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VICE PRESIDENT
NUCLEAR OPERATIONS

September 16, 1988
Fort St. Vrain
Unit No. 1
P-88337

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555

Docket No. 50-267

SUBJECT: Loss of All AC Power
Sources and Station
Battery Load Profile

Gentlemen:

Public Service Company of Colorado (PSC) hereby submits in the following attachment, information on the assessment of the Fort St. Vrain station battery load profile and PSC's interim position in response to a loss of all AC power event until the requirements of 10CFR50.63 can be assessed for a high temperature gas cooled reactor.

It is PSC's position that the service load demand on the station batteries need only satisfy a one hour load profile as described in the original Final Safety Analysis Report (FSAR) rather than a four hour load profile as currently described in the Updated FSAR.

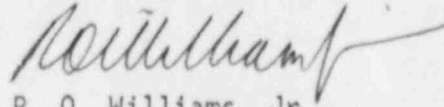
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Should you have any questions concerning this matter, please contact Mr. M. H. Holmes at (303) 480-6960.

Very truly yours,



R. O. Williams, Jr.
Vice President
Nuclear Operations

ROW/JCS:pa

Attachment

cc: Regional Administrator, Region IV
ATTN: Mr. T. F. Westerman
Chief, Projects Section B

Mr. Robert Farrell
Senior Resident Inspector
Fort St. Vrain

BACKGROUND INFORMATION

Section 8.2.3.4 of the FSV Preliminary Safety Analysis Report (PSAR) stated that each station battery (Battery 1A or 1B) was adequate to supply the DC shutdown loads for not less than one hour following a loss of all AC power. This basis was retained up through Revision 3 to the Final Safety Analysis Report (FSAR). In Revision 4, Section 8.2.3.4 of the FSAR was revised to state that Battery 1A or 1B is adequate to supply the required shutdown DC Loads for four hours following a loss of all AC power, consist with the four hour load profile defined in Station Battery Design Criteria DC 92-1 and as reflected in the surveillance requirements of SR 5.6.2 of the Technical Specifications for battery testing. FSAR Figure 8.2-14 shows the single line diagram of the DC distribution panels for station batteries 1A and 1B.

An assessment of the DC loads listed on the above referenced FSAR figure and the load profile defined in DC 92-1 finds that most of the critical safety functions being performed which require battery power are occurring within the first minute. These safety functions are those associated with the tripping of numerous circuit breakers and the actuation of numerous relays in the plant's control and PPS systems. Other critical safety functions occurring within the first hour are those associated with supplying standby diesel generator control power and with supplying inverter power for monitoring and control instruments and emergency lighting. The remainder of the loads associated with the battery are non-safety related such as plant computer power and items associated with equipment protection only (primarily associated with the main turbine).

PSC maintains the position that credit for the station batteries (batteries 1A, 1B and 1C) need only be assessed for a one hour duration following a loss of all AC power event. Well within one hour of the loss of AC power event, the Alternate Cooling Method (ACM) diesel generator can be started and aligned to provide AC power for effecting a reactor shutdown and recharging of a station battery. The following section provides the justification.

JUSTIFICATION

The following discussion demonstrates sufficient justification that AC power can be restored within one hour in the event of a loss of all AC power. Restoration of AC power within this time ensures that AC and DC power will be available to those systems, equipment and components required for shutdown of the plant.

(1) In a Station Blackout event (Loss of the Five Offsite Transmission Lines, Loss of the Main Turbine-Generator and Loss of Both Standby Diesel Generators), the ACM diesel generator would be available to provide power to the essential 480 VAC buses, so that forced circulation cooling could be established with either condensate or firewater. This is supported by the following:

- A. In a Station Blackout event, PSC considers that operators could implement the Restoration of Power To Essential 480 Volt Buses procedure, SSC-01, and supply ACM diesel generator power to these buses within 45 minutes. Establishing a one hour battery load profile requirement is conservative.

A walkdown of SSC-01, performed in 1987 as documented in PSC Internal Memo PPS-87-005, demonstrated operators could perform the necessary steps to establish ACM diesel generator power to a 480 VAC essential bus in less than 20 minutes. PSC recognizes that during a Station Blackout event, operators will initially work toward starting one of the Standby Diesel Generators (SDGs) and bringing in off-site power from one of the five offsite connections to FSV. However, since establishing a source of electrical power is the primary objective, it is not unreasonable to credit the operators with the ability to implement SSC-01 and power the essential buses from the ACM Diesel Generator in 45 minutes should power be unavailable from one of the other sources.

- B. With power supplied to the essential buses at one hour, operators can perform the necessary actions to establish forced circulation cooling with condensate (Fire Protection Shutdown/Cooldown Train A - Safe Shutdown Cooling Procedure SSC-03) or firewater (Safe Shutdown Cooling Procedure SSC-05) in 90 minutes. Provided adequate forced circulation is started at 90 minutes and maintained in operation, analyses demonstrate that peak core fuel temperatures will not exceed

2900 degrees F (a temperature well below that at which rapid fuel deterioration is anticipated) and no significant fuel particle coating failure will occur. Analyses also demonstrate that the reactor coolant pressure boundary and containment boundary will remain intact, preventing the release of significant amounts of primary coolant to the atmosphere. This assures that offsite doses resulting from a Station Blackout event will be a very small fraction of 10CFR100.

- (2) The FSV Technical Specifications govern the ACM diesel generator and provide assurance it will be available to "backfeed" the 480 VAC essential buses following a Station Blackout event.

Limiting conditions for operation and surveillance requirements applicable to the ACM diesel generator are defined in LCO 4.2.17, SR 5.2.20 and SR 5.2.21.

- (3) The original licensing basis as defined in the PSAR and subsequent SAR updates up to Revision 4 of the Updated FSAR established battery capacity basis to supply the required shutdown DC loads for one hour following a loss of all AC power.
- (4) The existing batteries and DC bus configuration are adequate to power the loads needed for one hour. After one hour the ACM diesel generator will be available to supply power to the essential buses for charging the batteries even in the event of a Station Blackout.

COMMITMENTS

In view of the above discussed justification, PSC commits to the following:

- A. Issuance of a change notice (CN) to revise the Station Battery Design Criteria, DC 92-1, to change the four hour load profile to a one hour load profile. Issuance of the CN will also incorporate the one hour load profile for Battery 1C, which is not currently addressed. This CN will be completed prior to restart following the 4th refueling.
- B. Revise the surveillance procedure which implements Technical Specification SR 5.6.2 surveillance to reflect the one hour load profile for battery testing requirements prior to the next

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scheduled battery surveillance test following the current outage testing requirements.

- C. Generate an interim procedure to address plant operation with only DC power available for up to one hour prior to restart from the current outage. This procedure will provide assurance that forced circulation is placed in effect at no later than 90 minutes after the loss of all AC power.

All of the above commitments will serve as the baseline for the future FSV assessment against the Station Blackout requirements defined in 10CFR50.63.