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SUBJECT: Advise that licensee plans to apply ASME Code Cases N-432 & N-474-1 at facility, if required.

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DECEMBER 21 1989

L-89-464
10 CFR 50.55(a)

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D. C. 20555

Gentlemen:

Re: St. Lucie Unit 1
Docket No. 50-335
Use of ASME Code Cases N-432 and N-474-1

In accordance with Article NCA-1140 of the American Society of Mechanical Engineers (ASME) Section III Code and Article IWA-4120 of the ASME Section XI Code, Florida Power & Light Company (FPL) plans to apply ASME Code Cases N-432 and N-474-1, if required, at St. Lucie Unit 1, as described below.

Of the 120 pressurizer heater sleeves at St. Lucie Unit 1, 114 are potentially susceptible to primary water stress corrosion cracking. During the February 1990 St. Lucie Unit 1 refueling outage, these sleeves will be visually inspected for leakage and leaking heater sleeves will be replaced or the heater penetration plugged. The location of these heater sleeves makes their replacement difficult because of the radioactive environment and the original internal weld design. Because of this, leaking pressurizer heater sleeves will be replaced or the penetration plugged from the outside of the pressurizer; a design using a weld joint located on the outside surface of the pressurizer will be used.

To plug a penetration, the existing heater sleeve will be partially removed and an inconel pad will be built up on the outside surface of the pressurizer shell. An extended pad may be added to allow the plug weld to be made in a horizontal plane to alleviate tooling interference problems. All welding equipment and tooling will be semi-automatic. Due to the high radiation field (1500 mR/hr 18 inches from the surface of the pressurizer), the existing internal heater sleeve weld and sleeve will not be removed.

To sleeve a penetration, the entire existing sleeve will be removed and an inconel pad will be built-up on the outside surface of the pressurizer shell. An extended pad will be added to allow the pressure boundary weld to be performed in a horizontal plane. An inconel sleeve will be expansion rolled into the penetration wall and a seal weld provided between the inconel sleeve and the internal clad surface. The new heater sleeve will then be welded to the extended pad.

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To implement the above, FPL intends to use the following ASME code cases:

ASME Code Case N-432

Repair Welding Using Automatic or Machine Gas Tungsten - Arc Welding (GTAW) Temperbead Technique
Section XI, Division 1

ASME Code Case N-474-1 (Pending Final Approval)

Design Stress Intensities and Minimum Yield Strength Values for Alloy 690 (UNO6690) With a Minimum Yield Strength of 35 ksi, Class 1 Components

Section III, Division 1

(The use of Alloy 690 in the SB-166 product form (forgings) was presented to the ASME Sections II, III, and IX committees the week ending December 1, 1989. This product form was added to Code Case N-474 which was approved by the main committee on December 1, 1989, and included the approval of SB-166 and SB-167 in addition to SB-163. Final approval by the Council on Codes and Standards, however, is not anticipated until January 1990. A draft copy of Code Case N-474-1 is attached.)

The inconel weld pad buildup described above will be performed using ASME Code Case N-432. Code Case N-432 allows the use of an automatic repair process. The automatic process allows weld repairs to be made without requiring a full 1150°F stress relief of the pressurizer base material. The man-rem savings over a manual process are significant.

ASME Code Case N-474-1 will be used for the Alloy 690 material required to perform the sleeve replacement or plugging of penetrations previously described. The tubing product form of Alloy 690 (SB-163) will be used for replacement heater sleeves. The forged product form of Alloy 690 (SB-166) will be used for plugs and corrosion resistant sleeves used in conjunction with replacement heater sleeves.

The NRC staff has found implementation of ASME Code Case N-432 generally acceptable in Regulatory Guide 1.147, Revision 6, dated May 1988. NRC authorization to use ASME Code Case N-474-1 is requested by January 31, 1990, in order to implement the repairs/modifications described above, if required, during the upcoming St. Lucie Unit 1 refueling outage, scheduled to begin in February 1990. The use of these Code Cases, if needed, would be documented in the St. Lucie Unit 1 Inservice Inspection Program.

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Please contact us if there are any questions about this information.

Very truly yours,

D.A. SAGER

B. H. J. Bossy
D. A. Sager
Vice President
St. Lucie Plant

DAS/EJW/gp

Attachment

cc: Stewart D. Ebnetter, Regional Administrator, Region II, USNRC
Senior Resident Inspector, USNRC, St. Lucie Plant

DRAFT

MFE 89-7
N 89-042
CASE

N-474

(-1)

CASES OF ASME BOILER AND PRESSURE VESSEL CODE

Approval Date: May 6, 1989

See Numeric Index for expiration
and any reaffirmation dates.

Case N-474
Design Stress Intensities and Yield Strength Values
for Alloy 690 With a Minimum Yield Strength of 35
ksi, Class 1 Components
Section III, Division 1

UN 06690

Inquiry: Is it permissible in the construction of Class 1 components conforming to the requirements of Section III, Division 1, to use nickel-chromium-iron Alloy 690 tubing with a minimum yield strength of 35 ksi as specified in material Specification SB-1632, SB 166, SB 167 AND SB 168?

IN 5
N 06690

Reply: It is the opinion of the Committee that the tubing material specified in the Inquiry may be used in the construction of Class 1 components under the rules of Section III, Division 1, provided the following additional requirements are met.

(a) The stress intensity and minimum yield strength values shall be as shown in Table 1.

(b) For external pressure the required thickness of the tubing shall be determined in accordance with NB-3133 using Fig. VII-1102-1 in Appendix VII of Section III.

(c) Welding Procedures and Performance Qualification shall be in accordance with Section IX and this Section. Separate welding procedures and performance qualification are required.

(d) This Case number shall be listed on the Data Report Form for the component.

THE MATERIAL
SHALL BE
CONSIDERED TO
BE PNO.43

TABLE 1

Temperature	Design Stress Intensity, S_w ksi	Yield Strength, ksi
100	23.3	35.0
200	23.3	31.6
300	23.3	29.8
400	23.3	28.7
500	23.3	27.8
600	23.3	27.6
700	23.3	27.6
800	23.3	27.6

5.2

DRAFT

