



FORT ST. VRAIN NUCLEAR GENERATING STATION

### DOCKET NO. 50-267

#### 1.0 INTRODUCTION AND BACKGROUND

AUCLEAR REGULATO

By letters dated January 15 and February 26, 1987, the staff approved the design and Technical Specifications for the Fort St. Vrain (FSV) Steam Line Rupture Detection/Isolation System (SLRDIS). SLRDIS is a unique system in use at FSV to mitigate the effects of a high energy line break (HELB). FSV has a special problem in withstanding HELB accidents because of the high temperatures used in the primary and secondary coolant (steam) system. HELB's can lead to temperatures in excess of qualification limits for those equipment items required to be qualified under 10 CFR 50.49, the equipment qualification rule.

SLRDIS was designed to respond quickly to significant HELB's by sensing rapid temperature rises in the FSV reactor and turbine buildings. If the rate-of-rise trip setpoint was exceeded, SLRDIS closed almost all of the valves in the secondary coolant system in order to isolate the HELB. This automatic action assured that the temperatures reached would not exceed the temperatures to which equipment had been qualified.

The licensee's technical evaluations of larger HELB's were verified by the staff through independent calculations. The licensee also stated that protection was provided for small HELB's by the SLRDIS fixed temperature high alarm. Upon receipt of a high temperature alarm, the operators could diagnose the potential problem and manually initiate SLRDIS if necessary to isolate the HELB.

Subsequently, the licensee reported by letter dated September 21, 1988, that errors were discovered in the computer codes used to evaluate the reactor and turbine building temperature following an HELB. In a subsequent letter, dated September 28, 1988, the licensee elaborated that the errors in the code mainly impacted calculations for small HELB's having rupture areas equal to or below 2% of the full offset rupture area. The licensee proposed to correct this problem by adding a fixed high temperature trip setpoint of 180°F. The following discusses an addition to the FSV Technical Specifications of an additional fixed high temperature trip setpoint.

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## 2.0 EVALUATION

The purpose of SLRDIS is to sense abnormal temperature increases in the FSV reactor and turbine buildings. For large HELB's, the current 55°F per minute rate of rise temperature trip serves to adequately isolate this class of HELB's. However, HELB's with small break areas can produce a slow temperature rise of 15 to 20°F per minute. This temperature rise is insufficient to produce an automatic SLRDIS actuation. The operator will become aware of the HELB through both alarms, and the obvious audible noise produced by such events. However, the staff's conservative approach to the human factor's aspects of such events requires that a period of at least 10 minutes elapse before the operators can begin to isolate the HELB through manual actions. This leads to excessively high building temperatures up to 275°F. This building temperature can persist for a sufficiently long duration to adversely affect environmentally qualified equipment.

The licensee has determined that addition of a fixed high temperature trip at about 180°F resolves this problem. Since SLRDIS will isolate the HELB almost instantly, the maximum temperature rise is limited to about 180°F. This reduces the equipment qualification temperature profile in this critical region so that equipment qualification is maintained. The addition of the fixed temperature trip feature is done entirely by software changes to SLRDIS. Therefore, modification is straightforward, and introduces no new failure modes. The staff's original basis for approval of the SLRDIS design is maintained.

Based on the above, the staff concludes that the licensee's proposal represents satisfactory approach to the problem at hand. The additional LCO's and SR's proposed by the licensee for inclusion in the FSV Technical Specifications to implement the new SLRDIS trip setpoint are therefore acceptable, and should be incorporated.

#### 3.0 ENVIRONMENTAL CONSIDERATION

This amendment involves a change in the installation or use of a facility component located within the restricted area. The 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 exposures. 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. Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR Section 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.

# 4.0 CONCLUSION

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

Date: February 27, 1989

Principal Contributors: Kenneth L. Heitner, PD-IV