



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)
FLORIDA POWER AND LIGHT COMPANY
ST. LUCIE UNITS 1 AND 2
DOCKET NOS. 50-335 AND 50-389

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 September 12, 1991. The staff found the licensee's proposed method of coping with an SBO for St. Lucie, Units 1 and 2 to be acceptable, subject to the satisfactory resolution of several recommendations which were itemized in the staff's SE. The licensee responded to staff's SE, and specifically to the recommendations, by letter from D.A. Sager, Florida Power and Light Company, dated November 26, 1991.

2.0 EVALUATION

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

2.1 Effects of Loss of Ventilation (SE Section 2.3.4)

In the SE, the staff reported that the licensee did not perform any calculations pertaining to loss of ventilation since the alternate AC (AAC) source would be available within approximately 10 minutes to power the necessary ventilation equipment. However, not all ventilation equipment would be powered by an AAC source during an SBO. The licensee indicated that additional studies would be made to assure that these areas would not overheat during an SBO.

SE Recommendation: In the SE, the staff recommended that the licensee should complete the ventilation studies and include the studies and the results in the documentation supporting the SBO submittal. The staff further recommended that the licensee should implement any procedure changes and modifications that are required to assure that adequate ventilation is maintained in the areas containing SBO equipment for the required coping duration.

Licensee Response: In the response to the above staff concern, the licensee committed to complete the SBO ventilation studies on a schedule sufficient to support the implementation of any procedure changes and modifications that may be required to assure adequate ventilation is maintained in the area containing safe shutdown equipment for the required coping duration. Any

9206170166 920611
PDR ADOCK 05000335
PDR



required procedure changes identified as a result of these studies will be in the procedures developed to deal with an SBO event at St. Lucie Unit 1. The licensee has committed to complete the procedural changes by September 12, 1993.

Staff Evaluation: Based on its review and the licensee's commitment, the staff finds the licensee's response acceptable and considers its concerns of the effects of loss of ventilation during an SBO event at the St. Lucie Unit 1 resolved.

2.2 Reactor Coolant Inventory (SE Section 2.3.6)

In the SE, the staff reported that the licensee plans to use one charging pump to maintain reactor coolant inventory. The charging pump has a capacity of 44 gpm and will be powered by the AAC. The AAC source will be available within 10 minutes following an SBO. In the attached TER, a leakage rate of 112 gpm was assumed based on data from similar plants. Based on this assumption the staff agreed with the conclusion reached in the TER that for a net loss of 68 gpm, there is reasonable assurance that the reactor core will be covered during an SBO of 8 hours.

SE Recommendation: In the SE, the staff recommended that the licensee should evaluate and confirm that there will be adequate RCS inventory to ensure continued core cooling for the required 8-hour SBO duration and recovery therefrom, and include this information in the documentation supporting the SBO submittal.

Licensee Response: In the response to the above staff concern, the licensee committed to evaluate and confirm that adequate RCS inventory will remain at the termination of the SBO event. The licensee further committed to maintain the St. Lucie Unit 1 emergency diesel generators (EDGs) at a reliability level equal to or greater than 0.975. As a result, the SBO coping duration is 4 hours. The evaluation will verify that the assumed 112 gpm reactor coolant system (RCS) leak rate, which the licensee will assume decreases throughout the course of the event as RCS pressure decreases, will not result in the loss of core coverage, that sufficient core cooling is available for the SBO duration of 4-hours, and that recovery from the event is analytically achievable.

The licensee stated that the St. Lucie Unit 1 RCS inventory evaluation and confirmation will be completed using RETRAN03 MOD000 and assuming a decay heat load in accordance with ANS 1979 (times a 1.05 uncertainty factor). The inventory loss evaluation will assume a pressure-dependent leak rate which decreases over the duration of the SBO event; RCS inventory makeup via a charging pump will be assumed at some time following the completion of the AAC intertie. Auxiliary feedwater (AFW) initiation will be assumed in accordance with system design and safety injection will be assumed to be unavailable for the 4 hour SBO event.

The evaluation and confirmation will be completed by September 12, 1993, and the results of the evaluation will be included in the St. Lucie Unit 1 Updated Final Safety Analysis Report (UFSAR).

Staff Evaluation: Based on its review and the licensee's commitments, the staff finds the licensee's response acceptable and considers its concerns of adequate RCS inventory to ensure continued core cooling for the required SBO duration at the St. Lucie Unit 1 resolved.

2.3 Proposed Modifications (SE Section 2.5)

SE Recommendation: In the SE, the staff recommended that the licensee should provide a full description, including the nature and objectives of the required modifications, in the documentation supporting the SBO submittals that is to be maintained by the licensee.

Licensee Response: In response to the above recommendation, the licensee stated that they will complete the SBO procedure changes by September 12, 1993. These procedures will give detailed instructions on the method for cross-tying the St. Lucie Unit 2 EDGs to Unit 1 as well as the Unit 1 EDGs to Unit 2. The revised procedures will not consider multiple event scenarios such as a small break loss of coolant accident (SBLOCA) resulting from reactor coolant pump (RCP) seal failure(s). Existing emergency operating procedures (EOPs) would be used for multiple event accident management.

The licensee stated that a full description, including the nature and objectives, of the required procedure changes identified in Sections 2.4 and 2.5 of the SE, will be included in the St. Lucie Unit 1 UFSAR.

Staff Evaluation: Based on its review and the licensee's commitments, the staff finds the licensee's response acceptable.

2.4 EDG Reliability Program (SE Section 2.7)

In the SE, the staff reported that the licensee's submittal on SBO did not specifically address the commitment to implement an EDG reliability program to conform to the guidance of Regulatory Guide (RG) 1.155, Position 1.2. However, during the site audit review, the licensee stated that their reliability program would meet these guidelines.

SE Recommendation: In the SE, the staff recommended that the licensee should confirm that an EDG reliability program which meets the guidance of RG 1.155, Section 1.2, will be implemented. 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: In the response to the above staff concern, the licensee committed to confirm, by September 12, 1993, that an EDG reliability program has been implemented to attain and maintain the St. Lucie Unit 1 targeted EDG reliability. Confirmation that such a program is in place will be included in the St. Lucie Unit 1 UFSAR.

Staff Evaluation: The staff finds this to be acceptable based on the understanding that the EDG reliability program will meet the guidance of RG 1.155, Section 1.2.

2.5 SE Issue: Unit 2 SBO Withstand Capability, SE Section 3.0

SE Recommendation: The staff recommended that the licensee is expected to maintain the reliability of the Unit 2 EDGs at 0.974 or greater in accordance with the licensing basis for Unit 2 in regard to the SBO issue. The licensee is also encouraged to update the SBO coping procedures for Unit 2 to incorporate the enhanced capability provided by the ac intertie between Units 1 and 2.

Licensee Response: In the response to the above staff recommendation, the licensee committed to maintain the reliability of the St. Lucie Unit 2 EDGs at 0.974 or greater in accordance with the licensing basis for Unit 2 in regard to the SBO issue by implementation of an EDG reliability program which attains and maintains the St. Lucie Unit 2 targeted EDG reliability.

Staff Evaluation: Based on its review and the licensee's commitment, the staff finds the licensee's response acceptable.

2.6 Station Blackout Duration (SE Section 2.1)

Licensee Comment: In the SE, the staff reported that during the May 21, 1991, meeting with the NRC staff, the licensee agreed to accept the staff's "I3" independence of AC offsite power classification and an 8-hour coping duration. However, the licensee has reconsidered its commitment for the required SBO duration. The licensee has revised its commitment conservatively and will maintain the St. Lucie Unit 1 EDGs at a targeted reliability level equal to or greater than 0.975. As a result, the licensee considers the required SBO coping duration for St. Lucie Unit 1 as 4 hours.

Staff Evaluation: Based on its review and the licensee's commitment to select an EDG target reliability of 0.975, the staff finds the licensee's evaluation of a 4-hour SBO coping duration acceptable and consistent with the SE.

2.7 Proposed AAC Power Source (SE Section 2.2.2)

Licensee Comment: The licensee clarified that they will analyze plant response to the SBO event assuming that a maximum of 3936 kW is available to both units from the operating St. Lucie Unit 2 EDG. This analysis will be used to conclude that an acceptable plant response to an SBO event can be confirmed considering the St. Lucie Unit 2 UFSAR LOOP EDG load profile concurrent with the St. Lucie Unit 1 required SBO loads. The analysis will confirm that these combined loads do not exceed 3936kW and will include the blacked-out unit's (i.e., Unit 1) components considered in the NRC SE which the licensee determines may be required during an SBO event. The ventilation studies described in licensee's response to the NRC request for SE Section 2.3.4 will determine which ventilation loads are required. Additionally, the licensee will assume calculated running kW loads for each required component during the SBO event in lieu of the worst-case design basis accident LOOP/LOCA EDG load values of the NRC's SBO SE. These loads, and the plant response analyses to support their acceptability, will be included in the St. Lucie Unit 1 UFSAR.

Staff Evaluation: Based on its review and the licensee's commitment to confirm that the combined loads do not exceed 3936kW, the staff finds the licensee's response acceptable.

2.8 SBO Submittal Documentation

Licensee Comment: In the staff's SE, various requests state that the licensee "...should...include this information in the documentation supporting the SBO submittal that is maintained by the licensee." The licensee intends to meet this aspect of the NRC's SBO SE for St. Lucie Unit 1, by incorporating the SBO evaluations and/or confirmations in the St. Lucie Unit 1 UFSAR.

As the licensee has committed to meeting 10 CFR 50.63 by September 12, 1993, all SBO evaluations and/or confirmations will be included in the first annual UFSAR update subsequent to September 12, 1993 (i.e., July 21, 1994).

Staff Evaluation: Based on its review and the licensee's commitment of meeting the above recommendation by incorporating the SBO evaluations and/or confirmation in the St. Lucie Unit 1 UFSAR, the staff finds this acceptable.

3.0 SUMMARY AND CONCLUSION

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 September 12, 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's responses to each of the staff's recommendations and comments have been evaluated in this Supplemental Safety Evaluation (SSE) and found to be acceptable.

Principal Contributors: Amar Pal
David Shum

Date: June 11, 1992

