

August 16, 2000

MEMORANDUM TO: Marsha Gamberoni, Chief, Section 1  
Project Directorate I  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

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

SUBJECT: NINE MILE POINT NUCLEAR STATION, UNIT NO. 2 –  
ELECTRONIC TRANSMISSION FROM THE LICENSEE REGARDING  
CORE SHROUD INSPECTION RESULTS (TAC NO. MA9057)

On July 26, 2000, Ken Embry of the licensee's staff e-mailed additional information (attached) to support the staff's review of the licensee's April 28, 2000, submittal regarding core shroud inspection results obtained during Refueling Outage 7. In accordance with NRC Management Directive (MD) 3.53, the e-mail is transmitted to ADAMS as record material. The files attached to Embry's e-mail are not treated as record material and are destroyed in accordance with MD 3.53.

Docket No. 50-410

Attachment: As stated

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**From:** <embryk@NiagaraMohawk.com>  
**To:** <pst@nrc.gov>  
**Date:** Wed, Jul 26, 2000 1:20 PM  
**Subject:** Information requested in June 21, 2000 conference call

As a follow-up to the conference call with the NRC dated June, 21, 2000, attached is the additional information relative to the Core Shroud which was requested by the NRC to address questions in the NRC memorandum from P.S. Tam to M.Gamberoni, dated June 7, 2000. Specifically, the response to questions 1 and 3 of the memorandum needed to be further explained. Question 2 was addressed during the conference call and is considered closed.

In addition, in Attachment 2 of NMPC's core shroud reinspection results submittal dated April 28, 2000, it was stated that the BWRVIP-14 crack growth rate of  $2.2 \times 10^{-5}$  in/hr was applicable for fluences  $< 5.0 \times 10^{20}$  n/cm<sup>2</sup> ( $E > 1$  MeV), and corresponded to water chemistries with a conductivity of less than or equal to 0.15 microseimens/cm (A typographical error was identified in the submittal dated April 28, 2000 in that the conductivity was identified as 0.15 microseimens/cm<sup>2</sup>). The units should have been microseimens/cm). NRC has requested that NMPC provide plant specific chemistry data. The chemistry data is being provided with this E-Mail.

Response to Questions 1 and 3 of NRC memorandum dated June 7, 2000:

Question 1: Provide a table showing the lengths and depths of all detected flaws found during Refueling Outages 6 and 7 for welds H4 and H5. Also provide a similar table(s) for characterized flaws which were used as input in the LEFM analysis.

Question 3: The current LEFM evaluation (RF07 evaluation) uses an average crack depth of 0.58 inch as the initial crack depth. However, the previous evaluation (RF06 evaluation) uses a crack depth of 0.5 inch, which is 28.2 % larger than the average crack depth of 0.39 inch, as the initial crack depth. Justify the relaxation for the initial crack depth assumption.

Response:

The attached Excel file titled "Outage Data" provides lengths and depths of all detected flaws found during RF06 and RF07 inspection of welds H4 and H5 (Upper and Lower Side of welds). The file titled "Profile" provides a comparison plot of RF06 and RF07 data for weld H4. Based on RF06 and RF07 inspection of weld H4, the ligaments for which credit was taken in the LEFM analysis are as follows (Note: Remaining ligaments were assumed to be flawed through-wall, consistent with BWRVIP-01):

Attachment

Ligament	
Start (Deg.)	End (Deg.)
2.6	18.7
22.9	35.0
54.9	77.4
85.9	125.0
140.7	174.9
182.6	305.0
320.7	354.7

In RF06, GE performed UT data analysis using the TOMOSCAN workstation. In RF07, however, UT data analysis was conducted by GE using the more refined TOMOVIEW workstation. A re-evaluation of the RF06 data using TOMOVIEW showed no significant variation in flaw sizing for welds H4 and H5. The RF06 data contained in the attached file "Outage Data" is based on the re-evaluation performed using TOMOVIEW. This allows for easier comparison of data between RF06 and RF07.

Based on RF06 UT inspection data, the average crack depth of welds H4 and H5 was estimated to be approximately 0.39 inches (TOMOSCAN data). Re-evaluation of RF06 data using TOMOVIEW, the average flaw depth of welds H4 and H5 was determined to be 0.41 inches and 0.40 inches respectively (see file "Outage Data"). The method used for determining the average flaw size is conservative in relation to the method established in BWRVIP-76, since the flaws are averaged over the flawed length as against the BWRVIP-76 methodology which averages the flaws over the inspected length. The actual LEFM analysis of weld H4 contained in Reference 1, however, used a more conservative average flaw size of 0.5 inches. The methodology used to perform the LEFM analysis was consistent with the BWRVIP-01 requirements.

Using the same conservative approach for determining the average flaw size in relation to the BWRVIP-76 method discussed above, the average flaw depth for weld H4 was determined to be 0.46 inches from the RF07 inspection. The actual LEFM analysis of weld H4 performed by GE was based on a more conservatively established average flaw depth of 0.58 inches. This average flaw depth was determined using the following criteria: (a) Flaws were averaged over the flawed length, (b) Each individual flawed segment depth was set equal to the peak UT depth for that segment. The maximum average calculation for weld H4 based on RF07 data is contained in the attached file "MaxAverage". The methodology used to perform weld H4 LEFM analysis is consistent with the BWRVIP-01 requirements. Also, the margins between the computed average flaw depth and the maximum (average) flaw depths used for performing the H4 LEFM analysis in RF06 and RF07 essentially provide the same margins.

Chemistry Data Requested in June 21, 2000 conference call:

Review of NMP2 chemistry data for Cycle 7 and period of Cycle 8 operation has

indicated the following:

Average Conductivity: 0.087 umho/cm

Average Reactor Dissolved Oxygen: 180 ppb

If you have any questions please contact Ken Embry at 315-349-1518.

(See attached file: Outage Data.xls)(See attached file: Profile.xls)(See attached file: MaxAverage.xls)

**CC:** <wolniakd@NiagaraMohawk.com>, <leonardm@NiagaraMoh...

**Mail Envelope Properties**

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**Creation Date:** Wed, Jul 26, 2000 1:20 PM  
**From:** <embryk@NiagaraMohawk.com>

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