June 16, 2000

Mr. Guy G. Campbell
Vice President - Nuclear
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 INSPECTION REPORT 50-346/2000003(DRP)

Dear Mr. Campbell:

On May 20, 2000, the NRC completed an inspection at your Davis-Besse reactor facility. The results were discussed with you and other members of your staff. The enclosed report presents the results of that inspection.

The inspection was an examination of 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. Within these areas the inspection consisted of a selective examination of procedures and representative records, observations of activities, and interviews with personnel.

Based on the results of this inspection, the NRC identified two issues which were categorized as being of very low risk significance (Green). These issues have been entered into your corrective action program and are discussed in the summary of findings and in the body of the attached inspection report. One of the issues was determined to involve a violation of NRC requirements, but because of its very low safety significance and the issue has been entered into your corrective action program, the violation is not cited. If you contest this Non-Cited Violation, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with a copy to the Regional Administrator, Region III; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-001; and the NRC Resident Inspector at the Davis-Besse facility.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its

enclosure will be available electronically for public inspection in the NRC Public Document Room or from the ADAMS Public Library component on the NRC Web site at http://www.nrc.gov/NRC/ADAMS/index.html (The Public Electronic Reading Room.)

Sincerely,

/RA/
Original signed by
Thomas J. Kozak

Thomas J. Kozak, Chief
Reactor Projects Branch 4

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

Enclosure: Inspection Report 50-346/2000003(DRP)

cc w/encl: R. Saunders, President - FENOC
J. Lash, Plant Manager
J. Freels, Manager Regulatory Affairs
M. O'Reilly, FirstEnergy
State Liaison Officer, State of Ohio
R. Owen, Ohio Department of Health
C. Glazer, Chairman, Ohio Public
Utilities Commission

ADAMS Distribution:
WES (E-Mail)
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U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket No:	50-346
License No:	NPF-3
Report No:	50-346/2000003(DRP)
Licensee:	FirstEnergy Nuclear Operating Company
Facility:	Davis-Besse Nuclear Power Station
Location:	5501 N. State Route 2 Oak Harbor, OH 43449-9760
Dates:	April 2 through May 20, 2000
Inspectors:	K. Zellers, Senior Resident Inspector D. Simpkins, Resident Inspector C. Lipa, Senior Resident Inspector, Perry K. Stoedter, Reactor Engineer
Approved by:	Thomas J. Kozak, Chief Reactor Projects Branch 4 Division of Reactor Projects

NRC's REVISED REACTOR OVERSIGHT PROCESS

The federal Nuclear Regulatory Commission (NRC) recently revamped its inspection, assessment, and enforcement programs for commercial nuclear power plants. The new process takes into account improvements in the performance of the nuclear industry over the past 25 years and improved approaches of inspecting and assessing safety performance at NRC licensed plants.

The new process monitors licensee performance in three broad areas (called strategic performance areas): reactor safety (avoiding accidents and reducing the consequences of accidents if they occur), radiation safety (protecting plant employees and the public during routine operations), and safeguards (protecting the plant against sabotage or other security threats). The process focuses on licensee performance within each of seven cornerstones of safety in the three areas:

Reactor Safety	Radiation Safety	Safeguards
● Initiating Events	● Occupational	● Physical Protection
● Mitigating Systems	● Public	
● Barrier Integrity		
● Emergency Preparedness		

To monitor these seven cornerstones of safety, the NRC uses two processes that generate information about the safety significance of plant operations: inspections and performance indicators. Inspection findings will be evaluated according to their potential significance for safety, using the Significance Determination Process, and assigned colors of GREEN, WHITE, YELLOW or RED. GREEN findings are indicative of issues that, while they may not be desirable, represent very low safety significance. WHITE findings indicate issues that are of low to moderate safety significance. YELLOW findings are issues that are of substantial safety significance. RED findings represent issues that are of high safety significance with a significant reduction in safety margin.

Performance indicator data will be compared to established criteria for measuring licensee performance in terms of potential safety. Based on prescribed thresholds, the indicators will be classified by color representing varying levels of performance and incremental degradation in safety: GREEN, WHITE, YELLOW, and RED. GREEN indicators represent performance at a level requiring no additional NRC oversight beyond the baseline inspections. WHITE corresponds to performance that may result in increased NRC oversight. YELLOW represents performance that minimally reduces safety margin and requires even more NRC oversight. And RED indicates performance that represents a significant reduction in safety margin but still provides adequate protection to public health and safety.

The assessment process integrates performance indicators and inspection so the agency can reach objective conclusions regarding overall plant performance. The agency will use an Action Matrix to determine in a systematic, predictable manner which regulatory actions should be taken based on a licensee's performance. The NRC's actions in response to the significance (as represented by the color) of issues will be the same for performance indicators as for inspection findings. As a licensee's safety performance degrades, the NRC will take more and increasingly significant action, which can include shutting down a plant, as described in the Action Matrix.

More information can be found at: http://www.nrc.gov/NRR/OVERSIGHT/index.html.

SUMMARY OF FINDINGS

Davis-Besse Nuclear Power Station
NRC Inspection Report 50-346/2000003(DRP)

The report covers a 7-week period of resident inspection. The significance of issues is indicated by their color (green, white, yellow, red) and was determined by the Significance Determination Process in Inspection Manual Chapter 0609.

Cornerstone: Initiating Events

- GREEN. During a 13.8 KV bus transfer test, which was performed during the low risk plant configuration of having the core offloaded into the spent fuel pool, an electrician checked the status of the wrong relay and inadvertently actuated the relay, resulting in a loss-of-offsite-power (LOOP). The failure to follow the applicable test procedure was a violation of 10 CFR 50, Appendix B, Criterion V. No loss of thermal margin or water inventory occurred. Therefore, this event was determined to have very low safety significance. (Section 1R22.1).

- GREEN. Poor work control resulted in 300 gallons of water from the core flood tanks (CFTs) being drained into the reactor coolant system (RCS) instead of the reactor coolant drain tank (RCDT). No loss of thermal margin or water inventory occurred. This finding was determined to have very low safety significance (Section 1R20.1).

Report Details

Summary of Plant Status: The plant was in a refueling outage from April 2 until May 18 when the reactor was synchronized to the grid. The power was then slowly increased until May 21, when power reached 100 percent.

1. REACTOR SAFETY

1R07 Heat Sink Performance

a. Inspection Scope

The inspectors observed the performance of the decay heat cooler 1-2 performance test, DB-PF-04727, completed on April 1, 2000. The inspectors reviewed the test to determine if: test acceptance criteria and results appropriately considered differences between test conditions and design conditions, acceptance criteria was appropriately compared to the test results, the frequency of inspection was sufficient to detect degradation prior to loss of heat removal capabilities below design basis values, and that test results considered test instrument inaccuracies and differences.

b. Issues and Findings

There were no findings identified during this inspection.

1R12 Maintenance Rule Implementation

a. Inspection Scope

The inspectors reviewed the licensee's implementation of the maintenance rule requirements, including reviewing scope, goal setting, and performance monitoring, short-term and long-term corrective actions, and current equipment performance status, for the following components and systems:

- essential and miscellaneous alternating current (AC)
- auxiliary feedwater
- emergency lighting
- component cooling water system

b. Issues and Findings

There were no findings identified during this inspection.

1R14 Personnel Performance During Nonroutine Plant Evolutions and Events

a. Inspection Scope

The inspectors reviewed control room operator performance during:

- a plant shutdown, conducted in accordance with DB-OP-06903, "Plant Shutdown and Cool-down"
- the initial drain of the RCS, conducted in accordance with DB-OP-06904, "Shutdown Operations," and DB-OP-06002, "RCS Drain and Nitrogen Blanketing"
- reactor startup, conducted in accordance with DB-OP-06901, "Plant Startup," and DB-OP-06912, "Approach to Criticality."

The inspectors checked that the governing procedures were adequate and were being complied with. Management oversight performance and problem identification and resolution performance during the evolutions was evaluated. The inspectors checked whether Technical Specification (TS) requirements were being observed and whether the plant was being operated in a safe manner. The adequacy of operator communications and licensee problem identification and resolution was evaluated. Operator response to alarms and unexpected indications was observed.

b. Issues and Findings

There were no findings identified during this inspection.

1R15 Operability Evaluations

a. Inspection Scope

The inspectors reviewed the following operability evaluations affecting mitigating systems and barrier integrity. The reviews considered whether the evaluations were technically justified, the adequacy and functionality of any compensatory measures, and any degradations that might cause a loss of function as described in the USAR or TSs.

- steam generator functional evaluation pertaining to the licensee improperly using leak before break considerations for not considering dynamic loads for steam generator tube repair criteria and repair method qualifications (CRs 1999-1022 and 2000-0300)

- containment vessel operability evaluation pertaining to finding standing water coming from non-inspectable portions of the containment vessel during the annulus ISI inspection (CR 2000-0709)

- multiple indications in the valve body casings of the auxiliary feedwater pump governor valves (CRs 2000-1122, and 2000-1129)

- boric acid precipitation enhancement modification design flow was measured at 250 gpm which was not expected and provided no margin to the test acceptance criteria (CR 2000-1294)

b. Issues and Findings

There were no findings identified during this inspection.

1R19 Post-Maintenance Testing

a. Inspection Scope

The inspectors reviewed that the following post maintenance testing procedures and activities were adequate to verify system operability, and functional capability. The procedure content and documentation were reviewed to ensure they were adequate for the maintenance performed. The acceptance criteria was verified for consistency with design basis documentation. Test data was evaluated for completeness and test results were compared to the acceptance criteria. The effect of the testing on plant risk was reviewed. Procedural adherence was evaluated. Test deficiencies were evaluated for proper licensee identification and resolution.

- radiography on boron precipitation modification, performed on April 22 to retest a weld (MWO-1999-04337-008)

- post modification test for MOD 97-74, boron precipitation enhancement, performed on May 3 to demonstrate operational readiness (DB-PF-10026)

- auxiliary feedwater pump high speed stop and over-speed trip test, performed May 8 after an overhaul of the turbine (DB-SP-04153)

- service water train 2 integrated flow balance, performed on May 8 as follow-up to service water train 2 maintenance activities (DB-SP-04020)

- local leak rate testing of valves MU-2A and MU-3, performed after valve maintenance (DB-PF-03008)

- RCS vent valve post maintenance testing performed May 9 after a connector had been replaced (DB-SP-03366)

b. Issues and Findings

There were no findings identified during this inspection.

1R20 Refueling and Outage Activities

.1 Refueling Outage Inspections

a. Inspection Scope

The inspectors performed the following inspection activities during the 12th refueling outage:

- reviewed the final outage safety review plan, QAD-00-80039, for conformance to the licensee's outage nuclear safety control procedure, NG-DB-0016
- reviewed the outage plan to ensure that activities that were more apt to cause a loss of decay heat removal or inventory loss were scheduled during low risk plant configurations.
- ensured that the licensee adequately tracked and controlled the configuration of the plant so as not to inadvertently change the shutdown risk profile
- verified that the licensee was complying with commitments made as a result of generic letter 88-17, "Loss of Decay Heat Removal"
- ensured that cool down rate limits were being complied with during reactor shutdown
- reviewed that the operation of decay heat/spent fuel pool heat removal systems was maintained and not threatened during reduced inventory operations
- reviewed that the reactor coolant inventory was controlled during RCS drain activities in accordance with the shutdown risk plan, and in accordance with the procedural requirements of DB-OP-06904, "Shutdown Operations," and DB-OP-06002, RCS Drain and Nitrogen Blanketing"
- reviewed that reactivity was controlled to ensure TS requirements for shutdown margin in the RCS, refueling canal and the spent fuel pool
- reviewed that containment closure ability was maintained, especially during reduced inventory conditions
- verified that refueling activities were performed in a controlled, predetermined manner, in accordance with DB-NE-06101, "Fuel/Control Component Shuffle"
- conducted a containment inspection prior to startup to ensure that material in containment would not degrade the ability of the emergency sump to perform its design function
- evaluated whether mode restraints were properly evaluated and that TS requirements for equipment operability were satisfied prior to changing mode

- ensured physics testing was conducted in accordance with DB-NE-03212, "Zero-Power Physics Testing"

b. Issues and Findings

While the plant was configured for a reactor coolant system (RCS) drain, operators commenced a core flood tank (CFT) drain after approval was obtained to conduct this evolution ahead of schedule. The ensuing valve lineup resulted in 300 gallons of water being drained from the CFT into the RCS instead of to the reactor coolant drain tank. Other work control issues occurred during the inspection period that did not result in an event (temporary loss of decay heat removal, inadvertent drain of the RCS), but the last barrier (operators in the field) was relied upon to prevent events from occurring.

The inspectors reviewed the drain of water from the CFT into the RCS with the shutdown operations significance determination process (NRC Manual Chapter 0609, Appendix G). No loss of thermal margin occurred, because the margin to boiling did not change by greater that 20 percent (there was no temperature increase) and no loss of water inventory occurred, therefore, no loss of control event occurred. Therefore, the issue was determined to have very low safety significance (Green).

1R22 Surveillance Testing

.1 Surveillances Observed

a. Inspection Scope

The inspectors verified by witnessing the following surveillance tests and/or reviewing the test data, that the subject risk-significant structures, systems, and components (SSCs) met TS, updated safety analysis report, and licensee procedure requirements and demonstrated that the SSCs were capable of performing their intended safety functions. The inspectors evaluated the tests for: preconditioning, effect of the test on plant risk, clear and adequate acceptance criteria, operator procedural adherence, test data completeness, test frequency, and post test equipment restoration. Licensee identification and resolution of test problems were also evaluated.

- integrated leak rate test of the containment vessel, DB-PF-10310
- integrated safety features actuation test, DB-SC-03114
- pressurizer pilot operated relief valve cycle test, DB-SP-03363

b. Issues and Findings

There were no findings identified during this inspection.

.2 Personnel Error During Testing Results on Loss-of-Offsite-Power (LOOP)

a. Inspection Scope

The inspectors reviewed licensee performance of the 13.8 kV System Bus A&B Transfer Test, DB-SC-03020. A LOOP occurred during this test as a result of a personnel error during the conduct of the test.

b. Issues and Findings

During a 13.8 kV bus transfer test, which was conducted on April 23, 2000, during the low risk plant configuration of having the core offloaded into the spent fuel pool, an electrician caused a LOOP event. The purpose of the test was to verify the fast transfer of 13.8 kV Bus A & B from the Unit Auxiliary Transformer X11 to start up transformers X01 and X02 when switchyard breakers 34560 and 34561 are tripped. Since this test was pre-determined to be a high risk test, it was intentionally scheduled to occur while the core was offloaded, which minimized the consequences of a LOOP event, should it occur during the performance of the test. An unexpected alarm annunciator response occurred during the test and the test leader directed an electrician to follow the steps in Procedure DB-SC-03020 to check if the lockout relays had energized. The electrician erroneously checked the wrong lockout relay, actuated it, and caused a LOOP at 11:46 p.m. The electrician immediately notified the control room that he caused the LOOP and that it was not due to an actual equipment malfunction. This information allowed operators to quickly reset the relays that were locked out because of his mistake and to restore offsite power to the station by about 11:50 p.m.

As a result of the LOOP, the station entered abnormal procedures for loss of instrument air and loss of AC bus sources and declared an unusual event at 12:10 a.m. Required notifications were made to state and local authorities and the NRC. The unusual event was terminated at about 12:54 a.m. because offsite power had been restored.

The inspectors reviewed the LOOP event with the shutdown operations significance determination process (NRC Manual Chapter 0609, Appendix G). No loss of thermal margin occurred, because the margin to boiling did not change by greater that 20 percent (SFP temperature changed about 1 degree and was less than 110 degrees). Additionally, no loss of water inventory occurred; therefore, no loss of control event occurred. Therefore, the event was determined to have very low safety significance (Green).

10 CFR 50, Appendix B, Criterion V, Instructions, Procedures, and Drawings, states in part that an activity affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings. Procedure DB-SC-03020, “13.8 kV System Bus A & B Transfer Test,” was used for an activity affecting quality. The failure of an electrician to check the relay specified in this procedure was a violation associated with an inspection finding that is characterized by the significance determination process as having very low risk significance (green) and is being treated as a Non-Cited Violation, consistent with Section VI.A.I of the NRC

Enforcement Policy. This violation is in the licensee's corrective action program as CR 2000-1124 **(NCV 50-346/2000003-001)**.

OTHER ACTIVITIES (OA)

4OA3 Event Followup

.1 (Closed) LER 50-346/2000-004: Personnel error during bus transfer testing results in loss of offsite power. This item was discussed in section 1R22.2 and resulted in a non-cited violation (Green).

.2 (Closed) LER 50-346/2000-002: Main steam safety valve setpoints greater than TS allowable values. This LER was a minor issue and was closed.

4OA5 Other

a. Inspection Scope (TI 2515/142)

The inspectors performed temporary instruction (TI) 2515/142, "Drain-down During Shutdown and Common-Mode Failure (NRC Generic Letter (GL) 98-02)." The objective of the TI was to confirm that the licensee did not have a potential drain-down path that could be created by operator error or equipment failure which could lead to a common-cause failure of emergency core cooling system (ECCS) pumps similar to that of the Wolf Creek event of September 17, 1994. The inspectors reviewed the licensee's assessment of GL 98-02 and controlled drawing OS-004, "Decay Heat Removal/Low Pressure Injection System," to determine if the emergency core cooling systems included certain design features, such as a common suction header, which could render the systems susceptible to common-cause failure similar to the type of event that occurred at Wolf Creek.

b. Issues and Findings

The inspectors determined that the licensee's ECCS system design was not susceptible to an event that was similar to what occurred at Wolf Creek. There were no findings identified during this inspection.

4OA6 Management Meetings

The inspectors presented the inspection results to Mr. G. Campbell and other members of licensee management on May 23, 2000. The licensee acknowledged the findings presented. No proprietary information was identified.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

G. R. Barteck, Safety Features Actuation System Engineer, Plant Engineering
M. C. Beier, Manager, Quality Assessment
J. E. Blay, Shutdown Risk Advisor, Quality Assessment
J. M. Bonfiglio, Shift Supervisor, Operations
T. J. Chambers, Supervisor, Quality Assurance
R. B. Coad, Jr., Manager, Plant Operations
S. A. Coakley, Supervisor, Outage Management
D. D. Duquette, 4160 VAC Breaker Engineer, Plant Engineering
D. L. Eshelman, Manager, Plant Engineering
J. L. Freels, Manager, Regulatory Affairs
D. C. Geisen, Manager, Technical Services
R. C. Hovland, Engineer, Plant Engineering
D. B. Kelly, Nuclear Engineer, Design Basis Engineering
J. H. Lash, Plant Manager
J. L. Lee, Auxiliary Feedwater System Engineer, Plant Engineering
D. H. Lockwood, Supervisor, Compliance
P. J. Mahoney, Engineer, Design Basis Engineering
P. J. Mainhardt, Service Water System Engineer, Plant Engineering
J. Messina, Director, Work Management
S. Moffitt, Director, Technical Services
L. D. Myers, Shift Supervisor, Operations
J. W. Rogers, Manager, Maintenance
D. W. Schreiner, Support Staff, Maintenance
P. Shultz, Manager, Radiation Protection
H. W. Stevens, Jr., Manager, Nuclear Safety & Inspections
T. S. Swim, Supervisor, Design Basis Engineering
G.M. Wolf, Engineer, Regulatory Affairs
L. W. Worley, Director, Support Services

NRC

T. J. Kozak, Chief, Reactor Projects Branch 4
K. S. Zellers, Senior Resident Inspector, Davis-Besse
D. S. Simpkins, Resident Inspector, Davis-Besse

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

50-346/2000003-001	NCV	Electrician inadvertently operated the wrong relay during offsite power testing, causing a loss-of-offsite-power while the core was offloaded.

Closed

50-346/2000003-001	NCV	Electrician inadvertently operated the wrong relay during offsite power testing, causing a loss-of-offsite-power while the core was offloaded.
50-346/2000-004	LER	Personnel error during bus transfer testing results in loss of offsite power.
50-346/2000-002	LER	Main steam safety valve setpoints greater that TS allowable values.

LIST OF ACRONYMS USED

AC	Alternating Current
CFT	Core Flood Tank
CFR	Code of Federal Regulations
CR	Condition Report
ECCS	Emergency Core Cooling System
EDG	Emergency Diesel Generator
IFI	Inspection Follow-up Item
kV	Kilovolt
LER	Licensee Event Report
LOOP	Loss-of-Offsite-Power
MOD	Modification
MWO	Maintenance Work Order
NRC	Nuclear Regulatory Commission
RCDT	Reactor Coolant Drain Tank
RCS	Reactor Coolant System
SDP	Significance Determination Process
SFP	Spent Fuel Pool
SSC	Structures, Systems, and Components
TI	Temporary Instruction
URI	Unresolved Item
USAR	Updated Safety Analysis Report
VIO	Violation