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SUBJECT: Forwards responses to request for addl info re feedwater nozzle N4D weld flaw provided during 980617 & 22 telcons. Repts encl.

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June 23, 1998
NMP2L 1793

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

RE: Nine Mile Point Unit 2
Docket No. 50-410
NPF-69

Subject: ***Responses to NRC Staff Questions Regarding Feedwater Nozzle N4D Weld Flaw Provided During Telephone Conversations of June 17, 18, and 22, 1998***

Gentlemen:

By letter dated on June 17, 1998, Niagara Mohawk Power Corporation (NMPC) submitted to the NRC an evaluation of a flaw found by examination in the subject feedwater nozzle at Nine Mile Point Unit 2 (NMP2). The examination was conducted to fulfill the requirements of Generic Letter (GL) 88-01, "NRC Position on IGSCC in BWR Austenitic Stainless Steel Piping." In accordance with GL 88-01, NMPC requested approval of the evaluation prior to restart, currently scheduled for June 25, 1998.

Additional information was requested from NMPC, by the NRC staff, during telephone conferences on June 17, 18 and 22, 1998. The responses to the questions are provided in Attachment A (and Enclosures) to this letter.

Sincerely,

Richard B. Abbott
Vice President Nuclear Engineering

RBA/JM/kap
Attachment
Enclosures

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

ATTACHMENT A

REQUEST FOR ADDITIONAL INFORMATION

NIAGARA MOHAWK POWER CORPORATION

NINE MILE POINT NUCLEAR STATION UNIT NO. 2

Request for Additional Information #1

In Structural Integrity Associates, Inc. Report SIR-98-067, Revision 0, June 1998, Table 3-1, there are six loads identified. What are the load combinations considered for the normal, upset and faulted conditions?

Response #1

Table 3-1 provided six separate load categories. For the purposes of responding to this request, the loads in the table are numbered from 1 to 6 as follows:

1	Deadweight
2	Thermal (envelope)
3	OBEA
4	OBEI, OCCU
5	OBEI, OCCE
6	SSEI, OCCF

Loads are combined for the purpose of this analysis as follows (the x-axis is aligned with the pipe centerline):

Normal/ Upset	1+2+4
Faulted	1+2+6

The evaluation calculates three primary stresses: primary membrane (P_m), primary bending (P_b), and expansion (P_e). The faulted loading combination creates the most limiting case. The loads that contribute to these stresses are as follows:

Primary Membrane (P_m)	Pressure Stress
Primary Bending (P_b)	1+6
Expansion Stress (P_e)	2

Structural Integrity Associates, Inc. Report SIR-98-067, Revision 1, June 1998, is provided as Enclosure 1.

Request for Additional Information #2

What was the weld process used for the Inconel 82 weld?

Response #2

The CBI weld records indicate that Gas Tungsten Arc Welding (GTAW) process was used to weld the replacement safe end to the nozzle.

Request for Additional Information #3

In order to evaluate the crack growth rate (CGR) data provided, provide the environmental operating history at the flaw location including temperature, oxygen content, and conductivity. Indicate where the oxygen samples were taken.

Response #3:

The feedwater temperature at this location is within the range of 405 degrees F to 425 degrees F. Oxygen content is required to be between 20ppb and 200ppb and is normally kept in the range of 20 to 50ppb. Conductivity and oxygen data for the last cycle are included as Enclosure 2. UFSAR figure 10.1-6b at location B4 shows the sample point. This location is on the 30 inch feedwater header downstream of the six point heaters.

Request for Additional Information # 4

Was the weld butter at the crack location post weld heat treated (PWHT)? If so, what were the heat conditions?

Response #4

The Inconel 182 weld buildup on the replacement safe end did not receive PWHT. Note 5 on CBI DWG 8-CN222 (Enclosure 4, page 3) states "... carbon steel safe end shall not be Post Weld Heat Treated."

Request for Additional Information #5

With regard to boiling water reactor (BWR) crack growth rate (CGR), what is the data depicted in Figure 3-2 of reference 10 to Structural Integrity Associates, Inc. Report SIR-98-067? What do the points represent?

Response #5

Reference 10 to Structural Integrity Associates, Inc. Report SIR-98-067, Revision 0, is Report SIR-98-068. Enclosure 3 is SIR-98-068, Revision 0, June 1998. See Alloy 182 Crack Growth Analysis Summary on page iii of SIR-98-068. The BWR crack growth rate (CGR) datapoints on Figure 3-2 are discussed on page 3-3 and 3-4 of SIR-98-068.

Request for Additional Information #6

Does NMPC have industry data on Inconel 182 CGR versus stress intensity factor (CGR vs. K)?

Response #6

Structural Integrity Associates, Inc. Report SIR-98-068, Revision 0, page 3-4 provides a discussion of the available industry data on Inconel 182 versus stress intensity factor (CGR vs. K)

Request for Additional Information #7

In Structural Integrity Associates, Inc. Report SIR-98-067, Revision 0, June 1998, there is discussion of Swedish test data and methodology on crack growth rate (CGR). How was crack growth (CG) equation used to calculate CG depth and how does it compare with NUREG-0313, Revision 2, equation for CGR?

Response #7

The information is provided by Structural Integrity Associates, Inc., in report SIR-98-067, Revision 1, June 1998 which includes a curve comparing NUREG-0313, Revision 2, CGR to the Swedish data.

Request for Additional Information #8

Provide a detailed sketch of the safe end to nozzle weld. Include the thickness of joined materials and dimensions of the weld itself.

Response #8

CBI fabrication drawings are provided in Enclosure 4. The UT wall thickness profile is provided in Enclosure 5.

Request for Additional Information #9

What has been the history of water hammer at NMP2 in the feedwater system that could affect the location containing the indication? What actions are normally taken operationally to reduce the risk of water hammer?

Response #9

Operations personnel routinely monitor systems for unusual configurations or unexpected system responses. Should such a condition occur, a Deviation/Event Report (DER) is written and Engineering will evaluate the DER. A control document database and DER database is maintained by NMPC. Both of these databases were reviewed by Engineering for transient evaluations for this portion of the Feedwater System. No documents were found that identified such a transient. Therefore, it is concluded that this portion of the Feedwater System has not experienced an unusual transient event. Enclosure 6 describes the actions and procedural references to steps in place at NMP2 to reduce the risk of water hammer occurrences.

ENCLOSURE 1