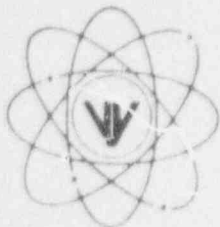


# VERMONT YANKEE NUCLEAR POWER CORPORATION



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

April 4, 1997  
BVY 97-45

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

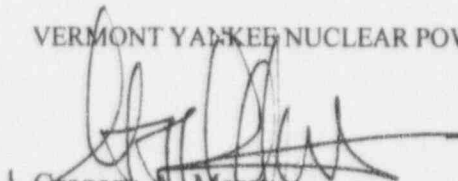
Reference: (a) License No. DPR-28 (Docket No. 50-271)

Subject: Reportable Occurrence No. LER 97-003, Rev. 0

As defined by 10CFR50.73, we are reporting the attached Reportable Occurrence as LER 97-003, Rev. 0.

Sincerely,

VERMONT YANKEE NUCLEAR POWER CORPORATION

  
Gregory A. Marek  
Plant Manager

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

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|   |  |                                    |                |  |                 |                               |        |                                   |                               |   |
|---|--|------------------------------------|----------------|--|-----------------|-------------------------------|--------|-----------------------------------|-------------------------------|---|
| NRC Form 366<br>(4-95)  |  | U.S. NUCLEAR REGULATORY COMMISSION |                | APPROVED BY OMB NO. 3150-0104<br>EXPIRES 04/30/98<br>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. |                 |                               |        |                                   |                               |   |
| LICENSEE EVENT REPORT (LER)   |  |                                    |                |  |                 |                               |        |                                   |                               |   |
| FACILITY NAME (1)   |  |                                    |                | VERMONT YANKEE NUCLEAR POWER STATION   |                 | DOCKET NUMBER (2)             |        | PAGE (3)                          |                               |   |
|   |  |                                    |                |  |                 | 05000271                      |        | 01 OF 03                          |                               |   |
| TITLE (4) Overpressure protection not provided for turbine building as described in the VY FSAR due to an unknown cause. The event investigation continues. |  |                                    |                |  |                 |                               |        |                                   |                               |   |
| 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)                                   |
| 03  | 05   | 97                                 | 97             | -- 003 --  | 00              | 04                            | 04     | 97                                | N/A                           | 05000   |
| OPERATING MODE (9)  |  | N                                  |                | 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)                               |
| POWER LEVEL (10)  |  | 100                                |                | 20.2203(a)(1)  |                 | 20.2203(a)(3)(i)              |        | X 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)                 |        | 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  |
| X   | YES<br>(If yes, complete EXPECTED SUBMISSION DATE) |                                    |                | NO   |                 |                               |        | 07                                | 30                            | 97  |

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

On 3/5/97, during investigation for a similar issue, it was discovered that the design for Turbine Building overpressure protection, described in the Vermont Yankee Final Safety Analysis Report, was never installed. The VY FSAR description of Turbine Building overpressure protection includes a 1000 sq. ft. blowout panel that would actuate at an internal pressure of 0.25 psi. No venting areas of this size have been found in the Turbine Building, and investigation to date has been unable to identify any other venting methods that may have been assumed, in lieu of the blowout panels, when the plant was constructed. The analysis for high energy line breaks (HELB) in the Turbine Building credits the blowout panel. Absent the blowout panel, the potential higher pressure raised concern for the structural capability of certain block walls and ductwork in the building. Analysis has been performed to assess the potential effects on safety related equipment and to justify continued operation. Where appropriate, compensatory measures are in place to reduce the areas potentially susceptible to an HELB absent the mitigating effects of the Turbine Building blowout panel. The affected ventilation system is being modified to prevent steam intrusion into the vital switchgear room in the event of an HELB in the Turbine Building. Because there has been no occurrence of an HELB in the turbine building during the plant's operating lifetime, and an accident of such magnitude is not expected to occur during the plant lifetime (ANSI 18.2-1973), this event is deemed to have presented no increased risk to the health and safety of the public.

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| NRC Form 366 U.S. NUCLEAR REGULATORY COMMISSION<br>(4-95) |  | APPROVED BY OMB NO. 3150-0104<br>EXPIRES 04/30/98<br>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. |  |                |                   |          |
| LICENSEE EVENT REPORT (LER)                               |  |  |  |                |                   |          |
| FACILITY NAME (1)   |  | DOCKET NUMBER (2)  |  | LER NUMBER (6) |                   | PAGE (3) |
| VERMONT YANKEE NUCLEAR POWER CORPORATION                  |  | 05000271   |  | YEAR           | SEQUENTIAL NUMBER | REV #    |
|   |  |  |  | 97             | -- 003 --         | 00       |
|   |  |  |  |                |                   | 02 OF 03 |

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

#### DESCRIPTION OF EVENT

On 3/5/97, while operating at 100% power, during investigation for a similar issue, it was discovered that the design for overpressure protection of the Turbine Building, as credited in the VY Final Safety Analysis Report, was not installed. The VY Final Safety Analysis Report (FSAR) section 14.6.5 entitled Main Steam Line Break (MSLB) Accident (outside of secondary containment) states that, "the pressure buildup in the Turbine Building (EIS=NM) will cause the blowout panels (EIS=RPD) to function, resulting in a release of the steam cloud in a matter of seconds." This same wording was present as early as the 1970 issue of the FSAR. However, through review of the VY Preliminary Safety Analysis Report (PSAR) the following was discovered. The PSAR states "The steam would travel up through the Turbine Building, partially condensing on the walls and equipment in the Turbine Building. The increase in pressure in the Turbine Building would result in portions of the siding and roof of the building being torn from the building structural members releasing steam to the environs. No damage to these structural members would be expected." It is not clear from these two different descriptions whether the change to "blowout panels" as exists in the FSAR today, was made as a result of a decision that an engineered feature needed to be installed or simply a case of interpretation (i.e., Turbine Building siding is expected to fail and act as a relief device).

The investigation for this event continues. The conclusion of that investigation will be reported in a supplement to this report.

#### CAUSES OF EVENT

The Root cause(s) of this event are still under investigation, and a supplement to this LER will be issued to report the conclusions of that investigation.

#### ANALYSIS OF EVENT

The issues noted in this report are the result of postulated HELB's of the feedwater or main steam piping (EIS = SJ or SB) in the Turbine Building. Rupture of such lines in the Turbine Building could result in a pressure rise to as high as 1.4 psig before the building siding fails and relieves pressure. In addition to the high internal pressure concerns, high area temperatures and steam environments in various areas of the Turbine Building could also result from such an HELB.

The concerns are: the structural capacity of certain block walls providing boundaries for the Turbine Building, equipment qualification in areas beyond these block walls, and Heating, Ventilating and Air Conditioning (HVAC, EIS=VK) supply ductwork to the switchgear (EIS=EB) rooms could be challenged by the potentially high Turbine Building pressure and temperature. Each area is discussed separately below.

An issue of concern is the block wall surrounding the Emergency Diesel Generators (EDGs, EIS=EK) and the EDG fuel oil day tank rooms. Preliminary analyses indicate that these block walls would withstand differential pressures of the postulated HELB without blowout panels. The block walls separating the EDG rooms and day tank rooms from the remainder of the Turbine Building form the Equipment Qualification (EQ) barrier between potentially harsh and mild environments assumed in the Vermont Yankee EQ program. The EDG and day tank rooms are considered mild environments for the MSLB in the EQ program. Although the EDG and day tank block wall loading during the postulated HELB would exceed code allowed values, the walls would remain intact at a differential pressure up to 2.5 psi. The walls are therefore expected to protect the EDGs from the potential harsh environment. The walls were therefore capable of performing their basic design function.

Another area of concern is the masonry wall which provides separation between the HVAC rooms and the turbine operating floor. The HVAC rooms are defined as mild environments in the VY EQ program. Preliminary analysis indicates that the walls associated with the HVAC rooms could fail when subjected to the projected internal Turbine Building pressures associated with an HELB without blowout panel protection. Failure of these walls could result in the introduction of a harsh environment into the HVAC rooms. The safety related equipment within these rooms is the Control Room HVAC (EIS=VI) equipment. This

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equipment has not been qualified for harsh environments. There is no concern that physical collapse of any walls could directly impact and pose adverse effects on safety related equipment in the area. All of the walls in this area have been previously assessed for seismic concerns under VY's masonry wall program and modifications have been installed, where required, to protect this equipment from damage due to wall collapse. Therefore, the concern in regard to HELB in this area is limited to the potential introduction of an adverse steam/temperature environment to safety related HVAC equipment. Should the postulated harsh environment affect the Control Room HVAC equipment, operators could isolate the system. Existing analyses done in conjunction with Appendix R scenarios involving loss of Control Room HVAC indicate that several hours (3 to 4) without cooling can be tolerated. This loss of HVAC could then be mitigated by use of portable ventilators and is not expected to be detrimental to equipment within the Control Room. Personnel habitability in the event of a Turbine Building HELB credits the use of Self Contained Breathing Apparatus rather than the HVAC system and is thus unaffected by this event.

A third area of concern for this scenario is the potential for steam intrusion into the vital switchgear rooms via failure of a block wall or the supply duct for the ventilation system. The switchgear room is considered a mild environment in the VY EQ program. Like the EDG day tank room walls, the switchgear room walls would exceed code should the postulated HELB, producing the higher Turbine Building pressure, occur. However, in the case of the switchgear room walls, failure would be predicted. The switchgear room block wall of concern has been effectively isolated from the postulated HELB pressures by closing a fire door in the corridor leading to the area. The door can withstand the postulated pressures in the Turbine Building without failure. The fire door is being maintained closed, except for personnel passage, by administrative controls. Wall integrity could have been challenged by a failure of the switchgear room HVAC system caused by the HELB. Because the HVAC system would isolate on high area temperatures in the event of the HELB, and the most probable failure modes would not significantly compromise wall integrity, very little steam is expected to enter the switchgear room should this short duration transient occur. The equipment in the switchgear rooms is therefore adequately protected from a harsh environment.

Because there has been no occurrence of an HELB in the turbine building during the plant's operating lifetime, and an accident of such magnitude is not expected to occur during the plant lifetime (ANSI 18.2-1973), this event is deemed to have presented no increased risk to the health and safety of the public.

#### CORRECTIVE ACTIONS

1. Event Reports (VY's corrective action process) were initiated to document this event, fully investigate the concerns, determine the root cause(s) and identify appropriate corrective actions. This process is on-going and a supplement to this report will be issued to communicate the results of this analysis.
2. Initial operability determinations were made and the Bases for Maintaining Operation (BMOs) are under development. The BMOs will provide the conclusions and supporting bases for assuring that the plant may continue to operate safely (expected completion date: 05/01/97).
3. The vital switchgear room HVAC system is being modified to prevent an HELB in the Turbine Building from introducing steam into the switchgear rooms (expected completion date: 4/10/97).

#### ADDITIONAL INFORMATION

The determination as to which of previously reported events are similar to this event will be determined following completion of the cause analysis and communicated in the supplement to this report.

Long term corrective actions will be determined using the VY Corrective Action Process. The investigation results and corrective actions will be communicated in a supplement to this report.