U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-346/85036(DRS)

Docket No. 50-346 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, OH

Inspection Conducted: September 23 through December 6, 1985

Inspectors: C. A. VanDenburgh _____ 12-23-85
Date

A. Dunlop Jr. _____ 12-23-85
Date

R. Smith _____ 12-23-85
Date

Approved By: M. Ring, Chief _____ 12-23-85
Test Programs Section Date

Inspection Summary

Inspection on September 23 through December 6, 1985 (Report No. 50-346/85036(DRS))
Areas Inspected: Special announced inspection by regional inspectors to identify a NRC review program for the System Review and Test Program (SRTP) required following the June 9 event; evaluate the SRTP procedures; evaluate the SRTP implementation; review the SRTP System Review Reports; perform SRTP test procedure review; and perform SRTP test procedure witnessing. The inspection involved 455 inspector-hours onsite and 98 inspector-hours in office by four NRC inspectors including 52 inspector-hours onsite during off-shifts.
Results: No violations or deviations were identified. However, some open items were identified during the inspection and are documented in the body of the report.

DETAILS

1. Persons Contacted

a. Toledo Edison

J. Williams, Jr., Senior Vice President Nuclear
L. Storz, Plant Manager
S. Quennoz, Group Director of Engineering
S. Smith, Assistant Plant Manager, Maintenance
W. O'Conner, Assistant Plant Manager, Operations
*J. Johnson, Engineering Supervisor, Operations
*L. Ramsett, TED Quality Assurance Director
*J. Heaton, Restart Quality Assurance
O. Mavro, SRTP Manager
*J. Ligenfelter, SRTP Coordinator
B. Zemenski, SRTP Test Manager
P. Hildebrandt, IPRC Chairman
S. Balch, JTG Chairman
*S. Piccolo, JTG Member
R. Peters, Nuclear Licensing Manager
T. Bloom, Licensing Staff
*S. Wideman, Senior Licensing Specialist

b. NRC

W. Rogers, Senior Resident Inspector
*D. Kosloff, Resident Inspector
*C. VanDenburgh, RIII Inspector
*A. Dunlop Jr., RIII Inspector

*Denotes those personnel attending the December 6, 1985 exit.

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

2. General

a. Course of Action Report

On June 9, 1985, the Toledo Edison Davis-Besse Nuclear Power Plant was operating at 90 percent power when it experienced an event that involved the loss of all feedwater. The NRC subsequently investigated the circumstances of this event and documented its conclusions in NUREG-1154 (Loss of Main and Auxiliary Feedwater Event at the Davis-Besse Plant on June 9, 1985). By letter dated August 14, 1985, the NRC advised Toledo Edison (TED) that the underlying causes of this event were indicative of significant programmatic and management deficiencies. Accordingly, NRC requested TED address these issues in

their response to the NRC concerns. A particular area of interest was identified in the enclosure to the August 14, 1985, letter concerning "the adequacy of safety system testing including verification that safety systems are tested in all configurations required by the design basis analysis."

By letter dated September 10, 1985, TED responded to the NRC August 14 letter and provided the "Toledo Edison Company Davis-Besse Nuclear Power Station Course of Action Report," dated September 9, 1985. This Course of Action (COA) report describes the activities that TED is undertaking to explicitly address each concern identified in the NRC letter. With respect to the safety system testing concern described above, TED proposed to implement a System Review and Test Program (SRTP). It is TED's intention that the SRTP will provide a comprehensive evaluation and functional demonstration of systems deemed to be "important to safe plant operations."

b. System Review and Test Program

TED has developed eight new administrative procedures, SRTP-001 through -008, which in conjunction with the existing plant procedures will implement the SRTP described in the COA. During the course of this inspection, the inspectors identified significant concerns based on their review of these procedures. These concerns were communicated to TED in an October 28, 1985, NRC letter and on October 31 by the inspectors in a meeting with TED. TED subsequently revised the SRTP procedures to address these concerns. This report reflects the inspector's review of these revised procedures.

The SRTP requires that TED review thirty-one systems that TED has determined are "important to safe plant operations". Attachment 1 provides a list of these systems. This list is not limited to safety-related systems and includes additional systems that TED has determined are important to reliable plant operations. The review of these systems will attempt to identify and correct any previously unidentified deficiencies and ensure that the systems have been satisfactorily tested in the configuration for which they were designed, as well as ensure that the present Technical Surveillances are adequate. This review is conducted by five System Review Groups (SRGs) and is reviewed and approved by an Independent Process Review Committee (IPRC). The IPRC was formed to provide an independent overall review of the SRTP to ensure that the scope and depth of the SRTP is adequate and that the results of other restart efforts have been adequately factored into the SRTP actions. Testing will be developed and implemented by a Test Organization under the control of a Test Manager. The procedures and test results are to be reviewed and approved by a Joint Test Group (JTG) in addition to the Station Review Board (SRB) and Plant Manager. The JTG consists of operations and system engineering personnel who act as a reviewing body and recommend test procedure and results acceptance by the Station Review Board (SRB).

In response to the NRC's request for a justification of safety-related systems which will not be included in the SRTP, TED has indicated that two additional systems will receive a limited supervisory review. These systems are listed in Attachment 1. This review will be in addition to the thirty-one systems already identified for review by the SRTP. This review will consist of a determination of the systems functions, system boundaries, and an interview of station personnel to identify problems and to evaluate the readiness of the system for operations. These findings will be presented to the IPRC for concurrence.

c. NRC Test Review Team

The review activities of this and subsequent inspection reports are but one aspect of a larger NRC program intended to determine the adequacy of the TED COA. The focus of this inspection report is to review and observe the performance and execution of the System Review and Test Program (SRTP) to assure that systems important to safe plant operations are fully functional. In support of this activity, the NRC has established a test review team consisting of Region III, I&E and contractor personnel. The NRC review team has developed the following eight point SRTP review program:

(1) An overall evaluation of the proposed SRTP to determine the degree to which it can achieve the stated program objectives.

(2) An assessment of whether the list of systems important to safe plant operations is sufficiently complete to provide reasonable assurance of safe plant operation. This would include evaluation of specific justifications for excluding any safety related systems.

(3) A review of the list of system functions important to safe plant operations to determine whether they are complete with respect to both specific system functions and plant-wide system safety functions.

(4) A review of selected test outlines to insure that they encompass all system functions required for safe plant operation and that the systems are tested under anticipated operating conditions. This would include review of proposed justifications for not testing any system functions deemed important to safe plant operation or not testing systems at anticipated system operating conditions.

(5) The review, witnessing and evaluation of the results of selected system test procedures.

(6) A verification that TED has developed, performed and evaluated the results of the remaining test procedures.

(7) An auditing of maintenance record reviews, personnel interview results, test leader qualifications and system review reports to evaluate the implementation of the SRTP requirements.

(8) An observation of SRTP program meetings such as JTG meetings and IPRC meetings to evaluate the performance of the SRTP review process.

The results of items 1 through 4 will be reflected in the Safety Evaluation Report (SER) to be issued by NRR. Items 5 through 8 will be documented in this and future Region III inspection reports Additional inspector concerns on any of the eight work tasks will be identified in inspection reports as the inspectors complete their reviews.

3. System Review and Test Program Evaluation

The inspectors reviewed the following procedures that TED has developed to implement and control the activities of the System Review and Test Program (SRTP). This program is intended to encompass identification and resolution of problems and testing of those systems and functions within the scope of the program that may not have been adequately tested previously or are needed to demonstrate proper system performance. These procedures were reviewed in order to determine if the program has sufficient scope to adequately demonstrate that the systems will operate in the various system configurations and plant conditions as near as practical to those for which the systems are required to function by their design basis.

Number	Title
SRTP-001	"System Review and Test Program Administrative Control Procedure," Revision 2
SRTP-002	"Guideline for Identification of System Functions," Revision 0
SRTP-003	"System Review and Test Program Interviews," Revision 1
SRTP-004	"System Review Evaluation and Corrective Action Development," Revision 1
SRTP-005	"Guideline for Test Review," Revision 1
SRTP-006	"Preparation of Test Outlines For System Review and Test Program," Revision 0
SRTP-007	"Qualification for Restart Test Program Test Leader," Revision 1

SRTP-008 "Release for Restart Testing," Revision 0

AD 1801.00 "Acceptance Test Program," Revision 7

AD 1805.00 "Procedure Preparation and Maintenance," Revision 25

a. With respect to the review of the SRTP in general, the inspector had the following concerns:

(1) The inspector noted during the initial review of the System Review Reports that there was a lack of consistency in the direction, scope and format of existing draft documents. This may have been the result of TED commencing work prior to having the procedures in place, or it may have resulted from the lack of specific details in the initial implementing procedures. The current SRTP procedures have been revised based on this concern and are reasonably specific with respect to direction, scope and format of the system documents. Discussions with the licensee indicate that additional efforts have been taken to ensure that the approved documents follow the requirements of the current revision of the SRTP. The inspector has noted that the recently approved documents follow the guidelines of these revised implementing procedures, and has no further concern in this area.

(2) The inspector noted during the review of draft System Review Reports that the system boundaries were not documented in the report. SRTP-001 requires that the SRGs determine the system boundaries for each individual system as part of the system review process, however, documentation for this review effort was not being maintained. A description of the system boundary is necessary in order to determine if all components important to safe plant operations are included in the SRTP. Based on this concern, TED has incorporated into SRTP-004 requirements to document the individual system boundaries. The inspector has verified that the approved "System Review Reports" document the system boundaries as required.

b. With respect to the review of SRTP-001, the inspector had the following concerns:

(1) The inspector noted that the description of the SRTP Coordinator's responsibilities and the "Flow Chart for Test Outline Processing" in Section E, both allow for the elimination of test outlines prepared by the SRGs at the discretion of the SRTP Coordinator. Discussions with the SRTP Coordinator indicate that this elimination refers to an optional parallel review by JTG and that this discrepancy will be corrected at the next revision.

(2) The inspector noted that SRTP-001, 002 and 006 do not require the IPRC to concur and sign for the satisfactory completion of the List of System Functions and the Test Outlines as is required in SRTP-001 and 005 for the Test Review. This is inconsistent with practice as observed by the inspectors in the review of available System Review Reports and as expressed in discussions with the involved individuals.

These items will be followed as an open item pending the next revision of these procedures (346/85036-01).

c. With respect to the review of SRTP-002, the inspector had the following concerns:

(1) Section A, concerning the determination of system functions, indicates that the functions considered important to safe plant operation may not coincide with the TED commitments as defined in the Technical Specifications or the USAR. The inspector is concerned that this would allow discrepancies to be identified in the licensing basis during the process of developing the system functions which would not be reviewed by the appropriate personnel for reportability and corrective action without appropriate requirements to document these discrepancies.

(2) There is no requirement to ensure that the list of system functions will be inclusive of the system functions identified in the Chapter 15 Safety Analysis. The inspector is concerned that without a cross-reference review of these Chapter 15 required functions a safety-related function of a system may be omitted.

(3) The source of system functions is not required to be documented. This information would allow for an independent review of the applicability of the function, provide a source for the acceptance criteria for testing and was required to be supplied in the IPRC meeting minutes of September 18, 1985. The inspector notes that although this information is not required, it has been provided in some of the final System Review Reports available for review.

These items will be followed as an open item pending a TED evaluation and revision of the procedure (346/85036-02).

d. With respect to the review of SRTP-008, the inspector noted that Section A.2 indicates that a partial test release can only be performed on those procedures which are written in phases or where each phase or section is a "stand alone" procedure. It is not clear how a procedure is designated as having "stand alone" sections and who would make this determination. The inspector is concerned that unless appropriate and obvious provisions are made during the development and approval of the procedure, the procedure intent and test results could be adversely effected by a partial release. This item will remain open pending TED evaluation (345/85036-03).

e. With respect to the review of AD1801.00 and AD1805.00, the inspector noted that AD1801.00 did not contain the general guidance concerning the use of the JTG as a Section Head as appears in Section 2.3 of AD1805.00. In addition, it appears that the guidance given in AD1801.00 concerning when a formal test procedure is required is in conflict with the stated purpose of the SRTP. Section 3.1.1 of this procedure indicates that setpoint changes and Technical Specification changes do not require a formal procedure, however the SRTP indicates that changes which are identified in the system review process are required to be verified by testing. Furthermore, Section 2.2 of AD1805.00 states that the procedure is not applicable to non-routine or non-repetitive procedures. As stated in the SRTP, it is anticipated that some one-time testing may be necessary. Discussions with TED and a review of the COA indicate that these are oversights and that the SRTP is the controlling document for the performance of the restart program. These discrepancies will be corrected in the next revision if required.

4. SRTP Program Implementation

With respect to the implementation of the SRTP that TED has identified in their COA, the inspector's reviewed the procedural requirements; interviewed licensee personnel performing the SRTP process; reviewed the system review and corrective action reports and associated documentation in order to determine if licensee personnel were conforming to the program requirements and providing the documentation required to support the conclusions of the review process; and attended IPRC and JTG meetings to examine the licensee's process for evaluating System Review Reports and developing test procedures. The inspectors identified the following concerns with respect to this review:

a. SRTP-003, "System Review and Test Program Interviews," and SRTP-004, "System Review Evaluation and Corrective Action Development," provide guidelines for the record review and interview phase of the SRTP, and the method for evaluating system reviews and developing corrective action plans. The process is intended to identify known significant and recurring problems which may impact the safe and reliable operation of the plant. These procedures, the System Review Reports generated from these procedures, and IPRC meeting minutes concerning these reports were reviewed. Meetings were held with the Responsible System Engineers (RSEs) and Process Support Engineers (PSEs) for one system chosen at random from each of the five System Review Groups in order to obtain additional information on how the procedures were implemented. In addition, several IPRC meetings were attended to observe their review of these reports. The following concerns were identified:

(1) The review of the various types of existing documents and the interview process described in SRTP-003 appears to be a reasonable method of identifying known significant and recurring problems which may impact the safe and reliable operation of the systems. However, meetings with selected

RSEs/PSEs and an examination of the lists of documents reviewed, (SRTP-003 Exhibit I), showed that there were a few cases where the documentation did not appear to be complete. Specifically, it was not shown on SRTP-003 Exhibit I whether Human Engineering Discrepancy reports, Facility Change Requests, or Transient Assessment Program reports were reviewed. In one case the Licensee Event Reports (LERs) reviewed were listed as LER 1977-1985 rather than listing the specific LERs reviewed. Also, some sources listed on the SRTP-004 problem report did not show up under the applicable section of SRTP-003 Exhibit I. The reason for this in most cases appears to be that these were completed reports and only outstanding reports of that type were required to be listed on SRTP-003 Exhibit I. This item will be followed as an open item pending review of the approved System Review Reports (346/85036-04).

(2) The documentation of information on some problem reports was also noted to be incomplete. Information that is sometimes missing or in insufficient detail in some problem reports is the description, cause/consequences, and recommended actions. Similar comments can be found to have been made in the IPRC minutes. In addition, there appeared to be little or no documentation on these reports of their resolution, reason for changing a RR item to a NRR item, or reason for deleting a NRR item. IPRC minutes contain some of this information, but it is not detailed information in many cases. This information should be included with the system files, but this file information is not part of the system review package provided for review. A recent revision to SRTP-004 adds a section for corrective action summary and resolution. This revision together with the continuing IPRC review process should resolve many of the above concerns when the final IPRC System Review Reports become available. This item will be followed in conjunction with open item 346/85036-04 discussed in Paragraph 3.a.1) above.

(3) Based on discussions with the five RSEs/PSEs selected at random, the interview process appears to have been conducted in accordance with the procedure. In addition, in some cases additional actions such as group interviews and sending memos to personnel prior to the interviews requesting any inputs they might have were also taken. The minimum of one interview from both the operations and maintenance departments as required by the procedure was exceeded for all the systems reviewed. The minimum number of interviews was three and the maximum number of interviews conducted for a system was 35, averaging approximately ten interviews per system. As the review continued, the RSEs/PSEs conducted additional interviews at their own initiative and as requested by IPRC. The interview process appears to have been effective and based on the sources shown on the problem reports, many of these items were identified through the interviews.

(4) The problem reports developed from the record review and interview process are divided into three types, problems important to plant safety and required for restart (RR), problems that are not required for restart (NRR) and problems classified as Category 3. The inspector noted that a number of the NRR problem reports were changed to Category 3 items during the review process and that these items have been deleted from the final System Review Reports. The SRTP does not address the designation of a Category 3 problem report, therefore the adequacy of this determination is unclear. Discussions with TED indicate that this categorization was used for those problem reports which were determined to not be valid deficiencies. The inspector is concerned that the screening guidelines and the final disposition of these problem reports are not documented. This item will be followed as an open item pending revision fo the SRTP (346/85036-05).

b. SRTP-007," Qualification of Restart Test Program Test Leaders," establishes the methodology to verify the qualification and perform a certification of the individuals assigned the responsibility to perform as Test Leaders. Certification under this procedure is intended to ensure that the individual meets or exceeds the education and experience recommendations for a Level II person as defined in ANSI/ASME N45.2.6-1978. A review of the ANSI/ASME N45.2.6 requirements and the Test Leader functions as described in AD 1801.00, "Station Modification Acceptance Test Program," and in SRTP-008, "SRTP Test Release," shows that a minimum of a Level II capability is appropriate for the Test Leader functions.

The program used to verify that the ANSI/ASME N45.2.6 requirements for the qualification of personnel who perform inspection, examination, and testing for nuclear power plants appears to be adequate. Specifically this program consist of General Orientation Training and Radiological Controls Training (GOT & RCT), a required reading list, additional training arranged by the Test Manager, review of the candidates education and experience profile, a health statement and vision examination, and individual interviews given by the Test Manager to ensure an understanding of the reading list was achieved and that the requirements of a Level II person are met.

In general, the format used for the record of certification conforms well with that described in ANSI/ASME N45.2.6-1978. However, some information that is included in the ANSI/ASME N45.2.6 description of a written certification is not specifically identified in the SRTP-007 Exhibit II, Certification of Restart Qualification. This information includes records of training, test results where applicable, level of capability, results of capability demonstration, and results of periodic evaluations. A review of the two qualification packages that have been completed shows that all of the requirements for certification were met and that information which was not specifically included in Exhibit II was either contained in another part of the package or it was not applicable.

c. The inspectors attended meetings of the JTG on 10-29-85, 11-1-85 and 11-15-85 and the IPRC on 9-24-85, 10-31-85, 11-13-85, 11-14-85 and 12-3-85 in order to witness the licensee's process of evaluating the System Review Reports, Test Review Reports, test outlines and test procedures which are required to verify that the systems necessary for safe plant operations will function as designed. The process appears to be functioning as required in providing helpful information and insight to the RSE/PSE's for incorporation into their procedures.

5. SRTP System Review Reports

The inspectors reviewed the following System Review Reports and associated Appendix A Test Review Reports which document the results of the system reviews, the corrective actions plans, the implementation schedule of corrective actions, the list of system functions and the associated testing required to demonstrate these functional capabilities. The review verified that the implementation schedule for the corrective action plans was consistent with the guidance of SRTP-004, and that sufficient testing was identified to demonstrate the functional capabilities of the system in the anticipated modes of operation.

Makeup and Purification
Component Cooling Water
Station and Instrument Air
Safety Features Actuation System
Steam and Feedwater Rupture Control System

The inspector's review was based on draft System Review Reports and has not been completed. The review will be documented in a subsequent inspection report following the review of the approved reports.

6. SRTP Test Procedure Review

The inspectors reviewed the following technical specification required surveillance testing, periodic testing and one-time performance testing which were utilized to verify the functional operability of the systems. This review verified that the test procedures adequately demonstrated the functional capabilities of the system in their anticipated operating conditions to the maximum extent practicable, were reviewed and approved by the appropriate management personnel and contained appropriate acceptance criteria.

TP 850.01, "RPS Response Time Calibration (FCR 85-103)," Revision 0
TP 850.07, "Functional Test of SA and IA Control Valves," Revision 1
TP 850.41, "CCW CRD Booster Pump Trouble Alarm (FCR 85-304)," Revision 0

The review of TP 850.01 and TP 850.41 have not been completed and will be documented in a subsequent inspection report.

7. SRTP Test Procedure Witnessing

The inspectors observed the following technical specification required surveillance testing, periodic testing and one-time performance testing which were performed to verify the functional operability of the systems. This review verified that the testing was performed in accordance with approved procedures, test instrumentation was calibrated, limiting conditions for operation were met, removal and restoration of the affected components were accomplished and that deficiencies encountered during the performance of the procedure were adequately documented and resolved prior to proceeding.

TP 850.07, "Functional Test of SA and IA Control Valves," Revision 1

a. With respect to the review of TP 850.07, the inspector witnessed the performance of Sections 6.2 and 6.3 of the procedure. During the performance of these sections, valves 1A2043 and 1A2044 failed to meet their acceptance criteria in that both valves began to move closed at 90 psi. This was believed to be due to inaccurate specification of the acceptance criteria and was documented in the test procedure for subsequent evaluation. During the performance of this test the inspector noted various construction tags hanging on the system under test. One tag indicated that a downsteam valve had an air leak and another indicated that a valve under test control should not be removed because it was under pressure. Discussion with the test engineer and operations personnel indicated that these tags were left from construction activities in 1977 and that confusion existed as to their present status. Personnel interviewed indicated that this condition existed throughout the plant and that previous attempts at removing these tags were not effective. The test engineer indicated that the tags in question were not noted in his system walkdown prior to the performance of the test. Further discussions with TED management personnel have indicated that this situation is not acceptable and that in the future both operations and test personnel will take action to have these tags evaluated and removed during the normal performance of system operation and system walkdowns in preparation for system testing. This item will be followed as an open item pending further evaluation by the inspectors (346/85036-06).

8. 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 Paragraph 2.b, 2.c, 2.d, 3.a.1), 3.a.4) and 6.a.

9. 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.

ATTACHMENT 1

SYSTEMS IMPORTANT TO SAFE OPERATION

Group 1
- Reactor Coolant System
- High Pressure Injection
- Core Flooding System
- Decay Heat Removal and Low Pressure Injection
- Containment Spray System
- Containment Emergency Ventilation
- Containment Air Cooling and Hydrogen Control
- Makeup and Purification System

Group 2
- Electrical 125/250 VDC (Includes Battery Room H&V)
- Electrical 4.16 KV System (13.8/4.16KV Transformers
- Electrical 480V Distribution (Includes Inverters and Required Transformers)
- Electrical 13.8 KV System (Includes Startup and Auxiliary Transformers)
- Emergency Diesel Generators (Includes "Q" Fuel Oil Tanks and Diesel Room Ventilation)
- Instrument AC Power (Includes Inverters and Required Transformers)

Group 3
- Anticipatory Reactor Trip System
- Control Rod Drive System
- Incore Monitoring (Includes Core Exit TC)
- Reactor Protection System
- Steam Feedwater Rupture Control System
- Safety Features Actuation System
- Integrated Control System
- Security System

Group 4
- Control Room Normal and Emergency H&V System
- Station and Instrument Air
- Station Fire Protection
- Component Cooling Water System
- Service Water System

Group 5
- Auxiliary Feedwater System
- Main Steam
- Steam Generator System
- Main Feedwater System

ADDITIONAL SYSTEMS FOR SUPERVISORY REVIEW

- Gaseous Radwaste
- Post Accident Sampling