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Iowa Electric Light and Power Company

July 8, 1980
LDR-80-184

LARRY D. ROOT
ASSISTANT VICE PRESIDENT
NUCLEAR GENERATION

Mr. James G. Keppler, Director
Office of Inspection and Enforcement
Region III
U.S. Nuclear Regulatory Commission
799 Roosevelt Road
Glen Ellyn, ILL 60137

Dear Mr. Keppler:

The enclosure to this letter is our response to IE Bulletin No. 80-08 concerning examination of containment liner penetration welds.

If there are any questions regarding this response, we will be pleased to discuss them with you.

Very truly yours,

Larry D. Root

Larry D. Root
Assistant Vice President
Nuclear Generation

LDR/RFS/mz
Attachment

cc: R. Salmon
D. Arnold
L. Liu
S. Tuthill
K. Meyer
D. Mineck
J. Van Sickle
T. Kevern (NRC)
File: A-101a, BN8008

Director, Division of Reactor Construction Inspection
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

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Item 1

Determine if your facility contains the flued head design for penetration connections, or other designs with containment boundary butt weld(s) between the penetration sleeve and process piping as illustrated in Figure NE 1120-1, Winter 1975 Addenda to the 1974 and later editions of the ASME B&PV Code.

Response: The configuration of the flued heads used at the DAEC matches with illustration "C" of Figure NE 1120-1, Typical Containment Penetrations, Winter 1975 Addenda to the 1974 and later editions of the ASME B&PV Code.

The flued head design at the DAEC was further subclassified into double and triple flued heads depending on the number of internal flues (nozzles) in the forgings. In the case of double flued heads, the containment penetration sleeve was directly welded to the flued head. In the case of triple flued heads, the containment penetration sleeve was attached through an expansion bellows joint which was designed to accommodate differential movement between the two. A guard pipe was installed between the process line and the bellows.

The welds which are included in this response are a part of the containment pressure boundary for these two types of flued heads. They are described as follows:

A) Containment Pressure Boundary Welds for Double Flued Head Fittings

- (i) All dissimilar metal welds on the containment penetration sleeve.
- (ii) The containment penetration sleeve to the flued head fitting weld.

B) Containment Pressure Boundary Welds for Triple Flued Head Fittings

- (i) The containment penetration sleeve to the expansion bellows weld.
- (ii) The expansion bellows to the flued head fitting weld.

Item 2

If an affirmative answer is reached for Item 1, determine the following:

- a) Applicability of the ASME Code including year and addenda and/or Regulatory Guide 1.19.

Response: The welds described in Item 1 were completed and examined between January 1972 and May 1973. The design and fabrication of the components involved in completing these welds and their installation were done in accordance with the following Codes:

Item 2a - Response (Continued)

- A) Flued Heads (Double and Triple) - ASME Section III 1971 Edition
- B) Expansion Bellows - ASME Section III 1971 Edition
- C) Containment Vessel and Containment Penetration Sleeves - ASME Section III 1968 Edition through Summer 1968 Addenda
- D) Installation of the Flued Heads and Expansion Bellows on the Containment Penetration Sleeves - ANSI B31.7
- E) Examination of Completed Welds - ANSI B31.7

The Safety Guide (Reg. Guide 1.19) was not applicable to this facility as it had been written specifically for the nondestructive examination of the containment steel liner and penetration welds in concrete containments. The containment (drywell) at the DAEC is a steel pressure vessel fabricated from SA 516 GR 70 material.

Item 2b Type of nondestructive examinations performed during construction.

Responses: The nondestructive examinations performed on the welds described in Item 1 during construction were as follows:

A) Double Flued Head Fittings

	<u>Welds</u>	<u>NDE</u>
(i)	Dissimilar Metal Weld on the Containment Penetration Sleeve	Radiography
(ii)	Containment Penetration Sleeve to the Flued Head Fitting Weld	Radiography and Liquid Penetrant (Note: 2)

B) Triple Flued Head Fittings

(i)	Containment Penetration Sleeve to the Expansion Bellows Weld	Radiography and Liquid Penetrant (Note: 1)
(ii)	The Expansion Bellows to the Flued Head Fitting Weld	Ultrasonic and Liquid Penetrant

Notes:

1. Performed ultrasonic and liquid penetrant examinations in place of radiography for main steam penetration welds.
2. Liquid penetrant examination was not performed on instrument air, control rod drive return, recirculation loop sample and standby liquid control penetration welds.

Item 2c Type of weld joints (including pipe material and size) and whether or not backing bars were used.

Response: All the welds described in Item 1 were open butt weld joints. The use of backing rings to complete these welds was not permitted by the Welding Procedures. The containment penetration sleeve sizes varied from 3.5" ID through 36" OD depending on the size of the process lines. The material specifications for containment penetration sleeves, expansion bellows pipe and flued heads are as follows:

A) Expansion Bellows Pipes

- (i) Carbon Steel A 155 KCF 70 CL 1
- (ii) Stainless Steel A 358 TP 304 CL 1

B) Containment Penetration Sleeves

- (i) Carbon Steel A 333 FR I or A 155 KCF GR 70
- (ii) Stainless Steel (Transition Piece) A 312 TP 304

C) Flued Heads

- (i) Carbon Steel SA 105 GR II
- (ii) Stainless Steel SA 182 F316

Item 2d Results of construction nondestructive examinations, i.e., if repairs were required, this should be identified including extent of repairs and description of defects encountered during repair, if known.

Response: The nondestructive examinations described in Item 2b were performed on the completed welds. Four of the nineteen welds examined ultrasonically were initially rejected because the discontinuities (i.e., slag and linear indications) were not within the ultrasonic examination acceptance standards of the applicable ANSI B31.7 Code. Similarly, seven of the thirty welds examined radiographically were initially rejected because the discontinuities (i.e., slag, porosity, incomplete fusion and excess weld metal) were not within the radiographic examination acceptance standards of the ANSI B31.7 Code. The rejected welds were repaired, re-examined and accepted in accordance with the ANSI B31.7 Code.

Item 3 For those facilities committed during construction to perform volumetric examination of such penetrations through SAR commitments which have not performed radiography, justify not performing radiography or submit plans and schedules for performing radiographic examinations.

Response: All the welds except specified below for double and triple flued heads were examined by radiography or by a combination of radiography and liquid penetrant examinations. The expansion bellows to the flued head welds and expansion bellows to the containment penetration sleeve welds for the main steam flued heads were examined by ultrasonic and liquid penetrant examinations. The geometry of the triple flued heads and location of the weld joints were such that successful and meaningful radiography was impractical.

The proper paper work had been initiated during construction to replace radiographic with ultrasonic and liquid penetrant examinations. The authorized code inspector concurred with this substitution. In addition, the results of the nondestructive examinations described in Item 2d were analyzed to determine the % weld rejections using the radiographic and ultrasonic examination methods and it was found that the % rejections were equal for both examination methods. We interpret this as signifying that equal attention and care had been taken during construction to perform ultrasonic examination and radiography on the completed welds, and that the quality of both methods was equivalent. Moreover, backing rings were not used on the completed welds further enhancing the equivalency of the methods as indicated in the final sentence of the descriptive portion of the Bulletin.

Therefore, where meaningful and successful radiography could not be performed, ultrasonic examinations with liquid penetrant examinations were used and at least equivalent results obtained.