

April 5, 2001

Mr. John H. Mueller
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SUBJECT: NINE MILE POINT NUCLEAR STATION, UNIT NO. 1 - CORE SHROUD
REINSPECTION SCOPE FOR REFUELING OUTAGE NO. 16 (TAC NO.
MB1006)

Dear Mr. Mueller:

By letter dated October 20, 1999, the NRC staff issued to Niagara Mohawk Power Corporation (NMPC) the results of its review of the Refueling Outage No. 15 (RFO-15) core shroud reinspection results at Nine Mile Point Nuclear Station, Unit No. 1. In that document, the staff requested NMPC to provide information regarding the scope of the core shroud reinspection at least 3 months before the start of RFO-16. Accordingly, NMPC provided such information by a letter dated December 15, 2000.

During March 6 thru 8, 2001, the staff held a number of telephone discussions with NMPC. The discussion centered around the staff's comments documented in an e-mail dated March 5, 2001 (publicly available, Accession No. ML010640205). As a result of these discussions, NMPC supplemented its original submittal by a letter dated March 13, 2001.

The staff completed its review of the referenced NMPC submittals. Review results are summarized in the enclosed safety evaluation. The staff finds NMPC's core shroud reinspection scope for RFO-16 acceptable.

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. 50-220

Enclosure: Safety Evaluation

cc w/encl: See next page

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

CORE SHROUD REINSPECTION FOR REFUELING OUTAGE NO. 16

NINE MILE POINT NUCLEAR STATION, UNIT NO. 1

NIAGARA MOHAWK POWER CORPORATION

DOCKET NO. 50-220

1.0 INTRODUCTION

By letter dated October 20, 1999, the NRC staff issued to Niagara Mohawk Power Corporation (NMPC) the results of its review of the 1999 Refueling Outage No. 15 (RFO-15) core shroud reinspection results at Nine Mile Point Nuclear Station, Unit No. 1 (NMP1). In that document, the staff requested NMPC to provide information regarding the scope of the core shroud reinspection at least 3 months before the start of RFO-16. Accordingly, by letter dated December 15, 2000, NMPC provided such information.

During March 6 thru 8, 2001, the staff held a number of telephone discussions with NMPC. The discussion centered around the staff's comments documented in an e-mail dated March 5, 2001 (publicly available, Accession No. ML010640205). As a result of these discussions, NMPC supplemented its original submittal by a letter dated March 13, 2001.

2.0 EVALUATION

Based on the two submittals referenced above, NMPC's proposed core shroud reinspection scope for RFO-16 can be summarized as follows:

- (1) The core shroud horizontal welds (H1 through H7) will not be inspected because these welds were structurally replaced by four tie rod assemblies.
- (2) Of the core shroud vertical welds, the accessible inside diameter (ID) surface area of the V4 weld will be visually inspected by enhanced visual techniques (EVT-1) inspection to reconfirm that the ultrasonic testing (UT) indication (about 6 inches in length) is not ID surface connected. During RFO-15, welds V9 and V10 were repaired by two clamp assemblies on each weld. For the remaining vertical welds, no structurally significant indications were found and the results of flaw evaluation have shown that these welds need not be inspected for at least two operating cycles.
- (3) The ring segment welds will not be inspected during RFO-16, because no indications were found in the previous inspections using UT and EVT-1 inspection during RFO-15 and RFO-14, respectively.

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- (4) All four tie rod assemblies will be visually inspected. One tie rod assembly at the 350-degree azimuth will be verified for tightness by measuring the tie rod nut rotation. One of the four core plate wedges will be reinspected.

In the telephone calls that took place during March 6 thru 8, 2001, the staff and NMPC discussed the proposed inspection scope of the repair components. As a result, NMPC supplemented its original submittal with the March 13, 2001, letter in which NMPC states that during the previous inspection (i.e. during RFO-15), a cap screw was found to have failed on the upper spring assembly of one tie rod assembly. As part of the subsequent extent of condition review, other cap screws that were susceptible to the same degradation mechanism were identified. NMPC's review concluded that the failed and susceptible locations on the tie rod assemblies were confined to the upper spring assembly region and that the failure was due to stress corrosion cracking resulting from high stress due to differential thermal expansion. During RFO-15, NMPC installed a modification at these upper spring locations to eliminate the high stress condition caused by differential thermal expansion. For RFO-16, NMPC would reinspect the modified areas. Additionally, NMPC will perform a complete visual inspection of all accessible areas of each tie rod assembly within the annulus.

- (5) All clamp assemblies installed on the vertical V9 and V10 welds will be visually inspected in detail to confirm that there are no changes from their initial conditions.
- (6) UT inspection will be performed on shroud support weld H8. NMPC is developing an advanced UT technique to improve the coverage of the H8 weld. This advanced UT technique will be qualified to Boiling Water Reactor Vessels and Internals Project (BWRVIP) standard, BWRVIP-03, "Reactor Pressure Vessel and Internals Examination Guidelines." If this technique is not successful, NMPC will use the contingency inspection technique of General Electric (GE) OD tracker UT method. The GE OD tracker UT method was used in 1995 and 1997 for core shroud inspection.
- (7) During RFO-15, shroud support weld H9 was visually inspected using the EVT-1 method. The inspection coverage was close to 100 percent and no indications were found. Based on the guidance in BWRVIP-38, "BWR Shroud Support Inspection and Flaw Evaluation Guidelines," shroud support weld H9 need not be inspected during RFO-16. However, NMPC plans to inspect this weld on a best-effort basis using an advanced UT method from the pressure vessel annulus.

3.0 CONCLUSION

The staff reviewed the proposed core shroud reinspection scope against historical documents (for a listing, see NMPC's March 13, 2001, letter). The staff finds that NMPC's core shroud reinspection scope proposed for RFO-16 at NMP1 is consistent with the requirements or guidance of these documents, and therefore, is acceptable.

Principal Contributors: W. Koo and C. E. Carpenter

Date: April 5, 2001