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Electric and Gas
Company

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OCT 10 1995

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United States Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555

Gentlemen:

**ASME CODE CASE N-523
SALEM GENERATING STATION UNIT NOS. 1 & 2
HOPE CREEK GENERATING STATION
FACILITY OPERATING LICENSE NOS. DPR-70, DPR-75 & NPF-57
DOCKET NOS. 50-272, 50-311 & 50-354**

Public Service Electric and Gas Company (PSE&G) requests, in accordance with the requirements of 10CFR50.55a(a)(3), approval to utilize American Society Of Mechanical Engineers (ASME) Code Case N-523, "Mechanical Clamping Devices for Class 2 and 3 Piping," for Salem Generating Station Unit Nos. 1 and 2 and Hope Creek Generating Station. This Code Case provides an alternative to the current ASME Section XI repair and replacement requirements by permitting the use of temporary clamping devices to control leakage through the pressure boundary and to maintain the structural integrity of Class 2 and 3 piping.

A detailed discussion of the basis for approval of the Code Case, and technical justification in accordance with 10CFR50.55a(a)3 is provided in Attachment 1.

Should you have any questions on this submittal, please contact us.

Sincerely,



Attachment



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ATTACHMENT 1
REQUEST FOR ASME CODE CASE N-523I. BACKGROUND

ASME Section XI Code Case N-523 entitled "Mechanical Clamping Devices for Class 2 and 3 Piping" was approved by the ASME on August 5, 1994. Code Case N-523 provides an alternative to the current ASME Section XI repair and replacement requirements by permitting the use of temporary clamping devices to control leakage through the pressure boundary and to maintain the structural integrity of Class 2 and 3 piping. The Code Case has not been approved for use in the industry by the NRC as of the issuance of Revision 11 of Regulatory Guide 1.147, "Inservice Inspection Code Case Acceptability - ASME Section XI Division 1". Therefore, Public Service Electric and Gas Company (PSE&G) requests approval of the use of Code Case N-523 in accordance with the requirements of 10CFR50.55a(a)(3) for Salem Units 1 and 2, and Hope Creek Generating Station. A copy of ASME Code Case N-523 is attached for your information.

II. DISCUSSION

The NRC issued Generic Letter (GL) 90-05, "Guidance for Performing Temporary Non-Code Repair of ASME Code Class 1, 2 and 3 Piping" on June 15, 1990. This GL provides guidance to be considered by the NRC staff in evaluating relief requests submitted by Licensees for temporary non-code repairs in accordance with the requirements of 10CFR50.55a(g)(6)(i). The NRC has acknowledged in GL 90-05 that required code acceptable repairs or replacements may be impractical, and a temporary non-code repair of piping that cannot be isolated without a plant shutdown is justified in some instances. The principal concern being the unnecessary stress on facility systems and components associated with a plant shutdown to perform the ASME Section XI Code repair or replacement. Therefore, the NRC has concluded that relief from the code requirements may be justified when considering the stability of the affected piping, the desire not to put the plant through an unnecessary shutdown/startup cycle, and the inability to isolate the affected portion of pipe and complete an ASME Section XI Code repair or replacement within the allowed outage time (AOT) of the Technical Specification Action Statement (TSAS).

The provisions of ASME Section XI Code Case N-523 will permit the use of temporary mechanical clamping devices to control leakage through the pressure boundary and maintain the structural integrity of Class 2 and 3 piping. The use of Code Case N-523 will not require NRC approval of a relief request in accordance

ATTACHMENT 1 (Cont'd)
REQUEST FOR ASME CODE CASE N-523

with 10CFR50.55a(g)(6)(i) per GL 90-05 for each instance when an ASME Section XI Code repair or replacement is not considered practical under the existing plant operating conditions. Additionally, the provision of Code Case N-523 will allow the installation of a mechanical clamping device to maintain structural integrity without the need to enter the respective TSAS to complete an ASME Section XI Code repair or replacement. Lastly, the Code Case will allow the installation of a mechanical clamping device when the affected piping is non-isolable, and a forced plant shutdown would be necessary to accomplish a Section XI Code repair.

ASME Code Case N-523 is applicable to moderate energy piping with nominal piping size 6 inches or smaller. The Code Case will not be used for piping larger than 2 inch nominal piping size in high energy systems (i.e., when the normal operating temperature or pressure exceeds 200°F or 275 psig). The mechanical clamping devices designed and installed in accordance with this Code Case will remain in service only until the next refueling outage, at which time the defect will be repaired or the piping containing the defect is replaced in accordance with ASME Section XI. The detailed design, installation and monitoring requirements will be met as specified in the attached Code Case N-523.

III. BASES FOR CODE CASE APPROVAL

PSE&G believes the request for approval of ASME Code Case N-523 for Salem Units 1 and 2 and Hope Creek is acceptable in accordance with 10CFR50.55a(a)(3) as follows:

Approval of the use of ASME Code Case N-523 ensures an acceptable level of quality and safety. The ASME has concluded that the use of mechanical clamping devices per the requirements of ASME Code Case N-523 is acceptable for controlling pressure boundary leakage and maintaining structural integrity of Class 2 and 3 piping. The Code Case is limited to moderate energy piping 6 inch nominal piping size and smaller, and high energy piping 2 inch nominal piping size and smaller. The Code Case will allow the installation of the mechanical clamping devices until the next refueling outage, at which time the affected piping will be repaired or replaced in accordance with ASME Section XI. ASME Code Case N-523 allows the use of interim remedial action similar to the provisions of GL 90-05, without the need for NRC relief request approval on a case-by-case basis.

ATTACHMENT 1 (Cont'd)
REQUEST FOR ASME CODE CASE N-523

While there is no immediately foreseeable need for using ASME Code Case N-523, the events that may warrant its use are emergent and unpredictable. Approval of the Code Case will provide greater flexibility should piping defects be identified, and where ASME Section XI code repairs are determined to be impractical while the plant continues to operate. Plant shutdowns to complete Section XI Code repairs could result in hardship or unusual difficulty without a compensating increase in the level of quality or safety by putting the plant through an unnecessary shutdown/startup cycle.

IV. SUMMARY

ASME Section XI Code Case N-523 provides an alternative to the current ASME Section XI repair and replacement requirements by permitting the use of temporary clamping devices to control leakage through the pressure boundary and to maintain the structural integrity of Class 2 and 3 piping (6 inch nominal piping size and smaller). The application of ASME Code Case N-523 continues to ensure an acceptable level of quality and safety in the event of pressure boundary leakage until a Section XI Code repair or replacement can be completed during the next refueling outage.

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Approval Date: August 5, 1994

See Numeric Index for expiration
and any reaffirmation dates.

Case N-523
Mechanical Clamping Devices for Class 2 and 3
Piping
Section XI, Division 1

Inquiry: What requirements may be used for mechanical clamping devices to control leakage through the pressure boundary and to maintain the structural integrity of Class 2 and 3 piping?

Reply: It is the opinion of the Committee that the following requirements may be used for mechanical clamping devices to control leakage through the pressure boundary and to maintain the structural integrity of Class 2 and 3 piping, NPS 6 and smaller.

1.0 SCOPE

(a) The provisions of this Case apply to piping and tubing, and their associated fittings and flanges, and the welding ends of pumps, valves, and pressure vessels, except for those that form the containment boundary. The provisions of this Case do not apply to other locations in pumps, valves, and pressure vessels.

(b) This Case shall not be used for piping larger than NPS 2 when the nominal operating temperature or pressure exceeds 200°F or 275 psig.

(c) Mechanical clamping devices constructed in accordance with this Case may remain in service only until the next refueling outage, at which time the defect shall be repaired or replaced in accordance with IWA-4000.¹

2.0 REPAIR/REPLACEMENT PLAN

A Repair/Replacement Plan shall be developed in accordance with IWA-4140(b), and shall identify the

¹References to Section XI are to the 1992 Edition with the 1993 Addenda.

defect characterization method, design requirements, and monitoring requirements.

3.0 AUTHORIZED INSPECTION AGENCY

The services of an Authorized Inspection Agency shall be used. The Owner shall notify the Authorized Inspection Agency prior to welded fabrication or installation of the clamping device and shall keep the Inspector informed of the progress so that necessary inspections may be performed.

4.0 DEFECT CHARACTERIZATION

The size, location, and apparent cause of the defect shall be determined. The defect size shall be suitably bounded to account for nondestructive examination limitations. If the defect size cannot be directly determined, a conservative bound of the actual defect size shall be determined and documented.

5.0 DESIGN REQUIREMENTS

5.1 General Design Requirements

The following general design requirements shall be included in the Repair/Replacement Plan and shall be considered in the analyses of the clamping device (para. 5.2) and piping (para. 5.3):

(a) Requirements to address environmental and corrosive effects of seal composition, seal installation, and system fluid on piping, clamping device, and bolting.

(b) The defect size used in the design of the clamping device shall include any projected growth.

(c) If additional supports are required to satisfy para. 5.2 or para. 5.3, they shall be considered non-pressure retaining items and shall be designed in accordance with the requirements of the Construction Code for the system or as permitted by IWA-4170(c) or (d).

5.2 Clamping Device

The following additional requirements apply to the design of the clamping device:

(a) No credit shall be taken for structural capability of the seal.

(b) Pressure retaining clamping device items shall be designed by analysis using the stress limits identified in NC-3324.11(b)(5)(a) and (b). Stresses shall be classified in accordance with Table NC-3321-2.

(c) Pressure stresses shall meet Level A Service Limits of Section III, using nominal system operating conditions, assuming postulated full circumferential severance of the pipe at the defect location.

(d) The clamping device shall be mechanically connected to the pipe. Seal welds may be added to prevent leakage. Serrated contact surfaces of the clamping device are acceptable, provided they do not affect structural integrity of the piping.

(e) The clamping device shall be designed to produce clamping friction of at least five times the friction load required to prevent slippage. If a coefficient of friction greater than 0.3 is used for friction type connections, the coefficient of friction for each interface design (e.g., serrated or nonserrated) and each combination of interface material P-Numbers, shall be experimentally determined.

5.3 Piping System

The following additional requirements apply to the evaluation of the piping system:

(a) Piping system vibration shall be considered when vibration is the apparent cause of the defect or the defect can be propagated by vibration.

(b) The temporary piping system configuration shall be evaluated in accordance with the Owner's Requirements, and either the Construction Code or Section III.

(c) Effects of the stiffness and weight of the clamping device shall be considered in the evaluation of the piping system. When the defect is caused by erosion or corrosion, the base material thickness at the load transfer area shall be determined and projected to the time of defect repair. The projected wall thickness shall be used when evaluating the piping system.

(d) Constraining effects of the clamping device shall be considered when evaluating effects of thermal expansion of the piping system.

6.0 MATERIAL REQUIREMENTS

(a) Material used for pressure retaining items of the clamping device shall be as permitted by Section III or a Section III Case, for use as Class 2 pressure boundary material. Pressure retaining material for the clamping device shall meet the requirements of NC-2000, except NC-2600, and shall be certified as required by NCA-3867.4. The other requirements of NCA-3800 are not applicable to this Case.

(b) If additional supports are required to satisfy para. 5.0, the support materials shall meet the requirements of the Construction Code for the system or as permitted by para. IWA-4170(c) or (d).

7.0 FABRICATION AND INSTALLATION REQUIREMENTS

Welding performed as part of fabrication and installation of the clamping device shall be accomplished in accordance with the requirements of IWA-4000. Welding shall be documented on an NIS-2 Form.

8.0 PRESSURE TESTING REQUIREMENTS

In lieu of hydrostatic testing, a system leakage test in accordance with IWA-5000 shall be performed on the portion of the system containing the clamping device.

9.0 MONITORING REQUIREMENTS

The Owner shall prepare a plan for monitoring defect growth in the area immediately adjacent to the clamping device. The plan shall include the following activities and requirements.

(a) Except as permitted by (b) below, and where precluded by the clamping device configuration, the area immediately adjacent to the clamping device shall be examined using a volumetric method. The examination frequency shall not exceed three months, and shall be specified in the Repair/Replacement Plan. When the examination reveals defect growth to a size that exceeds the projected size determined by para. 5.1(b), repair or replacement in accordance with IWA-4000 shall be performed.

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(b) Monitoring of defect size shall not be required for a circumferential crack.

(c) In addition to the requirements for monitoring defect size, the clamping device shall be monitored for leakage at least weekly. Any leakage at any time shall be dispositioned.

10.0 DOCUMENTATION REQUIREMENTS

Use of this Case shall be documented on an NIS-2 Form. The records required by IWA-4900 and the Repair/Replacement Plan shall be maintained by the Owner until the clamping device is removed.