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March 21, 1980

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U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Subject: Response to request for
Additional Information on SEP Topic III-5.B
Pipe Break Outside Containment - Dresden Unit 2
NRC Docket No. 50-237

Dear Mr. Ziemann:

In response to your January 17, 1980 letter requesting additional information, the following information is being provided.

Question 1

Provide a comparison of the design of the containment penetration piping outside containment between the containment and the first containment isolation valves for the main steam lines, isolation condenser steam and condensate lines, and reactor water cleanup inlet line with the provisions of section B.1.b of Branch Technical Position MEB 3-1 (appended to Standard Review Plan 3.6.2) in sufficient detail to identify the degree of conformance with and deviations from these provisions.

Response:

The piping outside containment for the main steam lines, isolation condenser steam and condensate lines, and the reactor water cleanup inlet line meet the provisions ASME Code Section III, Sub-article NE-1120. All lines are designated as Quality Group A (Class 1) up to the outboard containment isolation.

The stress analysis performed on these piping lines was in accordance with the regulations in effect at the time the plant was constructed. The stress limits, denoted for Class 1 piping in Section B.1.b(1) of Branch Technical Position MEB 3-1, could not be compared to the original stress analysis since there was no ASME Section III Class 1 Analysis performed on these lines. The stress limits which most closely represent what has been done on these lines are the limits described in Section B.1.b(2)(e). For the stress limits in this section, the lines are in conformance. All other sections of B.1.b(1) could not be compared as indicated below:

A. Section B.1.b(1).(a) required a maximum to the stress range based upon maximum allowable stress. The maximum allowable stress limit as required in the original analysis is different than S_m and no comparison can be made. The piping systems did meet the maximum allowable stress limit requirement and stress range of the original analysis.

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B. Section B.1.b(1).(b) could not be compared for the same reason as in Item A.

C. Section B.1.b(1).(c) discusses cumulative usage factors. No cumulative usage factors were calculated in the original analysis.

D. Section B.1.b(1).(c) discusses allowable stress limits outside the containment. These stresses could not be compared for the same reason as in Item A.

Question 2

Provide a comparison of the design of the containment penetration piping outside containment for the isolation condenser steam line and reactor water cleanup inlet line with the provisions of section B.2.C of Branch Technical Position ASB 3-1 (appended to Standard Review Plan 3.6.1) in sufficient detail to identify the degree of conformance with or the deviations from these provisions.

Response

Section B.2.C of Branch Technical Position ASB 3-1 contains four subsections which address the requirement of the fluid system piping in containment penetration areas. Each subsystem requirements are compared below.

1. Subsection B.2.C (1) discusses the stress limits in the piping near the containment penetrations and the need for pipe whip restraints in the area of the containment isolation valves. The lines were analyzed in accordance with codes in effect at the time of construction. Hence, the stress limits could not be compared (See Response 1). The restraints in the area near the isolation valves were not designed with respect to pipe whip and operability of the isolation valves. However, the physical routing of the lines and the routing of the power and control cabling for the isolation of the respective line is not endangered by a break of that line.

2. Subsection B.2.C(2) discusses piping that penetrates both sides of a dual barrier containment structure. Because of the design of the primary and secondary containment of Dresden-2, this subsection is not applicable to these lines.

3. Subsection B.2.C(3) discusses the terminal ends considered for the extended piping runs. Because of the design of the pipe lines this subsection is not applicable to the Dresden-2 design. The lines in question are high energy lines along their entire run, and hence, this question is not applicable.

4. Subsection B.2.C(4) discusses the piping classification of the lines. The isolation condenser steam line and the reactor water cleanup line are both considered to be Quality Group A lines up to and including the outboard containment isolation valve as required by Section 50.55a of 10CFR50. This classification was made without regard to pipe whip restraints. Because of the absence of the pipe whip restraints the break in classification of the piping was made after the outboard containment isolation valve.

Question 3

Provide an evaluation of the the consequences of a postulated main feed system high energy line break on the mezzanine floor of the turbine building. Consider the postulated loss of offsite power and a concurrent single active failure in accordance with the provisions of section B.3 of Branch Technical Position ASB 3-1.

Response

We have investigated the possibility of a break of the Feedwater System on the Dresden-2 mezzanine floor with respect to safe shutdown, flooding consequences, and control room habitability.

The first consequence of the rupture of the feedwater piping in the Feedwater Regulating Station is that of safe shutdown. Assuming that damage is done to all the cables routed through the regulating station area, the unit can be shutdown in the following manner. The ADS and the Isolation Condenser can be used to depressurize the system. The make-up water is provided by the Control Rod Drive Hydraulic System. These systems can be used since control and power cabling does not pass through the regulating station area. Also, assuming the worst single failure, failure of isolation condenser valve MO-1301-3 to open, the valve can be manually opened if necessary. Make-up water for the isolation condenser is provided by three different sources which are unaffected by the loss of cabling in the regulating station area. This method of shutdown has already been accepted by the NRC in the Fire Hazard/Safe Shutdown Report for Dresden 2 & 3.

With respect to the flooding consequences, the only safety-related equipment affected would be the Dresden-2 Diesel Generator located below the regulating stations. Measures have been taken to seal all possible drainage paths to the Diesel Generator Room. Thus shorting of electrical equipment is not possible. Also, the water would not affect the diesel generator and the auxiliaries once it reached the 517' elevation after draining through the stairs.

The other consideration is control room habitability. No path exists where the water could drain to the control room level of 534' from the 538' elevation. The stairs connecting the floors would allow the water to drain to the 517' elevation. This is because the stairs are made of grating material. The positive pressure in the control room would prevent the noncondensable radioactive gases from entering the control room. Also, the activity present in the feedwater line would be low thus keeping control room doses down.

Question 4

Provide additional details of the corrective actions implemented to prevent flooding of the Unit 2 diesel generator control cabinet as described in Reportable Occurrence Report 79-52 of October 17, 1979. Discuss the capability of the corrective measures (RTV sealant) to prevent disabling the diesel generator following a postulated main feed system pipe break on the mezzanine floor.

Response

Reportable Occurrence Report 79-52 for Dresden-2 was submitted on October 17, 1979. The D/G was declared inoperative due to a short in the control cabinet caused by water which had permeated through an HVAC duct due to a spill on the mezzanine floor.

In detail this is the scenario of the accident:

1. While installing the sprinkler system for the cable pans in the mezzanine area, water leaked out of the end of the sprinkler line onto the floor.

2. The drains in the area were sealed due to a modification of changing the discharge of the drains from the river to radwaste. Consequently, the water collected on the floor.

3. The water drained through the HVAC duct into the diesel generator room where some of the water seeped into the diesel generator control cabinet. This caused the short in the circuitry and an auto start block alarm.

4. The operating engineer declared the diesel inoperative and the required surveillances were performed.

5. The control cabinet was dried and the diesel was demonstrated to be operable within 24 hours.

In order to prevent this occurrence again, the area around the HVAC duct was sealed with GE-1200 silicone rubber sealant. The sealant was also used on the exhaust and air intake piping.

This was to prevent any leakage on the floor from draining into the diesel generator room. In addition, the design of the drain pipe rerouting to radwaste is proceeding.

Also, as part of the fire protection modifications the HVAC duct will receive a fire damper and an 18" curb around the damper. The damper will also be provided with spray protection to keep the water from entering the curb area. Therefore, neither spraying nor flooding will pose a problem to the diesel generator control cabinet.

Question 5

Provide an evaluation of the consequences of flooding both 4 kV switchgear 23-1 and 24-1 to the depth of the curb surrounding the switchgear panels from a postulated reactor building closed cooling water system leak (spray) on the 545' elevation of the reactor building.

Response

A postulated reactor building closed cooling water system leak (spray) on the 545' elevation of the reactor building could disable both 4kV switchgears 23-1 and 24-1 if flooded to the depth of the curb surrounding

them. Some of the breaker auxiliary components would be submerged and would be subject to failure. However, we do not feel that flooding to the top of the curb is a realistic scenario. There are two pipe penetration sleeves to the 517' elevation below. The first is an 8" sleeve with a 6" (with insulation) heating steam pipe in the penetration, and the other is a 12" pipe in a 20" sleeve. The 8" penetration has no lip on the sleeve so drainage can begin as soon as water flows to the penetration. The 20" penetration has a 1 1/2" lip on a sleeve, but this will be notched to permit drainage. Therefore, any level of water in the curb area would quickly drain and prevent flooding.

Please address any questions concerning this matter to this office. Attached for your review is one signed original and thirty nine(39) copies.

Very truly yours,

Robert F. Janecek

Robert F. Janecek
Nuclear Licensing
Administrator
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