

January 22, 1996

Mr. Robert E. Denton
Vice President - Nuclear Energy
Baltimore Gas and Electric Company
Calvert Cliffs Nuclear Power Plant
1650 Calvert Cliffs Parkway
Lusby, MD 20657 - 4702

SUBJECT: INSPECTION REPORT NOS. 50-317/95-08 AND 50-318/95-08 (REPLY)

Dear Mr. Denton:

This refers to your November 21, 1995, correspondence in response to our letter, dated October 16, 1995, regarding Calvert Cliffs Units 1 and 2. This correspondence dealt with a violation of the fire barrier requirements of 10 CFR 50, Appendix R, in that cork expansion joints were not designed or tested as 3-hour rated fire barrier penetration seals. We have reviewed this matter in accordance with NRC Inspection Manual Procedure 92903, "Engineering."

You found that the cause of the violation was an inadequate design and use of other than tested fire-retardant materials. Also, during your efforts to implement Appendix R requirements, you did not recognize expansion joints as a type of fire barrier penetration seal and the joints were not included in the surveillance test that performs visual inspections of fire barriers.

However, your response failed to discuss why the reviews conducted as part of the Fire Protection Penetration Seal Review Project, beginning in 1991, and the review of the April 14, 1995, expansion joint fire did not identify that the expansion joints did not meet the 10 CFR 50 Appendix R requirements for fire barriers. The identification, evaluation, and resolution of a potential deficiency in your review process is important to ensure that this violation was an isolated occurrence. We request that you review this issue and inform us of the results of your review within 30 days of receipt of this letter.

Your corrective actions, that include the installation of a fire-rated penetration seal in the expansion joints and improvements to the surveillance procedure, appear to be acceptable to resolve the expansion joint fire barrier concern.

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Mr. Robert E. Denton

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We will review the effectiveness of these actions in a future inspection.

Sincerely,

Original Signed By:

Lawrence T. Doerflein, Chief
Projects Branch No. 1
Division of Reactor Projects

Docket Nos. 50-317
50-318

cc:

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*file w/
112 95-08*



November 21, 1995

U. S. Nuclear Regulatory Commission
Washington, DC 20555

ATTENTION: Document Control Desk

SUBJECT: Calvert Cliffs Nuclear Power Plant
Unit Nos. 1 & 2; Docket Nos. 50-317 & 50-318
Reply to Notice of Violation -- NRC Inspection Report Nos. 50-317(318)/95-08

REFERENCE: (a) Letter from Mr. L. T. Doerflein (NRC) to Mr. R. E. Denton (BGE), dated October 16, 1995, Notice of Violation, Combined Inspection Report Nos. 50-317/95-08 and 50-318/95-08

In response to Reference (a), Attachment (1) details our response to a cited violation concerning the adequacy of expansion joint configurations in fire walls and floors to meet a three-hour fire rating as required under 10 CFR Part 50, Appendix R.

Should you have questions regarding this matter, we will be pleased to discuss them with you.

Very truly yours,

RED/CDS/bjd

Attachment

cc: D. A. Brune, Esquire
J. E. Silberg, Esquire
L. B. Marsh, NRC
D. G. McDonald, Jr., NRC

T. T. Martin, NRC
Resident Inspector, NRC
R. I. McLean, DNR
J. H. Walter, PSC

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ATTACHMENT (1)**REPLY TO NOTICE OF VIOLATION 50-317/95-08-01 AND 50-318/95-08-01**

Notice of Violation 50-317/95-08-01 and 50-318/95-08-01 describes a case of non-compliance with the 10 CFR Part 50 Appendix R requirements for ensuring that redundant trains of systems necessary to achieve and maintain hot shutdown conditions remain free of fire damage. Specifically, on April 14, 1995, a fire occurred in a section of wall expansion joint material in the "K" line wall that separates the Auxiliary Building and the Turbine Building, a three-hour rated fire wall. This and other expansion joints in fire rated walls were not designed to be rated fire barriers, nor had they been tested to be rated fire barriers.

I. REASON FOR THE VIOLATION

The expansion joints were not initially designed to be three-hour rated fire barrier penetration seals. They were originally installed to accommodate expansion and contraction of the concrete walls. At the time of initial plant construction during the mid 1970's, there was no requirement to ensure redundant hot shutdown systems were separated by three-hour fire barriers. The 10 CFR Part 50 Appendix R rule did not become effective until 1981.

The cause for the expansion joints ineffectiveness was an inadequate design, including lack of design details, and use of other than tested fire-retardant materials. During our efforts to implement the requirements of 10 CFR Part 50 Appendix R in the early 1980s, we did not recognize expansion joints as a type of fire barrier penetration seal assembly requiring evaluation. As a result, expansion joints were not identified as fire rated seals in our Technical Specification surveillance test for Penetration Fire Barriers. Technical Specification 4.7.12, Penetration Fire Barriers, requires a visual inspection of each fire barrier penetration once per 18 months. This surveillance test was performed by inspecting each wall as a unit rather than a visual inspection of each individual penetration. Over the years, on several occasions, we identified missing cork or gaps in some expansion joints in the plant. These deficient expansion joint seals were repaired by sealing with a poly-sulfide sealant material. However, the surveillance test method of inspection was not effective in identifying that expansion joints had no applicable fire rated sealing detail.

A root cause analysis was completed concerning the fire that occurred on April 14, 1995. It concluded exposure of the cork material in the expansion joint, combined with a loss of resiliency and shrinkage, reduced the effectiveness of their associated walls in retarding the spread of fire.

II. CORRECTIVE STEPS TAKEN AND RESULTS ACHIEVED

At the time of the April 14, 1995 expansion joint fire, we were in the process of conducting a Fire Barrier Penetration Seal Review Project. This project, begun in 1991, is scheduled to be completed around mid 1996. This project consists of planning, inspecting, individually numbering, and proceduralizing inspection of each fire barrier penetration seal in the plant. While planning this project, we recognized that expansion joints were fire barrier penetrations that needed to be evaluated and inspected to ensure they were capable of retarding the spread of fire. An evaluation was conducted under the guidance of Generic Letter 86-10, Implementation of Fire Protection Requirements, to accept the typical expansion joint configuration that was described in the plant design documents.

During the Penetration Seal Review Project walkdowns, we determined that the cork material in some expansion joints was questionable in its ability to prevent the spread of fire from one fire area to another, or

ATTACHMENT (1)

REPLY TO NOTICE OF VIOLATION 50-317/95-08-01 AND 50-318/95-08-01

was materially deficient. When discovered, materially deficient expansion joints were treated as inoperable and corrective actions were initiated to promptly repair them. At the time of the fire, the walkdowns were still in progress and had not yet inspected the expansion joint where the fire occurred.

After the April 14, 1995 fire, we evaluated the ability of the plant's expansion joints to meet the function of a fire barrier as described in the Technical Specifications. Our conclusion was that, while the expansion joints were not explicitly designed and tested as three-hour rated fire assemblies, many expansion joint configurations in the plant would be effective in mitigating the spread of a fire from one fire area to another until the fire could be detected and extinguished. Initially, we used this evaluation to conclude some expansion joint configurations were operable as fire barrier penetration seals while actions were being taken to restore them to a fully qualified configuration. All expansion joints that we concluded would not effectively mitigate the spread of fire from one fire area to another were declared inoperable, and fire watch patrols were established in accordance with the Technical Specifications. The review also concluded the safety significance of the degraded expansion joints was small.

Based on discussions with the Nuclear Regulatory Commission during and after the inspection that identified this violation, we declared the remainder of the expansion joints in Technical Specification fire barriers inoperable and implemented fire watch patrols.

Shortly after the expansion joint fire occurred, a modification was begun to develop and implement fire rated expansion joint design details. This modification (MCR 95-013-003) is currently in progress. Fire rated design details have been developed for expansion joints, and we are currently in the process of upgrading the material condition of the expansion joints in the plant to conform with these new design details. Currently we have completed repairs on over 90 percent of the expansion joints that were identified for repair during walkdowns. We expect to repair all expansion joints that have been identified for repair to a fully qualified status by the end of the year.

We have reviewed internal and industry events to determine if any similar events have occurred in the past. No previous similar events involving wall or floor expansion joint discrepancies were found. This event was communicated to the nuclear industry on the INPO NETWORK on April 14, 1995, and via Licensee Event Report 50-318/95-004 on May 15, 1995.

III. CORRECTIVE STEPS WHICH WILL BE TAKEN TO AVOID FURTHER VIOLATIONS

In addition to upgrading their material status, we are adding expansion joints to a revision of the surveillance procedure for 18-month visual inspection of fire barrier penetration seals. This procedure revision is a direct product of the Fire Barrier Penetration Seal Project, and a significant improvement over the existing procedure. The new revision will include inspections of individual penetration seals rather than a general inspection of the whole wall.

ATTACHMENT (1)

REPLY TO NOTICE OF VIOLATION 50-317/95-08-01 AND 50-318/95-08-01

IV. DATE WHEN FULL COMPLIANCE WILL BE ACHIEVED

Full compliance will be achieved when all expansion joints in fire rated walls have been upgraded to a fully qualified status. As stated earlier, over 90 percent of the expansion joints identified for repair have been repaired. We expect the remainder of the fire barrier expansion joints identified for repair will be in a fully qualified status by the end of the year.