

Mr. Marvin I. Lewis
6504 Bradford Terrace
Philadelphia, PA 19149

JAN 29 1985

Dear Mr. Lewis:

Reference: M. I. Lewis letter to Edward L. Jordan dated December 19, 1984
concerning Information Notice 84-89

In your letter of December 19, 1984, you expressed several concerns regarding
Information Notice 84-89, "Stress Corrosion Cracking in Nonsensitized 316
Stainless Steel." Our responses are enclosed.

We trust that this information is responsive to your concerns.

Sincerely,

Original Signed By:
E. L. Jordan

Edward L. Jordan, Director
Division of Emergency Preparedness
and Engineering Response
Office of Inspection and Enforcement

Enclosure: As stated

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Enclosure

Question 1: Could fabrication be the cause of the cracking?

Response: The fabrication processes, which include grinding, machining and welding, add stress to the metal. The magnitude of these stresses varies greatly. These stresses in combination with the service stresses and the environment may result in metal attack leading to intergranular stress corrosion cracking.

Question 2: Could preexisting cracks be the cause of the cracking?

Response: The welds and the adjacent material were examined by radiography and ultrasonic methods. No linear indications were found and there were not any preexisting cracks.

Question 3: Could the cracking have been something other than intergranular stress corrosion cracking?

Question 4: Can it be proven that the cracking was intergranular stress corrosion cracking?

Response: These two questions are clearly interrelated and therefore are answered together. The application of stress to this material would not, by itself, cause the indications found by the licensee. It is necessary for corrosion to be present. Of the various types of corrosion, only intergranular corrosion and stress corrosion are relevant for this stainless steel application. Since an examination of the cracks showed separation between the grains (intergranular) and the crack growth seemed consistent with the stress, the category was defined as intergranular stress corrosion cracking.

Question 5: Are submittals taken at face value without independent testing and verification?

Response: Submittals from licensees are reviewed for technical accuracy. Independent testing is performed when necessary. In this instance independent testing was not conducted because the cracking, although not expected, did not contradict previous experience and published literature. See attached Bibliography on stress corrosion cracking.

Bibliography on Stress Corrosion Cracking

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3. V. Cihal and J. Kubelka, PRACTICAL METALLOGRAPHY, Volume 12 number 148, (1975)
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9. D. Peckner and I. M. Bernstein, HANDBOOK OF STAINLESS STEELS, McGraw-Hill, New York 1977, pp. 16.84-16.86, 20.29
10. W. J. Shack, T. F. Kassner, D. S. Kupperman, F. A. Nichols, J. Y. Park and R. W. Weeks, NUREG/CR-2541 ENVIRONMENTALLY ASSISTED CRACKING IN LIGHT WATER REACTORS: CRITICAL ISSUES AND RECOMMENDED RESEARCH, U. S. Nuclear Regulatory Commission, Washington 1982, pp. 2.1-2.7, 3.34-3.42