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Alabama Power

the southern electric system

10CFR50.55a

July 2, 1990

Docket Nos. 50-348  
50-364

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

Gentlemen:

Joseph M. Farley Nuclear Plant  
ASME Code Case N-395, Laser Welding

Alabama Power Company is currently developing contingency plans for steam generator maintenance for Farley Unit 2. The Unit 2 refueling outage is scheduled to start in mid-October 1990. Dependent on the steam generator tube eddy current testing results, tube sleeving may be required. As presented at a meeting with the NRC Staff on June 7, 1990, Westinghouse is developing a laser welded steam generator tube sleeve for use in the Fall of 1990.

ASME Boiler and Pressure Vessel Code Case N-395, Laser Welding (attached), has not been authorized for use by the NRC Staff in accordance with 10CFR50.55a, footnote 6. In that this code case provides guidance for use of the laser welding process, the NRC Staff is requested to review Code Case N-395 and authorize its use at Farley Nuclear Plant for the sleeving process described above by October 1990.

If you have any questions, please advise.

Respectfully submitted,

W. G. Hairston, III

WGH,III/REM:mgd 21.28

Attachment

cc: Mr. S. D. Ebner  
Mr. S. T. Hoffman  
Mr. G. F. Maxwell

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**CASES OF ASME BOILER AND PRESSURE VESSEL CODE**

**Approval Date: February 20, 1984**

*See Numerical Index for expiration  
and any reaffirmation dates.*

**Case N-395  
Laser Welding  
Section III, Division 1**

*Inquiry:* May laser welding be used under Section III, Division 1, to join P-Nos. 8, 10G, 41, 42, 43, and 44 materials not exceeding 3/4 in. in thickness?

*Reply:* It is the opinion of the Committee that laser welding may be used under Section III, Division 1, to join P-Nos. 8, 10G, 41, 42, 43, and 44 materials not exceeding 3/4 in. in thickness, provided that:

(a) a Welding Procedure Specification shall be prepared and qualified in accordance with the requirements of Section IX; the following essential variables shall apply:

**(1) Joints**

- (a) a change in the type of groove;
- (b) the addition or deletion of a backing;
- (c) an increase in the qualified fit-up gap.

**(2) Base Metals**

(a) a change in base metal P-Number, type, or grade. When joints are to be made between base metals from two different P-Numbers (and two different groups), a procedure qualification must be made for the applicable combination of base metals even though procedure qualification tests have been made for each of the two base metals welded to itself.

(b) Where the measurement of penetration can be made by visual or mechanical means, requalification is required where the base metal thickness differs by 20% from that of the test coupon thickness. Where the measurement of penetration cannot be made, requalification is required where the base metal thickness differs by 10% from that of the test coupon.

**(3) Filler Metals**

- (a) the deletion or addition of filler metals;
- (b) for filler metal additions, any change from the nominal specified analysis of the filler metal qualified;
- (c) any change in the method by which filler metal is added, such as preplaced shim, top strip, wire,

wire feed, or prior weld metal buttering of one or both joint faces.

**(4) Postweld Heat Treatment**

(a) the addition or deletion of postweld heat treatment;

(b) a change in the postweld heat treatment temperature and time range.

**(5) Gas**

(a) a change from a single shielding gas to any other single shielding gas or to a mixture of shielding gases, or a change in specified percentage composition of shielding gas mixture;

(b) the addition or deletion of one or more of the following: shielding gas, trailing shielding gas, backing gas, or plasma-removing gas;

(c) a change of more than 5% in the flow rate of one or more of the following: shielding gas, trailer shielding gas, backing gas, and plasma-removing gas;

(d) any change of environment shielding, such as from vacuum to an inert gas or vice-versa;

(e) a change in the position or orientation of plasma removing gas jet relative to the workpiece (e.g., coaxial transverse to beam).

**(6) Electrical Characteristics**

(a) any change in the beam pulsing frequency and pulse duration from that qualified;

(b) a change in one or more of the following: lens focal length, focal distance, and spot size;

(c) a change in mode of operation from pulsed to continuous or vice-versa;

(d) a change in the wattage of more than  $\pm 2\%$  from that qualified;

(e) a change in energy distribution across the beam (i.e., multimode or gaussian);

(f) a change in energy received by the workpiece.

**(7) Technique**

(a) the addition or deletion of beam oscillation;

(b) a change in width, frequency, or dwell time of beam oscillation;

(c) a change from single to multiple pass or vice-versa;

## CASE (continued)

N-395

### CASES OF ASME BOILER AND PRESSURE VESSEL CODE

(d) a change in the type or model of the laser welding equipment;

(e) a change in welding speed of more than  $\pm 2\%$ , or lens to work distance of more than  $\pm 5\%$ , from those qualified;

(f) a change from the melt-in technique to the keyhole technique of welding, or vice-versa;

(g) a change from welding from one side to welding from both sides or vice-versa;

(h) a change in the method of initial and inter-pass cleaning;

(i) the addition of a wash pass.

(b) Requalification is required for any changes of the essential variables from those qualified.

(c) The performance qualification for laser welding operators shall duplicate the test coupons, test specimens, and requirements of the Welding Procedure Specification.

(d) This Case number shall be shown on the Data Report Form.