



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

July 9, 1980

Docket No. 50-10

Mr. D. Lewis Peoples
Director of Nuclear Licensing
Commonwealth Edison Company
P.O. Box 767
Chicago, IL 60690

Dear Mr. Peoples:

RE: FIRE PROTECTION REVIEW FOR DRESDEN NUCLEAR STATION, UNIT NO. 1

We have reviewed your submittals in regard to fire protection modifications at Dresden Nuclear Power Station, Unit No. 1 as indicated in Enclosure 1 to this letter. The status of our evaluation is also indicated in the same enclosure. Enclosure 2 is our Evaluation of Design Details and includes requirements resulting from our consultant's review. Enclosure 3 provides our review of items 3.2.3 "Fire Water System Feeds" and 3.2.4 "Exposed Structural Steel." Both of these items need additional attention and therefore none of the 3.2 items are complete to date. Enclosures 4 and 5, include the results of our consultants review on item 3.1.3 "Fire Water Pump" and design review items 3.1.1 "Fire Detection Systems" and 3.1.5 "Water Suppression Systems."

Please respond to the items in Enclosures 2 and 3 within 30 days of receipt of this letter.

Sincerely,

Dennis M. Crutchfield

Dennis M. Crutchfield, Chief
Operating Reactors Branch #5
Division of Licensing

Enclosures:
As stated

cc w/enclosures:
See page 2

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Mr. D. Louis Peoples

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July 9, 1980

cc w/enclosures:

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RESOLUTION OF INCOMPLETE ITEMS - STATUSDRESDEN 1

	<u>Staff Evaluation</u>	<u>Licensee Response Due</u>
3.1.1 Fire Detection Systems		
(1) In the control room	Requirement	
(2) In the sphere penetration	Complete	
3.1.3 Fire Water Pump	Requirement and Drawings	
3.1.5 Water Suppression Systems		
(a) Sphere Cable Penetr. Area	Complete	
(b) North Auxiliary Bay	Ongoing	
(c) Hydrogen Seal Oil Unit	Complete	
(d) Cable Passageway	Complete	
(e) Trackway	Complete	
(f) Screen House	Complete	
(g) Core Spray and Post Incident Area	Complete	
(h) New Fuel Receiving Area	Complete	
(i) Clean and Dirty Oil Rooms	Complete	
3.2.1 Detection Systems Tests	Information	1/80
3.2.2 Technical Specifications for Existing Fire Protection Systems and Hose Stations	Information	3/81
3.2.3 Fire Water System Feeds	Information	8/80
3.2.4 Exposed Structural Steel	Requirement	
3.2.5 Emergency Condenser Valves	SEP	
3.2.6 Emergency Condenser Makeup	SEP	
3.2.7 Emergency Condenser Level Indication	SEP	

DRESDEN UNIT 1
FIRE PROTECTION REVIEW - SUMMARY OF REQUIREMENTS
BASED ON EVALUATION OF DESIGN DETAILS

The following provides a summary of requirements based on our consultant's evaluation of the design details submitted by the licensee for proposed modifications. Our consultant's evaluation is contained in Enclosures 4 and 5. Numbers in parenthesis following each heading refer to the sections in our previously issued SER which address these design details.

Fire Detection Systems (3.1.1)

Our SER noted that the licensee would submit design details on the detection systems for the Control Room and the Sphere Penetration Area.

On December 4, 1979, the licensee submitted the design details for fire detection systems in the Control Room and Sphere Penetration Area. We have reviewed the detection system drawings and the results of our review are as follows.

Control Room

We will require that smoke detectors be provided in the control room consoles.

Sphere Penetration Area

We find that the detection system for the sphere penetration area provides the protection intended in our SER and is therefore acceptable.

Fire Water Pump (3.1.3)

Our SER noted that a 2500 gpm diesel driven fire water pump would be provided to replace the existing fire pump, and would be installed in conformance with NFPA-20. Further, that the screen wash pumps would be isolated from the fire water system by motor operated valves.

By letter dated December 4, 1979, the licensee provided drawings on the fire pump installation showing the discharge piping. We have reviewed the drawings and our evaluation results are as follows:

We will require that the eight (8) inch discharge pipe for the 2500 gpm pump be replaced with a ten (10) inch pipe to conform to NFPA #20, or that calculations be provided to demonstrate that this pump can meet the pressure requirements for the maximum water demand with the added losses due to the eight (8) inch pipe.

We will require that a 2-inch bypass be installed around the normally closed motor operated valves that control the flow of water from the Unit 2 and 3 screen wash pumps and the fire water system. (The licensee has agreed to this position in a telecon; however, this commitment has not been documented.)

Water Suppression (3.1.5)

Our SER noted that the following items would be reviewed for design adequacy:

1. Sphere Cable Penetration Area Deluge System.
2. Sprinkler System - North Auxiliary Bay.
3. Water Deluge System - Hydrogen Seal Oil Area.
4. Water Spray Preaction System - Cable Passageway.
5. Sprinkler Protection - Unit 1 Trackway, Laundry Storage and Welding Shop.
6. Diesel Fire Pump - Automatic Water Suppression System.
7. Core Spray and Post Incident Pump Areas - Automatic Water Suppression.
8. New Fuel Receiving Area - Water Sprinkler System.
9. Clean and Dirty Oil Storage Room - Extra Hazard Sprinkler System.

The licensee by letter dated December 4, 1979, forwarded design drawings for the asterisked items under 3.1.5, Water Suppression Systems, in the issued S.I.R.

We have reviewed the licensee's submittal and have the following requirements and comments:

1. Automatic Preaction System - sphere cable penetration area.
 - a. We will require the feed to the preaction system for the cable penetration area to be an independent feed from the feed that supplies the system protecting the tunnel.
 - b. The proposed design for the preaction sprinkler system in the cable penetration area includes two motor operated valves on the feed to the preaction system. A fire in the penetration area could cause a signal for containment isolation resulting in closure of these valves and loss of suppression water. We will require one of the following:
 - (i) rerouting of any cables which could cause a containment isolation due to a fire in the cable penetration area; or
 - (ii) barriers or enclosures to adequately isolate those cables which could cause a containment isolation signal from the rest of the combustibles in the penetration area; or

- (iii) provide a check valve in the preaction system line inside containment in lieu of the motor operated valve, and provide a handwheel on the motor operated valve outside containment.
 - (c) We will require that low air supervision be provided on the closed head spray piping with annunciation in the control room.
 - (d) We will require that the automatic spray heads be located at the centerline of each of the trays in the penetration area and that the protection to be provided will be extended from the containment wall to the point where the cable trays divide. (We were unable to confirm this from Drawing #26-1734 sheet 1.)
 - (e) We will require that deluge valve for the containment penetration system be located outside the containment boundary.
2. Automatic Sprinkler Protection - north auxiliary bay - drawings not received. To satisfy the requirements of our previous SER, we will require:
- (a) a water suppression system for both cable tray and area exposure protection;
 - (b) the sprinkler or spray heads protecting the cable trays should be located between and on the centerline of the trays;
 - (c) the density design shall meet the requirements of NFPA-15;
 - (d) if the licensee chooses to install a preaction system, we will require detection to be between the cable trays and at the ceiling. Low air supervision should be provided on the closed head piping system with alarm and annunciation in the control room; and
 - (e) the water feed for the water suppression system shall be independent of the hose station feeds in the area.
3. Automatic Deluge System - hydrogen seal oil unit.
- (a) We will require that the density for the protection of the tank be 0.25 gallons per minute per square foot over the entire surface area of the tank. (NFPA-15 paragraph 4.4.3.2b.)
 - (b) We will require that a remote actuation station for the deluge system be located outside the entrance to the room.

4. Automatic Preaction Systems - cable passageway.
 - (a) We will require that the spray heads be located at the center line of each of the trays being protected.
 - (b) We will require that low air supervision be provided on the closed head spray piping with annunciation in the control room.
5. Automatic Sprinklers - unit 1 trackway. Design found acceptable.
6. Automatic Sprinklers - screen house - diesel fire pump. Design found acceptable.
7. Automatic Sprinklers - core spray - post incident pump area. Design found acceptable.
8. Automatic Sprinklers - new fuel receiving area. Design found acceptable.
9. Extra Hazard Automatic Sprinklers - clean and dirty oil room. We will require the density requirements to be 0.28 gallons per minute per square foot over the entire room to meet the density requirements of NFPA 13 paragraph A2-2.1.2.6.

Subject to the satisfactory implementation of the above requirements, we find that Water Suppression Systems provide the protection intended in our SER and are, therefore, acceptable.

RESOLUTION OF INCOMPLETE ITEMSEVALUATION

The following provides our evaluation of the incomplete items. The number in parenthesis following the heading refers to the section of our previously issued SER which addressed this incomplete item.

Fire Water System Feeds (3.2.3)

Our SER noted that we had requested the licensee to separate the feeds for hose stations from the feeds for fixed suppression systems in the post incident-core spray area, Unit 1 cable passageway, the north auxiliary bay, and primary and secondary feed pump areas. The licensee indicated he would evaluate this concern.

By letter dated August 2, 1979, the licensee stated that:

The post incident/core spray area may be reached by hose station F-40 and is protected by a wet pipe sprinkler system. This sprinkler system is separated from the hose station by an isolation valve on the header.

The cable passageway is covered by hose station F-29. It is also covered by a preaction water suppression system. Isolation valves are provided to isolate the hose station from the preaction water suppression system. A hose station is being added at each of the two tie-in points for this preaction water suppression system.

By telecon on March 11, 1980, the licensee agreed to provide sufficient hose at each hose station to reach the mid point of the passageway. Pending receipt of written confirmation of this agreement we find the hose station feeds are acceptable.

The primary and secondary feed pump areas are protected by a local automatic flooding gaseous carbon dioxide system and also by two hose stations which provide water coverage for this area. The hose station ties to the header are provided with isolation valving between the two stations.

Since there is no fixed water suppression provided for the primary and secondary feed pump area there exists no need to provide isolation between the fixed suppression (in this case the CO₂ system is a separate system) and the hose stations. We find that the feeds for the hose stations for this area are also acceptable.

By letter dated August 2, 1979, the licensee indicated that the north auxiliary bay could be reached by two hose stations (F-21 and F-22) and that both stations and the fixed suppression are separated on the header by isolation valves. However, drawings for the new fixed water suppression system for the north auxiliary bay were not submitted for review and we therefore, could not verify that the feed for this new system was separated from the hose station for the area. We have previously stated a requirement to resolve this concern (item 3.1.5-2(f) from Enclosure 2).

Subject to resolution of item 3.1.5 as described in Enclosure 2, we find that adequate fire water system feeds are provided to satisfy staff guidelines, and accordingly are acceptable.

Exposed Structural Steel (3.2.4)

Our SER noted that we had requested that the exposed structural steel above the large concentration of cables in the north auxiliary bay be provided with flame retardant coatings.

By letter dated August 2, 1979, the licensee provided information on the north auxiliary bay stating the combustible content, indicating that the diesel fuel and lubricants were being removed, and concluding that since the fuel loading was low and sprinklers were to be provided, no structural protection was necessary.

We find that transient combustibles will be removed from the area to minimize the amount of combustibles in the area; however, there continues to exist a need for changeout of the lube oil for the reactor feedwater pumps. This could mean that the area sees as much as 120 gallons of oil during the changeout process. The reactor feed pump area is not separated from the north auxiliary bay (wire glass double doors which are normally open separate the two areas) by fire rated barriers.

Our evaluation indicates that since the reactor feed pump area is not separated from the (cable spreading) North Auxiliary Bay, and since we have not accepted administrative controls to assure safe shutdown, we will require that either 3-hour fire proofing be provided on the structural steel or that shutdown capability be provided independent of the area. Our evaluation of the ability to achieve safe shutdown for postulated fires is still under review.

BROOKHAVEN NATIONAL LABORATORY
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Department of Nuclear Energy

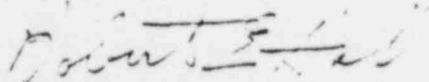
February 13, 1980

Mr. Robert L. Ferguson
Plant Systems Branch
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Bob:

Attached is the Brookhaven National Laboratory fire protection review for Dresden 1 nuclear power plant, Item 3.1.3, Fire Water Pump.

Respectfully yours,



Robert E. Hall, Group Leader
Reactor Engineering Analysis

REH:EAM:sd
attachment

cc.: R. Cerbone wo/att.
 W. Kato "
 E. MacDougall
 V. Panciera wo/att.
 E. Sylvester "

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DRESDEN 1

Fire Protection Review

Item 3.1.3 Fire Water Pump

Under a cover letter dated December 4, 1979, the licensee forwarded design details for the new 2500 gpm at 145 psi diesel drive fire pump to replace the existing pump. This item is covered under 3.1.3 Fire Water Pump in the Dresden 1 SER.

The review of the documents submitted show a discrepancy between the drawing M-970 and specification sheets. The specifications indicate a hose header with eight (8) 2-1/2 inch gated hose connections will be used but the drawing shows only six (6). The discharge cone is six (6) inches in diameter with a ten (10) inch discharge but the drawing shows only a six (6) inch discharge. The motor operated valve required in the SER to separate the screen wash system from the fire protection system is not shown on the drawing.

NFPA #20 requires a ten (10) inch discharge pipe for a 2500 gpm pump. The existing discharge is only eight (8) inch. The licensee should replace the eight (8) inch pipe with a ten (10) inch pipe or the licensee should submit calculations showing that the pump can meet the pressure requirements for the water demand with the added loss in the eight (8) inch pipe.

The drawings do not show the proposed 52 gpm jockey pump. This pump should be installed to maintain supervisory pressure in the fire loop. The actuation of the fire pumps should be based on the loss of this pressure.

The present P&ID drawing M970 is incorrect and should be modified to reflect existing and proposed piping. This drawing should be resubmitted along with the design drawings for the piping layout in the pump house.

On February 6, 1980 a telephone conference call was held with the licensee and the Nuclear Regulatory Commission. At this time the licensee proposed the following:

- Correct all the dimensional problems listed above.
- Document these changes on print M970 and forward revised print to the NRC.
- Eliminate the jockey pump and replace with a 2 inch by-pass around the normally closed motor operated valves that control the flow of water from the unit 2 and 3 screen wash pumps and the fire water system.

Based upon the above review and contingent upon NRC review of the drawings to be resubmitted we find the 3.1.3 Fire Water Pumps acceptable.

We recommend that the staff approve the omission of the jockey pump based on satisfactory completion of the changes listed above. We further recommend that the staff approve the dimension changes if documented by the licensee. We further caution that should the existing 8" discharge pipes not be changed to 10" that the licensee be required to submit evidence that he can meet the NFPA #20 pressure requirements.

BROOKHAVEN NATIONAL LABORATORY
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Department of Nuclear Energy

February 20, 1980

Mr. Robert L. Ferguson
Plant Systems Branch
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

RE: Dresden 1, Fire Protection Review, Items 3.1.1 and 3.1.5.

Dear Bob:

Attached are items 3.1.1, Fire Detection Systems, and 3.1.5, Water
Suppression Systems for the Dresden 1 nuclear power plant.

Respectfully yours,

Robert E. Hall
Robert E. Hall, Group Leader
Reactor Engineering Analysis

REH:EAM:sd
attachment

cc.: R. Cerbone wo/att.
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Entire document previously
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No. of pages: 4