index color? Describe the actual condition and corrective actions taken by the licensee, including the date when the revised PI information was submitted to the NRC.

   No. The inspectors did not identify significant errors in the reported data that resulted in a change to the indicated index color.

5. Did the inspectors identify significant discrepancies in the basis document which resulted in: (1) a change to the system boundary, (2) an addition of a monitored component, or (3) a change in the reported index color? Describe the actual condition and corrective actions taken by the licensee, including the date of when the bases document was revised.

   Yes. The inspectors did identify a discrepancy in the basis document that resulted in an addition of monitored components. Specifically, licensee personnel failed to identify two CCW valves in the decay heat boundary as being required to be monitored. This was brought to the licensee's attention by the inspectors. The licensee identified this issue in CR 06-08949, corrected the error, reviewed the rest of the systems for extent of condition, and found no other errors. The discrepancy did not cause the decay heat system MSPI to cross a threshold. The inspectors did not identify any discrepancy that resulted in either a change to a system boundary or a change in the reported index color.

c. Findings

No findings of significance were identified.

.4 In-Process Observation of the 2006 Safety Culture/Safety Conscious Work Environment Independent Assessment Activity

a. Inspection Scope

By letter dated July 14, 2006, FENOC addressed the NRC's March 2004 Confirmatory Order requirement for Davis-Besse to perform an annual independent assessment of safety culture/safety conscious work environment (SC/SCWE). The letter stated that the 2006 SC/SCWE assessment would be conducted by Synergy Consulting Services Corporation (Synergy).

As part of the NRC's continuing oversight inspection activities at Davis-Besse, members of the NRC's Davis-Besse Management and Human Performance inspection team met with representatives from FENOC and Synergy on September 21, 2006, at the NRC Headquarters in Rockville, Maryland (IR 05000346/2006004). In addition, members of the NRC team observed in-process Synergy activities on December 20 and 21, 2006 to assess how Synergy evaluated information gained during one-on-one interviews.

b. Observations and Findings

The NRC observed the evaluations of information gathered during 2 days of one-on-one interviews. The three-person Synergy team reviewed information gathered during the interviews, assessed how the information correlated with information from other interviews, and determined how the information correlated with data obtained from a written survey. In addition, the Synergy team identified areas to followup on during subsequent interviews. The inspectors noted that Synergy had scheduled about 90 one-on-one interviews.

The team concluded that the Synergy team appropriately evaluated individual interview results against other interviews and information obtained through the written survey. In addition, the Synergy team appropriately used the information to focus future interviews to gain additional insights into areas of interest.

.5 Inspection Plan Review of the 2006 Corrective Action Program Independent Assessment Activity

a. Inspection Scope

The inspectors reviewed the licensee's independent assessment plan for the 2006 Corrective Action Program Independent Assessment. The inspectors reviewed both the plan and the roster of individuals that the licensee proposed to conduct the assessment.

b. Observations and Findings

The 2006 Corrective Action Program Independent Assessment plan included the following areas:

- Review corrective actions from 2004 and 2005 Independent Assessments;
- Identification, Classification, and Categorization of Conditions Adverse to Quality;
- Evaluation and Resolution of Problems;
- Corrective Action Implementation and Effectiveness;

- Effectiveness of Program Trending;
- Impact of Program Backlogs;
- Effectiveness of Internal Assessment Activities; and
- Open corrective actions proposed in response to the NRC Special Team Inspection - Corrective Action Program Implementation - NRC Inspection Report 05000346/2003010.

The review concluded that the scope of the plan and the individuals who were selected to perform the independent assessment were appropriate.

.6 In-Process Observation of the 2006 Corrective Action Program Independent Assessment Activity

a. Inspection Scope

The inspectors observed the independent inspection team debriefing of licensee management on the results of the 2006 Corrective Action Program Independent Assessment.

b. Observations and Findings

At the conclusion of the 2006 Corrective Action Program Independent Assessment activities, the inspectors observed the independent assessment team debriefing with the licensee concerning the assessment results. The licensee submitted the final report for the "Corrective Action Program Implementation Independent Assessment with Action Plans - Year 2006," on October 23, 2006. The independent assessment team concluded that the licensee's overall implementation of the corrective action program was Effective. Of the general areas assessed, seven were rated as Effective and one was rated as Highly Effective. One Area-For-Improvement (AFI) was identified in the area of trending. Trending was an AFI in the 2005 assessment and because the corrective actions addressing trending had not been completed, the 2006 team considered the item to be an AFI in the 2006 assessment. The corrective actions were scheduled to be completed by the end of February 2007.

The independent assessment team identified several areas in need of attention. An area in need of attention was defined as an identified performance, program, or process element within an area of assessment that, although sufficient to meet its basic intent, management attention was required to achieve full effectiveness and consistency. These "areas in need of attention" were not required to be addressed by formal Action Plans submitted to the NRC, but were considered for entry into the corrective action program by the licensee.

4OA6 Meetings

.1 Exit Meeting

The inspectors presented the inspection results to V. Kaminskas, and other members of the licensee staff on January 4, 2007. The inspectors asked the licensee whether any material presented should be considered proprietary. No material was identified as proprietary.

.2 Interim Exit Meetings

Interim exit meetings were conducted for:

Biennial Operator Requalification Program Inspection with Mr. B. Allen, Plant Manager, on October 27, 2006.

Biennial Operator Requalification Program Inspection with Mr. C. Steenbergin, Operations Training, on November 21, 2006, via telephone.

As-Low-As-Reasonably-Achievable Planning and Controls Program for the occupational radiation safety cornerstone, with Mr. R. Schrauder and other members of the licensee staff on October 19, 2006.

Heat sink biennial inspection with Mr. V. Kaminskas, Plant Manager, and other members of the licensee staff on December 14, 2006.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

M. Bezilla, Site Vice President
B. Boles, Director, Maintenance
J. Grabner, Director, Station Engineering
L. Harder, Manager, Radiation Protection
R. Hruby, Jr., Fleet Oversight Manager
D. Imlay, Shift Operations Superintendent
V. Kaminskas, Director, Site Operations
M. Leisure, Regulatory Compliance Supervisor
D. Moul, Manager, Plant Operations
D. Noble RP Supervisor
C. Price, Manager, Regulatory Compliance
R. Schrauder, Director, Performance Improvement
A. Stallard, Supervisor, Operations Training
C. Steenbergin, Operations Training Supervisor
M. Trump, Training Manager

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Open and Closed

05000346/2006005-02	NCV	Improper Evaluation of Plant Risk
05000346/2006005-03	FIN	Failure to Adequately Implement ALARA Radiological Dose Controls

Opened

05000346/2006005-01	URI	Simulator Malfunction Test Performance

Closed

05000346/2006-003-00	LER	Degraded Condenser Pressure Due to Failed Drain Line Results in Manual Reactor Trip
05000346/2005301-02	URI	Use of Device to Pin SFAS Switch

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.

1R01 Adverse Weather Protection

DB-OP-06913; Seasonal Plant Preparation Checklist; Revision 15
WO200152710; Higher Vibes on BWST Heat Exchanger Recirculation Pump Motor- Void
WO200214578; Non-TS Fire Protection Circuit 70 Alarm Panel Reads
WO200228532; WE102 Grounded
WO200232478; Plywood Covers SW [Service Water] Intake Strainer

1R04 Equipment Alignment

DB-OP-06012; Decay Heat and Low Pressure Injection System Operating Procedure; Revision 28
DB-OP-06013; Containment Spray System; Revision 16
Drawing OS-004, Sheet 1; Decay Heat Removal/Low Pressure Injection System; Revision 42
Drawing OS-005, Containment Spray System; Revision 11
Drawing M-033B; Decay Heat Train 1; Revision 46

1R05 Fire Protection

Davis-Besse Nuclear Power Station Fire Hazard Analysis Report
CR 06-07906; NRC Raised a Concern With the Use of Fire Retardant Plastic on Cable Trays
Drawing A-225F; Fire Protection General Floor Plan El. 623'-0"; Revision 14
Drawing A-224F; Fire Protection General Floor Plan El. 603'-0"; Revision 21
Drawing A-223F; Fire Protection General Floor Plan El. 585'-0"; Revision 18
Drawing A-222F; Fire Protection General Floor Plan El. 565'-0"; Revision 13

1R06 Flood Protection Measures

DB-OP-02011; Heat Sink Alarm Panel 11 Annunciators; 11-1-E; Revision 7
DB-OP-02015; Turbine Alarm Panel 15 Annunciators; 15-1-F, 15-2-F, & 15-3-F; Revision 10
DB-OP-02517; Circulating Water Pump Trip/Circulating Water System Ruptures; Revision 3
Drawing OS-016A; Operational Schematic - Circulating Water System; Revision 30
Probabilistic Safety Assessment of Turbine Building Flooding at Davis-Besse; SAROS/96-5; May 1996
SD-034; System Description for Station Drains and Sumps; Revision 3
USAR Section 3.6.2.7.2.13; Circulating Water System
WO200138100; PM 6508 LSH3738A Condenser Pit Flood Level Switch; March 24, 2006

1R07 Heat Sink Performance

DB-SP-3160; Revision 16; AFW Pump Two Quarterly Test; performed July 29, 2006
DB-SP-3160; Revision 16; AFP Two Quarterly Test; performed October 19, 2006
DB-OP-06913; Seasonal Plant Preparation Checklist; Revision 16
DB-SS-03041; CREVS Train 1 Monthly Test Performed on November 21, 2006
DB-SS-03041; CREVS Train 1 Monthly Test Performed on November 3, 2006
Bechtel Calculation 26.9; SW Flow Versus Temperature Curve for CREVS Condensers; dated January 11, 1986
C-ME-028.01-003; Control Room Cooling Loads; Emergency Mode, Revision 4; Addendum A002; dated December 9, 2004
C-ME-028.01-010; SW Flow Requirements through CREVS Condenser; dated June 11, 2004
Bechtel Calculation 69.2; AFP Subcomponents Cooling Water Requirements; dated August 10, 1977
Bechtel Calculation 69.5; AFP Bearing Cooling Water Requirements; dated December 14, 1976
ESM-99-02; UHS Pond Silting Effect on SW Intake Temperature; dated October 20, 1999
Calculation 12501-M-00004; UHS Pond Thermal Performance Analysis, Addition 1; dated April 8, 2004
Operability Evaluation 04-0011; High AFP No. 2 Outboard Turbine Metal Temperature; dated April 9, 2004
WO200158753; Inspect/Clean/Repair Intake Crib; performed October 18, 2006
WO200117588; Inspect and Remove Silt from UHS Intake Crib and Forebay Performed; dated November 12, 2004.
WO200084087; Inspect/Clean/Repair Intake Crib Performed July, 29, 2004
WO200126081; Inspect/Clean/Repair CREVS 1 Condenser; performed December 12, 2005
WO200143003; Inspect/Clean/Repair/Replace AFP2/SW Piping Performed; dated April 24, 2006
WO200187504; CREV System Train 1 Monthly FA NORM; dated November 21, 2006
WO200174846; CREV System Train 1 Monthly FA NORM; dated November 3, 2006
PM 2169; CREVS 1 Condensing Unit (S33-1) Inspect/Clean/Repair
PM 2694; Inspect Intake Crib
PM 4894; Inspect Intake Canal/Forebay Area
PM 5928; Remove Service Water Piping to CCW Train 2 for Clean/Inspect
CR 04-07064; Silt Depth in Q Portion of the Intake Canal; dated November 16, 2004
CR 04-02576; AFPT2 Outboard Bearing Metal Temperature T016 Rise; dated April 8, 2004
CR 06-02010; Low Service Water Pump 3 Flow to CREVS No.1 thru CCW Heat Exchanger 1 or 3; dated April 21, 2006
CR 06-02011; CAC No.3 as No.1 Flow Less Than Flow Balance Acceptance Criteria; dated April 21, 2006
CR 06-02014; CAC No.1 Flow Less Than Flow Balance Acceptance Criteria; dated April 21, 2006
CR 06-02016; Low Service Water Pump 3 Flow to CAC No.3 thru CCW Heat Exchanger 1; dated April 21, 2006
CR 06-02997; SO 06-003 Evaluation Does Not Address Instrument Uncertainty; dated August 10, 2006
CR 06-010131, ECCS [Emergency Core Cooling System] Room Cooler E42-2 Indicates Signs of SW Biofouling; dated November 17, 2006
Standing Order 06-003; CREVs Train 1 Becomes Inoperable if UHS Exceeds 88 F; Revision 1

Engineer Evaluation for CR 06-0210; Revisions 0 and 1; dated April 23, 2006
10-120; CREVS 1 Heat Exchanger Specification Sheet; dated February 26, 1974
PM 5927; Remove Service Water Piping to CCW Train 1 for Clean/Inspect
DB-SP-03000; Service Water Loop 1 Integrated Flow Balance Procedure; Revision 8
DB-SP-03001; Service Water Loop 2 Integrated Flow Balance Procedure; Revision 7
NRC Generic Letter 89-13: Service Water Reliability Program Manual; Revision 0; dated July 29, 2004
Operability Evaluation 2003-0032; Service Water Trains 1 and 2 Flow Balance Tests Did Not Meet Flow Balance Acceptance Criteria; Revision 2

<u>1R11 Licensed Operator Requalification Program</u>

DBBP-TRAN-0017; Conduct of Simulator Training; Revision 2
NT-OT-07001; Training and Qualification of Operations Personnel; Revision 10
NOP-OP-1002; Conduct of Operations; Revision 3
Davis-Besse Nuclear Power Station, NRC Integrated Inspection Reports; dated various from February 11, 2005 through October 18, 2006
Davis-Besse Reactor Oversight Process Plant Issues Matrix from June 1, 2004 to October 10, 2006; dated October 10, 2006
LER 2005-006; TS Action Missed Due to Improper Valve Positioning By Operator; dated November 14, 2006
Six Licensed Operators' Medical Records; dated various
NG-NT-00601; Control of the Plant-Referenced Simulator; Revision 3
NT-OT-07001; Training and Qualification of Operations Personnel; Revision 10
NOP-TR-1001; FENOC Conduct of Training; Revision 0
DBBP-TRAN-0014; License Requirements for Licensed Operators; Revision 4
DBBP-TRAN-0019; Written Examinations and Quizzes for Operations Training Programs; Revision 0
DBBP-TRAN-0021; Simulator Configuration Control; Revision 1
DBBP-TRAN-0501; Conduct and Development of JPMs; Revision 4
DBBP-TRAN-0502; Development and Conduct of Continuing Training Simulator Evaluations; Revision 2
NOBF-NF-1013; Maintenance of the Training Simulator Core Model Fidelity; Revision 0
Requalification Examinations (Operating); dated various 2006
Requalification Examinations (Written); dated various 2006
Summary of 2005 LOR Examination Results; dated December 20, 2005
LORT Curriculum Review Committee Meeting Minutes; dated various from January 3, 2005 through August 11, 2006
Sample of Remediation Packages; NOP-TR-1001-01; Remedial/Make-Up Recommendations; dated various
FENOC Integrated Training System Successful Completions Report (for selected LOR activities); dated October 25, 2006
Licensed Operator Long Term Continuing Training Matrix; dated August 11, 2006
TNS-06-00042; Intra-Company Memorandum; 3rd Quarter 2006 Proficiency Status; dated October 3, 2006
Listing of Open Simulator Work Orders of Priority "A," "B," or "C"; dated October 19, 2006
Simulator Configuration Control Committee Meeting Minutes; dated October 20, 2006

Simulator Malfunction Tests; dated various
Simulator Transient Tests; dated various
Simulator Core Performance Tests; dated various
Davis-Besse Nuclear Power Station Simulator Training Certification Test T16 - Generator/Turbine Trip; dated November 6, 2005
CR 04–07142; Simulator Data Improvement Opportunity Noted During NRC Inspection; dated November 18, 2004
CR 04-07143; Criteria Used to Evaluate Crew Performance Could be More Objective; dated November 18, 2004
CR 04-07144; NRC Licensed Operator Requalification Training Program Inspection; dated November 16, 2004
CR 05-02762; Incorrect Emergency Plan Classification During Simulator Evaluation; dated May 10, 2005
CR 06-02567; Self-Assessment DB-SS-06-15, Simulator Performance Testing; dated June 16, 2006
Operations Training Requalification Cycle Reports; dated various
COIA-OPS-2005; Confirmatory Order Independent Assessment Operations Performance Davis-Besse Nuclear Power Station; dated August 22, 2005
COIA-OPS-2006; Confirmatory Order Independent Assessment Operations Performance Davis-Besse Nuclear Power Station; dated July 27, 2005
Licensed Operator Requalification Program Snapshot Self-Assessment DB-SS-06-30; dated September 18, 2006
Operations and Training Integrated Performance Assessments; dated various from November 1, 2004 through April 30, 2006

Condition Reports Initiated for NRC Identified Issues

CR 06-08850; Door Latch Mechanism for YAU Left Door Broke
CR 06-08873; NRC 71111.11: Simulator Evaluation Guides - Number of Malfunctions
CR 06-08876; NRC 71111.11: Unresolved Issue with CR-05-05279
CR 06-08894; NRC 71111.11: Alternate Path Versus Administrative JPM
CR 06-08917; Simulator Component Failure During Licensed Operator Examinations
CR 06-10403; NRC 7111.11 Unresolved Issue With Simulator Generator Trip Test

1R12 Maintenance Effectiveness

D-B System Health Report, Turbine Generator Window; 2nd Quarter 2006
D-B System Health Report, 480 VAC Window; 2nd Quarter 2006 and 3rd Quarter 2006
D-B System Health Report, Freeze Protection Heat Trace Window; 3rd Quarter 2006
Maintenance Rule Program Manual; Revision 20 and 21
Radiation Monitoring System Maintenance Rule (a)(1) Action Plan; July 26, 2005
Radiation Monitoring System Status; October 23, 2006
SD-017A; System Description for Process Radiation Monitors; Revision 3
CR 05-00239; MCC [Motor Control Center] E21A has Water in the MCC Causing a Smoke Smell
CR 05-01709; CTMT [Containment] Atmosphere Radiation Monitor Particular Filter
CR 05-04543; RIC4598BA Had an Equipment Malfunction Code For CH 3 Detector Failure
CR 05-04544; RIM1822A Module Failed

CR 05-05026; RIC 4598BB Display Incorrect
CR 05-05486; DB-MI-05405 Failed Test
CR 05-04543; Unexcepted Alarms on Radiation Elements RIM1998 and RIM8433
CR 05-05789; RE1003A Sample Line Full of Water
CR 05-05928; RE4597BA Equipment Failure, Failure Code 3, Motor Failure
CR 05-05974; RIC4597BA Motor Failure and Improper CH 1 Alarm Setpoint
CR 05-05999; Kaman Relay Board, Burnt Resister
CR 06-00152; RE4597AB CTMT Accident Range Radiation Monitor
CR 06-00366; RE4597BA Past TS Late Date For Functional Test DB-SC-03213
CR 06-00376; RE4598BA Channel 3 Detector Failure
CR 06-00520; Temperature Controller for Heat Trace Circuit 201 (Secondary) in Cabinets C3701TS
CR 06-01326; Drawing Status Incorrect
CR 06-02277; 480 VAC [Volt Alternating Current] Maintenance Rule Action Plan Revision 1
CR 06-02287; RE4597AA Inoperable With Abnormal Indications on Control Module
CR 06-02355; RE4598AA Failed Low Flow Test
CR 06-02866; Evaluation for Potential RWK-DB-FI4597AA (CTMT NRML [Normal] Range Sample FI [Flow Instrument])
CR 06-02909; Delays in Calibration of RE-4598BA
CR 06-02425; Boric Acid Primary Heat Trace Inadequate
CR 06-03317; FI4597AA Rotometer Stuck
CR 06-8705; RI8422 Auto Reset During Performance of DB-SC-04152
CR 06-9698; Heat Trace Circuit 152 Failed
CR 06-11536; Documentation of the History of BAAT Room Heaters E80-1
USAR Subsections; 5.2.4, 4.13.3, 8.3.1, 9.3.3.1, 9.3.4.2, 11.4.1, 11.4.2, 12.2.4, 3.11.1.2, 15.4.7, 15.4.1, & 6.2.3.2
Technical Specifications Subsections; 3/4.3.3.1, 3/4.3.3.6, 6.8.4.d, 3/4.6.1, & 3/4.9.4
DB-OP-065412; Process And Area Radiation Monitor; Revision 18
WO200083906; DB-SUB079-01 EWR 01-0065-00; Revision 9
WO200137337; DB-RE8414
WO200151774; DB-RIM5052A Function Switch Erratic
WO200155524; DB-RE4598AB R847 Computer Point
WO200203164; DB-RE8446 Correct Wiring Discrepancies
WO200214207; DB-RI8425 TSHT Cause of High
WO200226839; DB-RE1998
WO200226883; DB-RI8421 High Alarm Does Not Lock In
Maintenance Rule Expert Panel Minutes; Meetings on October 12, 2006; August 10, 2006; and May 11, 2006
Maintenance Rule (a)(1) Action Plan; 480 Volt AC System; Revision 2

1R13 Maintenance Risk Assessment and Emergent Work Evaluation

November 2006 Mini-Outage: Contingency plan for RCS Drain to 230"-250" pressurizer Without an Adequate RCS Vent Path; Revision 2
Cycle 15 Mini-Outage Time to Boil; November 18, 2006
Cycle 15 Mini-Outage Analysis of High Pressure Injection Adequate Flowrate in the Event of Loss of Decay Heat Removal; November 18, 2006
CR 05-05839; EDG 1-1 PRA Outlier

CR 06-7678; Potential Violation of Maintenance Rule Due to SBODG Outage Risk
CR 06-7688; Potential Timeliness Issue with PRA Corrective Action
NOP-DB-1007; Risk Determination; Revision 4
Weekly Maintenance Risk Summary for the Week of October 9, 2006; Revision 0
Weekly Maintenance Risk Summary for the Week of October 9, 2006; Revision 3

1R15 Operability Evaluations

CR 06-9924; Justification for Not Performing As-Found LLRTS [Local Leak Rate Tests] on the Containment Purge Valves
CR 06-7551; Various CC1467 Problems
CR 06-8948; CC1467 Stroke Time Outside Expected Range
CR 06-11027; Snubber Out of Specification
CR 06-11062; Snubber Piston Setting Out of Specification
WO200230727; DB-CC1467-HV1467: Correct Deficiencies
ODMI for Operating with Valve CC1467 Open; November 1, 2006
Problem Solving Plan for CC1467 Open Stroke Time Outside Expected Range; November 2, 2006
Operability Evaluation 2006-003; CC1467 Open; October 31, 2006
DB-PF-03008; Containment Local Leakage Rate Tests; Revision 7
WO 200189333; Test and Rebuild Snubber DB-SNA58
Drawing M-207C; Main Feedwater System Isometric, Auxiliary and Containment Buildings; Revision 16
Drawing M-618; Piston Settings, Locking Velocities, and Bleed Rates for Hydraulic Snubbers; Revision 30
Drawing C-615; Auxiliary Building Main Feedwater Seismic Restraints; Revision 12
Regulatory Guide 1.163; Performance-Based Containment Leak-Test Program; September, 1995
NEI 94-01; Industry Guideline for Implementing Performance-Based Option of 10CFR50, Appendix J; Revision 0
ANSI/ANS-56.8-1994; Containment System Leakage Testing Requirements
NRC Letter to Mr. Williams of Toledo Edison; Amendment No. 90 to Facility Operating License; November 27, 1985
Toledo Edison Letter to Mr. John Stolz of USNRC; November 20, 1984
NRC Letter to Mr. R. Crouse of Toledo Edison; Status of Generic Item B-24 and NUREG-0737 Item II.E.4.2; December 3, 1982

1R19 Post-Maintenance Testing

CR 06-8560; SV5889A (MS5889A) Indicates Tripped in SFRCS LCH #3
DB-SP-03137; Decay Heat Train 2 Pump and Valve Test; Revision 13
DB-SP-03212; Venting of ECCS Piping; Revision 6
DB-SP-03366; RCS Vent Path Operability and PORV Test; Revision 9
DB-SS-03253; Emergency Ventilation System (EVS) Train 2 Refueling Interval or Special Test; Revision 7
Drawing SF-003B Sheet 21; SFRCS Internal Schematic Diagram AFPT-1 MN STM IN ISO VLV; Revision 4
WO200039576; DH7A - Decontamination, Adjust Packing

WO200149109; Implement ECR 05-0159-00 (DH1518)
WO 200216919; F19-2 - Replace Upstream Charcoal Filters
WO200171447; PM4173 HICDH14A CAL DH Cooler #2 Outlet Valve
WO200233609; SFRCS Actuation Channel 1

1R20 Refueling and Outage Activities

Operations Evolution Order for the Pressurizer Code Safety Outage; November 16, 2006
CR 06-10341; Containment Housekeeping Items Noted by NRC Resident Inspector

1R22 Surveillance Testing

DB-PF-03030; Service Water Pump 3 Testing; Revision 11
Drawing OS-20; Service Water System; Revision 72

1EP6 Drill Evaluation

Davis-Besse Emergency Response Integrated Drill Manual; 2006
2006 Integrated Drill Conducted on November 2, 2006
RA-EP-02800; Preparation and Transport of Contaminated Injured Personnel; Revision 4, dated February 28, 2006

2OS2 ALARA Planning And Controls

ALARA Post Job Review: BACC and inspection; dated March 06, 2006
ALARA Post Job Review: Reactor Service Activities; Reactor Disassembly/Reassembly; CDRM Cable Replacement; and Remove and Install Head; dated March 06, 2006
ALARA Post Job Review: Refueling Activities Including the Following Refuel Reactor; Canal Decontamination and Instacote Work; Initial Incore Tank Decontamination; Pull and Park the Incores; Set up the Incore Cutters; Cutting of Incores; dated March 06, 2006
ALARA Post Job Review: Replace the Motors on RCP 2-1 and 2-2; Replace Rotating Assemblies; and Insulation and Interference Work; dated March 06, 2006
ALARA Post Job Review: OTSG [Once Through Steam Generator] Work Activities to Include Manway/Diaphragm Removal and Installation; Nozzle Dam Installation and Removal; dated March 06, 2006
RWP 2006-5401 and -5403; RCP 2-1 and 2-2 Inspection and Replacement Activities; dated March 14, 2006
RWP 2006-5001; -5002; -5003 and -5008; BACC Program; dated March 3, 2006
RWP 2006-5104; -5105 and -5106; Reactor Services Activities; dated March 6, 2006
RWP 2006-5107; -5108; -5109 and -5114; Refueling Activities; dated March 3, 2006
RWP 2006-5300; -5301; -5302 and -5304; OTSG Work Activities; dated March 6, 2006
ALARA Review Committee Minutes 14-RFO; dated March 15, March 22, March 27, March 30, April 4, and April 6, 2006
Radiation Protection Dose Reduction/Personnel Contamination, Post Outage Report; dated May 30, 2006
ALARA Work in Progress Review: Reactor Head Disassembly/Reassembly Work Activities; dated March 29, 2006
NOP-WM-7001; ALARA Program; Revision 0

4OA1 PI Verification

DBBP-RP-0002; Davis-Besse Business Practice; Occupational and Public Radiation Safety Cornerstone PI; Revision 0
DB-0393-13; Barricade and Barrier Posting and Integrity Checks; High Radiation Area Type and General Location; dated September 2005 to October 2006

4OA2 Identification and Resolution of Problems

CR 06-01844; Service Water Pump 2 Baseline Testing
CR 06-03013; Service Water Pump Two Quarterly Test Failure
CR 06-03376; Evaluation of Service Water Pump P3-2 Baseline Test Data
NOBP-LP-2019; Corrective Action Program Supplemental Expectations and Guidance; Revision 5
NOBP-LP-2011; FENOC Cause Analysis; Revision 6
Davis-Besse Fleet Oversight Quarterly Assessment Report DB-C-06-02; July 28, 2006
Davis-Besse Fleet Oversight Quarterly Assessment Report DB-C-06-03; September 14, 2006

4OA3 Event Followup

LER 2006-003-00; Degraded Condenser Pressure Due to Drain Line Resulting in Manual Reactor Trip; Revision 0

4OA5 Other

Consolidated Data Entry 3.0 MSPI Derivation Report, Davis-Besse Unit 1, July 2006, Cooling Water System, UAI/URI
Consolidated Data Entry 3.0 MSPI Derivation Report, Davis-Besse Unit 1, July 2006, Heat Removal System, UAI/URI
Consolidated Data Entry 3.0 MSPI Derivation Report, Davis-Besse Unit 1, July 2006, High Pressure Injection System, UAI/URI
Consolidated Data Entry 3.0 MSPI Derivation Report, Davis-Besse Unit 1, July 2006, Residual Heat Removal System, UAI/URI
Consolidated Data Entry 3.0 MSPI Derivation Report, Davis-Besse Unit 1, July 2006, Emergency AC Power System, UAI/URI
CR 05-01439; Mitigating System Performance Index (MSPI) Workshop
CR 06-6612; Misreporting MSPI CCW Unavailability Data
CR 06-7887; AFW Baseline Unavailability Misreported for MSPI
CR 06-8192; AFW Unavailability Discrepancies Identified During NRC MSPI Review
CR 06-8949; Addition of CC1467 and CC1469 as MSPI Monitored Components
Davis-Besse System Health Report, 1st Quarter 2005
Davis-Besse System Health Report, 2nd Quarter 2005
Davis-Besse System Health Report, 3rd Quarter 2005
Davis-Besse System Health Report, 4th Quarter 2005
Davis-Besse System Health Report, 1st Quarter 2006
DB-PF-03017; Service Water Pump 1 Testing; Revision 12
DB-PF-03027; Service Water Train 2 Valve Test; Revision 16
DB-PF-03071; CCW Train 1 Valve Test; Revision 10

DB-PF-03074; CCW Pump 3 Test; Revision 9
DB-PF-03154; AFW Train 1 Valve Testing; Revision 7
DB-PF-03201; EDG Fuel Oil Storage Tank Transfer Pump 1 Flow Test; Revision 4
DB-PF-03205; ECCS Train 1 Valve Test; Revision 10
DB-PF-03206; ECCS Train 2 Valve Test; Revision 9
DB-PF-03212; Venting of ECCS Piping; Revision 5
DB-PF-03215; Baseline Testing of Service Water Pump 2 in Modes 1-4; Revision 0
DB-PF-03216; Baseline Testing of Service Water Pump 3 in Modes 1-4; Revision 0
DB-SC-03111; SFAS Channel 2 Functional Test; Revision 12
DB-SP-03136; Decay Heat Train 1 Pump and Valve Test; Revision 13
DB-SP-03157; AFP 1 Response Time Test; Revision 10
DB-SP-03160; AFP Two Quarterly Test; Revision 16
DB-SP-03219; HPI Train Pump and Valve Test; Revision 12
DB-SP-04159; AFP 2 Monthly Test; Revision 6
DB-SS-03091; Motor Driven Feed Pump Quarterly Test; Revision 7
DBBP-PES-004; Plant Engineering NRC PI Reporting, Safety System Unavailability for MSPI Systems Input Sheets, 2nd Quarter 2006
GP-26; Operations Section Directive; On-Line Risk Management Process; Attachment 4, Equipment Availability Evaluations for AFW, HPI, DH, and EDGs; Revision 0
Nuclear Energy Institute (NEI) 99-02; Regulatory Assessment PI Guideline; Revision 4
Reactor Oversight Program Mitigating System Performance Index Basis Document Davis-Besse Nuclear Power Station; Revision 0

LIST OF ACRONYMS USED

ADAMS	Agencywide Document Access and Management System
AFP	Auxiliary Feedwater Pump
AFW	Auxiliary Feedwater
ALARA	As-Low-As-Reasonably-Achievable
BACC	Boric Acid Corrosion Control
CCW	Component Cooling Water
CDF	Core Damage Frequency
CFR	Code of Federal Regulations
CR	Condition Report
CREV	Control Room Emergency Ventilation
DIE	Design Interface Reviews and Evaluations
ECCS	Emergency Core Cooling System
EDG	Emergency Diesel Generator
FENOC	FirstEnergy Nuclear Operating Company
IMC	Inspection Manual Chapter
IR	Inspection Report
JPM	Job Performance Measure
LCO	Limiting Condition for Operability
LER	Licensee Event Report
LORT	Licensed Operator Requalification Training
MSPI	Mitigating System Performance Index
NCV	Non-Cited Violation
NRC	United States Nuclear Regulatory Commission
PI	Performance Indicator
PORV	Pilot Operated Relief Valve
PRA	Probabilistic Risk Assessment
RCP	Reactor Coolant Pump
RCS	Reactor Coolant System
RFO	Refueling Outage
RIS	Regulatory Issue Summary
ROP	Reactor Oversight Process
RWP	Radiation Work Permit
SAT	Systems Approach to Training
SBODG	Station Black Out Diesel Generator
SDP	Significance Determination Process
SFAS	Safety Features Actuation System
SFRCS	Steam Feed Rupture Control System
SSU	Safety System Unavailability
TI	Temporary Instruction
TS	Technical Specifications
UHS	Ultimate Heat Sink
URI	Unresolved Item
USAR	Updated Safety Analysis Report