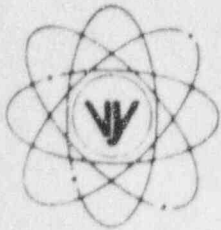


# VERMONT YANKEE NUCLEAR POWER CORPORATION



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September 20, 1995  
BVY 95-105

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

REFERENCE: Operating License DPR-28  
Docket No. 50-271  
Reportable Occurrence No. LER 95-14, Supplement 1

Dear Sirs:

As defined by 10 CFR 50.73, we are reporting the attached Reportable Occurrence as LER 95-14, Supplement 1.

Very truly yours,

VERMONT YANKEE NUCLEAR POWER CORPORATION

*Robert J. Wanczyk*  
Robert J. Wanczyk  
Plant Manager

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

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LICENSEE EVENT REPORT (LER)

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS MANDATORY INFORMATION COLLECTION REQUEST: 50.0 HRS. REPORTED LESSONS LEARNED ARE INCORPORATED INTO THE LICENSING PROCESS AND FED BACK TO INDUSTRY. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (T-6 F33), 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.

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TITLE (4) INCOMPLETE IMPLEMENTATION OF 10CFR50 APPENDIX "R" BASED ON IDENTIFIED DEFICIENCIES IN THE SAFE SHUTDOWN CAPABILITY ANALYSIS

EVENT DATE (5)			LER NUMBER (6)				REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NO.(S)	
07	25	95	95	-- 014 --	01	09	20	95	N/A	05000	

OPERATING MODE (9)	N	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: CHECK ONE OR MORE (11)								
POWER LEVEL (10)	94%	20.2201(b)	20.2203(a)(2)(v)	50.73(a)(2)(i)	50.73(a)(2)(viii)					
		20.2203(a)(1)	20.2203(a)(3)(i)	X 50.73(a)(2)(ii)	50.73(a)(2)(x)					
		20.2203(a)(2)(i)	20.2203(a)(3)(ii)	50.73(a)(2)(iii)	73.71					
		20.2203(a)(2)(ii)	20.2203(a)(4)	50.73(a)(2)(iv)	OTHER					
		20.2203(a)(2)(iii)	50.36(c)(1)	50.73(a)(2)(v)	(Specify in Abstract below or in NRC Form 366A)					
		20.2203(a)(2)(iv)	50.36(c)(2)	50.73(a)(2)(vii)						

LICENSEE CONTACT FOR THIS LER (12)

NAME	ROBERT J. WANCZYK, PLANT MANAGER	TELEPHONE NO. (Include Area Code)	802-257-7711
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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
					.....					
					.....					
					.....					
					.....					

SUPPLEMENTAL REPORT EXPECTED (14)				EXPECTED SUBMISSION DATE (15)	MO	DAY	YEAR
X	YES	(If yes, complete EXPECTED SUBMISSION DATE)	NO		11	30	95

**ABSTRACT** (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

On 07/25/95, at 1410 hours, an ongoing review of documents and correspondence associated with 10CFR50 Appendix "R" determined that the "hot short" concern described in NRC Information Notice 92-18 was applicable to Vermont Yankee such that the operation of various Motor Operated Valves, from Alternate Shutdown Panels, could be impacted in the event of a fire in one of four plant areas. Specifically, the issue involves the potential impact of a fire on plant equipment relied upon in the Vermont Yankee Safe Shutdown Capability Analysis for placing and maintaining the reactor in "cold shutdown." Subsequent to this discovery, additional Appendix "R" vulnerabilities were identified such that certain fire scenarios could result in loss of the Reactor Core Isolation Cooling (RCIC) system in the Alternate Shutdown mode, or inadvertent primary system depressurization. Also in question is the ability to initiate RCIC from the Alternate Shutdown Panel in the time necessary to meet Appendix "R" requirements. The root cause(s) of these events is being thoroughly investigated by an independent, multi-disciplined task team.

Corrective actions include the establishment of compensatory measures (firewatches) in the affected areas, and the formation of multiple task teams to investigate and resolve the identified issues. Full compliance with Appendix "R" requirements, without the need for crediting the compensatory measures detailed in this report, will be achieved by no later than the end of the 1996 Refueling Outage.

An additional supplement to this LER will be submitted to document the findings of the Root Cause Analysis task team. Based on task team investigations, additional corrective actions will be detailed in the LER supplement, as required.

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DESCRIPTION OF EVENT

On 07/25/95, at 1410 hours, with the reactor at 94% of rated power, an ongoing review of documents and correspondence associated with 10CFR50 Appendix "R" determined that the "hot short" concern described in NRC Information Notice 92-18 was applicable to Vermont Yankee such that the operation of various Motor Operated Valves (MOVs) from Alternate Shutdown Panels could be impacted in the event of a fire in certain plant areas. Specifically, the issue involves the potential impact of a fire in the Control Room, Cable Vault, or Reactor Building Fire Zones RB-1 or RB-3, on plant equipment relied upon in the Vermont Yankee Safe Shutdown Capability Analysis (SSCA) for placing and maintaining the reactor in "cold shutdown." This condition potentially renders the plant outside design basis in that it is not enveloped by the present Appendix "R" analysis. Based on this discovery, the Resident NRC Inspectors were briefed, and compensatory measures (fire watches) were promptly put into place such that the intent of 10CFR50 Appendix "R" was satisfied. In addition, copies of the associated Event Report and NRC Information Notice 92-18 were placed in the Operations Night Order Log Book for heightened operator awareness of the issue.

On 07/26/95, the subject "hot short" Event Report was reviewed at length by the Plant Operations Review Committee (PORC). Topics of discussion included: 1) the need to review actions contained within the related operating procedures, 2) the questioning of the potential for Safety Relief Valve (SRV)(EIS = SB) cable vulnerability, and 3) the recommendation to develop a task force to pursue resolution of this issue. Based on the PORC meeting, an Operations Standing Order was issued to establish formal guidance on the implementation of additional fire prevention controls in the susceptible areas, and convey management's intent to have operators initiate a reactor SCRAM and bring the plant to "cold shutdown" in the event of a confirmed fire that affects plant equipment in the Control Room, Cable Vault, or in Reactor Building Fire Zones RB-1 or RB-3. These compensatory measures were discussed at the 07/27/95 plant management morning meeting for increased awareness of the current Appendix "R" issues.

On 07/27/95, a followup to one of the questions raised by PORC during their review of the "hot short" concern identified a deficiency in the SSCA relative to the specific response to a fire in Reactor Building Zone RB-3. The analysis credits use of the Reactor Core Isolation Cooling (RCIC) system (EIS = BN) in the Alternate Shutdown mode, and repair of a cable for manual operation of a Safety Relief Valve. However, it was determined that additional wire and terminations for the SRV could be damaged for a fire in this area, making repair of the circuit unachievable. As a result, on 07/28/95, at 0000 hours, with the reactor at 100% of rated power, an event report for this issue was submitted, and compensatory measures were taken to satisfy the intent of Appendix "R" requirements.

On 07/28/95, Vermont Yankee management announced the formation of three task force teams to investigate the recently identified Appendix "R" issues. At the 07/31/95 plant management morning meeting, the function and scope of review of these (Evaluation, Design Change, and Self Assessment) teams were outlined. Subsequently, investigations by the task teams identified additional Appendix "R" vulnerabilities in the same plant fire zone areas. Specifically, under certain fire scenarios, loss of RCIC function in the Alternate Shutdown mode or inadvertent primary system depressurization could result from fire damage to RCIC or SRV cabling. Based on this, the existing compensatory (fire watch) measures were readjusted to account for the additional findings.

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On 08/17/95, the formation of a fourth independent, multi-discipline team was announced. This team is currently in the final stages of performing a formal root cause analysis of the subject Appendix "R" events. Their final report is expected by the end of September 1995.

On 08/23/95, at 1030 hours, with the reactor at 100% of rated power, the ongoing review of Appendix "R" issues identified that the computer output documentation associated with the calculation which established the time available to get Alternate Shutdown Systems in-service could not be found, and the results of this calculation could not be validated utilizing present day analysis techniques. The original calculation, performed in 1981, determined that 43 minutes were available. Recent preliminary re-analysis, however, indicates that a period of only approximately 25 minutes can be justified at this time. Based on initial evaluations using conservative design basis assumptions, operators would be unlikely to initiate RCIC in the Alternate Shutdown mode in the time necessary to meet Appendix "R" requirements. As a result, this concern was immediately brought to management's attention, an event report was submitted, and additional (firewatch and personnel awareness) measures were put in place to compensate for the discrepancy.

On 08/23/95, at 1705 hours, with the reactor at 100% of rated power, an Appendix "R" related issue associated with RCIC steam isolation logic was identified. It was determined that some of the high temperature sensors used to identify and isolate a RCIC high energy line break (HELB), may be susceptible to inadvertent actuation during certain fire scenarios. This could potentially result in an isolation of the RCIC turbine steam supply where the system is currently taken credit for in the Safe Shutdown Capability Analysis. The analysis relies on the use of RCIC for a fire in Reactor Building Fire Zone RB-2 and identifies the potential need for operator actions in manually operating various RCIC valves for system operations. However, the potential closure of the RCIC steam isolation valves was not identified. As a result, this issue was immediately brought to management's attention, an event report was submitted, and additional (firewatch and personnel awareness) measures were put in place to compensate for the discrepancy.

On 09/10/95, the formation of an Appendix "R" Project Team consisting of senior personnel from the Vermont Yankee and Yankee Atomic organizations was announced. The primary mission of this team will be to: 1) address all open issues identified by the analysis teams, 2) rewrite the Safe Shutdown Capability Analysis, 3) identify any necessary design changes, and 4) ensure the Vermont Yankee Appendix "R" Program becomes a well documented and comprehensive program.

#### CAUSE OF EVENT

The root cause of these events has not yet been determined. An independent, multi-discipline team is in the final stages of performing a detailed review of the subject Appendix "R" related events to determine root and contributing causes. This Root Cause Analysis team began investigations on 08/28/95 and is expected to provide a formal evaluation report by the end of September 1995. A supplement to the LER will be submitted to document their findings.

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### ANALYSIS OF EVENT

Plant fire protection systems and barriers are classified Non-Nuclear Safety. However, they protect and separate various areas containing safety related, safe shutdown equipment to ensure the reactor can be brought to and maintained in "cold shutdown" in the event of any analyzed in-plant fire. Although the events detailed in this report are significant in that they involved non-compliance with a regulatory licensing requirement, no equipment or systems have been rendered inoperable as a result of the identified conditions. The conditions involve deficiencies in some of the features credited for providing compliance with the specific requirements of 10CFR50 Appendix "R" for which compensatory measures have been taken. These measures supplement the normal fire detection and protection features, and include: continuous and roving firewatches, the limiting of combustible materials in the affected areas, and the application of additional controls to restrict hot work in these areas. In each case, as Vermont Yankee identified deficiencies in the implementation of Appendix "R" requirements, the NRC was promptly informed of the issues and corresponding compensatory measures that were put in place until the deficiencies are fully resolved. Since the conditions represented non-compliance with a regulatory requirement, it was recognized that NRC involvement was required. Vermont Yankee has established periodic dialogue with the NRC and will continue to provide frequent updates of the status of Appendix "R" issues.

The 08/23/95 issue associated with the time available to get Alternate Shutdown Systems in-service is significant in that margin is reduced, and for the limiting design basis Appendix "R" fire scenario, the RCIC System may not be initiated in the time necessary to meet Appendix "R" requirements and some minor core heatup may occur. However, the probability of experiencing this limiting design basis scenario (i.e. extreme fire damage affecting all core injection systems, spurious valve mispositioning, and multiple blown fuses) is considered low. Furthermore, even assuming conservative design basis fire events, no core damage is predicted.

With regard to recent industry concerns associated with TSI Thermo-Lag material, Vermont Yankee no longer relies on this type of fire wrap for meeting Appendix "R" safe shutdown requirements. Therefore, this industry issue does not impact the recently identified Appendix "R" issues at the plant.

### CORRECTIVE ACTIONS

#### Immediate:

1. Compensatory measures consisting of firewatches, equipment monitoring, administrative controls and enhanced awareness of potential Appendix "R" vulnerabilities have been implemented.  
(Status: See Note 1)
2. An Operations Standing Order has been issued to provide details of the conditions and specify operator actions for response to particular fire scenarios in the areas determined to be vulnerable.  
(Status: See Note 1)

[Note 1: Immediate Corrective Actions 1 and 2 were instituted to ensure the intent of 10CFR50 Appendix "R" is satisfied. These measures have been and will continue to be adjusted, as necessary, upon identification of any additional concerns.]

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- Vermont Yankee has established periodic dialogue with the NRC and will continue to provide frequent updates of the status of the subject 10CFR50 Appendix "R" issues.

Short Term:

- A Self Assessment team was assembled to ensure any additional vulnerabilities were promptly identified. The team reviewed the Vermont Yankee Safe Shutdown Capability Analysis to verify key assumptions and conclusions for each fire zone are acceptable. This included design, procedural, licensing, staffing, and training aspects. The Team was comprised of five senior personnel, with diverse backgrounds, from Vermont Yankee, Yankee Atomic and external organizations, none of whom had significant involvement in the original program development. The Self Assessment began on 08/07/95, and was completed on 09/08/95. (Status: Complete)
- An Evaluation team was established for review of concerns, operability considerations, compensatory measures, procedures, and analytical solutions. The team was formed on 07/28/95 and is in the process of documenting the results of the Evaluation Team efforts. (Expected Completion Date: September 1995)
- A Design Change team was established on 07/28/95 to evaluate conceptual designs that may be required for resolution of some of the identified Appendix "R" deficiencies. (Status: On hold; see Long Term Corrective Action #4.)
- An independent, multi-discipline Root Cause Analysis team was formed to determine root and contributing causes of these events. This team was fully assembled on 08/28/95. Their final report is expected by the end of this month. (Expected Completion Date: September 1995)

Long Term:

- Engineering will reassess the need for more explicit operator procedures for all fire zones relative to the Safe Shutdown Capability Analysis. (Expected Completion Date: November 1995)
- Full compliance with Appendix "R" requirements, without the need for crediting the compensatory measures detailed in this report, will be achieved by no later than the end of the 1996 Refueling Outage. (Expected Completion Date: Fall 1996 Refueling Outage)
- An additional supplement to this LER will be submitted to document the findings of the Root Cause Analysis task team. Based on task team investigations, additional corrective actions will be detailed in the LER supplement, as required. (Expected Completion Date: November 1995)

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4. On 09/10/95, the formation of an Appendix "R" Project Team consisting of senior personnel from the Vermont Yankee and Yankee Atomic organizations was announced. The primary mission of this team will be to: 1) address all open issues identified by the analysis teams, 2) rewrite the Safe Shutdown Capability Analysis, 3) identify any necessary design changes, and 4) ensure the Vermont Yankee Appendix "R" Program becomes a well documented and comprehensive program.  
(Expected Completion Date: Fall 1996 Refueling Outage)

#### ADDITIONAL INFORMATION

Similar events related to the implementation of 10CFR50, Appendix "R" were reported to the Commission under the following Licensee Event Reports:

- LER 93-01 "Degraded vital fire barriers due to inadequate documentation of assumptions and inadequate procedures"
- LER 94-11 "Failure to properly identify all areas requiring emergency lighting units in accordance with 10CFR50 Appendix R, Section III.J"
- LER 95-03 "Failure to provide required emergency lighting in an area in accordance with 10CFR50 Appendix R, Section III.J due to a failure in the management system."
- LER 95-04 "Incomplete repair of inoperable vital fire barrier penetration fire seal."

It is recognized that the events of this report are of concern when considered in conjunction with previous weaknesses in the fire protection and Appendix "R" areas. As a result of the recently combined Triennial/Annual Fire Protection Program Audit, a Fire Protection Program Improvement Team has been formed to assess the overall program and review the Fire Protection program base documents against the current regulatory documents. In addition, considerable improvement efforts were already underway in the SSCA as a result of the corrective actions from previously identified fire barrier and lighting issues. The findings of the task teams will be considered together with the other ongoing efforts, in determining the actions required to ensure continual improvement in the fire protection program.