April 27, 2000

Mr. John H. Mueller
Chief Nuclear Officer
Niagara Mohawk Power Corporation
Nine Mile Point Nuclear Station
Operations Building, Second Floor
P.O. Box 63
Lycoming, NY 13093

SUBJECT: NINE MILE POINT NUCLEAR STATION, UNIT NO. 2 - CORE SHROUD REINSPECTION PLAN FOR REFUELING OUTAGE 7 (TAC NO. MA7284)

Dear Mr. Mueller:

In a letter dated October 15, 1998, transmitting a safety evaluation regarding core shroud inspection and flaw evaluation for operation after Refueling Outage 6 (RFO6), the NRC staff requested you to submit the RFO7 core shroud reinspection plan at least 3 months before the RFO7 reinspection is performed. Accordingly, by letter dated December 2, 1999, you submitted the RFO7 core shroud reinspection plan. In response to our request for additional information dated February 10, 2000, you provided supplemental information by your letter of March 3, 2000.

The staff reviewed the information contained in your two letters. Our review results are set forth in the enclosed safety evaluation. We conclude that your proposed inspection of two horizontal welds, H4 and H5, during RFO7 is acceptable. We also reviewed your proposed re-inspection schedule for the remaining core shroud welds. We note that the development of the reinspection schedules are, in part, based on guidance provided in the Topical Reports BWRVIP-62, BWRVIP-63 and BWRVIP-76, which are still under review. You should consider our recommendations, if any, in the to-be-published safety evaluations of these topical reports for the proposed re-inspection schedules of the remaining core shroud welds.

Sincerely,

/RA/

Peter S. Tam, Senior Project Manager, Section 1
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-410

Enclosure: As stated

cc w/encl: See next page

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cc w/encl: See next page
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DATED: April 27, 2000

SAFETY EVALUATION, LICENSE NO. NPF-69 NINE MILE POINT UNIT NO. 2

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

CORE SHROUD REINSPECTION PLAN FOR REFUELING OUTAGE 7

NINE MILE POINT NUCLEAR STATION, UNIT NO. 2

NIAGARA MOHAWK POWER CORPORATION

DOCKET NO. 50-410

1.0 INTRODUCTION

In a letter dated October 15, 1998, transmitting a safety evaluation regarding core shroud inspection and flaw evaluation for operation after Refueling Outage 6 (RFO6), the NRC staff requested Niagara Mohawk Power Corporation (the licensee) to submit the RFO7 core shroud reinspection plan at least 3 months before the RFO7 reinspection is performed. Accordingly, by letter dated December 2, 1999, as supplemented by letter dated March 3, 2000, the licensee submitted the core shroud reinspection plan to be performed at RFO7. The staff reviewed the information contained in those submittals. Results of the staff's review follow. Additional background information may be found in the staff's October 15, 1998, safety evaluation referenced above.

2.0 EVALUATION

Based on the Boiling Water Reactor Vessel and Internals Project's (BWRVIP's) "Guidelines for Reinspection of BWR Core Shrouds," (BWRVIP-07) and "Shroud Vertical Weld Inspection and Evaluation Guidelines" (BWRVIP-63), the licensee proposed to inspect only two horizontal welds, H4 and H5, during RFO7. The inspection will be performed on all accessible areas of the welds using the GE OD Tracker. The accessible areas of these welds are estimated to be greater than 50 percent of the weld length. During the last refueling outage (RFO6) additional portions of the inside diameter (ID) surface of weld H5 were inspected due to the considerations of linear elastic fracture mechanics (LEFM) analysis. Subsequently, the licensee has performed a fluence calculation for weld H5. The licensee performed a preliminary fluence calculation which showed that the peak level at the end of Cycle 8 is expected to be less than 3×10^{20} neutrons/cm^2, well below the threshold where an LEFM analysis is required.

The licensee proposed the following re-inspection schedule, and associated rationale, for the remaining core shroud welds:

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(1) The horizontal welds H1, H2, H3, H6 and H8 were inspected during RFO6. The inspection results of these welds showed either no cracking or cracking did not exceed 10 percent of the inspected length. Based on guidance provided in BWRVIP-07, the reinspection interval for these welds is once every 10 years. These welds are scheduled to be re-inspected during RFO11.

(2) The cracking found in horizontal weld H7 during RFO6 exceeded 30 percent of the inspected length. The licensee performed a plant-specific analysis for weld H7. The re-inspection interval was determined to be greater than 6 years by using a crack growth rate of 2.2×10^{-5} inch/hour in accordance with BWRVIP-14, "Evaluation of Crack Growth in BWR Stainless Steel Reactor Pressure Vessel Internals." Based on the guidance in BWRVIP-76, "BWR Core Shroud Inspection and Flaw Evaluation Guidelines," the re-inspection interval of this weld is capped at 6 years. Therefore, the licensee has scheduled to re-inspect this weld during RFO9.

(3) Based on the guidance in BWRVIP-63, vertical welds V4, V5, V12 and V17 are scheduled for re-inspection during RFO11. The planned inspection interval of vertical welds V24 and V25 welds is 6 years, i.e. in RFO9, based on the H7 inspection interval and if credit for NobleChem/Hydrogen Water Chemistry protection (as allowed in BWRVIP-62, "Technical Basis for Inspection Relief for BWR Internal Components with Hydrogen Injection") is taken. The licensee indicated that NobleChem/Hydrogen Water Chemistry protection is expected to be available starting in the fall of 2000 and, therefore, the re-inspection of V24 and V25 will be scheduled for either RFO8 or RF09.

(4) The core shroud at Nine Mile Point 2 is not repaired. In accordance with BWRVIP-63, for unrepaired core shroud, the inspection of radial ring welds (V1 through V3, V6 through V11 and V18 through V23) is not required.

The staff has reviewed the licensee's core shroud reinspection plan for RFO7 and concludes that the proposed inspection of two horizontal welds, H4 and H5, in RFO7 is acceptable. This is because the proposed re-inspection plan for RFO7 meets the guidance in BWRVIP-07 and BWRVIP-63. The staff also reviewed the proposed re-inspection schedule for the remaining core shrouds welds. The staff notes that the development of the subject re-inspection schedules are, in part, based on the guidance provided in the Topical Reports BWRVIP-62, BWRVIP-63 and BWRVIP-76. The staff has not yet completed the review of BWRVIP-62 and BWRVIP-76, but has issued, by letter dated April 18, 2000, an initial safety evaluation (SE) for BWRVIP-63. This initial SE has several open items which the BWRVIP, and individual licensees using this BWRVIP guidance, will need to address. However, these open items do not change the above staff conclusions. The licensee should consider the staff's recommendations in the SEs of these topical reports for the proposed re-inspection schedules of the remaining core shroud welds.

Principal Contributor: William H. Koo

Date: April 27, 2000