



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 120
TO FACILITY OPERATING LICENSE NO. DPR-35
BOSTON EDISON COMPANY
PILGRIM NUCLEAR POWER STATION
DOCKET NO. 50-293

1.0 INTRODUCTION

To improve their electrical power distribution system design and control, Boston Edison Company performed an analysis and identified the need to change the trip and alarm setpoints for the Pilgrim Nuclear Power Station (PNPS) degraded voltage relays. By letter dated June 30, 1988, the licensee requested a revision to Technical Specification trip and alarm setpoints for degraded voltage protection.

2.0 EVALUATION

Boston Edison Company has proposed changes to the degraded voltage trip and alarm setpoints. The new setpoints have been determined as a result of additional analysis of the electrical power distribution system for Pilgrim Station. The analysis indicated that when the plant is being supplied from the startup transformer and supply voltage does not remain below the degraded voltage setpoint for longer than 9.2 seconds, the 4kV safety-related buses remain energized from the startup transformer. While degraded voltage trip conditions have not been met, this voltage may be only slightly above the degraded voltage setpoint. With the existing 3745V +2% setpoint, safety-related ECCS equipment may not have adequate voltage to operate properly. The degraded voltage setpoints are, therefore, being raised to assure the supply voltage to safety-related equipment remains adequate under this operating condition. When the plant is being supplied from the startup transformer and supply voltage remains below the degraded voltage trip setpoint for longer than 9.2 seconds, the startup transformer supply breakers for both safety-related 4kV buses will open, the diesel generators will start and the diesel supply breakers will close to each 4kV bus.

The licensee will install new degraded voltage relays with improved sensitivity to accommodate higher trip alarm setpoints. The proposed degraded voltage trip setpoint of $3868V \pm 0.5\%$, yields 3849V as the lowest allowed trip setpoint. This setpoint provides adequate margin over the minimum bus voltage and thus assures the adequacy of the 480V power supplies that come from the 4kV buses. The corrected degraded voltage trip setpoint calculations indicate a 480V motor control center voltage of 434V will occur when a 4kV bus reaches 3849V (assuming worst case LOCA loading conditions with load shedding initiated). This provides a 4V margin over the corrected minimum acceptable voltage of 430V and is, therefore, acceptable.

The degraded voltage alarm relay is also being used to enable load shedding on the safety related buses. The proposed degraded voltage alarm setpoint of $3959V \pm .5\%$, yields 3939V as the lowest allowed alarm setpoint. This setpoint provides an adequate margin over the minimum bus voltage that will

assure the adequacy of the associated 480V power supplies. The corrected degraded voltage alarm setpoint calculation indicates that with the worse case LOCA loading conditions, but without load shedding initiated, a 480V supply voltage of 434V will result when there is 3939V on the 4kV bus. Therefore, if the 4kV bus voltage drops below the lowest allowed alarm setpoint, load shedding must be initiated to assure the adequacy of the 480V power supplies when a signal indicating a LOCA is received. We find this to be acceptable.

The licensee has proposed to change the Remarks column of Table 3.2.B for the core spray and LPCI pump start timers from: "In conjunction with loss of power initiates sequential starting of CSCS pumps." to: "Initiates sequential startup of CSCS pumps on any auto start." We find this to be acceptable.

3.0 ENVIRONMENTAL CONSIDERATION

This amendment involves a change in the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that this amendment involves no significant hazards consideration and there has been no public comment on such finding. Accordingly, this amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b) no environmental impact statement or environmental assessment need be prepared in connection with the issuance of this amendment.

4.0 CONCLUSION

We have reviewed the licensee's submittal and have concluded that raising the degraded voltage setpoints and using tighter, more conservative setpoint tolerances does not affect the operation of safety related equipment, other than its initiation at a higher voltage. This will ensure the voltage at the safety related devices continues to be maintained above the voltage where proper operation can be assured and, therefore, the change is acceptable. The staff has concluded, based on the considerations discussed above, that (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (2) such activities will be conducted in compliance with the Commission's regulations, and the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public. Accordingly, we conclude that the proposed changes are acceptable.

Acknowledgement: N. Trehan, SELB/DEST

Date Issued: September 8, 1988