

U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-346/91022(DRP)

Docket No. 50-346

Operating License No. NPF-3

Licensee: Toledo Edison Company
Edison Plaza, 300 Madison Avenue
Toledo, OH 43652

Facility Name: Davis-Besse 1

Inspection At: Oak Harbor, Ohio

Inspection Conducted: December 1, 1991 - January 6, 1992

Inspectors: W. Levis
R. K. Walton

Approved By: I. W. Jackiw
I. W. Jackiw
Reactor Projects Section 3A

1-15-92
Date

Inspection Summary

Inspection on December 1, 1991, through January 6, 1992
(Report No. 50-346/91022(DRP))

Areas Inspected: A routine safety inspection by resident inspectors of licensee actions on previous inspection findings, licensee event reports followup, plant operations, followup of events, radiological controls, maintenance/surveillance, emergency preparedness, security, engineering and technical support, and safety assessment/quality verification was performed.

Results: No violations were identified. The licensee shut down the unit on December 6, 1991, in accordance with Technical Specification 3.8.1.1 when the #2 Emergency Diesel Generator (EDG) could not be returned to operable status within the required Technical Specification Action Statement Time requirements. The shutdown was orderly with the exception of a cooldown transient (Para 3). The licensee's troubleshooting plan to determine the cause of the EDG failure is considered a strength (Para 5). The unit was returned to service on December 11, 1991. While the plant was in Mode 3 a Steam and Feedwater Rupture Control System (SFRCS) actuation occurred during maintenance activities (Para 3). The licensee detected personnel problems with their alternate Joint Public Information Center during an Emergency Preparedness Drill (Para 7).

DETAILS

1. Persons Contacted

a. Toledo Edison Company

D. Shelton, Vice President, Nuclear
G. Gibbs, Director, Quality Assurance
*L. Storz, Plant Manager
*J. Heffley, Maintenance Manager
*M. Bezilla, Operations Superintendent
E. Salowitz, Director, Planning and Support
S. Jain, Director, DB Engineering
*R. Zyduck, Nuclear Engineering Manager
G. Grime, Site Protection Manager
D. Timms, Systems Engineering Manager
J. Polyak, Radiological Control Manager
*R. Cord, General Supervisor, Radiological Support
*J. Lash, Independent Safety Engineering Manager
*G. Honma, Compliance Supervisor
B. DeMaison, Emergency Preparedness Manager
*J. Wood, Plant Operations Manager
M. Stewart, Training Manager
R. W. Schrauder, Manager, Nuclear Licensing
*N. L. Bonner, Manager, Design Engineering
T. J. Myers, Director, Technical Services
*N. Peterson, Engineer, Licensing
*E. Caba, Manager, Performance Engineering
G. Skeel, Supervisor, Nuclear Sec. Cps
*E. C. Matranga, Supervisor, Systems Engr.
*C. Bramson, Plant Serv. Manager
*A. K. Zarkesh, Nuclear Engineering
*K. C. Prasad, Staff Engineer
*J. D. Moyers, Quality Verification Manager

b. USNRC

*W. Levis, Senior Resident Inspector
R. Walton, Resident Inspector

*Denotes those personnel attending the January 6, 1992, exit meeting.

2. Licensee Event Reports Followup (71707)

Through direct observation, discussions with licensee personnel, and review of records, the following licensee event reports (LERs) were reviewed to determine that reportability requirements were fulfilled, that immediate corrective actions to prevent recurrence were accomplished in accordance with Technical Specifications (TS).

(CLOSED) LER 91-005 Inadvertent Safety Features Actuation System (SFAS) Initiation due to Spurious Spike on Containment Radiation Monitor RE 2007. The licensee has previously received inadvertent SFAS actuation in a Mode when the SFAS system is not required. An SFAS Shutdown Bypass Modification was installed during the outage which will minimize inadvertent SFAS actuation. This item is closed.

(CLOSED) LER 91-006 Analysis of Post Large Break LOCA Boron Concentration was Potentially Non-Conservative. The details of this event were discussed in Inspection Report 346/91018. The inspectors reviewed the licensee's corrective actions and consider this LER closed.

No other violations or deviations were identified.

3. Plant Operations (71707, 93702)

a. Operational Safety Verification

Inspections were routinely performed to ensure that the licensee conducts activities at the facility safely and in conformance with regulatory requirements. The inspections focused on the implementation and overall effectiveness of the licensee's control of operating activities, and on the performance of licensed and non-licensed operators and shift managers. The inspections included direct observation of activities, tours of the facility, interviews and discussions with licensee personnel, independent verification of safety system status and limiting conditions of operation (LCO), and reviews of facility procedures, records, and reports. The inspectors observed that control room shift supervisors, shift managers, and operators were attentive to plant conditions, performed frequent panel walk-downs and were responsive to off-normal alarms and conditions.

The inspectors monitored the plant shutdown activities from the control room on December 6, 1991. Plant shutdown commenced at 8:04 a.m. from 100% power as required by paragraph 3.8.1.1 of the Technical Specifications. The inspectors noted that the control room at times, was crowded, but it did not appear to distract the operators from their responsibilities. The inspectors noted that communications in the control room were good and the appropriate procedures were followed. The operations department received necessary support from maintenance and nuclear engineering departments during the shutdown. The inspectors noted that when the plant was low in the power range, a

cooldown transient occurred which was ended when operators shut the feedwater block valves. The magnitude of the cooldown was small, but it was sufficient to reduce T_{ave} to less than 525 degrees F, minimum temperature for criticality. The licensee made an entry into Technical Specification 3.1.1.4, logged the event in the unit log, and complied with the action statement by entering into MODE 3 at 10.54 a.m. on December 6, 1991. The cause of the cooldown event is still being analyzed by the licensee and will be further reviewed by the inspectors.

On December 10, 1991, at 9:15 a.m. with the plant in MODE 3, maintenance personnel were taking voltage checks on the non-essential 4160 volt (D2) bus when a fuse to the bus undervoltage device blew. The device, sensing an under voltage condition on the bus, stripped the bus of its loads. The motor driven feedwater pump, which was used to feed the steam generators, was deenergized and caused the Steam and Feedwater Rupture Control System (SFRCS) to sense a loss of feedwater which actuated a reactor trip. The group 1 safety rods, which were the only rods withdrawn from the core, fully inserted. All SFRCS equipment actuated properly. Both main feedwater block valves closed, both main steam isolation valves closed and both auxiliary feedwater pumps started and fed both steam generators to their proper levels. The vital 4160 volt D1 bus, which was energized from the D2 bus, remained energized during the event. The licensee returned all SFRCS actuated equipment to normal and recovered the plant.

This is the second time in 3 months that an electrical bus was lost due to a maintenance activity. On September 27, 1991, the vital C1 and E1 buses were lost when workers, attempting to land a lead, shorted the undervoltage detection circuit. The most recent event was due to workers inadvertently shorting an undervoltage detection circuit when taking voltage readings. The licensee is continuing to investigate this event. The inspectors will review the licensee corrective actions for this event and circumstances leading to it when the LER is issued.

On December 11, 1991, the licensee returned #2 Emergency Diesel Generator (EDG) to operable status, exited Technical Specification 3.8.1.1., and commenced with reactor startup. The reactor was made critical on December 11, 1991 at 4:30 a.m. and entered MODE 1 on 11:15 a.m. The inspectors monitored reactor startup and noted that the startup was performed in a

controlled manner and in accordance with prescribed procedures. The plant attained 100% power on December 14, 1991.

b. Off-Shift Inspection of Control Rooms

The inspectors performed routine inspections of the control room during off-shift and weekend periods; these included inspections between the hours of 10:00 p.m. and 5:00 a.m. The inspections were conducted to assess overall crew performance and, specifically, control room operator attentiveness during night shifts. The inspectors determined that both licensed and non-licensed operators were alert and attentive to their duties, and that the administrative controls relating to the conduct of operations were being adhered to.

c. ESF System Walkdown

The operability of selected engineered safety features was confirmed by the inspectors during walk-downs of the accessible portions of several systems. The following items were included: verification that procedures match the plant drawings, that equipment, instrumentation, valve and electrical breaker line-up status is in agreement with procedure checklists, and verification that locks, tags, jumpers, etc., are properly attached and identifiable. The following systems were walked down during this inspection period:

- Service Water System
- Auxiliary Feedwater System

d. Plant Material Conditions/Housekeeping

The inspectors performed routine plant tours to assess material conditions within the plant, ongoing quality activities and plant-wide housekeeping. Housekeeping was generally adequate. The inspectors noted that the CCW pump room had several housekeeping deficiencies which were pointed out to the licensee. The licensee has since instituted a housekeeping log to document such deficiencies during their routine tours.

No violations or no deviations were identified.

4. Radiological Controls (71707)

The licensee's radiological controls and practices were routinely observed by the inspectors during plant tours and during the inspection of selected work activities. The

inspection included direct observations of health physics (HP) activities relating to radiological surveys and monitoring, maintenance of radiological control signs and barriers, contamination, and radioactive waste controls. The inspection also included a routine review of the licensee's radiological and water chemistry control records and reports.

Health physics controls and practices were satisfactory. Knowledge and training of personnel were satisfactory.

No violations or deviations were identified.

5. Maintenance/Surveillance (61700, 61726, 62703)

Selected portions of plant surveillance, test and maintenance activities on systems and components important to safety were observed or reviewed to ascertain that the activities were performed in accordance with approved procedures, regulatory guides, industry codes and standards, and the Technical Specifications. The following items were considered during these inspections: limiting conditions for operation were met while components or systems were removed from service; approvals were obtained prior to initiating work; activities were accomplished using approved procedures and were inspected as applicable; functional testing or calibration was performed prior to returning the components or systems to service; parts and materials used were properly certified; and appropriate fire prevention, radiological, and housekeeping conditions were maintained.

During an integrated test of the SFAS, on October 21, 1991, the licensee discovered that the #2 EDG failed to produce an output voltage. The licensee determined that a speed switch was at fault and replaced it with a speed switch from the station Blackout Diesel. On November 8, 1991, the #2 EDG was started for its monthly surveillance. During the starting sequence, the systems engineer noted that it took about 30 seconds for the generator to establish an output voltage. The machine was shut down, restarted and produced an output voltage in less than 10 seconds, as required. On November 19, 1991, additional troubleshooting on #2 EDG determined that the field flash relay was degraded. The relay was replaced and the #2 EDG was tested satisfactorily the following day. On December 3, 1991, at 5:00 a.m., the licensee declared #2 EDG inoperable to perform routine maintenance. After the maintenance was completed, the #2 EDG would not start after 4 attempts. The licensee determined that the speed switch for the diesel had failed. The licensee sent two suspect speed switches to the vendor for failure analysis. The vendor concluded that the first speed switch failure was due to normal wear and the second

speed switch failure was due to a rare manufacturing defect. The speed switch was replaced and the #2 EDG was started satisfactorily on December 4, 1991 and declared operational the following day. At 11:40 p.m. on December 5, 1991, control room operators received a #2 EDG Lockout annunciator and noted various anomalies with the #2 EDG speed switch. The licensee considered the #2 EDG inoperable and commenced a plant shut down at 8:04 a.m. on December 6, 1991 as required by paragraph 3.8.1.1 of the Technical Specifications after a temporary waiver of compliance asking for a 4 day extension was denied by Region III. The licensee had conservatively declared the machine inoperable starting at 5:00 a.m. on December 3, 1991, and not after the December 4, 1991, operability run. The inspectors note that this conservative call is considered a strength.

The plant entered MODE 3 at 10:54 a.m. on December 6, 1991. The licensee submitted, and Region III approved, a request for a waiver of compliance to allow the unit to remain in MODE 3 for up to 7 days while troubleshooting the #2 EDG. The inspectors monitored the licensee's troubleshooting activities and verified that compensatory actions required by the waiver of compliance were followed.

The licensee concluded, after considerable troubleshooting efforts, that the #2 EDG failure was due once again to a failed speedswitch. The cause of this failure will not be known until an independent electrical laboratory performs a failure analysis of the speed switch. The speed switch was replaced. The licensee installed equipment monitoring devices on #2 EDG in an attempt to locate the source of the fault. On December 9 and 10, 1991, the #2 EDG was test started several times. The monitoring equipment did not detect any faults. On December 10, 1991, the licensee communicated with Region III management the results of the #2 EDG troubleshooting and plant recovery. Region III staff reviewed the licensee's corrective actions and concluded that the licensee's actions were thorough and proper. On December 11, 1991, the licensee declared #2 EDG operable and commenced with reactor startup. The plant attained 100% power on December 14, 1991. Testing frequency of the emergency diesel generator was increased in accordance with NUMARC guidance to ensure the machine's reliability.

a. Maintenance

The reviewed maintenance activities included:

- Troubleshoot Electrical Circuitry #2 Emergency Diesel Generator
- Routine General Maintenance on #2 Emergency Diesel Generator

- Emergency Ventilation System Fan #2 Vibration Analysis

b. Surveillance

The reviewed surveillances included:

| <u>Procedure No.</u> | <u>Activity</u> |
|----------------------|---|
| DB-SC-03071 | Emergency Diesel Generator #2 Monthly Test. The inspectors continue to monitor the licensee's increased testing frequency of the #2 EDG. The monitoring equipment installed on #2 EDG has not detected any faults with the machine. |
| DB-SP-03159 | Auxiliary Feedwater Pump #2 Monthly Jog Test |
| DB-SP-03161 | Auxiliary Feedwater Train #2 Level Control, Interlock and Flow Test |

No violations or deviations were identified.

6. Emergency Preparedness (71707)

An inspection of emergency preparedness activities was performed to assess the licensee's implementation of the emergency plan and implementing procedures. The inspection included monthly observation of emergency facilities and equipment, interviews with licensee staff, and a review of selected emergency implementing procedures.

On December 13, 1991, the licensee performed an integrated emergency preparedness drill. The purpose of the drill was to monitor the performance of designated plant personnel during a simulated plant emergency and to correct noted weaknesses prior to the performance of the Emergency Preparedness Exercise which is scheduled for May 13, 1992. This is the first EP drill to utilize the new simulator facility in lieu of the control room. The inspectors noted that communications between the simulator and plant personnel were good. Drill objectives were met. The licensee detected a weakness in the performance of the Alternate Joint Public Information Center (JPIC) staff. The licensee will provide additional training to the staff.

No violations or deviations were identified.

7. Security (71707)

The licensee's security activities were observed by the inspectors during routine facility tours and during the inspectors' site arrivals and departures. Observations included the security personnel's performance associated with access control, security checks, and surveillance activities, and focused on the adequacy of security staffing, the security response (compensatory measures), and the security staff's attentiveness and thoroughness. Security personnel were observed to be alert at their posts. Appropriate compensatory measures were established in a timely manner. Vehicles entering the protected area were thoroughly searched.

No violations or deviations were identified.

8. Engineering and Technical Support (62703, 71707)

An inspection of engineering and technical support activities was performed to assess the adequacy of support functions associated with operations, maintenance/modifications, surveillance and testing activities. The inspection focused on routine engineering involvement in plant operations and response to plant problems. The inspection included direct observation of engineering support activities and discussions with engineering, operations, and maintenance personnel.

No violations or deviations were identified.

9. Safety Assessment/Quality Verification (92700)

An inspection of the licensee's quality programs was performed to assess the implementation and effectiveness of programs associated with management control, verification, and oversight activities. The inspectors considered areas indicative of overall management involvement in quality matters, self-improvement programs, response to regulatory and industry initiatives, the frequency of management plant tours and control room observations, and management personnel's participation in technical and planning meetings. The inspectors reviewed Potential Condition Adverse to Quality Reports (PCAQR), Station Review Board (SRB) and Company Nuclear Review Board meeting minutes, event critiques, and related documents; focusing on the licensee's root cause determinations and corrective actions. The inspection also included a review of quality records and selected quality assurance audit and surveillance activities.

On December 10, 1991, as a result of the Davis-Besse Individual Plant Examination, the licensee documented on PCAQ 91-0611 that a single passive failure of manual valve, SW82, would cause a loss of all ECCS room cooling. With this valve shut there would not be a service water flowpath through the ECCS room coolers and one train of containment air coolers.

The licensee's staff evaluated this condition and determined that it was within the plant's original design basis and therefore was not reportable to NRC. In addition, due to its relative inaccessible location, the licensee further determined that no additional actions such as locking the valve were required.

The inspectors reviewed the licensee's actions and concluded that the prudent thing to do was to lock the valve in the open position. The inspectors believed that the valve met the criteria for a locked valve as detailed in procedure DP-OP-00008, Rev 0, "Operation and Control of Locked Valves" and Toledo Edison's letter 1636 of September 28, 1989 to NRC. The inspectors noted that the valve's position is not easily determined from visual observation due to valve type (butterfly valve) and is not labeled well. Because of the inspector's concerns, the licensee has locked the valve open and is evaluating further the need for additional controls on this valve.

No violations or deviations were identified.

10. Management Meetings (30702)

On December 19, 1991, senior licensee management and their staff met with senior region III management and their staff to discuss topics of mutual interest.

11. Exit Interview (71707)

The inspectors met with licensee representatives (denoted in Paragraph 1) throughout the inspection period and at the conclusion of the inspection and summarized the scope and findings of the inspection activities. The licensee acknowledged the findings. After discussions with the licensee, the inspectors have determined there is no proprietary data contained in this inspection report.