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RECEIVED NOV 21 1974 U.S. ATOMIC ENERGY COMMISSION Regulatory Mail Section

Mr. Edson G. Case
Acting Director
Directorate of Licensing
Office of Regulation
U.S. Atomic Energy Commission
Washington, D.C. 20545

Subject: Dresden Station Units 2 and 3 Proposed Amendment to Facility Operating Licenses DPR-19 and DPR-25, AEC Dkts 50-237 and 50-249

Dear Mr. Case:

Pursuant to Part 50.59 of 10CFR50, Commonwealth Edison Company requests an amendment to DPR-19 Appendix A and DPR-25 Appendix A, Dresden Station Unit 2 and Unit 3 Technical Specifications. The purpose of this proposed amendment is to include appropriate operating requirements for the flood protection provisions described in Dresden Station Special Report No. 33 and to include an appropriate change to the performance requirements for the containment cooling service water pumps. The amendment is indicated on the attached revised pages 76, 81D, 81E, 85B, 86, 86A, 86B and 86C of Appendix A of DPR-19 and DPR-25.

The safety evaluation of the flood protection provisions is discussed in Dresden Station Special Report No. 33. The safety evaluation of the change to the containment cooling service water pump requirements, that is indicated on attached revised page 76, is attached to this letter.

The proposed amendment has received Onsite and Offsite review and has been approved as involving no unreviewed safety considerations.

Three (3) signed originals and 57 copies are attached for your approval.

Very truly yours,

Byron Lee, Jr.
Byron Lee, Jr.
Vice-President

11910

SUBSCRIBED and SWORN to
before me this 5th day
of November, 1974.

[signature]
Notary Public

SAFETY EVALUATION OF PROPOSED CHANGE TO

TECHNICAL SPECIFICATION 4.5.B.1.b

Received W/Ltr Dated 11-4-74

The change in pressure requirements at the CCSW pump discharge results from tests initiated to establish the actual pressures in the LPCI/CCSW system at Dresden Station. The limiting conditions and associated parameters affecting the system operation under the postulated loss-of-coolant accident are as follows:

I. The LPCI Subsystem

A. To flood the core in the event of loss-of-coolant accident, any three of the four LPCI pumps are required to deliver 14,500 gpm at a reactor pressure of 20 psig (Section 6.2.4.3 of FSAR and Section 4.5.A.3 of Technical Specification).

B. After core is flooded, only one LPCI pump is required to make up shroud leakage, the CCSW pumps may then be started for heat rejection purposes as electrical power is available. In the case of loss of offsite power, two CCSW pumps could be started not later than two hours into the accident.

C. Section 5.2.3.3 of the FSAR which indicates that "the primary containment system pressure equalizes out at about 27 psig." Thus the actuation of containment spray would not significantly increase the LPCI pressure requirement. (Figure 5.2.11 plots containment pressure vs. time for the loss-of-coolant accident). Preoperational testing information indicated that a minimum LPCI pump discharge pressure of 124 psig is required to supply 14,500 gpm at 20 psig reactor pressure. This takes into account the greater pressure requirement for two pumps pumping through the cross-tie line to inject into the undamaged loop.

D. A 20 psig differential pressure is required when service water is flowing through the tube side of the heat exchanger. Maintaining the service water at a pressure of 20 psi greater than the pressure on the LPCI side prevents reactor water from leaking into the river.

E. The design flow rate for containment water through the heat exchanges is 10,700 gpm. It would be at this flow rate that the maximum pressure drop across the heat exchanger would occur.

To establish the condition which would yield the highest pressure at the heat exchanger, the two LPCI pumps in the A and B loops of Units 2 and 3 were run at a flow rate of 10,700 gpm. At this flow rate, the maximum discharge pressure at the heat exchanger on the LPCI side was 110 psig. This may not be the limiting condition, however, since 124 psig is required at the LPCI pumps when two of the three LPCI pumps are discharging through the cross-tie to maintain a flow of 14,500 gpm. The actual pressure would range somewhere between 107 psig and 124 psig since only two pumps are running and line losses would decrease accordingly. The LPCI pumps will run back on the head curve to compensate for the need for higher discharge pressure. A minimum pressure of 135 psig is assumed at the heat exchanger outlet for conservatism. This value would allow for additional containment pressurization though it should never exceed 27 psig during the time the CCSW pumps are operated and "the containment long-term pressure is limited to less than 8 psig (from technical specification bases 3.5.B). The 27 psig valves is only 7 psig greater than the 20 psig reactor pressure for design conditions.

II. The Containment Cooling Service Water (CCSW) Subsystem

A. The design flow rate through the heat exchanger is 7000 gpm or 3500 gpm per CCSW pump.

B. The pressure on the service water side of the heat exchanger must be maintained at 20 psig greater than the LPCI side when service water is flowing.

C. Two CCSW pumps are required for design cooling capacity. The operating condition can be either two CCSW pumps operating at 7000 gpm in one loop, or one CCSW pump operating at 3500 gpm in each loop.

Based on actual data, the limiting condition which would yield the lowest pressure at the heat exchanger is realized with one CCSW pump in each loop with the flow throttled to the minimum acceptable flow rate of 3500 gpm. The flow through the heat exchanger would not be the limiting condition and therefore, the throttling valve on the discharge side of the heat exchanger would establish the pressure of the loop. Field data for the installed CCSW subsystem indicates that the maximum line loss between the CCSW pumps and the discharge of the heat exchanger is 25 psig. This line loss was established for the limiting condition of 2 pumps through one heat exchanger.

Conclusion:

When the limiting conditions are examined for the entire LPCI/CCSW system, the following pressures result:

1.	Pressure LPCI side of heat exchanger @ 10,700 gpm-	110 psig
2.	Pressure increase to yield 125 psig at ht. exch. discharge	15 psig
3.	Additional safety margin included-	10 psig
4.	Required ΔP between shell and tubes of heat exchanger-	20 psig
5.	Actual line losses between CCSW pumps and the outlet of heat exchanger (static and dynamic)	25 psig
6.	Required pressure at CCSW pumps @ 3500 gpm- TOTAL	180 psig

The proposed reduction of the pressure requirement at the CCSW pump discharge from 198 psig to 180 psig does not decrease the margin of safety or the designed capability of the CCSW pumps to supply adequate heat removal while also maintaining the necessary protection against leaking of reactor water into the service water and eventually the river. The change to the technical specification reflects a change from design pressures to actual operating parameters.

Received w/Ltr Dated 11-4-74

Proposed Amendment

To DPR-19 Appendix A and

To DPR-25 Appendix A

Pages 76, 81D, 81E, 85B, 86, 86A, 86B and 86C

3.5 LIMITING CONDITION FOR OPERATION	4.5 SURVEILLANCE REQUIREMENT

B. Containment Cooling Subsystem

1. Except as specified in 3.5.B.2, 3.5.B.3, and 3.5.F.3 below, both containment cooling subsystem loops shall be operable whenever irradiated fuel is in the reactor vessel and reactor coolant temperature is greater than 212°F.

2. From and after the date that one of the containment cooling service water subsystem pumps is made or found to be inoperable for any reason, reactor operation is permissible only during the succeeding thirty days unless such pump is sooner made operable, provided that during such thirty days all other active components of the containment cooling subsystem are operable.

3. From and after the date that one containment cooling subsystem is made or found to be inoperable for any reason, reactor operation is permissible only during the succeeding seven days unless such subsystem is sooner made operable, provided that all active components of the other

B. Surveillance of the Containment Cooling Subsystem shall be performed as follows:

1. Containment Cooling Service Water Subsystem Testing:

Item	Frequency
a. Pump & Valve Operability	Once/3 months
b. Flow Rate Test Each containment cooling water pump shall deliver at least 3500 gpm against a pressure of 180 psig.	After pump maintenance and every 3 months

2. When it is determined that one containment cooling service water pump is inoperable, the remaining components of that subsystem and the other containment cooling subsystem shall be demonstrated to be operable immediately and daily thereafter.

3. When one containment cooling subsystem becomes inoperable, the operable subsystem and the diesel generators required for operation of such components shall be demonstrated to be operable immediately and the operable containment cooling subsystem daily thereafter.

K. Condensate Pump Room Flood Protection

1. The systems installed to prevent or mitigate the consequences of flooding of the condensate pump room shall be operable prior to startup of the reactor.

2. The condenser pit water level switches shall trip the condenser circulating water pumps and alarm in the control room if water level in the condenser pit exceeds a level of 5 feet above the pit floor. If a failure occurs in one of these trip and alarm circuits, the failed circuit shall be immediately placed in a trip condition and reactor operation shall be permissible for the following seven days unless the circuit is sooner made operable.

K. Condensate Pump Room Flood Protection

1. The following surveillance requirements shall be observed to assure that the condensate pump room flood protection is operable.

   a. The testable penetrations through the walls of CCSW pump vaults shall be checked during each operating cycle by pressurizing to 15 $\pm$ 2 psig and checking for leaks using a soap bubble solution. The criteria for acceptance should be no visible leakage through the soap bubble solution. The bulkhead door shall be checked during each operating cycle by hydrostatically testing the door at 15 $\pm$ 2 psig and checking to verify that leakage around the door is less than one gallon per hour.

3. If Specification 3.5.K.1 and 2 cannot be met, reactor startup shall not commence or if operating, an orderly shutdown shall be initiated and the reactor shall be in a cold shutdown condition within 24 hours.

b. The CCSW Vault Floor

drain shall be checked during each operating cycle by assuring that water can be run through the drain line and actuating the air operated valves by operation of the following sensor:

i. loss of air

ii. high level in the condensate pump room (5'0")

c. The condenser pit 5 foot trip circuits for each channel shall be checked once a month. A logic system functional test shall be performed during each refueling outage.

in axial gaps between core bottom and top, and assures with a 95% confidence, that no more than one fuel rod exceeds the design linear heat generation rate due to power spiking. An irradiated growth factor of 0.25% was used as the basis for determining $\Delta P/P$ in accordance with General Electric Development and Planning Memorandum #45, "Length Growth of BWR Fuel Elements," R. A. Proebsthe, October 1, 1973 and U.S. Atomic Energy Commission report, "Supplement 1 to the Technical Report on Densification of General Electric Reactor Fuels," December 14, 1973.

3.5.K Flood Protection

Condensate pump room flood protection will assure the availability of the containment cooling service water system CCSW during a postulated incident of flooding in the turbine building. The redundant level switches in the condenser pit will preclude an postulated flooding of the turbine building to an elevation above river water level. The level switches provide alarm and circulating water pump trip in the event a water level is detected in the condenser pit.

Bases:

4.5 The testing interval for the core and containment cooling systems is based on a quantitative reliability analysis, judgment and practicality. The core cooling systems have not been designed to be fully testable during operation. For example the core spray final admission valves do not open until reactor pressure has fallen to 350 psig thus during operation even if high drywell pressure were simulated the final valves would not open. In the case of the HPCI, automatic initiation during power operation would result in pumping cold water into the reactor vessel which is not desirable.

The systems can be automatically actuated during a refueling outage and this will be done. To increase the availability of the individual components of the core and containment cooling systems the components which make up the system; i.e., instrumentation, pumps, valve operators, etc., are tested more frequently. The instrumentation is functionally tested each month. Likewise the pumps and motor-operated valves are also tested each month to assure their operability. The combination of a yearly simulated automatic actuation test and monthly tests of the pumps and valve operators is deemed to be adequate testing of these systems.

With components or subsystems out-of-service overall core and containment cooling reliability is maintained by demonstrating the operability of the remaining cooling equipment. The degree of operability to be demonstrated depends on the nature of the reason for the out-of-service equipment. For routine out-of-service periods caused by preventative maintenance, etc., the pump and valve operability checks will be performed to demonstrate operability of the remaining components. However, if a failure, design deficiency, etc., caused the out-of-service period, then the demonstration of operability should be thorough enough to assure that a similar problem does not exist on the remaining components. For example, if an out-of-service period were caused by failure of a pump to deliver rated capacity due to a design deficiency, the other pumps of this type might be subjected to a flow rate test in addition to the operability checks.

The surveillance requirements to assure that the discharge piping of the core spray, LPCI, and HPCI systems are filled provides for a visual observation that water flows from a high point vent. This ensures that the line is in a full condition. Between the monthly intervals at which the lines are vented, instrumentation has been provided to monitor the presence of water in the discharge piping. This instrumentation will be calibrated on the same frequency as the safety system instrumentation. This period of periodic testing ensures that during the interval between the monthly checks the status of the discharge piping is monitored on a continuous basis.

The requirement of 180 psig at 3500 gpm at the containment cooling service water (CCSW) pump discharge provides adequate margin to ensure that the LPCI/CCSW system provides the design bases cooling water flow and maintains 20 psig differential pressure at the containment cooling heat exchanger. This differential pressure preclude reactor coolant from entering the river water side of the containment cooling heat exchangers.

(Cont'd)

4.5 Surveillance Requirement Bases:

4.5.K Flood Protection

The watertight bulkhead door and the penetration seals for pipes and cables penetrating the vault walls have been designed to withstand the maximum flood conditions. To assure that their installation is adequate for maximum flood conditions, a method of testing each seal has been devised.

To test a pipe seal, another test seal is installed in the opposite side of the penetration creating a space between the two seals that can be pressurized. Compressed air is then supplied to a fitting on the test seal and the space inside the sleeve is pressurized to approximately 15 psi. The outer face of the permanent seal is then tested for leaks using a soap bubble solution.

On completion of the test, the test seal is removed for use on other pipes and penetrations of the same size.

In order to test the watertight bulkhead doors, a test frame must be installed around each door. At the time of the test, a reinforced steel box with rubber gasketing is clamped to the wall around the door. The fixture is then pressurized to approximately 15 psig to test for leaktightness.

Floor drainage of each vault is accomplished through a carbon steel pipe which penetrates the vault. When open, this pipe will drain the vault floor to a floor drain sump in the condensate pump room.

Equipment drainage from the vault coolers and the CCSW pump bedplates will also be routed to the vault floor drains. The old equipment drain pipes will be permanently capped preclude the possibility of back-flooding the vault.

As a means of preventing backflow from outside the vaults in the event of a flood, a check valve and an air operated valve are installed in the 2" vault floor drain line 6'0" above the floor of the condensate pump room.

The check valve is a 2" swing check designed for 125 psig service. The air operated valve is a control valve designed for a 50 psi differential pressure. The control valve will be in the normally open position in the energized condition and will close upon any one of the following:

Loss of air or power

High level (5'0") in the condensate pump room

Closure of the air operated valve on high water level in the condensate pump room is effected by use of a level switch set at a water level of 5'0". Upon actuation, the switch will close the control valve and alarm in the control room.

The operator will also be aware of problems in the vaults/condensate pump room if the high level alarm on the equipment drain sump is not terminated in a reasonable amount of time. If must be pointed out that these alarms provide information to the operator but that operator action upon the above alarms is not a necessity for reactor safety since the other provisions provide adequate protection.

A system of level switches has been installed in the condenser pit to indicate and control flooding of the condenser area. The following switches are installed:

	Level	Function
a.	1'0" (1 switch)	Alarm, Panel Hi-Water Condenser Pit
b.	3'0" (1 switch)	Alarm, Panel High-Circ. Water Condenser Pit
c.	5'0" (2 redundant switch pairs)	Alarm and Circ. Water Pump Trip

Level (a) indicates water in the condenser pit from either the hotwell or the circulating water system. Level (b) is above the hotwell capacity and indicates a probable circulating water failure.

Should the switches at level (a) and (b) fail or the operator fail to trip the circulating water pumps on alarm at level (b), the actuation of either level switch pair at level (c) shall trip the circulating water pumps automatically and alarm in the control room. These redundant level switch pairs at level (c) are designed and installed to IEEE-279, "Criteria for Nuclear Power Plant Protection Systems." As the circulating water pumps are tripped, either manually or automatically, at level (c) of 5'0", the maximum water level reached in the condenser pit due to pumping will be at the 491'0" elevation (10' above condenser pit floor elevation 481'0"; 5' plus an additional 5' attributed to pump coastdown).

In order to prevent overheating of the CCSW pump motors, a vault cooler is supplied for each pump. Each vault cooler is designed to maintain the vault at a maximum 105°F temperature during operation of its respective pump. For example, if CCSW pump 2B-1501 starts, its cooler will also start and compensate for the heat supplied to the vault by the 28 pump motor keeping the vault at less than 105°F.

Each of the coolers is supplied with cooling water from its respective pump's discharge line. After the water has been passed through the cooler, it returns to its respective pump's suction line. In this way, the vault coolers are supplied with cooling water totally inside the vault. The cooling water quantity needed for each cooler is approximately 1% to 5% of the design flow of the pumps so that the recirculation of this small amount of heated water will not affect pump or cooler operation.

Operation of the fans and coolers is required during pump operability testing and thus additional surveillance is not required.

Verification that access doors to each vault are closed, following entrance by personnel, is covered by station operating procedures.