



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

ENCLOSURE 1

SUPPLEMENTAL SAFETY EVALUATION

BY THE OFFICE OF NUCLEAR REACTOR REGULATION

STATION BLACKOUT RULE (10 CFR 50.63)

SOUTHERN NUCLEAR OPERATING COMPANY, INC.

JOSEPH M. FARLEY NUCLEAR PLANT, UNITS 1 AND 2

DOCKET NOS. 50-348 AND 50-364

1.0 INTRODUCTION

On July 21, 1988, Title 10 of the Code of Federal Regulations (10CFR), Part 50, was amended to include a new section 50.63, entitled "Loss of All Alternating Current Power," (Station Blackout (SBO)). The SBO rule requires each light-water-cooled nuclear power plant to be able to withstand and recover from an SBO of specified duration, requires licensees to submit information as defined in 10 CFR 50.63, and requires licensees to provide a plan and schedule for conformance to the SBO rule. Alabama Power Company¹ (the licensee) provided its response to SBO for the Joseph M. Farley Nuclear Plant, Units 1 and 2 (Farley), by letters dated April 12, 1989, and March 8, 1990. The Nuclear Regulatory Commission (NRC) staff's Safety Evaluation (SE) pertaining to the licensee's initial responses to the SBO rule, 10 CFR 50.63, was provided to the licensee by letter, dated April 25, 1991. The staff found the licensee's proposed method of coping with an SBO for Farley 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 by letter, dated June 5, 1991.

2.0 EVALUATION

The licensee's responses to each of the recommendations in the SE are evaluated below.

2.1 Proposed AAC Power Source, SE Section 2.2.2

SE Recommendation: The licensee should verify and confirm that:
(1) EDGs 1-2A, 1C, and 2C are (or will be made) connectable from the control room to a safe shutdown bus in either unit, and (2) the SBO procedures

¹Subsequent to these submittals, Amendment Nos. 90 and 83 to Facility Operating Licenses NPF-2 and 8, respectively, were issued authorizing Southern Nuclear Operating Company, Inc., to become the licensed operator. This change was implemented on December 23, 1991.

encompass as a minimum all possible three EDG failure combinations. The documentation associated with the above verification, including any modifications required to enhance EDG connectability, should be included with other documentation that is to be maintained by the licensee in support of the SBO submittals.

Licensee Response: The licensee stated that EDG 2C is connectable from the control room to both units at the same time in all design basis events. The licensee committed to make modifications so that EDG 2C will not supply power to any safety loads in any design basis accident. The alignment of EDG's 1-2A, 1B, 1C, and 2B in a dual unit loss of offsite power (LOOP) event is as follows: EDG 1-2A is aligned to Unit 1 train A, EDG 1B is aligned to Unit 1 train B, EDG 1C is aligned to Unit 2 train A, and EDG 2B is aligned to Unit 2 train B (per Farley Final Safety Analysis Report (FSAR) Table 8.3-2, Sh. 1).

The licensee stated that with the above train alignment of the four diesels during a LOOP event, only one unit will be in SBO even considering the failure of any three of the four aligned diesels. The EDG 2C becomes the fifth EDG, and it is the AAC source which can be connected to train B of either unit to power SBO loads. EDG 1B and EDG 2B are uniquely dedicated to train B of Unit 1 and Unit 2, respectively. EDG 1-2A and EDG 1C are each dedicated to train A, but their unit alignment (one diesel per unit) depends on the postulated event. Based on the considerations above, the licensee indicated that connectability of EDG 1-2A and EDG 1C is not an SBO consideration.

The licensee further stated that the SBO procedure will be developed to ensure that the train B safe shutdown loads in the SBO unit will be powered by EDG 2C. The licensee stated that EDG 2C will be dedicated as the AAC source, connectable from the control room to the train B safe shutdown bus in either unit, and will not be considered as a candidate for the design basis single failure.

Staff Evaluation: The staff finds the licensee's modification to use EDG 2C as an AAC power source, and the associated procedure changes acceptable. With this change, the staff accepts the licensee's statement that the connectability of EDG 1-2A and EDG 1C is not an SBO consideration. This change is found acceptable toward meeting the SBO rule. However, the licensee should confirm that the plant still meets its licensing basis for all design basis accidents with EDG 2C used as an AAC power source.

2.2 Effects of Loss of Ventilation, SE Section 2.3.4

SE Recommendation: The licensee should confirm that other areas which contain equipment or require personnel occupancy during an SBO have appropriate cooling. The documentation supporting this confirmation should be retained by the licensee and included with the other documentation supporting the licensee's responses to the SBO rule.

Licensee Response: The licensee stated that the EDG 2C is characterized fully capable AAC power source and has sufficient capacity to power a complete train of LOOP loads for one unit. The licensee further stated that the power

is available for the cooling equipment in all areas required for an SBO event and the degree of this power availability is the same as in any design basis event.

Staff Evaluation: Based on its review, the staff finds the licensee's response acceptable and considers its concern as described in the SE with respect to the effects of loss of ventilation during an SBO event at Farley resolved.

2.3 Proposed Modifications, SE Section 2.5

SE Recommendation: The licensee should include a full description, including the nature and objectives, of all modifications resulting from the above in the documentation supporting the SBO submittals that is to be maintained by the licensee.

Licensee Response: The licensee stated that the SBO modifications will reinstate a portion of a previous licensed design in which EDG 2C provided a backup feature to 4kV buses 1G or 2G in the event of failure of EDG 1B or EDG 2B. The proposed modification to make EDG 2C an AAC power source will be made to accomplish the connection of EDG 2C to train B of the SBO unit. The licensee indicated that automatic initiation of the 4 kV LOOP sequencer will automatically sequence the train B large LOOP shutdown loads onto EDG 2C.

Staff Evaluation: The staff did not perform a detailed review of modifications and procedure changes submitted by the licensee in order to connect the AAC power source to train B of the SBO unit.

However, the staff has a concern regarding the use of the automatic sequencing of the train B large LOOP shutdown loads onto EDG 2C. Per an October 4, 1991, meeting submittal, the train B LOOP load is 3434 kW for Unit 1 and 3382 kW for Unit 2. EDG 2C is rated for 3100 kW for 2000 hours. The licensee should review the loading of EDG 2C and confirm that EDG 2C will not be loaded to more than 3100 kW during an SBO event. Although the licensee plans to use an automatic load sequencer, the SBO guidance does not require the use of an automatic load sequencer to load AAC power source.

2.4 Quality Assurance and Technical Specifications, SE Section 2.6

SE Recommendation: The licensee should verify that the SBO equipment is covered by an appropriate quality assurance (QA) program consistent with the guidance of Regulatory Guide (RG) 1.155. Further, this evaluation should be documented as part of the package supporting the SBO rule response.

Licensee Response: The licensee stated that all SBO equipment is covered by their Quality Assurance Program consistent with the Operation Quality Assurance Program Manual (OQAPM) and 10 CFR Part 50 Appendix B requirements. This complies with the requirement of RG 1.155.

Staff Evaluation: The staff finds this to be acceptable based on the licensee's statement.

2.5 EDG Reliability Program, SE Section 2.7

SE Recommendation: The licensee should implement an EDG reliability program which meets the guidance of RG 1.155, Section 1.2. If an EDG reliability program currently exists, the program should be evaluated and adjusted in accordance with RG 1.155. 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: The licensee stated that the reliability of the emergency diesels will be calculated in accordance with existing Technical Specifications which refer to RG 1.108, Revision 1, August 1977. The licensee further stated that reliability will be compared to the target value and the testing frequency will be adjusted in accordance with Technical Specifications until reliability is reestablished. The licensee stated that the guidance given in RG 1.108 is the guidance that applies to Farley until Generic Issue (GI) B-56 is resolved. The licensee committed to develop a formal EDG reliability program in accordance with the guidance issued resolving GI B-56.

Staff Evaluation: The staff finds that the licensee does not have an EDG reliability program meeting the guidance of RG 1.155, Section 1.2. However, the licensee committed to develop a formal EDG reliability program in accordance with the guidance issued resolving GI B-56. The staff finds that the licensee should implement an EDG reliability program which meets the guidance of RG 1.155, Section 1.2, without waiting for the resolution of GI B-56.

In addition to the above, the licensee provided the following clarifications:

2.6 Compressed Air, SE Section 2.3.3

In the SE, the staff stated that power to an air compressor was not a concern because it could be manually connected to any of the EDGs within 10 minutes.

In its response, the licensee clarified that the air compressors capable of being supplied from emergency power at Farley can only be powered from train A. The AAC source (EDG 2C) will be connected to train B only. However, the licensee has determined that compressed air is not required for safe shutdown as described in FSAR Section 9.3.1. Therefore, compressed air is not relied upon to cope with an SBO event and is not a concern during an SBO event.

Based on its review, the staff concurs with the licensee that the compressed air system is not a concern at Farley during an SBO event.

2.7 Reactor Coolant Inventory, SE Section 2.3.6

The licensee stated that makeup is accomplished using the charging pumps which are centrifugal pumps rather than positive displacement pumps as indicated in the TFR and SE. The staff acknowledges the licensee's clarification.

3.0 SUMMARY AND CONCLUSION

The licensee's responses to each of the staff's recommendations contained in the SBO SE have been evaluated and were found to be acceptable contingent upon the following: (1) confirmation that the plant will meet its licensing basis for all design basis accidents with EDG 2C used as an AAC power source, (2) confirmation that EDG 2C (AAC power source) will not be loaded more than 3100 kW during an SBO event, and (3) implementation of an EDG reliability program that meets the guidance of RG 1.155, Section 1.2. The licensee should submit, within 30 days of receipt of this SSE, the proposed resolution of these issues and present a schedule for their implementation.

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Dated: June 12, 1992