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October 5, 1983
5211-83-290

Office of Nuclear Reactor Regulation
Attn: J. F. Stolz, Chief
Operating Reactors Branch #4
Division of Licensing
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Dear Sir:

Three Mile Island Nuclear Station, Unit 1 (TMI-1)
Operating License No. DPR-50
Docket No. 50-289
TMI-1 Steam Generator Hot Test Program Results

This letter is to provide you with a very preliminary evaluation of the results of steam generator hot testing prior to a more formal report scheduled for mid-October. As described in Topical Report 008, Rev. 3, a series of cooldowns were planned to place axial loads associated with operating transients on the repaired steam generator tubes.

This series of cooldowns is now complete. Although data reduction is still in progress, preliminary evaluations are outlined below. Final leakage rate measurements will be provided with our report on the test program, but values provided below are a representative estimate.

During the first cooldown transient, 60°F/Hr cooldown rate, the maximum attainable OTSG shell to tube differential temperature was 34°F. An expected OTSG shell to tube differential temperature approaching 70°F was not attained

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since the OTSG shell cooled down at a rate which is higher than the predicted value. The greatest cooling effect took place in the lower half of the shell which was being quenched by the high water level in the OTSG which should and does remain at the OTSG saturation temperature.

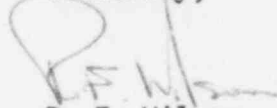
The second cooldown transient, at 90°F/Hr and OTSG water level maintained at approximately 30" on the start-up scale was expected to produce a maximum OTSG shell to tube differential temperature greater than 70°F. During this cooldown, the lower portion of the OTSG shell again cooled faster than expected, while the upper shell cooldown rates during the first and second cooldown were approximately the same. A tube to shell delta T of 46°F was obtained during this second cooldown transient.

Because these cooldowns did not attain the differential temperature desired, a third cooldown was conducted using the emergency feedwater (EFW) system to feed the OTSG to maintain a minimum water level, with main feedwater isolated. This transient provided a minimum quenching of the OTSG shell and thus produced higher shell to tube temperature differences. During this cooldown, a maximum tube-to-shell delta T obtained for the "A" OTSG was 107°F, and for the "B" OTSG, 98°F.

Steady state leakage was measured by monitoring condenser vacuum pump discharge for Kr⁸⁵ radioactive tracer gas before, during, and after each transient. While the cooldowns were in progress, leakage approximately doubled, but when temperatures and pressures were restored to steady state, leakage returned to approximately the pretransient value. The final leakage values will be determined when evaluation of calibration data from grab samples is complete, but it can be concluded that steady state primary-to-secondary leak rates are approximately 1 gph + 50%. Measurement of leakage by tritium or boron concentration in the secondary was also part of the program, but leakage rates were too low and concentrations never approached minimum detectable limits.

GPUN is very encouraged by the preliminary results of steam generator hot testing, and is returning TMI-1 to the cold shutdown condition. The formal report on results of the test program is scheduled for completion in mid-October and will be provided to you as soon as it is available.

Sincerely,



R. F. Wilson
Vice President
Technical Functions

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cc: H. Silver
C. McCracken