

October 1, 1990

PRELIMINARY NOTIFICATION OF EVENT OR UNUSUAL OCCURRENCE -- PNO-IV-90-35

This preliminary notification constitutes EARLY notice of events of POSSIBLE safety or public interest significance. The information is as initially received without verification or evaluation, and is basically all that is known by the Region IV staff on this date.

FACILITY: Omaha Public Power District  
Fort Calhoun Station  
Docket No. 50-285

Licensee Emergency Classification:  
 Notification of Unusual Event  
 Alert  
 Site Area Emergency  
 General Emergency  
 Not Applicable

SUBJECT: PLANT SHUTDOWN GREATER THAN 72 HOURS DUE TO DESIGN DEFICIENCIES

On September 28, 1990, at 6:01 p.m. (CDT), the licensee commenced a controlled shutdown from 100 percent power due to potential design deficiencies in the component cooling water (CCW), raw water (RW), and containment spray (CS) systems. The plant is currently in Hot Shutdown (Mode 3), which it entered at 3:40 a.m. on September 29, 1990.

During the ongoing Design Basis Reconstitution program at Fort Calhoun, the licensee identified that the Fort Calhoun Station could be outside the containment cooling design bases of the CCW, RW, and CS systems following a worst case design basis accident (DBA). These concerns were identified through preliminary calculations performed by the Stone and Webster (SWEC) and AEB Combustion Engineering (CE). The licensee implemented a controlled shutdown of the plant to Hot Shutdown as a conservative course of action pending final determinations.

The worst case DBA postulated was a large break loss of coolant accident (LOCA), concurrent loss of offsite power and instrument air, and failure of Emergency Diesel Generator (EDG) No. 2. These accident conditions would have the following effects:

- ° Upon loss of instrument air, the RW/CCW interface valves would fail open, thus rendering the CCW system inoperable due to loss of CCW inventory. Backup air accumulators on these valves are nonsafety-related and credit could not be taken for their availability. The RW system is the backup cooling for the CCW system.
- ° Upon loss of EDG No. 2, the RW system would be reduced to two RW pumps. Due to the elevation difference between the RW pumps and the containment air cooling coils, insufficient pressure would be available to prevent the RW from flashing to steam in the cooling coils. This could degrade the performance of the containment coolers.
- ° Upon loss of EDG No. 2, only one of the three CS pumps (SI-3A) would be available, due to present electrical bus alignment, to cool the containment during postulated accident conditions. The one CS pump would

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be aligned to both CS headers. In this configuration, system resistance and initial containment pressure would allow the pump and motor to operate in runout mode, where pump horsepower requirements exceed the motor's 300 HP capacity and 1.15 service factor (345 HP). Once containment pressure went above approximately 45 psig within 3 minutes of the accident, the pump would be operating within its service factor. The licensee determined that at the 60 psig containment design pressure, the pump would deliver the minimum required flow to mitigate the pressure transient.

On September 29, 1990, documented analyses were received confirming the equipment vulnerability in the postulated scenarios. The licensee issued a 4-hour report pursuant to 10 CFR 50.72(b)(2)(4).

In addition, during the review, the licensee determined that another possible design problem existed in the CCW system. This was based on a postulated large break LOCA, concurrent with a loss of offsite power and a loss of a DC bus. This scenario could render two of the three CCW pumps inoperable and prevent adequate cooling to the shutdown heat exchangers after initiation of a recirculation actuation signal.

Preliminarily, the licensee believes the problem with inadequate CCW flow to the containment coolers can be addressed by blocking the RW/CCW interface valves shut, negating the need for RW backup to CCW. To increase system resistance for the single CS pump to operate efficiently, the licensee is considering either modifying valve logic such that only one header would be available upon start of a single pump or adding mechanical restriction devices. The third concern of inadequate CCW flow to the shutdown heat exchangers in the post-LOCA scenario has not yet been confirmed and probable solutions have not been discussed.

The licensee has stated that it will formally address the proposed solutions to the design basis problems in a submittal to the NRC staff on October 1, 1990. The licensee estimates that the solutions, once finalized, will take approximately 1 week to implement.

The licensee has not issued a news release.

The state of Nebraska will be informed.

Region IV received notification of this occurrence from the Senior Resident Inspector at 4 p.m. (CDT) on September 28, 1990. Region IV has informed EDO, NRR, and PA.

This information has been confirmed with a licensee representative.

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(5520: <u>10/1/90 @ 10:30</u>
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