

U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-346/85022(DRP)

Docket No. 50-346

License No. NPF-3

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

Facility Name: Davis-Besse 1

Inspection At: Oak Harbor, OH

Inspection Conducted: June 25 through August 12, 1985

Inspectors: W. G. Rogers
D. C. Kosloff
D. S. Butler
N. C. Choules

Approved By: *I. N. Jackiw*
I. N. Jackiw, Chief
Reactor Projects Section 2B

9-6-85
Date

Inspection Summary

Inspection on June 25, through August 12, 1985 (Report No. 50-346/85022(DRP))

Areas Inspected: Special inspection by resident and regional inspectors of licensee actions on the root cause investigation of malfunctioning equipment during the transient of June 9, 1985. Routine, unannounced inspection of previous inspection findings, long term shutdown, allegation followup, TMI Action Items, Licensee Event Reports and senior management facility tours. The inspection involved 648 inspector-hours onsite by four NRC inspectors including 180 inspector-hours onsite during off-shifts.

Results: No violations or deviations are being issued at this time. Several findings are being evaluated as to their significance and potential for enforcement action.

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DETAILS

1. Persons Contacted

a. Toledo Edison

J. Williams, Jr., Senior Vice President Nuclear
*T. Murray, Nuclear Mission Assistant Vice President
*L. Storz, Plant Manager
*W. O'Conner, Operations Superintendent
S. Quennoz, Group Director of Engineering
*S. Smith, Superintendent of Maintenance
J. Faris, Administrative Coordinator
J. Ligenfelter, Technical Superintendent
R. Peters, Nuclear Licensing Manager
*S. Wideman, Senior Licensing Specialist
J. Wood, Facility Engineering General Supervisor
B. Beyer, Nuclear Projects Director
L. Simon, Operations Supervisor
*M. Beier, Quality Engineering Supervisor

b. NRC

*W. Rogers, Senior Resident Inspector
*D. Kosloff, Resident Inspector
D. Butler, Regional Inspector
N. Choules, Regional Inspector

*Denotes those personnel attending the August 9, 1985 exit.

The inspectors also interviewed other licensee employees, including members of the technical, operations, maintenance, I&C, training, health physics and nuclear materials management department staff.

2. Licensee Action on Previous Inspection Findings

- a. (Closed) Open Item (346/85003-13): Review of the emergency diesel alarm procedures for applicability during running and nonrunning conditions. The licensee reviewed the procedures and revised the procedures appropriately. The inspector verified that the revised procedures were present at the alarm panels. This item is closed.
- b. (Closed) Open Item (346/8018-02): Establishment of the Electrical Distribution Book as a controlled document. The book has been issued as controlled drawing number E-1040A. This item is closed.
- c. (Open) Violation (346/84020-01): Lack of control over testing activities. The inspector verified that a test leader was assigned for each test performed during the remainder of the 1984 refueling outage. The inspector verified that AD 1805.00, Procedure Preparation and Maintenance, had been modified to require the test performance

requirements of AD1801.00, Station Modification Acceptance Test Program, be incorporated into test procedures. Closure of this item in a future inspection will be contingent upon:

- (1) Verification that the station staff was trained on AD1801.00, AD1807.00 and AD1839.00 by July 1, 1985;
 - (2) Verification of a sign on the auxiliary feedwater door discussing operability;
 - (3) Verification that a chronological log and control copy for TP641.00 exists.
- d. (Closed) Open Item (346/85004-04): Replacement of decay heat interlock pressure switch. The inspector verified through record review that the switch was replaced under Facility Change Request 82-168. This item is closed.
- e. (Closed) Open Item (346/85004-02): Senior reactor operator review of maintenance work orders. AD1844.00, Maintenance, has been revised by T-Mod 9008, clarifying the review process. This item is closed.
- f. (Closed) Open Item (346/85010-05): Overtime requirements for maintenance personnel. AD1844.00, Maintenance, has been modified to provide the appropriate guidelines. This item is closed.
- g. (Closed) Violation (346/81003-01): Company Nuclear Review Board (CNRB) failures to review required correspondence. The inspector verified that Facility Change Request 81-132 was reviewed satisfactorily by the CNRB. Review of numerous CNRB minutes revealed that audit finding reports and station review board minutes were being reviewed. This item is closed.
- h. (Closed) Unresolved Item (346/8029-02): Overfeed transient requiring operator action. Facility Change Request 80-110 was implemented during the 1984 refueling outage. This modification isolates main feedwater to the steam generators if level is too high in either steam generator. Also, the additional shielding of the neutron detectors from the higher density downcomer coolant was evaluated by the NRC with no action required. The results of that evaluation are stated in a letter from the Chief of Operating Reactors Branch #4 to Toledo Edison dated May 12, 1982. This item is closed.
- i. (Closed) Open Item (346/84007-02): Material handling weaknesses. The (A) section of this item was closed in IER84012. Only section (B) of this item remained outstanding, regarding the inspection of material handling equipment. The licensee has established and implemented an inspection program as delineated in section 8, Followup Action System, of the Nuclear Material Management Procedures. This item is closed.

- j. (Closed) Open Item (346/81010-02): Replacement of reactor coolant system flow transmitters manufactured by Bailey with ones manufactured by Rosemount. The transmitters were replaced under Facility Change Request 78-525. Though environmentally qualified, the transmitters exhibit high noise levels which was a major contributor to the reactor trip of April 24, 1985. The licensee has unsuccessfully attempted to filter out the noise. The inspector will maintain an open item (346/85022-01) on the licensee's effort to eliminate or significantly reduce the noise.
- k. (Closed) Violation (346/83001-04): Failure to perform adequate testing. The inspector verified that ADMIN 013, Safety Evaluations, had been issued in the Nuclear Practices and Procedures series. The inspector determined that reviews of procedures using the Updated Safety Analysis Report (USAR) and the recording of operability requirements by Technical Section personnel were not viable. The licensee has since abandoned these programs and is performing a system-by-system review of the USAR described in the licensee's response to the Systematic Appraisal of the Licensee's Performance. The inspector will follow the licensee's actions in this area under open item 346/RP-99029. The licensee has completed the ASME section XI check valve testing review and incorporated solutions to the deficiencies in the current testing program. The licensee has upgraded testing of Technical Specification alarms by modification of procedures AP3005.01, ST5020.01 and issuance of procedure ST5020.02. This item is closed.
- l. (Closed) Open Item (346/79005-01): Implementation of a corrective action for failure to meet boric acid heat trace temperature requirements following makeup water injection through a portion of the boric acid addition line. The licensee implemented Facility Change Request 78-111 Revision C. This change request was a submittal to the NRC to change surveillance requirements on the heat trace line. Technical Specification amendment 67, granted by the NRC, allows some flexibility on when the boric acid heat trace temperature must be taken after makeup water transfer has taken place through the line. This item is closed.
- m. (Closed) Violation (346/83001-03): Failure to write nonconformance reports. The inspector reviewed the trending program established by QAI4151, Trend Analysis, in response to this violation and considered the program acceptable as implemented. This item is closed.
- n. (Open) Open Item (346/83019-02): Technical Specification on secondary safety valves. The licensee has initiated Facility Change Request 85-05 to request a license amendment to change Technical Specification section 3.7.1.1.
- o. (Closed) Open Item (346/81010-03): Installation of safety grade auxiliary feedwater flow indication. The flow indication was installed under Facility Change Request 79-430. This item is closed.

- p. (Closed) Open Item (346/84001-02): Notification of the NRC when the licensee invokes IEB 79-14 interim allowable stress limits. Procedures NFEP-050, Processing Surveillance Reports, and NFEP-036, Processing Nonconformance Reports, Supplier Deviation Reports and Supplier Deviation Disposition Reports, have been modified to require informing the resident inspector whenever the interim stress criteria is used. This item is closed.
- q. (Closed) Open Item (346/84028-05): Maintenance procedure for Limitorque valves. MP1410.10; Velan 2 1/2" to 24" Forged Gate, Globe and Check Valve Bonnet Gasket Replacement; has been written and issued. The inspector reviewed the procedure and determined that the IEB82-02 guidance had been incorporated. This item is closed.
- r. (Closed) Open Item (346/85004-01): Use of facility change notices to revise drawing change notices. Procedure NFEP-020, Design Work Packages, has been modified to eliminate this practice. The drawings identified as examples of this practice have been revised. This item is closed.
- s. (Closed) Violation (346/82034-01): Failure to test computer alarms. The licensee was to perform three corrective actions. Action 1 was reviewed satisfactorily in IER84028. Action 2 was modified in a letter to NRC Region III on January 3, 1985. Based upon that letter and the inspection performed on this item in IER84028, action 2 is considered complete. Action 3 was to modify ST5010.03, Post Refueling Physics Testing. The inspector verified this procedure had been modified to include testing the control rod drive sequence alarm circuitry. The inspector considers all corrective action for this violation implemented and the item closed.
- t. (Closed) Violation (346/84022-01(DRS)): The licensee did not perform surveillance test ST5067.01, Emergency Ventilation System Monthly, as required by Technical Specification (TS) 3.9.12. The inspector reviewed the licensee's corrective action taken to avoid further violations. Procedures PP1102.01.18, Pre-Startup Checklist, and ST5092.02.01, Core Alteration Prerequisites and Periodic Checks, were modified to include TS 3.9.12 requirements. The Davis Besse Maintenance Management System was modified to require performance of ST5067.01 monthly in operational modes 1 through 6. The inspector verified that ST5067.01 had been performed on July 13, 1985 with the plant in mode 6. This item is closed.
- u. (Closed) Violation (346/84022-03(DRS)): The licensee performed ST5084.01.10, Station Batteries Weekly Surveillance Test, using an uncalibrated piece of Measuring and Test Equipment (MTE). The inspector reviewed the licensee's corrective actions to avoid further violations. Procedure ST5084.01 has been modified to require the use of only calibrated MTE. The inspector interviewed electrical maintenance personnel and determined that they were knowledgeable of the calibration and storage of MTE. In addition, the inspector

verified that mechanical dial thermometers and glass hydrometers were in the MTE program; their accuracy was verified; and they were stickered to indicate their calibration status. This item is closed.

- v. (Closed) Violation (346/84022-02(DRS)): The licensee did not demonstrate the audible indication function of the Source Range Neutron Flux Monitor (SRM) prior to performing core alterations as required by Technical Specification (TS) 3.9.2. The inspector reviewed the licensee's corrective action taken to avoid further violations. ST5091.01, Source Range Functional Test, was modified to provide a functional test of the NIMBIN audible indication in the control room and inside the containment building. In addition, ST5099.01.19, Miscellaneous Instrument Shift Check, was modified to ensure TS 4.9.2.c is completed prior to core alterations and a comparison of the NIMBIN indicators is made. This item is closed.
- w. (Closed) Unresolved Item (346/84019-10(PAS)): The licensee did not maintain investigation records on out-of-calibration test instruments. The inspector reviewed maintenance procedure MP1410.03, Maintenance Test Equipment Calibration, and instrument calibration procedure IC2100.00, Test Equipment Calibration. The licensee has modified each procedure to review the Test Equipment Index Files for test equipment found out of calibration, missing, damaged or inoperable. Equipment requiring rework is identified in writing. An Out Of Calibration Test Equipment Action Taken Data Sheet (Attachment 2 of MP 1410.03) is filled out documenting the required action. A Retest List is proposed and Maintenance Work Orders are issued for each retest. The completed work is reviewed by the section foreman and maintenance supervisor. Attachment 2 is filed in the individual test equipment record file. This item is closed.
- x. (Closed) Unresolved Item (346/84019-03(PAS)): Observation of maintenance and operations activity. The licensee agreed to increase observation and improve documentation of quality assurance department personnel's observations. The inspector's review of this item showed that procedures had been revised to require observation of activities and to improve documentation. Review of recent audit reports showed that observation of activities by quality assurance auditors was being performed. This item is closed.
- y. (Open) Violation (346/83001-02): Failure to identify the cause of significant conditions adverse to quality. The licensee provided multiple short term and long term corrective actions. The inspector reviewed the short term corrective actions. Items A, B, C, D and F were accomplished per the violation response. Item E was to revise the main steam isolation valve (MSIV) maintenance procedure, MP1410.72, to specify all critical dimensions which are to be set and/or recorded during maintenance. This revision was to be performed by August 1, 1983. The inspector reviewed MP1410.72 and noted that the last procedure revision was issued on January 30, 1985 and the revision prior to that was the original issue of the procedure on July 23, 1982. Therefore, the licensee did not meet

the August 1, 1983 commitment. Also, the inspector could not determine from the procedure where any critical dimensions were required to be taken or recorded prior to disassembly or to verify proper valve assembly. The inspector discussed this situation with cognizant members of the maintenance staff. These discussions revealed that a sheet was being attached to the maintenance work orders for MSIV maintenance which required recording of critical dimensions before and after valve assembly. The inspector verified through record review that these sheets had been used on the one occasion when MSIV maintenance had been performed since the violation occurred. Attachment of the critical dimension sheet is not controlled or identified as required to be done in MP1410.72 and there is no assurance that the sheet will be used in the future. The inspector requested that the critical dimensions be recorded in MP1410.72 and be included as acceptance criteria for adequate completion of maintenance where appropriate. This is considered an open item (346/85022-02). The long term corrective actions will be reviewed in a future inspection.

3. Long Term Shutdown

The inspector observed control room operations, reviewed applicable logs and conducted discussions with control room operators during the months of July and August. The inspector verified surveillance tests required during the shutdown were accomplished, reviewed tagout records, and verified applicability of containment integrity. Tours of the facility's accessible areas, including exterior areas were made to make independent assessments of equipment conditions, plant conditions, radiological controls, safety, and adherence to regulatory requirements and to verify that maintenance requests had been initiated for equipment in need of maintenance. The inspector observed plant housekeeping/cleanliness conditions, including potential fire hazards, and verified implementation of radiation protection controls. The inspector by observation and direct interview verified that the physical security plan was being implemented in accordance with the station security plan. The inspector reviewed the licensee's jumper/bypass controls to verify there were no conflicts with technical specifications and verified the implementation of radioactive waste system controls.

During a tour of the auxiliary building, the inspector observed a disconnected wire which did not have a lifted wire tag on valve CV5016. CV5016 was under repair at the time. All other wires that had been disconnected were tagged. The inspector reviewed the drawings associated with the electrical scheme of CV5016 and was not able to determine the identification number for the wire in question. The inspector ascertained through discussion with the licensee that the wire is the shielding wire for the cable shield and does not need to be tagged. This matter is considered closed.

During the last two weeks of July, the licensee identified non-siesmically qualified startup strainers installed in the suctions of both high pressure injection pumps. The inspector will follow up on the licensee's

investigation into when the strainers were installed and why they were not removed. This issue is considered unresolved (346/85022-03).

During a tour of the turbine building, the inspector observed holes in the wall between the auxiliary feedwater pump rooms and in the wall between the #1 auxiliary feedwater pump room and the condenser pit. The holes were filled with Bisco fire seal and fireproof fiber. The inspector questioned the flood retention capability of the fire seal in these holes. The inspector will review the licensee's evaluation of this situation. This is considered an unresolved item (346/85022-04).

While on a tour of the auxiliary building during a rainstorm, the inspector heard and observed water running down the outside of the containment. This condition was brought to the attention of the licensee who plans to determine the cause and provide corrective action for this condition. This is considered an open item (346/85022-05).

4. Allegations

On May 21, 1985, the inspector received an anonymous phone call in which the caller alleged that a member of the C & HP staff had received a radiation overexposure while working at the radwaste drumming station. The inspector reviewed Radiation Exposure Permit (REP) 85-87. This REP documented the only recent situation in which C & HP staff members had received significant radiation exposure. The inspector's review revealed that no one working on the job controlled by REP 85-87 had been overexposed to radiation. No one on the job had an exposure that exceeded administrative radiation exposure limits, the total man-rem received was less than the man-rem estimated for the job, and the exposure received by individual C & HP staff members was consistent with the exposure of other individuals who worked on the job.

5. Inspection of Action Plans

The troubleshooting performed by the licensee on systems which may have contributed to the abnormal behavior of equipment during the June 9, 1985 event is controlled by detailed action plans and maintenance work orders. The first phase of each action plan includes detailed inspection and the recording of as-found conditions. Work then progresses as indicated by the nature of the abnormal behavior and the type of equipment involved. As the work progresses, ongoing results are noted in detail. The resident inspectors, with assistance from other Region III inspectors, observed the majority of the work done during the inspection period.

During the initial inspection and disassembly of components for each action plan, photographs were taken to record as-found conditions. Additional photographs are being taken as work progresses to record any additional conditions that may not have been recorded by the initial sets of photographs. A copy of each photograph is being given to the inspector.

Listed below are the significant observations of the inspectors for each action plan.

- a. Main Feedwater Pump Turbine (MFPT) and Controls: MFPT #1 local valve actuator panel had three LVDT (Linear Variable Differential Transducer) cannon plugs with loose connector shells; however, the plugs appeared correctly mated. In the local panels oil was laying on an exposed solenoid valve terminal strip and on the thrust wear detector pressure switches. The vibration pickup connectors for MFPT #1 and BFP (Booster Feed Pump) did not have good cable restraints; however, they did appear functional. Troubleshooting of the MFPT #1 MDT 20 speed controller took place in the control room. A 1 KHZ square wave input to Test Point TP 703 on the speed signal redundancy circuit board was monitored at TP 903 on the integrating amplifiers circuit board. The frequency to voltage (f/v) integrated circuit (IC 901) is between those test points. No output was observed at TP 903. Additional testing confirmed that the f/v circuit board was defective. Failure of IC 901 simulated zero turbine speed causing the controller circuitry to continuously increase the turbine speed until it tripped on overspeed. The board was shipped offsite for further evaluation.

Inspection of the MFPT sumps revealed four pressure reducing valve unit seats unpinned. This should not have affected the performance of the valves since a spring holds them in place.

- b. Auxiliary Feedwater Pump Turbine and Controls: Some of the operators who had participated in the June 9, 1985 event and the turbine vendor representative observed exercising of the overspeed trip throttle valves. The trip throttle valves were tripped and reset several times while the vendor representative pointed out specific areas to observe in the overspeed trip-to-valve linkage which verify resetting of the valve. Discussion with the operators and training staff revealed that these methods of verification were unknown to the operators and were not part of the operators' training. A review of the overspeed reset procedure revealed that the procedure did not provide enough information to reset the trip. Tests were conducted which showed that it was possible to cycle the trip-reset indicating limit switch fast enough to prevent the alarm printer from recording the change of state of the limit switch.
- c. Steam and Feedwater Rupture Control System: During channel and instrument calibration checks and response time testing the steam generator (SG) high level trip was found out of tolerance by 1 mv and a SG level transmitter found slightly out-of-tolerance was recalibrated. The inspector, after discussion with regional management, requested that any other transmitters found out-of-calibration be left as found until the licensee determined that the as-found readings would not be needed for future testing. While observing SG level bistable calibration and time response testing the inspector noted that procedure ST 5051.15.6 (used to perform the testing) required two temporary changes to complete the test. Two SG level transmitters were found out of calibration.

- d. Startup Feedwater (SUFW) Valve SP7A: The calibration check of FT SP3A (the transmitter measuring flow through SP7A) revealed that the transmitter was slightly out of calibration. However the flow loop appeared to respond adequately to simulated flow conditions. String testing was performed from the transmitter through the output buffer amplifier which inputs to the computer point for SUFW flow indication. The indication was off slightly at the high end but in tolerance near the flow rate that was indicated during the June 9, 1985 event. A static pressure test (zero shift) performed to a pressure of 1,000 psig revealed a small zero shift in the negative or conservative direction. Air was observed leaking from the inlet to the valve actuator cylinder cover. A test was performed which showed that this leakage did not affect the operation of the valve.
- e. Source range instruments (NI-1 and NI-2): Externally generated electrical noise was observed at the input to both channels of the NIs. Noise spikes were observed when an instrument mechanic opened the RPS Channel 3 cabinet door. The licensee informed the inspector that this is a recurring problem. All the safety related cabinets are "daisy chained" together through a common annunciator circuit. This nonsafety related annunciator alerts the reactor operator to an open cabinet door. The noise spikes apparently generated by the annunciator circuit seem to indicate a failure to properly separate a nonsafety system from divisionally separated safety related systems. This Unresolved Item (346/85022-06(DRS)) will be the subject of additional inspection.
- i. NI-1: Large random variations in count rates were observed. Various methods were used unsuccessfully in attempts to induce similar count rate variations. Resistance measurements were taken on connectors at the cabinet and on cables. Reflectometer readings were taken on cables. A station ground connection for cabinets C5755E and C5755F was found loose. The cable ground to station ground showed some erratic readings.
- ii. NI-2: Various unsuccessful attempts were made to duplicate the failure of this channel which had occurred on June 9, 1985. A recorder was installed to monitor count rate, start-up rate and detector high voltage. The high voltage was cycled off and on by increasing and decreasing the intermediate range indication. On one occasion the count rate did not respond until five minutes after the high voltage was turned on, indicating high voltage was not getting to the detector.
- f. Turbine Bypass Valve (TBV) SP13A2: The header drain valve and steam traps were disassembled and removed. Some internal damage was noted and some foreign material was found inside the traps and the drain valve. It was later determined that neither condition contributed to the damage to SP13A2. TBV SP13A and its operator were disassembled. The cotter key, nut, washer and pilot valve disc was missing from the bottom of the main valve disc assembly, this had allowed abnormal movement of and damage to the valve disc assembly

components. An O-ring at the top of the operator was deformed and apparently sealant had been used to stop leakage past the O-ring. Additional TBVs were disassembled. The other five TBVs were normal, however the nut at the bottom of each plug assembly was held in place by a star ring instead of a cotter key. The valve manufacturer informed the licensee that the star ring had been used at the time the plant was built and the cotter key was a later design improvement. The common isolation valve for both TBV header drain headers was found closed and was not controlled by procedure. This had rendered the steam traps and header drain valves useless.

- g. Power Operated Relief Valve (PORV): When the PORV was removed, the licensee noted that three of the valve-to-flange bolts were only finger tight. There was no evidence that this had allowed leakage or any other abnormal function. During disassembly of the PORV two representatives from the manufacturer were present. No damage or abnormal wear was noted and no other conditions were noted that could have caused the PORV to malfunction. During testing of the PORV control circuit an abnormality was observed in that when the voltage was increased, voltage at the valve was observed prior to the bistable light coming on.
- h. Valves AF599 and AF608: Differential pressure (dp) testing of both valves was performed. A dp of 1050 psi was established across AF608 and the motor operator was used to open the valve three times. During the first opening, no problems were noted. During the second opening, chattering of the torque switch, with the brake cycling (engagement and disengagement), was observed. On the third opening test the valve failed to open due to torque switch actuation. Chattering of the torque switch was again observed. When the valve hand operator was turned approximately 3/4 of a turn open, the motor operator opened the valve. Valve AF599 failed to stroke open on three attempts with a dp of 1050 psi. Failure to stroke was due to torque switch actuation. Tests at 750 dp and 350 dp were performed on both valves with no problems noted. Three additional attempts to open AF608 with 1050 dp produced the same results as the earlier 1050 dp tests.
- i. Steam Line Pressure Discrepancies: Bench testing on Integrated Control System (ICS) integrator module ICS 4.3.4 revealed that it was unstable. The module will be taken to Bailey Instruments for further testing. ICS Modules IC 4.3.4 and IC 4.3.6, both "Summer + Proportional + Integral" were removed for testing by Bailey. Also, Steam Generator 1 pressure channel PI-SP 12/B1 calibration was found slightly off at the low end, but was in calibration in the area of normal operation.
- j. Service Water Valve Controls for Auxiliary Feedwater (AFW) Supply: Tests showed that the response time of the AFW pump suction pressure transmitters was short enough to allow a short duration low pressure condition to be detected by the pressure transmitters without being recorded by the alarm printer.

- k. Valve MS106: Motor wire checks revealed one loose wire in the motor body. The wire is part of the input to the computer for valve position. The licensee reviewed the prints associated with this wire and determined that this wire being loose would not have caused the problem noted on June 9, 1985. The wire check also revealed that one wire was installed electrically correct but not in the sequence specified on the drawing. Also, some wires had not had their labels transferred into direct current nomenclature when the valve power supply was changed from AC to DC a number of years ago. Test stroking of the valve revealed that the torque switch was improperly set and that the torque switch was not in a balanced condition. The condition of the torque switch is an unresolved item (346/85022-07) which requires further inspection. A slight ground was also identified in the circuitry.

6. TMI Action Items

- a. (Closed) Item II.K.2.10.B: Licensee implementation of a safety grade Anticipatory Reactor Trip System (ARTS). The inspector reviewed the following surveillance tests (ST) against Davis-Besse Technical Specifications (TS):

5030.19.03	ARTS Monthly Functional Test
5031.14.14	SFRCS Monthly Test
5031.18.07	Steam and Feedwater Rupture Control System Integrated Test
5099.01.18	Miscellaneous Instrument Shift Checks

The ST's fully meet TS requirement 4.3.2.3 and TS definitions for Channel Calibration (1.9) and Channel Check (1.10).

- b. (Open) Item II.F.2.3.B: Licensee implementation of core cooling instrumentation. The inspector reviewed the following surveillance tests (ST) against Davis-Besse Technical Specifications (TS):

5038.01.03	TSAT Channel Calibration 18 Month
5038.02.04	PSAT/TSAT Monthly Channel Check

The ST's fully meet TS requirement 4.3.3.6 and TS definitions for Channel Calibration (1.9) and Channel Check (1.10). The instruments are TS Table 4.3-10; Instrument 26, "RC System Subcooling Margin Monitor"; and Instrument 34, "Incore Thermocouples".

The inspector reviewed the following drawings to ensure all changes had been incorporated:

M-030B	Rev. 1	Reactor Coolant System Instrumentation Loop Diagram
J-107	Rev. 1	Index Sh. Reactor Coolant Temp & Press Monitor
J-107	Rev. 0	Sh. 1 Reactor Coolant Temp Monitor CHNL B NNI CHNL 4 RPS

J-107	Rev. 0 Sh. 2	Reactor Coolant Temp Monitor CHNL 2 TSAT CHNL 2 RPS
J-107	Rev. 0 Sh. 3	Reactor Coolant Temp Monitor CHNL 1 TSAT CHNL A NNI
J-107	Rev. 0 Sh. 4	Reactor Coolant Temp Monitor CHNL A NNI CHNL 3 RPS
J-107	Rev. 0 Sh. 5	Reactor Coolant Temp Monitor CHNL 1 TSAT CHNL 1 RPS
J-107	Rev. 0 Sh. 6	Reactor Coolant Temp Monitor CHNL 2 TSAT CHNL B NNI
J-107	Rev.0D Sh. 7	RC Press TSAT Meter FCN 3817 Channel 1
J-107	Rev.OE Sh. 8	RC Press TSAT Meter FCN 3817 Channel 2
J-107	Rev. 0 Sh. 10	RC Press and Temp TSAT Channel 1
J-107	Rev. 0 Sh. 11	RC Press and Temp TSAT Channel 2
J-101	Rev. 1 Index Sh.	Incore Temp Monitoring
J-101	Rev. 0 Sh. 1, 2, 3, 4, 5, 6	Incore Temperature Monitoring Channel 1
J-101	Rev. 1 Sh. 7, 11, 12	Incore Temperature
	Rev. 0 Sh. 8, 9, 10	Monitoring Channel 2

The drawings were properly identified to ensure changes were to be incorporated.

- c. (Open) Item II.E.1.2.2c: Auxiliary Feedwater Flow Indication. The inspector visually verified that the flow meters had been installed. The inspector asked control room personnel whether the indicators were functional. The personnel stated that flow had been indicated on the meters when the auxiliary feedwater pumps were operating. The inspector will review the acceptance procedure and associated surveillance tests in a future inspection.
- d. (Closed) Item II.F.1.5, Additional Accident Monitoring - Containment Water Level. This action item required the installation of (1) A narrow range level instrument to measure the water level from the bottom to the top of the containment sump, and (2) A wide range level instrument to cover the range from the bottom of the containment to a level equivalent to 600,000 gallons of water. The inspector verified through the review of completed Facility Change Requests (FCR 79-408 and FCR 79-409) and visual verification of level indicators in the control room, that the narrow and wide range containment level instruments had been installed in 1982. The level instruments were originally tested and calibrated per test procedure TP 520.27 for the wide range and TP 520.24 for the narrow range. The instruments have been added to the Technical Specifications. They are checked periodically per Surveillance Tests as required by Technical Specification 4.3.3.6.

7. Licensee Event Reports Followup

Through direct observations, discussions with licensee personnel, and review of records, the following event reports were reviewed to determine that reportability requirements were fulfilled, immediate corrective

action was accomplished, and corrective action to prevent recurrence had been accomplished in accordance with technical specifications.

(Closed) LER 83-52, Decay heat cooler valve not pinned closed. DH13A was repaired under Facility Change Request 83-075. AD1844.00, Maintenance, has been modified to require a senior licensed operator review of maintenance work orders prior to implementation.

(Closed) LER 82-56, Jockey fire pump inoperability. The licensee has closed out the corrective actions associated with this LER in their internal tracking system.

(Open) LER 85-12, Auxiliary feedwater control room panel indicator wiring error. The inspector reviewed the circumstances and events leading up to the miswiring of the flow indicator. Based upon discussions with the personnel involved and record review, the following scenarios were developed. Following the reactor trip and Steam Feedwater Rupture Control System actuation on March 21, 1985, the licensee noticed that one of the flow indicators for auxiliary feedwater to the #1 steam generator, FI4521, did not indicate flow when it should have. A maintenance work order was issued on March 26, 1985, to recalibrate the sonic flow transmitter associated with the flow indicator. The assigned maintenance technicians acquired the services of the cognizant I&C staff individual who had been trained in the use of the calibration device used to check the transmitter. The transmitter was checked and found properly calibrated using the technical manual associated with this transmitter. However, on the initiative of the lead technician and while the calibration check was in progress, he sent another technician into the control room to observe the response of the flow indicator. Using the calibration technique designated, only the local flow indicator in the turbine building is observed. The technician in the control room observed the flow indicator not functioning properly. Since the maintenance work order did not allow maintenance activities on the flow indicator but only on the transmitter, a new maintenance work order was issued on March 29, 1985, to recalibrate or replace the flow indicator, FI4521. The technicians attempted to calibrate the indicator but were unsuccessful due to the meter pointer sticking throughout its travel. The technicians decided to remove the indicator from the control room for closer inspection of the indicator internals hoping to fix the sticking problem. The technicians disconnected the two electrical leads associated with the flow indicator and the two electrical leads associated with the discharge pressure for the #1 auxiliary feedwater pump. The additional leads had to be disconnected since the flow and the pressure indicator are integral pieces of one meter unit. The technicians then left the control room and proceeded to the I&C lab. Prior to disconnecting the leads, the technicians did not follow the administrative procedure associated with lifting leads, AD 1823.00, Jumper and Lifted Wire Control Procedure. Section 3.3.2 of AD1823.00 allows disconnecting leads during troubleshooting without tagging the leads provided the maintenance personnel do not leave the immediate work vicinity. Once the technicians left the control room area without leaving someone there or having the leads tagged, they were not acting

in accordance with the established administrative controls. This is considered an unresolved item (346/85022-08). Once in the I&C lab, the technicians removed the cover plate of the indicator exposing the meter internals. The technicians observed interference in the meter movement at the very back of the pointer past the pivot point. The technicians tried to shim a portion of the meter's movement to provide additional clearance for the back of the pointer but were unsuccessful. The meter was then discarded and a new meter acquired. The new meter was inserted in the control room and a voltage source placed on the flow indicator and the pressure indicator to verify that the pointer would respond to a prescribed valve for a given voltage. They both met the required tolerances and the leads were reconnected. However, the pressure leads were connected to the flow indicator and the flow leads were connected to the pressure indicator. The post maintenance testing requirements specified on both the original and the second maintenance work order were that the instruments meet the calibration tolerances of the instrument record. A specific surveillance test or a loop check was not specified. The testing requirements established did not identify the miswiring. This is considered an unresolved item (346/85022-09) pending additional review. On June 3, 1985, while performing the refueling test for the #1 auxiliary feedwater train, the operations personnel observed flow and pressure discrepancies during the test. A maintenance work order was written and the reversed leads were discovered and corrected during this maintenance on June 3, 1985. Therefore, from April 1, 1985 until June 3, 1985, the sonic auxiliary flow indicator was inoperable. Technical Specification 3.3.3.6 requires two flow indicators per steam generator. One may be out of service for 30 days or the plant must be placed in hot shutdown within 12 hours. The applicability of the Technical Specification is from hot standby and above. From April 13, 1985 until June 3, 1985, the plant was in hot standby or above. The plant was not placed in hot shutdown on May 14, 1985 this is considered an unresolved item (346/85022-10) pending further review. The inspector reviewed all surveillance testing performed on the auxiliary feedwater system after April 1, 1985, and determined that the test on June 3, 1985 was the first time the miswiring problem could have been credibly identified.

The inspector further reviewed the testing matrix associated with the sonic flow indicators and found that no 18 month channel calibration procedure existed. Discussion with I&C staff personnel revealed that this surveillance procedure had been written but had yet to be issued due to the necessity to resolve commitments on the procedure made by the station review board. The sonic flow indication system was originally installed as a short term TMI lessons learned item. Years after this installation, a Technical Specification amendment required this system to be in service as part of the post-accident monitoring instrumentation. The new Technical Specification required a monthly channel check and an 18 month channel calibration. To meet the 18 month channel calibration requirement, the licensee performed a channel calibration on June 28, 1984, for both flow indication systems. The calibration was performed using the vendor manual with the vendor representative present. The testing method used does not appear to be in the proper procedure format

as delineated in the licensee's administrative procedure nor were the calibration instructions approved by the station review board. This is considered an unresolved item (346/85022-11). Review of the calibration records associated with the calibration efforts of June 28, 1984, reveal the instruments to be inside the prescribed tolerances.

8. Management Tours

On July 18, 1985 the inspector toured the facility both Mr. Keppler, Regional Administrator of Region III, and Commissioner Asselstine. The tour included the route taken by a number of the operations personnel on June 9, 1985 to restore equipment to service outside the control room. The tour also consisted of a meeting with operations personnel and a presentation by the licensee on management initiatives being taken to improve the licensee's performance.

On July 25, 1985 the inspector accompanied Mr. Keppler and Commissioner Zech on a tour of the facility. The tour route was basically the same as the one taken on July 18, 1985 and included the licensee's training facilities. The licensee gave a presentation on actions being taken to achieve INPO accreditation in training and other management initiatives to improve the licensee's performance.

9. Unresolved Items

Unresolved items are matters about which more information is required in order to ascertain whether they are acceptable items, items of noncompliance, or deviations. An unresolved item disclosed during the inspection is discussed in paragraphs 3, 5 and 7.

10. Open Items

Open items are matters which have been discussed with the licensee, which will be reviewed further by the inspectors, and which involve some action on the part of NRC or licensee or both. Open items disclosed during the inspection are discussed in paragraphs 2 and 3.

11. Exit Interview

The inspector met with licensee representatives (denoted in Paragraph 1) throughout the month 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.