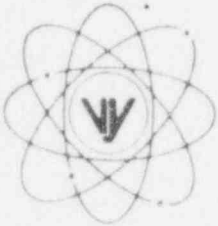


# VERMONT YANKEE NUCLEAR POWER CORPORATION



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October 26, 1995  
BVY 95-117

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 95-18

Dear Sirs:

As defined by 10 CFR 50.73, we are reporting the attached Reportable Occurrence as LER 95-18.

Very truly yours,

VERMONT YANKEE NUCLEAR POWER CORPORATION

Robert J. Wanczyk  
Plant Manager

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

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NRC Form 366 (4-95) U.S. NUCLEAR REGULATORY COMMISSION  <b>LICENSEE EVENT REPORT (LER)</b>	APPROVED BY OMB NO. 3150-0104 EXPIRES 04/30/98 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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FACILITY NAME (1) VERMONT YANKEE NUCLEAR POWER STATION	DOCKET NUMBER (2) 05000271	PAGE (3) 01 OF 05
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TITLE (4) Inadequate IST Surveillance and Reg Guide 1.97 Submittal Information on the Recirculation Loop Sample Line Isolation Valves due to Misinterpretation of the Existing Design Configuration during Program Development

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)	
09	29	95	95	-- 018 --	00	10	26	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)	100%	20.2201(b)		20.2203(a)(2)(v)	X	50.73(a)(2)(i)		50.73(a)(2)(viii)		
		20.2203(a)(1)		20.2203(a)(3)(i)		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
					.....					
					.....					
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<b>SUPPLEMENTAL REPORT EXPECTED (14)</b>				<b>EXPECTED SUBMISSION DATE (15)</b>		
X	YES (If yes, complete EXPECTED SUBMISSION DATE)	NO		MO	DAY	YEAR
				11	30	95

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

On 09/29/95, in response to an inquiry from Monticello Nuclear Station, a review of the control power and indication circuits for the two recirculation loop sample line isolation valves (FCV 2-39 and 40) which receive a close signal from the Primary Containment Isolation System determined that: 1) the existing circuit configuration does not meet the specific intent of Regulatory Guide (RG) 1.97 in that position indication for these valves is from non-redundant power sources, and only provides indirect indication of valve position, and 2) the In-Service Testing (IST) requirements for these valves have not been satisfied because previous testing relied on the position indication circuits for providing direct measurement of valve position.

The root cause of the RG 1.97 submittal discrepancies was determined to be a misinterpretation of the existing design configuration. With regards to the IST issue, root cause analysis of the inadequate FCV 2-39 and 40 surveillances is in-progress, the results of which will be provided in a supplement to this LER.

There is reasonable assurance these 3/4" air-operated (spring to close) valves would have isolated, if required, based on their fail-closed design to a loss of air/control power, and previous testing which cycled and leak rate tested the valves.

Immediate actions included: tagging the control switches for these valves in the closed position, informing the NRC, and verifying (daily) that the outboard isolation valve (FCV 2-40) is closed in accordance with Technical Specification requirements until the issues with these valves are resolved. Long term corrective actions include a design change that facilitates IST surveillance testing and meets the specific intent of RG 1.97 requirements.

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#### DESCRIPTION OF EVENT

On 09/29/95, at 1030 hours, with the reactor at 100% of rated power, a review of the control power and indication circuits for the two recirculation loop sample line isolation valves (FCV 2-39 and 40)(EIS = KN) that receive a close signal from the Primary Containment Isolation System (PCIS)(EIS = JM) identified the following issues:

- The indicating lights for both valves are supplied from the same power source. This appears to be contrary to the Post Accident Monitoring redundancy requirements of NRC Regulatory Guide (RG) 1.97 and the Vermont Yankee RG 1.97 submittal.
- The indicating light signals originate from control circuit contacts rather than from isolation valve position switches. The resulting indication shows whether the solenoid associated with the isolation valve is energized; as opposed to "directly" indicating whether the isolation valve is open or closed. This appears to be contrary to the direct measurement requirements of RG 1.97 and the Vermont Yankee RG 1.97 submittal.
- Present In-Service Testing (IST) performed to satisfy Technical Specification requirements relies on the indicating light configuration previously described. Since position switches are not utilized, past testing has not confirmed the appropriateness of actual valve stroke times; therefore, the subject Technical Specification requirements have not been satisfied.

Based on these issues, the control switches for FCV 2-39 and 40 were "tagged" in the closed position, the Resident NRC Inspectors were briefed, the Vermont Yankee Licensing Engineer informed the Office of Nuclear Reactor Regulation (NRR), and measures were instituted to verify, on a daily basis, that the outboard isolation valve (FCV 2-40) is closed in accordance with Technical Specification requirements until the associated IST and RG 1.97 issues are resolved. Additionally, these immediate corrective actions, and the status of additional actions/reviews in-progress were topics of discussion at subsequent plant management daily meetings.

The current RG 1.97 and IST issues associated with FCV 2-39 and 40 were identified by Vermont Yankee Engineering while researching a 09/25/95 inquiry from Monticello Nuclear Station as to whether our facility has redundant power supplies to the position indicators for the recirculation loop sample line isolation valves.

#### CAUSE OF EVENT

The root cause of the RG 1.97 submittal discrepancies was determined to be a misinterpretation of the existing design configuration. Specifically, it was not recognized or documented that FCV-2-39 and 40 did not meet RG 1.97 requirements for power source redundancy, nor was it confirmed that the method of providing valve position information was consistent with the RG 1.97 definition of direct measurement. In addition, subsequent RG 1.97 submittals did not identify these discrepancies.

Root cause analysis of the inadequate FCV 2-39 and 40 IST surveillances is in-progress. The root cause information for this portion of the event will be provided in a supplement to this LER.

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## ANALYSIS OF EVENT

The subject recirculation loop sample line isolation valves are air-operated, 3/4" globe valves which: 1) are normally closed, 2) receive a close signal from PCIS Group I Logic, and 3) fail-closed on a loss of air or control power. The purpose of the recirculation loop sample line, in which FCV 2-39 and 40 are located, is to provide an alternate means of obtaining reactor coolant chemistry samples (during normal power operation) in the unlikely event the "normal" sample path through the Reactor Water Cleanup (RWCU) System (EIS = CE) is unavailable.

As described in the Technical Specification Bases for primary containment isolation valves, "Double isolation valves are provided on lines that penetrate the primary containment and communicate directly with the reactor vessel (eg. FCV 2-39 and 40), and on lines that penetrate the primary containment and communicate with the primary containment free space. Closure of one of the valves in each line would be sufficient to maintain the integrity of the pressure suppression system. Automatic initiation is required to minimize the potential leakage paths from the containment in the event of a loss-of-coolant accident."

### In-Service Testing (IST) Issue

In-Service Testing (IST) and Appendix J Leak-Rate Testing are performed periodically to ensure valves function as required and in accordance with Technical Specification maximum stroke times, where applicable. The current issue associated with indirect position indication for FCV 2-39 and 40, combined with present testing which relies on this indication, resulted in the closure times of these valves not being verified satisfactory in accordance with Technical Specification IST requirements.

### Reg. Guide 1.97 Issues

RG 1.97, issued in 1980, describes "a method acceptable to the NRC staff for complying with the Commission's regulations to provide instrumentation to monitor plant variables and systems during and following an accident in a light-water-cooled nuclear power plant." With regards to primary containment isolation valve position, the intent of RG 1.97 is for valve position indication to be provided from "sensors that directly measure the desired variables." In this case, the desired variable is the closed/not-closed position of the valve. With regards to valve position indication power supplies, RG 1.97 states, "No single failure within either the accident-monitoring instrumentation, its auxiliary supporting features, or its power sources...should prevent the operators from being presented the information necessary for them to determine the safety status of the plant..." Currently, position indication for FCV 2-39 and 40 is from non-redundant power sources and only provides indirect indication of valve position.

### Safety Impact

Although the issues associated with FCV 2-39 and 40 position indication are significant in that: 1) the existing circuit configuration does not meet the specific intent of RG 1.97, and 2) Technical Specification IST surveillances for the valves were found to be inadequate, it is concluded the issues involve minimal safety significance. There is reasonable assurance that these 3/4" air-operated (spring to close) valves would have isolated, if required, based on their fail-closed design to a loss of air/control power, and previous Appendix J testing which cycled and leak rate tested the valves. Present position indication may not fully meet RG 1.97 requirements, however, these circuits do provide direct indication (in the control room) of the status of control power to the respective isolation valve trip solenoid. History has shown FCV 2-39 and 40 to be very good performers based on past Type 'C' leak rate testing which documented "as-found" leakage rates well below acceptance criteria limits. In addition, the valve located downstream of FCV 2-40 is also normally maintained in the closed position, except in the unlikely event it is necessary to obtain a coolant sample via this pathway. Although no credit is taken for this valve and its associated piping (which is rated for pressures well in excess of reactor system pressure), this equipment provides an additional barrier that further ensures isolation of the recirculation loop sample line.

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Since the identified IST and RG 1.97 issues involve conditions contrary to licensing commitments, it was recognized that NRC involvement was required. Based on this, the Resident NRC inspectors were briefed, and the Vermont Yankee Licensing Engineer informed NRR of the issues and corresponding immediate corrective actions. As the implementation of event corrective actions progress, the Vermont Yankee Licensing Engineer will be kept informed and will provide NRR with status updates, as appropriate.

Engineering has developed Basis for Maintaining Operation (BMO) documents to address the identified IST and RG 1.97 issues associated with FCV 2-39 and 40. These valves will continue to be maintained in the closed position pending the review and approval of the BMOs and supporting procedural revisions. As a compensatory measure, the BMOs require alternate means of direct verification of valve closure to be implemented for all evolutions that may open the valves. This requirement will remain in place until the subject issues are resolved via design change. {Note: A BMO is a Vermont Yankee evaluation which provides the basis for maintaining continued operation with a known deficiency in the analysis, design, or qualification of safety-related, environmentally qualified, or technical specification systems, structures, or components.}

CORRECTIVE ACTIONS

Immediate:

1. FCV 2-39 and 40 were "tagged" in the closed position, and in accordance with Technical Specification requirements, FCV 2-40 is being verified closed, on a daily basis, until the RG 1.97 and IST issues associated with these valves are addressed.
2. FCV 2-39 and 40 were verified to have been cycled and leak rate tested satisfactory in accordance with Appendix J requirements during the Spring 1995 and previous refueling outages.
3. The Vermont Yankee Licensing Engineer contacted NRR, described the event, and indicated the immediate corrective actions the facility has taken in response to the issues associated with FCV 2-39 and 40. As the implementation of corrective actions progress, the Vermont Yankee Licensing Engineer will be kept informed and will provide NRR with status updates, as appropriate.

Short Term:

1. Vermont Yankee design basis documents were reviewed to verify the existing FCV 2-39 and 40 position indication circuits are in accordance with the original design basis of the Primary Containment Isolation System. (Status: Complete)
2. A Nuclear Network entry was submitted to alert other facilities to the recently identified IST and RG 1.97 issues associated with our recirculation loop sample line isolation valves. (Status: Complete)
3. A BMO evaluation was performed to justify the cycling of FCV 2-39 and 40 to allow for completion of the respective IST surveillances by using alternate means of direct measurement of valve position. (Status: Complete)
4. A BMO evaluation was performed to address the discrepancies in the Vermont Yankee RG 1.97 submittal associated with FCV 2-39 and 40 position indication. (Status: Complete)

[Note: The approval of Short Term Corrective Actions 3 and 4, revision of the affected procedures, and satisfactory IST surveillance testing of FCV 2-39 and 40 will be confirmed prior to declaring these valves "operable."]

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Long Term:

1. The results of the Root Cause analysis of the inadequate FCV 2-39 and 40 IST surveillances will be provided in a supplement to this LER. (Expected Completion Date: November 1995)
2. A review of all RG 1.97 valves will be performed to determine if similar conditions exist relative to discrepancies between the present configurations and RG 1.97 commitments. (Expected Completion Date: November 1995)
3. A review of the position indication circuits for all power operated valves in the IST program will be performed to determine if similar conditions exist relative to discrepancies in IST testing methodology. (Expected Completion Date: November 1995)
4. A comprehensive review of the most recent Vermont Yankee RG 1.97 submittal will be performed to determine if there are any additional conditions which do not agree with information provided in the submittal. (Expected Completion Date: March 1996)
5. A design change that facilitates IST surveillance testing, and meets the specific intent of RG 1.97 requirements (ie. direct measurement of valve position, redundant control power) for FCV 2-39 and 40 will be implemented prior to startup from the 1998 Refueling Outage. (Expected Completion Date: April 1998)

ADDITIONAL INFORMATION

Similar events related to discrepancies in the implementation of RG 1.97 and IST requirements were reported to the Commission under the following Licensee Event Reports:

- LER 90-08 "Failure to Meet Separation Criteria for Power Cables to Regulatory Guide 1.97 Instrumentation Loops."
- LER 95-17 "Technical Specification 4.6.E Not Met Due to Components Not Included in the Inservice Test Program Scope."