



UNITED STATES
NUCLEAR REGULATORY COMMISSION
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MEMORANDUM TO: William H. Bateman, Project Director
Project Directorate II-1
Division of Reactor Projects I/II, NRR

FROM: Carl H. Berlinger, Chief
Electrical Engineering Branch
Division of Engineering, NRR *Carl H. Berlinger*

SUBJECT: REQUEST FOR TECHNICAL ASSISTANCE (TASK INTERFACE AGREEMENT)
REGARDING POWER LOCKOUT ON HIGH-HEAD SAFETY INJECTION
CROSS-CONNECT VALVES AT VIRGIL C. SUMMER NUCLEAR STATION
(TIA 94-018) (TAC NO. M89539)

During the inspection of April 1 to 30, 1994, at V. C. Summer Nuclear Station, Region II staff identified two charging/high-head safety injection (HHSI) pump cross-connect motor-operated valves, XVG-8133A and XVG-8133B, that are not included in the list of valves that require power lockout in order to meet the single-failure criterion in the fluid system as recommended by Branch Technical Position (BTP) EICSB 18, "Application of the Single-Failure Criterion to Manually Controlled Electrically Operated Valves." The concern is that when pump "C" is aligned to train "B," a "hot short" in the control circuitry (a single failure) of either the XVG-8133A or the XVG-8133B valve could cause a valve to mechanically change position while all HHSI flow is being delivered via the train "B" flow path, thus defeating the automatic function for both trains of HHSI. Both of these valves must be open during normal operations. A "power lockout" feature, if implemented, would prevent the valve from changing position in response to a hot short or inadvertent operator action.

The task interface agreement (TIA) memorandum from Jon R. Johnson, Region II, to Gus C. Lainas, DE/NRR, dated May 20, 1994, asked NRR to determine whether a "power lockout" feature is needed on these HHSI pump cross-connect valves at Summer or whether administrative controls implemented by the license for these valves provide adequate safety for the life of the plant.

BTP EICSB 18 establishes the acceptability of disconnecting power to electrical components of a fluid system as one means of designing against a single failure that might cause an undesirable component action. In the course of its review, the staff has always required a list in the Technical Specifications (TS) of all valves that require power lockout in order to meet the single-failure criterion in the fluid system. During licensing of the Summer plant, the licensee included in the Summer TS a list of valves that require power lockout. However, these two valves were not included in this

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list. The licensee's view is that Section 6.3.2.20 of the FSAR (involving valves that require power lockout) is a "licensing basis" issue rather than part of the plant's "design basis." The licensee contends that the spurious closure of these valves under a specific charging/safety injection pump alignment and during a specific time interval of a postulated accident is an event of such low probability as to require no corrective action in design or operation. The licensee has currently established administrative controls such that if plant conditions require the operation of HHSI pump "C" on train "B," then the supply breakers for both XVG-8133A and XVG-8133B would be locked open with the valves in the open position.

The Electrical Engineering Branch has reviewed the information in the TIA and concludes that the scenario as postulated could disable the HHSI, thereby compromising plant emergency response to small break (SB) loss-of-coolant accident (LOCA) and cooldown transient events. We have also reviewed the licensee's clarification/justification of its position as submitted on May 19, 1994. For purposes of evaluating the contribution to the risk of single-failure, we agree that the postulated single-failure represents a small risk. However, we do not agree that the risk probability justification proposed by the licensee applies to this issue because the design-basis/licensing-basis accident is postulated regardless of probability. Therefore, we conclude that these valves should have their power locked out in order to meet the single-failure criterion as required by BTP EICSB 18. Further, the administrative controls implemented by the licensee to ensure that the supply breakers for both valves are locked open with valves in the open position if the HHSI pump "C" is aligned to the train "B" HHSI is also acceptable, provided a redundant valve position indication for these valves is provided in the control room in order to fully satisfy the requirements of BTP EICSB 18. This memorandum completes our report on TAC No. MB9539.