U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

REGION III

Report No. 50-346/77-25

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

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

Facility Name: Davis-Besse Nuclear Power Station, Unit 1

Inspection At: Oak Harbor, OH

Inspection Conducted: July 19-21, 27-29; August 5, 6, 8-12, 18, and 19, 1977

Inspectors: T. N. Tambling RC Knop for 9/9/77

W. D. Shafer RC Knop for 9/9/77

L. R. Greger

Approved By: R. C. Knop, Chief RC Knop 9/9/77
Reactor Projects Section 1

Inspection Summary

Inspection on July 19-21, 27-29; August 5, 6, 8-12, 18, and 19, 1977 (Report No. 50-346/77-25)

Areas Inspected: License prerequisites required prior to entering Mode 2 and Mode 3 of operation, status of deferred preoperational testing, witnessing of initial criticality and zero power physic testing, review of licensee event reports, review of status of radiation protection, and radwaste program for startup testing. The inspection involved 137 inspector-hours onsite by three NRC inspectors.

Results: No items of noncompliance or deviations were found.

DETAILS

SECTION I

Prepared By: T. N. Tambling

1. Persons Contacted

*J. Evans, Station Superintendent
*T. Murray, Assistant Station Superintendent
*D. Zemenski, Operations Engineer
*L. Stalter, Technical Engineer
L. Grime, Reliability Engineer
D. Briden, Chemistry and Health Physicist
*W. Greer, Assistant to Station Superintendent
*J. Buck, Operations Quality Assurance Engineer
G. Humphreys, Instrument and Control Engineer
*R. Brown, Assistant Engineer
*G. Novak, Power Engineering General Superintendent
D. Lee, Test Program Manager (B&W)
T. Reddaway, Project Start-up Engineer (Bechtel)

The inspector also talked with and interviewed other licensee employees, including members of the technical and engineering staff, reactor shift crews, radiation protection, training, startup test leaders, and QC personnel.

*Denotes those attending exit interviews.

2. Licensee Action on Previous Inspection Findings

(Closed) (346/76-23): Licensee to develop a list of safety-related components, systems and activities to which the QA program is applicable. The inspector verified by review of revisions to the Quality Assurance Manual, that the licensee had developed reference lists of safety-related and ASME components systems and activities to which to QA program is applicable.

(Closed) (346/77-05): Licensee to provide an emergency plan implementing procedure to cope with weather conditions which require personnel to remain at the station for undetermined periods. (Ref Condition F.1.a of Attachment 2 to License NFP-3). The inspector verfied that an appropriate revision to the Emergency Plan implementing procedures had been made and issued.

(Closed)(346/77-05): Licensee to incorporated into the Emergency Plan implementing procedures (1) evacuation of personnel to

minimize exposure to hazard, (2) a personnel accountability system, and (3) conditions for re-entry into previously evacutated areas for search and rescue (also Condition F.1.b of Attachment 2 to License NFP-3). The inspector verified that appropiate revisions to the Emergency Plan implementing procedures had been made and issued.

3. Completed and Approved Test Procedure Results

The inspectors reviewed the following deferred preoperational test procedures for completeness with regard to:

a. Meeting acceptance criteria.

b. Appropriate management review and approval.

c. Conformances to the requirements of administrative procedures.

The review of the deferred sections of the test packages included review of temporary and major procedures changes, QC verification sheets, chronological logs, resolution of deficiency reports and other related material.

TP 161.02 - Containment H_2 Dilution and Hydrogen Purge System

TP 230.03 - Boric Acid Evaporator Acceptance Test

TP 271.09 - Main Steam Isolation Valve Test

TP 256.01 - Station Response to Loss of Instrument Air

TP 315.01 - Steam and Feedwater Rupture Control System

TP 330.04 - Control Rod Drive Integrated Test

TP 340.01 - Seismographic Monitoring System

TP 600.04 - Makeup and Purification System

TP 600.11 - Auxiliary Feedwater System and Steam Generator Level

TP 600.14 - Reactor Coolant System Expansion and Restraint Test

TP 600.19 - Power Conversion System Expansion and Restraint Tests

TP 600-15 - Reactor Non-Nuclear Instrumentation Calibration Test

TP 600-17 - CRD System Operational Test

4. Outstanding Preoperational Tests

Three defered pre-operational tests are not complete:

TP 261.02 - Freeze Protection System

TP 401.11 - Instrument Ground Grid System

TP 100.01 - Communication Test

On TP 261.02, heat tracing on the pressurized relief valves liquid seal loops and the nitrogen fill liner to the pressurizer and core flood tank are being upgraded. Temperature obtained on the pressurizer relief loop seals were in the range to restrict the number of valve actuations to 30 discharge cycles (See LER NP-32-77-12 dated August 19, 1977 for details). The licensee will track the number of cycles and also plans to upgrade the heat tracing.

On the nitrogen fill liner to the pressurizer and core flood tank the licensee will administratedly control the use of this line until the heat tracing is upgraded to provide the desired temperature control. The licensee commited to provide instructions to the field to monitor and control the line temperature during use.

On TP 401.11, the licensee could not meet the acceptance criteria of a electrically separate instrument ground system when the tie link to the station ground system was removed. (See letter L. E. Roe to J. G. Keppler, dated August 3, 1977, Serial No. 339). This was due in part to the instrument system supplied by Babcock and Wilcox Company and Bailey Meter Company which was not installed to have separate instrument and station ground.

The licensee has proposed to delete the test as a requirement. The licensee's request is currently under review. The licensee was informed that resolution on this test is a restraint to Mode 1 operation.

On TP 100.01, the licensee has completed all but the phase of the test dealing with the Turbine Building. Final balancing of the system is planned when the turbine is put into operation. The licensee stated in an exit interview that this phase of the test would be completed prior to exceeding 25% power.

5. Boron Dilution Mode Test

As a previous commitment in the FSAR the licensee has installed bypass lines around valves DH 1517 and DH 1518 to provide a minimum decay heat flow of 40 gpm during a post LOCA condition to provide a means to reduce boron buildup in the reactor core. To verify that these lines had been properly sized to provide a minimum of 40 gpm (Condition F.4 of Attachment 2 to License NPF-3), the inspector reviewed TP 203.03, Decay Heat Removal System Preoperational Test, Section 7.11. Based upon simulated post LOCA flow conditions, the test results indicated that minimum measured flow was greater that 40 gpm in each decy heat loop (40 to 50 gpm). This measured flow rate satisfies the design requirements.

6. Review of Nonroutine Events Reported by the Licensee

The inspector reviewed licensee actions with respect to the following listed nonroutine events reports to verify that the events were reviewed and evaluated by the licensee as required by Technical Specifications, that corrective action was taken by the licensee, and that safety limits, limiting safety system settings, and limiting conditions for operation were not exceeded. The inspector examined selected Station Review Board minutes, licensee investigation reports, logs, and records, and inspected equipment and interviewed selected personnel.

a. Failure to establish required communications, monitoring, and supervision during installation of incore detectors (NP-32-77-01).

b. One Containment Radiation SFAS outside LCO due to operator error (NP-32-77-04).

c. Loss of Decay Heat System flow due to unauthorized work on pressure transmitter (NP-32-77-9).

d. Failure of butter fly valve seats in the Component Cooling Water System (NP-32-77-10).

e. Failure to reset RPS high flux setpoint to $\leq$ 5% while in shutdown bypass (NP-33-77-8).

f. Seismic Trigger firing puriously (NP-33-77-13).

The inspector noted that the licensee had identified and corrected four items with the Technical Specifications related to these events.

No other items of noncompliance or deviations were identified.

During the exit interview the inspector discussed the number of events associated with personnel errors and the need for the licensee to reduce these. Also the licensee was requested to submit a supplement report to LER NP-33-77-13, on the investigation of the failure cause in accordance with Regulatory Guide 1.16. This supplemental report was submitted August 16, 1977.

The following licensee event reports were reviewed and closed out on the bases of an in-office review and evaluation:

a. Momentary loss of audible indication on source range detector (NP-33-77-3).

b. Containment radiation channel inoperable (NP-33-77-4)

c. Loss of Panel 41 and SFAS Channel 1 during maintenance (NP-33-77-10).

d. Failure of wind speed indicator (NP-33-77-12).

e. Failure of Containment Personnel airlock door to latch (NP-33-77-18).

f. Two hydraulic snubbers in Decay Heat Removal System inoperable (NP-33-77-19).

g. Containment Sump level and flow monitoring inoperable (NP-33-77-20).

h. Contaiment Spray Pump 1-1 surveillance instrumentation out of calibration (NP-33-77-21).

i. Removal of makeup pump 1-1 from service to perform maintenance on suction valve (NP-33-77-23).

j. Removal of makeup pump from service for corrective maintenance (NP-33-77-24).

k. De-emergized "J" bus to complete modification (NP-33-77-27).

7. Design Deficiency in Shield Building Blowout Panels, LER NP-32-77-7

The inspector reviewed the licensee's report dated July 25, 1977, and the corrective action (FCR 77-152). During this review it was noted that the blow out panel setpoint (i.e., the pressure at which the panel would relieve) was not an Q-listed item. This was due in part that the panels were installed for a feedwater line rupture protection and not considered a boundry of the Emergency Ventilation System.

The licensee commited to the following:

a. To Q-list the blowout panel design and setpoint.

b. Demonstrate that the current repair meets QA/QC requirements.

c. All future work on the blowout panels will have QA/QC involvement.

Based on the action taken and the commitments made by the licensee, the inspector concluded that the corrective action taken by the licensee appears to be adequate.

8. Seismic Qualified Flow Indication for Low Pressure and High Pressure Injection System

Per Condition C.(3)(m) of Operating License NPF-3, the licensee modified the existing low pressure and high pressure injection flow indication system to one which was seimically qualified and powered from essential power sources with flow indication in the main control room. The inspector reviewed QC documentation (FCP-97) on the procurement, installation and calibration to verify that the subject flow indication systems had been seismic qualified, installed, and calibrated in accordance with the commitment.

9. Diesel Oil Storage Tank Modification

Per Condition C.(3)(b) of Operating License NPR-3, the licensee modified the diesel fuel oil storage and transfer system to provide each diesel generator with a 40,000 gallon seismic Category 1 fuel oil storage and transfer system. Final tie into the new system is subject to a license amendment.

The inspector reviewed and examined the implementation of the subject modification as designated on Bechtel drawing change notice No. C-37-1 for Job No. 7749. No deficiencies were identified by this review.

The review effort included review and examination of procurement records, engineering calculations relative to design requirements, earth compaction records for burial portions of the system, protective coating tests for steel plates used for missile shields, (Close out of NCR 1232) and construction testing.

10. Natural Circulation Test

The licensee raised the question as to whether Condition 3.(a) of the operating licensee was in conflict with the test exception

in Section 3.10.3 of the Technical Specifications regarding the number of reactor coolant pumps required in Mode 1 and Mode 2 operation. The inspector conferred with the Project Manager in NRR and it was concluded that Section 3.10.3 provides the required control for performance of the Natural Circulation Test without operating reactor coolant pumps during the performance of the test.

11. Preparations for Initial Criticality

The inspectors reviewed the prequisites requirements for initial criticality covered in the operating license (Paragraphs 2, 5, and 8), status of deferred preoperational tests (Paragraphs 3 and 4) and tour of the plant and control room.

The tour of the plant included a walk-through the plant to observe operations, housekeeping, status of operating equipment, check of ventilation boundaries, doors, and locking of control cabinets in remote areas.

Tour of control room included discussions with the operators concerning status of outstanding annunicator lights, out of service equipment, boration paths, operating parameters, on going surveillance testing, and review of operating logs.

No items of noncompliance or deviations were identified.

12. Initial Review of Zero Power Physic Testing (ZPPT)

The inspector examined the control copy of TP 710.01, ZPPT and observed testing in progress for a temperature coefficient of reactivity. The inspector verified that analysis of data was being kept current (although it was preliminary in nature). All results to date appeared to be within acceptance criteria.

No items of noncompliance or deviations were identified.

12. Exit Interview

The inspector met with licensee representatives (denotes in Paragraph 1) at the conclusion of the inspection on July 21 and August 19, 1977. The inspector summarized the scope and findings of the inspection. The licensee representative made the following remarks:

a. Acknowledged the statements by the inspector with respect to nonroutine event reports and the noncompliance reported and corrected by the licensee. (Paragraphs 6 and 7)

b. Acknowledged the inspectors statements concerning the natural circulation test. (Paragraph 10)

c. Acknowledged the inspector statements concerning the close out of conditions of the operating license. (Paragraphs 2, 5, 8, and 9)

d. Acknowledged the inspectors statements concerning outstanding preoperational tests. (Paragraph 4)

e. The licensee stated that ZPPT should be completed August 20, 1977, with final analysis and review of the data completed early the next week.

DETAILS

SECTION II

Prepared By: L. R. Greger 9/9/77

Reviewed By: W. L. Fisher, Chief 9/9/77
Fuel Facility Projects and
Radiation Support Section

1. Persons Contacted

W. Alton, Senior Assistant Engineer
D. Briden, Chemist and Health Physicist
J. Evans, Station Superintendent
W. Green, Assistant to Station Superintendent
J. Hickey, Training Supervisor
D. Lee, Test Program Manager
J. Zell, Assistant Engineer

2. Radiation Protection/Radwaste Procedures

The radiation protection and radwaste related procedures for startup and power ascension testing have been completed and are ready for implementation. Review of these procedures by the inspector did not identify any significant discrepancies. The test results will be reviewed during a subsequent inspection.

No items of noncompliance or deviations were identified.

3. Radiation Protection/Radwaste Preoperational Testing

The inspector selectively reviewed the licensee's radiation protection, radwaste, process monitor, and ventilation related preoperational test results. The licensee was noted to have completed the preoperational testing required for initial criticality (Mode 2). Additional testing, to be completed during startup, will be reviewed during subsequent inspections. The additional testing to be completed is identified in the FSAR, in correspondence from the licensee to NRR dated February 22, 1977 and March 2, 1977, and in Attachment No. 2 to NRC License No. NPF-3.

No items of noncompliance or deviations were identified.

4. Startup Source Leakage

The inspector reviewed documentation from the startup source supplier regarding material specifications and initial leak test results. The use of thoriated tungsten in the source

welding process was confirmed by the supplier. Such use plausibly explains the protactinium-233 identified by the licensee in the fuel pool water. The supplier's leak test procedures, apparently not as sophisticated as those utilized by the licensee, did not detect the activation nuclides originating from the encapsulation material. No significant discrepancies in the licensee's evaluation of radionuclide analyses of the startup sources were identified.

No items of noncompliance or deviations were identified.

5. Ventilation Stack Samplers

The inspector reviewed the results of the collection test conducted as a check of the efficiency of the ventilation stack samplers. A polydispersed DOP (dioctyl phthalate) mixture was released in a ventilation line. Simultaneous samples were extracted from the ventilation stack and the ventilation stack sampler and compared. The test, performed by contract personnel, showed a one-to- one relationship between the two sample points according to the licensee. The licensee did not have documentation to identify the extraction points nor was the accuracy of the quantitative results specified. Licensee personnel stated that additional documentation of the test would be procured from the contract organization. This documentation will be reviewed during a subsequent inspection.

No items of noncompliance or deviations were identified.

6. Respiratory Protection

The licensee has not completed the required modifications to bring the respiratory protection program into conformance with Regulatory Guide 8.15 and, therefore, cannot take credit for the use of respiratory protection equipment in estimating exposures of individuals to airborne radioactive material.

No items of noncompliance or deviations were identified.