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REGION III

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Licensee: Toledo Edison Company

Facility: Davis-Besse Nuclear Power Station

Location: 5503 N. State Route 2
Oak Harbor, OH 43449

Dates: October 9 - November 27, 1996

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EXECUTIVE SUMMARY

Davis-Besse Nuclear Power Station
NRC Inspection Report 50-346/96010

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

Operations

- Operators appropriately recognized limiting conditions for operations (LCOs) with LCO entries made as required for Technical Specification related equipment that was to be taken out of service (Section 01.1).
- Plant response to the discovery of unexploded ordnance on or near the owner controlled area was appropriate and timely (Section 02.2).
- The inspectors noted that plant procedures allowed equipment to be temporarily realigned from their normal lineup without a safety review being performed for up to 6 months. This matter remained an inspection unresolved item at the conclusion of the inspection (Section 03.1).
- Operations, engineering and maintenance response to a November 1 loss of a power supply to certain control room and remote shutdown panel instrumentation was good (Section 04.1).
- Two reactor operators did not fully understand pressurizer spray valve indication and control logic when questioned by the inspectors. This situation did not meet plant management expectations. Procedural guidance was in place to direct necessary actions if needed (Section 04.4).
- The licensee identified that an emergency ventilation system valve was mispositioned for 14 hours without control room operators being aware. A contributing factor to the mispositioning appeared to be that the tagout process had not specified a final valve position for return to service (Section 04.5).

Maintenance

- Maintenance activities observed/reviewed during the inspection period were conducted in accordance with plant procedures and regulatory requirements. Good communication and teamwork were demonstrated (Section M1.1).
- Surveillance activities observed by the inspectors were conducted in accordance with procedural controls. Equipment was verified to operate as described in the Updated Safety Analysis Report (USAR) (Section M1.2).

- A weakness with the installation/design of the Emergency Diesel Generator (EDG) cylinder petcocks was noted by the inspectors during EDG surveillance testing activities (Section M1.3)
- The inspectors identified that an EDG test procedure did not preclude potentially preconditioning the airstart motors by allowing one set of motors to bar the engine and then to roll the engine for start (Section M1.3).
- Material condition of the station freeze protection system was improved (Section M2.1).

Engineering

- Portable air purifiers were placed in the control room without appropriate engineering controls (Section E1.1).
- The USAR specified a control room humidity lower limit that appeared inconsistent with actual equipment operating limits (Section E2.1).
- The licensee successfully maintained and implemented appropriate programs and processes that resulted in effective identification, resolution, and prevention of plant problems (Section E7.1).

Plant Support

- Radiological postings were in accordance with plant procedures, radiation monitoring equipment was functional with up to date calibration tags, and plant personnel were observed adequately adhering to radiation protection program requirements (Section R1).
- Fire brigade personnel protection equipment was verified as adequate, in-plant transient combustibles were well controlled, and annulus area compensatory measures equipment was verified to be functional (Section F2).
- The October 30 emergency preparedness drill was observed to be adequately conducted (Section P1).

Report Details

Summary of Plant Status

The unit operated at nominally full power throughout the inspection period.

I. Operations

01 Conduct of Operations

01.1 General Comments (71707)

The inspectors conducted frequent reviews of ongoing plant operations. Both operations management and operators were observed to be, overall, knowledgeable of the status of plant equipment. Operations personnel exhibited appropriate control/prioritization of maintenance activities in the plant. Plant problems that were identified by station personnel appeared to be adequately communicated to plant management. Preventive maintenance activities on major equipment reviewed during the inspection period were well planned and coordinated between the maintenance, engineering, and operations departments. Operators appropriately recognized limiting conditions for operations (LCOs) with LCO entries made as required for Technical Specification related equipment that was to be taken out of service.

The inspectors noted good operations, maintenance, and engineering personnel response to a November 1, failure of certain control room instrumentation associated with a power supply common with the remote shutdown panel.

However, the inspectors noted that during discussions with two reactor operators, both operators were not fully knowledgeable of the automatic operation of the pressurizer spray valve. Additionally, control room operators did not recognize, for some period of time, that an emergency ventilation system related damper was out of position.

02 Operational Status of Facilities and Equipment

02.1 Engineered Safety Features Systems Walkdowns (71707)

The inspectors conducted walkdowns of the accessible portions of the following engineered safety features and important-to-safety systems.

- Emergency Diesel Generators Nos. 1 and 2
- Containment Spray System - Trains 1 and 2
- Auxiliary Feedwater System - Train 1

All systems walked down during the inspection period were verified to be operable. Main flowpaths were determined to be in conformance with the Updated Safety Analysis Report (USAR). Equipment appeared to be

materially well maintained. Pump and motor fluid levels were within specified bands, and all required auxiliary/support equipment including instrumentation and controls, cooling water, room ventilation and electrical supply appeared to be functional.

02.2 Live Unexploded Ordnance Found on Owner Controlled Property

a. Inspection Scope (71707)

On October 30, plant personnel discovered what appeared to be undetonated explosive ordnance in the owner controlled area. The ordnance involved 11 shells/projectiles that were found in a marsh area near the edge of Lake Erie, the closest shell being approximately 500 yards from both the plant's intake canal and protected area. A similar discovery of ordnance was discovered on February 29, 1996, and was documented in NRC inspection report 50-346/96002.

The ordnance was identified during an emergency preparedness drill when a radiation monitoring team (RMT) entered the marsh area to collect samples and noted the shells/projectiles. The licensee postulated that the ordnance was from nearby Camp Perry's artillery test range.

The inspectors monitored licensee followup actions and independently evaluated the potential impact on plant operations. The licensee documented this issue in Potential Condition Adverse to Quality Report (PCAQR) 96-1390.

b. Observations and Findings

Since World War II, artillery has been fired from Camp Perry to a target area in Lake Erie a short distance from Davis-Besse. As a result, shrapnel and unexploded ordnance occupy the lake bottom near the plant site. Because of lake currents, etc., some of the submerged ordnance has gradually shifted towards the shoreline. In addition, due to high wind conditions at the time of discovery, Lake Erie water level had receded sufficiently to expose the ordnance. Similar findings along the beach or in the nearby Toussaint River have been made in the last several years.

Following discovery of the shells/projectiles, the inspectors verified that plant security had cordoned off the applicable areas, conducted additional inspections of the shoreline, and restricted access to the marsh. The licensee contacted the explosive ordnance disposal (EOD) unit at Wright-Patterson Air Force Base and a group of explosives experts were dispatched to disposition the discovered items.

Upon arrival, the EOD unit was able to characterize the 11 rounds as follows: 2-106mm, 2-155mm, and 7 bazooka (rocket) type rounds. The ordnance was then detonated in 5 separate explosions, indicating that at least several of the rounds were live.

The inspectors monitored the licensee's followup actions and verified that detonation of the ordnance would not adversely impact plant operation.

The inspectors also independently evaluated the potential for unexploded ordnance to find its way into the station's intake canal. The intake canal provides the water source to make up to the safety-related ultimate heat sink and service water intake structure. Applicable drawings and narrative descriptions in the Updated Safety Analysis Report (USAR) as well as plant drawings and system description information were reviewed. The inspectors also held discussions with engineering and operations personnel on the matter.

The inspectors determined that the intake canal's only communication to the lake was via a 96-inch outer diameter intake pipe that takes its suction from the lake about 3000 feet from the intake canal flood control dike. This suction location was beyond the range that unexploded ordnance from Camp Perry was expected to be found.

The inlet of the pipe was found to be oriented vertically, several feet above the lake bottom and protected by an offshore intake crib. This intake crib consisted, in part, of a submerged wooden structure whose design created a tortuous path for water flow to the intake pipe. This design protected the intake pipe suction from objects dropped from the surface and prevented the creation of a whirlpool effect at the surface of the lake.

The intake pipe had a slight incline from the intake crib to the intake canal. The intake canal's design also incorporated a trough arrangement at a point where the intake pipe ended which provided an additional trap for incoming material.

Periodic inspections by divers at the offshore intake crib structure and at the service water intake crib had not identified any evidence of unexploded ordnance.

c. Conclusions

The inspectors concluded that licensee remedial actions were appropriate.

Because of the distance from the protected area, neither the presence of, nor the detonation of the unexploded ordnance posed a threat to the operation of the plant.

Because of the many barriers preventing heavier than water objects from working their way into the intake canal, the potential for unexploded ordnance to transport from the Camp Perry firing range to the station's intake canal was not credible.

03 Operations Procedures and Documentation

03.1 Control of Temporary Deviations From Normal System Lineups

a. Inspection Scope (71707)

During the inspection period, the inspectors reviewed the licensee's program to control temporary, short term deviations from normal lineup of equipment. Administrative procedure DB-OP-00016 (Revision 02), Removal and Restoration of Station Equipment, was reviewed, and a sample of components processed per the procedure was evaluated.

b. Observations and Findings

The inspectors determined that operations personnel made temporary deviations from normal lineups per the "OP-16" program as written. Interviewed senior reactor operators appeared familiar with procedural requirements. Monthly reviews of outstanding OP-16 entries were made as required by the procedure as well.

However, the inspectors noted that DB-OP-00016 specified that a safety review (SR) was to be conducted if the subject component/equipment was positioned to an off-normal alignment for 6 months or more. The inspectors were concerned that 6 months may not be an appropriate timeframe to conduct an initial SR. A potentially unreviewed safety question could go unrecognized in the interim.

Case in point involved the temporary realignment of certain steam traps in the auxiliary feedwater system steam supply piping that was implemented on June 19, 1996. Procedure DB-OP-00016 would have allowed up to 6 months to have elapsed prior to a SR being performed to address the possibility of an unreviewed safety question. However, plant personnel had recognized that a SR may have been needed and initiated a PCAQR to assure a SR was conducted in a more foreshortened timeframe.

At the conclusion of the inspection period, the inspectors had not completed review of the PCAQR closure on this matter to ascertain whether a possible programmatic concern with the OP-16 process had been addressed. Pending review of the subject PCAQR closure package and resolution of the inspectors' concern relating to the timeliness of OP-16 SRs, this matter is considered an **unresolved item (50-346/96010-01(DRP))**.

04 Operator Knowledge and Performance

04.1 Response to a Control Room Instrumentation Power Supply Failure

a. Inspection Scope (71707)

On November 1, the inspectors observed personnel response to control room (CR) receipt of annunciator alarms indicating an Integrated Control System (ICS) input mismatch and an ICS input transfer.

b. Observations and Findings

Subsequent licensee troubleshooting revealed that a fuse to a power supply for the auxiliary shutdown panel (ASP) lost electrical contact with its fuseholder, alerting the operators to the condition through activation of the aforementioned CR annunciators. The loss of the power supply caused the following CR instrumentation/indications to fail mid-scale:

- PTSP12B1 Once-Through Steam Generator (OTSG) 1-1 Pressure
- LTSP9B3 OTSG 1-1 Startup level
- LTSP9A4 OTSG 1-2 Startup Level
- LT RC 14-3 Pressurizer level

Since none of the instruments were currently selected as input to the ICS or pressurizer level control circuitry, no plant transient or operational upset occurred and the plant remained at slightly less than 100% power. However, the computer generated secondary heat balance calculation was affected by the loss of OTSG 1-1 pressure, which required the operators to take compensatory actions.

Compensatory actions for the loss of the computer generated heat balance calculation were that operators reduced reactor power as indicated by nuclear instrumentation by one percent and initiated manual calculations of secondary heat balance power.

The inspectors observed operator response and noted that operators properly referenced and utilized annunciator response procedures, ensured the plant was in a stable condition, and requested support from engineering and maintenance personnel. The inspectors also independently verified that a proper assessment of Technical Specifications affected equipment was made.

The #1 AFW level controller lost input for auto control of steam generator level as a result of the event, rendering it inoperable, and requiring entry into the action statement for Technical Specification (TS) 3.7.1.2.a (72-hour action statement). Steam generator startup level instrumentation was not available to the ASP, requiring entry into the action statement for TS 3.3.3.5.1.a (30-day action statement). The post accident monitoring system (PAMS) instrumentation in the control room also lost power to portions of instrumentation, requiring entry into the action statement for TS 3.3.3.6.a (30-day action statement).

The inspectors observed that engineering and maintenance personnel, using applicable reference drawings, were able to trace the problem to a power supply for the ASP. A fuse for the power supply was not making good electrical contact with its fuseholder. The fuseholder was adjusted and the fuse was cleaned and reinstalled, returning power to the affected instrumentation. This was completed about 50 minutes after initial discovery. The equipment failure was documented in PCAQR 96-1400.

During the event, the inspectors noted one weakness in communications in that a maintenance worker installed the fuse into the fuseholder prior to receiving permission from the shift supervisor to do so. The shift supervisor had previously given direction that he should be notified prior to reinstallation of the fuse.

The inspectors independently reviewed related electrical drawings and verified that the subject fuse and fuseholder affected the specified power supply for the instrumentation as noted above.

c. Conclusions

Operator performance in responding to the equipment failure was good. Satisfactory use of annunciator alarm procedures was noted. Operators entered appropriate TS action statements as required.

Engineering and electrical maintenance activities to support root cause determination and to correct the problem were good. One minor weakness in communications between the maintenance craft and the shift supervisor was noted.

04.2 Response to a Failed Surveillance Test

a. Inspection Scope (71707)

The inspectors observed control room operator response to a November 19 licensee identified concern with a differential pressure (dp) switch found out of tolerance due to an apparently sticking internal micro-switch.

b. Observations and Findings

The inspectors noted that engineering, maintenance, and operations personnel discussed the issue in detail and a decision made very quickly to declare the associated channel 4 of the Steam/Feedwater Rupture Control System (SFRCS) Logic inoperable. The associated TS (3.3.2.2), thereafter required the Steam Generator #2 dp input to be tripped.

The inspectors noted that this action was accomplished by lifting the input lead to the channel. Drawings and procedures were correctly followed and double verified before the lead was lifted. The channel was tripped within a 31-minute period (TS required that the actions be taken within one hour).

c. Conclusions

Control room response to the subject equipment problem was conducted in an appropriate and timely manner.

04.4 Two Reactor Operators Did Not Fully Understand Pressurizer Spray Valve Indication and Control Logic

a. Inspection Scope (71707)

The inspectors reviewed the manual/automatic operation and control room indication associated with the pressurizer spray valve during the inspection period. Discussions with control room operators were also conducted relating to the operation of the pressurizer spray valve.

b. Observations and Findings

The pressurizer spray valve is a valve that when opened, provides a path for cold leg reactor coolant to spray into the pressurizer, causing the pressurizer steam bubble to cool and thereby control pressurizer and reactor coolant system (RCS) pressure.

The inspectors noted that in automatic operation, the pressurizer spray valve control logic was configured to open the spray valve to a 40% position when RCS pressure reached the open setpoint. This position was indicated on the control room handswitch by an amber 40% light. In order to fully open the spray valve to the 100% position (as indicated by a red open light), transfer of the control room handswitch from the automatic position to the open position was necessary.

During discussions with two reactor operators, the inspectors ascertained that they did not fully understand the indication and control logic for the pressurizer spray valve. One operator was not familiar with the function of the 40% amber light and the other operator thought that at increasing reactor coolant pressure, the spray valve would go to full open *automatically*. A Shift Technical Advisor was thereafter questioned and was able to correctly describe the automatic versus manual operation of the spray valve.

Interviews with operations management on this matter revealed that management expected operators to understand the pressurizer spray valve operating logic. As a remedial action, the licensee initiated a training request form to provide additional training to operators in this regard.

Operations advisors were questioned regarding the consequence of operators not completely understanding the pressurizer spray control logic. Plant emergency response procedures for RPS, SFAS, SFRCS Trip, or SG Tube Rupture provided explicit instructions for the operation of the pressurizer spray valve that did not depend on a reactor operator's understanding of the control and indication logic.

c. Conclusions

Two Reactor Operators did not fully understand portions of the pressurizer spray valve control and indication logic. Applicable procedural guidance was available to compensate for the apparent

weakness. Remedial actions planned by the licensee should resolve this knowledge concern.

04.5 Emergency Ventilation System Valve Found Out-of-Position.

a. Inspection Scope (71707)

On October 24, the licensee identified that valve CV5024, Fuel Handling Area to the Emergency Ventilation System (EVS) isolation damper, was closed versus its normally open position. The inspectors reviewed the licensee's preliminary root cause determination and followup actions on this matter.

b. Observations and Findings

The inspectors ascertained that on October 23, CV5024 had been closed as part of a maintenance boundary tagout to support work associated with CV5025, fuel handling area to EVS upstream isolation valve, that was in series with CV5024. The inspectors verified that appropriate equipment had been declared inoperable and the necessary Technical Specification actions had been taken in support of the original work. At approximately 8:00 p.m. on October 23, the portion of the tagout associated with CV5024 had been cleared, but the related equipment was not declared operable due to ongoing problems with CV5025.

Due to other activities ongoing at the time, coupled with apparent miscommunication, CV5024 was not reopened as intended when that portion of the tagout was cleared. The tagout clearance sheet apparently did not identify the final configuration of CV5024 for return to service but relied on the shift supervisor/operations to specify.

For approximately 14 hours, control room operators failed to recognize that control room indication for CV5024 indicated that it was closed in lieu of its normally open position. During the interim, two sets of reactor operator turnovers had occurred, as well as one set of senior reactor operator turnovers.

The incorrect positioning was eventually identified at about 10:00 a.m. on October 24. During a discussion between the shift supervisor and shift manager concerning ongoing CV5025 related operability issues that was held near the control room panel that provides indication of CV5025 and CV5024, the shift manager apparently observed that CV5024 was out of position.

In response to this event, the operations superintendent directly counselled the individuals involved with the oversight, and discussed with each oncoming shift their responsibility to assure their understanding of plant and equipment conditions prior to taking the watch. The inspectors noted that followup actions appeared to be appropriate and very timely.

c. Conclusions

Operator awareness of control panel indication was inadequate in this instance. Although the portion of the tagout involving this valve was lifted on the evening of October 23, and associated tags removed, operators failed to recognize the valve was inappropriately positioned for 14 hours. The tagout clearance sheet had not specified the final valve position for return to service, contributing to the mispositioning. No Technical Specification requirements were exceeded in the interim since the EVS system remained inoperable because of unrelated problems encountered with CV5025. No violation of plant procedures or regulatory requirements was identified.

08 **Miscellaneous Operations Issues (92901)**

- 08.1 (Closed) Inspection Followup Item (50-346/94017-02(DRP)): Groundwater in-leakage noted to Motor Control Center (MCC) E21A. This matter related to inspector identification that a tygon hose was connected to a cable tray feeding the MCC at a point just above the MCC with the hose routed to a floor drain.

The licensee subsequently determined that the tygon tubing had been installed in approximately 1983. In response to the concern the licensee initiated a PCAQR (95-0055). An extent of condition review was performed during which the licensee determined that several cable trays were located below the site water table.

Reviews of the associated cables/trays were performed and a determination made that some amounts of groundwater intrusion to the trays would not adversely affect performance of the enclosed cables. An electronic characterization and diagnostics (ECAD) check was performed on the cabling associated with MCC E21A. The electronic signatures were found to be acceptable and consistent with other similar service loads.

The licensee also conducted inspections of other areas including cable trays, junction boxes, etc. Appropriate preventative maintenance activities (PMAs) were initiated to ensure that weep holes associated with certain junction boxes and cable trays remained clear.

Because the licensee has a preventative maintenance program in place to assure that cable trays and other electric components remain clear of longstanding ground water, and repeat failures of groundwater intrusion induced problems have not been noted, this matter is considered closed.

II. Maintenance

M1 Conduct of Maintenance

M1.1 Maintenance Activities (62707)

a. Inspection Scope

The inspectors observed/reviewed all or portions of the following work activities:

- MWO-3-97-3758-01 Calibration Check of Fenwal Temperature Probe TSH 5058A
- MWO-1-95-0831-00 Replace Hydro-Motor for PDV 5014A
- MWO 3-96-0715-01 EDG #2 Overhaul

b. Observations and Findings

During observation/review of the aforementioned maintenance activities, inspectors noted the following:

- MWO related paperwork was at the job site and was observed to be used during the performance of maintenance activities. Narrative descriptions of completed maintenance activity steps were completed at the job site in a timely manner. Lifted lead logs were filled out when required. Locked valve entries that were checked were recorded in accordance with program requirements. Setpoints were verified with those documented in controlled drawings.
- A plant (system) engineer was observed interfacing with the maintenance craft on a real time basis during performance of maintenance activities associated with the overhaul of EDG #2.
- The inspectors observed the calibration of a replacement Fenwal temperature probe for an emergency ventilation system charcoal filter bank. The inspectors determined that the setpoint band was consistent with vendor recommendations and that the setpoint was conservative with regards to the intended function of preventing the overheating of emergency ventilation system charcoal filters.

c. Conclusions

Maintenance activities observed/reviewed during the inspection period were conducted in accordance with plant procedures and regulatory requirements. Good communication and teamwork were demonstrated.

M1.2 Surveillances

a. Inspection Scope (61726)

The following surveillance activities were observed/reviewed:

- DB-SC-03070 Emergency Diesel Generator 1 Monthly Test
- DB-MI-03211 Channel Functional Test of SFRCS CH 1 Logic for Mode 1
- DB-MI-03732 Channel Cal of Waste Gas O2/H2 Monitor
- DB-SC-03113 SFAS Channel 4 Monthly Functional
- DB-OP-06313 Idle Start of #2 Emergency Diesel Generator Following Overhaul
- DB-MI-03058 RPS Channel 2 Calibration
- DB-SP-03291 Containment Personnel and Emergency Air Locks Seal Leakage Test (emergency air lock)
- DB-PF-03008 Containment Local Leakage Rate Test (Penetration Nos. 80 and 81)

b. Observations and Findings

In general, the inspectors noted the following:

- Surveillances observed during the inspection period were conducted in a controlled manner, and no USAR discrepancies involving the functioning and performance of the subject systems were noted.
- Good reader/worker practices were observed to be utilized, including the verbatim reading of test procedure steps to test performers.
- Test deficiencies were promptly brought to the attention of operations and maintenance management for proper disposition. They were then translated into appropriate corrective action documentation for subsequent followup and tracking.
- Samples of surveillance documentation were reviewed to ensure that the documentation had been completed satisfactorily, that acceptance criteria had been met, and that operations management had conducted a review in a timely manner. No discrepancies were noted during these reviews.
- Expected as-found and as-left equipment lineups for safety features actuation system (SFAS) components were independently verified by the inspectors prior to and after a SFAS surveillance.
- The inspectors observed that operators properly shut down EDG #2 during an idle start of the diesel for post-maintenance testing when the idle release button did not work due to an alignment problem related to the EDG's overhaul. The alignment problem was subsequently corrected.

- Good cross-discipline focus on post maintenance testing was demonstrated as exhibited by the presence of the plant (system) engineer, quality control personnel, a maintenance representative, and two operators during the idle start of EDG #2 following overhaul.
- Some potential minor deficiencies were noted by the inspectors during performance of a routine monthly EDG surveillance (Further discussed in Section M1.3).
- Minor USAR inconsistencies were identified during inspector review with each being adequately handled by the corrective action program at the end of the inspection period.
- Applicable local leakrate test (LLRT) procedures were reviewed for technical adequacy, correct revision, and to verify the appropriate instruction and acceptance criteria were specified to accomplish the desired task being observed.
- Good communications were observed between Operations, Maintenance, Engineering, and Radiation Protection during the performance of LLRT testing. Radiation protection practices were appropriate.
- Instrumentation used during LLRT activities were calibrated, properly used, and were of the type necessary for the measurements taken.

c. Conclusions

Surveillance activities observed by the inspectors were conducted in accordance with procedural controls. Equipment was verified to operate as described in the USAR. Some minor discrepancies associated with an emergency diesel generator surveillance were identified (Reference Section M1.3).

M1.3 Minor Deficiencies Identified During EDG Surveillance Testing

a. Inspection Scope (61726)

While observing routine monthly surveillance testing of EDG #1 on November 14, the inspectors identified a number of minor discrepancies.

b. Observations and Findings

The operators performing the surveillance were knowledgeable of their duties and were appropriately following the test procedure. The plant (system) engineer was also observed monitoring the test.

The inspectors noted that some of the EDG cylinder petcocks were installed such that the compression relief vent hole was recessed in the outer housing. This condition could have restricted the drainage of any fluid while barring the engine over. The plant engineer documented this

condition for evaluation via PCAQR 96-1462. Although the operability of the EDG was not adversely affected in this instance, this condition could have defeated the purpose of the barring check.

Prior to starting the EDG, the engine was barred over using one of the two sets of installed airstart motors. The air supply to that start motor bank was then secured and the EDG was started with the other set of start motors. The inspector noted that although the procedure required alternating the airstart motor bank used for each test, it did not have a similar restriction on which starting bank was to be used for barring. This would allow barring the engine with the same airstart motor bank later used for starting the EDG, a condition which potentially could precondition that airstart motor bank.

Discussions with the operator indicated that he was aware of the intent to start the EDG with the opposite bank from that used for barring. He also indicated that a note to this effect had been inadvertently removed from the surveillance procedure during the latest revision. Plant personnel thereafter initiated PCAQR 96-1463 to assure this matter would be resolved.

c. Conclusions

EDG testing was appropriately performed to assure continued operability. Operators were knowledgeable of the evolution and controlled testing activities effectively. A minor weakness was noted with the installation/design of the cylinder petcocks.

However because of inspector concerns relating to the potential preconditioning of the airstart motor, the subject matter is considered an inspection followup item (50-346/96010-02) pending completion of inspector review.

M2 Maintenance and Material Condition of Facilities and Equipment

M2.1 Cold Weather Preparations

a. Inspection Scope (71714)

The inspectors conducted a review of the station's material condition relating to cold weather operations in accordance with Inspection Procedure 71714.

b. Observations and Findings

Freeze Protection Circuits

Compared to last year, the station had improved the material condition of freeze protection circuits. Inspector discussions with operations personnel determined that the number and frequency of circuits requiring attention had decreased somewhat. Also the number of material deficiency tags on the system had decreased.

Part of the decrease was attributed to operations increased reliance on the immediate maintenance team response to freeze protection circuit concerns. Additionally, improvements in adjusting the alarm setpoints of heat trace temperature control circuits were made so that alarm setpoints were outside of the controlling band of the circuit resulting in less false alarms.

Low Voltage Switchgear Room Ventilation Damper Leakage Reduced

Also last year, the station identified that during high wind conditions, a significant amount of cold air would blow through a closed low voltage switchgear room (LVSGR) ventilation damper. This condition cooled the room to such an extent that a temporary heating system was set up to blow warm air into the safety-related battery room (which was located inside the LVSGR) to keep the temperature above the Technical Specification limit of 60 degrees.

The licensee had apparently corrected the deficiency in the fall after determining that the dampers would not fully close and thereafter adjusted the damper hydromotor and linkage to obtain better closure.

LVSGR Ventilation System Degraded

The inspectors also reviewed the licensee's administrative controls relating to the degradation of the automatic temperature control circuit of the safety-related LVSGR ventilation system. The LVSGR ventilation system consisted of a safety-related exhaust fan, louvers, and associated duct whose function was to maintain the LVSGR room components to less than 104 degrees by drawing in and exhausting outside air. Above 104 degrees, the USAR stated that equipment in the room could not be assured of performing its intended safety function.

However, the licensee discovered that the temperature control circuit would not turn off at the correct temperature, which caused the Equipment Operators to periodically monitor LVSGR temperatures in order to manually turn the fan off before room temperatures got too low. Manually turning the fan off did not affect the automatic starting of the fan.

When the inspectors became aware of this condition, operations personnel were questioned as to the operability of the LVSGR fan. The fan was determined to be operable, but in a degraded condition. As a result of the questioning, the licensee implemented an existing operations policy (OP-06) to check LVSGR temperatures every four hours. The licensee had planned to correct the material condition of the LVSGR ventilation fan controller by the end of December.

Temperature Instrumentation Not Calibrated

The inspectors also ascertained that the in-place temperature monitors for the battery rooms and LVSGR rooms were not maintained in accordance with the licensee's calibration program. What was relied upon for the

maintenance of proper temperatures in these rooms was the calibrated LVSGR fan temperature control circuitry.

However, the LVSGR fan was designed to keep the temperature from exceeding 104 degrees, and was not designed to ensure that the battery room temperatures did not decrease below 60 degrees. The nonsafety-related ventilation system was relied upon to maintain battery temperature above 60 degrees. The operators normally relied on the in-place temperature detectors to provide warning of impending battery inoperability due to low room temperatures.

Equipment Operator Burdens

Another material condition item that the licensee was dealing with was the inability of the temperature controllers for radwaste and non-radwaste associated supply fans to operate properly. These conditions required that the station heating supply controller be bypassed with a manual throttle valve to maintain proper temperatures in the affected areas. As outside temperatures decreased, these throttle valve positions would need to be changed or the freeze protection circuit would trip the fan off and the area supplied by the fan would get too warm.

These extra burdens to equipment operators were recognized by operations management and were included into the operator burden list. The inspectors verified that these operator burdens were tracked and discussed for resolution during the station's plan of the day meetings. Correction of these deficiencies were scheduled to be completed by the end of January 1997.

c. Conclusions

The material condition of the station's freeze protection system was improved from last year.

The material condition of station heating temperature controllers was degraded which caused additional burden to equipment operators. However, station management had already identified the issue and were taking actions to correct the situation by the end of January 1997.

Because completion of a review of Low Voltage Switchgear Room ventilation and calibration of temperature instrument issues were not complete at the end of the inspection period, this matter is considered an inspection followup item (50-346/96010-03(DRP)) pending completion of the reviews.

M8 Miscellaneous Maintenance Issues (92902)

- M8.1 (Closed) Inspection Followup Item (50-346/94011-03(DRP)): Preventive maintenance testing of essential inverter YV1 input breaker did not consider the time delay setting associated with the trip setpoint.

In response, the licensee initiated a procedure change to plant procedure DB-ME-09202, "Maintenance of Essential SCI UPS." The procedure revision provided a means to check sensing board X6 independently of the time delay circuitry. The as-found time delay setting had not adversely affected operability of the inverter.

- M8.2 (Closed) Inspection Followup Item (50-346/94006-02(DRP)): Ventilation and intake filter screens servicing the No. 2 auxiliary feedwater pump room as well as the essential power supply for invertors YV1 and YV3 located in the low voltage switchgear rooms were noted to be partially blocked.

In response, the licensee reviewed their current preventive maintenance activities (PMAs) associated with the cleaning of ventilation intake ducts and filter screens and concluded that the currently established PMAs were adequate to ensure proper airflow in each case. The licensee determined that cleaning based purely upon a visual inspection of the screen was inadequate. Further review of differential pressure and/or other indications would be necessary to identify a problem with airflow. No adverse effect on associated equipment enclosed in the subject equipment spaces as a result of the partially blocked filters was identified.

Subsequent to the licensee's initial review of this matter, continuing concerns with an increasing mayfly population during the summer months was identified. As of the end of the inspection period, the licensee was in process of evaluating further followup actions to deter mayfly potential adverse effects. Since licensee ongoing actions appeared appropriate to adequately address this matter, this item is closed.

- M8.3 (Closed) Inspection Followup Item (50-346/93013-01(DRP)): SFAS Channel 2 containment high pressure bistable found inoperable due to failure of a nonsafety-related calibrating meter.

The licensee subsequently determined that all similar cabinet calibrating meters should be removed from service to preclude similar future failures. Modification 93-0051 was initiated to remove the unnecessary SFAS components and to abandon the meter housings in place. The modification was implemented via MWOs 2-93-0051-01 through 06 during the Tenth Refueling Outage that completed in Spring 1996.

III. Engineering

E1 Conduct of Engineering

E1.1 Portable Air Purifiers in Control Room

a. Inspection Scope (37551)

During a control room walkdown the inspectors noted that two portable air purifiers had been placed on or near control/annunciator panels.

One of the purifiers was observed on top of panel C5725, 345kv switchyard alarms, and the second was on a table located at the wall between panel C5798, Post Accident Monitoring, and panel C5715, Electrical Distribution. The inspectors questioned what reviews/approvals had been made to support their as-found placement.

b. Observations and Findings

The purifiers had been placed in an attempt to reduce airborne particulates generated by ongoing maintenance activities in the control room envelope. The inspectors ascertained that no formal engineering evaluation had been performed to support placement of the subject purifiers. However, engineering personnel apparently had been informally contacted and determined the purifiers would not constitute a seismic concern.

Initial licensee followup found that one of the purifiers had been unknowingly plugged into an electrical outlet supplied from Class 1E power. It was subsequently determined that the additional electrical loading was enveloped by prior calculated maximum assumed outlet loading. Since appropriate reviews/approvals to adequately control placement of the purifiers appeared to be lacking, the licensee removed the units and initiated PCAQR 96-1468.

Pending completion of inspector review of the significance of placing the subject purifiers in the specified control room locations, this matter is considered an **unresolved item** (50-346/96010-04(DRP)).

E2 **Engineering Support of Facilities and Equipment**

E2.1 Inconsistent Control Room Humidity Limits

a. Inspection Scope (37551)

During a control room walkdown, the inspectors noted that both control room humidifiers were inoperable and questioned whether there was an equipment lower humidity limit to preclude solid state circuitry static charge buildup. The inspectors thereafter reviewed licensee initial followup actions, independently reviewed the Updated Safety Analysis Report (USAR), and sampled equipment manufacturer recommendations and industry standards to attempt to assess actual control room humidity profile limits.

b. Observations and Findings

Licensee preliminary review indicated that no equipment lower humidity threshold was pertinent. However, the Updated Safety Analysis Report (USAR) did indicate in Table 7.2-3, "Environmental Conditions For Instrumentation and Controls," a lower relative humidity limit of 20%, and Table 7.3-4, "SFAS Operating Requirements," specified a lower relative humidity limit of 40%.

Actual control room relative humidity was determined to be 50% at the time. The licensee initiated PCAQR 96-1467 to track resolution of this matter. Pending resolution of actual control room humidity requirements (if any), this matter is considered an inspection followup item (50-346/96010-05(DRP)).

E7 Quality Assurance in Engineering Activities

E7.1 Effectiveness of Licensee Controls in Identifying, Resolving and Preventing Problems

a. Inspection Scope (40500)

During the inspection period the inspectors evaluated the effectiveness of licensee controls in identifying, resolving and preventing problems that could adversely affect the quality of plant operations. Areas reviewed included the licensee's use of safety review committees, root cause analysis and corrective action programs, self-assessment programs, and use of operating experience feedback.

b. Observations and Findings

PCAQR Program

The inspectors reviewed administrative procedure NG-NA-00702, Potential Condition Adverse to Quality Reporting, as well as, licensee implementation of the program. PCAQR initiation criteria appeared to be appropriately low to identify/capture requisite level of plant problems and issues. All levels from upper management to the craft utilized the PCAQR process to document potential problems onsite. The inspectors also assessed licensee followup actions associated with several PCAQRs, and determined corrective actions to be appropriate to each circumstance. Corrective actions also appeared to be implemented in a timely manner overall. For those PCAQRs that involved long term corrective actions (i.e., greater than 18 months), the licensee tracked and periodically discussed, at upper management levels, their status and schedule for completion.

The inspectors did note that, programmatically, PCAQRs could be closed by transferring the specified corrective actions to another onsite program. For instance, a PCAQR involving hardware related corrective actions could be closed by transferring those actions to a maintenance work order (MWO). Once transferred, no apparent restrictions seemed to be specified to control changes to the MWO implementation (including schedular changes). Although no such problems were noted with the sample reviewed, the inspectors were concerned that controls in this regard may be less than intended. This matter will continue to be evaluated as part of the routine inspection program.

Quality Assurance Assessments

The inspectors reviewed a sample of quality assurance audits and surveillances conducted during the latter half of 1996 and determined them to be appropriately critical and focused on performance overall. A sample of audit findings were assessed to ascertain whether the associated issues were corrected. The inspectors noted that in general, the specific QA audit findings reviewed had been appropriately corrected in a timely manner. All functional areas requiring periodic audit by Technical Specifications, etc., appeared to have audited within their specified timeframes.

Self-Assessment

The inspectors noted that many of the onsite organizations incorporated aspects of self-assessment into their program controls. Operations for instance specified certain formalized reviews to be conducted in several areas on a pre-established timeline. Engineering on the other hand conducted self-type audits in a number of areas on a less formalized schedule as well as performed additional reviews on an as-needed, case-by-case basis.

It was unclear as to whether self-assessment efforts were unilaterally effective in improving the performance of a given functional unit or whether other reviews/audits conducted by outside groups also contributed. Of the self-assessment activities reviewed, each had identified areas in need of improvement and, in general, the subject groups had made efforts to correct the identified deficiencies. The licensee had also just recently initiated actions to expand efforts in the self-assessment area. The inspectors intend to further evaluate additional self-assessment activities implemented under the licensee's new initiative as part of the routine inspection program.

Review Committees

The inspectors attended several meetings of the Station Review Board (SRB) and the Company Nuclear Review Board (CNRB) during the latter half of 1996. These boards comprised the onsite and offsite review committee functions respectively. The CNRB was recently combined with the Perry plant sister committee with current membership representing both sites and each full committee meeting reviewing both site's issues. Board members were appropriately qualified and, in general, appeared well prepared for the meetings. Good detailed discussions by the boards were noted. Conclusions reached during the meetings appeared appropriate and technically defensible.

During an October 16, CNRB meeting, a discussion was held outlining an issue at Perry that involved the potential consequence of a high energy line break (HELB) effect on mirror-type pipe insulation within containment. It appeared that mirror insulation manufactured by Diamond Corporation would fracture into small pieces when shocked by a HELB. The concern would be for the potential blockage of the emergency core

cooling systems' pump suction strainers. Davis-Besse utilizes large amounts of the specified manufacturer type mirror insulation in containment and appeared susceptible to a similar scenario. Preliminary engineering review by the licensee following the meeting determined that a pre-existing analysis had addressed a similar condition relating to insulation debris in containment and its effect on the emergency sump strainers. The conclusion of the analysis was that a HELB in containment would not result in excessive strainer blockage.

Pending completion of inspector review of this issue, including the engineering analysis results, this matter is considered an **inspection followup item (50-346/96010-06(DRP))**.

Operating Experience Feedback

The inspectors reviewed the licensee's program for implementing operational experience feedback. The inspectors ascertained that the licensee maintained a process to adequately collect industry information and disseminate that information to appropriate onsite departments. In general, the process appeared to have been well implemented. Improvements to address earlier weaknesses as discussed in inspection report 50-346/96008, appeared to have been made with the intent to use the PCAQR process to better highlight certain NRC issuances to the organization.

c. Conclusions

Overall, the licensee adequately maintained and implemented several programs that resulted in effective identification, resolution, and prevention of issues that adversely affected plant operational safety. In particular, the PCAQR process was effectively utilized and was routinely used by most plant personnel to capture and document potential problems and to assure their resolution. Review committees were useful in ensuring that significant issues were fully discussed in a collegial format. QA audits and surveillances continued to promote performance improvements in the areas reviewed.

IV. Plant Support

R1 Radiological Protection and Chemistry (RP&C) Controls

The inspectors conducted tours of the facility in accordance with Inspection Procedure 71707. Radiologically Controlled Areas (RCAs) were found to be posted with up-to-date surveillance data which were comprised of sufficient detail to inform personnel entering RCAs of conditions expected. Radiation and contamination areas were verified to have adequate posting. Radiation readings were verified independently by the inspectors to be representative of posted radiation survey results. Radiation monitoring equipment was functional and within calibration. Station personnel were observed to be cognizant of

radiological conditions and were observed to adhere to radiation protection program requirements.

F2 Status of Fire Protection Facilities and Equipment

The inspectors conducted tours of the facility in accordance with Inspection Procedure 71707. Areas toured were evaluated for the presence of transient combustible material and for the integrity of fire retardant penetration material with no substantial concerns noted. The operation of the remote video equipment that was used as a compensatory measure for inoperable radiant energy heat shields in the containment annulus was verified as adequate. The material condition of the fire brigade personnel protection equipment was verified as adequate.

P1 Conduct of Emergency Preparedness Activities

P1.1 Observation of an Integrated Emergency Drill

The inspectors reviewed portions of an October 30, integrated emergency drill. Activities were primarily observed from the Technical Support Center (TSC) and the Emergency Control Center (ECC). No significant weaknesses were noted, albeit, several players were functioning in positions they had just recently been reassigned to. The drill attempted to optimize real-time role playing. As such, several drill activities were played out in the plant equipment spaces. To preclude inadvertent operation of sensitive plant equipment, the licensee formally identified certain exclusion areas where drill participants were prohibited from entering.

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 November 27, 1996. 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.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

J. K. Wood, Vice President, Nuclear
J. H. Lash, Plant Manager
R. E. Donnellon, Director, Engineering and Services
T. J. Myers, Director, Nuclear Assurance
D. L. Eshelman, Manager, Operations
L. M. Dohrmann, Manager, Quality Services
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W. J. Molpus, Manager, Nuclear Training
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INSPECTION PROCEDURES USED

IP 37551: Onsite Engineering
IP 40500: Effectiveness of Licensee Controls in Identifying, Resolving, and Preventing Problems
IP 61726: Surveillance
IP 62707: Maintenance Observation
IP 71707: Plant Operations
IP 71714: Cold Weather Preparations
IP 92901: Followup-Operations
IP 92902: Followup - Engineering
IP 92903: Followup - Maintenance

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

50-346/96010-01	URI	OP-16 Allowance to Perform 6-Month Safety Review
50-346/96010-02	IFI	EDG Airstart Motor Potential Preconditioning
50-346/96010-03	IFI	Low Voltage Switchgear Room Ventilation Concern
50-346/96010-04	URI	Control of Portable purifiers in Control Room
50-346/96010-05	IFI	USAR Specified Control Room Humidity Limits
50-346/96010-06	IFI	Containment Mirror Insulation Post-HELB Debris

Closed

50-436/93013-01	IFI	SFAS Bistable Made Inoperable by Calibrating Meter
50-346/94006-02	IFI	Ventilation Filter PMs
50-346/94011-03	IFI	Invertor PMs Did Not Consider Time delay Function
50-346/94017-02	IFI	Groundwater Inleakage to Motor Control Center

LIST OF ACRONYMS USED

AFW	Auxiliary Feedwater
CFR	Code of Federal Regulations
CNRB	Company Nuclear Review Board
CR	Control Room
ECAD	Electronic Characterization and Diagnostics
ECC	Emergency Control Center
ECCS	Emergency Core Cooling System
EDG	Emergency Diesel Generator
EOD	Explosive Ordnance Disposal
ESF	Engineered Safety Feature
EVS	Emergency Ventilation System
HELB	High Energy Linebreak
HPI	High Pressure Injection
ICS	Integrated Control System
I&C	Instrumentation and Controls
IFI	Inspection Followup Item
IR	Inspection Report
LCO	Limiting Condition For Operation
LER	Licensee Event Report
LLRT	Local Leakrate Test
LVSGR	Low Voltage Switchgear Room
MCC	Motor Control Center
MWO	Maintenance Work Order
NCV	Non-Cited Violation
NRC	Nuclear Regulatory Commission
NRR	Office of Nuclear Reactor Regulation
OTSG	Once Through Steam Generator
PAMS	Post Accident Monitoring System
PCAQR	Potential Condition Adverse to Quality Report
PM	Preventive Maintenance
PMA	Preventive Maintenance Activity
QA	Quality Assurance
QC	Quality Control
RCS	Reactor Coolant System
RMT	Radiation Monitoring team
RO	Reactor Operator
RP	Radiation Protection
RPS	Reactor Protection System
SFAS	Safety Features Actuation System
SFRCS	Steam/Feedwater Rupture Control System
SG	Steam Generator
SR	Safety Review
SRB	Station Review Board
TS	Technical Specification
TSC	Technical Support Center
VIO	Violation