

ENCLOSURE

SAFETY EVALUATION

DOCKET NO. 50-416

GRAND GULF UNIT 1

QUALIFICATION OF CONTROL SYSTEM (IEN 79-22) LICENSE CONDITION 2.C.(19)

IE Information Notice 79-22, "Qualification of Control System", September 14, 1979, described an NRC staff concern that if control systems are exposed to the environment resulting from the rupture of reactor coolant lines, steamlines, or feedwater lines, the control systems could malfunction in a manner that would cause consequences to be more severe than assumed in safety analyses described in FSAR Chapter 15. The staff requested the licensee to perform a review to determine what, if any, design changes or operator actions would be necessary to ensure high-energy-line pipe breaks would not cause control system malfunction and complicate the event beyond safety analyses described in the Final Safety Analysis Report (FSAR). The staff's concern was expressed in Section 7.8C of the Grand Gulf 1 Safety Evaluation Report (SER), NUREG-0831, September 1981.

By letters dated March 23, and April 26, 1982, the licensee provided a description of a review initiated to determine whether high-energy-line pipe breaks could have an effect on multiple control systems and to investigate the impact of failure of the applicable systems on the FSAR Chapter 15 safety analysis. The low power license (NPF-13) issued on June 16, 1982, included License Condition 2.C.(25) which required design changes, if any were found necessary by staff's review of licensee's analysis. This license condition was included in the full power license (NPF-29) issued on November 1, 1984, as

8502200319 850212  
PDR ADOCK 05000416  
Q PDR

License Condition 2.C.(19). By letters dated October 25, 1982 and October 18, 1984, the licensee provided information summarizing the results of a design review, analysis, and plant walkdown addressing this concern.

The staff's review of the licensee's analysis of the effects of high-energy-line pipe breaks on control systems resulted in a need for additional information. By letter dated November 9, 1982, the licensee committed to (1) provide additional information clarifying the single active failure assumptions of this study and (2) provide the results of additional analysis of the effects of humidity, pressure, and temperature in addition to the effects of pipe whip and jet impingement on the operability of control systems. The October 18, 1984, letter contained the necessary additional information and analysis.

Based on our review, the staff concludes that there is no single high energy pipe break event that, in conjunction with a single failure in systems required for safe shutdown, results in an unreviewed safety concern. The single failures considered by the licensee were in addition to the consequences of high energy line breaks on non-safety control systems. The most significant non-safety control system failure results in an excess feedwater transient that is not terminated by a level 8 trip of the feedwater turbines and may be accompanied by a failure of the turbine bypass valves during main turbine trip. In Section 15 of Supplement 4 to our SER, the staff found the licensee's analysis of this event to be acceptable.

Because MP&L analyses demonstrate that, with presently installed systems, there is no unreviewed safety concern, the staff concludes that License Condition 2.C.(19) in Operating License NPF-29 has been satisfied.