

ENCLOSURE
COMMONWEALTH EDISON COMPANY (CECo)
BYRON STATION, UNITS 1 AND 2
DOCKET NOS. 50-454/455

BRIADWOOD STATION, UNITS 1 AND 2
DOCKET NOS. 50-456/457
SAFETY EVALUATION REPORT
PENETRAMETER PLACEMENT DURING RADIOGRAPHY

I. INTRODUCTION

This report was prepared with the technical assistance of DOE Contractors from the Idaho National Engineering Laboratory.

As part of a routine inspection conducted by Region III personnel on January 12 and 14, 1982 at Byron Station Units 1 and 2, the NRC staff reviewed radiographs and reports on shop welds fabricated for the Applicant by Southwest Fabricating and Welding Company. Eleven of the twenty weld radiographs reviewed had penetrameters located on the welds in the area of interest for interpretation. The total number of welds radiographed with penetrameters located on the weld material was not known. The radiographs met all other ASME Code requirements as discussed in NRC Inspection Reports 50-454/82-01 and 50-455/82-01 (Reference 1).

The condition described above was reported as being a violation of 10 CFR 50, Appendix B, Criterion IX which states in part that, "Measures shall be established to assure that special processes, including . . . nondestructive testing, are controlled and accomplished by qualified personnel using qualified procedures in accordance with applicable codes, standards, specifications, criteria, and other special requirements." The CECo Quality Assurance Manual Q.R. No. 9.0, paragraph 9.4, also requires that nondestructive examination will be in accordance with applicable codes.

II. CODE REQUIREMENTS

At the Byron Station Units 1 and 2 shop welds were fabricated in accordance with Section III of the ASME Code, 1974 Edition, Summer 1975 Addenda. Radiographic examination was performed based on the requirements of Section V of the ASME Code, 1974 Edition, Summer 1974 Addenda.

Paragraph T-262.2, Placement of Penetrameters, in the above referenced Code, states in part that, "The penetrometer shall be placed adjacent to the weld seam except in instances where

the weld metal is not radiographically similar to the base material or the geometric configuration makes it impractical, in which case, the penetrometer may be placed over the weld metal. When configuration or size prevents placing the penetrometer on the object being radiographed, it may be placed on a separate block as provided in Standard Method SE-142."

Paragraph T-233, Density Limitations of Radiographs, states "The film density through the area of interest of the radiographic image shall be 2.0 minimum for single viewing and 2.6 minimum for composite viewing of double film exposures and 3.8 maximum for either case. Each radiograph of a composite set shall have a minimum density of 1.3."

In addition, Paragraph T-262.3, Number of Penetrameters, states in part "If the density of the radiograph anywhere through the area of interest varies by more than minus 15 or plus 30 percent, then an additional penetrometer shall be used for each exceptional area or areas and the radiograph retaken. The required densities are in Paragraph T-233."

III. ACTION TAKEN BY THE APPLICANT

In order to resolve the issue (References 2, 3 and 4), the Applicant submitted a Code inquiry to the ASME on February 2, 1982 to establish the intent of the ASME Code with regard to the placement and number of penetrameters. The ASME Code Committee responded to the inquiry (References 5 and 6) with Code Case 1914 that became effective on February 7, 1983. CECO's position is that the technique used by Southwest Fabrication and Welding Company was not a violation of the intent of the Code as it applies to the placement and number of penetrameters and Code Case 1914 supports the practice (Reference 7). However, CECO requested that Southwest Fabrication discontinue this particular technique, which they did on January 22, 1979. The Q.A. Department performed a surveillance of Southwest radiographs which concluded that this technique was in fact discontinued (Reference 3).

The Applicant summarized the results (Reference 8) of a review of the radiographs involved at both the Byron and Braidwood stations as follows:

<u>Unit</u>	<u>Number of Welds Involved</u>	<u>Penetrameters Placed Over Weld</u>
Byron 1	3015	518
Byron 2	1233	38
Braidwood 1	2204	273
Braidwood 2	<u>1064</u>	<u>32</u>
	7516	861

The Applicant indicated that the lead penetrameter identifying numbers were not placed on the weld metal and that acceptable radiographs were produced considering the latitude and density permitted by the ASME Code. In a conference call on January 5, 1984, the Applicant also confirmed that penetrameter shims were not used on the subject radiographs.

IV. STAFF EVALUATION

Based on a review of the referenced documents, the staff has determined that the Applicant has met the requirements of Section V of the ASME Code, paragraph T-262.2 as modified by ASME Code Case 1914. Meaningful flaw indications would not have been obscured by the penetrameter placed on the weld material according to this Code case. The placement of penetrameters on the weld material should not degrade the quality of the radiographic image produced if the density requirements of

paragraphs T-233 and T-262.3 have also been met. Therefore, the staff has reached the conclusion that Code Case 1914 is technically acceptable for use during the construction at Byron Station Units 1 and 2 and Braidwood Station Units 1 and 2.

V. REFERENCES

1. January 27, 1982 letter from C. E. Norelius to Cordell Reed with enclosed Inspection Report Nos. 50-454/82-01 and 50-445/82-01.
2. January 27, 1982 letter from E. E. Potter to K. Ward.
3. February 26, 1982 letter from L. O. DelGeorge to J. G. Keppler.
4. May 12, 1982 letter from C. E. Norelius to Cordell Reed.
5. June 7, 1982, letter from M. E. Sheehan to E. E. Potter.
6. March 1, 1983 letter from P. D. Stumpf to E. E. Potter.
7. March 16, 1983 letter from D. L. Farrar to J. G. Keppler.
8. May 3, 1984 letter from T. R. Tramm to H. R. Denton.
9. American Society of Mechanical Engineers Boiler and Pressure Vessel Code, Sections III and V, 1974 Edition, including Addenda through Summer 1975.
10. American Society of Mechanical Engineers Boiler and Pressure Vessel Code, Code Case No. 1914 for Alternative Penetrameter Placement, Section V.