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REPLY TO
ENGINEERING OFFICE
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June 11, 1993
BVY 93-058

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

References: a) License No. DPR-28 (Docket No. 50-271)
b) Letter, USNRC to VYNPC, Inspection Report 93-05, dated 5/13/93

Subject: **Reply to a Notice of Violation - Inspection Report 93-05**

Dear Sir:

This letter is written in response to Reference (b), which documents that two of our activities were not conducted in full compliance with NRC requirements. The violations, classified as a Severity Level IV, were identified during a fire protection inspection conducted from February 17-25, 1993. Our response to these items is provided below.

VIOLATION:

10 CFR 50, Appendix R, Paragraph III.G.2 requires, in part, that cables and equipment of redundant trains of systems necessary to maintain hot shutdown condition, located within the same fire area outside the primary containment must be ... separated by a three hour fire barrier...

Further, Vermont Yankee Technical Specification Limiting Conditions for Operation 3.13.E.1 states, "...vital fire barrier seals protecting the Reactor Building, Control Room Building, and Diesel Generator Rooms shall be intact."

Contrary to the above, as of April 21, 1993, certain three hour fire barriers designed to separate equipment in redundant trains of systems necessary to maintain hot shutdown, including vital fire barriers protecting the reactor building, control room building, and the diesel generator rooms have been deficient since their original installation in 1979 and 1980. Specifically, numerous fire barrier penetration seals

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located in these barriers were not intact or were otherwise degraded due to: (1) inadequate depth of penetration fill material; (2) unqualified fill material; (3) installation of unqualified designs; and (4) through wall cracking of fire barriers.

This is a Severity Level IV violation.

RESPONSE

Based on our root cause analysis, this violation occurred primarily due to inadequate documentation of assumptions, inadequate procedures, and human error.

Discussions with cognizant personnel revealed that an assumption was made that piping insulation did not need to be removed to install the fire seal designs. This assumption ultimately resulted in the installation of seals without the supporting qualification documentation. A review of the design and installation procedures in effect in 1979/80 revealed that insufficient emphasis was placed on documenting assumptions that were made during the scoping of design efforts, ensuring as-built configurations satisfied test report requirements, and assessing the need for specific fire barrier penetration seal configurations. Additionally, "boot" type seals were not installed on lines with large displacements due to human error on the part of the cognizant Vermont Yankee engineer.

As a result of these identified problems, a raw design change has been implemented to install qualified fire seals on all insulated lines and other lines where an established seal design was not available. Additionally, an enhanced intrusive inspection was performed on all fire barriers (walls, floors, ceilings) and fire seals to verify adequacy of the fire barrier and seal configuration.

Implementation of the design modifications and surveillance repairs, and full compliance with regulatory requirements was achieved on May 21, 1993.

Design procedures will be revised to more clearly require the documentation of assumptions made during the development of the design change scope, to put additional emphasis on ensuring layout and arrangement drawings and as left field conditions meet the applicable supporting test report requirements, and to require that Vital Fire Barrier configuration control be considered as a design input and independent review requirement for future design changes. Modifications to these procedures are scheduled to be completed by August 1993.

An evaluation of fire penetrations containing un-insulated process lines was performed to assess the appropriateness of the seal type installed for the line displacements anticipated. This assessment concluded that the appropriate seal type was selected and that there was no potential impact on system operability due to line displacements.

The existence of through-wall cracks was the result of weaknesses in the surveillance procedure which is discussed with the response to the second violation.

VIOLATION

Technical Specification Section 4.13.E.1, requires that, "vital fire barrier penetration seals shall be verified to be functional by visual inspection at least once per operating cycle and following any repair."

Contrary to the above, since 1979/1980 and continuing until December 1992, the inspection conducted at least once per operating cycle to verify vital fire barrier penetration seals were functional was inadequate in that it did not define an acceptable method or provide inspection direction sufficient to verify the adequacy of the penetrations, as evidenced by the following:

*** Operating Procedure (OP) 4019, "Surveillance of Vital Barriers" in use prior to February 1993, lacked specific accept/reject criteria.**

*** Inspections conducted from 1980 until December 1992 failed to identify that numerous vital fire barrier penetrations were not functional due to various deficiencies and degradations.**

This is a Severity Level IV violation.

RESPONSE

Based on our root cause analysis, this problem occurred due to an inadequate surveillance procedure. The procedure controlling the surveillance activity (OP4019) lacked specific acceptance criteria and direction for inspection personnel.

The controlling procedure, OP 4019, "Surveillance of Vital Fire Barriers", has been revised to include specific guidance for performing the inspections and specific acceptance criteria based on penetration types along with specific training

An evaluation of fire penetrations containing un-insulated process lines was performed to assess the appropriateness of the seal type installed for the line displacements anticipated. This assessment concluded that the appropriate seal type was selected and that there was no potential impact on system operability due to line displacements.

The existence of through-wall cracks was the result of weaknesses in the surveillance procedure which is discussed with the response to the second violation.

VIOLATION

Technical Specification Section 4.13.E.1, requires that, "vital fire barrier penetration seals shall be verified to be functional by visual inspection at least once per operating cycle and following any repair."

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*** Inspections conducted from 1980 until December 1992 failed to identify that numerous vital fire barrier penetrations were not functional due to various deficiencies and degradations.**

This is a Severity Level IV violation.

RESPONSE

Based on our root cause analysis, this problem occurred due to an inadequate surveillance procedure. The procedure controlling the surveillance activity (OP4019) lacked specific acceptance criteria and direction for inspection personnel.

The controlling procedure, OP 4019, "Surveillance of Vital Fire Barriers", has been revised to include specific guidance for performing the inspections and specific acceptance criteria based on penetration types along with specific training

requirements. This revised procedure was used to conduct a one-time enhanced intrusive inspection of fire barriers (walls, floors, ceilings) and fire seals to verify barrier and seal integrity.

Implementation of the surveillance repairs, and full compliance with regulatory requirements was achieved on May 21, 1993.

Vermont Yankee plans to take credit for the recently completed enhanced surveillance to satisfy the surveillance requirement for this operating cycle. Vermont Yankee is currently developing the approach for future inspections which will include visual non-intrusive acceptance criteria based on penetration type. The approach is expected to be defined by December 1993 and OP4019 will be revised accordingly.

A review of other Technical Specification Surveillances that use a visual inspection methodology will be conducted to assess the adequacy of the established acceptance criteria. Additionally, Vermont Yankee will perform an assessment of how QA Surveillances are performed on design related installation activities. Those reviews are expected to be completed by December 1993.

The corrective actions provided above are considered the actions taken to address the primary causes related to preventing recurrence of this event. Additional corrective actions to address the contributing causes and follow-up actions planned to assess the effectiveness of the corrective actions taken, are included in LER 93-01 Supplement 1 and Vermont Yankee Nonconformance Report (NCR) 92-24. Completion of all corrective actions associated with this issue is expected by July 1994.

We trust the information provided is adequate; however, should you have any questions or require additional information, please do not hesitate to contact us.

Very truly yours,

Vermont Yankee Nuclear Power Corporation

Donald A. Reid
Vice President, Operations

cc: USNRC Regional Administrator, Region I
USNRC Resident Inspector, VYNPS
USNRC Project Manager, VYNPS