U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-346/84-22(DRS)

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

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

Facility Name: Davis-Besse Unit 1

Inspection At: Oak Harbor, Ohio

Inspection Conducted: September 24-28, October 9-12, November 5-9, 19-21 and December 10-14, 1984

Inspectors: W. Milbrot for L. A. Reyes — 1/16/85 Date

D. Butler — 1/15/85 Date

for W. Rogers — 1-16-85 Date

Approved By: L. A. Reyes, Acting Chief
Operational Programs Section — 1/16/85 Date

Inspection Summary

Inspection on September 24-28, October 9-12, November 5-9, 19-21 and December 10-14, 1984 (Report No. 50-346/84-22(DRS))

Areas Inspected: Routine, announced inspection of licensee action on previous inspection findings; refueling preparations, refueling activities; surveillance testing; and independent inspection of bistable trip setpoints and RTD testing. The inspection involved a total of 177 inspector-hours onsite by three NRC inspectors including 14 inspector-hours onsite during off-shifts.

Results: Of the five areas inspected, three items of noncompliance were identified in two areas (violation of TS operability requirements for the emergency ventilation system servicing the storage pool and the audible portion of the source range monitors during core alterations - Paragraph 4; and failure to properly identify and control measuring and test equipment - Paragraph 5.d).

DETAILS

1. Persons Contacted

   a. Licensee Employees

   *S. Quennoz, Plant Manager
   *D. Lee, Maintenance Engineer
   *W. O'Connor, Operations Engineer
   °*S. Wideman, Senior Licensing Specialist
   *K. Yarger, Instrument and Control Engineer
   *J. Greer, Quality Assurance Supervisor
   *D. Dibert, Nuclear and Performance Engineer
   °J. Faris, Administrative Coordinator
   *J. Lingenfelter, Technical Engineer
   °J. Byrne, Quality Assurance Engineer

   b. NRC Representatives

   W. Rogers, Senior Resident Inspector
   D. Kosloff, Resident Inspector

   The inspectors also contacted and interviewed other licensee personnel during this report period.

   *Denotes those personnel attending the November 21, 1984 exit.

   °Denotes those personnel attending the December 14, 1984 exit.

2. Licensee Action on Previous Inspection Findings

   a. (Closed) Noncompliance (346/81-18-01(DRS)): During the review of ST 5030.06, "RCS Temperature Input to RPS Refueling Period Calibration," the inspector determined the instrument string error had exceeded the DB Technical Specification (TS) temperature limit of Table 2.2.1. The licensee had an independent review performed for all their RPS setpoints. The review was completed by MPR Associates Inc., report number MPR-731. The review took into account the total string error for each RPS parameter and determined the range of the bistable setpoint. The procedures were modified to reflect the new bistable setpoint to ensure compliance with TS 2.2.1. The inspector reviewed Facility Change Request (FCR), 83-097, for Cycle Five RPS field setpoints. It was determined that the new setpoints contained allowances for total string error plus an additional safety margin to ensure the TS limits were not violated. The close out of the FCR will implement the incorporation of the new setpoints into the appropriate procedures.

b. (Open) Open Item (346/82-25-03(DRS)): This item was initially identified as an item of noncompliance regarding core cross shuffle, but was retracted by NRC letter dated May 17, 1983. The item was retained as an Open Item to review the forwarding of "inappropriate" information to the NRC by TECo's April 13, 1983 letter (Serial No. 934). In a discussion with nuclear licensing staff personnel it was indicated that a revision to the Toledo Edison Nuclear Procedure and Practice Manual is pending. The revision is to provide guidance and direction to personnel responding to NRC correspondence. This item will remain open pending NRC review of the manual revision, presently scheduled for issue in April 1985.

c. (Closed) Open Item (346/82-25-01(DRS)): Lack of RTD acceptance criteria. The inspector reviewed information relating to the non-nuclear instrumentation (NNI) temperature-hot (Th) input to the Integrated Control System (ICS) for operability and proper calibration acceptance criteria. The documents reviewed were for reactor coolant loop B and they are similar to loop A. Instruments not requiring a specific calibration procedure are calibrated according to the latest revision of IC 2001.00, "Instrument Calibration". The procedure describes in Section Two, "References", where to obtain the needed calibration information. In most cases the instrument specifications will be obtained from manufacturers instruction manuals. Data sheets are developed to document the calibration in accordance with IC 2001.00. The test results are reviewed by the IC Foreman and approved by the Lead IC Engineer.

The ICS receives inputs from two NNI cabinets. It can be hand switched between cabinet X and Y. The X cabinet contains all the instruments which are not redundant and one half of the redundant instruments. The Y cabinet contains the other half of the redundant instruments.

Both X and Y cabinets are required for normal plant operation. The plant may be operated in an abnormal condition without the Y cabinet. The hand switches (HS) are aligned to instruments required for normal operation as verified by "Switch Verification List A" in procedure SP 1105.06, Revision 8, "NNI Operating Procedure".

The Th input may be selected from RTD TE-RC3B1 (X cabinet) or TE-RC3B3 (Y cabinet) by HS-RC3B (Loop B), normally TE-RC3B1 is selected as the ICS input.

There is a linearity problem between TE-RC3B1 (PYCO 3-wire) and TE-RC3B3 (Rosemount 4-wire). The PYCO RTD is connected to a 4-wire linear bridge. Minor adjustment of the linear bridge is required as the reactor is brought to full power operation. The temperature difference between TE-RC3B1 and TE-RC3B3 is approximately 4°F. The Davis-Besse Maintenance Management System generates a Maintenance Work Order to adjust TE-RC3B1 linear bridge to read the same as TE-RC3B3. Section 5.4 of procedure SP 1105.06, "Operation of the Selector Switch", provides adequate instructions to inform the

operator of a possible transient to the ICS if the selector switch position is changed. The adjusting of TE-RC3B1 linear bridge appears to work and no adverse operational experiences have occurred. It does appear that installing the proper RTD and/or linear bridge would improve this system.

3. Refueling Preparations

The inspector performed a review of completed surveillance tests and periodic test procedures covering the checks and preparations necessary to assure that fuel handling equipment will function properly. The inspector also observed tests of the fuel handling bridge that demonstrated equipment operability consistent with Technical Specifications and reviewed administrative and technical fuel handling procedures to assure that the Technical Specifications and licensee's procedure and test requirements will be satisfied during fuel movement.

It was noted that the individual who verified completion of the fuel handling bridge load test and verified by signature that the acceptance criteria were satisfactory was the same individual identified later as the designated reviewer of the completed procedure. Having one review his own work does not provide the feature of an independent review of the activity. The licensee reported that the intent of the designated reviewer was to select an individual knowledgeable of the technical requirements of the procedure to assure that each was satisfied and not necessarily have an independent review.

No items of noncompliance or deviations were identified.

4. Refueling Activities

The inspector witnessed portions of reactor vessel core loading operations including the transfer of fuel assemblies from the spent fuel pool to the reactor vessel. The inspector also reviewed surveillance test procedures, plant procedures and other supporting documents to assure that fuel handling operations were conducted in accordance with required Technical Specifications and licensee's administrative procedures. During this review it was noted that the operating emergency ventilation system (train #2) servicing the spent fuel pool had not been demonstrated operable within the time frame required by Technical Specifications 4.9.12.1 and 4.6.5.1. The surveillance test covering this system was last completed on August 19, 1984. The second emergency ventilating system (train #1) servicing the spent fuel pool was not operable at the time because of maintenance activities.

Failure of the licensee to demonstrate operability of the emergency ventilation system servicing the spent fuel pool when loaded with irradiated fuel as required by Technical Specifications 4.9.12.1 and 4.6.5.1 is considered to be an item of noncompliance (346/84-22-01(DRS)). The licensee immediately initiated action to conduct Surveillance Test 5067.01, Revision 10, "Emergency Ventilation System (Monthly)" to demonstrate emergency ventilation system (train #2) operable. The test was completed satisfactory.

The licensee also conducted a review of Technical Specification requirements to assure that other required actions had not been missed or overlooked. None were reported.

During this same time period, an instrument and control mechanic reported to the control room shift supervisor that he had a concern about the audible alarm portion of the source range neutron flux monitors not functioning properly. Technical Specification 3.9.2. requires that two source range neutron flux monitors be operable, each with continuous visual indication in the control room and one with audible indication in the containment and control room. The mechanic's concern was that the audible mechanism of the Nuclear Instrument Monitor - BIN (NIM-BIN) may not sound an audible alarm if the neutron detectors were subjected to an increase in neutron count rate even though the audible alarm of the NIM-BIN had been verified operational. The NIM-BIN is a temporary addition to the source range neutron flux monitor that provides the audible alarm during core alterations. The performance of a channel functional test of the source range flux monitors, as required by Technical Specification 4.9.2, was accomplished by Davis-Besse Surveillance Test 5091.01, Revision 9, "Source Range Functional Test." This functional test verified operability of the meter or visual indication portion of the system but did not test the audible alarm of the NIM-BIN. The functional test of the NIM-BIN alarm consisted of initiating a simulated alarm signal within the NIM-BIN itself and not the injection of a simulated signal into the channel as close to the primary sensor as practicable to verify operability. There was no formal approved procedure for this test. When Instrument and Control Engineers conducted a complete check out of the source range neutron flux monitors it was discovered that one of the modules in the NIM-BIN had failed. The failed unit was replaced. A temporary change, dated November 20, 1984, was issued to Surveillance Test 5091.01 to incorporate a new section to functionally test the NIM-BIN portion of the source range neutron flux monitors to meet all of Technical Specification 4.9.2 requirements.

The failure of the licensee to determine the operability of the source range neutron flux monitor prior to core alterations is an item of noncompliance of Technical Specification 3.9.2. (346/84-22-02(DRS)).

No other items of noncompliance or deviations were identified in this area.

5. Surveillance Testing

a. The inspector observed the completion of ST5030.05, Revision 7, "RCS Flow to the RPS Refueling Period Calibration," for channel one instrumentation. The prerequisites were adequate to ensure no other RPS channels were being tested or in a tripped condition. Shift Supervisor permission was properly obtained before testing began and the key to unlock channel one RPS cabinets was administratively controlled. Testing was accomplished by injecting a signal at the transmitter and reading the results of the input/output voltages of each instrument in the flow channel. Any instrument found out of specification was individually calibrated with a Maintenance Work Order and the test was repeated to verify the flow channel was in calibration.

Each test is accompanied by a Data Cover Sheet. The cover sheet contains signoffs for review and approval of the test. The measuring and test equipment (MTE) selected met the accuracy requirements of the procedure. Each piece of MTE was verified to be in calibration and logged with the test package.

Four technicians were used to perform the test and the lead was a qualified Davis Besse Instrument and Control (DBIC) journeyman. Quality Control (QC) was notified prior to performing the test and a QC inspector witnessed the calibration. The test was completed satisfactorily and it met Technical Specifications 4.3.1.1.1 and 4.3.1.1.2.

b. The inspector observed a portion of Surveillance Test ST 5016.04, Revision 5, "Accessible Detector Channel Functional and Supervisory Circuit Checks". The test was performed on level 638, Auxiliary Building, "Air Conditioning Equipment Room." Included in the test was fire zone FDZ 603 which alarms in local panel C-6713 and the Main Control Room (MCR) computer. A detector was removed from its socket to verify its Class A supervisory circuit by observing the "Fault/Trouble" detector alarm on the local panel and in MCR panel C-5731. The detectors were verified operable by using a smoke source and observing the appropriate fire zone alarm on the local panel and MCR. Four technicians were used to perform the test and the lead was a qualified DBIC journeyman. The observed tests on detectors DS 8661A and DS 8661B were completed satisfactorily and they met Technical Specifications 4.3.3.8.1 and 4.3.3.8.2.

c. Calibration trimpots, QC Accept - Q53629, were replaced on the Intermediate Range (IRM), Contact Monitor, Flow Channel, and Power Range Test Modules in each RPS division. Verification of the test modules operability were completed by performing ST 5030.16, Revision 10, "RPS Monthly Functional Test in Shutdown Bypass". The inspector observed portions of ST 5030.16 on RPS channel three, Cabinet 5763F. During the functional test of the IRM, the "As-Found" calibration points were found near their upper tolerance limit. The IRM logarithmic amplifier module was removed and a bench calibration was performed with no improvement. A new IRM logarithmic amplifier module, QC Accept-Q64842A, was obtained from the storeroom and bench calibrated according to controlled manufacturer instructions and a Maintenance Work Order. The new IRM logarithmic amplifier module was installed in Cabinet 5763F and ST 5030.17, Revision 4, "Intermediate Range Prestartup Functional Test" was performed. The inspector reviewed test ST 5030.17 for IRM channel three and the completion of ST 5030.16.

The MTE selected met the accuracy requirements of the procedure. Each piece of MTE was verified to be in calibration and logged with the test package. Two technicians were used to perform the test and the lead was a qualified DBIC journeyman. QC was notified prior to performing the test and a QC inspector witnessed the calibration. The test was completed satisfactorily and it met TS 2.2.1, 4.3.1.1.1 and 4.3.1.1.2.

d. The inspector observed the completion of ST 5084.01, Revision 10, "Station Batteries Weekly Surveillance Test". The test was performed on the following pilot cells:

1N-21	1P-10
1N-56	1P-36

While testing the 1N cells, the inspector observed the electrician recording the cell temperature with a Taylor Bi-Therm thermometer, Equipment Number MC 2.54. The thermometer was not labeled with a properly dated calibration sticker as required by Section 6.5 of MP 1410.03, Revision 10, "Maintenance Test Equipment Calibration" and as required by Toledo Edison Nuclear Quality Assurance Manual, Section 12, "Control of Measuring and Test Equipment". The electrician was requested to reperform the test and used a calibrated digital thermometer. The digital thermometer, MC 2.41 had a calibration due date of May 31, 1985. Three electricians were used to perform the test and the lead was a qualified Davis-Besse electrical journeyman. The test was completed satisfactorily and it met TS 4.8.2.3 and 4.8.2.4.

The inspector continued a review of the Electrical Department Control and use of MTE, in particular, the storage and handling of glass hydrometers. The hydrometers were stored in a controlled area and in a locker designated for Electrical MTE. The locker contained both "In-Cal" and "Out-of-Cal" instruments. The inspector observed four (4) hydrometers labeled with Equipment Numbers lying on an "In-Cal" shelf without calibration stickers. The accompanying electrical foreman removed the hydrometers, indicated their "Out-of-Cal" status and placed them on an "Out-of-Cal" shelf. These instances are a violation of 10 CFR 50, Appendix B, Criterion XII for not properly identifying and controlling the use of MTE and are examples of an item of noncompliance (346/84-22-03(DRS)).

No other items of noncompliance or deviations were identified.

6. Independent Inspection

a. The inspector reviewed the bistable trip setpoints for the following procedures:

Procedure	Number/Revision	Title
RPS	ST5030.02.21	RPS Monthly Functional Test
	ST5030.04.08	RCS Pressure to RPS Refueling Period Calibration
	ST5030.05.07	RCS Flow to RPS Refueling Period Calibration
	ST5030.06.14	RCS Temperature Input to RPS Refueling Period Calibration
	ST5030.07.07	Containment Pressure to RPS Monthly Channel Functional Test

	ST5030.15.06	RPS Shutdown Bypass High Pressure and High Flux Trip Functional Test
	ST5030.16.10	RPS Monthly Functional Test in Shutdown Bypass
	ST5030.18.06	Check RPS Flux/Delta Flux/Flow Bistable Setpoint
SFAS	ST5031.01.10	SFAS Monthly Test
	ST5031.02.10	RCS Pressure Input to SFAS Refueling Period Calibration
	ST5031.03.10	Containment Pressure to SFAS Channel Calibration
	ST5031.04.13	Containment Radiation Monitor Input to SFAS Refueling Period Calibration
	ST5031.05.08	BWST Level Inputs to SFAS Channel Calibration
	ST5031.13.01	Containment Radiation Monitor Trip Setpoints
SFRCS	ST5031.14.13	SFRCS Monthly Test
	ST5031.16.06	Steam Generator Level to SFRCS Refueling Calibration

Reference materials used to complete the review were MPR Associates Inc. reports MPR-731 (RPS), 713 (SFAS), 732 (SFRCS), and Technical Specifications Tables 2.2.1 (RPS), 3.3.4 (SFAS), and 3.3.12 (SFRCS).

The bistable setpoint range of actuation was determined by combining the errors attributed to the MTE used in the calibration, drift, instrument tolerance and any additional margin added in by the licensee. The range of bistable actuation was then compared to the TS to ensure the trip setpoint allowable value was not exceeded.

It was determined that the procedures listed had enough margin allowed in setting the bistable to ensure the bistable trip setpoint range would not exceed the TS trip setpoint allowable value.

Additional procedures were reviewed that had sections relating to the above list. SFAS containment radiation setpoint is set at two times (2X) background at rated thermal power. Procedure ST 5031.13 and ST 5031.04 are needed to determine and adjust the trip setpoint. Over the refueling calibration period and monthly functional test period there is the chance that the background may change causing the 2X background setpoint to be exceeded. Procedure ST 5099.01, Revision 18, "Miscellaneous Instrument Shift Checks" is performed each shift and provides instructions in step 6.2.4 to notify the IC Engineer to recalibrate the containment radiation trip setpoint if the 2X background trip would be exceeded.

Three procedures were reviewed to determine if adequate instructions were provided to ensure the high flux trip would be set correctly. Procedure PP 1102.01, Revision 14, "Pre-Startup Checklist", uses the

mode checklists to determine which surveillance tests are required before making a mode change. The following checklists were checked for the correct ST to set the high flux trip:

Mode #4 Hot Shutdown Checklist	Setpoint
Step B.8 requires ST 5030.15	$\leq$ 5%
Mode #3 Hot Standby Checklist	
Step B.7 requires ST 5030.15	$\leq$ 5%
Mode #2 Startup Checklist	
Step B.16 requires ST 5030.16	5%

Procedure PP 1102.02, Revision 18, "Plant Startup", provides a note in section 7.1 to set the high flux trip per the Shift Supervisor's recommendation for the number of RCP's operating.

During power operation and a RCP trips, procedure AB 1203.21, Revision 2, "Reactor Coolant Pump and Motor Abnormal Operation" has instructions in steps 1.3.4, 2.3.4, and 5.3.4 to reduce the high flux setpoint for three RCP operation.

The additional procedures reviewed met their applicable TS requirements.

b. The inspector reviewed the testing of PYCO (3-wire) and Rosemount (4-wire) RTD's used in the Post Accident Monitoring System as a result of the linearity problem observed in item 346/82-25-01 of this report. The RTD's are used to monitor the saturated temperatures (Tsat) in the reactor coolant system after a loss of coolant accident. The RTD's are connected to 3-wire linear bridges. The inspector reviewed the installation and testing of the Tsat instrument string as implemented by Facility Change Request 79-439. Initial testing was completed by TP 520.21, Revision 0, "T-SAT/P-SAT Meter Post Implementation Test" and the testing was completed satisfactorily. The test data from ST 5038.01, Revision 2, "TSAT Channel Calibration 18 Month" was reviewed and no linearity problems in the string calibration were noted. The test was completed satisfactorily and it meets the requirements of TS 4.3.3.6 and Table 4.3.10 and it appears that 4-wire RTD's will operate satisfactorily with a 3-wire bridge.

No other items of noncompliance or deviations were identified.

7. Exit Meeting

The inspectors met with licensee representatives (denoted in Paragraph 1) on November 21, 1984 and December 14, 1984 to discuss the scope and findings of the inspection. The licensee acknowledged the statements made by the inspectors with respect to items discussed in the report.