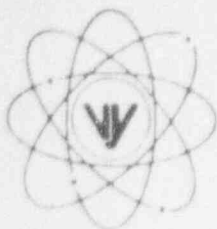


VERMONT YANKEE NUCLEAR POWER CORPORATION



P.O. Box 157, Governor Hunt Road
Vernon, Vermont 05354-0157
(802) 257-7711

April 27, 1995
BVY 95-47

U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Attn: Document Control Desk

References: Operating License DPR-28
Docket No. 50-271
Reportable Occurrence No. LER 95-004

Dear Sir:

As defined by 10 CFR 50.73, we are reporting the attached Reportable Occurrence as LER 95-004.

Very truly yours,

Robert J. Wanczyk
Plant Manager

RJW/dm

cc: Regional Administrator
USNRC
Region I
475 Allendale Road
King of Prussia, PA 19406

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PDR ADOCK 05000271
S PDR

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NRC Form 366 U.S. NUCLEAR REGULATORY COMMISSION (5-92)						APPROVED BY OMB NO. 3150-0104 EXPIRES 5/31/95 ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNBB 7714), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.						
LICENSEE EVENT REPORT (LER)												
FACILITY NAME (1) VERMONT YANKEE NUCLEAR POWER STATION						DOCKET NUMBER (2) 05000271		PAGE (3) 01 OF 05				
TITLE (4) Incomplete Repair Of Inoperable Vital Fire Barrier Penetration Fire Seal												
EVENT DATE (5)			LER NUMBER (6)				REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)		
MONTH	DAY	YEAR	YEAR	SEQ #	REV #	MONTH	DAY	YEAR	FACILITY NAMES	DOCKET NO.(S)		
03	29	95	95	- 04	- 00	04	27	95		05000		
OPERATING MODE (9)		N	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: CHECK ONE OR MORE (11)									
POWER LEVEL (10)		0	20.402(b)		20.405(c)		50.73(a)(2)(iv)		73.71(b)			
20.405(a)(1)(i)		50.36(c)(1)		50.73(a)(2)(v)		73.71(c)						
20.405(a)(1)(ii)		50.36(c)(2)		50.73(a)(2)(vii)		OTHER:						
20.405(a)(1)(iii)		X	50.73(a)(2)(i)		50.73(a)(2)(viii)(A)		(Specify in Abstract below and in Text, NRC Form 366A)					
20.405(a)(1)(iv)		50.73(a)(2)(ii)		50.73(a)(2)(viii)(B)		50.73(a)(2)(x)						
20.405(a)(1)(v)		50.73(a)(2)(iii)		50.73(a)(2)(x)		50.73(a)(2)(x)						
LICENSEE CONTACT FOR THIS LER (12)												
NAME ROBERT J. WANCZYK, PLANT MANAGER								TELEPHONE NO. (Include Area Code) 802-257-7711				
COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)												
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS			
N/A	N/A	N/A	N/A	N/A							
											
											
											
SUPPLEMENTAL REPORT EXPECTED (14)								EXPECTED SUBMISSION DATE (15)		MO	DAY	YEAR
YES (If yes, complete EXPECTED SUBMISSION DATE)				NO				DATE (15)		MO	DAY	YEAR

ABSTRACT

On 03/29/95, with the plant shutdown for refueling, personnel performing the operating cycle surveillance of vital fire barriers and penetration fire seals identified a fire seal that did not satisfy the acceptance criteria for operability. The seal is required to be operable at all times in accordance with Technical Specification 3.13.E.1. The seal was declared inoperable and a continuous fire watch was established within one hour. Subsequently, the seal was repaired and the barrier was declared operable. On 03/30/95, with the plant remaining shutdown, it was determined that the seal had not been completely repaired and was still inoperable. The seal was declared inoperable, a continuous fire watch was established, and repair efforts were initiated. The seal was reinspected following the second repair and determined to be fully operable.

A root cause for the initial inoperable condition could not be determined; the apparent cause is a work control process failure in that an unidentified work activity left the seal in an inoperable condition. The root cause for the incomplete seal repair is human error in the failure to adequately implement the requirements of the fire barrier and penetration fire seal repair procedure.

Similar events regarding inoperable fire barriers and penetration fire seals were reported within the past five years as LER 93-001 and LER 94-018.

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DESCRIPTION OF EVENT

Introduction:

Vermont Yankee (VY) Technical Specification (TS) §3.13.E.1 requires vital fire barriers protecting the Reactor Building, the Control Room Building and the Diesel Generator Rooms to be intact at all times. VY TS §4.13.E.1 requires vital fire barriers and penetration fire seals to be verified functional by visual inspection at least once per operating cycle and following any repairs. VY performs a 100% visual inspection of all vital fire barriers and penetration fire seals each operating cycle.

Inoperable Penetration Seal

On 3/29/95, with the plant shutdown for refueling, the operating cycle vital fire barrier and penetration fire seal surveillance of vital fire barrier #44 was performed in accordance with plant procedure OP 4019, "Surveillance of Vital Fire Barriers And Fire Rated Assemblies". Fire barrier #44 separates the Control Building (EIS = NA) Cable Vault from: (1) the Turbine Building (EIS = NM) High Pressure Heater Bay; (2) the Administration Building (EIS = MA) Computer Room; and, (3) an anteroom connecting the Control and Administration Buildings. The barrier is a 3-hour rated wall constructed primarily of reinforced concrete and is required to be operable at all times per TS §3.13.E.1. The wall is posted as a vital fire barrier on both sides.

Fire barrier penetrations between the Turbine Building High Pressure Heater Bay and the Cable Vault consist of conduits and cable trays routed through two 3' X 4' penetration areas. The Heater Bay is a locked high-radiation area during power operations and this barrier is inspected during plant shutdown only. One of the two penetration areas is sealed with ≥ 8" of approved masonry material ("grout") and cut-outs in the grout for cable trays are sealed with ≥ 6" of approved RTV silicone elastomer. Penetration #44-T11561 is a 3" X 18" cable tray routed through this penetration area.

The inspector identified 9 small holes (approximately ¼" - ⅜" diameter each) in the silicone elastomer seal for the cable tray in penetration #44-T11561. The holes were determined to fully penetrate the fire barrier seal. The barrier was then declared inoperable, a continuous fire watch was established within one hour as required by TS §3.13.E.1, and a work order was initiated to repair the seal.

Incomplete Repair Of Seal

When notified of the potentially inoperable seal, the VY Fire Protection Coordinator (FPC) examined the seal and determined that it was inoperable. Subsequently, the FPC and the Craft Superintendent (CS) responsible for seal material installation and repair work, examined the seal area containing the deficiencies and reviewed the appropriate repair methods. Proper repair required excavation of existing seal material. The CS later reviewed the area requiring excavation with the supervisor of excavation work at the scene. The repair work commenced and was completed on the succeeding shift. A Quality Control (QC) inspector examined the seal and determined that the repairs were acceptable. The seal and barrier were then declared operable and the continuous fire watch was terminated.

The FPC examined the repair work the next day (3/30/95) and determined that an area of the seal containing several holes had not been properly repaired. The FPC notified the Control Room that the seal and barrier were inoperable. A continuous fire watch was established within one hour and action was initiated to repair the remaining discrepancies. The area was then properly repaired and inspected, and the barrier was declared operable.

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CAUSE OF EVENT

Inoperable Penetration Seal

Examination revealed that the holes in the seal for penetration #44-T11561 were all smooth and symmetrical, evidently caused by the removal of wires after which the resulting holes were not sealed.

Both sides of the penetration area were inspected in April 1993 during an enhanced fire barrier and penetration seal surveillance during an unscheduled plant shutdown. The area was subjected to significant examination and analysis for baseline documentation concurrent with the enhanced surveillance. The holes were not identified at that time. The penetration area was re-inspected during a plant refueling shutdown the following September. Based upon the additional level of scrutiny and the conspicuousness of the holes when found, it is highly unlikely that the holes existed and were not detected during the 1993 inspections.

The Heater Bay is a locked high-radiation area during power operations and it is expected that any wire installation or removal activities through this barrier section would be performed only during plant shutdown. The deficiencies were discussed with key individuals from organizations normally responsible for wire routing, installation and removal at VY. However, no work activity involving wire installation or removal in this area subsequent to the September 1993 inspection was identified. Two possible instances were identified in which old, abandoned equipment may have been removed from the general area of the Heater Bay near the penetration area at the conclusion of the 1993 refueling outage. The equipment thought to have been removed - a wiring harness or a tubing assembly - could account for both the sizes and quantities of holes found in the penetration fire seal.

VY procedures related to work control, design control and cable installation were reviewed to determine whether the potential existed for performance of wire installation or removal without adequate consideration of the impact on fire barriers and penetration seals. It was determined that work classified as having no safety significance (e.g. work involving non-essential power panels, office lighting, electrical receptacles, etc.) could be performed without adequate controls to prevent inadvertent fire barrier and penetration seal damage. Such work is controlled by plant procedure AP 0021, "Work Orders", which includes the fire seal installation and repair procedure as a reference only. While AP 0021 explicitly addresses work that could impact safety-related, security and EQ systems/components, fire protection systems and fire barriers are not explicitly addressed. The unconfirmed removal of the abandoned equipment discussed above could have been accomplished under these circumstances.

No root cause was determined for this event as the activity that caused the holes could not be identified. The apparent cause is a work control process failure that allowed wiring removal that was not classified as safety-significant work. This work had been performed under a procedure that does not provide explicit requirements for, or precautions regarding, potential impact on fire barriers.

Incomplete Seal Repair

The majority of the holes were located in the center of the upper seal area, which was otherwise free of wires or other visual obstructions. The remaining holes were located in the upper right seal area (as viewed from the Heater Bay) and were interspersed between wires such that they were less readily visible.

Investigation determined that the scope of seal material excavation was misunderstood as the deficiencies in the center seal area were clearly obvious while the smaller number of deficiencies in the upper right seal area were comparatively obscure. Only the center area was excavated and subsequently resealed. Procedure OP 0046 (Installation of Fire Barrier Penetration Seals and Fire Breaks) requires an inspection of the complete seal following repair. However, the QC inspector examined the area of obvious repair only and determined that the repairs were satisfactory. Neither the excavation work supervisor nor the QC inspector noticed the remaining, less conspicuous holes in the upper right area.

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The root cause for this event is human error in the failure of the QC inspector to examine the entire penetration seal following repair as required by OP 0046. A contributory cause was the inadequate verbal communication of repair scope between the CS and the excavation work supervisor. A second contributory cause was inadequate documentation that described or depicted the deficiencies requiring repair, as required by OP 4019.

ANALYSIS OF EVENT

The inoperable seal was located in the section of Fire Barrier #44 that protects the Cable Vault from an external fire in the Heater Bay. The Heater Bay is unoccupied during power operations and, therefore, normally free of significant transient combustible materials and activities involving ignition sources. The Heater Bay is also equipped with a substantial automatic sprinkler system and with fire (heat) detection, although there are no sprinkler heads or detectors in close proximity to the fire barrier. However, fixed combustible loading in the area of the barrier is generally limited to cables in enclosed cable trays. Both the Heater Bay and the Cable Vault are classified as Fire Control Areas which are subject to plant administrative controls (including permits) for ignition source work and introduction of significant combustible materials.

The Cable Vault is equipped with an automatic CO₂ suppression system (EHS = LW) and ionization (smoke) detection. An hourly fire watch was established as a conservative measure during the periods the barrier was declared inoperable, as would be required by TS §3.13.D.2 if the CO₂ system were inoperable. However, based on a subsequent evaluation of the impact of the holes, the Cable Vault CO₂ system was not rendered inoperable by the inoperable seal. Alternative shutdown capability is provided for loss of the Cable Vault, due to a fire during power operations, in accordance with the VY Safe Shutdown Capability Analysis (SSCA).

Additionally, VY maintains a 24 hour/day, five-person/shift fire brigade capable of prompt response to a fire on either side of the barrier.

Based on the above, this event did not pose a significant threat to the plant or to the health and safety of the public.

CORRECTIVE ACTIONS

Immediate

1. A continuous fire watch was established on one side of Fire Barrier #44 within one hour as required by TS §3.13.E.2.
2. An hourly fire watch was established as a conservative measure for a potentially inoperable Cable Vault CO₂ system.
3. The inoperable seal was repaired using approved materials and procedures.
4. An additional inspection of completed seal repair work was performed by the plant Fire Protection Coordinator.
5. The Quality Control (QC) personnel responsible for inspection of fire barrier and penetration fire seal repair work were counselled regarding (a) the requirement for adequate documentation of identified deficiencies, and (b) the requirement to inspect the entire seal face(s) of repaired seals rather than the repaired area(s) only.

Long Term

6. Administrative control processes will be reviewed and revised as necessary to provide enhanced guidance for control of non-safety significant work activities that may impact fire barriers and penetration seals. This action is expected to be completed by August, 1995.

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7. Procedures OP 0046 and OP 4019 will be reviewed to determine the adequacy of work scope definition and QC inspection requirements for repair of penetration fire seals. This action is expected to be completed by August, 1995.
8. The applicable sections of Vermont Yankee General Employee Training (GET) will be reviewed to determine the adequacy of training regarding activities that may impact fire barrier and penetration fire seal integrity. Any resulting recommendations will be forwarded to the Training Department by October, 1995

ADDITIONAL INFORMATION

Similar events involving inoperable fire barriers and penetration seals were reported within the past five years as LER 93-001 and LER 94-018.