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Downers Grove, Illinois 60515

August 20, 1993

Dr. Thomas E. Murley, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Attn: Document Control Desk

Subject: Dresden Nuclear Power Station Units 2 and 3
Quad Cities Nuclear Power Station Units 1 and 2
Revision to the Reactor Water Clean-up (RWCU) Outboard Piping
Inspection Plan for Dresden and Quad Cities Stations
NRC Docket Nos. 50-237/249 and 50-254/265

References: (a) J.L. Schrage to T.E. Murley letter dated December 14, 1992.
(b) B.L. Siegel to T.J. Kovach letter dated December 23, 1993.

Dear Dr. Murley:

In Reference (a), Commonwealth Edison Company (CECo) submitted the RWCU Outboard Piping Inspection Plan for Dresden and Quad Cities Stations in order to address the requirements of Generic Letter 88-01 (and Supplement 1) with regards to this piping. In Reference (b), NRR accepted the Inspection Plan with the provision that CECo notify the Staff prior to restart from the then current refueling outage should any cracking be identified during the inspections. The D2R13 preliminary inspection results and repair plans were provided to members of the NRC Staff on March 11, 1993. The purpose of this letter is to provide the final inspection results from the D2R13 and Q2R12 refueling outages and to outline the future actions to be taken by CECo regarding the RWCU Outboard Piping.

Dresden Inspection Results

Two return side piping welds and six supply side piping welds were inspected during the D2R13 refueling outage. One of the return side welds (50%) and six of the supply side welds (100%) were found to contain circumferential IGSCC indications. Attachment 1 provides the number and sizes of the indications identified in each weld. All piping encompassing the welds in which indications were identified was replaced "like-for-like" prior to unit start-up.

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Quad Cities Inspection Results

Two return side and six supply side piping welds were inspected at Quad Cities Unit 2 during the Q2R12 outage. Both return side welds and three supply side welds were found to have IGSCC. Three welds were sent to Argonne National Laboratory (ANL) for confirmation of IGSCC by destructive testing. One return side weld that contained axial cracks only but indicated some circumferential components by follow-up UT and two supply side welds, that showed no indications, were sent to ANL. To date, destruction testing results of the welds from ANL have not been received. Attachment 2 provides the number and size of the indications identified in each weld that were found by UT testing.

Current Inspection/Replacement Plan

Reference (a) stated that the supply side piping through the regenerative heat exchangers would be replaced during the following two refuel outages (given procurement restraints) if the total number of supply side indications exceeded 40% on that unit. It also provided criteria for increased return line inspection samples during subsequent refuel outages if indications were found during the initial inspection, and stated that the return side piping would be replaced during the following outage if the total number of return side indications, with a minimum sample size of eight, exceeded 40% on that unit.

Proposed Dresden Modified Plan

As a proactive response to the number of indications identified during the D2R13 refuel outage, and to more effectively manage the site radiation exposures resulting from the inspection and subsequent repair activities, Dresden Station proposes to revise the Reference (a) commitment regarding the RWCU Outboard Piping as follows.

Dresden Station will replace all IGSCC susceptible outboard supply and return piping and the regenerative heat exchangers on both Units 2 and 3 using IGSCC resistant materials. The replacement will modify the system from a dual train design to a single train design. Replacement activities for each unit will require two refuel outages and the operating cycle between. Since the outboard supply and return lines are configured with common sections of piping going through a pipeway prior to entering the two heat exchanger rooms (each containing one train of the dual train system), replacement of the outboard piping during a single refuel outage would necessitate an unnecessary outage extension.

Current plans during the first outage are to: (1) replace the common supply and return piping; (2) replace the piping associated with the auxiliary cleanup pump; and (3) physically isolate one train from the system in preparation of replacement. The replacement and isolation activities planned for the first outage encompass approximately 48% of the supply side welds and 40% of the return side welds with operating temperatures over 200 °F. During the following operating cycle, replacement of the piping and regenerative heat exchangers on the isolated train will be performed, while the other train remains in service. During the second outage, the replaced train (with the non-susceptible piping and regenerative heat exchangers) will be physically attached to the previously replaced common supply and return piping to complete the single train design. Also at this time, the remaining train (with susceptible piping) will be physically isolated from the system and permanently abandoned in place.

The refuel outages during which the planned replacements will take place, as well as their currently scheduled start dates are as follows:

Dresden Unit 2

D2R14 - November, 1994

D2R15 - August, 1996

Dresden Unit 3

D3R14 - November, 1995

D3R15 - August, 1997

In Reference (a) CECo committed to inspecting six supply side and two return side RWCU outboard welds during the D3R13 refuel outage. As was discussed previously, a commitment was made to replace the supply side piping through the regenerative heat exchangers during the following two refuel outages (starting D3R14) if the total number of supply side indications exceeded 40% on that unit. Because Dresden Station is already making a proactive commitment to replace all IGSCC susceptible outboard supply and return piping and the regenerative heat exchangers on Unit 3 starting with the D3R14 refuel outage, no interim inspections will be performed during the D3R13 refuel outage. It is not possible to begin replacement activities during the D3R13 refuel outage due to the long lead times required for major equipment and material procurement.

Additionally, the upgrades/enhancements to the RWCU isolation valves needed to meet the requirements of Generic Letter 89-10, Supplement 3, were completed for Unit 2 during the D2R13 refuel outage and will be completed for Unit 3 during the upcoming D3R13 refuel outage. These enhancements, coupled with the replacement of all IGSCC susceptible piping and regenerative heat exchangers, will eliminate any concerns regarding the integrity of the RWCU outboard piping at Dresden Station, and will fulfill the requirements of Generic Letter 88-01 (and Supplement 1) for this piping in its entirety. Consequently, no future IGSCC inspections will be performed on the RWCU outboard piping once replacement activities have been completed.

Proposed Quad Cities Modified Plan

Quad Cities proposes to replace all IGSCC susceptible outboard supply and return piping and the regenerative heat exchangers on both Units 1 and 2 with resistant material in lieu of performing any future inspections. The replacement will modify the system from a dual heat exchanger train design to a modified single heat exchanger train design. A single stack of regenerative heat exchangers will connect to a parallel stack of non-regenerative heat exchangers capable of passing two percent of feedwater flow. The modified single train design is a change from the full single train design. As such, due to a modification that was performed in 1981 which removed the RWCU main recirculation pumps from the hot supply side piping and relocated the pumps after the non-regenerative heat exchangers on the cold leg of piping, there is a section of piping on the suction side and discharge side of the pumps that operated at temperatures of 545°F for approximately ten years. Under the modified single train design, it is not planned to replace or inspect this section of pipe. The piping has operated at high temperatures for only ten years and the probability of significant IGSCC is low. The proposed schedule for pipe replacement for each Quad Cities unit is provided below.

For Quad Cities Unit 1, the supply side piping and regenerative heat exchangers will be replaced during the Q1R14 refueling outage. Q1R14 is an extended outage. The return side piping will be replaced during the Q1R15 outage. No inspections would be performed during the upcoming Q1R13 outage. Replacement also would not be started during the Q1R13 outage because of insufficient lead time to obtain major equipment and material. Due to the inspection results obtained from the inspections of Quad Cities Units 2 and Dresden Unit 2, it is believed that there is a high probability that IGSCC will be discovered on Unit 1. If the affected piping is replaced on the proposed modified schedule in lieu of performing inspections and repairs, the high dose experienced from inspections and pipe spool piece replacement which occurred at

Quad Cities Unit 2 and Dresden Unit 2 could be avoided.

These interim efforts (inspections and like-for-like replacement) will not significantly improve the safe operation of the plant if full pipe replacement (IGSCC resistant material) is performed. If inspections are performed and extensive cracking is found in the sample size during the Q1R13 outage, the Q1R14 and Q1R15 outages are the currently scheduled and approved outages for RWCU pipe replacement.

For Quad Cities Unit 2, in lieu of replacing the supply side piping and regenerative heat exchangers during the Q2R13 outage, the return side piping will be replaced during the Q2R13 outage. The supply side piping will then be replaced the following Q2R14 outage. The Q2R14 outage is scheduled to be an extended outage. Since the replacement of the supply side piping and heat exchangers will take the greatest amount of effort, the chances of an outage extension will be minimized if the work can be performed during the Q2R14 outage.

The upgrades/enhancements to the RWCU isolation valves needed to meet the requirements of Generic Letter 89-10, Supplement 3 were completed for both Quad Cities Units 1 and 2. As such, operational margin for Quad Cities has been improved. In addition, since the piping will be replaced in essentially the same time frame as outlined in the current plan if cracking is discovered, the recommended revisions to the currently approved inspection and repair plan will not degrade the existing margin of safety. These enhancements, coupled with the replacement of all IGSCC susceptible piping and regenerative heat exchangers, will eliminate any concerns regarding the integrity of the RWCU outboard piping at Quad Cities Station, and will fulfill the requirements of Generic Letter 88-01 (and Supplement 1) for this piping in its entirety. Consequently, no future IGSCC inspections will be performed on the RWCU outboard piping once replacement activities have been completed.

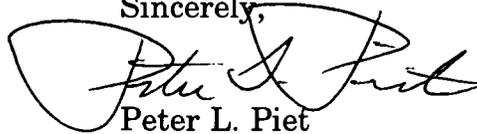
August 20, 1993

Schedule

In order to support the current schedule for replacement activities, CECO requests NRC Staff review and approval of this revised commitment regarding the RWCU outboard piping by September 30, 1993.

If there are any questions concerning this matter, please contact this office.

Sincerely,



Peter L. Piet

Nuclear Licensing Administrator

Attachments: 1 - Dresden Station Unit 2 RWCU Outboard Piping Inspection Results

2 - Quad Cities Station Unit 2 RWCU Outboard Piping Inspection Results

cc: J. B. Martin - Regional Administrator - RIII
J. F. Stang - Project Manager, NRR
C. P. Patel - Project Manager, NRR
M. N. Leach - Senior Resident Inspector - Dresden
T. Taylor - Senior Resident Inspector - Quad Cities
R. A. Hermann - NRR

Attachment 1

Dresden Station Unit 2 RWCU Outboard Piping Inspection Results

Return Piping Welds (6" diameter)

- Weld No. 1** Circumferential indication 1 1/4" long, 13% through wall on pipe side.
- Weld No. 2** No IGSCC detected.

Supply Piping Welds (8" diameter)

- Weld No. 1** Circumferential indication 2" long, less than 10% through wall on pipe side.
- Weld No. 2** Weld was destroyed in removal process and must also be assumed to be cracked.
- Weld No. 3** Intermittent circumferential indication 180° around both sides of weld. 30% through wall on pipe side, 27% through wall on elbow side.
- Weld No. 4** Intermittent circumferential indication 4" long, 44% through wall on pipe side.
- Weld No. 5** Circumferential indication 2" long, 35% through wall on pipe side.
- Weld No. 6** Circumferential indication 1 3/4" long, 90% through wall on pipe side. Intermittent circumferential indication 6" long on elbow side (this indication was not sized for through wall depth).

Attachment 2

Quad Cities Station Unit 2 RWCU Outboard Piping Inspection Results

Return Piping Welds (4" diameter)

- Field Weld #2 (1201A-3):** 1 axial 1/8" long, elbow side
- Field Weld #3 (1205A-4):** 2 circumferential cracks 7/16" long and 5/16" long separated by 0.2" with a remaining ligament of 0.120", elbow side; 1 axial 1/8" long, elbow side.

Supply Piping Welds (4" diameter)

- Field Weld #5 (1203C-7):** 1 circumferential crack 15/16" long with a remaining ligament of 0.2", elbow side.
- Field Weld #7 (1203C-8):** 5 axial cracks 1/8" to 1/4" long, elbow side; 1 circumferential crack 1/4" long with axial component 1/4" long, pipe side.
- Field Weld #8 (1203C-9):** 1 circumferential crack 1" long, with a remaining ligament of 0.150", elbow side.