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SUBJECT: Forwards rept GE-NE-523-B13-01920-39, "Structural Margin Assessment to Support Current Fuel Cycle Operation of Nine Mile Point Unit 1 w/Shroud Vertical Weld Indications," revising overly conservative assumptions re GL 94-03.

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April 30, 1998
NMP1L 1310

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

RE: Nine Mile Point Unit 1
Docket No. 50-220
DPR-63

Subject: ***Generic Letter 94-03, "Intergranular Stress Corrosion Cracking of Core Shrouds in Boiling Water Reactors"***

Gentlemen:

The purpose of this letter is to provide the results of the structural margin assessment of the Nine Mile Point Unit 1 (NMP1) core shroud vertical welds and to provide new schedules for completion of: 1) the fracture toughness testing of the core shroud material and, 2) the final review of the fluence measurement results.

By letter dated February 27, 1998 (NMP1L 1290), Niagara Mohawk Power Corporation (NMPC) provided the results of the NMP1 core shroud boat sample electrochemical potentiokinetic reactivation (EPR) testing and tensile specimen testing. The technical justification for extension of the current NMP1 core shroud vertical weld inspection interval from 10,600 hours of hot operation to 14,500 hours of hot operation also was provided. The basis for the extension included reference to supplemental fracture mechanics which demonstrate additional margin. The analysis provided in General Electric (GE) report GE-NE-523-B13-01920-39, "Structural Margin Assessment to Support Current Fuel Cycle Operation of Nine Mile Point Unit 1 with Shroud Vertical Weld Indications," (Attachment 1) is the completed supplemental fracture mechanics analysis referred to in the February 27, 1998 submittal.

The attached analysis revises several overly conservative assumptions made by NMPC in the April 1997 assessment of the vertical weld cracking which were not required by the BWRVIP-01 guidelines. These assumptions were considered prudent until the boat sample analysis could be completed and additional fracture mechanics assessments could be completed which credit the horizontal welds. The boat sample analysis has eliminated much of the uncertainty regarding the nature of the vertical weld cracking and the vertical weld material condition. This reduced uncertainty combined with the supplemental review of the vertical weld ultrasonic (UT) data, enhanced visual examination (EVT-1) inspections, and additional fracture mechanics analysis cases, have resulted in the conclusion that these conservative assumptions are not warranted and create overly restrictive analysis conditions. The structural analysis has clearly established that the NMP1 core shroud will maintain the required ASME code and NRC required safety factors even considering the extreme assumption of a 5E-5 in/hr crack growth for the entire operating cycle of 14,500 hours. The conservatism in this structural evaluation is further supported by the crack growth rate analysis, submitted February 27, 1998, which established that the maximum

crack growth rate anticipated is over a factor of 10 lower (4.2E-6 in/hr) than the previous assumption. The analysis documented in this report has demonstrated by several analysis techniques that the NMP1 core shroud has multiple levels of margin which sufficiently bound any uncertainty regarding the analysis assumptions.

In the February 27, 1998 letter, NMPC stated that a final review of the fluence measurement results was planned after the completion of the re-evaluation of the reactor vessel material surveillance 210 degree vessel coupon dosimetry analysis. The results of this review were scheduled to be completed in April, 1998, and NMPC stated that if any changes to the fluence measurement results were required, they would be submitted by April 30, 1998. The reactor vessel material surveillance 210 degree vessel coupon dosimetry analysis and the associated neutron transport analysis have not been completed. The preliminary review has concluded that the Cu dosimeter may indicate that the total fluence is slightly higher than was measured based on the Fe and Ni activity used to measure the shroud fluence. The potential increase is currently estimated to be less than 15% which would not affect any of the structural margin and crack growth assessments which are the basis for the 14,500 hour operating interval. The final vessel dosimetry analysis is currently scheduled to be completed in May 1998. If the core shroud boat sample fluence analysis requires revision, a revised report will be submitted by the end of June 1998.

In the February 27, 1998 letter, NMPC also stated that the results of the fracture toughness testing would be submitted by April 30, 1998. NMPC has completed the preliminary design of a miniature fracture toughness specimen from the V9 boat sample material. At this time, NMPC is pursuing industry support for the completion of this fracture toughness testing and is also investigating alternative laboratories to complete the testing. This testing is not considered by NMPC as required to support the core shroud vertical weld fracture analyses which are based on the BWRVIP-01 guidelines and fracture toughness assumption requirements. NMPC will provide the results of the fracture toughness testing when completed.

In conclusion, the Attachment 1 analysis incorporates the overall conclusions reached from review of the vertical weld boat samples, review of the inspection data, and review of the fracture mechanics analyses. The analysis confirms that the core shroud structural margins can be maintained for the operating period in excess of the 14,500 hot operating hours requested in the February 27, 1998 submittal.

Very truly yours,

Richard B. Abbott
Vice President - Nuclear Engineering

RBA/TRE/kap
Attachment

xc: Mr. H. J. Miller, Regional Administrator, Region I
Mr. S. S. Bajwa, Director, Project Directorate I-1, NRR
Mr. B. S. Norris, Senior Resident Inspector
Mr. D. S. Hood, Senior Project Manager, NRR
Records Management

ATTACHMENT 1