

U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-346/91018(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: October 29, 1991, through  
November 30, 1991

Inspectors: W. Levis  
R. K. Walton  
A. Dunlop

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

12-12-91  
Date

Inspection Summary

Inspection on October 29, 1991, through November 30, 1991  
(Report No. 50-346/91018(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, startup testing - refueling, radiological controls, maintenance/surveillance, emergency preparedness, security, engineering and technical support, 10 CFR 21 inspection, and safety assessment/quality verification was performed.

Results: There were no violations or deviations identified. Several strengths and one weakness were displayed. The licensee imposed power limits on the unit during startup until a boron precipitation problem was resolved (Para. 5). Operators performed well to prevent a load rejection from occurring during a site yard fire and is considered a strength (Para. 5). Plant startup and escalation to full power was smooth (Para. 6). A weakness in quantifying the volume and source of water drained from a H<sub>2</sub> line to the Makeup (MU) tank caused a 350 gallon spill of makeup water into the protected area yard. Poor communications prior to and during the event also contributed to the magnitude of the spill. An area of the yard was excavated to remove contaminated soil (Para. 7).

A review of the licensee's 10 CFR Part 21 (Reporting of Defects and Noncompliance) program reveals that the program meets NRC requirements (Part. 13).

## DETAILS

### 1. Persons Contacted

#### a. Toledo Edison Company

- D. Shelton, Vice President, Nuclear
- \*G. Gibbs, Director, Quality Assurance
- \*L. Storz, Plant Manager
- \*M. Heffley, Maintenance Manager
- \*M. Bezilla, Superintendent, Operations
- E. Salowitz, Director, Planning and Support
- S. Jain, Director, DB Engineering
- \*R. Zyduck, Nuclear Engineering Manager
- G. Grime, Manager Site Protection
- \*D. Timms, Systems Engineering Manager
- \*J. Polyak, Radiological Control Manager
- \*R. Coad, General Supervisor Radiological Support
- \*J. Lash, Independent Safety Engineering Manager
- T. O'Dou, Radiological Assessor
- \*J. Moyers, Manager Quality Verification
- L. Worley, Manager Quality Systems
- \*T. Anderson, Manager Maintenance Planning and Outage/Mgmt
- G. Honma, Compliance Supervisor
- B. DeMaison, Emergency Preparedness Manager
- \*J. Wood, Plant Operations, Manager
- M. Stewart, Training Manager
- C. Hengge, Supervisor, Secondary System
- S. M. Love, Resident Engineer (B&W)
- \*R. W. Schrauder, Manager, Nuclear Licensing
- N. L. Bonner, Manager, Design Engineering
- \*T. J. Myers, Director, Technical Services
- \*N. Peterson, Engineer, Licensing
- K. C. Prasad, Nuclear Engineering
- H. Stevens, Supervisor, Independent Safety Engineering
- \*E. Caba, Manager, Performance Engineering
- A. S. Wilson, Supervisor, Integrated Planning
- \*G. Skeel, Supervisor, Nuclear Sec. Ops

#### b. USNRC

- \*W. Levis, Senior Resident Inspector
- \*R. Walcon, Resident Inspector
- A. Dunlop, Reactor Inspector

\*Denotes those personnel attending the December 2, 1991, exit meeting.

### 2. Licensee Action on Previous Inspection Findings (92701)

(OPEN) Open Item (346/89201-03): Two errors in licensee

procedures which could have an impact on the intersystem loss of coolant accident (ISLOCA) scenarios. The first issue concerned the startup procedure which did not specify the removal of control power from the Decay Heat Removal (DHR) suction valves to provide a second layer of protection against an ISLOCA by preventing inadvertent operation. The licensee added Attachment 14 to DB-OP-06900, "Plant Heatup," to remove control power from the DHR suction valves.

The second issue concerned not properly venting the High Pressure Injection (HPI) System after the performance of surveillance tests such that the HPI discharge high pressure alarm could be in the alarmed condition for a prolonged period resulting in reduced operator sensitivity to an actual ISLOCA event. The licensee reviewed the quarterly pump and valve test procedures (DB-SP-03218 and DB-SP-03219) and although it does not contain specifics to vent the system, it does appear to perform this function. The initial valve lineup has HP-1556 and HP-26 (HP-27) open to perform the test and HP-29 is opened during the test to provide a flow path for the HPI pump to the Borated Water Storage Tank (BWST). After the pump is secured, HP-29 is throttled back to two turns open. This action should allow the discharge piping to vent to the BWST and clear the HPI discharge pressure high alarm.

Since the inspectors initial review of this issue, the licensee has revised the quarterly tests. The inspectors reviewed the procedures and associated P&IDs and concluded that the alarm should clear after performance of the surveillance.

As part of the review of this item, the inspectors also reviewed the High Pressure Injection System Procedure (initially SP 1104.07, Rev. 21, revised to DB-OP-06011, Rev. 0). SP 1104.7, step 4.2.7, stated to refer to the quarterly HPI pump tests to clear the computer alarm. The inspectors informed the licensee at the time that the quarterly tests did not give specific instructions to clear the alarm. The revised DB-OP-06011, Notes 3.1.10 and 3.2.10 state that the information for clearing the alarm is contained in DB-SP-03214, Rev. 1 and DB-SP-03215, Rev. 1, respectively (ECCS Valves Quarterly Tests). A review of these procedures does not reveal any instructions on how to clear the alarm. In addition, the tests themselves if done with the reactor at pressure will cause the alarm with no provision to clear it. The licensee issued Procedure Change Request 91-3973 to delete references for clearing the alarm in DB-OP-06011. The operating procedure will reference DB-OP-02522, Small RCS Leaks, to identify the cause of the alarm prior to clearing the alarm. This item will remain open pending

licensee implementing the procedure changes.

Although not a part of the open item, but directly related, a condition existed where the HPI discharge high pressure alarm (P465) was in the alarmed condition for a prolonged period. The licensee identified in November 1990 that HPI line 2-2 isolation valve HP-2B had seat leakage that allowed the HPI discharge line for pump #2 to be at RCS pressure, thus causing the HPI high discharge pressure alarm. The licensee was unsuccessful in stopping the leak by flushing the valve seat. Standing Order 90-057 (changed to 91-025) was initiated to provide guidance to the operators on ISLOCA indications with this alarm condition until the valve was repaired during RFO #7. Compensatory measures taken by the licensee included: placing BWST level on a trend pen to monitor for level increases, trend HPI discharge pressure on a 4 hour cycle for each pump, and closely monitor Makeup Tank level for early indication of leak. The Standing Order also identified DB-OP-02522, "Small Leak Procedure," to be performed if a leak was indicated. The actions taken by the licensee appeared to be an appropriate response to address the issue.

On October 31, 1991, the licensee identified that computer point P465 was giving erroneous alarms and issued an MWO to repair it. On November 4, 1991, the licensee canceled Standing Order 91-025 due to HP-2B being repaired. However, since the alarm was not available to provide the operators an indication of an ISLOCA event, the same condition exists as when the alarm was in the constant alarm condition. The licensee issued a work request to repair or calibrate the pressure switch, but the alarm cleared before the work was performed. The licensee believes that the pressure switch was sticking and is currently operable. In addition, the licensee is taking local readings of HPI discharge pressure gage each shift. This item will remain open until the inspectors can review the licensee's corrective action for repair of the pressure switch which generates a signal for computer point P465.

No violations or deviations were identified in this area.

3. Licensee Event Reports Followup (92701)

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 and that immediate corrective actions to prevent recurrence was accomplished in accordance with Technical Specifications (TS).

(CLOSED) LER 91004 Deficient Reactor Protection System

Response Time Surveillance Testing. The inspectors reviewed the LER and the licensee's corrective actions and consider the item to be closed.

No violations or deviations were identified.

4. Plant Operations (42700, 71707, 71714, 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.

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 adequate. Plant deficiencies, in most cases, were appropriately tagged for deficiency correction. The inspectors pointed out to the licensee several examples in the Auxiliary Building where scaffolding, ladders, and other equipment from the outage were not yet stored properly.

No violations or no deviations were identified.

5. Followup of Events 71707, 92703

During the inspection period, the licensee experienced several events, some of which required prompt notification of the NRC pursuant to 10 CFR 50.72. The inspectors pursued the events onsite with the licensee and/or other NRC officials. In each case, the inspectors verified that the notification was correct and timely, if appropriate, that the licensee was taking prompt and appropriate actions, that activities were conducted within regulatory requirements and that corrective actions would prevent future recurrence. The specific events are as follows:

Boron Precipitation

During licensee's preparation for startup, B&W identified a potential safety concern with respect to possible boron precipitation following a break in the cold leg piping followed by an assumed single failure of the decay heat drop line valves. If precipitation were to occur, it could potentially block flow channels and reduce heat transfer from the fuel rods. Previous modeling of this scenario indicated that boron precipitation would occur approximately 40 days following the accident. Reanalysis, based on a new model which included the plenum cylinder, showed that this phenomenon could occur as soon as 1.5 hours after the accident requiring actions much sooner by licensees to initiate some method of hot leg flow. Since the time of the possible precipitation was much sooner than previously assumed, auxiliary spray, one method of dilution, may not be effective since the boil off rate due to decay heat would be greater than spray through the auxiliary spray line.

After being informed of the issue, the licensee concluded that startup preparations could continue up to a power level of 5%. This conclusion was based on low decay heat level of the core. Subsequent analysis by the licensee determined that operation at 50% power was acceptable based on demonstrated auxiliary spray flow of 70 gpm (versus 40 gpm assumed in analysis). The licensee limited the unit to this power until 1637 on November 8, 1991. After further analysis and discussion with B&W and NRR, the licensee concluded that the unit could be taken to 100% power based on additional flow through leakage gaps in the reactor vessel internals which in combination with other dilution flow paths would provide sufficient dilution flow to prevent boron precipitation. In addition, the licensee's EOPs were changed so that actions to preclude boron precipitation were taken immediately after entering recirculation phase of Low Pressure Injection. The inspectors concluded that the licensee's actions to resolve this issue were timely and adequately addressed the technical issues.

#### Switchyard Fire

On November 22, 1991, at approximately 7:25 p.m., after isolating the Lemoyne 345 Kv transmission line, 1 of 3 offsite power sources, for repair work, operations personnel noted severe arcing in the vicinity of one of the main generator output breakers. To prevent a load rejection, the load dispatcher was contacted and the Lemoyne transmission line was re-energized and a rapid unit shutdown commenced. Further investigation determined that the fault was upstream of the main generator output breaker 34561. The load dispatcher was requested to open DCS 34561C in a further attempt to isolate the fault. This was accomplished at 7:40 p.m., at which time the fault was isolated. Reactor power was 88% at the time and stable.

In order to repair the damaged switchyard components, the main generator had to be removed from service. This was accomplished the next day and repairs commenced. Damage was isolated to the B phase of DCS 34561C. Repair work was completed that evening and the generator was returned to service at 12:06 a.m. on November 4, 1991. At 6 a.m., the unit was back at 100% power.

The licensee theorized that the B phase of DCS 34561C was not making proper contact. When the Lemoyne transmission line was opened, greater load was placed on the high resistance disconnect resulting in arcing. The licensee noted that these disconnect switches were repaired during the last outage. The inspectors will follow the licensee's root cause evaluation and followup corrective actions.



The inspectors reviewed operators' actions and witnessed a portion of the repair work in the switchyard. The inspectors concluded that the operators performed well, both in response to the event and subsequent removal and return to service of the main generator.

No violations or deviations were identified.

6. Startup Testing - Refueling (72700)

The inspectors observed the tests listed below and verified that the refueling outage startup testing was conducted in accordance with technically adequate procedures and that the facility was being operated within license limits.

The inspectors provided augmented shift coverage and observed various licensee organizations during plant startup. Initial reactor criticality occurred on November 5, 1991. The inspectors observed the performance of low power physics testing on November 6 and 7, 1991. The inspectors reviewed core physics data to ensure that it was within the limits as required by the Technical Specifications. The inspectors noted that the plant startup and physics testing was done in a controlled manner. Data was reviewed in a timely fashion and problems encountered during testing were resolved prior to continuing. When the nuclear engineering group questioned the data from their 1/M plot during the approach to criticality, the startup was stopped and the calculations reverified before proceeding. This questioning attitude reflected conservative operations by the licensee. The generator was synchronized to the grid on November 7, 1991, ending the 69-day refueling outage. Power escalation commenced November 8, 1991, and the reactor achieved 100% power on November 11, 1991.

No violation or deviations were identified.

7. Radiological Controls (71707, 83522)

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.

No problems were identified with health physics controls and practices or the knowledge and training of personnel.

The licensee has had problems with condensate forming and then freezing inside the hydrogen supply piping to the makeup tank. Periodically, in accordance with monthly activity log, operators drain the line by opening valve G222 which directs, typically, one gallon of condensate to the ground by the compressed gas bunker located in the protected area yard. On November 5, 1991, at 12:30 a.m., an operator commenced draining condensate from the line between the hydrogen cylinders and the makeup tank. The operator drained the line for about 3 minutes then informed the control room that an excessive amount of water was still draining. Control room personnel verified the lineup to be proper and the drain continued for approximately 2 hours when a control room operator calculated that too much water had been drained. Control room personnel told the operator to close G222 to stop the drain. Approximately 350 gallons of warm water was drained. Control room operators concluded that two check valves and three solenoid valves had leaked past their shut seats and that the operator was draining purified reactor coolant from the makeup tank into the protected area yard. Radiological controls personnel performed a radiological survey of the area and confirmed that the ground was contaminated. A sample of the makeup tank and G222 confirmed that the water came from the makeup tank. The sample indicated that tank activity was about  $1.3 \text{ E-3 uci/cc}$ . Additional radiological surveys were performed in the bunker to identify the extent of contamination. A small area beneath two pressure gages in the bunker was found to have low levels of contamination. The licensee believes that there was no spread of contamination from the bunker and that the fluid spilled remained in the vicinity of the spill area. About 150 cubic feet of contaminated soil was excavated from the spill area and will be transported to a waste disposal facility.

Investigations of how the reverse flow occurred revealed that the solenoid operated valves were not designed to remain closed with a reverse differential pressure generated from a pressurized make up tank. Additionally, no maintenance on any of the valves involved in this event had ever been performed. These valves are considered nonsafety related. The licensee believes that the condensate present in the line was back leakage from the makeup tank and that the condition existed for a long time but was not discovered until this event occurred. The licensee is no longer using the hydrogen addition path from the bunker but is adding hydrogen to the tank from inside the auxiliary building using a temporary modification. The inspectors will carry this as an open item (346/91018-01(DRP)) pending inspector review of the licensee's corrective actions, including facility modification for new Hydrogen addition station, review of other similar solenoid operated valve applications

and correction of communication weaknesses.

The inspectors note that this event could have been prevented by better communications between the operator and the personnel in the control room. The operator, noting that an excessive amount of water was draining from the line, notified the control room but communicating that concern to the control room was a weakness. The Assistant Shift Supervisor, in acknowledging the operators concern, also did not provide explicit instructions concerning how much water should be drained out or how long he should continue draining. His only instructions, after verifying the valve line-up were to drain the water out of the line. In addition, he did not provide necessary followup to ensure that the operator's concern was resolved.

No violations or deviations were identified.

8. Maintenance/Surveillance (61726, 62703, 92701)

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.

a. Maintenance

The reviewed maintenance activities included:

- Alignment of Circulating Water Pump #4
- RPS Power Range Calibration

b. Surveillance

The reviewed surveillance included:

<u>Procedure No.</u>	<u>Activity</u>
DB-SC-03110	SFAS Channel #1 Functional Test
DB-NE-03212	Zero Power Physics Testing
DB-SP-03159	Auxiliary Feedwater Pump #2 Monthly Jog Test

No violations or deviations were identified.

9. 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.

No violations or deviations were identified.

10. 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.

11. Engineering and Technical Support (62703, 71707, 92701)

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.

12. Safety Assessment/Quality Verification (90712, 92701, 94600)

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 October 30, 1991, the inspectors met with members of the State of Ohio Utility Radiological Safety Board (URSB) to provide them with information concerning the NRC Inspection Program. The URSB will accompany the inspectors periodically on future inspections of the facility.

No violations or deviations were identified.

13. 10 CFR PART 21 INSPECTION (36100)

The inspectors reviewed the licensee's program for implementing the requirements of 10 CFR Part 21 including the following: Part 21.6 posting requirements, Part 21.31 for specifying Part 21 requirements in procurement documents, Part 21.21(a) for evaluating identified deviations, Part 21.21 for NRC reportability requirements, and Part 21.51 regarding maintenance of records.

The licensee has established four posting locations. The inspectors reviewed one location and the licensee's procedure requiring the posting, NL-LC-010006, "NRC Posting Requirements," and concluded that the licensee's procedures adequately address the regulation's requirements and are properly implemented.

The inspectors reviewed procedure EN-DP-00070, 'Procurement,' which requires a Data Assignment Sheet (DAS) be included with the procurement package for each item purchased. The DAS includes Standard Paragraphs, such as A77, which states that the requirements of 10 CFR Part 21 are applicable. The inspectors reviewed the Standard Paragraphs maintained by Purchasing to ensure they were up-to-date and verified in several procurement packages that the Standard Paragraphs were included.

The licensee documents equipment problems and failures on Potential Condition Adverse to Quality Reports (PCAQRs) per NG-QA-00702, 'Potential Condition Adverse to Quality

Reporting'. This procedure was recently revised to incorporate the new Part 21 requirements. As part of the process, PCAQRs are evaluated by the licensee for reportability under Part 21. Attachment 6 to the procedure lists four guidelines for evaluating and reporting potential Part 21 conditions. A flow chart of the process is provided in Attachment 9, which also includes the appropriate time requirements. The PCAQR form in section 5 requires evaluation to determine if item is Part 21 reportable. The inspectors reviewed a number of PCAQRs initiated in the past 2 years and determined that the licensee has conducted the reviews for Part 21 reportability as required. A justification as to why an item is not reportable is provided if the determination is questionable, although in most cases a block is checked stating not reportable. The last concern reported as a Part 21 was in February 1989. The licensee also puts all Part 21 reports received into the PCAQ system to determine applicability to the station.

The licensee recently identified a problem with the transformer used for the station blackout diesel. Even though the transformer is nonsafety-related and Part 21 is not applicable, the licensee contacted the vendor to determine if other licensee's had purchased this transformer as a safety-related item. The vendor reviewed their records and concluded that this type transformer had not been supplied as a qualified safety-related item.

The licensee, per NG-QA-00702, designated the Director-Technical Services as being the responsible individual for notifying the NRC of Part 21 reports. The times specified for these notifications coincide with the requirements stated in Part 21.21.

PCAQRs are sent to Nuclear Records Management where these records are maintained for the life of the plant.

14. Temporary Instructions (TI) Reviews

(CLOSED) TI 2500/27 Inspection Requirements for NRC Compliance Bulletin 87-02, Fastener Testing to Determine Conformance With Applicable Material Specifications. The inspectors reviewed the TI, licensee documentation, and its response to Bulletin 87-02 and verified that the licensee met the requirements of the TI for inspection and testing of safety related fasteners. Additional information can be found in Inspection Report 346/89005. This item is closed.

15. Open Items

Open Items are matters which have been discussed with the licensee which will be reviewed further by the inspector and

which involve some action on the part of the NRC or licensee or both. An Open Item disclosed during this inspection is discussed in paragraph 7.

16. 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.