

UNITED STATES NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

### SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

# RELATED TO A REQUEST TO USE AN ALTERNATIVE TO

## ASME CODE, SECTION XI, 1986 EDITION

## PUBLIC SERVICE ELECTRIC AND GAS COMPANY

### SALEM NUCLEAR GENERATING STATION, UNIT NO. 2

DOCKET NO. 50-311

## 1.0 INTRODUCTION

The Technical Specifications for the Salem Nuclear Generating Station, Unit No. 2, state that the inservice inspection and testing of the American Society of Mechanical Engineers (ASME) Code Class 1, 2 and 3 components shall be performed in accordance with Section XI of the ASME Boiler and Pressure Vessel Code and applicable Addenda as required by Title 10 of the <u>Code of Federal Regulations</u> (10 CFR), 50.55a(g), except where specific written relief has been granted by the Commission pursuant to 10 CFR 50.55a(g)(6)(i). Section 50.55a(a)(3) states that alternatives to the requirements of paragraph (g) may be used, when authorized by the U.S. Nuclear Regulatory Commission (NRC), if (i) the proposed alternatives would provide an acceptable level of quality and safety or (ii) compliance with the specified requirements would result in hardship or unusual difficulties without a compensating increase in the level of quality and safety.

Pursuant to 10 CFR 50.55a(g)(4), ASME Code Class 1, 2 and 3 components (including supports) shall meet the requirements, except the design and access provisions and the preservice examination requirements, set forth in the ASME Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," to the extent practical within the limitations of design, geometry and materials of construction of the components. The regulations require that inservice examination of components and system pressure tests conducted during the first 10-year inspection interval and subsequent intervals comply with the requirements in the latest edition and addenda of the date 12 months prior to the start of the 120-month interval, subject to the limitations and modifications listed therein. The applicable edition of Section XI of the ASME Code for the second 10-year inservice inspection interval is the 1986 Edition.

### 2.0 REQUEST ALTERNATIVE

99040

050

9904070266

ADDCK

PDR

In a letter dated July 16, 1998, the Public Service Electric and Gas Company (the licensee) submitted a request, pursuant to 10 CFR 50.55a(g)(5)(iii) to use the 1992 edition of the ASME Code, Section XI, Article IWA-4500, for the automatic (machine) gas tungsten arc welding (GTAW) process when performing a temper bead weld repair on ferrous base materials. The 1992 edition of the ASME Code has not yet been endorsed by the NRC.

#### 2.1 Licensee's Basis for Requesting the Use of an Alternative

The licensee stated that during the Salem Unit 2 tenth refueling outage, feedwater nozzle inspections will be performed. Following the inspections there may be a need for weld repair on the steam generator feedwater nozzle(s) inner diameter surface areas. The nozzles are constructed of ASME SA-508 Class 2 material (P3-Group 3).

The applicable ASME Code edition for the spring 1999 outage at Salem Unit 2 is the 1986 Edition. This version of the ASME Code, Section XI, only permits the use of the shielded metal arc welding (SMAW) process to accomplish such repairs. However, the licensee states that an automatic GTAW process allows for better control of vital process variables, which contribute to the quality of such welds.

The licensee stated that, because of the change in sectional thickness of the feedwater nozzle along its principal axis, a post weld heat treatment of these welds would be extremely difficult, representing undue hardship. Additionally, the performance of a post weld heat treatment would contribute to the total permissible cumulative post weld heat treatment time qualified during the original construction of the Salem steam generators. Consequently, the licensee states that it is desirable to employ a welding technique that does not require a post weld heat treatment.

The licensee requested the use of the 1992 Edition of the ASME Code, Section XI, Article IWA-4500. This article provides for the procedure qualification test assembly to meet the same P number and group number of the material, including a postweld heat treatment that is at least equivalent to the time and temperature already applied to the material being repaired. The licensee stated that this alternative in the 1992 Edition of the ASME Code provides acceptable material properties for the procedure qualification test assembly, without imposing undue complications of replicating the materials for the test assembly to that which is being repaired.

2.2 Alternate Weld Process

The automatic GTAW process using F43 filler metal with the temper bead technique would be used as provided for in the 1992 Edition of the ASME Code, Section XI, Article IWA-4500.

#### 2.3 Staff Evaluation

The NRC staff has reviewed the licensee's request for relief as a request to use an alternative pursuant to 10 CFR 50.55a(a)(3)(i), since the request is to use a part of an ASME Code edition not yet incorporated by reference in 10 CFR 50.55a(b).

The staff has reviewed the licensee's submittal and has concluded that the use of the provisions of the 1992 Edition of the ASME Code, Section XI, Article IWA-4500 in place of ASME Code, Section XI, 1986 Edition, which only provides for using the SMAW process, is an acceptable alternative. The staff agrees with the licensee that the provisions for control of the

GTAW process are adequate to produce sound repairs using the temper bead technique. These controls are sufficient to ensure weld integrity and, thus, provide an acceptable level of quality and safety. Therefore, pursuant to 10 CFR 50.55a(a)(3)(i), use of the licensee's proposed alternative is authorized provided that all related requirements of the respective edition (1992) and addenda are met for ASME Code, Section XI, Article IWA-4500.

#### 3.0 CONCLUSION

Pursuant to 10 CFR 50.55a(a)(3)(i), the NRC staff finds the licensee's proposed request to use the 1992 Edition of the ASME Boiler and Pressure Vessel Code, Section XI, Article IWA-4500, for the potential repair of feedwater nozzles is acceptable. The feedwater nozzles will be inspected during the tenth refueling outage at Salem Unit 2 which is scheduled to start in April 1999.

Principal Contributor: A. Keim

Date: April 1, 1999