ENCLOSURE

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
ADDRESSING THE APPROPRIATENESS OF REACTOR PROTECTION
SYSTEM PROTECTIVE CIRCUITRY TECHNICAL SPECIFICATION
BOSTON EDISON COMPANY
PILGRIM NUCLEAR POWER STATION, UNIT 1
DOCKET NO. 50-293

1.0 INTRODUCTION

By letter dated September 24, 1980, the NRC requested the Boston Edison Company (the licensee) to modify the power supplies for the Reactor Protection System (RPS) at the Pilgrim Nuclear Power Station. The modifications consisted of the installation of GE designed undervoltage, overvoltage, and under-frequency protective circuitry, two in each of three sources of power to the RPS (two M-G sets and one alternate source). The staff approved the modifications subject to the requirement that appropriate surveillance of the RPS protective circuitry be implemented as part of the technical specifications. Subsequently, by letter dated February 17, 1987, the licensee proposed that the surveillance be implemented by procedure and be limited to calibration on a once per operating cycle frequency.

2.0 EVALUATION

To justify the use of procedure versus technical specification, the licensee used criteria developed by the NRC for the purpose of defining surveillance requirements that belong in technical specifications in accordance with the requirements of 10 CFR 50.36. These criteria are contained in NRC's Interim Policy Statement on Technical Specification Improvements for Nuclear Power Reactors, published in the Federal Register on February 6, 1987 (52FR3788). The licensee applied these criteria to surveillance of RPS protective circuitry as follows:

1. The RPS protective circuitry is not instrumentation that is used to detect, by indicators in the control room, a significant abnormal degradation of the reactor coolant pressure boundary;

2. The RPS protective circuitry does not monitor a process variable that is an initial condition of the Design Basis Accident (DBA) and transient analysis; and

3. The RPS protective circuitry is only peripherally part of a primary success path designed to function so as to mitigate a DBA or transient.

Because RPS protective circuitry is not directly needed for the prevention or mitigation of design basis events or transients, the licensee concluded that it is not appropriate to incorporate the RPS protective circuitry into the technical specifications.

Supporting discussion, contained in the interim policy for criterion 3, requires that support systems (i.e., systems that are necessary for items in the primary success path to successfully function) must be included in the technical specifications. RPS protective circuitry is provided to remove power from the RPS bus in the event of overvoltage, undervoltage, or underfrequency conditions in their non-safety power supplies. During and following a design basis event or transient, the RPS protective circuitry is not needed to assure successful function of items in the primary success path (i.e., the reactor protection system). The staff thus agrees with the licensee that RPS protective circuitry is only peripherally part of a primary success path and would not be required, by our interim policy, to be included in the plant's technical specifications. However, the staff considers the RPS protective circuitry an important part of the primary success path of an essential safety system. The circuitry provides assurance that safety loads connected to the RPS bus will not be adversely affected by unacceptable voltage and frequency conditions that may have existed prior to a design basis event or transient. On this basis, the staff considers it appropriate to incorporate the RPS protective circuitry into the technical specifications.

In addition, the licensee proposed that surveillance of the RPS protective circuitry be limited to calibration on a once per operating cycle frequency. Because surveillance recommended for inclusion in the Standard Technical Specifications and approved on other recently licensed plants include a six month channel functional test as well as calibration on a once per operating cycle frequency, it is the staff's understanding that the licensee's proposal is for the deletion of the six month channel functional test from the surveillance requirement. In justification, the licensee indicated that failure of RPS protective circuitry is in the "safe" direction (i.e., failure ultimately results in cold shutdown). The staff disagrees. In the event of failure of the RPS protective circuitry to function as designed, the RPS loads may experience a degraded power condition. This condition could potentially cause equipment degradation and the plant safety function (reactor scram) may be jeopardized. Therefore, based on the justification, the staff is unable to reach a conclusion as to the acceptability of the licensee's proposal for the deletion of the six month channel function test.

3.0 CONCLUSION

The staff has concluded, based on the consideration discussed above, that: (1) it is appropriate to incorporate the RPS circuitry into the technical specifications, and (2) sufficient justification has not been provided to support a conclusion of acceptability of the proposal for deletion of the six month channel functional test such that surveillance of the RPS protective circuitry would be limited to calibration on a once per operating cycle frequency. On this basis the staff finds the proposal unacceptable. The staff position remains that the licensee should, prior to restart, submit for NRC review and approval Technical Specifications for the RPS protective circuitry including a six month functional test and calibration on a once per operating cycle frequency. On this basis the staff finds the proposal unacceptable. The staff position remains that the licensee should, prior to restart, submit for NRC review and approval Technical Specifications for the RPS protective circuitry including a six month functional test and calibration on a once per operating cycle frequency.

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