

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-346/90007(DRS)

Docket No. 50-346

License No. NPF-3

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

Facility Name: Davis-Besse Nuclear Power Station

Inspection At: Oak Harbor, OH 43449

Inspection Conducted: April 23-27, May 21-24, June 1, July 6, and August 16, 1990

Inspectors: Rudy Hodor
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8-20-90
Date

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8/21/90
Date

Inspection Summary

Inspection on April 23-27, May 21-24, June 1, July 6, and August 16, 1990
(Report No. 50-346/90007(DRS))

Areas Inspected: Special, announced inspection of licensee action on previous inspection findings which included Sections III.G, J, and L of 10 CFR Part 50, Appendix R. In addition, an enforcement review was made of license amendment changes or deficiencies described in the licensee's March 22, 1990 submittal; a review was made of additional changes to the licensee's post-fire safe shutdown capability approach; and a review was made of the technical basis of granted and pending exemption requests. The inspection was performed in accordance with NRC Manual Chapter Procedures 30703, 64100, 64704, 92701 and 92702.

Results: Of the areas inspected, one apparent violation was identified (failure to adhere to fire protection/industrial safety procedures - Paragraph 11). Additionally, five other violations were also identified; however, in accordance with 10 CFR Part 2, Appendix C, Sections V.A and V.G, a Notice of Violation was not issued. The first two of these violations regarded the lack of the committed number of portable fire extinguishers

(Paragraph 15); the next two violations regarded the lack of quick response type sprinklers in nine plant areas (Paragraph 15); and the fifth violation regarded the failure to install an 8-hour emergency lighting unit in the Makeup Pump Room (Paragraph 15). Strengths observed in the licensee's program included the engineering effort put forth in the fire damper upgrade program and the installation of a more durable fire barrier wrap material. A weakness identified during the inspection regarded examples of significant changes and isolated errors within individual post-fire safe shutdown areas that were found in the Appendix R analyses.

DETAILS

1. Persons Contacted

Toledo Edison Company (TE)

- *C. Ashworth, Quality Assurance Senior Auditor
- **R. Brandt, Manager, Plant Operations (Acting)
- **R. Gaston, Licensing Technician
- *G. Gibbs, Director, Quality Assurance
- **C. Hengge, Fire Protection, Coordination Supervisor
- *P. Jacobsen, Design Engineer, Supervisor Electrical
- **S. Jain, Director, Engineering
- +J. Moyers, Manager, Quality Verification
- **T. Myers, Director, Technical Services
- **M. Murtha, Fire Protection Engineer
- **K. Prasad, Nuclear Engineering Manager (Acting)
- *B. Rachel, Quality Assurance Surveillance Supervisor
- *R. Rishel, Quality Assurance Supervisor, Quality Verification
- #+K. Roys, Licensing
- **R. Schrauder, Manager, Nuclear Licensing
- *V. Sodd, Operations Shift Supervisor
- **K. Spencer, Licensing
- +D. Shelton, Vice-President, Nuclear
- *D. Staudt, Operations Shift Supervisor
- *L. Storz, Plant Manager
- *J. Strausser, Senior Fire Protection Engineer
- +J. Syrowski, Nuclear Training
- +D. Timms, Systems Engineering
- *V. Watson, Design Engineer Manager
- **L. Young, Fire Protection

Gasser Associates

- **M. Gasser, Auditor

Tenera Corporation

- *H. George, Senior Vice President, Engineering Services
- **D. Wood, Nuclear Licensing

U.S. Nuclear Regulatory Commission (NRC)

- *P. Byron, Senior Resident Inspector
- *R. Gardner, Chief, Plant Systems Section, DRS
- °J. Hannon, Director, Project Directorate III-3, NRR
- *N. Jackiw, Chief, Projects Section 3A, DRP
- *D. Kosloff, Resident Inspector
- **M. Lynch, Senior Project Manager, NRR
- *K. Walton, Resident Inspector
- °*T. Wambach, Project Manager, Davis-Besse, NRR

Cleveland Electric Illuminating Company (CEI)

- *A. Caplinger, Fire Protection System Engineer
- *J. George, Licensing
- *M. Makar, Fire Protection Engineer

American Electric Power Service Corporation (AEP)

- *B. McLean, Nuclear Safety and Licensing Engineer
- *E. Taylor, Electrical Engineer

*Denotes those persons in attendance + the exit interview on April 27, 1990.

+Denotes those persons in attendance at the exit interview on May 24, 1990.

°Denotes those persons participating at the exit interview on May 24, 1990, by telecon.

**Denotes those persons in attendance at both exit interviews on April 27 and May 24, 1990.

#Denotes those persons participating at the exit interview on July 6, 1990, by telecon.

The inspectors also contacted other licensee personnel during this inspection.

2. Background Information

In July 1983, the NRC conducted an inspection to ascertain whether the licensee was in conformance with the applicable post-fire safe shutdown requirements (10 CFR Part 50, Appendix R, Sections III.G, J, O and L), including exemptions and other requirements approved by the Office of Nuclear Reactor Regulation (NRR). During that July 1983 inspection, it was determined that numerous deficiencies in meeting the post-fire safe shutdown requirements and other fire protection requirements existed. As a result of the seriousness with which the NRC viewed these deficiencies, the licensee was required to submit to NRR for review, the short-term and long-term programs for addressing these deficiencies. By letters dated December 2, 1988, and July 31, 1989, the licensee indicated that the installation of additional fire protection capability used to protect safe shutdown equipment (10 CFR Part 50, Appendix R) would be completed by the end of the sixth refueling outage. However, by letters dated February 16, 20 and March 22, 1990, the licensee identified changes from previous submittals in the fire protection compliance approaches and provided comments on the draft fire protection program safety evaluation report. Subsequently, NRR conducted a meeting at NRC Headquarters on April 5, 1990, with the licensee and Region III personnel to discuss the Fire Area Optimization Report (FAOR) (formerly the Compliance Assessment Report (CAR)), high impedance fault analysis, and other Appendix R issues including the three letters. Consequently, prior to the meeting following the April 5, 1990 meeting, NRR and Region III dispositioned review responsibility for the

individual issues described in the specified submittals. Those issues tasked for regional review are addressed in this inspection report. The purpose of this inspection (April 23-27, May 21-24, and June 1, 1990), was, in part, to assess the licensee's completion of those long-term actions remaining open, including an audit of certain exemptions. During the April 23-27, 1990 inspection visit, new information that affected the review process was found to exist. As a result, by letter dated May 10, 1990, the licensee submitted a summary of differences between the CAR (Revision 5) and the FAOR (Revision 1). Prior to this letter being docketed, a meeting was held at NRC Headquarters on May 9, 1990, to discuss the differences between the CAR and FAOR so as to facilitate a more timely NRR and Regional review of the FAOR. The NRR review of this submittal is still pending.

Consequently, a followup post-fire safe shutdown review was conducted May 21-24, 1990. This report documents both the April 23-27 and May 21-24, 1990 site visits and the June 1, 1990 telecon meetings which finalized resolution of two startup issues that remained outstanding.

3. Action on Previous Inspection Findings and Licensee Event Reports (LER)

- a. (Closed) Violation (346/83-16-01A): Only those portions of this item that remained open are addressed below:

(Item (1)) As indicated in Inspection Report No. 50-346/83-16, the licensee developed procedure AB 1203.26, "Serious Control Room Fire," to address the necessary actions to achieve hot standby and subsequent cold shutdown in the event of a fire resulting in total loss of the control room or cable spreading room accompanied with loss of offsite power. The procedure was considered "interim" since it contained a number of repair activities required to achieve hot standby, pending satisfactory completion of the modifications required to meet Appendix R.

During this inspection, the inspectors reviewed the current "Serious Control Room Fire" procedure, and determined that as a result of completed modifications, hot standby repairs were not necessary. Therefore, this portion of the item is considered closed.

(Item (2)) The licensee identified that, in a majority of the fire areas, the pressurizer heaters remain available for pressure control; however, in five specific areas where both trains of pressurizer heaters are present, the heaters could have been lost as a result of a fire, requiring the plant to proceed to cold shutdown as directed by procedure AB 1023.02, "Serious Station Fire." As a result, the licensee did not consider the pressurizer heaters as a required safe shutdown component.

During this inspection, the inspectors reviewed the licensee's changes to procedure DB-OP-0250, Revision 01. Based on this review, this portion of the item is considered closed.

(Item (4)) This item pertained to the missing process variables necessary to perform and control reactor shutdown from outside the control room. The licensee planned to provide source range flux and reactor coolant temperature (Th and Tc for both loops) indication outside the control room.

During this inspection, the inspectors determined that the necessary modifications and procedure (DB-OP-02519, Revision 01) were completed satisfactorily. Therefore, this portion of the item is considered closed.

- b. (Closed) Unresolved Item (346/83-16-04): A fire at the auxiliary shutdown panel could have caused the loss of pressurizer heater banks 1 and 2. If a loss occurred, a repair would have been necessary to regain function. Repairs are not allowed for hot standby conditions. The licensee had not addressed the issue of pressure control while maintaining hot standby. This issue was considered unresolved for both a fire in the control room and a fire in the auxiliary shutdown panel and transfer switch room.

During this inspection, the inspector reviewed the licensee's revised methodology which specified a limited cooldown rate of no more than 1.5°F/hour in the event pressurizer heaters were not available. The inspector determined that this revised methodology was acceptable. Therefore, this item is considered closed.

- c. (Closed) Violation (346/83-16-05): During a review of Section 111.J of Appendix R to 10 CFR Part 50, "Emergency Lighting," the following was determined: (1) six areas of the facility did not have installed emergency lighting units; (2) three areas of the facility had inadequate lighting; and (3) two of six emergency lighting units failed the 8 hour discharge test.

On April 23, 1990, the inspectors conducted a walkdown of draft Abnormal Procedure DB-OP-02519, "Serious Control Room Fire," Revision 01. As part of this walkdown, the inspectors considered the adequacy of the facility's emergency lighting. The inspectors reviewed the licensee's emergency lighting evaluation contained in the CAR, Revision 5, and the FAOR, Revision 1, for a fire in the control room or cable spreading room utilizing the above procedure. Numerous emergency lighting modifications were proposed in Table 6-3 of the CAP so as to satisfy the Rule, including the installation of additional battery-powered 8-hour units, and the redirection/relocation of certain existing lighting units and lamps. During the walkdown of Abnormal Procedure DB-OP-02519, the inspectors made routine checks to assure adequate emergency lighting was in place or was planned to

be in place. For several plant areas the adequacy of emergency lighting was questioned. Consequently, the licensee conducted loss of AC power tests in those questionable areas during off-normal hours. The NRR team representative witnessed these tests. The inspectors concluded that, in certain of the areas tested, the lighting was marginally acceptable and requested the licensee to evaluate the need for additional lighting units. The licensee acknowledged this request and indicated that additional lighting units would be added as necessary. Also, during the walkdown, the inspectors noted that certain lighting unit lamps appeared to be misdirected. This was believed due, in part, to outage related activities. The licensee indicated that Periodic Test Procedure DB-ME-04100 would be conducted to verify the proper positioning of the lamps and that this test would be completed prior to re-start from the sixth refueling outage.

The inspectors identified an incorrect assumption and basis of evaluation for the emergency lighting area in Section 6.2.2 of the FAC. Credit was incorrectly taken for hand-held lighting units in the confines of fire areas/rooms of the plant and inside containment to satisfy Section III.J of Appendix R, without an approved exemption, for lighting needed within the first eight hours of the fire event. However, hand-held lights can be used for those areas expected to be entered after 8 hours into the event and as an interim compensatory measure. The licensee acknowledged the inspectors' concern and indicated further procedural wording changes would be completed to resolve this concern. With the above exceptions, which the licensee was responsive in committing to resolve, no other emergency lighting concerns were raised.

By letter dated January 12, 1987, the licensee requested an exemption from certain aspects of the technical requirements of Section III.J of Appendix R to 10 CFR Part 50. This exemption requested that the licensee be allowed to utilize existing "hard-wired" AC/DC essential lighting in portions of the auxiliary and turbine buildings, and to utilize hand-held portable lighting units in outside plant areas.

Regarding the first issue, the NRC was initially concerned that a fire could damage the circuits and components associated with the AC/DC system such that emergency lighting essential for operator access and manual actions would not be available. The licensee responded that the results of an internal evaluation confirmed that the AC/DC lighting system would not be disabled by a fire in those locations (control room and cable spreading room) where reliance on the system is credited. During this inspection, an inspector reviewed the licensee's internal evaluation.

The primary objective of this evaluation, titled "Revised Task 4 - Emergency Lighting Survey - Circuit Review," was to identify all emergency lights outside the control or cable spreading room which are powered from the panels located inside the control or cable spreading room, or share the same circuits with the lights inside these rooms. The inspector's review of this evaluation found it to adequately address the NRC's concern. In addition, the licensee's

evaluation noted that a modification would be required to remove certain circuits from the cable spreading room. Specifically, the incoming power feed cable to Emergency DC Lighting Panel L5781 from DC MCC1 would be rerouted from the cable spreading room. This work was performed under Modification 85-046. On this basis, the use of the "hard wired" AC/DC emergency lighting system was determined to be acceptable.

The CAR required the use of the "hard wired" AC/DC lighting systems to achieve compliance. The licensee's revised analysis (FAOR, Revision 1) no longer takes credit for these systems being required to achieve alternate safe shutdown from outside the control room. Specifically, Section 6.2 of the FAOR, Revision 1, states:

"Credit is not being taken for the AC/DC incandescent pendant emergency light. . . . The AC/DC incandescent pendant emergency lighting will be available as stated in the letter to the NRC requesting an exemption regarding emergency lighting. . . . However, no credit is being taken for these lights for this evaluation.

In addition, the "hard wired" lighting systems were not observed to be used during the inspection team walkdown of the serious control room fire procedure. Therefore, the inspectors questioned the need for this exemption. At the time of the inspection, representatives of the licensee noted that the exemption is still being requested so that the AC/DC "hard wired" systems may be used as a backup, if needed, to the existing battery powered emergency lighting.

Regarding the second issue, the NRC had two concerns with this exemption request. First, manual operator actions necessary to achieve safe shutdown would be made more difficult by carrying portable lighting units. Second, the route of travel for operators in outside plant areas would be potentially hazardous to someone equipped with just a portable lighting unit. According to a February 2, 1990 meeting summary, the licensee confirmed that no manual actions requiring the use of both hands would be necessary in these locations and that the subject outside areas are free from potentially hazardous conditions. During this inspection, an inspector evaluated those concerns during the Abnormal Procedure walkdown and found the licensee's position to be valid. Therefore, these concerns were considered resolved.

- d. (Closed) Open Item (346/83-16-09): The licensee had not performed an analysis to determine the level of Gaitronics communication operability that would remain after a control room/cable spreading room fire. This item remained open pending the completion of a formal test to verify that adequate communications systems were available to implement the alternate shutdown procedures.

It was determined during this inspection that the licensee relies on the use of portable, hand-held radios as the primary means of providing communications during the implementation of the serious station fire procedures. In addition, the licensee had performed

a formal test of the communications capability using the portable radio system. The results of this test, documented in a licensee memorandum dated May 30, 1990, indicated that satisfactory radio communications were established in all rooms except for AFW Rooms 237 and 238. The memorandum specified the need for additional antennas to correct the identified communications deficiencies. The memorandum indicated that the Station serious fire procedures have been modified to only require radio communication from the entrance at the top of the stairs to Rooms 237 and 238 and that radio communications from this location were satisfactory. Although the procedure revisions satisfy the requirements of Appendix R, the memorandum also indicated that additional corrective actions (i.e., installation of additional antenna coverage) were planned but will not be completed until after the sixth refueling outage. On June 27, 1990, inspector discussions with members of the licensee's staff indicated that the installation of the additional antenna coverage was no longer planned to be performed. Based on the review of the licensee's alternate shutdown communications capability performed at the time of the audit and the licensee's corrective actions in response to the results of its communications capability test, this item is considered closed.

- e. (Closed) Unresolved Item (346/83-16-10): In Room 314, the equipment (e.g., junction boxes, conduits) believed to be in need of fire wrapping to satisfy the Appendix R requirements were found lacking this protection.

According to the licensee's September 3, 1985 Fire Protection Activities Summary, a walkdown was performed to ensure that all conduit and/or trays identified as requiring wraps per Field Change Request (FCR) 79-032 were, in fact, wrapped. This document also indicated that all discrepancies were corrected prior to restart from the 1983 refueling outage and that quality control measures were in place during the walkdowns. Subsequently, a re-identification effort was performed to ascertain the circuits requiring one-hour protection to meet Section III.G.2 separation requirements. The licensee documented this effort and all conduits and cable trays requiring wraps were identified by fire area. According to the September 3, 1985 Summary letter, following the above evaluation, a cross check of wraps required per the revised analyses to those identified in FCR 79-032 was performed which showed that the number of conduits and/or cable trays was greatly reduced. Consequently, a FCR was initiated to revise the listing of required wraps on controlled drawing E-899A. The licensee performed walkdowns to further determine whether Appendix R compliance would be achieved by either wrapping or re-routing.

During this inspection, the inspectors utilized drawing E-899A, Revision 5, "General Notes for the Installation of TSI Therm-Lag Fire Barrier System," to verify that adequate separation as required by Appendix R was achieved.

In addition, the licensee provided a list of Appendix R fire wraps needed by plant fire areas. The inspectors' review included a

selective review of previously identified unprotected equipment, in addition to equipment now required by the FAOR, Revision 0, to be fire wrap protected (see Paragraph 3.f for further circuit and safe shutdown analysis specific review). Ten circuits having one-hour fire barrier wrap separation as required in the component cooling water (CCW) pump room were verified to be satisfactory by field walkdown.

One circuit was also verified by field walkdown as having a required three-hour fire barrier wrap. Three additional circuits were confirmed through drawing review. In addition, eighteen fire area boundary barriers or penetrations within those barriers were inspected by field walkdown with the exception of those features that were inaccessible and, therefore, could not be viewed.

In addition, a number of circuits were verified to have radiant energy shield fire wrap protection including the use of the 3M Interam material installed inside containment and related areas.

Based on the above, this issue is considered closed.

- f. (Closed) Violation (346/83-16-11): Lack of a one-hour fire barrier on equipment required to be fire wrapped to satisfy Appendix R requirements. In Room 328, CCW pump room (Fire Area T), conduits 36010C, 37452A, 37450B, 47342B, 37474A and 37035A were provided with a wrapping material which protected only partial lengths of the conduit. Also, temperature and flow monitoring instrumentation was installed at various locations and was not protected by the fire barrier. Additionally, junction boxes for the pump power cables, including JB3716, JB3715, and JB3718 were not protected. Further, conduits 36011A, 36203A, and 36111A, the power cables for the CCW pumps, were also not protected. In Room 53, service water intake valve room, the Kaowool wrappings for the conduit needed for operation of valves SW-2929, SW-2930, SW-2931, and SW-2932 were found to be worn in places so as to expose bare conduit. In one case (conduit 30526), the wrapping was found incomplete.

Based on the fire barrier review described in Paragraph 3.e, certain of the identified conduits and junction boxes remaining were verified to now be fire wrap protected, as required. The remaining circuits and instrumentation equipment were reviewed by the inspectors to confirm that the Appendix R requirements were met.

Each of the above noted deficiencies were reviewed as follows:

- (1) By letter dated September 30, 1988, the licensee stated that conduit 47342B does not contain circuits required to satisfy Appendix R. Circuits contained in conduit 47342B were reviewed at the time of this inspection. As indicated in Section 4 of the FAOR, Revision 1, conduit 47342B contains circuit No. 2PBF1119A. This circuit is the power cable for Train 2, Motor-Operated CCW Return Isolation Valve CC5098. This valve is located in the RCP seal return flow line. In the event of fire in Fire Area T, the ability of this valve to operate remotely is assumed to be lost.

The licensee has implemented procedural actions (Serious Station Fire Procedure DB-OP-02501) which specify the manual operation of this valve, locally at the valve. It should also be noted that the licensee's evaluation concluded that valve CC5098 would not need to be operated prior to 8 hours. The licensee's evaluation and method of control for conduit 47342B was found to be acceptable.

- (2) Conduit 37035A contains control circuit 1CV1424G for solenoid operated Isolation Valve SW 1424 and conduit 37452A contains control circuit 2CV1424 for solenoid operated Isolation Valve SW 1429. The purpose of these valves is to isolate service water from Component Cooling Heat Exchangers 1 and 3, respectively. To prevent fire induced circuit failures from causing the valves to spuriously close, the licensee has implemented modification 87-1315. This modification was scheduled to be completed prior to startup from the refuel outage currently in progress. This modification will permit the valves to "modulate" when their solenoid is energized and cause the valves to fail to the fully open position when their solenoid is de-energized. The licensee's evaluation and method of protection for circuits enclosed in conduits 37035A and 37452A were found to be acceptable.
- (3) Conduit 37450B is associated with CC5096, CCW Line 2 Discharge Isolation Valve. FAOR, Section 4.7, Note 16, requires procedural action after 8 hours. Procedure DB-OP-2501, Attachments 41 and 42, Step 7.0.b.1, directs restoring RCP seal cooling using Attachments 49 and 50. Time is available for manual operation of CC5095 and CC5096 as specified in Procedure DB-OP-2501, Attachments 49 and 50. The licensee's manual actions were found to be acceptable.
- (4) Conduit 36010C was verified to be protected with the newly installed TSI fire wrap material.
- (5) Conduit 37474A is associated with CCW ventilation. The licensee's letter dated March 25, 1989, Serial No. 1642, Attachment 1, Page 9, discusses the licensee's analysis demonstrating that, in the event of fire, the CCW pump room temperature will remain 20 degrees F below the maximum allowed ambient operating temperature for the CCW pumps. Since the licensee's analysis demonstrates that the CCW pumps will remain operable without ventilation, an alternative shutdown capability for ventilation is not required for the CCW pumps.
- (6) The numerous monitoring instruments considered as safe shutdown components were listed in Appendix A of the CAR. Section 4 DJ of the CAR states that HPI flow indication will be installed at the alternate shutdown panel and a backup means of steam generator outlet pressure indication will be established in the control room to resolve deficiencies in Fire Area DJ. Section 4.T of the CAR indicates that no modifications were required for monitoring instruments in Fire Area T.

Fire Area DJ of the CAR is part of the new Fire Area A in the FAOR. The FAOR (Page 4.A-27) specifies that HPI flow will be determined by monitoring pressurizer level. The pressurizer level instrument is located in annulus room 314. Review of the FAOR Fire Area Evaluation for Fire Area T determined that FAOR (Page 4.T-19) specifies that flow indicators MU31 and MU34 and MUP Train 2 Flow Indicators were being repowered from Train 2 by modification 88-0145. Modification 88-0145 was a non Appendix R modification.

Since the alternate shutdown panel HPI flow indication was provided for and no Appendix R modifications were required for monitoring instruments in Fire Area T, this portion of the item is considered closed.

- (7) Junction boxes JB3715 and JB3718 were verified to be protected with the newly installed TSI fire wrap material. Junction box JB3716 was determined by the licensee to not need fire wrap protection. This was confirmed by the inspectors.
- (8) Based on the the licensee's exemption evaluation submittal, dated April 29, 1982, related discussions during this inspection, and a tour of the area, it was determined that the CCW power cables need not be fire wrapped.
- (9) During a previous NRC inspection documented in Inspection Report No. 346/86006, local manual action for Service Water System Motor Operating Valve Nos. SW-2929, SW-2930, SW-2931 and SW-2932 was confirmed and found acceptable.

Based on the above, this issue is considered closed.

- g. (Closed) Unresolved Item (346/83-16-12): The fire barrier material had not been qualified by an acceptable test as a one-hour fire barrier for the configuration being used and the fire barrier may not have been installed properly to achieve a one-hour rating based on the manufacturer's own testing (one test out of four).

By letter dated September 3, 1985, the licensee indicated that a decision was made to install new one-hour fire barriers and to replace existing wraps required to provide protection to the requirements of Appendix R utilizing a wrap material and acceptable installation configuration. Consequently, according to the February 2, 1990 Meeting Summary, the licensee committed (reference licensee letter dated May 27, 1987) to replace the existing wrap material with a type that has met all of the acceptance criteria of the standard fire test method of ASTM E-119.

The licensee affirmed that TSI fire barrier wrap, which replaced the previous material, meets the acceptance criteria of the above stated standard.

During this inspection, an inspector utilizing selective, applicable fire wrap manufacturer installation instructions confirmed that

certain fire barrier wrap materials have been installed as required (see Paragraphs 3.e and 3.f for further details).

Based on the above, this issue is considered closed.

- h. (Closed) Open Item (346/86006-02(DRS)): Due to design deficiencies, safety-related and safe shutdown fire dampers were in need of being replaced.

During this inspection, twenty-six fire dampers were chosen to be walked down to determine whether the previously identified deficiencies have been corrected. The fire dampers chosen included Appendix R, Appendix A and other categorized dampers. Certain of these dampers could not be viewed due to accessibility difficulties or the physical location of the damper. The remaining fire dampers that were inspected included both Pullman and Ruskin manufactured dampers that were positioned vertically and horizontally, single and ganged, or two single dampers in series. The inspector reviewed the fire damper procedure data sheets to confirm that steps were incorporated for setting a thermal expansion space, caulking of retaining angles, and proper damper assembly orientation and that as-installed drop tests were conducted as part of the modified dampers acceptance criteria. Additionally, the licensee presented surveillance test procedures showing that fire dampers were scheduled to receive a periodic inspection. No discrepancies were noted during this review. Based on the above, this issue is considered closed.

At the exit interview of May 24, 1990, this area was now considered by the inspectors to be a strength in the licensee's fire protection program.

Closure of this item also resolves those issues raised in Special Report 346/86010-LL.

- i. (Closed) Special Report (346/86030-LL): As a result of on-going design document reviews, discrepancies were found in the areas of Kaowool wraps, emergency lighting and fire detection.

These issues were previously addressed in Inspection Report No. 346/87027. In addition, certain of these issues were reviewed during this inspection. Based on this review, this item is considered closed.

- j. (Closed) Licensee Event Report (LER) (346/86034-LL): This event report regarded deficiencies identified during a re-evaluation of acceptance criteria on barrier seals to ensure suitability for fire rating, flood sealing and high energy line break (HELB) pressure sealing. In part, this review was believed to be initiated due to NRC identified penetration seal deficiencies (refer to NRC Inspection Report No. 346/85028).

According to Revision 2 of this LER, the flood and HELB seals were repaired prior to entering Mode 4 from the spring 1987 outage. In addition, certain fire barrier seals were found inoperable due

to inadequate design control, inadequate installation instructions, and inadequate surveillance procedures. According to the LER, these seals were scheduled to be repaired by December 31, 1987, with the licensee having an overall improved fire and seal program in-place.

During this inspection, the NRR inspector performed a field walkdown of examples of penetration fire barrier seal detail types identified on the seal detail drawings (M-43A through E). The following plant locations, seal type and penetration numbers were inspected:

Room Number	Seal Type	Penetration Number	Comments
239 (Auxiliary Feed-water Pump Room)	FB-T1	238-E-26	Boot Seal with non-tested gasket material (Calc # C-FP-013.06-30)
	Non-Rated Opening	238-E-21	
	LDF-1	238-E-45	
	GFS-2	238-E-44	
322 (Passage)	LDF-1	322-S-56	
	LDF-4	322-S-55	
	GFS-1	322-W-1	
	SHG-3	322-W-2	
	HDE-4	322-W-36	
319A (Upper Level Diesel Generator Room)	LDF-2	319A-N-11	
	GFS-1	319A-N-53	
	HDE-1	319A-F-6	

Based on the above review, this item is considered closed. In addition, as part of this review, the inspector confirmed that acceptability of the licensee's program for bus ducts, seismic gaps and spare conduit sleeves was satisfactory.

- k. (Open) Open Item (346/87027-02): This issue regards fire brigade drill deficiencies observed by the NRC during unannounced fire drill activities. These observations were documented in Inspection Reports No. 346/87027 and No. 346/88028.

During this inspection, the licensee provided Management Corrective Action Report (MCAR) No. 90-0001 regarding additional deficiencies observed by quality verification personnel in the performance of fire brigade personnel during fire drill activities.

Based on previous inspector discussions with licensee personnel, the licensee has taken actions to improve the fire brigade readiness and according to the above MCAR have in-progress a corrective action plan scheduled to be completed by December 31, 1990. This item will remain open pending additional reviews of licensee fire brigade performance.

1. (Open) Unresolved Item (346/87027-03): During a critique following a fire drill, several plant operators voiced a need to reduce the number of nuisance and/or inadvertent type fire alarms believed at the time to be caused primarily by maintenance work activities. The inspector requested the licensee's staff to perform a review to determine the cause of the nuisance and/or inadvertent fire alarm actuations and take the necessary corrective actions.

By letter dated July 31, 1989, the licensee concluded that the root cause of the nuisance alarms was due to the lack of preventative maintenance (PM) on the computer multiplexer system associated with the fire detection system. During this inspection, a licensee staff member provided a list of fire alarms occurring on a daily basis (certain dates were blank) from May 26, 1989 through May 21, 1990. Based on these lists, the frequency of fire alarms has decreased in recent months. The licensee attributes this decrease to the performance of the PM program on the computer multiplexer system. The inspector concurred that this determination was most likely based on the information provided. However, the list showed that for certain days a lesser number of nuisance and/or inadvertent fire alarm actuations were still occurring. To further reduce nuisance and/or inadvertent fire alarm actuations, the licensee was adding additional PM steps to the fire detector surveillance test procedure. Since no mention of periodic testing of the fire detector sensitivity adjustment was identified in the manufacturer's literature (Technical Bulletin DI-3 Ionization Detector) provided the inspector by the licensee, licensee personnel were pursuing appropriate manufacturer detector PM recommendations. The inspector requested the licensee to provide the detector PM results following the test completion. This item will remain open pending continuing discussions with the licensee personnel regarding this issue.

- m. (Closed) Licensee Event Report (346/88017-LL): This event report was issued August 18, 1988, regarding a licensee review of roving fire watch tour documentation that identified four occurrences of roving fire watch patrols that had exceeded the 1 hour patrol interval due to personnel error. Prior to and following these occurrences, the licensee identified similar examples of this type of occurrence. The evaluations of these other occurrences were documented in NRC Inspection Reports No. 346/88028 and No. 346/89012. Since this event occurred between each of the other occurrences and was of a similar nature to those which have already been addressed by the NRC, this LER is considered closed.

- n. (Closed) Open Item (346/88031-01): The licensee discovered that the safe shutdown cables for trains one and two of the service water system were located in a common manhole (MH 3001) enclosure that did not provide adequate Appendix R cable separation. The manhole was provided for cable pulling operations during initial plant construction. The cables were run in separate conduits prior to entering and when exiting the manhole. The cables were routed in separate enclosed metal raceways within the manhole. The cable routings and raceways were designed to meet the requirements of Regulatory Guide 1.75, "Physical Independence of Electric Systems."

The probable cause for a fire in MH 3001 would be from an electrically induced cable insulation fire. The manhole is not easily accessible. It is protected by a bolted metal cover provided with missile protection, and by a metal door. A permanently installed sump pump was used to remove water seepage. The inspector requested the licensee to identify all safety and non safety cables running through the manhole; determine the maximum short circuit current and over current protective device capability; and determine the allowable short circuit capability of each cable. The licensee supplied the inspector the information that was requested. In all cases, the maximum short circuit current available was less than the allowable short circuit capability of the cable. In addition, the sump pump was provided with adequate short circuit protection.

Consequently, by letter dated July 31, 1989, the licensee requested approval of an exemption from the requirements of Section III.G.2 of Appendix R regarding separation and protection of redundant safe shutdown systems. Although this exemption is still pending, it has been reviewed as described in the draft SER attached to an NRC Meeting Summary, dated February 2, 1990. The review concluded that redundant shutdown circuits are located less than 6 feet from one another in a manhole in the yard area. The manhole features no active or passive fire protection. The physical arrangement of the manhole is as described in the above referenced letter. The licensee justifies the exemption based on the limited fire hazard and the absence of sources of ignition.

The NRC was concerned with the perceived vulnerability of redundant trains of safe shutdown cabling within the manhole. The only observable threat to the cables is from a cable induced fire within the manhole itself. Because the manhole is constructed with a concrete raised sill and features an opening on the top with a bolted-in-place steel cap, external fire sources were not considered credible. The licensee affirmed that the cables within the manhole are qualified to the criteria of IEEE Standard 383-1974 or its equivalent and will not sustain combustion unless an external heat source is present. This, coupled with the fact that redundant cables are separated in accordance with the criteria delineated in Regulatory Guide 1.75 provides assurance that the existing configuration of cables within the manhole is acceptable. Based on the above, this issue is considered closed.

- o. (Closed) Violation (346/89012-02): Failure to assemble the fire brigade immediately upon receipt of any unplanned fire alarm received in the control room. By letter dated June 5, 1989, the licensee committed to submit a request for deviation from the NRC guidelines covering this subject by September 30, 1989. In a letter dated July 18, 1989, the NRC accepted the fact that no further actions were necessary regarding this issue pending NRC review of the planned deviation request. By letter dated September 30, 1989, the licensee submitted a deviation requesting relief from the NRC guidelines contained in an August 29, 1977 document, "Nuclear Plant Fire Protection Functional Responsibilities, Administrative Controls and Quality Assurance." In this letter, the licensee described criteria by which individual plant fire areas were evaluated for potential vulnerability. The result was that three locations were identified as requiring the immediate assembly of the fire brigade. This issue has been reviewed, and although still pending, is discussed in an NRC Meeting Summary dated February 2, 1990. As discussed in this document, the NRC initially expressed concern that the criteria would not require the dispatch of the brigade if multiple alarms of a certain type were received such as multiple alarms from the fire detection system. The draft SER attached to the meeting summary indicated that the licensee affirmed that multiple fire detector alarms would be considered "diverse" alarms and, therefore, implied fire brigade assembly for those conditions. However, on February 13, 1990, the licensee submitted a voluntary report for failing to immediately assemble the fire brigade after receiving multiple fire alarms. The decision not to assemble the fire brigade was based on a prompt verification that no smoke or fire detector alarms accompanied the sprinkler alarm and the confirmation of normal bearing temperature on all service water pumps. Each operating shift has since discussed the proper response to take in accordance with the fire procedure. In conclusion, this review of the licensee's approach to this issue concluded that it provides reasonable assurance that future fire brigade response will be timely in areas which contain potentially vulnerable redundant shutdown systems. Therefore, this issue is considered closed. Any further examples of failing to assemble the fire brigade upon receipt of redundant, diverse fire indications may result in additional enforcement action being taken.
- p. (Closed) Violation (346/89012-06(DRS)): Recurring examples of personnel error in failing to properly follow the fire watch procedure.

According to a letter dated June 5, 1989, the licensee attributes these recurring examples to the significant changes that have been on-going in the area of fire protection including the significant procedural revisions and substantial number of fire protection components being declared inoperable, primarily related to fire barriers.

The licensee performed a review of LERs that have occurred from 1989 to date regarding the above subject matter. This review demonstrated that a reduction in LERs has occurred since 1989. The inspector

conferred with the plant Resident Inspection Staff who agreed that corrective action improvements in this area appear to have been successful. It was also noted that the improvement in this area was due, in part, to the licensee's efforts in placing back in service significant numbers of inoperable fire protection equipment. Based on the above, this issue is considered resolved.

4. Post Fire Safe Shutdown Submittals

Following the NRC's July 1983 post fire safe shutdown inspection, the licensee submitted a letter (August 23, 1983) describing a corrective action plan to address the NRC identified issues. This letter specifically stated that a program of long-term actions had been initiated. This letter specified the long-term actions by task numbers. The task review process had varying completion dates, the longest scheduled for completion by April 30, 1984. By letter dated April 16, 1984, the licensee informed the NRC that the post fire safe shutdown capability long-term tasks would not be completed as scheduled (April 30, 1984) but were rescheduled for completion by September 1, 1984. Subsequently, on September 6, 1984, the licensee submitted the completed safe shutdown reassessment in a CAR document. In addition, licensee management commissioned additional reviews of the CAR. According to a licensee letter dated March 27, 1986, these reviews consisted of internal as well as an independent external review of the CAR. The objective of these reviews were to ensure that the commitments identified in the two-volume CAR were accurate, clearly defined, adequately planned, and that statements made within the CAR accurately reflected plant analysis conditions. As a result, Revision 1 of the CAR was submitted on June 3, 1986. Consequently, the NRC requested the licensee to document all outstanding Change Notices to the licensee's Fire Hazards Analysis Report (FHAR) and CAR as formal revisions (reference licensee letter dated May 27, 1987). In preparing for this inspection, Revision 11 of the FHAR and Revision 5 of the CAR were the most current (December 18, 1989) licensee analysis submittals. However, by letter dated February 16, 1990, the licensee submitted three safe shutdown approaches not previously submitted and seventeen changes to safe shutdown implementation approaches which had been previously submitted for review. During the April 23-27, 1990 inspection, modification information not previously reviewed was determined to exist. Consequently, on April 25, 1990, the licensee docketed a document which superseded the current CAR (Revision 5) referred to as the FAOR. This document was intended to represent the Appendix R plant configuration at startup from the sixth refueling outage. As a result of an electrical error having been identified by the electrical inspector, the Plant Manager directed a re-review of the FAOR to be completed. On May 9, 1990, a meeting was held at NRC Headquarters to identify differences between the CAR and FAOR. Following this meeting, the licensee formally docketed Revision 1 to the FAOR and a "Summary of Differences Between (the) Compliance Assessment Report Analysis and the Fire Area Optimization Report." In part, this information was reviewed during the May 21-24, 1990 inspection visit, while other remaining analyses are pending NRR technical review. Examples of significant changes or errors found in the submitted Appendix R analyses that were identified during this inspection are addressed in Paragraphs 7, 8, and 15 of the report. The length of time the licensee has spent reanalyzing the post fire safe shutdown capability and the continuing significant changes raised concerns as to the thoroughness of the licensee's Appendix R

re-analysis. The examples were considered to be indicative of a weakness in the licensee's Appendix R engineering/design program.

5. Cold Shutdown

The licensee requested an exemption from the requirement that the plant be capable of achieving cold shutdown within 72 hours without the use of offsite power. According to an NRC Meeting Summary dated February 2, 1990, this exemption was reviewed but is still pending formal issuance. During this inspection, this issue's methodology was reviewed further. Without offsite power the Reactor Coolant Pumps (RCPs) cannot be operated and, therefore, pressurizer spray is unavailable. The licensee's cooldown method is natural circulation. To preclude formation of steam in the upper reactor vessel head, natural circulation cooldown is limited to a 1.5 degrees F per hour cooldown rate. This cooldown rate limitation extends the cooldown time to approximately 193 hours. The 193 hour cooldown time was considered to be acceptable because the licensee's procedures, systems and resources will accommodate an extended cooldown time.

6. Alternative Shutdown

The following fire areas at Davis-Besse have been identified as requiring alternative shutdown capability:

a. Fire Area BF - Service Water Pump Area

For a fire in this area resulting in a loss of service water; the backup service water pump (P180) is used instead of service water pump P3-1, or P3-3.

The required alternative shutdown actions specified in Abnormal Procedure DB-OP-02501, "Serious Station Fire," Attachment 9, "Fire in Area BF," were found to be acceptable.

b. Fire Areas DD/FF - Control/Cable Spreading Rooms

For a fire in these areas requiring control room evacuation, the plant is shutdown from the Alternate Shutdown Panel C3630 (Fire Area R).

Abnormal Procedure DB-OP-02519, "Serious Control Room Fire," specifies the alternative actions required to be taken for a fire in areas DD/FF that require control room evacuation. Review and walkdown of this procedure identified procedural deficiencies and required corrective action by the licensee. For details see Paragraph 7 of the report.

c. Fire Area EE - Radwaste and Fuel Handling Area, Radwaste Exhaust Fan Room, Duct Chase and Purge Exhaust Room

For a fire in this area resulting in the loss of turbine driven AFW, the motor-driven feedwater pump taking suction from the condensate storage tank is used.

The required alternative shutdown actions specified in Abnormal Procedure DB-OP-02501, "Serious Station Fire," Attachment 21, for a fire in area EE, were found acceptable.

- d. Fire Area HH - AC Equipment Room, Records and Storage Area, Vestibule

For a fire in this area requiring control room evacuation, the alternate shutdown panel will be used. Abnormal Procedure DB-OP-02501, Attachment 24, for a fire in area HH, specifies using Abnormal Procedure DB-OP-02519 if the control room becomes uninhabitable as a consequence of the fire in Area HH. The inspectors' review determined that a fire in Area HH could cause a loss of the portable radio safe shutdown communication system. Control room evacuation without safe shutdown communications were found to be unacceptable. Subsequently, the licensee took corrective action to resolve this concern. This corrective action was found acceptable. For details see Paragraph 3.d of the report.

- e. Fire Area Q - High Voltage Switch Gear Room B

For a fire in this area damaging circuit 1FYE104A and disabling the low voltage switchgear room damper (HV5305), portable ventilation is required.

The required alternative shutdown actions specified in Abnormal Procedure DB-OP-02501, Attachment 38, for a fire in area Q, were found to be acceptable.

7. Abnormal Procedural Review

- a. Abnormal Procedure DP-OP-02519, Revision 01, "Serious Control Room Fire"

In the event of a fire in the main control room, the cable spreading room, or fire area HH (AC equipment room, records and storage area, vestibule) serious enough to require control room evacuation, the licensee has developed Procedure DB-OP-02519 for shutdown from outside of the control room. The procedure consists of 12 attachments with the first seven assigned to individual members of the shutdown complement.

Attachment 1 Shift Supervisor Actions Outside the Control Room

Attachment 2 Assistant Shift Supervisor Actions Outside the Control Room

Attachment 3 Primary Side Reactor Operator Actions Outside the Control Room

Attachment 4 Secondary Side Reactor Operator Actions Outside the Control Room

- Attachment 5 Equipment Operator 1 Actions Outside the Control Room
- Attachment 6 Equipment Operator 2 Actions Outside the Control Room
- Attachment 7 Shift Manager and Shift Supervisor's Administrative Assistant Actions Outside the Control Room

Once the decision to evacuate the control room is made, the reactor is tripped from the control room, driving the control rods in for initial reactivity control. Several other immediate actions will be attempted from the main control room prior to evacuation. If unsuccessful, the remaining immediate actions can be performed from outside the control room. The operating personnel then proceed to implement their assigned actions, with the shift supervisor directing and coordinating the shutdown from the alternate shutdown panel.

During the review of post fire safe shutdown procedures, the inspection team reviewed the licensee's "time-line" for performing the post fire safe shutdown procedure as well as the actual procedure steps. The "time-line" is used to demonstrate that the time sensitive procedural steps or actions can be completed or accomplished within required time limits. The required time limits for specific procedural steps are established by the licensee; typically the time limits are determined during the licensee's post fire safe shutdown analysis process.

At Davis Besse the inspection team's review of the time-line for Abnormal Procedure DB-OP-02519, Revision 1, Serious Control Room Fire, found that the licensee had identified the following time sensitive actions and their associated required completion times:

<u>REQUIRED ACTION</u>	<u>REQUIRED COMPLETION TIME</u>
CCW Restored	5 Minutes
ESS Restored	10 Minutes
CS Stopped	12 Minutes
Avert S/G Overfill	20 Minutes
MU Restored	24 Minutes
SW Restored	17 Minutes

Having identified the above time sensitive actions the inspection team conducted a partial walkdown of the procedure.

In analyzing time sensitive actions, satisfactory performance is demonstrated if the verified time to perform manual actions is:

- * Equal to or less than the time-line allowed time, or
- * If the verified time exceeds the time-line allowed time, then associated subsequent time sensitive actions must be at or before the time-line specified completion time.

During the inspection, the inspection team found that the licensee verified time-line failed to demonstrate restoration of CCW within 5 minutes. This failure had the operational impact of precipitating a station blackout. The following sequence of events would have initiated a station blackout:

- (1) Since the Secondary Reactor Operator (RO) required 6 minutes 14 seconds to complete the manual actions in Room 325, the Secondary RO would not have verified power to Component Cooling Water within 5 minutes.
- (2) A conservative analysis requires that CCW flow be considered not verified until the secondary RO verifies power to the CCW pumps. Since power to the CCW pumps was not verified within 5 minutes, CCW flow to Emergency Diesel Generator Number 1 can not be verified by the Assistant Shift Supervisor. Abnormal Procedure DB-OP-02519, Serious Control Room Fire directs the Assistant Shift Supervisor to trip the Number 1 Emergency Diesel Generator if CCW flow is not verified.
- (3) After the Assistant Shift Supervisor trips the Number 1 Emergency Diesel Generator, additional manual actions are performed and then the procedure directs the Assistant Shift Supervisor to trip the Number 2 Emergency Diesel Generator.
- (4) Since the licensee's procedures direct the operators to initiate a loss of off-site power, a station blackout would be initiated when Assistant Shift Supervisor tripped Diesel Generator Number 2.

Since the information provided to the inspection team supports the above analysis, the inspection team determined that the licensee's Abnormal Procedure DB-OP-02519, Revision 1, Serious Control Room Fire, would cause a station blackout whenever the procedure was implemented.

The inspectors held discussions with the licensee on May 23, 1990 identifying the self-induced station blackout concern as being unacceptable and contradicting the Davis-Besse October 11, 1989 response to the NRC. Consequently, on May 24, 1990, the licensee committed to revising Abnormal Procedure DB-OP-02519 prior to startup. The revised procedure was reviewed and found to not initiate a station blackout. The discrepancy between the licensee commitment not to induce a station blackout as was described in the October 11, 1989 letter, and the Abnormal Procedure DB-OP-02519, Revision 1, contradiction of causing a station blackout whenever the procedure would have been implemented is being considered an unresolved item (346/90007-01(DRS)). On August 16, 1990, an inspector informed a member of the licensing staff as to the categorization of this issue following regional management review. This issue is pending further review by the NRC. No further licensee action on this issue is necessary at this time. The inspectors

considered this methodology change to be an example of an FAOR approach change that was different than the CAR approach. This was not described in the licensee's "Summary of Differences Between the FAOR and CAR" document dated May 10, 1990. Therefore, it appeared that the licensee's post-fire safe shutdown capability approach was still undergoing significant change. This is considered to be a weakness in the licensee's engineering analysis/design of Appendix R systems.

An additional action by the licensee to intentionally induce a loss of off-site power as a basic safe shutdown methodology was previously identified during the NRR review to be unacceptable. During the May, 1990 inspection visit, discussions held with the licensee were unable to produce a satisfactory resolution of this issue. Consequently, on May 31, 1990, a meeting was held between the licensee and NRR technical personnel. As a result, the licensee agreed to revise the applicable procedure which was determined to be acceptable by the NRR technical reviewer.

b. Abnormal Procedure DB-OP-02501, Revision 1, "Serious Station Fire"

This procedure provides guidance for safe shutdown in the event of a fire in any area other than those covered by DB-OP-02519. The inspectors reviewed sample fire areas in this voluminous (170 page) procedure and identified a manual action missing in Attachment 3 (fire in Fire Area A). Listed under Note 52 in the Fire Area A, Table 1 notes (Fire Area Optimization - Volume 1) was a requirement to manually close valve DH2733 and trip breaker BE1121 at MCE11A. DH2733 is the BWST suction valve for decay heat pump 1. FAOR Fire Area A, Table 1, Note 52, specifies the requirement to fail DH2733 closed, however, the procedure specified a manual closure of DH 2733. The licensee corrected this deficiency in the draft procedure.

The draft SER attached to the Meeting Summary, dated February 2, 1990, addressed a concern that plant operators may experience confusion in implementing post-fire safe shutdown procedures for a fire in Fire Area A. The use of either Train 1 or Train 2 components was the basis for the concern. Abnormal Procedure DB-OP-02501, "Serious Station Fire," Attachments 2 and 3, "Fire in Area A," Part 1 and Part 2, provide specific directions for use of either Train 1 or Train 2 components. Walkdown of the procedure in Fire Area A did not identify any procedure implementation problems. See Paragraph 7.c.(2) further procedure walkdown details.

c. Procedure Walkdown

- (1) The "Serious Control Room Fire" procedure (DB-OP-02519) walkdown was initiated at 1300 hours on April 23, 1990, using six people from the licensee's operating staff with the proper training and qualifications to fill the required positions. A member of the inspection team accompanied each operator performing the required actions. The walkdown was terminated after stable hot standby was achieved.

The inspection team noted the following items as a result of the walkdown:

- (a) The operators displayed a good understanding of the actions, and the safe shutdown equipment required.
 - (b) At one time during the walkdown the secondary side reactor operator assigned to Attachment 4 had difficulty in contacting the shift supervisor (stationed at the alternate shutdown panel) with the hand-held radio. It took 5 or 6 attempts for the operator to contact the shift supervisor. This was considered to be an isolated incident.
 - (c) Equipment Operator No. 1, implementing Attachment 5, had to manually operate some valves for which access was difficult. These are valves located in the makeup pump room and the No. 1 Mechanical Penetration Room. The licensee agreed to review the problem.
 - (4) The emergency lighting appeared to be marginal to perform manual valve actions in the No. 1 ECCS Room catwalk. See Paragraph 3.c. for the results of the emergency lighting review.
- (2) During the May 21-24, 1990 inspection visit, the "Serious Station Fire" procedure (DB-OP-02501) was walked down by an inspector. This walkdown included those actions with time restraints less than two hours for the following:

- Attachment 2, Fire in Area A, Part 1
- Attachment 20, Fire in Area E
- Attachment 21, Fire in Area EE
- Attachment 22, Fire in Area F
- Attachment 26, Fire in Area J
- Attachment 27, Fire in Area K
- Attachment 41, Fire in Area T, Part 1
- Attachment 42, Fire in Area T, Part 2

The procedure walkdown was conducted to verify that manual actions were not required to be performed in the fire area of concern or were not required to be performed until after the fire was extinguished. Component accessibility was also checked. No unacceptable conditions were identified.

d. Operator Training on Safe Shutdown Procedures

In addition to observing the operator's performance during the walkdown of the DB-OP-02519 "Serious Control Room Fire" procedure, operator training personnel were interviewed concerning operator training on the DB-OP-02519 procedure. The training program includes classroom instruction, walkdowns, and hands-on operating experience. A two year requalification cycle is maintained. Lesson plans provided for inspection and training records for operating shift personnel were reviewed. The areas reviewed were found to be adequate.

8. Protection for Associated Circuits

As discussed in Attachment No. 1, "Clarification of Generic Letter," to Generic Letter 81-12, circuits located within a fire area may receive fire damage that can affect shutdown capability and thereby prevent post-fire safe shutdown. Associated circuits of concern are defined as those cables (safety-related, non safety-related, Class 1E, and non Class 1E) that have a physical separation less than that required by Section III.G.2 of Appendix R, and have one of the following:

- ° A common power source with shutdown equipment (redundant or alternative) and the power source is not electrically protected from the circuit of concern by coordinated breakers, fuses or similar devices.
- ° A connection to circuits of equipment whose spurious operation would adversely affect the shutdown capability (e.g., RHR/RCS isolation valves, POK's, steam generator atmospheric dump valves, instrumentation, steam bypass, etc.).
- ° A common enclosure (e.g., raceway, panel, or junction box) with the shutdown cables (redundant or alternative) and,
 - (1) are not electrically protected by circuit breakers, fuses, or similar devices, or
 - (2) will allow propagation of the fire into the common enclosure.

The review of the protection provided for associated circuits of concern at Davis-Besse was intended to be based on a detailed evaluation of a previously selected sample of circuits for each of the following concerns:

- ° Common Bus (power source) Concern
- ° Spurious Signals Concern
- ° Common Enclosure Concern

The sample of circuits selected for review during the inspection was based on pre-inspection, in-office review of the licensee's analysis of associated circuit concerns documented in Revision 1 of its FAO report. This analysis was formerly documented in the licensee's CAR, Revisions 3 and 5, and formed the basis of a previous inspection performed during the week of April 23-27, 1990. At the time of the April site visit, however, it was learned that the licensee had revised its analysis documented in its CAR and incorporated this new information in its FAOR. Subsequently, the inspectors requested that the licensee provide a listing which describes the specific differences between the original evaluation contained in the CAR and the revised analysis documented in the FAOR. The following table provides a summary of these changes:

Deleted

4.k Transfer SWGR CD

Added

328 Power Circuits required for SSD

ECCS Pump Room Vent. Fans C31 and C32	62 Cabinets 8 Relay Cabinet Circuits
CCW Pump Room Vent. Fans C75-1 and C75-2	Evaluation of Breaker/Fuse Coordination
CCW Pump Room Dampers HV5443 A, B & C and HV5444 A, B & C	120VAC distribution panels Y1A and Y2A Fuse/Breaker Type and Reference Drawings to support feeder load coordination calcs.
SG Drain Valves MS4531 and MS4532 SG Drain Isolation Valves MS603 and MS611	
RCP CCW Out. Iso. Valves CC4100, CC4200, CC4300, and CC4400	
18 entries related to 4.16KV SWGR C2 and D2 (9 ea.)	

During the inspector's review of information contained in Revision 0 of the FAOR report regarding associated circuit concerns, it became apparent that the report incorporated several significant changes to the analysis originally presented in the CAR. In addition, this review identified several errors of both a technical and editorial nature. For example, during the review of the protection provided for 480V MCC F11B, an error was identified in the information contained in Section 4 of the FAOR report. Specifically, the Safe Shutdown Analysis for Fire Area V was found to indicate that the breaker coordination of F11B was adequate when, in fact, the coordination of this power supply was deficient. As a result of this finding, the licensee committed to perform a thorough re-evaluation of the FAOR, Revision 0. The results of this review were incorporated into Revision 1 of the FAOR and form the basis for this inspection. This is considered a further example of a weakness in the licensee's engineering analysis/design of Appendix R systems.

a. Common Bus Concern

The common bus associated circuit concern is found in circuits, either safety-related or non safety-related, where there is a common power source with shutdown equipment and the power source is not adequately protected from the circuit(s) of concern.

The common bus concern is made up of two items:

- Circuit Coordination (Reference Generic Letter 81-12)
- High Impedance Faults (Reference Generic Letter 86-10)

(1) Circuit Coordination

In the context of Appendix R, circuit breaker coordination is defined as the selectivity between the individual load breakers and the upstream feeder breaker of a power supply required to achieve post-fire safe shutdown. The existence of such coordination between electrical protective devices ensures that in the event of a faulted circuit the protective device located nearest the fault will isolate the fault prior to the fault current initiating a trip of the upstream feeder breaker to the supply.

Circuit coordination is evaluated through a review of time/current characteristic curves contained in the licensee's analysis of this concern. On a sample basis the following circuits were selected for review during the April 23-27, 1990 inspection visit:

<u>Circuits</u>	<u>Comment</u>
4160V AC C1	Coordination Satisfactory
4160V AC C2	Coordination Satisfactory
480V AC E11A	Coordination Satisfactory
480V AC E11D	Coordination Satisfactory
480V AC F11C	Coordination Satisfactory
480V AC F11B	Unsatisfactory (see below)
480V AC E11B	Unsatisfactory (see below)
480V AC E12C	Unsatisfactory (see below)
480V AC F11E	Unsatisfactory (see below)
125V D1P	Coordination Satisfactory
125V D2P	Coordination Satisfactory
125V DC D1NA	Coordination Satisfactory

Additional circuit coordination was reviewed during the May 21-24, 1990 inspection visit. For those power sources which are not provided with a sufficient level of coordination, the licensee's alternative measures of protection/control were evaluated. Based on a review of the FAOR, Revision 1, the following additional circuits were selected for review.

<u>Power Supply</u>	<u>Comment</u>
480V AC MCC E12D	This power supply was found to have unsatisfactory coordination. However, a review of the licensee's analysis found all circuits powered from this supply to be routed within Fire Areas BD and BE. In the event of fire in either of these areas, the redundant train (Train 2) is relied on to achieve safe shutdown. Therefore, fire induced damage to circuits powered from this supply will not affect the post-fire, safe shutdown capability, and the licensee's analysis was found to be acceptable.

480V AC MCC F16A Satisfactory Coordination
480V AC MCC F7 Satisfactory Coordination
Control Power Pnl. Satisfactory Coordination
Y3602
Control Power Pnl. Satisfactory Coordination
ZC6451
Control Power Pnl. Satisfactory Coordination
ZC6459

The FAOR was found to take credit for the coordination of electrical protective devices where it currently exists. For power supplies, such as those indicated above, that were found to lack a sufficient level of protective coordination, the FAOR documents an evaluation of the potential effect of fire on the safe shutdown capability for each fire area of concern. Appendix C-3 of the FAOR summarizes the results of the licensee's breaker coordination study and lists all loads associated with a required power supply. In addition, this appendix identifies each power supply that relies on the safe shutdown component list but was found to lack an acceptable level of coordination. Appendix C-1 of the analysis identifies the specific cable routing, by fire area, of each potentially affected circuit. This list includes both required and associated circuits. Section 4 of the FAOR presents an analysis of each fire area and provides a description of each circuit routed through that area. Additionally, this section presents a justification and/or corrective actions to be taken to mitigate the loss of a required supply due to the occurrence of fire induced faults. Where applicable, the corrective actions typically required the incorporation of additional manual actions into post-fire operational procedures (e.g., manual operation of motor-operated valves).

A review of the licensee's FAOR analysis and method of control for power supplies relied on to achieve safe shutdown did not identify any significant items of concern and was found to be acceptable.

(2) High Impedance Faults

The licensee's analysis of the high impedance fault (HIF) concern is based on a maximum HIF fault current of 5 amps per circuit. This analysis was under review by an NRR electrical reviewer.

b. Spurious Signals Concern

The spurious signals concern is made up of two items:

- ° False motor, control, and instrument readings which could be caused by fire initiated grounded, shorted or open circuits.
- ° Spurious operation of safety-related or non safety-related components that would adversely affect safe shutdown capability.

(1) High/Low Pressure Interfaces

The licensee had identified the following high/low pressure interfaces and methods for controlling the interfaces:

<u>Interface</u>	<u>Method of Control</u>
High Point Vent Valves RC4608A, RC4608B, RC4610A & RC4610B	The design flow capacity is less than the definition of a LOCA
Pressurizer Pilot Operated Relief Valve (PORV) & Pressurizer Pilot Relief (Block) Shutoff Valve	Modification 88-0145, currently scheduled for completion prior to restart, provides fire protection features in accordance with Section III.G.2 of Appendix R for the PORV and its block valve
DH Normal Suction Valves DH11 & DH12	The 2 valves are in series and are administratively controlled (normally closed & depowered)
Letdown Cooler Isolation Valves MV02A, MV02B, MV01B and MV03	Manual actions were governed by written procedure to isolate the line. In the event either MV02A or MV02B cannot be closed, MV01A and MV01B (2 valves in parallel) or MV03 is used to isolate the letdown path.

The review of this issue was based on information obtained by the inspector during the pre-inspection review of the licensee's analysis contained in Revision 5 of the CAR.

During the May 1990 inspection visit, differences between the information presented in the CAR and FAOR documents were reviewed. This review did not identify any items of concern and the licensee's protection for fire induced spurious operation of high/low pressure interfaces was found to be acceptable.

(2) Isolation of Fire Induced Spurious Signals

The licensee provided isolation of fire instigated spurious signals by various methods, including:

- ° Administrative Controls
- ° Rerouting of Cables
- ° Wrapping of Cables
- ° Isolation/Transfer Switches (redundant fuses used)

During the inspection, all forms of isolation listed above were observed. The licensee's methods of fire instigated spurious signal isolation were found to be acceptable.

c. Common Enclosure

The common enclosure associated circuit is found when redundant circuits are routed together in a raceway or enclosure and they are not electrically protected, or fire can destroy both circuits due to inadequate fire protection means.

Licensee representatives specified that:

- 1) Redundant safe shutdown cables are never routed within a common closure.
- 2) Non safety-related cables routed within a common enclosure with redundant safety-related cables are never routed between redundant trains.
- 3) All circuits are electrically protected.

During the inspection, the licensee was requested to provide the cable number, function, component served, size, and type as well as the size, type and location of the electrical protection provided for each cable routed within a sample of enclosures/raceways.

Based on a review of the electrical protection provided for all circuits located within each enclosure selected for review, the licensee's protection for the common enclosure associated circuit concern was found to be acceptable.

d. Cable Routing

The routing of power and control cables associated with a number of components was evaluated during the April 23-27, 1990 inspection. This evaluation was based on a review of color coded, marked-up cable tray and raceway drawings provided by the licensee. These drawings depicted the power and control cable routings of each of the cables.

Cable Routing Review Comments:

- (1) Cables within Fire Area R associated with the AFW turbine governor control valves (ICS038B and ICS038A) were found to lack a level of protection equivalent to that required by Section III.G.2. The licensee's analysis for a fire in this area determined that since the Train 2 turbine governor control valve is normally open on the high speed stop and will fail as is (i.e., open), the AFW pump turbine will continue to operate at normal high speed. In the event of a fire within this area, AFW flow will be controlled using the Train 2 AFW flow control valve (AF6451). The licensee's method of controlling AFW flow in the event of fire in Fire Area R was found to be acceptable.
- (2) Cables associated with the AFW flow control valves (AF6452 and AF6451) were found to lack a level of protection equivalent to

that required by Section III.G.2 within Fire Area A. A review of the licensee's analysis for a fire in this area found these valves to be normally open. These valves are required to be throttled for safe shutdown. In the event of fire within this area, control of these valves may be lost. To mitigate the potentially adverse effect of fire in this area on steam generator level control, the licensee has developed written procedures (Serious Station Fire OP-02501) which direct operator actions to establish AFW control via the AFW turbine governor control valves (ICS038B for SG-1 level control or ICS038A for SG-2 level control). The licensee's method of controlling auxiliary feedwater flow in the event of fire in Fire Area A was found to be acceptable.

The review of power and control cable routing for components required to achieve post-fire safe shutdown did not identify any items of concern. Based on the results of this review, the licensee's method of protection for cables of components required to achieve safe shutdown was found to be acceptable.

9. Communications

The licensee has identified three communication systems that would be available for safe shutdown:

- ° Portable Hand-Held Radios
- ° Sound Powered Phones
- ° Gaitronics System

The primary means of communications during alternate shutdown are the portable hand-held radios. During the walkdown of the alternate shutdown procedure, hand-held radios were used for communications and appeared to be adequate.

During this inspection, the licensee's evaluation of radio communications capability was reviewed. This evaluation was documented in the "Davis-Besse Appendix R Radio Communications Study," Revision 1, dated April 20, 1990. Attachment 5 of this evaluation states: "For a fire in Fire Area HH, the entire communication system could be lost along with the ability to communicate throughout the plant."

Fire Area HH has been designated as an alternate shutdown fire area (III.G.3). In the event of fire in Fire Area HH, coincident with a loss of offsite power, the normal control room ventilation system would automatically shut down as it is powered solely from normal offsite power. Fire Area HH also contains unprotected circuits of the control room emergency ventilation system. Therefore, a fire in this area may result in a total loss of control room ventilation capability. Such an event would ultimately require control room evacuation with performance of the necessary shutdown actions locally and at the emergency control stations.

Section 4 of the FAOR is divided into subsections which contain an evaluation of each specific fire area. In addition, each subsection includes a listing of those safe shutdown system components located within the area. Subsection HH for FAOR Section 4 contains the licensee's evaluation of Fire Area HH. A review of this subsection revealed that it did not consider the results of the radio communications study to the extent that it did not address the potentially adverse impact of fire in this area on the plant radio communications capability. A subsequent review of Serious Station Fire Procedure DB-OP-02501 (procedure for fire outside the control room/cable spreading room) found this procedure to indicate that in the event of fire in Fire Area HH, control room evacuation may be necessary and directs operators into Serious Control Room Fire Procedure DB-OP-02519 (Control Room/Cable Spreading Room Fire procedure). As noted previously, this procedure specifies the use of portable, hand-held radios. However, the procedure did not advise the operators that radio communications may be lost in the event of fire in Fire Area HH. In addition, the procedure did not specify an alternative communications system (i.e., Sound Powered Phone or Gaitronics) that would remain available in the event of fire in this area. Therefore, at the time of the inspection, a fire in Fire Area HH had the potential of requiring the performance of manual shutdown actions from outside the control room without a communications capability known to be free of fire damage.

Subsequent to the inspection, the licensee revised Serious Station Fire Procedure DB-OP-02501. A draft version of procedure DP-OP-02501, Revision 1, was received on May 31, 1990. Attachment 24 of this procedure was found to provide additional operator guidance in the event of a fire in Fire Area HH. Specifically, the attachment was found to indicate that a fire in this area may damage the radio communication system, and specifies the use of the plant sound powered communications system. In addition, the licensee had performed an evaluation of the sound powered phone communications capability in the event of fire in this area. This evaluation was documented in the Davis-Besse Appendix R sound powered phone system evaluation for Fire Area HH, Revision 0, dated May 31, 1990. This evaluation was found to be acceptable.

The review of the licensee's procedural revisions and its evaluation of the effect of fire on alternate shutdown communications capability for a fire in Fire Area HH did not identify any items of concern. For further details, refer to Paragraph 3.d of this report.

The inspectors requested the licensee to incorporate the Appendix R radio communications study into the FAOR. The licensee acknowledged this request.

10. Exemption Review

a. Auxiliary Feedwater Pump Rooms

The licensee requested and was granted an exemption, by NRC letter dated August 20, 1984, from the technical requirements of Subsection III.G.2 of Appendix R to 10 CFR Part 50. Subsection III.G.2 of Appendix R to 10 CFR Part 50 requires that redundant trains of equipment necessary for safe shutdown be

separated by one of three specific methods to ensure that one of the redundant trains of equipment will be free of fire damage. One of the methods specified is separation by a fire barrier having a 3 hour rating including any penetrations. The licensee requested an exemption from the requirement for a 3 hour rated barrier with respect to a door which separates rooms containing equipment necessary for safe shutdown. This door (No. 215) is located in a designated 3-hour fire barrier between Room 237 in Fire Area E, Fire Zone No. E-1 and Room 238 in Fire Area F, Fire Zone No. F-1. Each of these areas contains an AFW pump. According to the licensee, Door 215 located in the fire wall separating the AFW pump rooms was designed to serve as a pressure rated door. Therefore, an Underwriters Laboratories (UL) rated fire door could not be installed. Instead, the licensee performed an engineering evaluation to determine the fire resistance of Door 215, simulating the fire test requirements of NFPA 251. The exemption was granted on the basis of the licensee's determination that the combustible material in either pump room is of low fuel load, and that a smoke detection system is installed in each room. According to the Safety Evaluation, there is reasonable assurance that an incipient fire would be detected promptly and that the response of the fire brigade would be expected in less than 25 minutes.

Subsequently by letter dated July 31, 1989, the licensee informed the NRC that Door 215 was replaced with another door that was evaluated as being equivalent to a 3 hour rated door, although not labeled. This letter specified that the construction of the current door is different from the original, but was considered by the licensee to be addressed by the previous exemption request. This issue was discussed at the April 5, 1990 meeting held at NRC Headquarters.

During this inspection, the licensee provided a Factory Mutual analysis for the presently installed fire door which was determined to meet the criteria described in Generic Letter 86-10. As part of this review, an inspector confirmed that Rooms 237 and 238 have installed fire detectors. Due to outage related activities, scaffolding with wooden planking and other miscellaneous amounts of ordinary combustible material were observed in Rooms 237 and 238. However, during the inspector's walkthrough of these areas, licensee personnel reiterated that these materials would be removed prior to startup from this outage. On this basis, it was determined that the above features used as a technical basis for acceptance of the exemption were being or would be maintained as described by the licensee.

b. Varied Plant Areas

By letter dated January 12, 1987, the licensee requested exemptions discussed in an NRC Meeting Summary dated February 2, 1990. The exemptions regarded the technical requirements of Subsection III.G.3 of Appendix R to 10 CFR Part 50 to the extent that the licensee was not providing a fixed fire suppression system for certain fire areas. These exemption requests regarded the following fire areas: (1) Fire Area R - auxiliary shutdown panel and Transfer Switch Room No. 324;

(2) Fire Area EE - Purge Exhaust Equipment Room No. 515, radwaste exhaust equipment and Main Steam Exhaust Fan Room No. 501, and radwaste fuel handling areas and Air Supply Equipment Area Room No. 500; and (3) Fire Area AB - Decay Heat Coolers Room No. 113, Hatch Area Room No. 113A, and Emergency Core Cooling System Pump Room No. 105. The licensee justified these exemptions primarily on the basis of low amounts of combustibles, early warning fire detection capability, and the fact that alternate shutdown capability was provided. Due to outage related activities, miscellaneous amounts of ordinary combustible materials were observed in Fire Area AB. As discussed with licensee personnel, these materials were scheduled to be removed prior to plant restart. On this basis, the inspector verified that the above features used as a basis for acceptance of the exemptions were being or would be maintained as described by the licensee.

However, another observation made during the walkthrough of Room 113A (Fire Area AB) and Room 115 (Fire Area A) regarded an extension cord hung over and through Appendix R fire barrier door 119A. This door is normally maintained open by a hold open device. Due to the extension cord, the door may not have latched under a fire condition. This condition rendered the door technically inoperable.

In accordance with Technical Specification 3.7.10, all fire barriers separating portions of redundant safe shutdown systems required in the event of a fire shall be operable at all times. The Technical Specifications require when one or more of these fire barriers are inoperable that within one hour, either: establish a continuous fire watch on at least one side of the affected fire barrier, or verify the operability of the fire detectors on at least one side of the affected fire barrier and establish an hourly fire watch patrol.

According to the licensee's staff, the extension cord was incorrectly put in-place by workmen performing outage related activities. These individuals were later counseled about this condition. Although this door was technically rendered inoperable, the licensee's staff provided a fire watch log that showed door 119A was being fire watch patrolled, thereby satisfying the Technical Specification Action Statement and ensuring that a fire condition would have been discovered in a timely manner.

11. Fire Protection Administrative Controls

During a tour of the cable spreading room on April 23, 1990, an inspector observed various minor amounts of individual accumulations of ordinary combustible materials including miscellaneous combustible trash, extension cords, wooden broom stick(s), polyethylene ropes, and rags while no work activity was evident for more than one hour, nor were these combustibles removed at what appeared to be the end of the job. No transient combustible permit had been issued. In addition, a four gallon sized container (had a small amount of liquid in the container) labeled as a "flammable" liquid was found unattended for more than an hour in an area that appeared to have had cable pulling work activity performed. Consequently, the licensee's staff determined that the container did not contain a flammable liquid but

instead contained a non-flammable product known as "Yellow 77 Wire Pulling Lubricant." The licensee's staff provided the applicable material safety data sheet for this product specifying it to be non-flammable. The licensee's staff was unable to determine any specific information as to when or who brought the container into the cable spreading room. During discussions with the licensee regarding these findings, the licensee's response was that a major clean-up effort conducted on approximately April 20-22, 1990, failed to identify and take the appropriate action to correct these deficiencies.

At the exit meeting of April 27, 1990, the inspector emphasized that the above concern illustrated a lack of control of flammable liquid containers and combustible materials. The licensee acknowledged the inspector's concern.

These findings are considered examples of a violation of fire protection requirements (346/90007-02(DRS)) as described in the Notice of Violation. For the individual findings, the licensee took corrective action prior to the inspectors departing the site.

12. Pre-Fire Strategy Procedures

During the NRC review of the licensee's revised fire protection program, the NRC reviewer expressed concern that the licensee may not have adequately planned how to deal with the smoke produced by a fire. The specific concern centered on the venting of products of combustion to avoid damage to redundant shutdown equipment. The licensee responded to this concern in the May 27, 1987, letter by committing to revise the fire protection (pre-fire) strategy procedures to prioritize the methods of smoke venting so as to minimize the potential impact of smoke on sensitive electrical equipment. The NRC reviewer reviewed the licensee's proposals and concluded that this was an acceptable approach to this issue.

During this inspection, an inspector reviewed the cable spreading room and component cooling water heat exchanger and pump room pre-fire strategy procedures (both Revision 0) and confirmed that these procedures do include ventilation/smoke removal consideration information. According to the licensee, other plant area pre-fire strategy procedures have had this information incorporated.

13. Turbine Building Roof Vent

During the NRC review of the licensee's NFPA code conformance to Standard No. 204, which pertained to the design, installation and maintenance of the turbine building roof venting, a maintenance concern was raised. This concern regarded the lack of a program for testing the roof vents to confirm their operation. Subsequently, by letter dated July 31, 1989, the licensee committed to develop and implement a comprehensive program for periodic testing and verification of the vent operation.

During this inspection, an inspector was provided documentation showing that maintenance Work Order No. 1-88-2225-00 was completed on August 29, 1989. This work activity repaired and made operable each of the turbine building roof vents. In addition, the licensee provided documentation

showing that Preventive Maintenance No. 4331, scheduled to be initiated by October 1990, will perform an annual maintenance on these roof vents. On the above basis, this issue is considered resolved.

14. Inadvertent Fire Suppression System Actuation Analysis

By letter dated November 22, 1989, the licensee described the protection of plant equipment from the effects of inadvertent fire suppression system actuations. At present, the licensee has analyzed systems categorized as safe shutdown systems in regards to the effects of inadvertent fire suppression system actuations. Discussions were held during the May 9, 1990 meeting as to the need for the licensee to broaden the analysis of systems to those categorized as "safety related" and "important to safety." Since it was concluded that the resolution to Generic Issue No. 57 will incorporate the NRC position on this issue, no further actions were deemed necessary at this time. This issue can be reviewed further following resolution of the generic issue.

15. Review of Licensee Changes from Previous Submittals in Fire Protection Compliance Approaches

By letters dated February 16 (issues not addressed in report being reviewed by NRR), 20 (being reviewed by NRR) and March 22, 1990 (technical licensing actions being reviewed by NRR as specified), the licensee submitted changes from previous submittals in fire protection compliance approaches. The licensee's submittals included the following: (1) compliance approaches not previously submitted; (2) changes to Appendix R implementation approaches previously submitted; and (3) changes to License Amendment No. 18 Safety Evaluation compliance approach. At the request of NRR, the regional inspection team reviewed certain of the above submitted changes and approaches for acceptability.

a. February 16, 1990 Submittal - Attachment 2 (Changes to Previously Submitted Compliance Approaches)

- (1) Change No. 7 in the submittal - Commitment: In the notes in Section 4 of the CAR, Toledo Edison stated that Containment Emergency Sump Isolation Valves DH09A and DH09B could spuriously open with unacceptable results. An isolation switch in the circuit scheme for valves DH09A and DH09B was to be installed such that fire damage cannot spuriously open the valves.

Revised Commitment: Toledo Edison has determined that the original modification is no longer required to resolve the spurious operation concern. Instead of the modification, the breakers (BF1142 and BE1112) for valves DH09A and DH09B will be left normally open to prevent spurious valve opening as a result of a fire. This action to open the breakers will be completed by the end of the sixth refueling outage. A more detailed discussion of the modification and the procedure changes was provided in a Toledo Edison letter to the NRC (Serial 1744, dated January 9, 1990).

Review of Revised Commitment:

DH09A (Train 2) and DH09B (Train 1) provide suction from the containment sump in the event of a LOCA when BWST inventory is depleted. The valves are normally closed motor-operated valves (MOV) and are required to be in the closed position to achieve post-fire safe shutdown so that BWST inventory is not diverted to the containment sump in the event of spurious opening of the valves. If this were to occur, the containment emergency sump could fill with water to the point that water could come in contact with the reactor vessel and thereby cause thermal shock.

Since MOVs fail "as is" upon the loss of electromotive power and both valves are normally closed, the review of this item concentrated on verification of administrative procedures to maintain circuit breakers BF1142 and BE1112 in the open position during normal operations. This verification was acceptably resolved based on the inspectors' review of change No. 5 to the licensee's decay heat and low pressure injection operating procedure dated May 5, 1990.

- (2) Change No. 8 in the submittal - Commitment: In Note 10 of Section 10 of the CAR for Fire Area II (Room 53), Toledo Edison stated that the circuits for Service Water Pumps 1 and 3 are currently protected with a one-hour fire barrier. Since detection and automatic suppression systems presently exist in Room 53, these circuits are currently in compliance with Appendix R, Section III.G.2. On May 23, 1988, Toledo Edison committed to upgrade the sprinkler system in Room 53.

Revised Commitment: Toledo Edison has re-evaluated the method of Appendix R compliance in Room 53 and determined the need to provide a three-hour fire barrier without requiring the detection system and the upgrades to the sprinkler system. The upgrade for the circuits for Service Water Pumps 1 and 3 will be completed by the end of the sixth refueling outage.

Review of Revised Commitment: As part of the inspectors' review to determine if the licensee was or would be satisfying the Appendix R Rule prior to startup from the sixth refueling outage, the inspectors reviewed the licensee's revised method of compliance. This review selectively verified that a 3-hour fire barrier was installed between Appendix R designated redundant equipment. In addition, a selective review of Appendix R designated circuits was also performed and confirmed that adequate separation requirements were satisfied. Based on the above review, this revised commitment was considered acceptable.

- (3) Change No. 9 in the submittal - Commitment: Toledo Edison committed to install and/or modify the emergency lighting system as described in CAR Table 6-3, "Emergency Lighting System Modifications Identified," and CAR Table 6-6, "Summary of Recommendations for a Serious Station Fire." Also, a note to Table 6-6 stated that two rooms required further evaluation.

Revised Commitment: Emergency lighting has been or will be installed in the areas as described in CAR Tables 6-3 and 6-6, except for 3 rooms (250, 705 and 706). Rooms 250, 705 and 706 no longer require emergency lighting based on the latest walkdown of the safe shutdown procedure. The two rooms containing the diesel air compressor system listed in the Note to CAR Table 6-6 have been evaluated for manual action. No manual actions are required in these two areas; therefore, no additional emergency lighting is required. The emergency lighting required to support the safe shutdown procedures will be completed by the end of the sixth refueling outage.

Review of Revised Commitment: During the inspectors' review of the licensee's post-fire safe shutdown procedure(s), the inspectors confirmed that operator action(s) for an Appendix R scenario do not need to occur in Rooms 250, 705, or 706. According to the licensee, these rooms are not pathways for the operators to traverse. Therefore, it was concluded that emergency lighting for the specified rooms was no longer necessary. Based on the above review, this revised commitment was considered acceptable.

- (4) Change No. 10 in the submittal - Commitment: In CAR Table 6-2, "Emergency Lighting Evaluation for a Fire in the Control Room or Cable Spreading Room," Toledo Edison committed to relocate the diesel air compressor and associated valves to resolve lighting concerns.

Revised Commitment: Toledo Edison has determined that the air system is not necessary to achieve safe shutdown. Therefore, there is no need to relocate the diesel air compressor and associated valves to resolve lighting concerns.

Review of Revised Commitment: The inspectors reviewed the function of the diesel air compressor and associated valves in achieving a post-fire safe shutdown and found that the licensee's safe shutdown procedures are performed by manual operations without instrument air.

Based on this review, it was concluded that the air system was not necessary to achieve post-fire safe shutdown. Therefore, this revised commitment was considered acceptable.

- (5) Change No. 11 in the submittal - Commitment: In the notes in Section 4 of the CAR (for various fire areas), Toledo Edison stated that the associated circuits of concern would be resolved by installation of ground fault protection at the breakers.

Revised Commitment: Toledo Edison has re-evaluated the method of providing ground fault protection at the breakers and determined that the most effective method is to change the solidly grounded 480V Class 1E bus to a high resistance grounding system to preclude a ground from tripping a breaker. Based on the analysis of the buses and loads which are required

for safe shutdown, several breakers to cascaded MCCs will be removed to achieve the desired breaker coordination. This modification will be completed by the end of the sixth refueling outage.

Review of Revised Commitment: Circuit breaker coordination of those 480V power sources identified by the licensee as required to achieve post-fire safe shutdown was reviewed as part of the overall Davis-Besse Appendix R associated circuit compliance assessment and found to be acceptable. Therefore, a review was conducted to verify that the high resistance grounding scheme for the 480V Class 1E system was installed as required or was planned to be installed prior to startup from the sixth refueling outage. At the time of the inspection, this work was found to be included in the scope of Davis-Besse Commitment No. 85-0063. The level of completeness of this commitment was determined from a review of the then current list of related maintenance work orders. This review found that all activities required to complete this project to be either closed or in the final process of completion. Based on the above, the licensee's revised commitment was found to be acceptable.

- (6) Change No. 12 in the submittal - Commitment: In Note 4 of Section 4 of the CAR (for Fire Area T), Toledo Edison stated that isolation devices will be installed for both trains of 125V DC circuits to preclude the loss of 125V DC control power to the flow switches for the three component cooling water pumps.

Revised Commitment: Toledo Edison has re-evaluated the method of Appendix R compliance for the 125V DC circuits and determined that the most effective method is to wrap the circuits as well as the switches themselves with one-hour fire barriers. The fire area contains area wide suppression and detection and with the one-hour fire wrap satisfies the 10 CFR 50, Appendix R requirements. The one-hour fire wrap of the circuits and switches will be completed by the end of the sixth refueling outage.

Review of Revised Commitments: The review of this item was performed jointly by both the electrical systems inspector and the fire protection inspector. This review verified that a one-hour fire barrier was planned to be installed between Appendix R designated redundant equipment prior to startup from the sixth refueling outage. In addition, a selective review of Appendix R designated redundant circuits was also performed and did confirm that adequate separation requirements were satisfied. Based on the above review, this revised commitment was considered acceptable.

- (7) Change No. 13 in the submittal - Commitment: In Note 73 of Section 4 of the CAR (for Fire Areas DD/FF), the licensee stated that a Source Range Flux monitor will be installed at the Auxiliary Shutdown Panel.

Revised Commitment: The licensee has re-evaluated the method of providing source range flux monitoring and determined that an acceptable method is to provide source range flux monitors in the two electrical penetration rooms (402 and 427) where the circuits exit the containment. The reading of a source range flux monitor in either electrical penetration room has been evaluated as part of the time line for manual actions and is acceptable from a time and manpower standpoint. These source range flux monitors will be installed and the procedure revised for their use by the end of the sixth refueling outage.

Review of Revised Commitment: The inspectors found that Abnormal Procedure DB-OP-02519, "Serious Control Room Fire," Attachment 3, "Primary Side Reactor Operator Actions Outside the Control Room," includes the actions to "Proceed to #1 Electrical Penetration Room via the Emergency entrance to RCA" and "Check that power is dropping in the source range at C4808, Gamma Metrics Cabinet, using neutron flux monitor NY-5874C." Review of the licensee's time line for performing DB-OP-02519 verified that adequate time existed for using the source range monitor in the No. 1 Electrical Penetration Room. Also, the operators were observed monitoring the source range monitor in the No. 1 Electrical Penetration Room during the procedure walkdown. The licensee's revised commitment on source range monitors was found to be acceptable.

- (8) Change No. 14 in the submittal - Commitment: In Note 38 of Section 38 of the CAR (for Fire Area DD/FF), Toledo Edison stated that the power supply circuit to the ammeter will be isolated by de-energizing the circuit by means of a shorting bar at 4.16KV AC Switchgear Bus C1.

Revised Commitment: The licensee has re-evaluated the circuit of concern and determined that the power supply to the ammeter on the 13.8KV bus will be de-energized by a manual action following a serious fire in Fire Area DD/FF. Thus, the loss of this circuit would not pose a concern and the manual action as described in the CAR is no longer required.

Review of Revised Commitment: The inspectors reviewed Abnormal Procedure DB-OP-02519, "Serious Control Room Fire," and found that Attachment 4, "Secondary Side Reactor Operator Actions Outside the Control Room," includes a step to verify that breaker ABDC1 at C1 Bus (Cubicle 2) is open. Opening Breaker ABDC1 at the C1 Bus will de-energize the ammeter on the 13.8KV bus. The licensee's revised commitment for de-energizing the 13.8KV bus ammeter was found to be acceptable.

- (9) Change No. 15 in the submittal - Commitment: In Note 2 of Section 4 of the CAR (for Fire Areas D and DA) and in Note 3 (for Fire Area DF), the licensee specified that the circuits for Containment Air Cooler (CAC) Fans 1, 2 and 3 will be separated with radiant energy shields. The licensee specified

that the circuits for CAC Fan 3 (i.e., the swing train of equipment) will be protected with a one-hour barrier.

Revised Commitment: The licensee has determined that the protection of only one train of CAC fans is required to satisfy Appendix R requirements. Therefore, only one train of CAC fans will be protected in a particular fire area. As required by Appendix R, this protection will be provided by a radiant energy shield in the containment and annulus and with a one-hour barrier and suppression and detection or a three-hour barrier in the auxiliary building.

This approach of protecting only one train of a system to satisfy Appendix R requirements will be applied to other systems with swing components.

Review of Revised Commitment: The inspectors reviewed the licensee's analysis, Calculation C-ME-60.05-004, dated December 17, 1987, and found that the maximum allowed temperature for the limiting component inside containment was 200 degrees F. The licensee's analysis, RFA 90-0311, dated February 28, 1990, demonstrated that the maximum temperature inside containment with 1 CAC on slow is 150 degrees F. Since one CAC on slow will maintain the temperature inside containment to less than the maximum allowed for the limiting component, the licensee's revised commitment was found to be acceptable.

- (10) Change No. 16 in the submittal - Commitment: In Note 33 of Section 4 of the CAR (for Fire Area DJ), Toledo Edison stated that the circuits for Service Water Valves SW 1367 and SW 1368 would be provided with isolation switches to resolve the spurious action concern.

Revised Commitment: Toledo Edison has determined that the modification is no longer required to resolve the spurious action concern. There is sufficient time available to manually operate these valves for a fire in the area. As stated in Attachment 2, Item 4 of this letter, SW 1367 and SW 1368 will remain available for manual repositioning following the extinguishing of the fire. Thus, the isolation switches are no longer required.

Review of Revised Commitment: The inspectors reviewed the licensee's procedure time line for a fire in Area A (formerly Fire Area DJ) and determined that manual operation of SW 1367 and SW 1368 is not required until after the fire is extinguished. Inspection of Fire Area A revealed that SW 1367 and SW 1368 valve operators will experience limited fire exposure. Since adequate time is available to perform required manual operations and the valves will receive limited fire exposure, the licensee's revised commitment was found to be acceptable.

- (11) Change No. 17 in the submittal - Commitment: In Section 4 of the CAR, Notes 5 and 8 (for Fire Area Q), Note 6 (for Fire Area X), and Note 46 (for Fire Area DD) specify that the damage to HVAC electrical circuits results in the malfunction of dampers and will require a three-hour wrap or manual action to provide ventilation in Rooms 429 and 429B.

Revised Commitment: The licensee has re-evaluated the commitment and has performed a calculation that determined that the temperature transients following a fire will not be detrimental to plant equipment in Rooms 429 and 429B (Low Voltage Switchgear and Battery Rooms). Therefore, the HVAC electrical circuits are not required to be wrapped. The manual action is to provide ventilation in Room 429. The manual actions will be proceduralized by the end of the sixth refueling outage. Attachment 5 provides an overview of the calculation to support the conclusions.

Review of Revised Commitment: The inspectors reviewed Abnormal Procedure DB-OP-02501, Serious Station Fire, Attachment 38, Fire in Area Q, and Attachment 54, Establishing Temporary Ventilation. Attachment 38 specifies establishing, within 60 minutes, temporary ventilation in accordance with Attachment 54. Since the licensee has implemented procedures to establish temporary ventilation within the required analyzed time and prepositioned the necessary equipment to provide the temporary ventilation, the revised commitment was found to be acceptable.

- b. March 22, 1990 Submittal - License Amendment Request to Change License Condition 2.C(4) (Formerly Attachment 3 of the February 16, 1990 Submittal)

- (1) License Amendment Request: License Amendment 18 required additional hand-held portable fire extinguishers be provided in the No. 3 Mechanical Penetration Room (Room 303). The licensee failed to install the required extinguishers and subsequently submitted a proposed amendment change. The licensee's proposed change to Amendment 18 takes the position that one hand-held dry chemical portable fire extinguisher in Room 303 is sufficient. The licensee's basis for this amendment change, in part, was the FHAR. Section 5 and Appendix 2 of the FHAR describe the manual suppression capabilities in Room 303 as one dry chemical portable fire extinguisher and a hose station located in the room. The FHAR further describes additional manual suppression capabilities available from adjacent areas. Additionally, Toledo Edison has performed a National Fire Protection Association (NFPA) 10, "Standard for Portable Fire Extinguishers," review for Room 303. The review considered the size of the room, the type and size of the existing hand-held portable fire extinguisher, the type of combustibles present, and the fire loading in the room. The review determined that the currently installed extinguisher in this room is sufficient.

Review of License Amendment Request: The failure to install the required extinguishers was identified by the licensee in Revision 1 to Special Report 86-030. The overall issue of portable fire extinguisher adequacy was an area generically under review by the NRC. During this and previous inspections, the NRC conducted walkdowns of certain facility areas to determine whether sufficient numbers and types of fire extinguishers were in place. Based on these walkdowns and the licensee's code review, it was determined that the adequacy of portable fire extinguishing equipment in certain facility locations including Room 303 were satisfactory.

However, Section B.1 of Table 1 of the Safety Evaluation to License Condition Paragraph 2.C(4) required the installation of additional hand-held portable fire extinguishers. Therefore, this issue is considered an example of a violation (346/90007-03(DRS)) of License Amendment No. 18. Based on the above evaluation, this violation meets the tests of 10 CFR Part 2, Appendix C, Section V.A; consequently, no Notice of Violation will be issued and this matter is considered closed.

- (2) License Amendment Request: License Amendment 18 required additional hand-held portable fire extinguishers to be added in Maintenance Room 320. The licensee failed to install the required extinguishers and subsequently submitted a proposed amendment change. The proposed change states that one hand-held dry chemical portable fire extinguisher in Room 320 is sufficient. The licensee's bases for this amendment change was, in part, the FHAR. Section 5 and Appendix 2 of the FHAR describe the manual suppression capabilities in Room 320 as one dry chemical portable fire extinguisher and a hose line from an adjacent hose station. This FHAR section also describes additional manual suppression capabilities available from adjacent areas. Additionally, a NFPA 10 standard review was performed for Room 320. The review considered the size of the room, the type and size of the existing hand-held portable fire extinguisher, the type of combustibles present, and the fire loading in the room. The review determined the currently installed extinguisher is sufficient.

Review of License Amendment Request: The failure to install the required extinguishers was identified by the licensee in Revision 1 to Special Report 86-030. Based on walkdowns and the licensee's code review, it was determined that the adequacy of portable fire extinguishing equipment in certain facility locations including Room 320 was satisfactory. However, Section B.1 of Table 1 of the Safety Evaluation to License Condition Paragraph 2.C(4), required the installation of additional hand-held portable fire extinguishers. Therefore, this issue is considered an example of a violation (346/90007-04(DRS)) of License Amendment No. 18.

Based on the above evaluation, this violation meets the tests of 10 CFR Part 2, Appendix C, Section V.A; consequently, no Notice of Violation will be issued and this matter is considered closed.

(3 and 4) License Amendment Request:

Amendment 18 required the licensee to install wet pipe sprinkler systems equipped with quick response type heads in ten different fire areas. The licensee failed to install nine of the ten required quick response sprinkler systems. The proposed change includes a commitment to install a three hour fire barrier and to install sprinkler heads which comply with NFPA-13.

Review of License Amendment Request: The failure to install the required sprinkler heads was identified by the licensee. A review of this license amendment request determined that nine of the ten required wet pipe sprinkler systems were not equipped with quick response type heads. However, each of the nine rooms did have wet pipe sprinkler systems with normal operating temperature sprinkler heads installed.

Discussions with NRR staff did not identify any further licensing basis to have fast acting sprinkler heads installed. These sprinkler system design features were reviewed against the Appendix A Branch Technical Position (BTP) guidelines. No specific mention was given to specific sprinkler head preference. The licensee believed that the reference to "quick response type sprinklers" was intending only to refer to ordinary sprinklers (as installed) that would respond in a relatively quick manner. Regardless, it was determined that the time delay which may have occurred due to the lack of installed fast acting sprinkler heads had minimum significance. However, the licensee's letter of January 10, 1979, and Section B.2(a) of Table 1 of the Safety Evaluation to License Condition Paragraph 2.C(4) required the installation of wet pipe sprinkler systems equipped with quick response type sprinklers. Therefore, these issues are considered two examples of a violation (346/90007-05(DRS) and 346/90007-06(DRS)) of License Amendment No. 18. Based on the above evaluation, this violation meets the tests of 10 CFR Part 2, Appendix C, Section V.G; consequently, no Notice of Violation will be issued and this matter is considered closed.

Additionally, an inspector discussed sprinkler system code conformance that included walkthroughs and a drawing review with licensee staff. No discrepancies were identified.

- (5) License Amendment Request: Amendment 18 required the licensee to install a wet pipe sprinkler system equipped with thermal actuated type water spray nozzles in the cable spreading room. The installation was completed as required. The sprinkler

system was evaluated by the licensee for compliance with NFPA-13, "Standard for the Installation of Sprinkler Systems." The proposed amendment change was to upgrade the sprinkler system to resolve the code deficiencies identified in the Toledo Edison letter to the NRC, dated May 23, 1988 (Serial No. 1497).

Review of License Amendment Request: As specified above, the licensee met the specific license condition requirement(s) required at the time of the 1979 amendment. With regard to this license amendment change, this issue is pending NRR technical review. Other sprinkler system design questions raised by the reviewer during the April 5, 1990 licensee/NRC meeting were believed resolved during the April 17, 1990 licensee/NRR telecon.

- (6) License Amendment Request: The SER requirement was for Door 508 to have a 1½ hour fire rating since it was part of the fire rated boundary for the control room complex. The original requirement was satisfied. The proposed change deletes the requirement for Door 508 to have a 1½ hour fire rating. Section 5 of the FHAR (for Fire Area FF) was revised to redefine the fire rated boundary such that the wall containing Door 508 is no longer part of the control room complex fire boundary. Thus, Door 508 does not require a 1½ hour fire rating. The proposed revision reflecting the revised boundary is described in the FHAR. It has been concluded that there is no adverse impact on providing the required fire boundary for the Control Room Complex.

Review of License Amendment Request: As specified above, Door 508 (actually Door 503) was rated as required for a 1½ hour fire rating. Therefore, the license condition was satisfied as required. With regard to this license amendment change, this issue is pending NRR technical review.

- (7) License Amendment Request: The SER requirement was to apply a spray-on type fire proofing on the supports for four horizontal cable trays penetrating the 3-hour fire barrier at column line Q-F on elevation 602'0". In lieu of using a spray-on fire proofing, additional sprinklers have been installed to protect the supports and to prevent the potential associated degradation of the fire barrier between the turbine building and the cable spreading room. The additional sprinklers provide adequate cooling to ensure the integrity of the cable tray supports in the event of a fire in the area. The additional sprinklers were installed in accordance with NFPA 13 requirements to assure that the associated fire barrier will not be breached.

Review of License Amendment Request: This issue was identified to the NRC in Special Report No. 86-030. The failure to satisfy Section B.9 of Table 1 of the Safety Evaluation to License Condition Paragraph 2.C(4) was previously described in Inspection Report No. 346/87027 as a violation.

It was determined that the existing condition represents an acceptable level of protection.

- (8) License Amendment Request: Amendment 18 required the application of a spray-on fire proofing on the supporting structural steel in mechanical and electrical penetration rooms (Rooms 208, 236, 303, 314, 402 and 427). In lieu of using a spray-on fire proofing, sprinklers have been installed in these rooms. Subsequently, the NRC accepted the use of the sprinklers in lieu of a spray-on fire proofing. Although FHAR Revision 6 provides justification for use of suppression systems as the means of protecting against an exposure fire for each of the rooms listed above, the NRC approval did not include Room 314 in the list of those rooms for which structural steel fireproofing was not required. The proposed change reflects the use of sprinklers to protect the supporting structural steel in Rooms 208, 236, 303, 314, 402 and 427. These systems will be upgraded to satisfy NFPA-13 requirements and these upgrades will be completed prior to power ascension from the sixth refueling outage. Thus, the proposed revision provides adequate assurance that the supporting structural steel capabilities will not be compromised.

Review of License Amendment Request: This issue was identified to the NRC in at least two previous known correspondence and was discussed in NRC Inspection Report No. 346/87027. Based on the inspector's previous review, the documented information and the licensee's justification, it was determined that the existing condition represents an acceptable level of protection.

- (9) License Amendment Request: Amendment 18 required the application of a spray-on fire proofing on the supporting structural steel in the turbine building as determined by the turbine building thermal expansion analysis. The proposed revision provides an equivalent level of structural steel fire protection using sprinklers. Toledo Edison concluded that sprinklers would provide an acceptable means of controlling a postulated fire and therefore reduce the potential for fire damage. The sprinkler systems were to be upgraded to satisfy NFPA-13 requirements. Based on the review of the required fire protection, Toledo Edison has concluded that three plant areas do not require either sprinklers or spray-on fireproofing as described below:

(a) Turbine Building Roof Train Bay

The sprinklers in the Turbine Building Roof Train Bay are at the 692 ft. elevation and provide coverage for 2400 sq. ft. of the Railroad Bay which is at the 585 ft. elevation. The Train Bay is in the northeast corner of the Turbine Building and two walls of the Train Bay are exterior walls with the remainder open to the Turbine Building Operating Floor (elevation 623 ft.). Due to the open construction of the Train Bay and the height of the

Turbine Building roof over the Train Bay, the sprinklers provide very limited fire suppression capability. The sprinkler system protects the roof steel and does not protect the Turbine Building structural steel. Thus, the proposed revision does not alter the conclusion that thermal expansion in the Turbine Building is limited to an acceptable level.

(b) Turbine Building Meteorological Laboratory (Met Lab)

The Met Lab includes a calibration lab and fire brigade locker room that is located at the 623 ft. elevation on the turbine building operating floor. The lab is approximately 10 ft. in height. Originally the area was a lunch room and an instrumentation and control shop, but has been converted to a calibration lab and fire brigade locker room with a significant reduction in the combustible loading. The minor amount of combustibles contained in this small enclosure on the turbine building operating floor would not produce enough heat to cause unacceptable expansion of the supporting structural steel members considering the large volume and area of the turbine operating floor and the installed smoke and heat vents in the turbine building ceiling. The proposed change deletes the sprinkler system in the Met Lab as part of the requirement for protecting structural supporting steel in the turbine building. Based on the above discussion, this revision does not alter the conclusion that the thermal expansion in the turbine building is limited to an acceptable level.

(c) Turbine Building Heater Bay Roof Truss

Two sprinkler systems were installed at the 692' elevation in the turbine building heater bay area and cover the same area with one set of nozzles aimed upward and one set aimed downward. These sprinkler systems were evaluated for compliance with NFPA-13, "Standard for Installation of Sprinkler Systems." The sprinkler systems were to be upgraded to one system that resolves the code deficiencies as identified in the Toledo Edison letter to the NRC, dated May 23, 1988 (Serial No. 1497). These upgrades were to be completed prior to power ascension from the sixth refueling outage as stated in the Toledo Edison letter to the NRC, dated December 2, 1988 (Serial No. 1595). The proposed change deletes the sprinklers in the turbine building heater bay roof truss (FSA-7502) and retains the sprinklers in the turbine building heater bay (FSA-7501). This sprinkler system (FSA-7501) will be in compliance with NFPA-13. Thus, the proposed revision does not alter the conclusion that thermal expansion in the turbine building is limited to an acceptable level.

Review of License Amendment Request: For purposes of this inspection, it was determined that the alternative protection represented an acceptable level of protection to satisfy the license condition. However, with regard to this license amendment change, this issue is pending NRR technical review.

- (10) License Amendment Request: Amendment 18 required the installation of a fire detector in Room 233. The proposed revision deletes the requirement for this detector. A review of Fire Zone G-8 was performed by the licensee which determined that a detector is not required due to minimal fire loading (400 BTU/F²) and that no safe shutdown cables were being routed in the room. The room is inaccessible except through concrete shield plugs from the room above which are normally in place. The lack of room openings and low fire loading ensure containment of any postulated fire. The proposed revision has been evaluated and there is no adverse impact on the fire detection capability for Fire Area G.

Review of License Amendment Request: This issue was identified to the NRC in Special Report No. 86-030. The failure to satisfy Section B.10 of Table 1 of the Safety Evaluation to License Condition Paragraph 2.C(4) was previously described in Inspection Report No. 346/87027 as a violation. With regard to this license amendment change, this issue is pending NRR technical review.

- (11) License Amendment Request: Amendment 18 required the installation of additional area type detection in the fuel handling area (Room 300). Local detection is provided in Room 300. The proposed revision requires the detector installation by the end of the seventh refueling outage.

Review of License Amendment Request: This issue was identified to the NRC in Special Report No. 86-030. The failure to satisfy Section B.10 of Table 1 of the Safety Evaluation to License Condition Paragraph 2.C(4) was previously described in Inspection Report No. 346/87027 as a violation. With regard to this license amendment scheduler change, this issue is pending NRR review.

- (12) License Amendment Request: Amendment 18 required the installation of in-tray linear type, thermal sensing fire detectors inside all the cable trays in the cable spreading room (Room 422A). In addition to these detectors, the cable spreading room contains 5 area ionization type smoke detectors which were to be upgraded to resolve the NFPA-72E, "Standard of Automatic Fire Detectors," code deficiencies. Based on cable spreading room construction utilizing a smooth ceiling approximately 3 ft. high and the upgrade to resolve the NFPA 72E deviations, the area ionization type smoke detectors provide adequate detection capability and the in-tray detectors are no longer required. The proposed revision deletes the requirement for the in-tray, linear type,

thermal sensing fire detectors. The upgrade of the area ionization type smoke detectors will provide an adequate level of detection capability in the cable spreading room.

Review of License Amendment Request: During review of this issue, it was determined that the original installation was completed therefore the license condition was met as required. With regard to this license amendment change, this issue is pending NRR technical review.

- (13) License Amendment Request: Amendment 18 required the installation of 8-hour emergency battery pack lights in Passage 241. In 1987, a lighting unit in Passage 241 was installed with the power supplied from a battery unit in Passage 227. The proposed revision clarifies that Passage 241 is illuminated without the 8-hour emergency battery pack being in the room. The proposed revision, which reflects the existing plant configuration, has been reviewed by the licensee. The review concluded that there is sufficient illumination in Passage 241.

Review of License Amendment Request: This issue was identified to the NRC in Special Report No. 86-030. The failure to satisfy Section B.12 of Table 1 of the Safety Evaluation to License Condition 2.C(4) was previously described in Inspection Report No. 345/87027 as a violation. Based on a walkthrough of the area and on the licensee's justification, it was determined that the existing condition represents an acceptable level of protection.

- (14) License Amendment Request: Amendment 18 required the installation of 8-hour emergency battery pack lights in Makeup Pump Room 225. Instead of installing the lights in Room 225, the emergency battery pack lights were installed in the vestibule (Room 226A) with light directed into Room 225 to provide illumination for access and egress in Room 225. The lighting from Room 226A is continuous because there is no door or other intervening objects which could block the light. Thus, the emergency light is situated such that its light beam provides adequate illumination to Room 225 for access and egress. In addition, an emergency lighting unit has recently been installed in Room 225 for Appendix R required manual actions. This unit was installed after the date required by Amendment 18. The proposed revision, which reflects the existing plant configuration, has been reviewed by the licensee. The review concluded that there is sufficient illumination in Room 225 for access and egress.

Review of License Amendment Request: Based on the above information, a walkthrough of the area and discussions with licensee staff, it was concluded that adequate emergency lighting does exist. However, Section B.12 of Table 1 of the Safety Evaluation to License Condition Paragraph 2.C(4) required the installation of 8-hour emergency battery pack lights in Room 225 (makeup pump room). Therefore, this issue is considered an

example of a violation (346/90007-07(DRS)) of License Amendment No. 18. The inspectors, however, concluded that the illumination from the vestibule (Room 226A) may have been adequate. Based on the above evaluation, this violation meets the tests of 10 CFR Part 2, Appendix C, Section V.G; consequently, no Notice of Violation will be issued and this matter is considered closed.

- (15) License Amendment Request: Amendment 18 required the installation of a 1/2 hour fire rated barrier (Kaowool) around the power and control circuits for the service water valves (SW 2930, SW 2931) located in the service water discharge header. The original installation was completed but later removed. The affected valve was depowered which negated the need for the fire barrier wrap. The proposed change deletes the requirement for the 1/2 hour fire rated barrier (Kaowool). The licensee's CAR stated that one of the four service water discharge valves is normally open and depowered (controlled administratively) to ensure a SW return flow path is available following a fire in the area. The proposed revision has been analyzed in the CAR. The analysis concluded that there is no adverse impact on the ability of the system to function as required for safe shutdown.

Review of License Amendment Request: According to the licensee's staff, this issue was identified to the NRC in Special Report No. 86-030. Consequently, the failure to satisfy Section B.13 of Table 1 of the Safety Evaluation to License Condition Paragraph 2.C(4) was previously described in Inspection Report No. 346/87027 as a violation.

During this inspection, the inspectors reviewed the licensee's analysis and note in the "Compliance Assessment Report" (CAR), Revision 5 and found the alternative approach acceptable. Service Water System Operating Procedure, DB-OP-06261, Revision 0, dated April 7, 1990, Attachment 1, specifies that one (1) Service Water discharge valve be open with its associated circuit breaker tagged open. These administrative controls were found to be acceptable.

This issue is pending NRR technical review; however, based on the inspector's review and the licensee's justification, it was determined that the change represents an acceptable level of protection and was recommended for acceptance.

- (16) License Amendment Request: Amendment 18 required the installation of a 1/2 hour fire rated barrier (Kaowool) in Passage 227 around the circuits for the Train 1 Auxiliary Feedwater Pump Suction Valve FW 786 and the interlock to Train 1 Service Water Valve SW 1382. The original requirement was met by installing Kaowool barriers on conduit 27572A (cabling for the interlock to SW 1382) and on conduit 27708A (cabling for Auxiliary Feedwater Pump Suction Valve FW 786). Subsequently, the licensee determined that the Kaowool had been removed. The proposed revision

deletes the requirement for the 1/2 hour rated barrier (Kaowool). The proposed revision has been analyzed in the CAR. The analysis concluded that there is no adverse impact on the safe shutdown capabilities.

Review of License Amendment Request: According to the licensee's staff, this issue was identified by inference to the NRC in Special Report No. 86-030. Consequently, the failure to satisfy Section B.13 of Table 1 of the Safety Evaluation to License Condition Paragraph 2.C(4) was previously described in Inspection Report No. 346/87027 as a violation.

The inspectors found the availability of Train 2 equipment to be satisfactory to ensure safe shutdown. Passage 227 is located in Fire Area G. Abnormal Procedure DB-OP-02501, "Serious Station Fire", Fire Area G, specifies use of Train 2 systems to achieve safe shutdown in the event of fires in Area G. The licensee's procedure was in compliance with the proposed revision.

This issue is pending NRR technical review; however, based on the inspector's review and the licensee's justification, it was determined that the availability of Train 2 equipment was an acceptable method to ensure a safe shutdown and was recommended for acceptance.

- (17) License Amendment Request: Amendment 18 required the installation of a 1/2 hour fire rated barrier (Kaowool) in Passage 209 around the circuit for the borated water storage tank (BWST) level instrumentation, Makeup Pump No. 2, and Train 2 BWST outlet valve. The original requirement was met by installing Kaowool barriers on conduit 28222A (cabling for Makeup Pump No. 2), conduit 27670C (cabling for BWST Outlet Valve DH 07A), and on the four conduits containing the four trains of BWST level instrumentation. Subsequently, the licensee determined that the Kaowool had been removed. The proposed revision deletes the requirement for the 1/2 hour rated barrier (Kaowool).

The proposed revision, which deletes the requirement for the half-hour wraps, has been analyzed in the CAR. The analysis concluded that there is no adverse impact on the safe shutdown capabilities.

Review of License Amendment Request: According to the licensee's staff, this issue was identified by inference to the NRC in Special Report No. 86-030. Consequently, the failure to satisfy Section B.13 of Table 1 of the Safety Evaluation to License Condition Paragraph 2.C(4) was previously described in Inspection Report No. 346/87027 as a violation.

The inspectors reviewed the licensee's methodology and time lines and agree with the licensee's conclusion that there is no adverse impact on the safe shutdown capabilities. Passage 209

is located in Fire Area G. Abnormal Procedure DB-OP-02501, Serious Station Fire, Attachment 23, Fire in Area G, specifies that BWST outlet valve (D.107A) must be opened within 44 minutes. The licensee's procedure walkdown has validated the ability to open the BWST outlet valve (DH07A) within 23 minutes. The licensee's safe shutdown methodology was in compliance with the proposed change.

This issue is pending NRR technical review; however, based on the inspector's review and the licensee's justification, it was determined that the change represents an acceptable level of protection and was recommended for acceptance.

- (18) License Amendment Request: Amendment 18 required the installation of 1/2 hour fire rated barriers (Kaowool) in Fire Area U around conduits 46088B and 47342A, which contain Trains 1 and 2 power cabling, respectively, for valves CC5095, CC5096, CC5097 and CC5098. Originally, these valves were protected as required. Subsequently, the licensee determined that the Kaowool had been removed. The original basis for the protection of the valves was to ensure cooling for the makeup pumps and the immediate reestablishment of reactor coolant pump seal cooling and seal return. The proposed revision deletes the requirement for the 1/2 hour fire rated barrier for the subject conduits.

In Section 4, Note 4 of the CAR for Fire Area U, the licensee states that HPI is the system that is assured for RCS injection (inventory and reactivity control) for safe shutdown in this fire area. Therefore, the makeup pumps are not required. The existing RCP seals are being replaced with a newly designed RCP seal. Based on test data, integrity of the new seal is maintained without seal cooling for eight hours. After eight hours, RCP seal cooling and seal return will be re-established. As part of the process of providing RCP seal cooling and seal return, some fire areas contain motor or air operated valves which could be exposed to a fire in the area and require manual repositioning.

These motor or air driven valve operators would not be mechanically impaired by a fire in such a manner to prevent subsequent manual handwheel operation of the valves. The seal changeout and the procedure revision to reestablish RCP seal cooling and seal return was to be completed by the end of the sixth refueling outage. Since the valves are not immediately required to achieve hot shutdown and adequate time is available for required manual actions, the fire barrier wraps are not required. Thus, the proposed revision has been analyzed and there is no adverse impact on the safe shutdown capabilities.

Review of License Amendment Request: According to the licensee's staff, this issue was identified by inference to the NRC in Special Report No. 86-030. Consequently, the failure to satisfy Section B.13 of Table 1 of the Safety Evaluation to License Condition Paragraph 2.C(4) was previously described in Inspection Report No. 346/87027 as a violation.

Abnormal Procedure DB-OP-02501, "Serious Station Fire, Attachment 43, Fire in Area U", specifies use of Train 2 HPI/PORV's for RCS makeup and pressure control; therefore, the makeup pumps are not required for a fire in Area U. Since the eight (8) hour RCP seals are an NRR generic issue, the licensee's use of the seals was not evaluated during the inspection. Upon inspection, the motor and air driven valve operators were found to be capable of operation by manual handwheels. These manual operations will not be required until after the fire is extinguished. This issue is pending NRR technical review; however, based on the inspector's review and the licensee's justification, it was determined that the change represents an acceptable level of protection and was recommended for acceptance.

- (19) License Amendment Request: Amendment 18 required the installation of a 1/2 hour fire rated barrier (Kaowool) for the circuits associated with the service water pumps (1, 2 and 3) and for the service water valves on the return line to the forebay (SW 2930) and the cooling tower makeup (SW 2931). The service water valve motors (SW 2930, SW 2931) located in Room 53 were also enclosed with a 1/2 hour fire rated barrier. The original installation was completed as required. Subsequently, the licensee determined that the barrier had been removed. The proposed revision deletes the requirement for the 1/2 hour fire rated barrier (Kaowool). The proposed revision has been analyzed in the CAR. The analysis concluded that there is no adverse impact on the ability of the system to function as required for safe shutdown.

Review of License Amendment Request: According to the licensee's staff, this issue was identified by inference to the NRC in Special Report No. 86-030. Consequently, the failure to satisfy Section B.13 of Table 1 of the Safety Evaluation to License Condition Paragraph 2.C(4) was previously described in Inspection Report No. 346/87027 as a violation.

During this inspection, the inspectors reviewed the licensee's analysis and note in the CAR, Revision 5, and found the alternative approach acceptable. SWS Operating Procedure, DB-OP-06261, Revision 0, dated April 7, 1990, Attachment 1, specifies that one (1) service water discharge valve be open with its associated circuit breaker tagged open. These administrative controls were found to be acceptable. The backup service water pump was confirmed to be in Fire Area BD. Since Fire Area BD is separated from Fire Area BF by a three-hour barrier, the backup service water pump will not be affected by a fire in Fire Area BF.

This issue is pending NRR review; however, based on the inspector's review and the licensee's justification, it was determined that the change represents an acceptable level of protection and was recommended for acceptance.

- (20) License Amendment Request: Amendment 18 required the installation of a 1/2 hour fire rated barrier (Kaowool) around the circuits for the component cooling water pumps (1, 2 and 3) and the power and control circuits for the CCW crossover valves (CC 5095, CC 5096). The underside of the valve motors were also required to be protected with a 1/2 hour fire rated barrier. The original installation was completed as required. Subsequently, the licensee determined that the barriers had been removed. The proposed revision deletes the requirement for the 1/2 hour fire rated barrier for the CCW crossover valves (CC 5095, CC 5096), but retains the fire barrier wrap requirement for the CCW pumps circuits.

In Section 4, Note 1 of the CAR for Fire Area T, the licensee states that HPI is the system that is assured for RCS injection (inventory and reactivity control) for safe shutdown. CC 5095 and CC 5096 are required when the makeup system is being utilized to provide RCS injection. As discussed in Item 18 above, procedural actions to open/verify valves CC 5095 and CC 5096 are required to restore RCP seal cooling and time is available for manual actions. Therefore, the fire barrier wraps are not required. The Kaowool wrap required for the CCW pump circuits was to be replaced during the sixth refueling outage with a one-hour fire rated wrap which is more durable than the Kaowool wrap. Thus, the proposed revision has been analyzed in the CAR and there is no adverse impact on the safe shutdown capabilities.

Review of License Amendment Request: According to the licensee's staff, this issue was identified to the NRC in Special Report No. 86-C30. Consequently, the failure to satisfy Section B.13 of Table 1 of the Safety Evaluation to License Condition Paragraph 2.C(4) was previously described in Inspection Report No. 346/87027 as a violation.

During this inspection, the inspectors found that the FAOR and Abnormal Procedure DB-OP-02501, "Serious Station Fire," Attachments 41 and 42, "Fire in Area T Part 1 and 2", specifies the makeup system is assured for RCS injection (inventory and reactivity control) instead of HPI. FAOR, Section 4.T, Note 1C, requires procedural action after 8 hours. Attachment 41 and 42, Step 7.0.b.1 direct restoring RCP seal cooling using Attachments 49 and 50. Time is available for manual operation of CC5095 and CC5096 as specified in Attachments 49 and 50. The inspectors found the change request to be acceptable. However the request should be modified to correctly reflect that the makeup system is required for RCS injection instead of HPI. This difference in the licensee's safe shutdown approach was not addressed in the licensee's "Summary of Differences Between the FAOR and CAR" document dated May 10, 1990. This was another example in which the licensee's safe shutdown approach appeared to be continuing to change causing NRC concern with regard to the thoroughness of the licensee's analysis at this time in the Appendix R modification schedule.

During this inspection, an inspector confirmed that the one-hour fire wrap was in place.

During the inspection and at the exit interview of May 24, 1990, the inspectors advised the licensee that the above license condition requirements must remain in effect until NRR approval is granted. However, it was the inspectors' understanding that the NRR representatives participating in the exit interview of May 24, 1990, considered the licensee compliance approach changes to be sufficient for the interim until the formal NRR review is completed. This was based on those NRC reviews performed to date.

The inspectors emphasized that if any of those issues that are pending NRR technical review are subsequently deemed unacceptable, further NRC action may need to occur.

16. Violations for Which A "Notice of Violation" Will Not be Issued

The NRC uses the Notice of Violation as a standard method for formalizing the existence of a violation of a legally binding requirement. However, because the NRC wants to encourage and support licensee's initiatives for self-identification and correction of problems, the NRC will not generally issue a Notice of Violation for a violation that meets the tests of 10 CFR 2, Appendix C, Section V.G. These tests are: (1) the violation was identified by the licensee; (2) the violation would be categorized as Severity Level IV or V; (3) the violation was reported to the NRC, if required; (4) the violation will be corrected, including measures to prevent recurrence, within a reasonable time period; and (5) it was not a violation that could reasonably be expected to have been prevented by the licensee's corrective action for a previous violation.

In addition, 10 CFR 2, Appendix C, Section V.A has been changed to provide the staff with the flexibility not to issue a Notice of Violation for inspection findings which involve isolated violations at a Severity Level V. Such violations are by definition of minor regulatory concerns.

Five violations of regulatory requirements being addressed as a result of this inspection for which a Notice of Violation will not be issued are discussed in Paragraph 15.

17. Exit Interview

The inspector met with licensee representatives (denoted in Paragraph 1) at the conclusion of the inspection on April 27, 1990, May 24, June 1, July 6, and August 16, 1990, and summarized the scope and findings of the inspection. The inspector also discussed the likely informational content of the inspection report with regard to documents reviewed by the inspectors during the inspection. The licensee did not identify any of the documents as proprietary.