

U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-346/84-15(DRP)

Docket No. 50-346

License No. NPF-3

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

Facility Name: Davis-Besse 1

Inspection At: Oak Harbor, OH

Inspection Conducted: June 11 through July 27, 1984

Inspectors: W. Rogers

D. Kosloff

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

9-10-84
Date

Inspection Summary

Inspection on June 11 through July 27, 1984 (Report No. 50-346/84-15(DRP))

Areas Inspected: Special inspection of the circumstances surrounding three events: the discovery of both control room emergency ventilation systems being incapable of performing their air conditioning function; removal of an emergency diesel generator ventilation fan from service without declaring the diesel inoperable; and inoperable auxiliary feed pump due to an open startup feed pump suction valve. The inspection involved 30 inspector-hours onsite by two NRC inspectors including 4 inspector-hours onsite during off-shifts.

Results: Five items of noncompliance were identified (both trains of the control room emergency ventilation system made inoperable; emergency diesel ventilation supply fan taken out-of-service rendering the diesel generator inoperable; one auxiliary feedwater pump inoperable due to an open startup feed pump suction valve; procedures for startup feed pump and shift turnover not adhered to; improper 10 CFR 50.59 determination that changing the position of a SUFF valve did not constitute a change in the facility).

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DETAILS

1. Persons Contacted

T. Murray, Station Superintendent
B. Beyer, Assistant Station Superintendent
S. Quennoz, Assistant Station Superintendent
D. Miller, Operations Engineer
I. Simon, Operations Supervisor
J. Faris, Administrative Coordinator

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

Enforcement Conference on July 13, 1984

Toledo Edison Personnel

R. P. Crouse, Vice President, Nuclear Mission
T. D. Murray, Station Superintendent
J. Helle, Engineering Division Director
T. Myers, Nuclear Services Director
J. Lingenfelter, Technical Engineer
R. Peters, Nuclear Licensing Manager

NRC Personnel

C. E. Norelius, Director, Division of Reactor Projects
W. D. Shafer, Chief, Projects Branch 2
I. N. Jackiw, Chief, Projects Section 2B
W. G. Rogers, Senior Resident Inspector
D. C. Kosloff, Resident Inspector

2. Control Room Emergency Ventilation System Inoperable

a. Background Information

Davis-Besse Technical Specification Limiting Condition for Operation 3.7.6.1 requires two independent control room emergency ventilation systems (CREVS) to be operable in Modes 1, 2, 3 and 4. Both independent systems are the same with redundant 100% capacity capable of performing the two safety functions associated with a CREVS. The two safety functions are: (1) Maintain the ambient air temperature below the maximum allowable temperature for continuous duty rating for the equipment and instrumentation, cooled by this system and (2) Maintain the control room habitable for operations personnel during and following all credible accident conditions.

A CREVS is composed of three subsystems. The first subsystem circulates air through the control room via a 3300 cfm centrifugal fan and associated ventilation ducting. The second subsystem cools the air passing through the first subsystem by a cooling coil located in the ductwork of the first subsystem. The cooling medium is freon R-12 which is supplied to the cooling coil via a compressor and associated piping. The third subsystem cools the freon in the second subsystem. This is accomplished by either an air-cooled condensing unit or a service water cooled heat exchanger, depending upon the outside temperature conditions.

b. Event

At 0930 on May 7, 1984, the licensee was preparing to perform the 15 minute flow test required every 31 days by Technical Specification surveillance requirement 4.7.6.1.b. The licensee's procedure for this test is ST 5076.01, Control Room Emergency Ventilation Monthly Test. The first prerequisite in ST 5076.01 is to verify that the "on-off" switch powering the freon compressor on the second subsystem is in the "on" position. The operator performing the prerequisite observed the switch to be in the "off" position.

The operator also observed that the control switch to the other freon compressor was also in the "off" position. The operator immediately notified the shift supervisor of the situation. The shift supervisor directed that the switches be repositioned to the "on" position and ST 5076.01 be performed on both independent CREVSs. The shift supervisor then logged that Technical Specification 3.0.3 was invoked for two inoperable CREVSs. ST 5076.01 was successfully completed on both ventilation systems, the systems declared operable and the unit removed from Technical Specification 3.0.3 requirements within an hour. Technical Specification 3.7.6.1, Control Room Emergency Ventilation System, requires that two independent control room emergency ventilation systems be operable in Modes 1, 2, 3 and 4. Technical Specification 6.8.1.a requires that procedures be established, implemented and maintained covering the applicable procedures recommended in Appendix "A" of Regulatory Guide 1.33, November 1972. Administrative procedures delineating responsibilities for plant operation and shutdown are listed in Appendix "A" of Regulatory Guide 1.33.

The licensee's Administrative Procedure AD 1839.00.9, Station Operations, requires that during removal from service of a system or component, the operability of redundant safety-related equipment shall be verified by inspection and an evaluation be made of Technical Specification Action Statements. Between April 23, 1984 and May 7, 1984, the air conditioning portions of both trains of the Control Room Emergency Ventilation System (CREV) were removed from service without complying with AD 1839.00.9. This resulted in both trains of the Control Room Emergency Ventilation System being inoperable. Failure to follow procedures and ensure operability of both CREVs is a violation (346/84-15-01A).

c. Licensee Followup of the Event

A deviation report was written on this event and an investigation into the event was initiated. The deviation report is the licensee's mechanism for reporting conditions adverse to quality under Criterion XVI of 10 CFR 50 Appendix B. The licensee issued LER 84-005 on June 6, 1984 documenting the event and the results of the investigation. The LER attributed the apparent cause of the occurrence to personnel not returning the switches to the "on" position following preventive maintenance on the systems. The switches were being positioned to the "off" position and then back to the "on" position to check proper freon compressor performance under the statement "Check pump down system" on the instructions for performing preventative maintenance attached to the maintenance work order.

d. NRC Followup

Upon notification the inspector began an inspection into the circumstances surrounding the event. Following a review of the system drawings the inspector requested that the licensee perform a safety analysis assuming both CREVSs were incapable of performing their air-conditioning function to determine the safety significance associated with this condition. This request was made on June 7, 1984, during an exit interview for IE Report 84-06.

The inspector continued the review of the event based on the information supplied in LER 84-005. The inspector interviewed the personnel involved with the ventilation system preventative maintenance program. Based upon those discussions and record review of when preventative maintenance and surveillance testing were accomplished it became apparent that the positioning of both control switches to the "off" position could not have been done under the approved preventative maintenance program. The last preventative maintenance performed on a CREVS was on April 4, 1984. ST 5076.01 had since been performed for CREVS #1 on April 9, 1984 and on April 23, 1984 for CREVS #2. The inspector found no indication that the switches were in the "off" position during those tests. Therefore, the switches were repositioned sometime between April 23, 1984, and May 7, 1984. The inspector reviewed maintenance work orders assigned to the CREVS startup system number for that time period and could not find any maintenance work that would account for the control switches being in the "off" position. The licensee was informed of the inaccuracy of attributing the event to the preventative maintenance personnel and is revising the LER. This is considered an open item (346/84-15-02) until the LER is revised.

During the review of the preventative maintenance program the inspector noted that during the quarterly preventative maintenance activities the CREVSs were not being declared inoperable even though the air-conditioning portion of the CREVSs were being disabled.

The licensee had established administrative controls in AD 1844.00, Maintenance, to keep this from occurring. These controls were accomplished by the completion of an attachment to the maintenance work order entitled "Tech Spec Equipment Operability Checkoff List" by the maintenance staff. This checkoff list required a written determination as to whether the maintenance activity authorized by the maintenance work order affected operability of any Technical Specification equipment. The maintenance work order and the checkoff list was then reviewed by the shift supervisor for concurrence of the maintenance staff's operability determination. The operability determination associated with the quarterly preventative maintenance on the CREVSSs was being made by the maintenance staff and concurred with by the shift supervisor as not affecting system operability on the Tech Spec Equipment Operability Checkoff List.

The inspector also noted that the only formalized training requirements, as delineated in the AD 1828 series on training of the maintenance staff, was General Orientation Training. This training did not cover Technical Specifications and the Updated Safety Analysis Report operability requirements of safety systems.

e. Safety Significance Assessment

The analysis requested by the inspector (reference 2.d above) and discussed in the July 13, 1984, enforcement conference was presented to the inspector in a meeting with the Engineering Division Director on July 19, 1984. The analysis stated "...it is felt that if a situation were to occur where the emergency ventilation system was 'inoperable' due to the compressors not functioning, it would be recoverable in sufficient time so as not to affect the operability of control/monitoring equipment and/or the safety of the plant."

The inspector reviewed the licensee's analysis against the two safety functions assigned in the bases of Technical Specifications for CREVSS. The inspector concluded that the safety function of the habitability of the control room for all creditable accident functions was not affected by the loss of the freon compressors since the isolation of outside air to the control room was not affected. Based on the licensee's "after the fact" analysis, the inspector concluded that the safety function of maintaining the control room temperature below maximum instrumentation/equipment ratings, though degraded, would have been minimized through reasonable operator action.

3. Emergency Diesel Generator Ventilation Fan Taken Out of Service

While reviewing the licensee's safety tag log and the jumper/lifted wire log on November 1, 1983, the inspector observed that an emergency diesel generator (EDG) #1 ventilation supply fan had been taken out of service at 0600 and returned to service at 1055. The inspector determined that this maintenance activity made the diesel generator inoperable based on a

review of Section 9.4.2.1.2 and Table 9.4-4 of the Update Safety Analysis Report (USAR). The USAR states that the two supply fans associated with one EDG are each 50% capacity fans. The unit was in Mode 1 for all of November 1, 1983.

Technical Specification 3.8.1.1 requires two operable EDGs in Mode 1, 2, 3 and 4. If an EDG becomes inoperable the action statement requires the licensee to demonstrate the operability of the offsite power sources by performing a breaker alignment and power availability check, and demonstrate the operability of the unaffected EDG. These actions are required to be performed within one hour of the EDG being declared inoperable.

Since the maintenance staff and shift supervisor had determined that the EDG would be operable during the maintenance activity, the affected EDG was not declared inoperable. The failure to recognize that the maintenance activity made the EDG inoperable is considered an example of an item of noncompliance against Technical Specifications 3.8.1.1 (346/84-15-01b).

After the event was brought to the licensee's attention by the inspector an analysis of the EDG ventilation requirements was performed. The analysis concluded that only one of the two supply fans was required if the ambient outside temperature was less than 68°F. During the time the supply fan was out of service the highest ambient outside temperature was 59°F. A 10 CFR 50.59 review was not conducted to determine the acceptability of this analysis. This is considered an open item (346/84-15-03).

The licensee requested general ventilation requirements for equipment operability from their architect-engineer after this event occurred. The architect-engineer provided a list to the shift supervisors identifying general ventilation systems required for operability of safety related equipment. In addition, licensee management developed administrative controls requiring their concurrence prior to placing these systems in an abnormal configuration.

The inspector reviewed procedure, SP 1107.11, Emergency Diesel Generator Operating Procedure and noted that the procedure did not reflect the requirement for two ventilation supply fans to be operable. Also, a licensee review of the procedure was conducted on August 26 and October 17, 1983 without identifying this deficiency. The inspector ascertained that the cognizant individual responsible for the above review was not aware of the Updated Safety Analysis Report (USAR) requirement.

In the response to IE Report 83-01 the licensee committed to increase emphasis on design assumptions by providing procedure reviews with the related USAR sections for their use during annual procedure reviews. Selection of the USAR sections was to be by a computer program that correlates USAR sections to inputted keywords. The keyword computer index utilized by the licensee did not reference the ventilation USAR section when the "EDG" keyword was inputted.

4. Auxiliary Feed Pump Inoperable

a. Background Information

The Startup Feed Pump (SUFPP) system is a system which provides secondary cooling during plant startup and shutdown. The system is composed of discharge piping, a pump, suction piping and manual valves. The discharge piping connects to the common main feedwater piping upstream of where the main feedwater piping splits to each of the steam generators. The pump is electric driven and its maximum heat removal capacity is 1-2% reactor power. The suction piping for the SUFPP goes through the two auxiliary feed pump rooms to two water sources, the deaerator storage tank and the condensate storage tank.

On May 14, 1984, the licensee determined that one auxiliary feedwater pump (AFWP) was inoperable because Figure 10.4-12 of the Updated Safety Analysis Report (USAR) was not being complied with. This USAR requires the startup feedwater pump (SUFPP) suction isolation valves from the deaerator tank (FW 32) and from the condensate storage tank (FS 91) to be closed to prevent flooding of the auxiliary feedwater pump rooms during a medium energy pipe break.

One suction valve (FW 32) to the startup feed pump mentioned in the USAR was being maintained open per the Startup Feed Pump Operating Procedure SP1106.27, and the Turbine Plant Cooling Water Operating Procedure SP 1104.39. Therefore, the auxiliary feedwater pumps were not being protected from flooding in the event of a medium energy pipe break.

To ensure operability of the AFWP and to ensure compliance to Figure 10.4-12 of the USAR, the licensee closed the valve in question, removed the fuses for the SUFPP breaker and wrote temporary modifications (T-Mods) to all affected procedures to maintain the valve closed except when the startup feed pump was in service.

In addition, on June 14, 1984 the licensee determined that the original Safety Analysis Report did not encompass all the break spectrums associated with the startup feedpump piping. The licensee had not taken into account a high energy break of the discharge piping. The licensee shut the discharge valve and changed applicable procedures to reflect this condition.

b. Event

On June 24, 1984, the plant tripped during surveillance testing of the control rod drive trip breakers due to a personnel error. During the recovery from the reactor trip the licensee placed the startup feedwater pump (SUFPP) in service. The SUFPP was shut down following plant startup activities on June 25, 1984, however, the SUFPP's suction valve (FW 32) was again left open. The valve was found open by an equipment operator on July 1, 1984. This rendered an

auxiliary feed pump inoperable from June 25 to July 1, 1984 in excess of the 78 hours allowed by the Technical Specifications for Mode 1. The plant was in Mode 1 during the June 25 to July 1, 1984 time period. This is considered an item of noncompliance for failure to meet a Limiting Condition for Operation (346/84-15-01C).

c. Followup of Event

The inspector interviewed the investigating personnel and the personnel involved in the startup and shutdown of the startup feed pump. Based on these inputs the inspector ascertained that the Startup Feedwater Operating Procedure was not properly used to start the pump and the procedure was not used to shut the pump down. Evidently, when it came time to shut down the SUFP the assistant shift supervisor provided the equipment operator with a list of valves he wished repositioned after shutting down the pump. One of the valves on the piece of paper was FW32, the SUFP suction valve. The equipment operator repositioned all the valves except FW32. Prior to the repositioning of this valve the equipment operator was called away to the switchyard. The shift supervisor was informed that the valve had not been repositioned. The need to close FW32 was lost during the next shift turnover. This is considered an example of an item of noncompliance (346/84-15-1C) for failure to conduct an adequate turnover.

During the next shift, the shift supervisor directed an operator to check some of the startup feed valves for proper position. The operator reported that all valves were properly positioned and erroneously identified normally closed valve FW 33 as FW 32.

The inspector performed a record review of applicable logs and procedures. The results of that review were:

- (1) Sections of SP 1105.27 and 1106.27 (startup and shutdown of the SUFP) were not signed off for starting and shutting down the SUFP as required. Prerequisites, action steps and valve checklist steps were not signed.
- (2) Trip Recovery Procedure PP 1102.03 step 4.2.2. as amended by T-mod 8048, was initialed annotating that the SUFP was started per SP 1106.27.
- (3) Plant Startup Procedure PP 1102.2, step 8.1.4, as amended by T-Mod 8047, was initialed annotating that the SUFP had been stopped per SP 1106.27.
- (4) Temporary Modifications (T-Mods) for Procedures PP 1102.03 and SP 1106.27 were still attached even though other more recent T-Mods had deleted these T-Mods. This is normal practice on T-Mods that have been authorized for use but had not been approved by the onsite safety review committee.

- (5) Temporary modification 8057 as written was inadequate to start the SUFP and assure proper operation. One step in the procedure instructs the operator to start the SUFP even before the installation of the power fuses to the pump's breaker. Other steps in the procedure are not referenced as required to be performed after the pump is started.
- (6) Completion of PP 1102.02 section 3, Zero to 25% Power Operations, was not signed off.
- (7) The reactor operator's log for June 24, 1984, does not reflect when the SUFP was put in service.
- (8) The procedures for restoring the startup feed pump's suction and discharge valves, the startup feed pump's lube oil cooling and the startup feed pump's pump seal cooling did not require independent verification.

Items (1), (2), (3), (6), (7) and (8) are examples of an item of noncompliance for failure to properly implement procedures (346/84-15-01C). Item (5) is considered an example of an item of noncompliance for failure to maintain an adequate procedure (346/84-15-01C).

The inspector performed a historical review of revisions and reviews of SP 1106.27, Startup Feed Pump Operating Procedure. The results of that review were:

- (1) Since the beginning of plant operation, SP 1106.27 required that valve FW 32 be open.
- (2) SP 1106.27 had an annual review on July 7, 1983 by a co-op student and on November 23, 1983, by a shift supervisor. The Technical Section provided an USAR review package for SP 1106.27 which did not include any of USAR section 3.6. requirements for the position of the suction valve.
- (3) USAR section 3.6, Protection Against Dynamic and Environmental Effects Associated with Postulated Rupture of Piping, was not keyworded in the licensee's computer data bank.
- (4) On December 19, 1982, the station operations department initiated Facility Change Request (FCR) 82-176 requesting valve FW 32 be shown open instead of closed on design document, P&ID M-006B. The FCR was implemented on May 24, 1983. The licensee's engineering staff determined that this FCR did not constitute a change to the facility as described in the Safety Analysis Report even though Figure 10.4-12 of that report showed valve FW 32 closed. As a result, the licensee did not perform an adequate 10 CFR 50.59(b) safety evaluation. Changing

the position of valve FW 32 constituted an unreviewed safety question requiring prior NRC approval before implementation. If the licensee realized the safety significance, it is reasonable to conclude that the licensee would have directed closure of FW 32 at that time.

Item (4) is considered an example of an item of noncompliance for failure to perform an adequate 10 CFR 50.59 review (346/84-15-1D).

5. Enforcement Conference

On July 13, 1984, an Enforcement Conference was held at the NRC regional office to discuss the circumstances surrounding the mispositioning of the freon compressor control switches. Licensee representatives in attendance are denoted in paragraph 1. The meeting started with opening remarks from the NRC and a presentation of past events leading to and continuing to be a concern of the NRC in the area of the licensee's inability to recognize design basis requirements for operability of safety-related equipment. The licensee made a presentation on their short term corrective action of requiring a senior reactor operator to review maintenance work orders for operability requirements before submission to the shift supervisor. Potential long term corrective action was also presented dealing with key senior experienced licensee personnel reviewing the design basis of all safety-related equipment and identifying all components necessary for operability.

A general discussion then took place as to whether previous corrective actions in this area should have prevented the event. The discussion then centered on the safety significance associated with the freon control switches being in the "off" position. The licensee indicated that 20 to 30 minutes would be available to the operator to take corrective action and that this time frame was adequate to determine the mispositioning of the switches and reposition them.

A discussion then ensued as to the CREVS function and its impact on station operations. The licensee stated that the reason for the switches being placed in the "off" position was still under investigation. The meeting concluded with the NRC stating that further internal discussion would have to be pursued to: (1) determine if the safety significance of the event would constitute escalated enforcement for violation of a Limiting Condition for Operation based on review of the licensee's analysis and (2) determine if the event occurred due to lack of adequate management controls in an area where inadequacies had been previously identified and corrective actions implemented.