UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

ENCLOSURE

SUPPLEMENTAL SAFETY EVALUATION

BY THE OFFICE OF NUCLEAR REACTOR REGULATION

TENNESSEE VALLEY AUTHORITY

WATTS BAR NUCLEAR PLANT, UNITS 1 AND 2

COMPLIANCE WITH THE STATION BLACKOUT RULE (10 CFR 50.63)

DOCKET NOS. 50-390 AND 50-391

1.0 INTRODUCTION

The NRC staff's Safety Evaluation (SE) pertaining to the Tennessee Valley Authority's (TVA) initial response to the Station Blackout (SBO) Rule, 10 CFR 50.63, was transmitted to TVA by letter dated March 18, 1993. The staff found that TVA's proposed method of coping with an SBO to be acceptable subject to the confirmation that the expected frequency of a grid-related loss of offsite power (LOOP), based on TVA's experience, does not exceed once in 20 years. TVA provided the above confirmation as well as two clarifications (Class 1E battery design margin and 250V battery adequacy), by letter dated April 28, 1993.

2.0 EVALUATION

TVA's response to the SE recommendation and the clarifications regarding Class 1E battery design margin and 250V battery adequacy are evaluated below:

2.1 Station Blackout Duration (SE Section 2.1)

SE Recommendation

TVA should not rely on NUREG-1032 alone, and should confirm, based on its experience, that the expected frequency of a grid-related loss of offsite power (LOOP) does not exceed once in 20 years.

TVA Response

TVA stated that the statement regarding the expected loss of grid-related LOOP events does not exceed once per 20 years for WBN, is supported by site-specific records, as well as the annual report by the Electric Power Research Institute (EPRI) on LOOP events at US Nuclear Plants. TVA stated that two 161kV incoming lines were installed at WBN in 1977 and it never had both lines out-of-service concurrently.

TVA further indicated that EPRI's NSAC-182 report included the reliability of the TVA grid at the Sequoyah Nuclear Plant (SQN) since October 1980, and Browns Ferry Nuclear Plant (BFN) since June 1973. A complete LOOP has not been experienced at either of these facilities for the time periods covered in the EPRI report.

Staff Evaluation

Based on its review, the staff finds TVA's response acceptable and concludes that this issue is resolved.

2.2 Class 1E Battery Capacity (SE Section 2.2.2)

TVA Clarification

TVA clarified that no formal calculation demonstrating the existence of design margin in the SBO battery loading calculation will be maintained. TVA does not plan to maintain the 6.9 percent margin value referenced in the January 27, 1993 response or the 5 percent margin suggested by NRC in the teleconference on March 30, 1993. TVA stated that the battery loading calculation is maintained as is, and updated as required, to ensure that the loading stays within the design capacity of the battery.

TVA maintains that the design margin discussed in IEEE-485 does not apply to the SBO battery loading analysis. TVA stated that the best philosophy for ensuring the safety of the plant during an SBO event is to allow as many of the desirable loads as practical to remain on the batteries, provided the resulting battery load is within the analyzed capacity of the battery. TVA further stated that the battery testing and surveillance required by the draft Watts Bar Technical Specifications (TS) provide adequate assurance that the likelihood for the degraded condition to exist undetected would be remote.

Staff Evaluation

Based on its review, the staff agrees with TVA that a design margin is not required as long as the loading (loads required for coping with an SBO and the loads that are needed by the operator for monitoring important parameters) stays within the design capacity of the battery, and the battery is maintained properly. The staff does not agree with TVA that practically any margin could be provided, but at the expense of shedding desirable loads. TVA should make sure that the loads that are needed for coping with the SBO and that are needed by the operators for monitoring important parameters are not shed.

2.3 250 Volt Station Batteries

TVA Clarification

TVA clarified that restoration from the emergency diesel generators (EDGs) was and is the preferred analyzed source for restoration of ac-power following an SBO. TVA committed in the January 27, 1993 SBO submittal to ensure that the 250V batteries had adequate capacity for ac-power restoration, via the switchyard, and to revise the SBO procedure to allow the operator to use this

restoration method if desired. TVA stated that they do not have plans to extend additional measures such as heating, ventilating, and air conditioning (HVAC) calculations, and augmented quality assurance requirements to include the potential SBO functions of the 250V batteries and battery board rooms. TVA reiterated that the WBN EDGs have dedicated batteries and, therefore, provide greater assurance that power can be restored via the EDGs following an extended SBO.

Staff Evaluation

Based on its review, the staff agrees with TVA that 250V battery should not be considered as an SBO equipment and hence, HVAC calculations and augmented QA requirements are not required provided no other loads which are required during an SBO event are fed from the 250V battery.

3.0 SUMMARY AND CONCLUSION

The staff has reviewed TVA's April 28, 1993 letter pertaining to the staff's SE recommendation, and TVA's comments on the staff's SE, and found TVA's response and comments acceptable as discussed above.

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