Niagara Mohawk®

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April 12, 2001
NMP2L 2017

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: ***Response to Request for Additional Information Related to Request to Use Risk-Informed Inservice Inspection Alternative (TAC No. MB0297)***

Gentlemen:

By letter dated October 16, 2000 (NMP2L 1990), as supplemented by letter dated March 19, 2001 (NMP2L 2013), Niagara Mohawk Power Corporation (NMPC) submitted a request for authorization to use a risk-informed inservice inspection program as an alternative to the current requirements of Section XI of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code for Class 1 and 2 piping at Nine Mile Point Unit 2. A telephone discussion concerning this request was held with the NRC staff on March 21, 2001. As a result of this discussion, a request for additional information (RAI) was issued by the NRC staff on March 23, 2001. NMPC's response to the RAI is attached.

Sincerely,

Richard B. Abbott
Vice President Nuclear Engineering

RBA/JJD/mlg
Attachment: Response to RAI – 7 pages
xc: Mr. H. J. Miller, NRC Regional Administrator, Region I
Mr. G. K. Hunegs, NRC Senior Resident Inspector
Ms. M. K. Gamberoni, Section Chief PD-I, Section 1, NRR
Mr. P. S. Tam, Senior Project Manager, NRR
Records Management

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Niagara Mohawk Power Corporation Response to NRC Request for Additional Information Dated March 23, 2001

Question 1(a):

In Section 2.1 of the Risk-Informed Inservice Inspection (RI-ISI) Program Plan, the alternative RI-ISI program is limited to American Society of Mechanical Engineers (ASME) Code Class 1 and Class 2 piping systems:

The Class 1 pipe components under Examination Category B-F are included in the proposed RI-ISI program plan. In accordance with Table IWB-2500-1 in the ASME Boiler and Pressure Vessel Code, B-F welds include both butt and socket welds for all pipe sizes. Please clarify the scope of B-F welds, preferably by the item number in the ASME Table, included in the RI-ISI program.

Response:

Examination Category B-F, Pressure Retaining Dissimilar Metal Welds

ASME Item No.		Total B-F	Selected RI-ISI
	Reactor Vessel		
B5.10	Nominal Pipe Size (NPS) 4 or Larger - Nozzle to Safe-End Butt Welds	30	8
B5.20	Less than 4 NPS - Nozzle To Safe-End Butt Welds	1	0
	Piping		
B5.130	NPS 4 or Larger - Dissimilar Metal Butt Welds	2	0
B5.150	Dissimilar Metal Socket Welds	10	0
	Totals	43	8

All other code items in this category are not applicable to Nine Mile Point Unit 2.

Question 1(b):

In Section 2.1 of the RI-ISI Program Plan, the alternative RI-ISI program is limited to ASME Code Class 1 and Class 2 piping systems:

The Class 1 pipe components under Examination Category B-J are included in the proposed RI-ISI program plan. In accordance with Table IWB-2500-1 in the ASME Code, B-J welds include circumferential, longitudinal, and socket welds for all pipe sizes. Please clarify the scope of B-J welds, preferably by the item number in the ASME Table, included in the RI-ISI program.

Response:

Examination Category B-J, Pressure Retaining Welds in Piping

ASME Item No.		**Total B-J**	**Selected RI-ISI**
B9.10	NPS 4 or Larger		
B9.11	Circumferential Welds	635	74
B9.12	Longitudinal Welds	(84)*	(11)*
B9.20	Less than NPS 4		
B9.21	Circumferential Welds	215	11
B9.30	Branch Pipe Connection Welds		
B9.31	NPS 4 or Larger	41	1
B9.32	Less Than NPS 4	18	0
B9.40	Socket Welds	37	0
	Totals	946	86

* (XX) Longitudinal welds associated with the applicable circumferential weld examination per Code Case N-524 are not counted in total piping welds.

All other code items in this category are not applicable to Nine Mile Point Unit 2.

Question 1(c):

In Section 2.1 of the RI-ISI Program Plan, the alternative RI-ISI program is limited to ASME Code Class 1 and Class 2 piping systems:

The Class 2 pipe components under Examination Categories C-F-1 and C-F-2 are included in the proposed RI-ISI program plan. In accordance with Table IWC-2500-1 in the ASME Code, C-F welds include circumferential, longitudinal, and socket welds for all pipe sizes. Please clarify the scope of C-F welds, preferably by the item number in the ASME Table, included in the RI-ISI program.

Response:

Examination Category C-F-1, Pressure Retaining Welds in Austenitic Stainless Steel or High Alloy Piping

ASME Item No.		**Total C-F-1**	**Selected RI-ISI**
C5.10	Piping Welds ≥ 3/8 in. Nominal Wall Thickness for Piping > NPS 4		
C5.11	Circumferential Weld	49*	4
C5.12	Longitudinal Weld	(36)**	(0)**
	Total	17	4

* Twenty welds are inaccessible as listed in relief request RR-IWC-2. Twelve welds are excluded per Table 2500-1 Note 2 and not required to be nondestructively examined.

** (XX) Longitudinal welds associated with the applicable circumferential weld examination per Code Case N-524 are not counted in total piping welds.

All other code items in Category C-F-1 are not applicable to Nine Mile Point Unit 2.

Examination Category C-F-2, Pressure Retaining Welds in Carbon or Low Alloy Piping

ASME Item No.		Total C-F-2	Select RI-ISI
C5.50	Piping Welds ≥ 3/8 in. Nominal Wall Thickness for Piping > NPS 4		
C5.51	Circumferential Welds	1399	27
C5.52	Longitudinal Welds	(14)*	(0)*
C5.70	Socket Welds	12	0
C5.80	Piping Branch Connections of Branch Piping ≥ NPS 2		
C5.81	Circumferential Welds	27	0
	Total	1438	27

* (XX) Longitudinal welds associated with the applicable circumferential weld examination per Code Case N-524 are not counted in total piping welds.

All other code items in Category C-F-2 are not applicable to Nine Mile Point Unit 2

Question 2:

In Section 3.5 of the RI-ISI Program Plan, Niagara Mohawk Power Corporation (NMPC) states that Nine Mile Point Unit 2's (NMP2) RI-ISI program will be inspecting greater than 10 percent of the Class 1 piping systems as given in Table 3.5-1. In accordance with Table 5-1, there are 94 Class 1 welds selected for inspection under the RI-ISI program. Please provide the population of Class 1 B-J and B-F welds within the scope of the RI-ISI program.

Response:

At NMP2, the total number of ASME Section XI Category B-F and B-J welds is 989. For RI-ISI, non-augmented program purposes, 94 welds were selected for inspection (9.4%). This number does not include 30 Generic Letter 88-01 intergranular stress corrosion cracking (IGSCC) Category D and E inspections, which when considered brings the Class 1 inspection population to 124 inspections (>12%).

Question 3:

As discussed in Section 3.2.3 of the NRC's safety evaluation related to the Electric Power Research Institute (EPRI) report TR-112657, dated October 28, 1999, a pipe segment susceptible to a degradation other than flow accelerated corrosion (FAC) and which also has the potential for water hammer should receive a high pipe failure potential. NMPC has not identified water hammer as a potential degradation mechanism for selected pipe segments. Please clarify if any of the selected system welds are susceptible to water hammer and any other aging mechanism other than FAC.

Response:

Per section 3.4.2 of TR-112657, a service experience and susceptibility review was conducted for each of the systems within the RI-ISI scope. This review identified one area, in the reactor core isolation cooling system, documented as a potential water hammer event. One of the corrective actions implemented in response to this event was the installation of a keep-fill modification to preclude voiding. This modification has removed the potential for water hammer. Therefore, no systems within the scope of the RI-ISI application were evaluated as being susceptible to water hammer.

Question 4:

Is there any recognizable plant experience regarding piping failures at NMP2?

Response:

No. A review of the NMP2 inspection history did not identify any piping failures for those systems within the scope of the RI-ISI program,

Question 5:

(This question is deleted)

Question 6:

For the systems identified as FWS [feedwater], ICS [reactor core isolation cooling], RHS [residual heat removal and low pressure core injection A, B & C], RPV [reactor vessel nozzle], and WCS [reactor water cleanup], there are welds in certain risk categories that are exposed to other degradation mechanisms (e.g., transgranular stress corrosion cracking (TGSCC), crevice corrosion (CC), thermal transient (TT)) in addition to FAC or IGSCC. All welds in these specific risk categories are typically selected in the augmented FAC or IGSCC program. In some cases, none of these welds are selected in the RI-ISI program. Since the weld examination volume for one aging degradation type may be different from another aging degradation type, please clarify how welds in these specific risk categories are examined for the degradation mechanism (e.g., thermal stratification, cycling and striping (TASCS), CC, TT) other than FAC or IGSCC.

Response:

The appropriate examination volume and technique for each degradation mechanism for which a location is susceptible is selected for use during the RI-ISI examination.

Question 7:

There are some differences when Table 3.8-1B and Table 3.8-2A (or 2B) are compared with respect to the following:

(i) Number of welds currently inspected in accordance with Section XI (for systems identified as DER [drain connection to reactor water cleanup], ISC [instrumentation], MSS [main steam], RDS [control rod drive], RPV, SLS [standby liquid control], and WCS),

(ii) Missing degradation mechanism for each risk category (for systems identified as RPV and WCS),

(iii) Missing consequence for each risk category (for systems FWS and RHS), and

(iv) Missing high consequence welds for system WCS.

Please clarify the discrepancies between the data presented in these tables with respect to the four subject areas (i) to (iv).

Response:

The differences between Tables 3.8-1B and 3.8-2A (or 2B) can be explained by one or more of the following:

Surface Examination – Locations that have a surface only examination in the present Section XI program (i.e., volumetric examination is not performed) are not credited in the delta risk assessment. At NMP2, examinations per Item Nos. B5.20, B5.150, B9.21, B9.32, B9.40, C5.70, and C5.81 are surface only examinations. Consistent with TR-112657 and the pilot plant applications, surface examinations are only credited in the delta risk assessment when a location is identified as susceptible to a degradation mechanism initiated from the outside diameter (i.e., external chloride stress corrosion cracking (ECSCC)).

FAC – Welds in the FAC Program scope and with no other damage mechanism identified are excluded from the delta risk assessment because they remain in the FAC program and since there is no change in the program there is no change in risk.

IGSCC – Welds included in the Generic Letter 88-01 augmented IGSCC program scope (non-Category A welds) with no other degradation mechanism are excluded from the delta risk assessment. Since there is no change in the ISI program, there is no change in risk.

Risk Categories 6 and 7 – Inspections in these categories (low risk region) are excluded from the delta risk assessment (based on Section 3.7 of EPRI TR-112657) because removal of these inspections have a negligible impact on risk.

The specific differences between Tables 3.8-1B and 3.8-2A (or 2B) identified in the question are explained as follows:

(i) See Surface Examination and Risk Category 6 and 7 discussions.
(ii) See FAC and IGSCC discussions.
(iii) See FAC and Risk Category 6 and 7 discussions.
(iv) See IGSCC and Risk Category 6 and 7 discussions.