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)

NEBRASKA PUBLIC POWER DISTRICT

COOPER NUCLEAR STATION

DOCKET NO. 50-298

1.0 INTRODUCTION

The NRC staff's safety evaluation (SE) pertaining to the Nebraska Public Power District's (the licensee's) response to the Station Blackout (SBO) Rule, 10 CFR 50.63, was transmitted to the licensee by letter dated August 22, 1991. The staff's SE found the licensee's proposed method of coping with an SBO to be acceptable contingent upon the resolution of several recommendations listed in the SE. The licensee responded to the staff's SE by letters from G. R. Horn dated September 30, 1991, and February 27, 1992.

2.0 EVALUATION

The licensee's responses to the staff's concerns are evaluated below.

2.1 Station Blackout Duration (SE Section 2.1)

SE Recommendation: In the SE, the staff recommended that the licensee should use data provided in NUMARC 87-00, i.e., SW Group "3," and ESW Group "3," or provide further justification to demonstrate that the NUMARC values are not applicable to the Cooper Station. In lieu of the above, the licensee was to

provide additional plant specific weather data to include the extreme weather conditions in support of its ESW and SW group classifications.

Licensee Response: In its February 27, 1992, response, the licensee submitted a revised calculation (NEDC 92-023, Rev. 0). The revised calculation utilizes existing weather data taken at the Cooper Nuclear Station (CNS) site and from the National Severe Storm Forecast Center (NSSFC) to determine the ESW and SW groups for CNS and provide justification that the NUMARC 87-00 values are not applicable to CNS.

The methodology employed extreme value statistical methods to estimate the maximum wind speeds at CNS based on the existing site-specific database. The calculation followed the extreme value statistical methods developed by Arnold Court and Emil Simiu. Court's technique and Simiu's technique both employ Type I distributions which provide the optimum fit at most weather stations. The probability plot correlation coefficient (PPCC) method was used to verify that the Type I distribution was appropriate for the CNS wind speed database.

The CNS database consists of the monthly maximum values of the maximum hourly average values (the maximum of 720 values each month) for a period from 1975 through 1990 (192 maximum values). Using this database, the following values were calculated:

Using Court's methodology, the resulting expected frequency of winds between 75 and 125 mph was calculated to be 1.012E-3, and the expected annual frequency of exceeding winds of 125 mph was calculated to be 6.78E-8. Using the Simiu methodology, the resulting expected frequency of winds between 75 and 125 mph was calculated to be 7.0954E-4, and the expected annual frequency of exceeding winds of 125 mph was calculated to be 3.264E-8. Using the "TERPLOT" data provided by the National Severe Storm Forecast

Center (NSSFC), the expected annual frequency of tornadoes with wind speeds greater than 113 mph was calculated to be 2.357E-4. Based, on these values, the licensee concludes that the site specific data results in an SW classification of "2," and an ESW classification of "2".

Staff Evaluation: After reviewing the licensee's submittal, the staff had a telecon with the licensee to determine if average hourly wind speeds had indeed been used in the SW and ESW calculations. The licensee confirmed that one-minute wind speeds had been measured and averaged over the hour to determine hourly average wind speeds. The maximum of these hourly averaged wind speeds during each month was then used in the calculations.

The staff concludes that it is improper to use average hourly wind speeds in determining the probability of extreme wind speeds that could result in damage to transmission/distribution facilities. The staff also questions whether the use of monthly maximum wind speeds (rather than yearly maximums) results in a conservative analysis. The staff believes that the fastest mile, or the fastest minute, annual wind speeds should normally be used for the SW and ESW calculations. Where the yearly data base is insufficient for a reliable statistical analysis, a sensitivity analysis should be made to determine whether the monthly extremes or the annual extremes results in the most conservative analysis.

Since the licensee's determinations of the ESW and SW classifications is based on hourly average extreme wind speeds, the staff cannot conclude that the licensee's site specific analysis is meaningful. Therefore, the licensee should use the ESW3 and SW3 classifications based on NUMARC 87-00, which require an EDG target reliability of 0.975 in order to remain a 4-hour coping plant.

2.2 Condensate Inventory For Decay Heat Removal (SE Section 2.2.1)

SE Recommendation: The licensee should establish a procedure to monitor the condensate level in the emergency condensate storage tanks so as to ensure that the minimum permissible condensate (100,000 gallons) is maintained during plant operation.

Licensee Updated Response: In its earlier response, the licensee committed to update by March 1, 1992, CNS Procedure 6.2.4.1 to incorporate routine monitoring and recording of the condensate level in the emergency condensate storage tanks. In its updated response, the licensee indicated that this procedural revision had been completed and implemented.

Staff Evaluation: Based on its review, the staff finds the licensee's responses acceptable and, therefore, considers the SE issue related to condensate inventory for decay heat removal resolved.

2.3 Effects of Loss of Ventilation (SE Section 2.2.4)

2.3.1 Control Room (SE Section 2.2.4.1)

SE Recommendation: The licensee should establish a procedure in accordance with the guidance described in NUMARC 87-00 for opening the control room cabinet doors within 30 minutes following an SBO event.

Licensee Updated Response: The licensee committed in its earlier response to revise by March 1, 1992, CNS Station Blackout Emergency Procedure 5.2.5.1 to open the doors of all control room cabinets equipped with backs within 30 minutes following an SBO event. In its updated response, the licensee indicated that this procedural revision had been completed.

Staff Evaluation: Based on its review, the staff finds the licensee's response acceptable and, therefore, considers the SE issue related to the effects of loss of ventilation in the control room resolved.

2.3.2 DC Switchgear Room (SE Section 2.2.4.3)

SE Recommendation: The licensee should verify that the inverters will remain operational during an SBO event.

Licensee Updated Response: In its earlier response, the licensee indicated that it had verified that the HPCI inverter and the new RCIC inverter which was installed during the 1991 refueling outage will remain operational during an SBO event. In addition, the licensee committed to revise CNS Station Blackout Procedure 5.2.5.1 to require that the door to DC switchgear room 1A be opened within 30 minutes following an SBO event to support operation of the new no-break power panel inverter which was installed during the 1991 refueling outage. In its updated response, the licensee indicated that this procedural revision had been completed.

Staff Evaluation: Based on its review, the staff finds the licensee's response acceptable and, therefore, considers the SE issue related to the effects of loss of ventilation in the DC switchgear room resolved.

2.3.3 HPCI Room (SE Section 2.2.4.4)

SE Recommendation: The licensee should perform a heatup calculation for the high pressure coolant injection (HPCI) room and assess the equipment operability in this area.

Licensee Updated Response: In its earlier response, the licensee indicated that it did not consider the HPCI room a dominant area

of concern (DAC) as only one cycle of HPCI operation is required to stabilize reactor water level, after which level can be maintained with the RCIC system. However, to conserve battery energy the licensee committed to revise by March 1, 1992, SBO procedures to specify the securing of the HPCI system. In its updated response, the licensee indicated that it had revised CNS Station Blackout Procedure 5.2.5.1 accordingly.

Staff Evaluation: Based on its review, the staff finds the licensee's response acceptable, and, therefore, considers the SE issue related to the effects of loss of ventilation in the HPCI room resolved.

2.3.4 Steam Tunnel (SE Section 2.2.4.5)

SE Recommendation: The licensee should perform a heatup calculation for the steam tunnel area and assess the equipment operability in this area.

Licensee Updated Response: In its earlier response, the licensee indicated that following initial valve opening, only MOV-RCIC-16 (outboard steam isolation valve) might be required to close. This valve had been environmentally qualified up to 308°F local temperature.

The other two DC-powered valves located in the steam tunnel area, MOV-HPCI-19 (injection valve) and MOV-RCIC-21 (injection valve) would be immediately opened to provide coolant injection early in the SBO event, and would not be required to close. The licensee would perform a heatup calculation for the steam tunnel area to verify that the temperature remains below 308°F during the 4-hour SBO event to confirm the valve's ability to perform its isolation function. This heatup calculation would be completed by March 1, 1992.

In its updated response, the licensee indicated that a heatup calculation for the steam tunnel area was performed as committed. The licensee used conservative heat load values and calculated the heat rise using NUMARC 87-00 methodology. The peak steady-state SBO temperature was calculated to be 300°F. Therefore, MOV-RCIC-16 is expected to remain operational to fulfill its containment isolation function during an SBO event.

Staff Evaluation: Based on its review, the staff finds the licensee's response acceptable and, therefore, considers the SE issue related to the effects of loss of ventilation in the steam tunnel area resolved.

2.3.5 Drywell (SE Section 2.2.4.5)

SE Recommendation: The licensee should provide, for staff review, a revised analysis of the drywell heatup considering reactor coolant system (RCS) leakage in accordance with the guidance of NUMARC 87-00 (18 gpm per recirculation pump) plus the allowable leakage of 25 gpm to show that the drywell design temperature limit (281°F) will not be exceeded during the 4-hour SBO duration.

Licensee Updated Response: In its earlier response, the licensee committed to review with NUMARC, the CNS design basis LOCA analysis to determine if the LOCA analysis bounds drywell heatup during an SBO event assuming reactor coolant system leakage of 18 gpm per recirculation pump plus the allowable 25 gpm leakage, or to perform a separate analysis of the drywell heatup. In its updated response, the licensee indicated that it performed a separate analysis of drywell heatup and provided calculation NEDC 91-261 for staff review. This analysis predicts a peak drywell temperature of 263°F after four hours compared to the drywell design temperature of 281°F.

Staff Evaluation: Based on its review, the staff finds the licensee's responses acceptable and, therefore, considers the SE issue related to the effects of loss of ventilation in the drywell resolved.

2.4 Quality Assurance And Technical Specifications (SE Section 2.5)

SE Recommendation: The licensee should verify that the SBO equipment is covered by an appropriate QA program consistent with the guidance of RG 1.155. Confirmation that such a program is in place or will be implemented should be included as part of the documentation supporting the SBO Rule response.

Licensee Response: The licensee responded that the SBO equipment is covered by the existing, in-place QA program that is consistent with the guidance of RG 1.155.

Staff Evaluation: The staff accepts the licensee's confirmation and finds this issue to be resolved.

3.0 SUMMARY AND CONCLUSION

The staff has reviewed the licensee's responses to the staff's August 22, 1991, SE pertaining to the SBO Rule (10 CFR 50.63). We find the licensee's responses to be acceptable except that the staff does not agree with the licensee's site specific weather analysis used for determining the extreme severe weather (ESW) and severe weather (SW) classifications. As a result, the licensee's EDG target reliability is 0.975 in order for the Cooper plant to remain a 4-hour coping plant and satisfy the SBO Rule.

This SSE documents the NRC's final regulatory assessment of the licensee's proposed conformance to the SBO Rule. Therefore, no further submittals are required.

The staff considers the two-year clock for implementation of the SBO Rule in accordance with 10 CFR 50.63 (c)(4) to begin upon receipt by the licensee of this SSE. Therefore, the licensee should commit to an 0.975 EDG target reliability to assure complete compliance with the SBO Rule as indicated in the staff's SE and SSE.

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