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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 180 TO FACILITY OPERATING LICENSE NO. DPR-40

OMAHA PUBLIC POWER DISTRICT

FORT CALHOUN STATION, UNIT NO. 1

DOCKET NO. 50-285

1.0 INTRODUCTION

By application dated November 16, 1995, as supplemented by letter dated August 8, 1996, Omaha Public Power District (OPPD) requested changes to the Technical Specifications (Appendix A to Facility Operating License No. DPR-40) for the Fort Calhoun Station, Unit No. 1 (FCS). The requested changes would revise TS 2.7, "Electrical Systems," and TS 3.7, "Emergency Power System Periodic Tests." The changes include adding the safety-related inverters A, B, C, and D into the technical specifications (TSs) with a limiting condition for operation along with a surveillance test for the inverters, and deleting the nonsafety related instruments buses, which include inverters #1 and #2, from the TS.

The August 8, 1996, supplemental letter provided additional clarifying information that did not change the initial no significant hazards consideration determination published in the Federal Register on March 13, 1996 (61 FR 10395).

2.0 BACKGROUND

The FCS a-c instrument system is comprised of six separate buses, four of which supply power to safety-related instrumentation. Each instrument bus is supplied by a separate solid-state inverter which receives input power from the d-c system. Safety-related inverters identified as A, B, C, and D are single phase 120-volts ± 2 percent and are rated 7.5 KVA at a 0.8 power factor. The remaining two inverters identified as #1 and #2 are single-phase 120-volts ± 2 percent and are rated 10 KVA at a 0.8 power factor.

Each of the instrument inverters that supply power to the instrument buses has a bypass source which supplies power to the bus when there is an inverter failure or when inverter maintenance is necessary. In the event of inverter failure, the load on the inverter is automatically transferred to the bypass source. The bypass source is supplied with power from the 480-volt distribution system. In addition to the bypass transformers, inverters #1 and #2 each have a dedicated test transformer that can supply convenience power to instrument buses 1 and 2 respectively when the normal inverter/bypass power supply is unavailable.

Annunciation in the main control room is provided for all instrument buses upon detection of low bus voltage. Each inverter has its own annunciator point in the control room that is actuated when the inverter is in an off-normal condition.

3.0 EVALUATION

The licensee has proposed the following specific changes to the FCS TSs:

Change 1: Under Specification 2.7, (1) Minimum Requirements, part (j.), delete "120V a-c instrument panels AI-42A and AI-42B" and add "Inverters A, B, C, and D."

Change 2: Under Specification 2.7, (1) Minimum Requirements, part (o.), delete "Either one of the 120V a-c instrument panels AI-42A or AI-42B may be inoperable for up to 8 hours" and add "One inverter (A, B, C, or D) may be inoperable for up to 24 hours provided the reactor protective and engineered safeguards systems instrument channels supplied by the remaining three inverters are all operable and the 120V a-c instrument bus associated with the inoperable inverter is powered from its bypass source."

Change 3: Under Basis, add a final paragraph: "The time allowed to repair an inoperable inverter is based upon engineering judgement, taking into consideration the time required to repair an inverter and the additional risk to which the unit is exposed because of the inverter inoperability. In the event of inverter failure, the load on the inverter is automatically transferred to its safety related bypass source. The associated 120V a-c instrument bus is considered OPERABLE when it is being powered from its bypass source and during the short time it takes to manually or automatically transfer between sources."

Change 4: Under 3.7 Emergency Power System Periodic Tests, add "(5) Inverters A, B, C and D. The correct inverter output (voltage, frequency, and alignment to required 120V a-c instrument buses) shall be verified weekly."

The staff expressed the concern that deleting the 120V a-c instrument panels AI-42A and AI-42B from the TSs may result in degrading the treatment of the inverters that normally supply power to these panels. If this were the case, the number of occurrences of loss of power output from these inverters would increase with an attendant increase in the number of occurrences involving loss of power from these panels. Thus, the potential for increasing the number of plant transients may result from this TS change due to the increased number of occurrences of loss of power from one or both of these panels. In response to this concern, the licensee stated that under the maintenance rule for the component reliability and demand failures, the nonsafety related inverters on the 120V a-c instrument panels AI-42A and AI-42B will be treated the same as the safety-related inverters. Preventative maintenance on the

inverters is performed consistent with the reliability-centered maintenance practices in accordance with the Fort Calhoun Station preventative maintenance program. Further, the licensee stated that OPPD had performed a study which concluded that in a normal plant alignment, loss of AI-42A and AI-42B will not result in a plant trip.

During its review, the staff also indicated that the Standard Technical Specifications (STS) explicitly notes that two hours are permitted for a normally inverter-supplied 120V a-c vital bus to be connected to an alternate power source if the inverter is inoperable. However, the proposed TS change does not explicitly address this. In response to this issue, the licensee documents that TS 2.7(2) only allows either the inverter or the vital bus to be inoperable. The STS have two separate limiting conditions for operation (LCO), one for the inverter and one for the vital bus, that can be entered simultaneously. The two hours is the time allowed by the LCO for an inoperable vital bus in the STS. Since TS 2.7(2) only allows one of the conditions listed, having both an inverter and vital bus inoperable at the same time is a circumstance in excess of those addressed by TS 2.7, which requires entry into TS 2.0.1 and a plant shutdown. Thus, the proposed change is more conservative than the STS because it would not allow any vital bus to be de-energized at the same time an inverter is inoperable.

The change permitting an inverter to be inoperable for 24 hours versus the current 8 hours is consistent with the STS requirement. The 24-hour limit is based upon engineering judgment taking into consideration the time required to repair an inverter and the additional risk to which the unit is exposed because of the inverter inoperability. This is balanced against the risk of an immediate shutdown, along with the potential challenges to safety systems such a shutdown might entail. The weekly TS surveillance requirement is also consistent with STS requirements.

On the basis of the above, the staff concludes that the proposed TS changes are technically adequate, consistent with STS requirements, and are acceptable.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Nebraska State official was notified of the proposed issuance of the amendment. The State official had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

The amendment changes a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The NRC staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendment involves no significant hazards consideration, and there has been no public comment on such finding (61 FR 10395). Accordingly, the amendment

meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b) no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

6.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

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