MAR 01 1985

Docket No. 50-354

Mr. R. L. Mittl, General Manager
Nuclear Assurance & Regulation
Public Service Electric & Gas Company
P. O. Box 570, T22A
Newark, New Jersey 07101

Dear Mr. Mittl:

SUBJECT: PRESERVICE INSPECTION OF PIPE WELDS WITH CORROSION RESISTANT CLADDING

The purpose of this letter is to transmit to PSE&G the staff's interim technical position (Enclosure) regarding the preservice inspection of pipe welds with corrosion resistant cladding. In the Enclosure, the staff emphasizes the conclusions discussed at the November 26, 1984 meeting regarding potential methods of resolution and identify specific information which should be provided to support your final conclusions.

Since different technical approaches may provide an acceptable resolution of this issue, the staff will review both the examination procedure and the technical basis for your conclusions after these subjects are finalized.

Please contact us should you have any questions.

Sincerely

Original signed by:

A. Schwencer, Chief
Licensing Branch No. 2
Division of Licensing

Enclosure: As stated

cc: See next page

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

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PUBLIC SERVICE ELECTRIC & GAS COMPANY

Evaluation of Volumetric Inspection of Pipe Welds With Corrosion Resistant Cladding (CRC)

Objective

The objective of the staff review is to assure that effective ultrasonic and/or radiographic techniques are used to examine the piping system welds with CRC and the techniques are capable of detection of the significant flaws, if present. The staff intends to review the applicant's examination procedure and the technical bases for his conclusions after these subjects have been finalized.

Background Information

The staff's review of the Preservice Inspection (PSI) Program determined that the large diameter ASME Code Class 1 piping systems contained approximately 57 welds with CRC applied to both the inside diameter (ID) and outside diameter (OD) surfaces. Since, the PSI Program indicated that the examination procedure and calibration standards were under development, the staff requested additional information in a letter dated October 23, 1984.

At the request of the applicant, a meeting was held on November 26, 1984. A meeting summary dated December 18, 1984 was published and distributed to interested parties. The applicant presented a progress report on his program to develop an effective ultrasonic examination technique. At the November 26, 1984 meeting the staff indicated that a plant-specific resolution of the inspectability of CRC welds should include the following elements:

1. trial examinations at Hope Creek of typical CRC welds,

2. demonstration of the ability to detect cracks through OD cladding,

3. PSI examinations of CRC welds with both the prototypical transducer described at the meeting and the SLIC-40 transducer with personnel who have demonstrated their ability to detect IGSCC through weld overlays, and

4. establishment of acceptable recording and reporting criteria for flaw indications based on experience in finding cracks through OD cladding.

Since other technical approaches may provide an acceptable resolution, the applicant should consider the staff's interim conclusions described above and use the results from his laboratory data and related field experience on the detection of IGSCC.

Technical Basis

During the progress report on November 26, 1984, the Applicant described the general configuration of the CRC and the basic characteristics of the prototypical ultrasonic transducer developed by his inspection contractor, Southwest Research Institute (SRWI). Detailed information concerning the specific welds was not available at this meeting. The Applicant should consider the following subjects during his development program:

1. As-Built Dimensions and Heat Treatment of the Plant Welds.

   Figure 3 of the Applicant's handout has a sketch of a CRC weld that shows a weld crown and the O.D. clad above the surface of the pipe. The Applicant should confirm that the O.D. cladding and weld crown are essentially flush with the pipe surface on all welds identified in the PSI Program. The Applicant's records should also confirm that no pipe ends have only I.D. cladding.

   The Applicant's use of the term "solution heat treatment of the pipe after applying CRC" is ambiguous. Confirm whether both sides of all pipe and fittings were solution annealed. To understand the potential benefit of solution heat treatment for the mitigation of IGSCC, the Applicant should distinguish between the shop and field welds and explain the sequence of applying the CRC and heat treatment for typical pipe, fittings and components.

2. Number of Laboratory Specimens

A 12 inch riser segment with CRC is being used during the initial development effort. CRC was applied to larger diameter pipe and the dimension of the CRC varies with the diameter and fabrication process (heat treatment and fit-up) of the component. Test specimens and calibration standards with representative CRC should be available for all diameters of pipe.

3. Ultrasonic Instrumentation

The prototypical transducer developed by SWRI is a focused transducer with a relatively small focal zone. To be effective, this transducer will require accurate measurement of the O.D. contour of the weld, the thickness of the pipe and possibly the thickness of the CRC. Several transducers may be required to examine a specific weld. The Applicant may need to develop unique data recording and reporting standards associated with use of this transducer.

4. Related Experience Concerning IGSCC

In operating BWRs weld metal was applied to the OD surface as a temporary repair of IGSCC. For the generic development programs, the industry groups have assembled specimens with flaws fabricated

from pipe removed from service or laboratory-induced IGSCC. The Applicant should demonstrate the capability to detect significant flaws with available specimens by characterizing and locating IGSCC through weld overlays.

In the event that radiography is selected as the primary inspection method, the Applicant should demonstrate that the examination procedure and equipment have the capability of detecting service-induced degradation in CRC welds.

5. Preservice and Inservice Inspection Requirements.

a. Section XI of the ASME Code requires that all welds with CRC be examined during the PSI. The Applicant's development program should be directed towards finding a technique that will provide reasonable assurance of the initial structural integrity of the welds and provide a baseline for future examinations.

b. During the inservice inspection, Section XI requires that a representative sample of welds be examined and the sample repeated to detect the potential generic degradation. The welds with CRC probably are less susceptible to IGSCC than the remainder of the welds. Therefore, only a few of the CRC welds would be required to be examined on a repetitive basis.

c. Specific augmented inservice inspection requirements will be identified when NUREG-0313, Revision 2, is finalized and published.

Supporting Technical Information

Before starting the preservice inspection of the welds with CRC the Applicant should prepare and submit for staff a final technical report addressing the subjects discussed above and describing the technical basis for his conclusions.