

# VERMONT YANKEE NUCLEAR POWER CORPORATION



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April 17, 1992

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 92-012

Dear Sirs:

As defined by 10 CFR 50.73, we are reporting the attached Reportable Occurrence as LER 92-012.

Very truly yours,

VERMONT YANKEE NUCLEAR POWER CORPORATION

Donald A. Reid  
Plant Manager

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

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NRC Form 366 U.S. NUCLEAR REGULATORY COMMISSION (6-89)  LICENSEE EVENT REPORT (LER)	APPROVED OMS NO. 3150-0104 EXPIRES 4/30/92 ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20515, AND TO THE PAPERWORK REDUCTION PROJECT (3160-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20603.
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FACILITY NAME (1) VERMONT YANKEE NUCLEAR POWER STATION	DOCKET NO. (2) 0 5 0 0 0 2 7 1	PAGE (3) 0 1 OF 0 3
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TITLE (4) Degraded Grid Undervoltage Relays Found Below Technical Specification Limits

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)			
MONTH	DAY	YEAR	YEAR	SEQ #	REVR	MONTH	DAY	YEAR	FACILITY NAME			DOCKET NO. (8)
0 3	3 1	9 2	9 2	0 1 2	0 0	0 4	1 7	9 2				0 5 0 0 0

OPERATING MODE (9) N	THIS REPORT IS SUBMITTED PURSUANT TO REQ'TS OF 10 CFR §: CHECK ONE OR MORE (11)											
POWER LEVEL (10) 0 0 0	20.402(b)			20.405(v)			50.73(a)(2)(iv)			73.71(b)		
	20.405(a)(1)(1)			50.36(c)(1)			50.73(a)(2)(v)			73.71(c)		
	20.405(a)(1)(11)			50.36(c)(2)			50.73(a)(2)(vii)			OTHER:		
	20.405(a)(1)(111)			XX 50.73(a)(2)(11)			50.73(a)(2)(viii)(A)					
	20.405(a)(1)(1V)			50.73(a)(2)(11)			50.73(a)(2)(viii)(B)					
20.405(a)(1)(V)			50.73(a)(2)(111)			50.73(a)(2)(ix)						

LICENSEE CONTACT FOR THIS LER (12)

NAME DONALD A. REID, PLANT MANAGER	TELEPHONE NO. 8 0 2 2 5 7 - 7 7 1 1
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COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYST	COMPONENT	MFR	REPORTABLE TO NPRDS	CAUSE	SYST	COMPONENT	MFR	REPORTABLE TO NPRDS
X	E B	- - 2 7	A S 0 0	.... YES	N/A				....
N/A				....	N/A				....

SUPPLEMENTAL REPORT EXPECTED (14)

<input type="checkbox"/> YES (if yes, complete EXPECTED SUBMISSION DATE)	<input checked="" type="checkbox"/> NO	EXPECTED SUBMISSION DATE (15)	MO DAY YR
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ABSTRACT (Limit to 1400 spaces, i.e., approx. fifteen single-space typewritten lines) (16)

On 3/31/92, with the reactor shutdown for routine refueling and maintenance, the Electrical Maintenance Department found the setpoints of four degraded grid undervoltage relays (E1IS-EB) to be below their technical specification limits. This condition was identified while performing normal surveillance activities associated with emergency busses three and four. The relays were reset to the proper trip setpoint. Safety related motors at Vermont Yankee are rated for service between 3600 volts and 4400 volts. In all cases found during this surveillance, the low voltage trip was above the minimum 3600 volts. Therefore adequate protection was available to protect the equipment even though the set points were outside of the technical specification requirements.

The cause of the event is attributed to setpoint drift outside of an extremely tight tolerance band. The relays were reset to within their proper tolerance band.

NRC Form 366A U.S. NUCLEAR REGULATORY COMMISSION (6-89)		APPROVED OMS NO. 3150-0104 EXPIRES 4/30/92			
LICENSEE EVENT REPORT (LER) TEXT CONTINUATION		ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3160-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20603.			
FACILITY NAME (1)	DOCKET NO (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQ #	REV #	
VERMONT YANKEE NUCLEAR POWER STATION	45000271	92	- 012	- 00	02 OF 03

TEXT (If more space is required, use additional NRC Form 366A) (17)

#### DESCRIPTION OF EVENT

On 3/31/92, with the reactor shutdown for routine refueling and maintenance, the Electrical Maintenance Department found the setpoints of four degraded grid undervoltage relays (EIIS=EB) to be below their Technical Specification limits. This condition was identified while performing normal surveillance activities associated with emergency busses three and four. The relays were reset to the proper trip setpoint.

#### CAUSE OF THE EVENT

The cause of this event is attributed to setpoint drift outside of an extremely tight tolerance band. The specified tolerance band is 3700 volts  $\pm$  40 volts for all 4kv loads. This corresponds to a voltage at the relays of 104.57-106.85 volts. The nominal value used to set the relays such that there is equal room for setpoint drift both high and low is 105.7 volts. This allows for a 1.13 volt drift prior to reaching the low voltage setpoint. Review of the last surveillance data which was completed during the previous refueling outage in 1990, indicates that two of the four relays were left at 105 volts. This would allow for only a .43 volt drift prior to reaching the Technical Specification limit. Given that the accuracy of the relays is typically 1% in addition to the accuracy of the voltage meter used to set/calibrate the proper voltage on the relays, it is felt that the normal setpoint drift is enough to allow the voltage to fall below the required setpoint. The as found voltages ranged from 103.6-104.4 volts.

#### ANALYSIS OF EVENT

Safety related motors at Vermont Yankee are rated for service between  $\pm$  10% of rated voltage. Motors for the 4kv system have a minimum operating voltage of 3600 volts and 460 volt motors have a minimum operating voltage of 414 volts. The undervoltage relays setpoint was selected to detect the minimum operating voltage at the motor terminals to assure continuous operation of the motors without damage from a low voltage condition.

From the station voltage study done at Vermont Yankee, 3660 volts at the 4kv bus corresponds to 3650 volts at the motor terminals of worst case 4kv motors (10 volt drop in motor leads) and 417 volts at the worst case continuous duty 460 volt motor.

The lowest setpoint found on only one of the subject relays was 3626 volts and provided adequate protection for the 4kv motor (given a 10 volt drop due to cable losses, the minimum voltage at the bus while still maintaining adequate protection would be 3610 volts). This would also correspond to a voltage of only 1 volt less than the minimum voltage of 414 volts for the 460 volt motor. We conclude that the motor would not be damaged by this voltage and no significant safety concern existed. The other three relays would protect both the 4kv and the 460 volt motors at the as found setpoints.

The functions of the grid undervoltage relays are to: 1) provide annunciation in the Control Room if either of the two relays per bus sensed an undervoltage condition existed on the emergency buses; and 2) assure that adequate voltage is available for starting safety class motors in the event of an accident condition by automatically disconnecting emergency loads from offsite power and transferring them to the diesel generator if both relays per bus sense an undervoltage condition coincident with an ECCS signal. Note that since either relay per bus actuates the undervoltage alarm, protection would have been provided by the alarm feature.

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FACILITY NAME (1)  VERMONT YANKEE NUCLEAR POWER STATION			YEAR	SEQ #	REV #		OF
		0 5 0 0 0 2 7 1	9 2	- 0 1 2	- 0 0	0 3	0 3

TEXT (If more space is required, use additional NRC Form 366A) (17)

CORRECTIVE ACTIONS

IMMEDIATE CORRECTIVE ACTIONS

- 1) Reset the relays to the specified voltage range.

LONG TERM CORRECTIVE ACTIONS

- 1) An engineering evaluation will be performed to review the current setpoint tolerance band as it relates to the Technical Specification limits. The evaluation will also include a review of the past surveillance history, vendor setpoint drift recommendations, and design limitations of the relays.
- 2) Vermont Yankee will continue to monitor the performance of these relays and take corrective action as appropriate.

ADDITIONAL INFORMATION

There have been no similar events reported to the Commission by Vermont Yankee within the past 5 years.