



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

SUPPLEMENTAL SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

STATION BLACKOUT RULE (10 CFR 50.63)

BOSTON EDISON COMPANY

PILGRIM NUCLEAR POWER STATION

DOCKET NO. 50-293

1.0 INTRODUCTION

The NRC staff's Safety Evaluation (SE) pertaining to the licensee's initial responses to the Station Blackout (SBO) Rule, 10 CFR 50.63, was transmitted to the licensee by letter dated February 13, 1991. The staff found the licensee's proposed method of coping with an SBO to be acceptable, subject to the satisfactory resolution of several recommendations which were itemized in the staff's SE. The licensee responded to the staff's SE and, specifically, to the recommendations by letter from G. W. Davis, Boston Edison Company (BECO) to the Document Control Desk, U.S. Nuclear Regulatory Commission, dated June 3, 1991.

2.0 EVALUATION

The licensee's responses to each of the staff's SE recommendations are evaluated below:

2.1 Station Blackout Duration

In the SE, the staff stated that after reviewing the available information in the licensee's submittal, Regulatory Guide (RG) 1.155, NUMARC 87-00, and SAIC's Technical Evaluation Report, the staff finds that the offsite power design characteristic group of the Pilgrim Nuclear Power Station (PNPS) site is P3 with a minimum required duration of eight hours.

Licensee Response

In their June 3, 1991, response, the Boston Edison Company (BECO) stated the 4-hour SBO duration was selected based upon NUMARC 87-00 and RG 1.155 that places Pilgrim in the P2 offsite design characteristic group. One consideration for the P2 group selection for PNPS was based on the results achieved from switchyard improvements implemented to reduce offsite power failures due to salt spray contamination in the PNPS switchyard. The licensee has further evaluated the salt spray-related power failures at PNPS since these improvements were implemented and concluded that PNPS should remain in the P2 offsite design characteristic group with an SBO duration of 4 hours. Enclosure 2 to the June 3, 1991, licensee's response provides information in support of this conclusion.

### Staff Evaluation

The staff has reviewed the licensee's June 3, 1991, response and remains unpersuaded that the PNPS offsite power design characteristic group should be changed to P2 because: (1) the licensee's submittal does not describe the life of the Sylgard bushing coating; (2) the storm of October 30, 1991, raises questions about the Sylgard coating effectiveness under similar conditions; and (3) the Poisson process used to model the bushing failure probability is inappropriate for an increasing failure rate process with cyclic components.

### 2.2 Proposed AAC Power Source

#### Safety Evaluation Recommendation

A test of the operability of the 4 kV and 480 V crosstie circuits under SBO conditions should be performed to ensure that the AAC source meets the guidelines of NUMARC 87-00, Appendix B, Item B.12.

#### Licensee Response

The licensee stated that the AAC system will be demonstrated to energize the shutdown buses within 10 minutes of an SBO and the demonstration would include the testing of 4 kV and 480 V crosstie connections.

#### Staff Evaluation

Based on the above, the staff accepts the licensee's commitment to demonstrate the operability of the crosstie circuits under SBO conditions.

### 2.3 Condensate Inventory for Decay Heat Removal

#### Safety Evaluation Recommendation

The licensee should estimate the condensate requirements for maintaining RCS inventory during depressurization and verify that the site has sufficient condensate inventory for coping with an SBO of 8-hour duration.

#### Licensee Response

The licensee stated that the SE recommendation will be evaluated for the SBO duration within the requirements for the AAC source (10 CFR 50.2).

#### Staff Evaluation

The staff accepts the licensee's commitment to evaluate and to assure that sufficient condensate inventory is available for coping with an 8-hour SBO duration.

## 2.4 Effects of Loss of Ventilation

### Safety Evaluation Recommendation

The licensee should ensure that other areas which have equipment needed for SBO have appropriate cooling or have been analyzed to show that they are not dominant areas of concern.

### Licensee Response

The licensee stated that the SE recommendation will be evaluated for the SBO duration within the requirements for the AAC source (10 CFR 50.2).

### Staff Evaluation

The staff accepts the licensee's commitment to evaluate that all areas which have equipment needed for an SBO have appropriate cooling or have been analyzed to show that they are not dominant areas of concern for an 8-hour SBO duration.

## 2.5 Reactor Coolant Inventory

### Safety Evaluation Recommendation

The licensee should ensure that the torus temperature and the reactor vessel conditions are maintained according to the plant Technical Specifications (TS).

### Licensee Response

The licensee stated that the SE recommendation will be evaluated for the SBO duration within the requirements for the AAC source (10 CFR 50.2).

### Staff Evaluation

The staff accepts that the licensee will evaluate that the torus temperature and the reactor vessel conditions are maintained according to PNPS TS for an 8 hour SBO duration.

## 2.6 Quality Assurance and Technical Specifications

### Safety Evaluation Recommendation

The licensee should verify that the SBO equipment is covered by an appropriate QA program consistent with the guidance of RG 1.155. Further, this evaluation should be documented as part of the package supporting the SBO Rule response.

### Licensee Response

BECO has designated the SBO Diesel Generator (DG) as the SBO equipment. This SBO DG was procured, installed, and tested as non-Class 1E equipment. The QA guidance for RG 1.155 will be evaluated for QA/QC controls to the SBO equipment.

The interface components and modifications to the safety-related system will be accomplished in accordance with the QA program for safety-related systems.

#### Staff Evaluation

The staff's position is that the licensee must commit to implementing a QA program consistent with the guidance of RG 1.155, Appendix A.

#### 2.7 Emergency Diesel Generator Reliability Program

##### Safety Evaluation Recommendation

The licensee should implement an EDG reliability program which meets the guidance of RG 1.155, Section 1.2. Confirmation that such a program is in place or will be implemented should be included in the documentation supporting the SBO submittals that is to be maintained by the licensee.

##### Licensee Response

BECO is formalizing the existing collection and analysis of EDG performance data by utilizing the applicable elements of the reliability program of NUMARC 87-00, Appendix D. Implementation of the EDG reliability program is planned to begin January 1, 1992.

##### Staff Evaluation

The staff accepts the licensee's commitment to implement a reliability program consistent with the November 1987 version of NUMARC 87-00, Appendix D, which is equivalent to RG 1.155, Section 1.2.

#### 3.0 SUMMARY AND CONCLUSION

The staff's SE pertaining to the licensee's initial responses to the SBO Rule, 10 CFR 50.63, was transmitted to the licensee by letter dated February 13, 1991. The staff found the licensee's proposed method of coping with an SBO acceptable contingent on satisfactory implementation of the recommendations. The licensee responded to the staff's SE and specifically to the recommendations by letter dated June 3, 1991. The staff has reviewed the licensee's response and finds it acceptable provided that PNPS is analyzed for an 8-hour SBO coping duration. Based on our review of the submittal, we find the licensee's design and proposed method of dealing with an SBO to be in conformance with the SBO Rule, contingent upon receipt of confirmation from the licensee within 30 days that recommendations and evaluations as documented in the staff SE dated February 13, 1991, and this SSE will be implemented, or that the analyses will be made to show coping capability for an 8-hour coping duration. The schedule for the implementation of the above recommendations and evaluations should also be provided in accordance with 10 CFR 50.63(c)(4).

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