

Docket Files

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Docket No. 50-315

Arkansas Power & Light Company
ATTN: Mr. William Cavanaugh, III
Executive Director, Generation
and Construction
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Little Rock, Arkansas 72203

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Gentlemen:

The HRC staff has completed a preliminary review of the overpressure protection system for Arkansas Nuclear One, Unit 1 (ANO-1). We have found that the system currently installed, in combination with the proposed changes, does not meet all the criteria established by the HRC.

Your proposed system maintains a gas blanket or bubble in the pressurizer at all times, in conjunction with a single low pressure setpoint power-operated relief valve (PORV). This design has certain advantages over other concepts because failure of an operator to manually enable the low pressure setpoint of the relief valve does not totally defeat protection against a pressure transient. The staff has concluded that your proposed system adequately accommodates all postulated overpressure transients with the exception of an inadvertent initiation of safety injection by the high pressure injection (HPI) pump.

Based on your analyses we have identified HPI as the limiting mass addition overpressure transient. Operation of the HPI pump, which is capable of delivering flow against full system operating pressure, is required whenever a reactor coolant pump is in operation. Since the discharge of the HPI pump is isolated from the reactor coolant system by a single injection valve, a single error or equipment failure could open the injection valve and initiate a pressure increase in the primary system. If failure of the single low setpoint power operated relief valve is then assumed as the single failure following initiation of the event, your analysis shows that operator action is required within five minutes to maintain primary system pressure below Appendix G limits. This is not in accordance with HRC criteria for operator action which prohibits operator intervention for ten minutes.

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Since your proposed system does not fully satisfy our established criteria, we require that you propose system modifications that will provide overpressure protection in full conformance with NRC criteria, and that you provide a schedule and a value-impact assessment to make all necessary hardware changes.

It is also the NRC position that to assure proper alignment of the overpressure protection system during plant cooldown, an enabling alarm must be provided which monitors the system enabling switch and the position of the isolation valve upstream of the PORV.

In addition to the items discussed above, the staff has identified several concerns related to maintenance and HPI testing for the currently proposed system. If the relief valve requires maintenance, the upstream isolation valve would need to be closed, thereby removing the single relief valve from service. Therefore the staff will require technical specifications which stipulate that when the reactor vessel temperature is below the minimum value for which the vessel can be fully pressurized the PORV may be removed from service for a short period of time only if: (1) charging pumps are out of service and all HPI injection valves are closed and power removed, or (2) the vessel head is removed. Regarding HPI testing, the staff will require that your procedures state that the HPI valve be allowed to be cycled only if all HPI pumps are out of service, or vessel temperature is above the minimum value for which the vessel can be fully pressurized, or the reactor vessel head is removed.

We will require that your technical specifications identify the system enabling temperature and the PORV setpoint. In addition, you should propose specifications related to system testing.

These maintenance and testing restrictions should be examined to assure compatibility with present technical specification requirements regarding the operability and periodic testing of ECC and emergency boration systems. Also, since the impact of the proposed technical specifications will be considered by the staff in determining the acceptability of the proposed overpressure mitigating system, you should provide a thorough evaluation of the effect of these maintenance and testing requirements on the susceptibility of the reactor coolant system to a pressure transient.

You should provide the above requested information and the proposed technical specifications within 45 days of receipt of this letter.

The following additional information, which was requested from your staff during a telephone conversation on June 30, 1977, should also be provided within 45 days of receipt of this letter:

- (1) Assumptions made regarding steam bubble collapse.
- (2) Verification of number of HPI pumps assumed in operation on Figure A-1 of AP&L March 24, 1977 letter.
- (3) Result of AP&L investigation into lowering shutdown pressurizer level to less than 180".
- (4) Description of HPI test referred to in response to Question No. 6, AP&L March 24, 1977 Letter.
- (5) Discussion of probability of operator error with regard to HPI test (response to Question No. 6, AP&L March 24, 1977 letter).
- (6) Description of administrative controls to assure HPI trains (pumps and/or valves) are "racked out" when required and are "racked in" only when authorized and then only for specific, controlled purposes, such as start-up or HPI test.

We consider your present overpressure mitigating system to provide adequate protection until all modifications are complete, even though the present system does not meet all of the HRC criteria.

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Sincerely,

Don K. Davis, Acting Chief
 Operating Reactors Branch #2
 Division of Operating Reactors

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