TOLEDO EDISON

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United States Nuclear Regulatory Commission
Document Control Desk
Washington, D. C. 20555

Gentlemen:

In letter dated December 17, 1986 (Log No. 2166), the NRC transmitted a Request for Additional Information (RAI) regarding Fire Protection and requested a meeting to discuss the issues. Such a meeting was held on February 17 and 18, 1987, during which an additional eight questions were asked by the NRC. Toledo Edison provided its initial response to NRC Question No. 24, RCP Seal Cooling, and supplementary NRC Question No. F, Cable Ignitibility in letter dated May 27, 1987 (Serial No. 1361). Toledo Edison subsequently committed in a discussion on February 2, 1988 with the NRC Project Manager to complete its response to these two NRC Questions by February 8, 1988. Enclosed are the responses which Toledo Edison believes should close these two NRC Questions.

As discussed with the NRC Project Manager, Mr. A. W. DeAgazio, and as documented in letter dated January 6, 1988 (Serial No. 1456), the final Toledo Edison responses to the remaining four NRC questions are scheduled to be completed by March 15, 1988. This schedule is necessary to complete the engineering evaluation and review. These four remaining questions are No. 1, Time Available for Operation Action; No. 19, NFPA 72E Compliance Review; No. 20, NFPA 13 Compliance Review; and No. 29, High-Low Pressure Interfaces. At that time, Toledo Edison's responses to the NRC's questions requested in letter dated December 17, 1986 (Log No. 2166) and at the February 17 and 18, 1987 meeting will be completed.

During the discussions of the schedule to complete its responses to the NRC Questions, Mr. DeAgazio requested Toledo Edison to reaffirm its current schedule to establish compliance with 10CFR50, Appendix R by restart from the sixth refueling outage. At the NRC meeting on October 28 and 29, 1987, Toledo Edison presented its schedule for completion of its Fire Protection Plan and associated major activities. These activities include physical modifications, program and procedure revisions, and additional engineering evaluations. The purpose of these activities is to establish compliance with Appendix R by the end of the sixth refueling outage.

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Toledo Edison has reviewed these scheduled activities and concluded that the currently identified physical modifications and program/procedure revisions will be completed prior to restart from the sixth refueling outage. While certain evaluations have been rescheduled, the current evaluation schedules are sufficient to identify and implement any resulting modifications and/or program/procedure revisions prior to restart from the sixth refueling outage. Consequently, Toledo Edison's schedule to establish compliance with 10CFR50, Appendix R remains as restart from the sixth refueling outage.

The previous meetings with the NRC have expeditiously resolved NRC questions regarding the Toledo Edison progress in establishing compliance with Appendix R. Toledo Edison would be pleased to meet with the NRC approximately June of this year to discuss the progress of its fire protection program. Please contact Mr. R. W. Schrauder at (419) 249-2366 if such a meeting or additional discussions are desired.

Very truly yours,

DC Shelton

MAL:bam

Attachments

cc: A. B. Davis, Regional Administrator
Resident Inspector
D. Kubicki

Those access/egress routes that are through the fire area postulated to contain the fire (See Attachment 1) also do not represent an adverse impediment to the re-establishment of seal cooling. As previously discussed, seal cooling is not required to be re-established for 39 hours after its loss for the condition where controlled seal bleedoff is unisolated. In this case, there is a sufficient time for the on-site Fire Brigade to extinguish the fire such that operations personnel may access the necessary valves.

Further Response

Toledo Edison believes that no further response is necessary to resolve this question.

QUESTION F - CABLE IGNITIBILITY

Address the ignitibility of cables installed at Davis-Besse relative to the seal protected-side temperature limits.

Response

In letter dated February 12, 1987 (Serial No. 1352), Toledo Edison provided seal details and test summaries to document the conformance of Davis-Besse fire seals with ASTM E-119. Although there were instances of protected-side thermocouple readings in excess of the ASTM limits, those seals were shown to have readings within the 700°F temperature limit of IEEE 634. Toledo Edison concluded in that letter that the 700°F temperature limit of IEEE 634 was based on the minimum self-ignition temperature of cable jacketing and that the test results confirmed that potential heat transferred through the fire seals is less than that required to cause self-ignition of the Davis-Besse cables. This information was also presented in Toledo Edison's letter dated May 27, 1987 (Serial No. 1361) in response to NRC Question 13.

This matter was further discussed in a meeting with the NRC on February 17 and 18, 1987 during which the NRC requested that Toledo Edison:

1. Document the method of sealing internal conduit seals (Reference Question H)

2. Verify transient combustibles are not placed against fire seals (Reference Question G)

3. Review the ignitibility of Davis-Besse cables relative to the protected-side temperature limits of the fire seals (Reference Question F)

Toledo Edison's responses to Questions G and H were submitted in letter dated May 27, 1987 (Serial No. 1361), which addressed the above items 1 and 2. In summary, Toledo Edison stated that the method of sealing internal conduits would preclude the spread of fire to a separate fire area and that transient combustibles are not placed against fire seals. In a meeting with the NRC on October 28 and 29, 1987, the NRC Staff Reviewer, Mr. D. Kubicki, stated that the responses to Questions G and H were adequate.

Toledo Edison's initial response to Question F was also contained in letter dated May 27, 1987 (Serial No. 1361), which addressed the above item 3. This response stated that Toledo Edison would review the ignitibility of Davis-Besse cables to ensure a single exposure fire would not ignite cables in a separate fire area due to heat transfer through a cable penetration fire seal. Toledo Edison anticipated that this assurance would be obtained by the comparison of cable manufacturer ignitibility data to the protected-side temperature test results for the Davis-Besse Cable penetration fire seals.

Toledo Edison has completed such an evaluation to the extent that cable manufacturing data could be determined. The cables installed at Davis-Besse consist of three general categories:

1. Cables confirmed to satisfy the standards of IEEE 383
2. Cables having a jacketing of polyethlene/polyvinyl chloride
3. Cables whose jacketing construction is unknown

Toledo Edison's review has determined that polyethylene/polyvinyl chloride cable jacketing is considered by the industry to represent the worst-case material for cable ignitibility. This is supported by the listings of the self-ignition temperatures of typical cable jacketing materials contained in the forward of IEEE 634 and is recognized by EEI in Topical Report WEFP01-P, "Conduit Fire Protection Research Program." The EEI test and several fire tests involving Davis-Besse prototype seals were conducted using cables with polyethylene/polyvinyl chloride jacketing. These tests and the above worst-case material discussion conclude that the penetration fire seal materials provide sufficient thermal insulation to preclude the Davis-Besse cable jacketing from self-igniting on the protected side.

Cables confirmed to satisfy IEEE 383 are tested to identify their fire-propagation features. While the IEEE 383 tests do not involve a determination of cable self-ignition temperatures, it is reasonable to conclude that cables with fire-propagation features sufficient to satisfy IEEE 383 would also have self-ignition temperatures above the 700°F protected-side temperature limits of IEEE 634.

Based on the above described review, Toledo Edison has determined that the properties of Davis-Besse cables and penetration fire seals are such that a single fire would not ignite cables in a separate fire area due to heat transfer through a cable penetration fire seal.

Further Response

Toledo Edison believes that no further response is necessary to address this question.

Enclosure

Response to NRC Questions 24 and F

Question 24 - Reactor Coolant Pump Seals

Regarding (CAR) Page 3-12, provide justification that reactor coolant pump seal injection and cooling via the component cooling system is not necessary.

Response

In letter dated May 27, 1987 (Serial No. 1361), Toledo Edison provided its initial response to this question. In summary, Page 3-12 of the Davis-Besse Appendix R Compliance Assessment Report (CAR) states: "In a post-fire scenario, it has been determined that Makeup System RCS seal injection and seal cooling via the [Component Cooling Water System] CCWS is not required to be maintained in order to preserve the integrity of the [Reactor Coolant Pump] RCP seals, if controlled seal staging is isolated." However, Toledo Edison stated that a test conducted on the type of RCP seals used at Davis-Besse demonstrated that no seal failure or excessive leakage was experienced due to the loss of seal cooling for 39 hours or due to the restoration of cooling water. Consequently, Toledo Edison committed to identify the manual operator actions necessary to re-establish seal cooling well within 39 hours after its loss. In that letter, Toledo Edison stated that it anticipated the most probable source of cooling water would be from the High Pressure Injection (HPI) pumps via a cross-connection to the Makeup System (MU) seal injection flow path or directly from the MU System, rather than seal cooling via CCWS.

Toledo Edison has evaluated the results of the aforementioned seal test and the available methods of providing seal cooling at Davis-Besse. It was initially concluded that the preferred method of seal cooling is seal injection via the MU or HPI Systems and that this method could be established well within 39 hours without physical modifications with controlled seal staging isolated. However, the seal test was conducted with controlled seal bleedoff (staging) unisolated, and Toledo Edison has determined that a single exposure fire in certain plant fire areas could cause controlled seal bleedoff to be isolated. Toledo Edison has been unable to locate data from other tests which would demonstrate that the controlled seal bleedoff may be isolated without any seal cooling and not lead to seal failure. Consequently, the time to implement the manual operator actions for seal injection via the MU or HPI Systems may not be adequate in plant fire areas where a single exposure fire could be postulated to cause the isolation of controlled seal bleedoff and the loss of CCWS seal cooling.

At this time Toledo Edison has not identified the means to assure controlled seal bleedoff is not isolated or to assure CCWS is available. Toledo Edison has begun the review to determine those fire areas in which a single fire could cause the loss of controlled seal bleedoff . This review of these fire areas is intended to identify whether CCWS seal cooling would be assured available or whether controlled seal bleedoff flow could be assured and to identify any associated modifications or manual operator actions. In parallel with this review, Toledo Edison will also attempt to identify information that demonstrates that controlled seal bleedoff may be isolated without any seal cooling and not lead to seal failure. The implementation of any required physical modifications or procedure revisions will be completed prior to restart from the sixth refueling outage.

Toledo Edison has identified the manual operator actions required to re-establish seal injection via the MU or HPI Systems. These manual operator actions would be adequate in those fire areas in which a single exposure fire would not cause the isolation of controlled seal bleedoff. These manual operator actions would involve manually repositioning certain valves or verifying that these valves are opened. These valves are on the HPI and MU Systems. The specific valves to be verified as opened or to be repositioned would depend on the location of the fire. The affected procedures are AB1203.02, "Serious Plant Fire," and AB1203.26, "Serious Control Room Fire."

Additionally, Toledo Edison has evaluated the location of these valves relative to the location of any fire postulated to cause the loss of all seal cooling. Based on this evaluation, Toledo Edison has identified that certain HPI and MU valves could be subjected to the postulated exposure fire and also require subsequent manual operation in order to establish seal cooling. Also, the access/egress routes to reach certain valves required to re-establish seal cooling could be through the fire area postulated to contain the fire. Attachment 1 identifies these valves and access/egress routes, their description, and their location and associated combustible loading.

As discussed in letter dated May 27, 1987 (Serial No. 1361), Toledo Edison had evaluated the effects of fire on valves and their operators in response to Question No. 28. In summary, the CAR assumes that passive mechanical components remain functional during and after a fire unless they are ignition sources. These components include heat exchangers, manual and check valves, piping and tanks. Toledo Edison had also concluded that valve operators do not require fire protection since they may be disengaged from the valve and the valve manually operated subsequent to the extinguishment of the fire. This conclusion remains valid for those valves identified by Attachment 1 and their associated valve operators.

ATTACHMENT 1

VALVES REQUIRED FOR SEAL COOLING AND SUBJECT TO A FIRE

Fire Area	Valve ID No.	Description	Combustible Loading (BTU/sq. ft)
DC	MU66A MU66B MU66C MU66D	RCP Seal Injection Flow Isolation Valves	5,123
DE	MU19	RCP Seal Injection Flow Controller Valve	9,025
HA	MU208	High Pressure Line Flow Test Isolation Valve	7,886

ACCESS/EGRESS ROUTES THROUGH FIRE LOCATION

Valve ID No	Description	Valve Location	Fire Location	Fire Location Combustible Loading (BTU/sq. ft)
HP27	HPI Pump 1-2 Flow Test Isolation Valve	A	AB	5,409*
MU208	High Pressure Line Flow Test Isolation Valve	HA	G	12,567
MU19	RCP Seal Injection Flow Controller Valve	DE	V	21,049

*The combustible loading for Fire Area AB is 5,409 BTU/sq. ft. as indicated in the Davis-Besse Fire Hazards Analysis Report, Rev. 8. The combustible loading for this fire area was incorrectly identified as 4,448 BTU/sq. ft. in the Davis-Besse Appendix R Compliance Assessment Report (CAR), Rev. 2 and in Toledo Edison letter dated May 27, 1987 (Serial No. 1361). This inconsistency in the CAR has been corrected by Change Notice 62.