



UNITED STATES  
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D. C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
RELATED TO AMENDMENT NO. 152 TO FACILITY OPERATING LICENSE NO. DPR-35  
BOSTON EDISON COMPANY  
PILGRIM NUCLEAR POWER STATION  
DOCKET NO. 50-293

1.0 INTRODUCTION

By letter dated October 19, 1993, the Boston Edison Company (BECO) proposes to change Pilgrim Nuclear Power Station (PNPS) Appendix A of Operating License No. DRP-35 in accordance with 10 CFR 50.90. The proposed change is to physically remove the low condenser vacuum scram (LCVS) and remove reference of LCVS from the Technical Specifications (TSs).

The second change reduces the turbine first-stage pressure (TFSP) setpoint at which it is permissible to bypass the turbine control valve (TCV) fast closure and the turbine stop valve (TSV) closure trip (scram) signals. This change is made in response to information provided by the General Electric Company (GE) and using methodology consistent with Regulatory Guide (RG) 1.105 "Instrument Spans and Setpoints." (Ref. 1)

2.0 BACKGROUND

The purpose of the LCVS is to protect the main condenser from overpressure. A loss of condenser vacuum initiates a reactor scram, automatic closure of the TSV and turbine bypass valves. The trip setpoint, which is less than or equal to 23 inches Hg vacuum, is selected to initiate a scram before the closure of the TSV is initiated. The LCVS is only required during power operations and must be bypassed to start up the unit.

Both the TSV closure and the TCV fast closure reactor scram occur above 45% reactor thermal power. The TSV closure and TCV rapid closure at power results in a nuclear steam pressure increase that collapses steam voids which results in positive reactivity to the core. The TSV closure scram is initiated earlier than either the neutron monitoring system or nuclear system high-pressure scrams to provide a margin below thermal hydraulic limits for abnormal operational transients. The TCV fast closure at power also protects the fuel from damage.

### 3.0 EVALUATION

BECO has determined that the LCVS is an anticipatory scram and is not part of the PNPS design basis. It is not required to ensure the safe operation of PNPS and its removal will reduce the potential for spurious scrams. Therefore, this scram can be removed from PNPS and from reference to the TS. The TSV closure and TCV fast closure scrams will remain functional.

Either generator load rejection or turbine trip initiates closure of the TSV and fast closure of the TCV to protect the turbine. To protect the reactor from overpressure due to positive reactivity, a reactor scram is provided from either closure of the TSV or the rapid closure of the TCV. The bypass signal for the TSV closure scram and the TCV fast closure scram is generated from the TFSP. The pressure setpoint for the TFSP scram is currently 305 psig which corresponds to 45% of reactor rated thermal power. The scrams are bypassed when core power is less than 45% because the severity of pressurization transients is reduced; therefore, these scrams are not needed.

GE previously issued a Nuclear Service Information Letter (SIL) regarding the bypass setpoint for TSV closure and TCV rapid closure scrams (Ref. 2). The SIL recommended that two plant operating conditions needed to be considered when selecting the bypass setpoint for the TFSP scram:

1. During startup, when the feedwater heaters are out of service, the higher inlet sub-cooling results in lower steam flows and thus lower TFSP at a given reactor thermal power; and
2. During startup, when one or more turbine bypass valves are open, the TFSP will result in lower values at a given reactor thermal power.

The SIL recommended that setpoint drift and uncertainties be considered in developing calibration procedures and TS changes.

BECO has considered the above GE recommendations in selecting a new setpoint for the TFSP using methodology consistent with RG 1.105. This setpoint selection also considered the desirability of prevention of reactor safety relief valves from opening after a turbine trip at low power. The BECO analysis resulted in a maximum TFSP permitting scram signal bypass setting of 112 psig. This reduction of the TFSP from 305 psig to 112 psig provides a more conservative setting for the TSV closure and TCV rapid closure scram bypass setpoints, and will reduce the overpressure effects on scram actuation.

### 4.0 CONCLUSION

Based on the above, the NRC staff concludes that the licensee's analysis supporting TS changes for removal of the LCVs scram and reduction in setpoint for bypass of TCV fast closure and TSV closure scrams is consistent with the guidelines of RG 1.105 and the PNPS licensing basis and is, therefore, acceptable.

## 5.0 REFERENCES

1. Letter from E. T. Boulette, Senior Vice President BECo, to NRC "Proposed Change to Technical Specifications to Remove the Low Condenser Vacuum Scram and Change the Turbine First-Stage Pressure Bypass Parameter" dated October 19, 1993.
2. General Electric Nuclear SIL No. 423 "Erroneous Scram Bypass Setpoint" dated May 31, 1985.

## 6.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Massachusetts State Official was notified of the proposed issuance of the amendment. The State official had no comments.

## 7.0 ENVIRONMENTAL CONSIDERATION

The amendment changes a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The NRC 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 the amendment involves no significant hazards consideration, and there has been no public comment on such finding (58 FR 64603). Accordingly, the 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 the amendment.

## 8.0 CONCLUSION

The Commission 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, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: F. Paulitz

Date: May 5, 1994