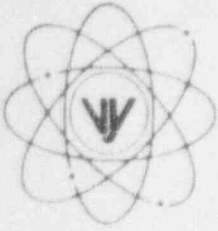


# VERMONT YANKEE NUCLEAR POWER CORPORATION



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

June 1, 1995  
BVY 95-61

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

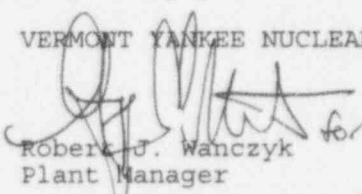
REFERENCE: Operating License DPR-28  
Docket No. 50-271  
Reportable Occurrence No. LER 95-006

Dear Sirs:

As defined by 10 CFR 50.73, we are reporting the attached Reportable Occurrence as LER 95-006.

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 (5-92)		U.S. NUCLEAR REGULATORY COMMISSION			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 (MNB 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 04				
TITLE (4) RCIC System Inoperable With Isolation Valve in Closed Position Due to a Tripped Supply Breaker as a result of a low Instantaneous Trip Setting											
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)	
05	02	95	95	06	0	06	01	95	N/A	05000271	
OPERATING MODE (9)		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: CHECK ONE OR MORE (11)									
N		20.402(b)		20.405(c)		50.73(a)(2)(iv)		73.71(b)			
POWER LEVEL (10)		005		20.405(a)(1)(i)		50.36(c)(1)		X 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)		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)			
				20.405(a)(1)(v)		50.73(a)(2)(iii)		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	
B	BN	BKK	G066	N	.....						
					.....						
SUPPLEMENTAL REPORT EXPECTED (14)						EXPECTED SUBMISSION DATE (15)		MO	DAY	YEAR	
YES (If yes, complete EXPECTED SUBMISSION DATE)				X NO							

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

On 5/2/95 at 1715 hours with the Reactor at 5% power and Mode switch in Shutdown the RCIC-16 (\*BN) outboard valves emergency feeder breaker tripped during Alt. Shutdown surveillance testing. The Operators closed the RCIC-15 inboard valve in accordance with Tech. Spec Requirements. The RCIC-16 valve was returned to the normal feeder breaker supply and tested with no problems found. The emergency feeder breaker was inspected and found to have an instantaneous trip setting which was too low. A setpoint change was implemented and the valve was satisfactorily tested on the emergency feeder breaker. At 2045 hours the RCIC-15 was opened, the surveillance completed and the system returned to service at 2355 hours.

The cause of the event was that the emergency feeder breaker's instantaneous trip setting was too low. The setting was adequate for normal motor inrush currents, however the operator conducting the surveillance reversed the valve as soon as it was closed causing additional currents from the electro motive forces in the motor to be additive to the existing inrush current. An Engineering Calculation has been performed to address these conditions and is in the process of being implemented with 36% of the valves already completed. The recommendations will be implemented in the next scheduled maintenance period of sufficient duration or by the end of the next refueling outage. Operations personnel will receive training in the conditions experienced when a motor is reversed quickly during surveillance activities.

\*Energy Information Identification System (EIS) Component Identifier

(Continued)

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LICENSEE EVENT REPORT (LER) TEXT CONTINUATION					
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TEXT (If more space is required, use additional copies of NRC Form 366A) (17)

#### DESCRIPTION OF EVENT

On 5/2/95 at 1715 hours, with the Reactor at 5% power and the Mode Switch in Shutdown, while conducting Reactor Core Isolation Cooling (RCIC) Alternate Shutdown surveillance testing, the feeder breaker for the RCIC-16 valve tripped. The RCIC-16 valve functions as the outboard steam supply line isolation for the RCIC system. During this surveillance the power supply is transferred from the normal DC feed source to the emergency DC feed source at the manual transfer switch and the valve control is established at the local control panel in the Reactor Building. Operations personnel stroked the valve closed, observed the closed light indication and then stroked the valve in the open direction. When the valve was stroked in the open direction the valve position indication lights went out indicating an overload or feeder breaker trip.

The control room was notified that the valve was in the closed position with the emergency feeder breaker tripped in the power supply circuit. Control Room operators closed the inboard steam supply isolation valve RCIC-15 at 1722 hours per Technical Specification for the Primary Containment Isolation System (PCIS), which requires the operational valve to be placed in the isolated position, and the RCIC system was declared inoperable in accordance with Technical Specifications.

At 1845 hours the Maintenance personnel who were investigating the tripped breaker, isolated the valve's motor circuit, tested the motor windings and returned the RCIC-16 valve power source to the normal power supply for operational testing. The valve was stroked open and then closed while ampere readings were monitored and compared with previous motor data. The valve was operating at the normal ampere values and stroke times.

A Maintenance Department evaluation of the emergency feed breaker indicated that the existing trip setting on the circuit breaker was low and should be increased to a higher level. A setpoint change was initiated to raise the trip value and the valve's power supply transferred back to the emergency feed for testing. The valve was stroked to the open position back to the closed position and back to the open position again with normal ampere readings.

At 2045 hours RCIC-15 was opened, the Alternate Shutdown surveillance completed, and the RCIC system was started for operability surveillance from the control room. The RCIC system was declared operable at 2355 hours.

#### CAUSE OF EVENT

The Root Cause of this event is attributed to the instantaneous trip setting on the emergency feeder breaker being set too low. These settings have previously been identified as not allowing sufficient margin where motor operated valves may experience automatic or manual reversals in direction at the completion of a stroke. Additional margins have been proposed in a recent Engineering Calculation which are in the process of being implemented.

A contributing cause for this event is the rapid reversal of the valves control switch by the operator in the conduct of the surveillance activity. In normal operations this valve is normally open and for a Primary Containment Isolation System (PCIS) function the valve would be required to stroke to the closed position and could not instantaneously reopen because the PCIS signal is required to be manually reset. For the Emergency Core Cooling System (ECCS) function the valve will receive an open signal for system initiation. During RCIC injection mode this valve serves as an isolation device for the RCIC turbine steam supply and will close on high area temperature, high steam flow or low steam pressure. The low steam pressure isolation signal will automatically reset and if an injection signal is present the valve will reopen. However, in all of these functions an instantaneous automatic reversal operation of this valve would not be expected to occur.

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### ANALYSIS OF EVENT

This event resulted in RCIC being declared inoperable since the RCIC-16 valve was in the closed position and aligned by the tripped emergency feeder breaker and would not have opened for injection unless the breaker was manually reset or returned to the normal feeder supply breaker.

Evaluation of the trip setpoint on the emergency feeder breaker for RCIC-16 indicated that the trip setting was 30 amperes on dial setting No. 2. This value is well above the measured inrush of 23 amperes, however, if the valve is run in the reverse direction prior to a complete stop, additional motor current results. A review of the ampere values experienced in the last portion of the valve's stroke indicates that current increases from the normal running values of 3.6 amperes to as much as 16 amperes as the torque switch opens and the contactor circuit drops out. As the valve enters the last few percent of travel into the seat, the closed light will indicate the closed position even though there is still current flow in the motor windings. If the valve is reversed during this short time period, the feeder circuit breaker will experience the normal inrush of 23 amperes and will also have to counter the existing electro motive forces within the motor windings as the magnetic fields are collapsed. The addition of the inrush current to the residual current may, depending on the timing of the operation, exceed the breaker's trip setpoint of 30 amperes. The setpoint change, initiated to add additional margin, has moved the trip set point to 66 amperes which is more than adequate to prevent future trips even if the valve is reversed quickly, and is still low enough to protect the cables feeding the motor.

The above concern with reversing a valve prior to dissipation of the residual electro motive forces was previously experienced in the 1993 Refueling Outage and as a result an Engineering Calculation was performed for all safety class Motor Operated Valves based on industrial standards. The standard recognizes that "it is usual to set the instantaneous trip at 10 to 11 times the motor full load current." However, the standard also recommends that the setting for loads subject to automatic reclosing or in this case, reversing the motor prior to full stop, should be set higher than normal due to the residual amperes that may exist in the motor circuit. The Engineering Calculation has selected a value of approximately 20 times the full load amperes for AC valves or 2 times the locked rotor amperes for DC valves with recommended breaker sizing and settings for all Safety Class motor operated valves. Work orders have been generated to implement the changes recommended in this calculation. Approximately 36% of the required changes have been completed.

A review of the Engineering Calculation indicated that the emergency feeder circuit breaker was not addressed and only the normal feeder breaker was evaluated for the RCIC-16 valve. An interview with the author of the calculation indicated that omission of this breaker was an oversight in the total review and that the other Alternate Shutdown emergency feed breakers are included in the calculation.

### CORRECTIVE ACTIONS

#### Immediate Corrective Actions

1. A set point change was implemented to increase the trip value of the emergency feeder breaker for RCIC-16 and the valve tested successfully.

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#### Long Term Corrective Actions

1. Operations personnel will receive training in this event for future surveillance activities so that they are aware that a fast reversal of a valve could result in a breaker instantaneous trip until all the set points have been reset. This training will be conducted in the next License Operator Re-qualification training cycle No.2 starting in June 1995. This training effort will be completed in August 1995
2. The Maintenance Department will prioritize the Engineering Calculation recommendations and implement the remaining changes in the next scheduled maintenance period of sufficient duration or by the end of the 1996 Refueling Outage, November 1996.
3. The Engineering Calculation will be revised to include the RCIC emergency feed breaker and will be reviewed to ensure that no other breaker settings have been overlooked. This effort will be completed by August 11, 1995.

#### ADDITIONAL INFORMATION

A review of past LERs did not locate any similar events within the last 5 years.