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May 21, 1984

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Lee S. Dewey, Esq.
Office of the Executive
Legal Director
U.S. Nuclear Regulatory
Commission
Washington, D.C. 20555

In the Matter of
Public Service Electric and Gas Company
(Hope Creek Generating Station)
Docket No. 50-354 OL

Dear Mr. Dewey:

This letter and enclosures respond to your letter of February 5, 1984 asking for further information requested by the regulatory Staff. Please advise us if there is any other information you need.

As you also requested, I am furnishing these enclosures to the service list. Because the Licensing Board has previously indicated that it does not wish to receive bulky documents, I am providing the enclosed drawings only to you and counsel for the Public Advocate.

Sincerely,

Robert M. Rader

Robert M. Rader
Counsel for Public Service
Electric and Gas Company

RMR/dlf
Enclosures
cc: Service List

D503

QUESTION 1a

Describe the piping and weld materials of each weld joint, especially the carbon content and the material specifications to which the materials were purchased.

ANSWER 1a

GE piping is ASTM A358, Type-304 stainless steel. Pump and Valve Castings are ASME SA351 CF8M. Weld materials are ASTM A298 or A371, Type-308 stainless steel. The carbon contents are less than 0.08 weight percent.

Bechtel piping and weld materials for RHR and RWCU interconnection with the GE Recirculation piping are as follows:

1. RHR - ASME SA 358, Gr. 304L, with 0.03% max. carbon content (Code Case 1748), Sizes 12" and 20".

2. RWCU - ASME SA 312, Gr. TP 304L, seamless with 0-035% max. carbon content, Size 4". This material is used as a stainless steel transition piece at the RWCU/recirculation interface. RWCU pipe material downstream of this interface is ASME SA 106, Gr. B, seamless.

Weld material used for RHR/RWCU to recirculation interface weld is E308L per SFA 5.9, with 0.03% max. carbon content.

Pipe material for instrumentation piping that interfaces with the recirculation piping is ASME SA-312, Gr. TP304L with 0.035% max. carbon content. Weld material is E308L per SFA 5.9, with 0.03% max. carbon content.

QUESTION 1b

Provide isometric diagrams for each piping system and describe each weld joint such as "cast stainless steel valve to stainless steel pipe."

ANSWER 1b

The Recirculation Loop Piping Purchased Part Drawing 761E350, Rev. 14 (3 sheets attached) provides all weld joint information including interface welds. Welds No. 3, 4, 7, and 8 are cast stainless steel valve to stainless steel pipe welds. Welds No. 5 and 6 are cast stainless pump casing to stainless steel pipe welds. Other welds shown are stainless steel pipe to stainless steel pipe or stainless steel pipe to stainless steel fitting welds of the specifications shown on the attached drawing 761E350 Sheet 2 of 3. (A and B designates A or B Loop.)

QUESTION 1c

Identify which welds are conforming and nonconforming in accordance with the guidelines in NUREG-0313, Revision 1, and provide the reasons for classifying the welds as conforming.

ANSWER 1c

The Recirculation Loop Piping Reference IGSCC Mitigation Measures Drawing No. 796E916, Rev. 1 (attached) identifies the IGSCC mitigation conformance of each weld (as described in NUREG-0313, Rev. 1).

All interface welds with the recirculation piping are in conformance with the guidelines of NUREG-0313, Revision 1, except for the socket weld interface (2" and smaller). We propose that these interface welds (socket welds) are acceptable and meet the intent of NUREG-0313, Revision 1, based on the rationale that it is standard industry practice not to provide special IGSCC mitigation techniques to regular type stainless steel sockets and there have been no known failures of socket weld connections directly attributable to IGSCC in the industry.

QUESTION 1d

Specify which welds are shop welds and field welds and indicate if Solution Heat Treatment (SHT) was applied after completion of welding. When SHT was applied, provide information regarding solution annealing temperature, holding time, and the method of cooling.

ANSWER 1d

The Recirculation Loop Piping Reference IGSCC Mitigation Measures Drawing No. 796E916, Rev. 1 identifies both shop and field welds including SHT information.

With regard to heat treatment, the following specification requirement was applied:

> All materials for austenitic stainless steel piping, fittings and equipment pressure parts shall be in the solution heat treated condition. Waiver of final heat treatment and marking the material "HTO" (Heat Treatment Omitted) is prohibited. Material shall be solution heat treated by heating to a temperature between 1900 and 2000°F (metal temperature) and held at this temperature for a minimum of 15 minutes per inch of thickness but not less than 15 minutes or more than 1 hour; followed by quenching in circulating water to a temperature below 400°F. The metal temperature of the slowest cooling surface shall not be in the range of 1800°-800°F for more than 2 minutes. Prior to heat treatment, materials shall be precleaned in accordance with ASTM A-380, "Cleaning and Descaling Stainless Steel Parts, Equipment and Systems."

QUESTION 1e

Provide information regarding whether the inside surface of the weld was ground or any local repair was applied after completion of welding or SHT.

ANSWER 1e

Corrosion Resistant Cladding (CRC) was applied and SHT performed after fabrication of the shop subassemblies.

The only field weld repair which resulted in grinding of the I.D. of the pipe was performed on Weld No. A6, shown on GE Drawing 761E350, Revision 14 Sheet 1 (Weld No. 38 on GE Drawing 796E916, Revision 1), in accordance with FDDR KT1-059. Weld A6 is between the cast stainless steel pump casing and stainless steel pipe with CRC on the I.D. The repair was limited to the root area of butt weld A6. The repair area was masked to minimize grinding and the area was polished to an RMS 32 finish. Other repairs involved excavation of the weld metal from the exterior of the pipe in accordance with a GE approved Bechtel weld repair procedure and had no effect on the cladding on the interior surface.

QUESTION 1f

Provide the information regarding pipe size, type of weld (e.g., bimetallic weld, fillet weld, etc.) piping system, weld identification number, stress rule index (if available) and its isolability of each weld joint.

ANSWER 1f

The Recirculation Loop Piping Purchased Part Drawing No. 761E350, Rev. 14 provides all the information requested above except the stress rule index, which will not be available until January 1985, when the as-built stress analysis will be completed.

Pipe sizes for the RHR/RWCU interface with the recirculation piping are 20 in., 12 in. and 4 in. Pipe sizes for instrumentation is 1-in. and 1-1/4 in. and for vents and drains is 3/4 in. The two 12 in. RHR pipe interface connections with the recirculation piping are identified as Field Weld Nos. 6 and 7 on Bechtel isometric Drawings 1-P-BC-034 and 1-P-BC-037, respectively (Weld No. 50 on GE drawing 796E916, Revision 1, attached)). The 20 in. RHR pipe interface connection is identified as Field Weld No. 6 on Bechtel Isometric Drawing 1-P-BC-032 (Weld No. 6B on GE Drawing 796E916, Revision 1, attached). The 4 in. RWCU pipe interface connection is identified as Field Weld No. 1 on Bechtel Isometric Drawing 1-P-BG-012 (Weld No. 3 on GE Drawing No. 796E916, Revision 1, attached). The Bechtel field weld numbers for the 1-1/4 in. and smaller interface connections have not been assigned as yet (Weld Nos. 11B, 13B, 15A, 18, 20, 22, 24, 28, 35, 40 and 62B on GE Drawing No. 796E916, Revision 1, attached).

QUESTION 1g

Identify any design or physical limitations that will preclude (such as penetration welds) or limit (accessible from one side of the weld or oversized weld crown) the full UT inspection.

ANSWER 1g

Throughout the design of Hope Creek, access and clearance have been maintained to allow for the UT inspection. Although several pipe to fitting welds exist in the recirculation system, a full Code examination of the weld can be obtained by examining the weld from one side (pipe side) and examining on the weld crown. Any limitations or interferences which may occur as a result of plant construction will be identified during the preservice inspection. If any of these limitations preclude the use of UT, then alternate means such as RT will be utilized to obtain full volumetric Code coverage.

QUESTION 1h

Identify any future plans and schedule to mitigate or replace the nonconforming pipe lines.

ANSWER 1h

The recirculation loop piping including the RHR and RWCU interface connections have IGSCC mitigation conformance as described in NUREG 0313 Rev. 1. No piping replacement is considered or planned on the basis of mitigation actions taken.

QUESTION 2

Describe in detail the Ultrasonic Testing (UT) technique and criteria you plan to use to inspect the piping welds with pipes treated with CRC and provide the supporting data regarding the accuracy, repeatability, and the limitations of the technique.

ANSWER 2

PSE&G presently proposes to perform volumetric examination of the CRC treated welds on the Hope Creek recirculation loop piping using Radiographic Method (RT) with a portable high energy linear accelerator such as that developed under EPRI Project 822-6 and described in EPRI Report NP-3164 SR. It is further proposed that the welds be inspected in accordance with ASME Section III, Pargraphs NB-5111, NB5320 and Table NB5111.1. Equipment and technique described in the above report has been demonstrated to provide the necessary sensitivity (2T reference hole) and to detect IGSCC in recirculation loop piping welds at Peach Bottom #3 and other BWR's. Repeatability is assured with RT by proper use of permanent radiographic reference marks.

PSE&G will continue to pursue ultrasonic examination as an alternate means of inspection and is presently collaborating with Southwest Research Institute and the EPRI NDE Center in parallel programs to develop an acceptable technique for inspecting CRC treated welds with mechanized systems.