VERMONT YANKEE
NUCLEAR POWER CORPORATION

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Dec. 11, 1997
BVY 97-169

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

Reference: (a) License No. DPR-28 (Docket No. 50-271)

Subject: Reportable Occurrence No. LER 97-022, Rev 0

As defined by 10CFR50.73, we are reporting the attached Reportable Occurrence as LER 97-022, Rev. 0.

Sincerely,

VERMONT YANKEE CORPORATION

Gregory A. Maret
Plant Manager

cc: USNRC Region I Administrator
USNRC Resident Inspector – VYNPS
USNRC Project Manager – VYNPS

IE22

A006

NRC Form 366 (4-95) U.S. NUCLEAR REGULATORY COMMISSION

LICENSEE EVENT REPORT (LER)

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.

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
VERMONT YANKEE NUCLEAR POWER STATION	05000271	01 OF 04

TITLE (4) INADVERTENT PRIMARY CONTAINMENT ISOLATION SYSTEM ACTUATION DUE TO A SPURIOUS SPIKE ON A REACTOR BUILDING VENT RADIATION MONITOR - REPEAT EVENT.

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) 05000
11	15	97	97	-- 022 --	00	12	11	97	N/A	

OPERATING MODE (9)	N
POWER LEVEL (10)	97

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: CHECK ONE OR MORE (11)

	20.2201(b)		20.2203(a)(2)(v)		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)	X	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	TELEPHONE NO. (Include Area Code)
GREGORY A. MARET, PLANT MANAGER	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
NA				NO	NA				
NA					NA				

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)

At 0141 hours on 11/15/97, with the reactor operating at 97% of rated power, a Standby Gas Treatment System (SBGTS) initiation and Reactor Building Ventilation isolation occurred concurrent with a Primary Containment Isolation System (PCIS) Group III isolation. These isolations and the initiation of SBGTS were caused by a spike on the "B" Reactor Building Vent Radiation Monitor.

The apparent cause of the event was a spurious electronic noise signal of a magnitude greater than the trip setpoint of the radiation monitor. Corrective actions included conducting a radiological survey in the area of the radiation monitor detector to determine if a valid signal had been received, and troubleshooting the radiation monitor circuitry.

There were no adverse implications to plant equipment or to the health and safety of the public because the isolation of the containment purge, vent (EIIS=VB), air dilution and monitoring (EIIS=IK) systems, and SBGTS initiation are conservative system actuations with respect to protection of the public.

DESCRIPTION OF EVENT

At 0141 hours on 11/15/97, with the reactor operating at 97% of rated thermal power, a Reactor Building Vent Channel 'B' Radiation High alarm was received, a Standby Gas Treatment System (SBGTS) (EIIS = BH) initiation and a Reactor Building Ventilation (EIIS = VA) isolation occurred concurrent with a Primary Containment Isolation System (PCIS) (EIIS = JM) Group III isolation. The Group III isolation causes automatic closure of isolation valves in the process lines in the primary containment vent and purge system, the containment air monitoring system, and the containment air dilution system. These isolations and the initiation of SBGTS were caused by a spike on the "B" Reactor Building Vent Radiation Monitor (EIIS = IL). The monitor strip chart recorder documented a single spike of sufficient amplitude to actuate the radiation monitor trip circuit.

At 0200 hours, after verification of normal area radiation levels, Control Room personnel reset the isolation. At approximately 0210 hours, the affected systems were returned to normal.

There are two radiation detectors monitoring the Reactor Building Ventilation effluent. A signal from either detector will cause the system to trip, generate a PCIS Group III isolation signal, isolate Reactor Building Ventilation, and start the Standby Gas Treatment System. The VY Reactor Building Radiation Monitoring System uses GE Model 112B2802G12 detector modules.

This event is essentially a repeat of a previous event (event date 4/21/97) reported on 5/21/97 as VY LER 97-07. At that time a review of the affected equipment maintenance history revealed that several years ago VY had experienced what it considered to be an unacceptable number of Group III isolations from spurious random spikes from this same radiation monitoring system. Because of those spikes, and the resulting Group III isolations, VY instituted a practice of replacing the affected detector modules on a routine basis. Since that time VY has experienced few invalid actuations of the related isolation circuitry. The apparent success of the routine replacement of the detector modules led VY to believe that the event reported in April was an anomaly. The failure of the affected detector module was entered into the VY Maintenance Rule program for tracking and trending.

The investigation for the April event revealed that the current system, with all components performing as designed, would be expected to result in some invalid isolation signals. These invalid signals are due to the design of the actuation circuit and the signal instability inherent in the current design detector modules. The investigation resulted in recommendations which included system redesign options. However, it was VY's belief that the routine replacement of the detector modules was able to adequately compensate for the identified design vulnerability, a conclusion apparently substantiated by the rarity of such events in the preceding 5 years. VY also recognized that the circuit responds to an "invalid" isolation signal in a manner which is conservative relative to plant and public safety. Therefore, VY concluded that no corrective actions beyond basic troubleshooting was warranted.

Because there has been a recurrence of this event, corrective actions were potentially inadequate. The VY Maintenance Rule program requirements are being invoked to determine if the condition merits a system configuration change, based upon the frequency of recurrence.

CAUSES OF EVENT

The apparent cause of the event was the occurrence of a noise spike the amplitude of which was greater than the setpoint of the radiation monitor trip.

A contributing cause to this event was the decision to forego corrective action to prevent recurrence for the April 1997 event due to the recognition that the event had no adverse safety implication.

ANALYSIS OF EVENT

The PCIS, SBGTS, and Reactor Building Ventilation system operated as designed. PCIS successfully isolated the affected system process lines. The Reactor Building Ventilation system automatically aligned to isolate the reactor building volume. The SBGTS started automatically, filtering the reactor building atmosphere and discharging via the plant stack. A PCIS Group III isolation, SBGTS initiation, and Reactor Building Ventilation system isolation are the expected results of a trip of one side of the Reactor Building Vent Radiation Monitoring system.

No surveillance tests or unusual activities were identified to be in progress at the radiation detector or the panel that houses the radiation monitor electronics. The radiation level of the two Reactor Building Vent radiation monitor channels are recorded on the same strip chart recorder.

There are two radiation detectors monitoring the Reactor Building Ventilation effluent. A signal from either detector will cause the system to trip, generate a PCIS Group III isolation signal, isolate Reactor Building Ventilation, and start the Standby Gas Treatment System.

Troubleshooting of the radiation monitor channel was conducted to determine the cause of the spurious trip. No causes other than the inherent design vulnerability were discovered. The spurious signal did not recur.

SAFETY SIGNIFICANCE

Although the event did result in actuation of ESF equipment, there were no adverse implications to plant equipment or to health and safety of the public because the isolation of the containment purge and vent, containment air dilution and monitoring systems, and SBGTS initiation are conservative system actuations with respect to protection of the public. The occurrence of a spurious signal causes the radiation monitor to operate as if a valid high radiation signal had been received.

CORRECTIVE ACTIONS

Immediate Actions:

1. Upon verification of normal radiological conditions, the isolations were reset and ventilation systems were returned to normal.

2. I&C technicians conducted troubleshooting to determine the cause of spurious spikes. There was no recurrence of spurious spikes. The radiation monitor was determined to be operating satisfactorily.

3. An Event Report was initiated to document this event, perform the cause analysis and determine appropriate corrective actions.

4. The "B" Reactor Building Vent Radiation Monitor detector will be replaced as a precautionary measure. The detector module will then be sent to the manufacturer for examination. The expected completion date is 01/30/98.

Long Term Actions:

VY will evaluate, in light of Maintenance Rule program requirements, the following long term corrective actions:

- Modifying the Reactor Building Vent Radiation Monitoring System such that its trip circuits ignore any spurious signals; but continue to respond to valid high radiation signals.

- Installing new Reactor Building Vent Radiation Monitoring equipment that is not susceptible to spurious noise signals.

- Increasing the number of radiation monitor channels, and changing the actuation logic scheme to include redundancy to prevent any one spurious signal from actuating the system, yet allow proper response to a valid signal.

VY expects to have completed its initial screening and evaluation of the above listed configuration changes by 09/01/98. Should the radiation monitor detector manufacturer determine that the affected detector was defective, VY will resume normal Reactor Building Radiation Monitoring system tracking and maintenance in lieu of evaluating the redesign options in the long term corrective action described above. Configuration change(s) selected, and relevant implementation schedules established, will be consistent with the VY Maintenance Rule program requirements for the affected equipment reliability.

ADDITIONAL INFORMATION

Although this event is the second occurrence in this calendar year, Vermont Yankee considers this event to be relatively rare, and consistent with the conservative system design. Vermont Yankee's event report process and Maintenance Rule program will continue to monitor the performance of the affected equipment following detector replacement. Further actions taken will be determined consistent with the requirements of 10CFR50.65 and the VY Maintenance Rule program.

LER 97-07, reported on 05/21/97, describes a similar event, wherein a Group III containment isolation and the initiation of the SBGTS were caused by a spike on the "B" Reactor Building Vent Radiation Monitor.

LER 94-07 was an event reported to the Commission which involved spurious radiation monitor spikes, but was attributed to dirty/oxidized contacts.