

SAFETY EVALUATION FOR ESW MODIFICATION

By letter dated November 8, 1982, Pennsylvania Power and Light (PP&L) Company described a single failure in the emergency service water (ESW) system that resulted in having less than 100 percent heat removal capability from one ESW loop for a specific large break LOCA. The scenario, described in detail below, results in two low pressure core spray (LPCS) pumps being cooled by the operable ESW loop plus one LPCI pump (without cooling to the room, oil coolers or seal cooler) to cool the core following the postulated LOCA. As reviewed and evaluated in our November, 1982 SSER, General Electric performed analyses to show that acceptable core cooling is maintained under these conditions if the single LPCI pump is operated for at least 10 minutes. In that same supplement we also evaluated manufacturer's data for the LPCI pumps, backed up by test data that showed the LPCI pumps could operate for 10 minutes following loss of ESW. As reported in our November, 1982 SSER, we concluded that the analyses and pump tests were acceptable, and therefore, that the design was acceptable.

In the November 8, 1982 Letter, PP&L also identified several modifications that would eliminate a single active failure in the



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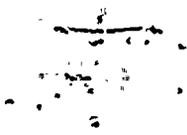
ESW system from resulting in the above concern. PP&L indicated that modifications would be made in the long term such that ESW cooling water would be available to the necessary emergency core cooling systems (ECCS) for all postulated single failures in the ESW system.

By letter dated May 16, 1983, PP&L proposed a modification to the ESW system piping as a long term resolution to the single failure concern. In the existing design the Division 1 ESW loop (ESW pumps powered by diesel generators A&C) supplies water to LPCI pumps A&C, while the Division 2 ESW loop (powered by diesel generators B&D) supplies cooling water to LPCI pumps B&D. A loss of flow in the Division 1 loop (same basic failure mode for Division 2), causes loss of cooling to LPCI pumps A&C and the postulated LOCA can cause LPCI pumps B&D to be ineffective. The most limiting single failure for the Division 1 loop is the loss of the A diesel generator which causes loss of Division 1 ESW loop flow (due to failure to open of the bypass valve to the spray pond) and loss of LPCI pump A. LPCI pump C would be available without cooling water. The proposed modification is to repipe cooling water to LPCI pumps C&D such that cooling water is provided by the opposite ESW loop. Hence, the Division 1 ESW loop would provide cooling water to LPCI pumps A&D and the Division 2 ESW

loop would supply cooling water to LPCI pumps B&C. With the proposed modifications at least one LPCI pump with cooling water, would be available for any postulated LOCA plus single active failure, including failure of a diesel to start. It should be noted that the failure of either diesel generator C or D does not result in complete loss of flow in either ESW loop, therefore, only the LPCI pump powered by diesel generator C or D would be lost and cooling water would continue to be supplied to the remaining LPCI pumps (A, B and C or D).

The proposed modifications enable the ESW system to transfer heat from the equipment important to safety under normal operating and accident conditions assuming loss of offsite power and any single active failure in accordance with General Design Criterion 44, "Cooling Water."

Based on our review of the proposed modifications we conclude that the ESW system meets the requirements of General Design Criterion 44 and that the proposed modifications resolve the concerns associated with a single failure in the ESW system resulting in less than 100 percent heat removal capability. We, therefore, conclude the proposed modifications are acceptable.



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