



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATING TO THE SAFETY PARAMETER DISPLAY SYSTEM

BOSTON EDISON COMPANY

PILGRIM NUCLEAR POWER STATION

DOCKET NO. 50-293

1.0 INTRODUCTION

This Safety Evaluation (SE) supplements the SE dated March 21, 1985, in which the staff identified three items of concern remaining to be resolved relative to the conceptual design description of the Safety Parameter Display System (SPDS) that is to be installed at the Pilgrim Station. These concerns pertain to the adequacy of radiation data, display format clutter, and electrical isolation between the SPDS and the station's safety systems.

By letters dated June 13, 1985 and October 7, 1985, Boston Edison Company (BECO/licensee) provided additional information relative to the above concerns. A telephone conference with BECO representatives was conducted on December 17, 1985 to discuss its submittals.

2.0 EVALUATION

Radiation Data - As indicated in our SE dated March 21, 1985, we concluded that the licensee's process variables selected for display in the SPDS would be acceptable with the addition of a containment radiation variable. The licensee's response identified a list of radiation monitors, including drywell and torus monitors, that will provide signals to the SPDS as input data for use in evaluating the Radioactivity Control Critical Safety Function (CSF). Because these signals from the drywell and torus monitors will continue to be available to the SPDS during containment isolation, the user of the SPDS will be able to evaluate the Radioactivity Control CSF for this condition of plant operation. The staff's concern relative to adequacy of radiation data is, therefore, satisfied.

Display Format Clutter on the Reactor Pressure Vessel (RPV) Control within the SPDS was identified as a concern because the clutter would increase a user's search time for data, which would increase the potential of operator error during times of stress. The same concern was initially identified in the staff's review of the GESSAR II, BWR/6 Nuclear Island Design by the General Electric Company (GE), which also designed the licensee's SPDS. With respect to GESSAR's RPV control, the issue was resolved by a GE

design modification that deleted text characters to reduce the display density. Similarly, BECo has identified text abbreviations that will be used in the Pilgrim RPV control display format. We have reviewed this design modification and conclude that the staff's concern relative to display clutter has been resolved.

Electrical Isolation - BECo's response indicates that fiber-optic cables will be used to serve as the interface between the data multiplexer within the non-Class 1E SPDS and Class 1E safety-related equipment at Pilgrim Station. The fiber-optic cable system will be similar to that approved by the staff in its review of GESSAR II (see NUREG-0979, Supplement No. 4, July 1985). This unique device provides the necessary electrical isolation to meet all requirements for maximum credible faults and electrical interference considerations. Ground loop problems, inherent to copper cables, are also eliminated. In addition, GE has performed environmental (IEEE-323-1974) and seismic (IEEE-384-1985) tests as part of its qualification program for the isolators. Based on our review of this information, the staff finds that the design methodology and the hardware (fiber-optic cables) are acceptable for interfacing the SPDS with safety-related systems at Pilgrim Station.

3.0 CONCLUSION

The staff concludes that its concerns relative to adequacy of radiation data, display format clutter, and electrical isolation have been resolved. The conceptual design of the Pilgrim SPDS is, therefore, acceptable.

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Dated: March 24, 1986