

## SNUPPS

Standardized Nuclear Unit  
Power Plant System

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April 13, 1984

SLNRC 84-0064 FILE: 0491.10.2  
SUBJ: Significant Deficiency Report (SDR)  
84-03: Failures In Control Devices  
In RCS PORV's

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Docket Nos. STN 50-482 and STN 50-483

Gentlemen:

The enclosed report is forwarded on behalf of the SNUPPS Utilities; i.e. Union Electric Company and Kansas Gas and Electric Company, as a final Significant Deficiency Report under 10CFR50.55(e) criteria. The deficiency involves undersized relays in the overpressurization protection control circuits, designed by Bechtel for the Reactor Coolant System (RCS) Power Operated Relief Valves (PORV's). Since the SNUPPS project utilizes a standardized design for both Callaway and Wolf Creek plants, this deficiency is considered to be generic in nature. As indicated in the enclosure, design modifications have been developed to correct this problem and will be implemented in the field by means of Field Change Work Plans.

The deficiency described in the enclosed report was reported via telecon by Union Electric Co. and Kansas Gas and Electric Co. to NRC Regions III and IV, respectively, on March 2, 1984. The problem with the control circuits was initially detected during startup testing at Callaway Site in June, 1983. A preliminary review at that time indicated the problem was not reportable under 10CFR50.55(e) criteria on the basis that it had been detected and corrected in the course of routine startup testing. This matter has been re-examined and it has since been determined the deficiency in question would be reported to NRC.

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If you have any questions regarding the enclosed report, please advise.

Very truly yours,



S. J. Seiken  
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WAB/dck/18b10

Encl: Final Report on Failures in Control Devices in RCS PORV's

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10 CFR 50.55(e) REPORT  
ON  
FAILURES IN CONTROL DEVICES IN REACTOR COOLANT SYSTEM  
POWER OPERATED VALVES INSTALLED AT THE SNUPPS UNITS

April 10, 1984

BECHTEL POWER CORPORATION  
Gaithersburg, Maryland

10 CFR 50.55(e) REPORT ON POWER OPERATED RELIEF VALVES

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## 1.0 INTRODUCTION

In accordance with the requirements of 10 CFR 50.55(e), this report provides a summary of the generic deficiency related to improperly rated fuses and relay contacts in Reactor Coolant System (RCS) Power Operated Relief Valves (PORV) installed at the Callaway and Wolf Creek jobsites.

This deficiency was initially reported to Mr. R. Lerch of NRC Region III by Union Electric, and to Mr. J. Jaudon of NRC Region IV by Kansas Gas & Electric on March 2, 1984.

The problem was first identified during functional testing of the RCS at Callaway. A Startup Field Report was written to document the actuation of the fuses during startup testing of the control circuit for the PORVs. With the energization of the solenoids in the circuit, the fuses on the positive and negative legs blew causing the PORVs to fail closed. It was also determined that the contacts of the auxiliary relays (manufactured by Struthers-Dunn) used to switch the solenoids were not rated sufficiently for the magnitude of current drawn by the solenoid.

## 2.0 DESCRIPTION OF REPORTABLE DEFICIENCY

The actuation of the fuses leaves the PORVs inoperable in the closed position. The non-availability of the PORVs prevents these valves from functioning to mitigate the consequences of a cold overpressure event, and maintain the RCS below 10 CFR 50 Appendix G limits. There are two valves in each SNUPPS plant associated with this deficiency.

## 3.0 ANALYSIS OF SAFETY IMPLICATIONS

A review of the Startup Field Report discloses that the failure mode of the subject valve is "closed." If the solenoid is energized, the current drawn by the coil exceeds the 3 amp. fuses installed in the circuit; hence the 3 amp. fuses blew, de-energizing the circuit and causing the PORVs to close. During the startup or shutdown of the plant when the RCS temperature is below 368°F, the PORVs are required to be available to function to mitigate the consequences of a cold overpressure event and maintain the RCS below 10 CFR 50 Appendix G limits. Below a temperature of 350°F, the Residual Heat Removal (RHR) system relief valves may be available to the RCS and may be used to serve this function. Above 368°F, the pressurizer safety valves perform the overpressure protection function.

## 4.0 CAUSE OF DEFICIENCY

The original design, which was described in a Bechtel electrical drawing issued in February 1982, called for 3 amp. fuses on the positive and negative legs of the control circuit. This design was based on the full load current of less than 3 amps. depicted in the applicable Westinghouse drawing. However, the Garrett valve drawings furnished by Westinghouse indicate a maximum of 9 amps. drawn by the solenoid which reflect post-TMI design modifications established by the NSSS supplier. The higher value of current drawn by the solenoid was not detected and was not incorporated into the control circuit. Consequently, the fuses blew when the solenoids were energized during startup testing.

## 5.0

CORRECTIVE ACTION

A design change package was issued to incorporate 15 amp. fuses into the PORV control circuit and to add a DC contactor rated in excess of the maximum current drawn by the solenoid. The design drawings have been revised to reflect these changes, and equipment changes will be made prior to the requirement for the valves to be operable per the technical specifications.

The design requirements for the relief valves specified by Westinghouse have been reviewed again to confirm that the latest Westinghouse design requirements have been properly identified and incorporated into the A/E design. The results of this review confirm that the circuit deficiency was limited to the considerations as discussed in sections 1.0 through 4.0 of this report.