



# VERMONT YANKEE NUCLEAR POWER CORPORATION

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VERNON, VERMONT 05354

March 20, 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 92-004

Dear Sirs:

As defined by 10 CFR 50.73, we are reporting the attached Reportable Occurrence as LER 92-004

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)										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 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3160-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20603.									
LICENSEE EVENT REPORT (LER)																			
FACILITY NAME (1)										DOCKET NO. (2)					PAGE (3)				
VERMONT YANKEE NUCLEAR POWER STATION										0 5 0 0 0 2 7 1					0 1 OF 0 3				
TITLE (4) High Pressure Coolant Injection System Inoperable Due to Degradation of Station Battery Bus Voltage Caused by Failed Battery Charger Component																			
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. (5)					
0 2	2 0	9 2	9 2	- 0 0 4	- 00 00	0 3	2 0	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)		20.402(b)				20.405(c)				50.73(a)(2)(iv)				73.71(b)					
		20.405(a)(1)(i)				50.36(c)(1)				XX 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)									
		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										TELEPHONE NO.									
										AREA CODE									
DONALD A. REID, PLANT MANAGER										8 0 2 2 5 7 - 7 7 1 1									
COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)																			
CAUSE	SYST	COMPONENT			MFR			REPORTABLE TO NRPDS	CAUSE	SYST	COMPONENT			MFR			REPORTABLE TO NRPDS		
B	E J	R J X	C	1 7 3	YES														
SUPPLEMENTAL REPORT EXPECTED (14)										EXPECTED SUBMISSION DATE (15)					MO DAY YR				
<input type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE)										<input checked="" type="checkbox"/> NO									

**ABSTRACT** (Limit to 1400 spaces, i.e., approx. fifteen single-space typewritten lines) (16)

On 2/20/92 at approximately 0449, with the reactor operating at 89% power, the Plant "A" Station Battery Charger (BC-1-1A) (EIIS=EJ) output voltage increased rapidly. At approximately 0450 the "A" Station Battery Bus voltage increased from 132 volts DC to approximately 150 volts DC. This increased voltage caused the HPCI (EIIS=BJ) voltage inverter to trip on over voltage conditions. The cause of the event was the failure of the Main Station Battery Charger voltage regulating control circuit. The loss of the HPCI inverter rendered the HPCI system inoperable for a short period of time (approximately 20 minutes) until the spare charger was placed into service. Once the spare charger was placed into service, the HPCI inverter was reset and the HPCI system was operable. A Potential Reportable Occurrence(PRO) was generated to fully evaluate the event. On 2/26/92 a determination that the event was reportable was made and a 4 hour NRC notification should have been made on 2/20/92.

The cause of the event was the failure of an electrical component in the voltage regulating control circuit which resulted in an increased voltage in the charger output.

NRC Form 366A U.S. NUCLEAR REGULATORY COMMISSION (6-89)		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 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3160-0164), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20603.													
LICENSEE EVENT REPORT (LER) TEXT CONTINUATION															
FACILITY NAME (1)  VERMONT YANKEE NUCLEAR POWER STATION	DOCKET NO (2)  05000271	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="4">LER NUMBER (6)</th> </tr> <tr> <td style="width: 25%;">YEAR</td> <td style="width: 25%;">SEQ #</td> <td style="width: 25%;">REV #</td> <td style="width: 25%;"></td> </tr> <tr> <td>92</td> <td>004</td> <td>00</td> <td></td> </tr> </table>	LER NUMBER (6)				YEAR	SEQ #	REV #		92	004	00		PAGE (3)  02 OF 03
LER NUMBER (6)															
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TEXT (If more space is required, use additional NRC Form 366A) (17)

### DESCRIPTION OF EVENT

On 2/20/92 at approximately 0449, with the reactor operating at 89% power, the "A" Station Battery Charger (BC-1-1A) (EIIS=EJ) output voltage increased rapidly. At approximately 0450 the "A" Station Battery Bus voltage had increased from 132 volts DC to approximately 150 volts DC, at which time a small inverter in the Control Room tripped on overvoltage. The inverter converts the "A" Station Battery DC voltage to an AC voltage and supplies power to the High Pressure Coolant Injection (HPCI) (EIIS=BJ) Flow Control Instrumentation. The bus voltage peaked at approximately 150 volts DC and remained there for approximately 10 minutes before the normal battery charger was removed from service and the spare battery charger (BC-1-1C) was placed in service at approximately 0500. Bus voltage was returned to normal, the HPCI Inverter reset at approximately 0509 and the HPCI System was operable. The total time that HPCI was inoperable was approximately 20 minutes.

At the time of the event, it was not identified that the loss of the inverter rendered the HPCI system inoperable. A PRO was generated to review the potential reportability. The PRO was evaluated on 2/24/92 and determined that the event was reportable to the NRC due to HPCI being inoperable for approximately 20 minutes. It was concluded at that time that a 4 hour notification should have been made. At that time the Engineering Supervisor should have immediately notified the Shift Supervisor of his conclusions. However, his conclusions were forwarded on for additional review/concurrence. On 2/26/92 at 1810, the Shift Supervisor notified the NRC that a 4 hour reportable occurrence may have been required based on the 2/20/92 0450 event under 10 CFR 50.72(b)(2)(iii).

### CAUSE OF EVENT

The cause of this event was component failure. The voltage regulating control circuit of the battery charger failed, resulting in the increase in charger output voltage. The battery charger was manufactured by C&D BATTERIES (ELTRA CORP). It is suspected that a diode(s) in the control circuit failed causing the regulator to malfunction. A component level failure analysis is in progress to identify the exact component(s) that failed.

The failure of the charger's voltage regulating circuit and subsequent loss of voltage control resulted in the loss of the HPCI inverter when the "A" Station Battery Bus Voltage exceeded the over-voltage protection setpoint of the HPCI INVERTER. With the power to the HPCI System Flow Controller isolated, HPCI was inoperable and would not have responded to an initiation signal had one occurred.

A contributing factor in this event was the failure to recognize that HPCI was inoperable during the time the inverter was inoperable. The apparent cause of this was a misleading statement in the alarm response sheet which implies that if the alarm can be reset, HPCI need not be considered inoperable. Based on the fact that the circuit was re-energized once the standby DC charger was put into service, the alarm could be reset. However, due to the fact that the HPCI DC inverter was not capable of performing its function for the period of time until it was reset, the HPCI system should have been considered inoperable for that period of time.

The delay in notification once the determination was made that HPCI was inoperable was a failure to follow procedure on the part of the supervisor who initially made the inoperability determination. The procedure calls for the supervisor to immediately notify operations when it is determined that a notification should have been made.



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		YEAR	SEQ #
VERMONT YANKEE NUCLEAR POWER STATION	0 5 0 0 0 2 7 1	9 2	- 0 0 4 -
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TEXT (If more space is required, use additional NRC Form 366A) (17)

#### ANALYSIS OF EVENT

There were no adverse safety implications as a result of this event. The inverter over-voltage trip is a protective function of the inverter to prevent damage to the HPCI inverter and downstream components during DC voltage fluctuations. The inoperability of the HPCI System during this event was not significant as other safety systems were available to provide emergency reactor coolant make-up and control reactor pressure if needed.

Other loads supplied from the "A" Station Battery Bus were reviewed to determine if any further failures should be expected. Other loads consist primarily of relay coils, status indicating lights, and valve motor control center components. Due to the plant status at the time of the event, only a very small percentage of these components actually experienced the elevated voltage. Relays, motor control center components, and valves supplied from the "A" Station Battery Bus are normally deenergized, therefore these items were unaffected by the increased voltage. Switches, contactors, and limit switches typically have voltage ratings considerably higher than the 150 volt DC bus voltage that was experienced. Degradation of indicating light sockets or bulbs is not a concern due to the short term of the event. Therefore, no further equipment failures are expected as a result of this event.

A review of the DC loads on the system which would be required to operate had an accident condition occurred has determined that all required equipment would have operated and accomplished its required safety function with the high voltage present on the DC bus.

#### CORRECTIVE ACTIONS

##### IMMEDIATE CORRECTIVE ACTIONS

1. Remove the 1-A battery charger from service and replace with the spare charger. This resulted in providing the normal voltage to the batteries and being able to reset the HPCI inverter and therefore making HPCI operable.
2. The existing alarm response sheet has been revised to identify the fact that the HPCI system is to be considered inoperable whenever the HPCI inverter is tripped and incapable of performing its function.
3. An Engineering review of the increased voltage was completed and concluded that no adverse effects had occurred.
4. The Operations Supervisor has counselled the Shift Supervisor involved regarding HPCI operability when its inverter is temporarily out of service.
5. The Engineering Supervisor has been counselled as to the importance to follow the procedure when dealing with operability.

##### LONG TERM CORRECTIVE ACTIONS

1. The 1-A charger was/is scheduled to be replaced during the next operating cycle. A replacement for the 1-B charger has been ordered and will be installed at a future date.

##### ADDITIONAL INFORMATION

There have been no similar type of occurrences at Vermont Yankee reported to the commission in the past five years.