U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket No:	50-346
License No:	NPF-3
Report No:	50-346/99009(DRP)
Licensee:	Toledo Edison Company
Facility:	Davis-Besse Nuclear Power Station
Location:	5501 N. State Route 2 Oak Harbor, OH 43449-9760
Dates:	June 23 - August 2, 1999
Inspectors:	K. Zellers, Senior Resident Inspector S. Campbell, Senior Resident Inspector, Fermi
Approved by:	Thomas J. Kozak, Chief Reactor Projects Branch 4 Division of Reactor Projects

EXECUTIVE SUMMARY

Davis-Besse Nuclear Power Station
NRC Inspection Report 50-346/99009(DRP)

This inspection included aspects of licensee operations, maintenance, engineering, and plant support. The report covers a six-week period of resident inspection.

Operations

- The facility was operated in a conservative manner and no operator-initiated events occurred during the inspection period (Section O1.1).

- The inspectors concluded that operators were not fully cognizant of the reasons for all computer points which were in alarm and the relatively large number of computer point alarms tended to mask the significance of individual alarms (Section O1.2).

- The inspectors concluded that the Company Nuclear Review Board (CNRB) was an effective tool for improving licensee performance (Section O7.1).

Maintenance

- Overall, the plant was maintained in an effective manner. Management considered risk in scheduling maintenance activities and operators were informed of maintenance in progress. However, the inspectors identified that electrical maintenance personnel did not consistently implement plant management's expectation to use three-part communications during surveillance testing activities (Section M1.1).

- Jumpers used for a high risk activity (anticipatory reactor trip system testing) were not verified to be properly installed prior to the test. Inadequate jumper installation has resulted in several industry events and, in this case, if the jumpers had been improperly installed, a plant trip would most likely have occurred during the test. The licensee indicated that an evaluation of ways to ensure that jumpers were adequately installed would be conducted (Section M1.2).

- Electrical maintenance personnel worked on the wrong heat trace equipment on two separate occasions because of poor self-checking work practices. The root cause investigation was well documented and the proposed corrective actions should result in better overall maintenance department performance (Section M1.3).

- Overall, maintenance and operations personnel effectively removed, tracked and coordinated the EVS Train 1 maintenance activity while making reasonable efforts to manage risk (Section M1.4).

- The inspectors concluded that plant management conservatively tracked equipment out-of-service time and effectively ensured that outage times were minimized by providing the necessary resources to perform equipment maintenance and resolve emergent issues in a timely manner (Section M2.1).

Engineering

- Station management exhibited a commitment to nuclear safety when they took measures to ensure the startup feedwater pump would be available for accident mitigation functions, even though no regulatory requirement existed to do so (Section E2.1).

Plant Support

- Through system flushes, the licensee effectively reduced the dose rates associated with decay heat removal system train 1 (Section R1.1).

Report Details

Summary of Plant Status

The plant operated at nominally 100 percent throughout the inspection period, except for brief periods of time at about 95 percent power for equipment testing.

I. Operations

O1 Conduct of Operations

O1.1 General Comments (71707)

The licensee operated the facility in a conservative manner. Problems were brought to the attention of appropriate levels of management. Operators were aware of plant conditions and identified degraded conditions for resolution, with minor except as noted in Section O1.2 of this report. Plant status, evolutions in progress, and planned activities were effectively communicated during shift turnovers. No significant operator-initiated events occurred during the inspection period.

01.2 Operator Awareness of Computer Point Alarms (71707)

Computer point alarms provide a low threshold indication to operators of abnormal plant conditions that require followup, but do not require entry into an alarm procedure. During control room observations, the inspectors noted that a relatively large number of computer points were in alarm. However, when the control room operators were questioned on the reason for certain alarms, the operators could not provide an explanation. For example, operators were not aware of the reason for a reactor coolant system (RCS) flow computer point alarm and they did not confidently explain the reason for two other computer point alarms (high cold leg temperatures and low hot leg temperatures). Subsequently, operators submitted requests to engineering and maintenance personnel to have the alarms resolved. Additionally, the monitor that displayed the computer point alarms did not meet plant management's goal of having all of the alarms displayed at the same time. Management indicated that many alarms were caused by hot weather and that efforts to resolve the problems associated with the alarms were underway. The inspectors concluded that operators were not fully cognizant of the reasons for all computer points which were in alarm and the relatively large number of computer point alarms tended to mask the significance of individual alarms.

O2 Operational Status of Facilities and Equipment

O2.1 System Walkdowns (71707)

The inspectors walked down the accessible portions of the following engineered safety features (ESF) and important-to-safety systems during the inspection period:

- Emergency Diesel Generators 1 and 2
- Auxiliary Feedwater Trains 1 and 2
- Service Water Trains 1 and 2

- Low Pressure Injection Trains 1 and 2
- High Pressure Injection Trains 1 and 2

No substantive concerns were identified during the walkdowns. Major flowpaths were verified to be consistent with plant procedures/drawings and the Updated Safety Analysis Report (USAR). Pump/motor fluid levels were within their normal bands. Only minor oil and fluid leaks were noted on occasion. However, some minor pump water leaks were not identified with a material deficiency tag. Also, a screenwash pump room 4160 volt cubicle had water dripping on it from a rainstorm. The inspectors informed licensee management of the minor concerns identified during the walkdowns and the issues were resolved appropriate to the situation.

O2.2 Equipment Performance During Hot Weather (71707)

In late July, ambient air temperatures routinely exceeded 90 degrees Fahrenheit (^{0}F) and the inspectors tracked the performance of equipment during this time frame. Invertor YVA, which provides the normal power to bus YAU, which is important to maintain mode 1 operations, had to be transferred to the alternate power supply on two separate occasions, because the static transfer switch malfunctioned. The apparent cause for the malfunctions was temperature-related failures of the inverter circuit cards. This invertor is scheduled to be replaced during the 13th refueling outage but will be evaluated for earlier replacement due to its recent unreliability. Also, the ultimate heat sink (UHS) temperature rose to 83.7 ^{0}F on July 31. The TS limit of 85 ^{0}F required a plant shutdown. The licensee had been in the process of evaluating the operability of plant equipment and concluded that all safety-related equipment would remain operable with an UHS temperature of 90 ^{0}F. Therefore, the licensee submitted a license amendment request to raise the TS limit to 90 ^{0}F. This request was under review at the end of the inspection period. High temperatures on some balance of plant motors were compensated for with temporary fans. High containment temperatures that approached the TS limit of 120 ^{0}F were addressed by directing more water flow through the containment air coolers. This was done by raising the temperature setpoint on the component cooling water system, which caused less water to flow through the component cooling water heat exchangers and therefore more water to flow through the containment air coolers. The hot weather did not cause any plant transients or significant equipment problems. The inspectors concluded that, overall, plant equipment operated well during the recent hot weather spell.

O2.3 RCS Leakage Detection System Problems (71707)

The inspectors reviewed the licensee's efforts to resolve frequent low flow alarms on the containment atmospheric particulate and gaseous radiation monitor system. Engineering and maintenance personnel did extensive testing of the system, but did not identify any functional problems with the system. The licensee noted that system filters had accumulated a dark colored particulate (along with a white colored boric acid residue) and independent testing determined that the particulate was primarily iron oxide (a corrosion product). The results of this determination were documented on condition report (CR) 1999-1300. The licensee postulated that the corrosion particulate was the cause of the low flow alarms. At the end of the inspection period, the licensee planned to install temporary air purification equipment into the containment in an attempt to clean its atmosphere.

O7 Quality Assurance in Operations

O7.1 Company Nuclear Review Board (CNRB) (71707)

The inspectors observed a portion of a CNRB meeting. Critical comments about plant performance were well received by station management. Members conducted a constructive discussion of the self-assessment program. The inspectors concluded that the CNRB was an effective tool for improving licensee performance.

O8 Miscellaneous Operations Issues (92700)

O8.1 (Closed) Licensee Event Report (LER) 50-346/98-002-00: Plant Trip Due to High Pressurizer Level As a Result of Loss of Letdown Capability. On April 10, 1998, while shutting the plant down for a refueling outage, a purification demineralizer resin retention element failed which resulted in the isolation of the reactor coolant letdown system. The loss of the letdown system caused an increase in pressurizer level and, in response, plant operators manually tripped the plant. The details of the event, the licensee's actions, and corrective actions are documented in Inspection Report (IR) 50-346/98005(DRP). This LER is closed.

O8.2 (Closed) LER 50-346/96-010-00: Control Room Emergency Ventilation System (CREVS) Not Realized as Inoperable When Rad Monitors Were Inoperable. On December 10, 1996, with one station ventilation radiation monitor out-of-service, workers removed the second station ventilation radiation monitor from service without realizing that this rendered both CREVS trains inoperable. With both CREVS trains inoperable, TS 3.0.3 applies, which requires the plant to be in hot standby within 6 hours. The two radiation monitors were simultaneously out-of-service for 87 minutes; therefore, no violation of the TS 3.0.3 action statement time requirement for shutting the plant down occurred. The licensee changed procedure DB-OP-06412, "Process and Area Radiation Monitor Procedure," to include information that the removing both radiation monitors from service rendered both trains of CREVS inoperable and the TS 3.0.3 applied in that case. This LER is closed.

O8.3 (Closed) LER 50-346/98-011-00: Manual Reactor Trip Due to Component Cooling Water System Leak. On October 14, 1998, the reactor was manually tripped due to a component cooling water system leak. The circumstances leading up to the event, the licensee's actions during the event, and the licensee's corrective actions are documented in IR 50-346/98019(DRP). The inspectors reviewed the LER and IR and determined that no new issues were identified. This LER is closed.

II. Maintenance

M1 Conduct of Maintenance

M1.1 Maintenance and Surveillance Activities (61726, 62707)

The following maintenance and surveillance testing activities were observed/reviewed during the inspection period:

- Anticipatory Reactor Trip System (ARTS) Interchannel Logic Test for Mode 1 conducted per DB-MI-03355

- Channel Functional Test/Calibration and Response Time of Reactor Coolant Pump Monitor (RC3601) to Steam and Feedwater System Rupture Control System Logic Channel 1 and Reactor Protection System Channel 1 conducted per DB-MI-03205

- Decay Heat Pump Quarterly Pump and Valve Test conducted per DB-SP-03136

- Emergency Diesel Generator (EDG) 1 184-Day Test conducted per DB-SC-03076

Management considered risk in scheduling maintenance activities and operators were informed of maintenance in progress. The equipment which was tested performed as designed and test personnel were knowledgeable of the systems tested. However, the inspectors noted that electrical maintenance worker communications while conducting surveillance test DB-MI-03205 were not per management expectations to use three-way communications during surveillance tests. During the test, an electrician manipulated a component before he repeated back to the procedure reader his intended action, which was essentially one-way communications. On another occasion, an electrician anticipated the next activity and started it before he was instructed to perform it. Although management expectations for communications were not effectively implemented in these cases, no procedure violation occurred. During the inspection exit meeting, maintenance management indicated that efforts were ongoing to improve maintenance personnel performance in this area.

M1.2 Jumper Use During ARTS Testing

The inspectors observed that prior to conducting surveillance test DB-MI-03355, "ARTS Interchannel Logic Test for Mode 1," which was considered by plant management to be a high risk evolution, instrumentation and controls (I&C) technicians did not verify the continuity of jumpered contacts prior to conducting this test. Additionally, the wire jumper that was used was not verified to be functional prior to use. According to the I&C technicians, the control rod drive breakers would open during the test and cause reactor trip if the contacts were not adequately jumpered. Maintenance management acknowledged that verifying adequate jumper connectivity is a good practice, and could result in avoiding an unnecessary plant transient in a case where a jumper was not adequately installed. The licensee indicated that an evaluation of ways to verify that ARTS test jumpers were properly connected would be conducted.

M1.3 Maintenance Personnel Work on Wrong Equipment

a. Inspection Scope (71707)

The inspectors reviewed the circumstances surrounding an event where electricians performed work on the wrong equipment.

b. Observations and Findings

On July 15, 1999, an electrician identified that he had worked on the wrong heat trace control cabinet. A condition report was initiated and classified as significant with a root cause evaluation required to be performed. The subsequent root cause determination identified that electricians had also worked on the wrong heat trace equipment on a second occasion. This equipment was not safety-related and is not subject to regulatory requirements. However, the inspectors were concerned with the work practices that caused the error to occur in that these work practices could cause similar problems while working on safety-related equipment.

The root cause investigation team interviewed electrical maintenance personnel, reviewed records and conducted a behavior factor analysis. The resulting report was detailed and provided a problem statement, event narrative, data analysis, experience review, root cause determination, and a comprehensive list of recommended corrective actions. The recommendations did not focus on the event itself, but focused on the behaviors that caused the event. The root causes for the event were inadequate self-checking practices by the craft and an inadequate pre-job brief between supervision and craft. Contributing factors were a lack of guidance to the craft on when and how to perform pre-job briefs, infrequent supervisory in-field observations, and STAR (Stop, Think, Act, Review) principles were not a normal part of electrical maintenance culture.

The electrical and I&C shop conducted a stand-down to: (1) emphasize the STAR principle, (2) communicate guidance to verify work on proper equipment, and (3) discuss the event and other industry events where using the STAR principle would have been beneficial. Also, electricians practiced self-verification assignments. When the second occurrence was discovered, plant staff ensured that electricians were working in the correct equipment prior to starting work. More formal corrective actions to address the underlying root causes will be developed in CR 1999-1214.

c. Conclusions

Electrical maintenance personnel worked on the wrong heat trace equipment on two separate occasions because of poor self-checking work practices. The root cause investigation was well documented and proposed corrective actions which, if implemented, should result in better overall maintenance department performance.

M1.4 Emergency Ventilation System (EVS) Charcoal Filter Replacement

a. Inspection Scope (62707)

The inspectors reviewed documentation associated with and observed a replacement of the EVS Train 1 charcoal filter.

b. Observations and Findings

The inspectors verified that tagouts were properly installed and that approved work order instructions were used at the job site. Control room operators properly tracked and complied with limiting conditions for operations. The alternate train was available and work was not allowed on its equipment while train 1 work was ongoing.

The charcoal filter consists of 54 trays filled with charcoal and ideally, each tray would be filled with charcoal from the same batch; however, charcoal from at least four different batches was used for this filter. Technical Specification Surveillance Requirement 4.6.5.1.c, required charcoal testing be performed per Regulatory Guide 1.52. Regulatory Guide 1.52 recommended that laboratory testing of charcoal absorption be performed per American National Standard Institute Standard N510-1975 which specified that representative charcoal samples be obtained for absorbent testing. The term "representative sample" was not defined in the ANSI standard. The inspectors noted that samples were not obtained from each charcoal batch during previous absorbent testing in March 1996 and January 1997; rather, a single charcoal sample was obtained for absorbent testing. The licensee indicated that the TS SR was adequately met by obtaining a single sample but that it was a good practice to obtain a sample from each charcoal batch. In addition, the licensee indicated that its normal practice was to use charcoal from the same batch and that this practice would be proceduralized.

c. Conclusions

Overall, maintenance and operations personnel effectively removed, tracked and coordinated the EVS Train 1 maintenance activity while making reasonable efforts to manage risk.

M2 Maintenance and Material Condition of Facilities and Equipment

M2.1 Maintenance Rule Implementation

a. Inspection Scope (62707)

The inspectors reviewed station implementation of portions of the maintenance rule.

b. Observations and Findings

Operators made reasonable determinations that systems remained functional. For example, the decay heat removal system remained functional when cooling water was secured to the decay heat removal cooler, because the cooling water could have been restored quickly by a dedicated operator. On the other hand, the EDG was determined not functional when barring the EDG, because an operator would have to perform too many operations to reliably restore the EDG in a short time.

Equipment availability times were effectively tracked by operators. Shift managers had a list of equipment that required tracking availability times. Any time equipment on the list became nonfunctional or was returned to being functional, a unit log annotation was made. The equipment out-of-service time was then translated to the daily status report. System engineers then used these numbers for tracking their system out-of-service time. These times were conservatively tracked as equipment was designated as nonfunctional when the tagout was given to an equipment operator to hang, and functional when the tagout was completely restored.

The inspectors noted that management was engaged in assuring that equipment availability times were minimized. During plan of the day meetings, system engineers presented executive summaries of plans to conduct maintenance outages on safety-

significant equipment. Management displayed a questioning attitude towards minimizing equipment outage time by ensuring that appropriate maintenance and supervisory coverage was available around the clock to handle any unforeseen problems in an efficient manner.

c. Conclusions

The inspectors concluded that plant management conservatively tracked equipment out-of-service time and effectively ensured that outage times were minimized by providing the necessary resources to perform equipment maintenance and resolve emergent issues in a timely manner.

M8 Miscellaneous Maintenance Issues (92700)

M8.1 (Closed) LER 50-346/96-006-00: Reactor Coolant Pump Motor 1-2 Oil Collection System 1.5 Inch Lip Not Installed. On May 14, 1996, the licensee discovered that a 1.5 inch high lip around the top of reactor coolant pump motor (RCPM) 2-1 was not in place. This lip is part of the RCPM oil collection system and serves to direct any oil leakage from the RCPM flywheel cover and upper bearing oil level control enclosures to the oil cooler enclosure. This condition did not comply with 10 CFR 50, Appendix R fire protection requirements and was therefore outside the design basis. The licensee determined that the oil collection system was replaced during the 1993 refueling outage; however, the oil collection lip located on the top of the pump was not identified in the work package and was therefore not installed. The licensee installed the oil collection lip on May 20, 1996, and revised the maintenance procedure for the reactor coolant pumps to ensure that the oil collection system is verified to be in service after all maintenance on the pumps. The inspectors determined that the licensee's corrective actions were appropriate.

10 CFR 50, Appendix R, Section III, Paragraph O, "Oil collection system for reactor coolant pump," states, in part, that the reactor coolant pump shall be equipped with an oil collection system if the containment is not inerted during normal operation. Such collection systems shall be capable of collecting lube oil from all potential pressurized and unpressurized leakage sites in the reactor coolant pump lube oil systems. Leakage points to be protected shall include lift pump and piping, overflow lines, lube oil cooler, oil fill and drain lines and plugs, flanged connections on oil lines, and lube oil reservoirs where such features exist on the reactor coolant pumps. The Davis-Besse containment is not inerted. Contrary to this, on May 14, 1996, the RCPM was not equipped with an oil collection system capable of collecting lube oil from the RCPM flywheel cover and upper bearing oil level control enclosures. This Severity Level IV violation is being treated as a Non-Cited Violation, consistent with Appendix C of the NRC Enforcement Policy. This violation is in the licensee's corrective action program as LER 50-346/96-006-00 **(NCV 50-346/99009-01(DRP))**.

M8.2 (Closed) LER 50-346/97-005-01: Surveillance Requirement Missed Due to Inadequate Safety Evaluation. On February 12, 1997, the licensee identified that the TS surveillance test for the vacuum leakage rate was not completed within the required frequency. This item was discussed in IR 50-346/97003(DRP) and was dispositioned as a Non-Cited Violation. The inspectors reviewed the LER and determined that the circumstances described were consistent with those previously reported. This item is closed.

M8.3 (Closed) LER 50-346/98-010-01: Misdiagnosis of Feedwater Control Valve Solenoid Valve Failure During Testing Results in Manual Reactor Trip. Operators manually tripped the reactor after the main feedwater control valve to Steam Generator 1 inadvertently closed during testing activities. This revision to the original LER updates corrective action efforts, such as engineering personnel troubleshooting training and initiatives to determine the solenoid valve failure mode. The original LER was closed out and discussed in Inspection Report 50-346/98017(DRP).

M8.4 (Closed) LER 50-346/98-001-00 and 01: Main Steam Safety Valve Setpoints Outside TS Allowable Values. On April 8, 1998, while operating at near 74 percent power, 8 of 11 main steam safety valves (MSSVs) that were tested (18 MSSVs are installed) failed to lift within the TS limits. Six of the MSSVs had a lift sitting pressure more than one percent below the TS setpoint, and two of the MSSVs had a lift setting pressure more than one percent above the TS setpoint. The safety valve lift settings were adjusted within the time allowed by the TSs, and the valves were retested satisfactorily. Engineering personnel evaluated the as-found lift data and determined that the main steam system pressure would not have exceeded previously analyzed values during anticipated over-pressure transients. During the next refueling outage, five of the valves were removed from the system and were either rebuilt or replaced. The apparent causes for the failures were: (1) the time interval between tests was too long resulting in spring relaxation, (2) main steam line vibration caused some wear of the disk to spindle connections, (3) minor galling of the seat and nozzle surfaces while a valve was in storage for an appreciable amount of time, and (4) limitations of the test method accuracy. To address the apparent causes, the licensee committed to reduce the time intervals between testing each valve from every three operating cycles to every operating cycle, and to require testing of a MSSV after installation if the MSSV was in storage for greater than two years. Other details of this item were documented in IR 50-346/98005(DRP). This LER is closed.

M8.5 (Closed) LER 50-346/98-005-00: Both Low Pressure Injection/Decay Heat Removal Pumps Inoperable During Test. On June 1, 1998, at 98 percent power, an operator inadvertently closed the train 1 low pressure injection (LPI) system pump suction valve instead of the train 2 LPI system pump suction valve during train 2 testing activities. This caused both LPI system trains to become inoperable, because the fuses to LPI system train 2 pump were removed. The operator immediately recognized the error and re-opened the injection valve. Both trains were inoperable for only 33 seconds, therefore, no TS action statement violations occurred. The licensee determined that the root cause was personnel error by not doing an adequate self-check. Corrective actions conducted were individual training and lessons learned training for the operations department. The inspectors determined that the corrective actions were appropriate. This item was discussed in IR 50-346/98009 (DRP) and was dispositioned as a minor violation.

M8.6 (Closed) LER 50-346/98-012-00 and 01 and Inspection Followup Item (IFI) 50-346/98017-01(DRP): Reactor Trip Due to ARTS Signal While Removing ARTS Channel One From Bypass. On October 18, during reactor restart activities, an automatic reactor trip occurred from four percent power due to an inadvertent ARTS actuation. The cause of the trip was non-installed wires on the spare position of all four ARTS Test Trip Bypass Switches, coincident with an operator that inadvertently positioned the test switch to the spare position, contrary to procedural directions. Corrective actions to prevent recurrence were to change ARTS procedures to preclude the condition from

recurring, and to install the missing ARTS wiring prior to startup from the 12th refueling outage. Other details of the event were documented in IR 50-346/98017(DRP).

Criterion V to Appendix B to 10 CFR 50, "Instructions, Procedures, and Drawings," states, in part, that activities 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-OP-06901, "Plant Startup," is used during reactor startups, an activity affecting quality. Step 3.21 of Procedure DB-OP-06901 required an operator to position the ARTS channel 1 test trip bypass switch to the operate position. Contrary to this, on October 18, 1998, while performing step 3.21 of Procedure DB-OP-06901, an operator positioned the ARTS bypass switch to the spare position instead of the operate position. This action, in conjunction with a degraded wiring condition in the ARTS cabinet, caused a trip of the reactor. The failure to position the switch in accordance with this procedure was a violation. This Severity Level IV violation is being treated as a Non-Cited Violation, consistent with Appendix C of the NRC Enforcement Policy. This violation is in the licensee's corrective action program as LER 50-346/98-012 **(NCV 50-346/99009-02(DRP))**.

III. Engineering

E1 Conduct of Engineering

E1.1 Evaluation of an EDG Degraded Condition (37551)

During a test of EDG 1, the inspector was concerned that a small hydraulic leak on the governor system would require frequent hydraulic oil additions to the governor during an extended EDG run and be a burden to operators. The EDG system engineer generated a CR that determined that the EDG would continue to run for greater than four days before hydraulic oil would need to be added. Additionally, frequent operator log readings of the governor hydraulic oil sight glass would provide early indication of lower than desired levels. The inspector concluded that the system engineer conservatively documented and dispositioned the inspectors' question pertaining to the EDG 1 governor hydraulic oil leak.

E2 Engineering Support of Facilities and Equipment

E2.1 Update to Station Integrated Plant Examination (IPE) Results in Efforts Decrease in Core Damage Frequency (37551)

The startup feed pump is not credited in the USAR for accident mitigation functions and has no TS requirements associated with it. Since the installation of the motor-driven feed pump, the startup feed pump had not been used or maintained. However, during the recent update to the IPE, station engineering personnel determined that the startup feedwater pump would provide a substantial benefit to mitigate the consequences of a loss of feedwater accident. Therefore, management added the pump to the maintenance rule program and started to perform maintenance on the pump to ensure its functionality. The inspectors concluded that station management exhibited a commitment to nuclear safety, when they took measures to ensure the startup

feedwater pump would be available for accident mitigation functions, even though no regulatory requirement existed to do so.

E8 Miscellaneous Engineering Issues (92700, 2515/141)

E8.1 (Closed) LER 50-346/97-012-01: Decay Heat Cooler Seismic Design Inadequacy. On September 4, 1997, the licensee identified that the decay heat coolers were not seismically qualified. This LER revision updated the completion time for evaluating whether nozzle loads were properly addressed for other tanks and heat exchangers. The original LER was closed and dispositioned as a Non-Cited Violation in IR 50-346/99008(DRP).

E8.2 (Closed) LER 50-346/98-013-00 and 01: Safety Valve Rupture Disks May Induce Excessive Eccentric Loading of Pressurizer Vessel Nozzles. On November 5, 1998, the licensee determined that eccentric loading of pressurizer safety valve nozzle piping could occur if one of the two rupture disks on the safety valve discharge tees remained intact during a safety valve lift. The licensee removed the rupture disks as a precautionary measure. A modification of the system was completed to eliminate the two rupture disks and install a single disk configuration that ensured even loading on the nozzle piping. The licensee determined that the error occurred in 1987 when erroneous assumptions were used to raise the rupture set point. The licensee evaluated its current modification process and determined that similar errors would not occur. The licensee initially determined that the system was not able to meet its design function. Further analysis using the actual relief capacity of the pressurizer safety valves determined both rupture disks would burst for all safety valve lift scenarios at all expected safety valve lift settings and therefore, there was no potential to induce excessive eccentric loads existed. Therefore, the licensee retracted the event on June 23, 1999. This item is closed.

E8.3 Review of Year 2000 (Y2K) Readiness of Computer Systems (2515/141)

The inspectors reviewed the licensee's closeout of a Y2K readiness open item pertaining to the maintenance management system for surveillance tracking (MMST). The inspectors reviewed documentation that certified that the MMST would function properly and questioned plant personnel who participated in the test activities to verify that the MMST was Y2K ready. The MMST was modified by FirstEnergy corporate personnel and tested to ensure it would function during Y2K sensitive dates. This involved running the modified system on a test platform, rolling the dates to the sensitive dates, and systematically verifying that the MMST continued to function as expected. Additionally, in the event that communications between FirstEnergy computers and Davis-Besse were disrupted, compensatory measures to print out an extended surveillance schedule prior to December 31 were planned.

IV. Plant Support

R1 Radiological Protection and Chemistry (RP&C) Controls

R1.1 Dose Reduction Efforts (71750)

The inspectors reviewed the licensee's efforts to reduce the dose rates from equipment associated with decay heat removal (DHR) system train 1. Portions of the DHR system that had relatively high radiation levels were flushed during a normally scheduled quarterly pump test. A one-time evolution procedure was generated to accomplish the task, since the test procedure did not provide for the additional steps required to flush these portions of the system. Execution of the flush plan extended the time to perform the surveillance test by about two hours. Radiation doses were reduced on some hot spots by a factor of four. A previous flush on DHR train 2 reduced hot spot radiation levels more dramatically (up to a factor of 500 decrease in hot spot activity). The inspectors concluded that the licensee effectively reduced the dose rates associated with decay heat removal system train 1.

R8 Miscellaneous RP&C Issues (92700)

R8.1 (Closed) LER 50-346/99-002-00: Both Trains of EVS Rendered Inoperable Due to Unattended Open Door. On February 8, 1999, the licensee discovered a shield building airtight door was open which rendered both trains of EVS inoperable. The door was immediately closed. A subsequent investigation identified that the door had been left open for about 18 minutes by a radiation protection technician. Due to the short duration of the condition, no violation of TS action requirements occurred. Additionally, although the EVS would not have been able to draw down the vacuum in the negative pressure boundary to values assumed in the accident analysis, the EVS would have still functioned to filter out postulated accident fission products that could leak from the containment vessel. The licensee conducted training with all radiation protection personnel to provide awareness of the requirement to maintain boundary doors in the proper positions.

V. Management Meetings

X1 Exit Meeting Summary

The inspectors presented the inspection results to members of licensee management at the conclusion of the inspection on August 2, 1999. The licensee acknowledged the findings presented. The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

X3 Management Meeting Summary

On July 30, 1999, the NRC Region III Administrator toured the plant and met with licensee management individuals. Topics discussed included the licensee's corrective action program, and its actions to improve work management processes and human performance at the station.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

M. C. Beier, Manager, Quality Assessment
W. J. Bentley, Work Control Support
G. G. Campbell, Vice President Nuclear
R. B. Coad, Jr., Superintendent, Radiation Protection
R. M. Cook, Licensing, Engineer
R. E. Donnellon, Director, Engineering and Services
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D. M. Imlay, Superintendent, Operations
D. F. Isherwood, Supervisor, Documentation Management
J. H. Lash, General Manager, Plant Operations
D. H. Lockwood, Supervisor, Compliance
J. L. Michaelis, Manager, Maintenance
S. P. Moffitt, Director, Nuclear Support Services
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NRC

K. S. Zellers, Resident Inspector, Davis-Besse

INSPECTION PROCEDURES USED

IP 37551:	Onsite Engineering
IP 61726:	Surveillance Observations
IP 62707:	Maintenance Observation
IP 71707:	Plant Operations
IP 71750:	Plant Support Activities
IP 92700:	Onsite Follow-up of Written Reports of Nonroutine Events at Power Reactor Facilities
2515/141	Review of Year 2000 (Y2K) Readiness of Computer Systems

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

50-346/99009-01	NCV	inadequate reactor coolant pump oil collection system
50-346-99009-02	NCV	operator procedure error contributes to reactor trip

Closed

50-346/98-002-00	LER	plant trip due to high pressurizer level as a result of loss of letdown capability
50-346/96-010-00	LER	CREVS not realized as inoperable when rad monitors were inoperable
50-346/98-011-00	LER	manual reactor trip due to component cooling water system leak
50-346/96-006-00	LER	reactor coolant pump motor 2-1 oil collection system 1.5 inch lip not installed
50-346/97-005-01	LER	surveillance requirement missed due to inadequate safety evaluation
50-346/98-010-01	LER	misdiagnosis of feedwater control valve solenoid valve failure during testing results in manual reactor trip
50-346/98-001-00; 50-346/98-001-01	LER	main steam safety valve setpoints outside TS allowable values
50-346/98-005-00	LER	both low pressure injection/decay heat removal pumps inoperable during test
50-346/98-012-00; 50-346/98-012-01	LER	reactor trip due to ARTS signal while removing ARTS channel one from bypass
50-346/98017-01	IFI	automatic reactor trip during plant restart
50-346/97-012-01	LER	decay heat cooler seismic design inadequacy
50-346/98-013-00; 50-346/98-013-01	LER	safety valve rupture disks may induce excessive eccentric loading of pressurizer vessel nozzles
50-346/99-002-00	LER	both trains of EVS rendered inoperable due to unattended open door
50-346/99009-01	NCV	inadequate reactor coolant pump oil collection system
50-346/99009-02	NCV	operator procedure error contributes to reactor trip

Discussed

None

LIST OF ACRONYMS USED

ARTS	Anticipatory Reactor Trip System
CFR	Code of Federal Regulations
CNRB	Company Nuclear Review Board
CR	Condition Report
CREV	Control Room Emergency Ventilation
DHR	Decay Heat Removal
EDG	Emergency Diesel Generator
ESF	Engineered Safety Feature
EVS	Emergency Ventilation System
I&C	Instrumentation and Controls
IFI	Inspection Followup Item
IPE	Integrated Plant Examination
IR	Inspection Report
LER	Licensee Event Report
LPI	Low Pressure Injection
MMST	Maintenance Management System Tracking
MSSV	Main Steam Safety Valves
NCV	Non-Cited Violation
NRC	Nuclear Regulatory Commission
PDR	Public Document Room
RCS	Reactor Coolant System
RP	Radiation Protection
RWP	Radiation Work Permit
TS	Technical Specification
USAR	Updated Safety Analysis Report
VIO	Violation