



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

SUPPLEMENTAL SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

STATION BLACKOUT

NORTHEAST NUCLEAR ENERGY COMPANY

MILLSTONE NUCLEAR POWER STATION, UNIT NO. 3

DOCKET NO. 50-423

1.0 INTRODUCTION:

The NRC staff's Safety Evaluation (SE) pertaining to Northeast Nuclear Energy Company's (the licensee's) initial responses to the Station Blackout (SBO) Rule, 10 CFR 50.63, was transmitted to the licensee by letter dated August 20, 1990. The staff found the licensee's proposed method of coping with an SBO to be acceptable, subject to the satisfactory resolution of the recommendations which were itemized in the staff's SE. The licensee responded to the staff's SE, and specifically to the recommendations, by letters dated September 26, 1990, from E. J. Mroczka, and August 1, 1991, from W. D. Romberg, Northeast Nuclear Energy Company, to the Document Control Desk, U.S. Nuclear Regulatory Commission.

2.0 EVALUATION:

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

2.1 Proposed AAC Power Source, SE Section 2.2.2

SE Recommendation: 1) The SBO loads (name plate rating) and the capacity of the AAC diesel generator should be verified and included, along with other design information of related modifications in the documentation supporting SBO submittals; and 2) the licensee should conduct the appropriate AAC tests in accordance with the guidance of NUMARC 87.00, Appendix B, Item B.12.

Licensee Response: The licensee stated that a load list of equipment required to cope for the 8-hour SBO event was generated and total load was 1160 kW. The licensee further indicated that the load list had been reviewed by NUSCO Probabilistic Risk Assessment, NUSCO Engineering, Millstone, Unit No. 3 Operations and Engineering and would become an official calculation. The licensee determined the AAC diesel generator capacity of 2000kW (continuous rating). The licensee mentioned that the necessary modifications and any associated testing will be completed during the 1992 refueling outage of Millstone, Unit 3.

Staff Evaluation: Based on the AAC diesel generator continuous rating of 2000kW, the staff's assessment of the proposed AAC power source indicates that it would fall into the fully capable AAC power source category. The staff finds this to be acceptable.

2.2 Class 1E Battery Capacity, SE Section 2.3.2

SE Recommendation: The staff agrees with the licensee's assessment contingent on confirmation of the following:

1. Since the calculations used actual current values (ammeter readings) instead of nameplate ratings, any change to the present plant DC loading will require a reevaluation of battery capacity (refer to SAIC TER).
2. The actual ammeter readings are acceptable provided that they are maximum values taken over a period of testing and not from a one-time test.
3. The normal battery-backed plant monitoring and electrical system controls in the control room for at least one safety train will remain operational during an SBO. These are considered to be essential for successful coping with the recovery from an SBO.

The documentation supporting the SBO submittals that is to be maintained by the licensee should include confirmation of the items identified above.

Licensee Response: The licensee stated that it was part of the normal design process to review battery capacity if there was a change to DC loading. The licensee further indicated that the Nuclear Engineering and Operations Procedure NEO 3.03, "Preparation, Review, and Disposition of Plant Design Change Records (PDCR)," had provided the basis for Northeast Nuclear Energy Company's design control program for many years and ensured that the appropriate calculation was reviewed for any impact to battery capacity when revising, adding, or deleting a battery-supplied load.

The licensee mentioned that the ammeter readings used in the battery loading calculation were to provide the continuous battery load after a loss of AC power. The licensee believes that the DC load is not expected to deviate significantly from the test values, regardless of the fact that the ammeter readings were taken from a one-time test. The licensee noted that the Class-1E batteries have greater than an 8-hour capacity using the ammeter readings as the steady state load. Since the battery charger will be powered within 1 hour after the onset of an SBO, the battery has significant excess capacity.

The licensee further stated that both battery safety trains will remain operational during the SBO coping and recovery durations.

Staff Evaluation: The staff finds this to be acceptable based on the licensee's commitment to provide a fully capable AAC power source which will provide power to the battery charger of one train within 1 hour.

2.3 Compressed Air, SE Section 2.3.3

SE Recommendation: The licensee should develop procedures and simulate the appropriate actions and provide the operator training to ensure that decay heat removal can be maintained.

Licensee Response: The licensee stated that the Millstone Unit No. 3 operator training programs currently contain practice in those actions necessary to maintain decay heat removal in the event of an SBO, as listed in the procedure EOP 35 ECA-0.0, "Loss of All AC Power." Modifications or enhancements to this existing training will be conducted in coordination with the pending equipment installation and the procedure changes in accordance with NED 3.03 "Preparation, Review and Disposition of Plant Design Change Records (PDCR)."

The licensee stated that the training needs would be evaluated based on these modifications and the appropriate training methods would be employed to assure adequate operator capabilities to control decay heat removal.

Staff Evaluation: The staff finds this to be acceptable as the response agrees with the SE recommendation.

2.4 Effects of Loss of Ventilation, SE Section 2.3.4

SE Recommendation: The licensee should reevaluate the effects of loss of ventilation for the areas identified above and correct the deficiencies. If the licensee's reevaluation shows that additional procedure changes or hardware modifications are necessary to ensure equipment operability in the above mentioned areas, then the licensee should implement the required procedure changes or modifications. In addition, the cabinet doors in the control room should be opened within 30 minutes from the onset of SBO to provide adequate air mixing to maintain cabinet temperatures in equilibrium with the control room temperature and plant procedures should be revised accordingly.

Licensee Response: The licensee stated that the room heatup calculation for the main steam valve room has been revised to delete consideration and therefore not take credit for the east main steam valve building (MSVB) wall adjacent to containment as a heat sink. The revised temperature after 8 hours is 167°F instead of 152°F. The area remains a dominant area of concern. However, reasonable assurance of equipment operability is assured since the MSVB temperature is well below high energy line break (HELB) temperature profiles and the equipment has been qualified to operate in a harsh environment due to HELB. The licensee also stated that operator access for manual intermittent operation of the main steam pressure relieving valves (MSPRVs) would be provided by opening doors in the area, if needed, within 30 minutes. The licensee indicated that limited ventilation in the MSVB would be available within 1 hour from the AAC power source.

The licensee also stated that a new control room heatup calculation was prepared to reflect the recently completed installation of a new acoustic

ceiling and to address the heat contribution by control room personnel and common walls between the control room and instrument rack rooms. The new calculated room temperature, using transient convective heat transfer methods for the control room during SBO, is 98.1°F after 8 hours. The new calculated temperature for the instrument rack room is 99.4°F. The licensee stated that control room air conditioning would be provided after AAC is available (within one hour) and the instrument and control cabinet doors would be opened within 30 minutes.

Staff Evaluation: The staff finds this to be acceptable based on the licensee's commitment to provide control room air conditioning and limited ventilation in the MSVB within 1 hour and to open instrument and control cabinet doors within 30 minutes.

2.5 Proposed Modification, SE Section 2.5

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

Licensee Response: The licensee stated that the major hardware modification was the installation of an independent air-cooled diesel generator as the AAC source for Millstone Unit No. 3. The scheduled completion of this hardware modification and associated procedure modification is the end of the 1992 refueling outage, currently planned to commence November 1992. The licensee indicated that the appropriate procedures have been modified and implemented with the exception of those associated with the AAC diesel generator modification. The PDCR process will require timely procedure changes when the AAC diesel generator is installed.

Staff Evaluation: The staff finds this to be acceptable. Since the 1992 refueling outage is only approximately 2 months beyond the 2-year time period specified under the SBO Rule for completing the proposed modifications, and the proposed diesel generator addition represents a major modification, the staff agrees with the licensee's proposed completion schedule.

3.0 SUMMARY AND CONCLUSION

The NRC staff's Safety Evaluation (SE) pertaining to the licensee's initial responses to the SBO Rule, 10 CFR 50.63, was transmitted to the licensee by letter dated August 20, 1990. The staff found the licensee's proposed method of coping with an SBO to be acceptable, subject to the satisfactory resolution of the recommendations which were itemized in the staff's SE. The licensee's responses to each of the staff's recommendations have been evaluated in this Supplemental Safety Evaluation (SSE) and found to be acceptable.

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Date: January 30, 1992