

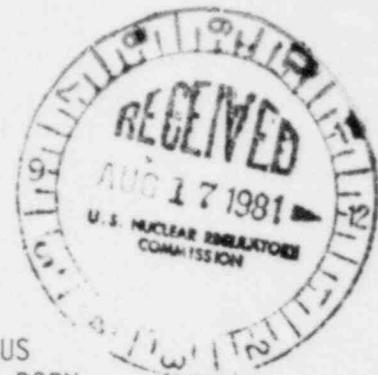
TEXAS UTILITIES SERVICES INC.

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Log # TXX-3387
File # 825

August 14, 1981

Mr. Spottswood Burwell
Licensing Project Manager
U. S. Nuclear Regulatory Commission
Office of Nuclear Reactor Regulation
Washington, D.C. 20555



SUBJECT: COMANCHE PEAK STEAM ELECTRIC STATION
CONSEQUENCES OF A POSTULATED LOSS OF DC BUS
COUPLED WITH A SINGLE FAILURE DISABLING A PORV
ALLOWING A COLD DEPRESSURIZATION EVENT

Dear Mr. Burwell:

Please find attached a response to the subject concern raised by your RSB.

If you have any questions, please call.

Sincerely,

H. C. Schmidt for

H. C. Schmidt

AND

AND:tls
Attachment

cc: R. D. Calder
J. T. Merritt
J. C. Kuykendall
R. A. Jones
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Sill*

CONSEQUENCES OF A POSTULATED LOSS OF DC BUS
COUPLED WITH A SINGLE FAILURE DISABLING A PORV
ALLOWING A COLD DEPRESSURIZATION EVENT

QUESTION: (Informal by NRC-RSB)

ADDRESS THIS SCENARIO:

With the plant in a cooled down and depressurized condition in which the cold overpressure protection system is required to be operable, and with charging and letdown established, a DC vital bus fails. This failure causes normal letdown to isolate and also results in the loss of one of two Power Operated Relief Valves (PORV)(1).

RESPONSE:

To begin this discussion the limitations placed on plant operation by the current Westinghouse Standard Technical Specifications (STS) will be addressed.

1. With Reactor Coolant System (RCS) temperature below 200°F, i.e. Cold Shutdown, one Residual Heat Removal (RHR) pump is required to be in operation and the other RHR loop is required to be operable. This requirement ensures that at least one RHR suction relief valve is available for overpressure protection of the RCS. This valve is typically sized to

(1) Due to loss of DC power to the solenoid valve which directs air away from the valve diaphragm failing the valve closed.

relieve the capacity of one charging pump at the valve lift setting pressure.

2. Whenever the RCS is in a condition in which the cold overpressure protection system is required to be operable, all but one charging pump are required by technical specifications to be made incapable of operation. This requirement assures that only one charging pump would be operating at the initiation of the event. Considering these requirements, any time RHR is in operation and the RCS is in a condition requiring the cold overpressure protection to be operable there will be no overpressure event as a result of the prescribed scenario. Assuming the event as described⁽²⁾ did occur the RHR relief valve would prevent RCS pressure from reaching the Appendix G limit by relieving all charging flow.

Typically the RHR system is in operation, or at a minimum the RHR loop suction valves are open providing an open path from the RCS to the RHR suction relief valves, whenever RCS temperature is below 350°F. For this reason an overpressure event resulting from the prescribed scenario is very unlikely, however, the discussion will be extended to the infrequent case where the RHR system is isolated from the RCS and the cold overpressure protection system is required to be operable.

To gain a better understanding of the results of the event it is necessary to address the functions of some of the Chemical and Volume Control System (CVCS) control valves. As stated earlier,

the letdown valves will fail closed on loss of DC power isolating letdown. The normal charging isolation valve will fail open on loss of DC power to the solenoid air valve, however between the charging pump and the normal charging isolation valve are two normally throttled valves which receive their power from the process and control racks powered by the vital AC instrument buses. These valves then would be unaffected by a DC bus failure and would continue to work normally during the event. One of these valves is the charging flow control valve (FCV-121) which automatically regulates flow to maintain a prescribed pressurizer level. Assuming this valve continues to function normally, as pressurizer level rises charging flow would be reduced until the charging flow would be limited to that required for seal injection (32 gpm) plus a minimal amount (15 gpm) required for Regenerative HX cooling. At this flowrate ample time is provided (as discussed below) to allow appropriate operator action. If valve control were in manual the valve position would remain unchanged. The other valve is the charging flow backpressure regulator (HCV-182) which is manually positioned to regulate flow to the seal. These valve would remain in its initial position. The effect of these two valves would be to limit charging flow to its value at the beginning of the event. Assuming maximum letdown at the initiation of the event total flow (charging plus seal injection) to the RCS would be limited to approximately 120 gpm.

An additional consideration is that with the plant in the Hot Shutdown condition and RHR isolated from the RCS, normal operation is to have a steam bubble in the pressurizer of approximately 1350

ft³. At a maximum charging rate of 120 gpm it would take in excess of 30 minutes to reach the Appendix G limit at 200⁰F, the temperature corresponding to the coldest RCS temperature at which RHR is permitted to be isolated. As an extreme case, with a bubble of only half the normal size, the corresponding time available for appropriate action would be in excess of 16 minutes.

1. The postulated event is unlikely to occur since the DC buses have a battery as an emergency power supply and should the DC bus fail it must be coupled with the additional failure of the second PORV for overpressurization.
2. In the unlikely event that the prescribed scenario did occur RHR would normally be on line and capable of mitigating any potential overpressure resulting from one charging pump.
3. In the highly unlikely event that the scenario should occur when RHR is isolated from the RCS the operator would have sufficient time to mitigate the event.
4. The Appendix G curves are excessively conservative for their intended purpose of assuring vessel integrity during cold shutdown.

The applicant maintains that no further action is necessitated to address this postulated event and that existing plant design and operational techniques will result in successful event mitigation.