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50-410
CASE # MA8478A

Dear Sir:

This is to bring to your attention, my concerns regarding a crack in the RPV nozzle for the High Pressure Core Spray System of the Nine Mile Point Unit 2 (NMP2) nuclear station at Lycoming, NY.

In 1990, a circumferential crack extending over about 20 percent of the circumference with a maximum depth of about 0.4 inch from the inside surface, was detected in the bottom side of the weld between the nozzle and the safe end. To stabilize the crack, MSP treatment - radial compression to induce residual compressive stress at the crack tip - was performed. However, ultrasonic examination after the MSP treatment indicated significant crack extension. Based on the evaluations by GE and the MSP vendor, NRC allowed the plant to be started on the condition that the crack be examined after about 8 months. Subsequent examinations showed the crack size to be smaller than that indicated immediately after the MSP treatment. Consequently NRC, in due course, relaxed the examination requirement to every other refueling outage.

For radiation protection during ultrasonic examination, the High Pressure Core Spray piping adjoining the RPV nozzle is covered with heavy lead blankets. This results in high compressive dead weight stress at the crack and an under-estimate of the size of the crack. The larger crack size indicated after MSP treatment, which was disregarded based on later measurements, was probably realistic for the following reasons:

- a. The lead shielding weight was lower at that time.
- b. The constant support hanger in the vicinity of the nozzle was pinned. (During subsequent examinations, the hanger was not pinned because it could not be qualified for the seismic load in the pinned condition.)
- c. According to GE, MSP treatment at Peach Bottom nuclear plant had resulted in crack extension requiring weld repair.

The long horizontal run of the High Pressure Core Spray piping adjoining the RPV nozzle, is subject to significant thermal stratification during plant operation. The thermal stratification load is not considered in piping stress analysis and consequently in the crack evaluation.

Over a period of time, the beneficial residual stress induced by the MSP treatment may be dissipated by fatigue cycling.

At NMP2, the High Pressure Core Spray nozzle also serves as the RPV inlet for the Standby Liquid Control (boron injection) System. Hence the integrity of this nozzle is of vital safety significance.

In view of the above concerns, I hope that during the current refueling outage, NRC will require a thorough examination of the crack, with the hanger pinned, and the lead shielding distributed on either side of the hanger so as to minimize compressive stress at the crack.

If you have a question, please call.

Sincerely,



Khushwant S. Grewal

Xc: The Plant Manager, NMP2

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