



Commonwealth Edison

One First National Plaza, Chicago, Illinois

Address Reply to: Post Office Box 767

Chicago, Illinois 60690

December 15, 1984

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Subject: Quad Cities Station Unit 2
Stainless Steel Piping
Inspection and Repair Plan
Spring 1985 Refueling Outage
NRC Docket No. 50-265

Reference (a): H. R. Denton letter to D. L. Farrar
dated February 15, 1984 (Confirmatory
Order).

Dear Mr. Denton:

In Reference (a), the NRC required that plans for inspection, corrective actions, and/or modification, including replacement of the recirculation and/or coolant pressure boundary piping systems be submitted three months prior to the start of the next refueling outage of Quad Cities Unit 2.

The next refueling outage is planned to begin in April 1985. However it may be moved up to sometime in March 1985. Therefore, in compliance with the Confirmatory Order, we submit the following plan:

1. A final decision has not been made on whether or not to chemically decontaminate the recirculation system piping. As soon as this decision is made you will be notified.
2. During the Fall 1983 outage, Induction Heat Stress Improvement (IHSI) was performed on 99 welds (77 Recirculation welds, 10 RHR welds, and 13 RWC welds). There are currently no plans to perform IHSI on any welds during this outage.
3. The tables in Attachment A provide a sampling plan for addressing the Intergranular Stress Corrosion Cracking (IGSCC) concerns for the Quad Cities Unit 2 outage planned for Spring 1985. During the previous outage for this unit, all the identified accessible welds in non-conforming material were

8412270144 841215
PDR ADOCK 05000265
Q PDR

A047
1/1

ultrasonically examined by procedures and examiners complying with I&E Bulletin 83-02. Induction Heating Stress Improvement (IHSI) was performed on the Recirculation system and portions of the Residual Heat Removal system. These welds were UT examined after IHSI. Partial replacement of the Reactor Water Cleanup system was made, with Heat Sink Welding (HSW) used for welds attaching the new low carbon Type 304 stainless steel piping to the existing material.

Generic Letter 84-11 does not provide clear guidance on the inspection requirements for uncracked welds that have received IHSI or HSW stress mitigation. Guidance has been taken from NUREG-1061 Volume 1 where such stress mitigations are considered Countermeasure B Processes and the treated welds are placed in Weld Category B for inspection. Weld Category B requires inspection of 50 percent of the welds of each pipe size in 10 years. Table 1, NUREG-1061 Category B Welds, identifies the mitigated welds by system and size. Seven welds (next to last column) constitute the Category B inspection sample. The 72 mitigated welds have been subtracted from the total Type 304SS welds, resulting in 171 welds (last column) to be addressed under Generic Letter 84-11.

Table 2, Generic Letter 84-11 Welds, addresses uncracked and cracked welds from the previous inspection. The uncracked welds are shown in the second column with a sample of 46 welds (third column) to be inspected. Although not specifically covered by Generic Letter 84-11, 3 of the 12 recirculation system safe end-to-nozzle welds (2 inlet and 1 outlet) will be examined, including the thermal sleeve to safe end welds on the inlets.

All of the 13 cracked welds which were IHSI treated (column 4) will be inspected. If this inspection and a subsequent inspection after an additional operating cycle show no change in the detected cracks, we intend to reduce further inspections to a sample of the 13 welds.

The nine overlaid welds (column 5) will not be inspected as there is no demonstrated UT technique available. We consider the favorable compressive stresses developed in the underlying base material to have arrested the cracks. Although this can not be demonstrated in the absence of a meaningful UT inspection, Commonwealth Edison believes there is adequate understanding of the beneficial effects of weld overlays to justify an additional operating cycle without inspection.

The inspection sample for the Quad Cities Unit 2 outage for Spring 1985 totals 66 welds. The welds selected from the non-flowing branch lines will generally be biased to the higher temperature portions of these lines. The safe end-to-nozzle welds in the Recirculation system and the sweepolet welds in the ring header will be treated as sub-categories from other welds in those pipe sizes. If cracks are detected within the inspected sample of a specific piping system and size, the inspection will be expanded in accordance with IWB2430 of ASME Code Section XI for that system and size. However, if the detected cracks are minimal both in number and size we may elect to request relief from Section XI inspection expansion requirements.

4. The NDE contractors performing UT inspection will be Lambert, MacGill and Thomas (LMT) and Universal Testing Laboratories (UTL) - Kraft Werke Union (KWU). The Level II and III UT personnel performing evaluations of crack indications were qualified at the EPRI NDE Center by successfully performing the practical (83-02) examination. Level I and II UT personnel performing scanning duties will be trained by the contractor on site. Results of the contractor examinations will be provided to Commonwealth Edison Company. NDE personnel for review and ultimate resolution. These CECO personnel were qualified by the practical (83-02) examination at the EPRI NDE Center. Advanced techniques will be used in the final evaluation of all circumferential crack indications to determine whether they are indeed cracks and, if so, what is their depth and length.

If any circumferential cracks are identified EPRI qualified IGSCC Sizars may be used to measure the crack depth. If EPRI qualified IGSCC Depth Sizars are used, their measured crack depth will be used for analysis.

5. Each flaw indication will be evaluated in accordance with the guidance of NUREG-1061 volume 1. If repairs are required, weld overlays will be utilized which take into account flaw characterization, depth, length, and material toughness concerns for SMAW and SAW deposited material.
6. A piping replacement commitment has not been made for Quad Cities Unit 2. However plans are underway to be prepared for replacement during the Fall 1986 outage.

H. R. Denton

- 4 -

December 15, 1984

If you have any further questions regarding this matter, please contact this office.

One signed original and forty (40) copies of this letter and its attachment is provided for your use.

Very truly yours,

A handwritten signature in dark ink, appearing to read "B. Rybak". The signature is fluid and cursive, with a large, sweeping "B" and a stylized "Rybak".

B. Rybak
Nuclear Licensing Administrator

lm

cc: NRC Resident Inspector - Quad Cities
R. Bevan - NRR

9504N

ATTACHMENT A

Quad Cities Station Unit 2

Stainless Steel Piping Inspection Plan

9504N

AUGMENTED ISI

QUAD CITIES 2 SPRING 1985

TABLE 1 NUREG-1061 CATEGORY B WELDS

	TOTAL WELDS (304SS)	IHSI (UNCRACKED)	HEAT SINK WELDS	CATEGORY B SAMPLE	84-11 WELDS
Recirculation Risers (12")	44	37	0	3	7
Noz-SE	10	0	0	0	10
Ring Header (22")					
Butt Welds	14	4	0	0	10
Sweepolets	8 ¹	0	0	0	8 ¹
Outlets (28")	30	19	0	2	11
Noz-SE	2	0	0	0	2
Bypass Stubs (4")	8	0	0	0	8
Residual Heat Removal					
LPCI (16")	32	6	0	1	26
SD Cooling (20")	18	2	0	0	16
Head Spray (4")	17	0	0	0	17
(6")	5	0	0	0	5
Core Spray (10")	27	0	0	0	27
Reactor Water Cleanup (6")	8	1	3	1	4
CRD Return (4")	7	0	0	0	7
Head Vent (4")	3	0	0	0	3
Jet Pump Instru- mentation (Total Assemblies)	10	0	0	0	10
	243	69	3	7	171

¹ Records indicate these welds are solution annealed. They are included due to reported crack indications at other units.

0408B/70

AUGMENTED ISI

QUAD CITIES 2 SPRING 1985

TABLE 2 GENERIC LETTER 84-11 WELDS

	84-11 WELDS	UNCRACKED WELDS TOTAL	WELDS SAMPLE	CRACKED WELDS IHSI	WELDS OVERLAY	84-11 SAMPLE ¹
Recirculation Risers (12")	7	0	0	3	4	3
Noz-SE	10	10	2 ³	0	0	2
Ring Header (22")						
Butt Welds	10	8	2	2	0	4
Sweepolets	8 ²	8	2	0	0	2
Outlets (28")	11	0	0	7	4	7
Noz-SE	2	2	1 ³	0	0	1
Bypass Stubs (4")	8	8	2	0	0	2
Residual Heat Removal						
LPCI (16")	26	26	5	0	0	5
SD Cooling (20")	16	14	3	1	1	4
Head Spray (4")	17	17	3	0	0	3
(6")	5	5 ⁴	4	0	0	4
Core Spray (10")	27	27	5	0	0	5
Reactor Water Cleanup (6")	4	4	2	0	0	2
CRD Return (4")	7	7	2	0	0	2
Head Vent (4")	3	3	3	0	0	3
Jet Pump Instrumentation (Total Assemblies)	10	10 ⁴	10	0	0	10
	171	149	46	13	9	59

¹ Total of "uncracked welds" sample and "cracked welds" with IHSI. Overlay welds are not in the sample due to no demonstrated UT technique available.

² Records indicate these welds are solution annealed. They are included due to reported crack indications at other units.

³ Special category not addressed by 84-11.

⁴ Includes welds not previously examined.