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January 29, 1980

1-010-26
2-010-22

Director of Nuclear Reactor Regulation
ATTN: Mr. Darrell G. Eisenhut, Acting Director
Operating Reactors
U.S. Nuclear Regulatory Commission
Washington, D. C. 20555

Subject: Arkansas Nuclear One - Units 1 and 2
Docket Nos. 50-313 and 50-368
License Nos. DPR-51 and NPF-6
Lessons Learned Implementation
(File: 1510.3, 2-1510.3)

Gentlemen:

Our letter of January 18, 1980, documented Arkansas Power and Light Company's methods of compliance with the Category A Lessons Learned requirements of NUREG-0578. On January 21-23, 1980, an implementation team visited the Arkansas Nuclear One site to survey our compliance methods. During that site visit, several verbal requests for additional information were received. This letter provides a restatement of your request, as we understand it, and our response for those items for which information is readily available. The remaining information will be provided by January 31, 1980.

Very truly yours,

David C. Trimble

David C. Trimble
Manager, Licensing

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Attachments

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Item 2.1.1 - Emergency Power Supply

ANO-1

Question - What is the basis for pressurizer heater size and time to initiate? Is this based on actual heat loss conditions? Is it conservative? Why do B&W and CE positions differ?

Response

B&W has recommended at least 126 KW of pressurizer heaters be available from an assured power source within two (2) hours after loss of off-site power to establish and maintain natural circulation at hot standby conditions. The number of pressurizer heaters was determined by taking into account the following:

1. The loss through the pressurizer insulations. The surface areas of the insulation was calculated and an average heat flux of 80 BTU/hr $ft^2$ was assumed on the outside surface area. This resulted in an approximate heat loss of 96,000 BTU/hr.

2. The loss through the uninsulated pressurizer areas around the horizontal heater bundles was calculated and resulted in an approximate heat loss of 50,000 BTU/hr.

3. B&W's experience has shown that the insulation heat losses account for only 20 to 40% of the total losses. Therefore, it was recommended that a minimum factor of 2.5 be applied to the sum of the accounted losses. This results in an additional heat loss of 219,000 BTU/hr.

Thus the total calculated heat loss from the system is 365,000 BTU/hr or 107 KW. Due to the grouping of the heaters, the value of 126 KW was selected.

The time for establishing the heaters was determined by the amount of heat losses from the pressurizer and the initial water level in the pressurizer.

Actual measured heat losses with the RCS maintained at an average temperature of 535°F and pressure of 2155 psig have been measured. In July 1974, 169.9 KW was the measured value for heat loss. Following pressurizer insulation modification, heat losses were again measured under the same conditions in November 1975, and determined to be 82.75 KW. Therefore, 126 KW is shown to be a conservative value.

Also, as can be seen from the above discussion, pressurizer insulation design plays a significant role in the amount of pressurizer heaters needed to maintain natural circulation. Therefore, one would reasonably expect calculated values to be different between the C.E. and B&W units.

ANO-2

Question - Provide justification for the capability of the diesel generator to accept 150 KW of pressurizer heaters.

Response

We have assumed worse case (i.e., main steam line rupture and maximum diesel generator loadings) to determine the diesel generator loads of 2856 KW (i.e., 2706 KW plus 150 KW of pressurizer heaters). The 2856 KW loading represents 6 KW more than the 2850 KW continuous rating but does not exceed the 2000 hour rating of 3100 KW (See Section 8.3.1.19 of the ANO-2 FSAR). Table 8.3-1 of the ANO-2 FSAR shows many loads required only for a short time (such as 8 hours, 12 hours, and 1 day) which will reduce the actual continuous loading further. Also, the total loading of the diesel generator assumed a motor efficiency of only 90%. Actual test efficiencies have been found to be above this value. For example, the service water pump efficiencies are 91.5%, 92.5%, and 93% at 2/4, 3/4 and 4/4 loads. This one instance will allow a reduction in actual loads of more than 6 KW.

Item 2.1.3.b - Instrumentation for Detection of Inadequate Core Cooling

ANO-1 & 2

Question - What is the alarm setpoint for the saturation meters?

Response

When 30°F margin to saturation is reached, based on saturation meter calculations, an alarm will annunciate in the control room.

Item 2.1.4 - Diverse Containment Isolation

ANO-1

Question - Provide justification for not using a diverse containment isolation system for systems 3-8.

Response

All of the systems listed as items 3 through 8 are closed loop cooling systems for essential equipment (i.e., control rod drives, reactor building coolers, reactor coolant pumps, letdown heat exchangers and seal water heat exchangers). All of the items are needed for a "normal" orderly cooldown following receipt of an ES signal. Since the introduction of an ES signal does not necessarily follow a LOCA situation, the equipment needed for "normal" orderly shutdown should be left in service. Only when a LOCA condition is verified by a high building pressure should the equipment operation be degraded to isolate the containment. Also, none of the above items have direct contact with the reactor coolant such that non-isolation would allow contaminated fluid to escape unless the integrity of the closed loop system was also violated. For the above reasons, Items 3 through 8 do not require modification to the Reactor Building Isolation System.

Item 2.5.a - Dedicated $H_2$ Control Penetrations

ANO-1

Question - Describe changes to be made on the $H_2$ purge service water system. When will these be completed?

Response

Solenoid valves will be added to the seal water supply lines to the hydrogen purge inlet and outlet fans so that manual valve alignment will no longer be necessary. The valves will be operable from the control room in the same panel as other hydrogen purge controls. Installation will be completed at the first available outage of sufficient duration.

ANO-2

Question - Correct the error in January 18, 1980 letter which states the ANO-2 Operating License is based of hydrogen recombiners and a hydrogen purge system.

Response

Only the redundant, safety-grade, in-containment hydrogen recombiners are listed in the ANO-2 Technical Specifications as being required to be operable for post-LOCA hydrogen control. While a hydrogen purge system is installed, no credit for its operation is assumed.