



VERMONT YANKEE NUCLEAR POWER CORPORATION

P. O. BOX 157  
GOVERNOR HUNT ROAD  
VERNON, VERMONT 05354

December 3, 1990  
VYV #90-380

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 90-15

Dear Sirs:

As defined by 10 CFR 50.73, we are reporting the attached Reportable Occurrence as LER 90-15.

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

9012100223 901203  
PDR ADOCK 05000271  
S PDC

TEZZ  
|||

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) VERMONT YANKEE NUCLEAR POWER STATION DOCKET NO. (2) 0500027101 OF 04 PAGE (3)

TITLE (4) Reactor Scram Due To Turbine Trip Caused By A Malfunction In The Turbine Emergency Tripping System

EVENT DATE (5) MONTH DAY YEAR 1 1 0 4 9 0 9 0 LER NUMBER (6) YEAR SEQ. # REV# - 0 1 5 - 0 0 0 REPORT DATE (7) MONTH DAY YEAR 1 2 0 3 9 0 OTHER FACILITIES INVOLVED (8) FACILITY NAMES DOCKET NO.(S) 050000 050000

OPERATING MODE (9) N THIS REPORT IS SUBMITTED PURSUANT TO REQ'MTS OF 10CFR §: ONE OR MORE (11) 20.402(b) 20.405(c) x 50.73(a)(2)(iv) 73.71(b) POWER LEVEL (10) 9 4 20.405(a)(1)(I) 50.36(c)(1) 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 DONALD A. REID, PLANT MANAGER TELEPHONE NO. 802257-7711 AREA CODE

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYST	COMPNT	MFR	REPORTABLE TO NPRDS	CAUSE	SYST	COMPNT	MFR	REPORTABLE TO NPRDS
B	T	G	33G080						

SUPPLEMENTAL REPORT EXPECTED (14)

YES (If yes, complete EXPECTED SUBMISSION DATE) X NO EXPECTED SUBMISSION DATE (15) MO DA YR

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

On 11/4/90 at 0120 hours, with reactor power at 94%, while performing weekly testing of the Turbine Emergency Governor (JC\*), a reactor scram occurred as a result of a turbine control valve fast closure signal. The turbine control valve fast closure signal was generated by the acceleration relay after operators removed a trip lockout from the Emergency Trip Valve. This operator action was taken based on Emergency Trip Valve position information later identified as erroneous due to a missing set screw on a collar in the turbine front standard linkage. Since the collar was not attached to the linkage, a spring was not able to act upon the linkage and the Emergency Trip Valve limit switch did not change state as the valve moved.

The plant was stabilized without incident following the transient and the turbine (TA\*) was placed on the turning gear at 0241 hours. The turbine vendor (GE) assisted plant personnel in repairing and testing the malfunctioning linkage prior to restoring the turbine control system (TG\*) to service. The reactor was returned to critical on 11/4/90 at 2222 hours. A procedure is being revised to provide additional operator actions to be taken if light indications are abnormal. Turbine outage maintenance is being expanded to include an inspection of similar locking collars and position indicating.

\*Energy Information Identification System (EIIS) Component Identifier

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.

UTILITY NAME (1)	DOCKET NO. (2)	LER NUMBER (6)			PAGE (3)	
		YEAR	SEQ. #	REV#		
VERMONT YANKEE NUCLEAR POWER STATION	05000271	90	015	00	02	04

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

DESCRIPTION OF EVENT

On 11/4/90 at 0120 hours, with reactor power at 94%, while performing weekly testing of the Turbine Emergency Governor (JC\*), a reactor scram occurred as a result of a turbine control valve fast closure signal. The turbine control valve fast closure signal was generated by the acceleration relay when operators removed a trip lockout for the Emergency Trip Valve, following weekly surveillance testing. This operator action was taken based on Emergency Trip Valve position information, later identified as erroneous due to a missing set screw on a collar in the turbine front standard linkage.

The turbine emergency tripping system (JC\*) contains a testable three way valve whose primary purpose is to provide turbine over-speed protection. When reset, the valve maintains main shaft pump hydraulic oil pressure on the entire turbine trip/control system, allowing the main stop valves and control valves to be opened and the acceleration relay to be reset. When tripped, the valve dumps oil pressure and causes all of the turbine valves to go closed, thus shutting down the turbine.

While performing testing of the Turbine Emergency Trip valve, the linkage which provides light indication (IT\*) in the control room did not function as designed and provided incorrect valve position information to operators. The test of the Turbine Emergency Trip System consists of the following steps:

1. bypass (lock-out) the trip feature
2. manually trip the valve from the control room
3. observe the trip occurs from light indication
4. reset the trip and verify the trip is reset from light indication
5. remove the trip bypass.

Due to a linkage malfunction, the operators did not receive position indication that the manual trip had actually occurred. The limit switch that illuminates the lamp for trip indication also operates the lamp that illuminates when the trip is reset. During the performance of the test the reset lamp did not extinguish and the trip light did not illuminate. The operators realized that the indication was not as expected but had no reason to believe that the governor tripped during testing. An inoperable test trip solenoid circuit would have given the same position indications as seen during this event. The control switch was positioned to the reset position and held there momentarily, in an attempt to ensure the trip was reset. When the operators positioned the switch to the normal (not locked-out) position, the turbine tripped because the Emergency Trip Valve had not been successfully reset. The Reactor Protective System (RPS) (JC\*) received a turbine control valve fast closure signal which resulted in a reactor scram. All other equipment performed as designed during this event.

\*Energy Information Identification System (EIIS) Component Identifier

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.

UTILITY NAME (1)	DOCKET NO. (2)	LER NUMBER (6)			PAGE (3)	
		YEAR	SEQ. #	REV#		
VERMONT YANKEE NUCLEAR POWER STATION	05000271	90	-015	-00	03	OF 04

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

The plant was stabilized without incident following the transient and the turbine was placed on the turning gear at 0241 hours. The turbine vendor (GE) assisted plant personnel in troubleshooting the problem and identified the missing set screw and locking collar on the Emergency Trip valve position indicating linkage. The malfunctioning linkage was repaired and the turbine control system was returned to service. The reactor was returned to critical on 11/4/90 at 2222 hours.

CAUSE OF EVENT

The root cause of this event has been attributed to the failure of the set screw and collar to operate as intended and resulted in incorrect operator information. Since the collar was not attached to the linkage, a spring was not able to act upon the linkage and prevented it from following the Emergency Trip Valve position. Therefore, the Emergency Trip Valve limit switch did not change state as the valve moved and this resulted in a lack of valve position indication in the Control Room.

Contributing Cause

A contributing cause to this event is that outage turbine maintenance does not specifically address inspection and maintenance of Emergency Trip Assembly position indicating actuator rods and linkages.

ANALYSIS OF EVENT

The events detailed in this report did not have adverse safety implications.

1. When the turbine trip lockout was removed from the Emergency Trip Valve assembly and the trip signal was present, the Turbine Emergency Tripping System operated as designed and tripped the turbine.
2. The Reactor Protective System (JC\*) operated as designed and scrammed the reactor after receiving a turbine control valve fast closure signal from the acceleration relay.
3. All other safety systems responded as expected.

\*Energy Information Identification System (EIIS) Component Identifier

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 20503.

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

UTILITY NAME (1)	DOCKET NO. (2)	LER NUMBER (6)			PAGE (3)	
		YEAR	SEQ. #	REV#		
VERMONT YANKEE NUCLEAR POWER STATION	05000271	90	-015	-00	04	OF 04

TEXT (If more space is required, use additional NRC Form 366A) (1)

CORRECTIVE ACTIONS

IMMEDIATE CORRECTIVE ACTIONS

1. Immediate corrective actions included recovering from the reactor scram utilizing appropriate plant procedures.
2. The turbine vendor (GE) assisted on-site identifying and correcting the Emergency Trip system malfunction. The collar and linkage was reconnected and the system verified operational.
3. The weekly surveillance interval for testing of the Turbine Emergency Governor was evaluated and it has been determined that a monthly surveillance interval is adequate.

LONG TERM CORRECTIVE ACTIONS

1. The Operations Department is revising their procedure to include additional actions to be taken when the Emergency Governor Test indications are not as expected.
2. The plant will expand outage maintenance to include an inspection of components associated with locking collars and position indicating linkages.

ADDITIONAL INFORMATION

There have been no similar events of this type in the past five years.

\*Energy Information Identification System (EIIS) Component Identifier