

Docket No. 50-346

Toledo Edison Company  
ATTN: Mr. Lowell E. Roe  
Vice President, Facilities  
Development

Edison Plaza  
300 Madison Avenue  
Toledo, Ohio 43652

Gentlemen:

SUBJECT: REQUESTS FOR ADDITIONAL INFORMATION - FIRE HAZARD ANALYSIS  
REPORT - DAVIS BESSE UNIT 1

Distribution

Docket File	R. Hartfield
NRC PDR	ELD
Local PDR	IE (3)
LWR 1 File	V. Stello
R. S. Boyd	B. Grimes
R. C. DeYoung	R. Reid
D. B. Vassallo	G. Vissing
F. J. Williams	V. Leung
J. Stolz	P. Matthews
L. Engle	
E. Hylton	bcc:
R. J. Mattson	J. R. Buchanan, NSIC
D. Ross	T. B. Abernathy, TIC
J. P. Knight	ACRS (16)
R. Tedesco	
H. Denton	
V. A. Moore	
R. H. Vollmer	
M. L. Ernst	
R. P. Denise	

As a result of our review of the Fire Hazard Report, Revision 1 and the site visit of our Fire Protection Team to Davis Besse, Unit 1 May 23-25, 1978, we find that we need additional information to complete our evaluation. The specific information is listed in the enclosure to this letter.

Our review of the Fire Hazard Analysis Report for Davis Besse, Unit 1 in conjunction with our site visit has identified certain areas that are not acceptable to the staff. In order to maintain our schedule for completion of our evaluation, we are advising you of the staff's positions. The positions, identified by the letter RSP in the left-hand margins of the enclosure, reflect the staff's resolution of safety issues for determining the acceptability of the plant fire protection. Accordingly, we request that you amend the Fire Hazard Analysis Report, Revision 1, to clearly state your intent regarding compliance with each of the positions identified in the enclosure. Where commitments for modifications are provided, we request that a description of the modifications be provided, as well as a schedule for implementing the modifications. To assure complete understanding of the factors at issue and the bases for our positions, we are prepared to meet with you to discuss these positions.

Our tentative review schedule is based on the assumption that this information will be available for our review by August 22, 1978. If you cannot meet this date, please inform us within seven days following receipt of this letter so that we may revise our schedule accordingly.

OFFICE →						
SURNAME →						
DATE →						

8001310505

Toledo Edison Company

- 2 -

Please contact us if you desire any discussion or clarification of the material requested.

Sincerely,

John F. Stolz, Chief  
Light Water Reactors Branch No. 1  
Division of Project Management

Enclosure:  
Request for Additional  
Information

OFFICE	LWR 1	LWR 2				
SURNAME	LEngle/red	JStolz				
DATE	7/5/78	7/6/78				

Toledo Edison Company

- 3 -

cc: Mr. Donald H. Hauser, Esq.  
The Cleveland Electric  
Illuminating Company  
P. O. Box 5000  
Cleveland, Ohio 44101

Gerald Charnoff, Esq.  
Shaw, Pittman, Potts  
and Trowbridge  
1800 M Street, N. W.  
Washington, D. C. 20036

Leslie Henry, Esq.  
Fuller, Seney, Henry and Hodge  
300 Madison Avenue  
Toledo, Ohio 43604

OFFICE ➤						
SURNAME ➤						
DATE ➤						

ENCLOSURE

REQUEST FOR INFORMATION  
FIRE HAZARDS ANALYSIS REPORT  
FOR  
DAVIS BESSE, UNIT 1  
DOCKET NO. 50-346

1. Table 4-1, Item C4a(8), General Guidelines  
(RSP)

The Auxiliary Transformers and buss tie transformers are located within 50 feet of the north wall of the auxiliary building. A total of five openings in the wall adjacent to the transformers were noted during our site visit. These openings are in direct communications with the switchgear room and the battery room, which are needed for safe shutdown of the plant. It is our position that 3 hour fire door dampers be provided for these openings.

2. Table 4-1, Item C4a(10), General Guidelines

For the following listed items substantiate their fire resistance capabilities as they pertain to safety-related areas or high hazard areas by verifying that their construction will be in accordance with a particular fire tested design. Identify the design, test method, and acceptance criteria.

- a. Rated wall assemblies: Provide any test results as well as fire tested assemblies that were used in the design of rated barriers. Also include the results of the spray or fire proofing used to provide fire resistance on the structural members throughout the plant.
- b. Fire dampers and fire doors, including the installation of the same in ventilating ducts penetrating fire barriers of safety related areas, fire door dampers are required in all 3-hour rated penetrations. Verify that the installation of all fire door dampers conforms to UL555, especially ventilation grills that terminate on one side of fire barriers.
- c. Fire barrier penetration seals around ducts, pipes, cables, cable trays, and conduit or any other penetrations. Demonstrate that in case of horizontal trays support failure, the resultant unsupported load and torque on the penetration seal will not affect the integrity of the seal, otherwise provide 3-hour fire resistance coating for these supports.

3. Table 4-1, Item 4e(1), Lighting and Communication  
(RSP)

You state that the emergency lightup has a 2-hour battery supply which is through a conduit instead of individual battery supply. This is unacceptable. It is our position that fixed selfcontained lighting consisting of flourescent or sealed-beam units with individual 8-hour-minimum battery power supplies should be provided in areas that must be manned for safe shutdown and for access and egress routes to and from all fire areas. Safe shutdown areas include those required to be manned if the control room must be evacuated. Confirm that you will comply with this position.

4. Table 4-1, Item 5c, Water Sprinkler and Hose Standpipe System

You indicate that the sprinkler system for both the emergency diesel generator rooms are connected to a common header. Provide information to demonstrate that a through-wall leakage crack in the 10" common header will not affect the sprinkler system for both diesel generator rooms. Also provide additional hose stations in the area to properly protect all areas in the vicinity of each emergency diesel generator including its associated day tank.

5. Table 4-1, Item 6a, Primary and Secondary Containment  
(RSP)

During our site visit, we observed that the reactor coolant pump oil collection system was inadequate to contain a pressurized oil leak. Revise your system design and provide drawings to indicate that the pressurized oil can be contained completely.

6. Table 4-1, Item 6a, Primary and Secondary Containment  
(RSP)

It is our position that adequate self-contained breathing apparatus be provided near the containment entrances for firefighting and damage control personnel. These units should be independent of any breathing apparatus provided for general plant activities.

7. Table 4-1, Item 6b, Control Room Complex  
(RSP)

- a. It is our position that you provide portable extinguishers for protection against a Class A deep-seated fire for the control room complex. Extinguishers should be spaced and installed according to NFPA 10.
- b. Verify that the suspended control room ceiling has been tested in accordance with Standards Method of Fire Tests of Building Construction and Materials (NFPA No. 251) and which has obtained a fire resistance rating of not less than 1-hour, since the present ceiling is being used as a return air plenum from the control room.

8. Table 4-1, Item 6c, Cable Spreading Room  
(RSP)

Based on our site visit, we consider that the present arrangement of the conduit and cable trays in the cable spreading room make manual fire fighting difficult as entrance cannot be gained into the major area of the room. Both divisions are contained within the room and there is presently no fire suppression system installed. Hose stations and portable fire extinguishers are located near the entrances to this room.

Taking these factors into account and providing a defense-in-depth protection for this room, it is our position that an automatic spray fog system be provided at the ceiling level. Provide preliminary drawings of such a system showing piping and spray head locations.

In addition, we will require the licensee to establish emergency remote shutdown capability and procedures for Davis-Besse, Unit No. 1, to achieve cold shutdown in the event of a cable spreading room fire or a control room cabinet fire, which disables redundant cable division of systems necessary for safe shutdown, assuming a turbine generator trip. Use of non-safety related systems may be considered for this purpose. Confirm that you will meet the above positions.

9. Throughout your fire hazards analysis you take credit for alternative means of achieving cold shutdown if both redundant pieces of safety related equipment are lost due to a fire. Verify that where such credit is taken that written procedures have been established for immediate use by appropriate individuals and that cold shutdown can be achieved within 72 hours.

10. Table 4-1, Item 6i, Diesel Generator Areas

Provide sufficient information to demonstrate that an oil spillage in the diesel fuel oil day tank room will not spread to either diesel generator rooms or any other safety related areas by means such as interconnecting drains.

11. Table 4-1, Item 6h, Related Safety Pumps  
(RSP)

All three service water pumps and two cooling tower makeup pumps are located in one room of the intake structure. It is our position that a noncombustible 1/2-hour rated barrier separate each service water pump and motor from its redundant train (two barriers required). The barriers should be extended from floor to ceiling. Also provide a preaction sprinkler system to cover the entire room, except the motor control center with alarm and annunciation in the control room. Any redundant cabling or conduit from one train within the barrier of the other should be totally enclosed in Kaowool or other suitable material to give at least a half hour fire rating.

All openings in the wall separating this room from the diesel fire pump room should be sealed with a material to achieve a 3-hour fire rating. Also provide a curb around the entrance to the SW pump area on the fire pump side to prohibit a liquid from running under the door separating the two rooms.

It is also our position that you provide a 1-1/2 inch hose station in the immediate area of the surface water pump room within the intake structure to cover all portions of any area containing safety related equipment.

12. Item 5.A.3.2, Fire Zone A-13, ECCS Pump Room 115, Auxiliary Building  
(RSP)

It is our position that an approved 3-hour rated rolling type fire door which can be actuated by fire alarms from either sides of the room, be provided at the southwest corner of ECCS pump room 115, fire area A-13, elevation 54% to prevent direct communication with its redundant train.

13. Item 5.A.3.5, Fire Zone A-3, Clean Waste Receiver Tank Room 124, Auxiliary Building  
(RSP)

At present, both cable trains in fire area A-3, clean waste receiver tank room 124, elevation 545, are separated from each other by 30 feet and are approximately 31 feet above the floor of this room. One of the redundant trains contains cables for the component cooling water pumps, diesel generator, and 4.16 KV feeder breakers of the substation. It is our position that the trays of each train be protected from an exposure fire on the floor by a 1/2 hour fire rated barrier. In addition, provide automatic sprinkler system to cover the area between the cable divisions.

14. Item 5.A.3.6, Fire Zone A-3, Clean Waste Receiver Tank Room 124, Auxiliary Building  
(RSP)

It is our position that you provide 1-1/2 inch fire hose (each station) should be equipped with a maximum of 100 feet of rubber lined hose and suitable nozzle) stations at the following locations:

- a. Entrances to the annulus in No. 2 mechanical penetration room 235 and No. 1 mechanical penetration room 208 on elevation 565'.
- b. No. 4 mechanical penetration room 314 and No. 3 mechanical penetration room 303, elevation 585 ft.
- c. Fire zone D-24, No. 2 main steam line area, Room 502 and Fire Zone D-25, No. 1 main steam line area, Room 601.

15. Item 4.D.4, Fire Propagation Control  
(RSP)

Verify that the structural steel in the mechanical and electrical penetration rooms on all elevations of the auxiliary building will be protected with a 3-hour fire rated sprayed-on-type fire proofing as stated in your fire hazards analysis.

16. Item 5.D.4, Fire Propagation Control

Throughout your analysis credit is taken for the proposed water curtain instead of a blank 3 hour fire wall. Provide a description of such a water curtain including preliminary drawings and activation, as well as the criteria used in the design.

17. Item 5.D.5, Fire Detection  
(RSP)

It is our position that due to the communication of the various electrical and mechanical penetration rooms on the various elevations that smoke detectors be installed on a maximum of 250 square feet of ceiling area per detector. Verify that such spacing per detector is being met.

18. Item 5.D.3.11 Fire Zone D-17, No. 3 Mechanical Penetration Room 303, Auxiliary Building  
(RSP)

Power and control cabling trays for the four seal isolation valves are contained in the No. 3 mechanical penetration room 303, elevation 585 ft. It is our position that these valves should be protected against an exposure fire for at least 1/2 hour to prevent damage to the RCP seals for lacking of sealing water.

19. Verify the type of automatic suppression system proposed to be installed for fire zone D-16 - Mechanical Penetration Room No. 4 room 314, elevation 585 feet of the auxiliary building.

20. Item 4.E.3.1, Fire Zone E-1, Auxiliary Feed Pump Room 237, Auxiliary Building  
(RSP)

It is our position that the opening in the ceiling of the auxiliary feed pump unit room 237, fire zone E-1, elevation 565 feet be sealed with a suitable material. It is also our position that fire door dampers be provided for the ventilation openings of the auxiliary feed pump room 237 at the ceiling which communicates with the heater bay above. Also provide fire doors to the stairwell air intake between room 238 of the auxiliary feed pump room and the heater bay area.

21. Item 5.G.3.5, Fire Zone G-11, Passage 227, Auxiliary Building  
(RSP)

It is our position that a suitable fire resistant barrier be provided between the proposed automatic sprinklers and the lowest conduit-cable trays for fire zone G-11, passage room 227, elevation 565 of the auxiliary building. Verify that sprinkler protection will be provided for area in front of (but not including) the motor control center panels in this passageway.

22. Item 5.H.3.1, Fire Zone H-T, Makeup Pump Room 225, Auxiliary Building  
(RSP)

It is our position that automatic sprinkler protection be provided for fire zone 4-1, make-up pump room 225, auxiliary building, elevation 565 feet for protection against an exposure fire involving both make-up pumps. Activation of the system should be alarmed and annunciated in the control room.

23. Item 5.H.3.2, Fire Zone H-2, Corridor 209, Auxiliary Building  
(RSP)

- a. It is our position that additional fire detectors be installed in Corridor 209, fire zone H-2, Auxiliary building, elevation 565 feet to enable early detection of a fire. At present there is only one detector for the entire length of the corridor.
- b. It is our position that a 1/2 hour rated fire barrier (kaowool or equivalent) be provided around the conduit for the decay heat system and the high-pressure injection system in Corridor 209, fire zone H-2, elevation 565 feet of the auxiliary building for protection against an exposure fire involving its redundant division in motor control center E11A.

24. Item 5.J.3.1, Fire Zone J-1, Diesel Generator Room 319, Auxiliary Building  
(RSP)

It is our position that an additional hose station be provided (adjacent to diesel generator room 319 fire zone J-1, elevation 585 feet) to enable sufficient coverage to be provided. At present the only hose available is in the charge room 321.

25. Item 5.P.3.1, Fire Zone P-1, Passage 332, Auxiliary Building  
(RSP)

It is our position that drainage be provided for fire zone P-1, passage room 322, elevation 585 feet so that water will not run into adjacent safety related electrical rooms in the immediate area which also have no drainage. Credit is now taken for drainage into the heater bay area of the turbine building; however, an 8 inch curb separates this area from the passage.

It is also a position that a 1/2 hour fire rated barrier be provided around one of the cable trains (to protect the CCW valves conduit/cable tray) to ensure both trains are not exposed to a single fire in the preceding area.

26. Item 5.I.3-1, Fire Zone I-1, Component Cooling Water Heat Exchanger and Pump Room 328, Auxiliary Building  
(RSP)

It is our position that automatic sprinklers be provided in the area of the three component cooling water exchanger and pump room 328, fire zone I-1, elevation 585 feet of the auxiliary building for protection against an exposure fire. Also provide a noncombustible

barrier of at least 1/2 hour rated from the floor to the ceiling to separate each pump from the other. Activation of the sprinkler system should alarm and annunciate in the control room.

It is our position that the hydrogen line passing through this area be relocated to another location not containing safety related equipment. Verify that no piped hydrogen lines are located through or exposes any other safety related equipment or conduit cable. For any areas where such condition exists, these lines should be relocated to a safe distance away, or demonstrate that the hydrogen can be safety vented.

27. Item 5.U.3.1, Fire Zone U-1, Passage and Hatch area 310 and 313,  
(RSP) Auxiliary Building

Fire Zone U-1 passage room 310, auxiliary building, elevation 587 contains power and instrument cables/conduit from both divisions. It is our position in addition to the proposed automatic sprinkler system for this area that safety related conduit/cable of both divisions be provided with a suitable fire rated barrier of at least one-half hour. It is also our position that all storage in the area be relocated to another location.

It is also our position that due to the hydrazine tank storage being located adjacent to the above that the proposed automatic sprinkler system for passage 310 be extended to cover hatch area room 313 at the same elevation.

28. Item 5.V.3.1, Fire Zone V-1, Fuel Handling Area 300, Auxiliary Building  
(RSP)

It is our position that a fire detection system which alarms and annunciates in the control room be installed in the northwest corner area of fire zone V-1, fuel handling area room 300, elevation 585 feet of the auxiliary building due to the storage of combustible material prior to it being sealed in 55 gallon drums and placed in the drumming area.

29. Item 5.V.3.2, Fire Zone V-6, Corridor 304, Auxiliary Building  
(RSP)

It is our position that a suitable barrier such as Kaowool and good for 1/2-hour fire rating be provided for those conduits of both trains necessary to achieve cold shutdown in fire zone V-6, corridor room 304, auxiliary building, elevation 585 feet.

30. Item 5.V.3.3, Fire Zone V-7, Battery Room A and B, Auxiliary Building  
(RSP)

It is our position that the combustible storage located in both battery room A and B, rooms 428A, 429B, elevation 603 feet, auxiliary building be removed to another location not exposing safety related equipment.

31. It was noted that 2 conduits from the opposite train were routed in room 429, fire zone Y-1, low voltage switchgear room E Bus, elevation 603 feet of the auxiliary building. Identify the functions of these conduits and verify the ability of the plant to achieve cold shutdown should a fire in the room damage both cable trains.
32. (RSP) It is our position that all peripheral rooms within the control room complex be separated from the control room by at least 1 hour fire resistant construction. Some of the doors to these rooms were hollow metal steel type construction with no fire rating.
33. (RSP) It is our position that the numerous curtain type fire doors that are bolted together to protect the opening in the 3 hour fire wall separating the turbine area from the supply air and exhaust equipment room 516 fire zone EE-1, elevation 623 feet are not an acceptable arrangement. Describe what additional measures will be taken to provide acceptable protection to properly protect the openings.
34. (RSP) It is our position that the four horizontal cable trays penetrating the 3 hour fire wall on elevation 602 feet at column line 9-F be supported as in the fire test. As an alternate modify the supports to provide 3 hour protection as the present trays are supported only by two bare steel rods.
35. State whether the collapse of the turbine building roof due to a fire would effect the integrity of safe shutdown or associated equipment in the area or adjacent to the turbine building. Demonstrate that safe shutdown can be accomplished in the event of the turbine building roof collapse.
36. Throughout your fire hazards analysis reference is made to the fact that a horizontal curtain type fire door is installed in vertical duct penetrations. Supply information such as the model number, manufacturer, fire rating, and testing laboratory of such a fire door/damper to verify that they are approved for such installation and meets 3 hour fire rating.
37. General Design Criterion 19 requires that control room be provided to control operation of the reactor during normal conditions and to maintain it in a safe condition under accident conditions. The criterion also requires remote capability (outside of the control room) for prompt hot shutdown and the potential capability for subsequent cold shutdown of the reactor.

From our site visit it was not clear how the Davis Besse design satisfies GDC 19 in the event of fire. Therefore, we require that complete descriptions for safely shutting down the reactor be provided as follows:

- (a) 1. Safely shutting down the reactor from the main control room when fire disables any safe shutdown equipment controlled from remote locations.
- 2. Safely shutting down the reactor from remote locations when the main control room is uninhabitable and when fire disables safe shutdown equipment controlled from the main control room or the cable spreading room.

(b) These descriptions should include:

- 1. A list of all instrumentation and controls required by and will be available to the operator safely shutdown the plant from the main control room.
- 2. A list of all instrumentation, controls and communications equipment required by and available to the operators to safely shutdown the plant from locations that are remote from the control room. Also identify the location of each instrument, each control components and the communications equipment available to the operators for remote safe shutdown of the plant.
- 3. The design provisions made to preclude a fire at any location from preventing safe shutdown of the plant.
- 4. Procedures to achieve hot shutdown and also to achieve cold shutdown for each case of item A above.

- 38. (RSP) It is our position that the 18 inch X 12 inch supply grill at elevation 623, Room 501 to Room 603 electrical penetration room, elevation 603 be supplied with a 3 hour horizontal type fire door.
- 39. Verify the type of protection to be provided for the blowout panels between rooms 235 and 124 at elevation 565 feet, auxiliary building.
- 40. It is our understanding that modifications to the existing fire alarm system are being made. Describe in detail the modifications being made, including a description of the detector system circuitry (from the detectors to the main control room fire alarm panel). Include in the description a single line drawing from the detection circuits, water-flow alarms, through the sub-panels and into the control room. The drawing should show how primary and secondary power is maintained on the system. Verify that all equipment connected to the fire alarm system is electrically supervised.
- 41. (RSP) During the site visit to Davis-Besse 1, we were informed that only seal wire would be used for all non-electrically supervised sectional, divisional, and control valves, rather than locking the valves open with strict key control. This is not acceptable; therefore, revise your design to meet the guidelines of Appendix A to BTP 9.5-1.

2. (RSP) During our site visit we were informed that Davis-Besse, Unit 1 would only provide a 3 man fire brigade rather than a 5 man brigade. We have reviewed the information contained in your letter dated April 11, 1978, and we have concluded that the minimum size of the fire brigade shift should be five persons. Our position and the bases, thereof, for delineating a minimum fire brigade size of five persons, and also, our position and bases for allowing the sharing of duties to meet minimum staffing requirements for the Davis Besse, Unit 1 fire brigade size are delineated in the enclosure to our letter sent to you on May 26, 1978.