



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

ROCHESTER GAS AND ELECTRIC CORPORATION

R. E. GINNA NUCLEAR POWER PLANT

DOCKET NO. 50-244

1.0 INTRODUCTION

The Safety Evaluation Report (NUREG-0916) related to the restart of Ginna after the steam generator tube rupture (SGTR) incident on January 25, 1982 and specifically license conditions 2.C(9)1 through 20 required that Rochester Gas and Electric Corporation (RG&E) address 20 long-term items. Two of the license conditions 2.C(9)18 and 2.C(9)19 concerned potential for pressurized thermal shock (PTS) resulting from stagnant flow conditions in a coolant loop followed by actions which would draw cold water into the vessel.

By letter dated November 22, 1982 (Reference 1) RG&E provided sufficient information to the staff to evaluate the licensee's response to the staff's concerns.

2.0 BACKGROUND

During the staff's review of the January 25, 1982 steam generator tube rupture (SGTR) incident, it was determined that after the main steam isolation valves were closed on the faulted steam generator, the primary coolant flow path changed. It went from natural circulation to stagnant to reverse flow as water in the "B" loop cold leg was drained toward the ruptured tube. Although the staff determined that during the SGTR incident, there was no indication of crack initiation at Ginna, there was concern regarding a general class of events in which one loop is stagnant and cold with respect to the other loop. The general concern is that a venting action could draw relatively cold HPI water into the vessel prior to being mixed by a loop circulation flow.

Based on this concern, the staff requested that the licensee review and identify potential transients and accident scenarios that could produce relatively stagnant flow conditions in a coolant loop, and examine the effect of the operator taking actions which would draw cold water into the vessel. For scenarios identified, the licensee was to review and modify procedures, and train operators as necessary to prevent or minimize the flow of cold water into the vessel. In the long term, the licensee was to include an evaluation of the scenarios in the overall resolution of the pressurized thermal shock issue. Equipment, procedures, and operator training were to be modified in accordance with the resolution of the issue.

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3.0 EVALUATION

The situations addressed which might result in stagnant flow were: (1) inadequate core heat generation (decay heat fractions less than 0.5 percent of full power), (2) loss of reactor coolant system inventory (small break LOCA), (3) inadequate symmetric heat removal (loss of heat sink), and (4) non-symmetric heat removal (overcooling in one steam generator, due to steam line break or steam generator tube rupture resulting in the isolation of one steam generator).

Following a period of loss of natural circulation, starting the reactor coolant pumps (RCPs), using the PORV to depressurize the reactor coolant system, or a subsequent break in the hot leg or reactor vessel upper head region can draw the cold safety injection water into the downcomer. During extended periods of loss of natural circulation (on the order of 20 minutes), safety injection will result in low downcomer temperatures.

The staff has evaluated PTS for Westinghouse plants in SECY-82-465 (Reference 3) based on the Westinghouse Owners Group PTS program (Reference 4). This evaluation included the consequences of the events described above. In SECY-82-465 the staff concluded that the risk associated with PTS, including events which lead to loss of natural circulation, is acceptable for plants with nil-ductility transition reference temperatures below the screening criterion value of 300°F (circumferential welds). The reference temperature calculated for R.E. Ginna was 213°F (as of December 31, 1981).

The Ginna SGTR event of January 25, 1982 was also evaluated in SECY-82-465. It was concluded that for a reference temperature below 378°F, no PTS related vessel failure would occur for this event.

Prior to implementation of a NRC PTS Rule, the actions taken by the licensee, through involvement in the Westinghouse Owners Group programs for both PTS and Operator Guidelines, provide reasonable assurance that the risk associated with PTS at the R.E. Ginna Nuclear Power Plant is acceptable. Pending implementation of the PTS Rule, the staff concludes that no further actions need to be taken by the licensee at this time. As a member of the Westinghouse Owners Group, the licensee will implement design changes and operator procedure changes as necessary, and as identified in the resolution of USI A-49.

4.0 CONCLUSION

Based on its review, the staff concludes that the licensee has adequately addressed the requested scenerios. In a separate evaluation (SECY-82-465), the staff also concluded that for the January 25, 1982 SGTR, no PTS related vessel failure would occur. Further, it was concluded that through involvement with the Westinghouse Owners Group program for PTS and operator guidelines, the risk associated with PTS at Ginna is acceptable.

5.0 ACKNOWLEDGEMENT

E. Throm prepared this evaluation.

Date: October 31, 1983

6.0 REFERENCES

1. Docket 50-244, "Response to Safety Evaluation Report NUREG-0916 Steam Generator Tube Rupture Incident R. E. Ginna Nuclear Power Plant Docket No. 50-244," letter from J. E. Maier to D. M. Crutchfield, November 22, 1982.
2. NUREG-0916, "NRC Report on the January 25, 1982 Steam Generator Tube Rupture at R. E. Ginna Nuclear Power Plant," USNRC, April 1982.
3. SECY-82-465, "Pressurized Thermal Shock (PTS)," November 23, 1982.
4. "Summary of Evaluations Related to Reactor Vessel Integrity," WOG Letter OG-70, from O.D. Kingsley to H. Denton, May 28, 1982.