VERMONT YANKEE
NUCLEAR POWER CORPORATION

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

October 17, 1996
BVY 96-127

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 96-015

As defined by 10CFR50.73, we are reporting the attached Reportable Occurrence as LER 96-015

Sincerely,

VERMONT YANKEE NUCLEAR POWER CORPORATION

Robert J. Wanczyk
Plant Manager

c: USNRC Region 1 Administrator
USNRC Resident Inspector - VYNPS
USNRC Project Manager - VYNPS

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

LICENSEE EVENT REPORT (LER)

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

TITLE (4) Original B31.1 ANSI Code Section that Required Overpressurization Relief for Isolated Piping Sections was not Considered during Original Design

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
07	25	96	96	015 -	00	10	17	96	N/A	

OPERATING MODE (9)	N
POWER LEVEL (10)	99%

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)	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)
ROBERT J. WANCZYK, 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					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)

On 7/25/96, with the plant at 99% power, while reviewing the potential for thermally induced pressurization of piping, due to an event identified at another facility, Vermont Yankee (VY) determined that the original code used during construction of VY, ANSI B31.1, 1967, stipulated that portions of piping that could exceed design pressure limits if they became isolated, be protected from overpressurization. Contrary to this, the original design of VY did not document consideration of this requirement. This event is therefore reportable under 10CFR50.73(a)(2)(ii) as being in a condition outside the design basis. Six lines in different systems were identified as lacking the required overpressurization protection. General Electric, provided a technical evaluation which determined that the piping in question could potentially deform, but not fail, due to thermal expansion of water in the isolated portions following a Loss of Coolant Accident (LOCA).

Based on age, root causes cannot be conclusively determined, however, it appears that: 1) the personnel involved in the original design of the plant failed to apply Section 101.4.2 of B31.1 - 1967 of the ANSI Code which would provide pressure relief to specific isolated sections of piping, and 2) an inadequate failure modes and effects evaluation.

Immediate corrective actions included obtaining input from General Electric to determine of operability, and basis for maintaining operation evaluation. Long term corrective action included a design change which provided the required overpressure protection for the affected lines. This change was completed during the 1996 refueling outage.

As it was determined that no piping failure would occur there was no danger to the health and safety of the public.

DESCRIPTION OF EVENT

On 7/25/96, with the plant at 99% power, the Engineering Department discovered, while performing an industry experience review for applicability to VY, that the original piping code ANSI B31.1, (1967) requirements to design for thermal relief protection appears not to have been addressed in the final plant design.

This affected systems wholly within and partially within the containment that are automatically or manually isolated following a LOCA.

The affected systems include portions of the Reactor Building Closed Cooling Water System (RBCCW) (EIIS = BI), the Residual Heat Removal (RHR) Shutdown Cooling System (EIIS = BO), Main Steam Line Drains (MSD) (EIIS = SB), Liquid Radwaste System (LRW) (EIIS = WD)(2 lines), Recirculation System Sampling System (EIIS = AD) and the containment RBCCW Reactor Recirculation Units (RRU's) (EIIS = VB).

An immediate operability evaluation was completed and later confirmed by input from Engineering and General Electric that the plant could continue operations.

The plant was shutdown for a refueling outage on 9/7/96 at which time a design change was incorporated that provided overpressure protection for these lines. The intent of the design change is to provide overpressure protection of isolated piping systems whose pressure could increase due to thermal expansion.

CAUSE OF EVENT

The root cause of this event could not be determined, however, it appears that personnel responsible for the original design of the plant failed to apply Section 101.4.2 of B31.1 - 1967 of the ANSI Code which would provide pressure relief to specific isolated sections of piping following a LOCA and also did not provide adequate failure modes and effects evaluations for the post-LOCA conditions of the affected systems.

ANALYSIS OF EVENT

The six lines that are affected are a part of either the Reactor Building Closed Cooling Water System (RBCCW), the Residual Heat Removal (RHR) Shutdown Cooling System, Main Steam Line Drains, Liquid Radwaste System (LRW) (2 lines), Recirculation System Sampling System or the containment RBCCW Reactor Recirculation Units (RRU's). Specific lines in each of these systems would be affected as each would be isolated following a LOCA. The isolated piping in these systems are filled with water which would expand under LOCA temperatures achieving a pressure greater than the design rating of the piping.

Following discovery of this event, Vermont Yankee contacted General Electric to evaluate the isolated sections of piping to determine if any breach or damage would occur as a result of the overpressurization. General Electric stated that the pressure could exceed the design of the piping but because of the ductility of the pipe the piping would only potentially deform and no failure would occur and therefore the piping and containment would remain intact.

This is a conservative analysis based on the following assumptions: 1) The deformation of the pipe was not considered to reduce the pressure in the pipe, 2) the liquid trapped in the piping was heated up from 70 degrees to 325 degrees F and, 3) there was no credit taken for valve leakage to relieve the pressure. The analysis also shows that a conservative estimate of the pipe strain is 4 percent which would put the pipe in the plastic yielding zone. However, the ultimate strain of low carbon steel is 25 percent. Consequently, the pipe is not expected to catastrophically fail with a 4 percent expansion. Realistically, if a LOCA were to occur, the excessive pressure exerted on valve discs, bonnets and seals in the affected systems would cause

some amount of leakage which would relieve the pressure on the piping, limiting the pressure peak to a lower value which would further ensure the integrity of the piping.

As no breach of the containment or piping would occur there would be no danger to the health and safety of the public due to overpressurizing the piping concerned in this issue.

The design change to incorporate pressure relief protection for these lines does not impact the existing Vermont Yankee Technical Specifications. Additionally, the lines penetrating the drywell affected by this design are not relied on to prevent or actively mitigate any of the design basis accidents or transients as described in Section 14 of the Vermont Yankee Final Safety Analysis Report. The safety function of the RBCCW, LRW, RHR(Shut Down Cooling), MSD and Recirculation Sample line penetrations is to maintain pressure integrity for containment boundary purposes. The drywell RRU's do not perform a safety function and their process lines need only to maintain pressure integrity for containment boundary purposes.

CORRECTIVE ACTIONS

IMMEDIATE CORRECTIVE ACTION

1. A one-hour notification to the Commission was made in accordance with 10CFR50.72(b)(1)

2. A Plant Event Report was issued to evaluate this issue.

3. Vermont Yankee contacted General Electric, and Yankee Nuclear Services Division and discussed the issue with engineers from the piping analysis and piping design groups and determined that there were no immediate operability concerns.

4. A Basis for Maintaining Operations (BMO) (A BMO is a Vermont Yankee evaluation which provides the basis for maintaining continued operation with a known deficiency in the analysis, design, or qualification of safety-related , environmentally qualified, or technical specification systems, structures, or components) was generated and approved by plant management.

LONG TERM CORRECTIVE ACTIONS

1. An Engineering Design Change Request (EDCR) was written to provide pressure relief protection for the affected lines. The relief protection consisted of either relief valves or check valves installed to relieve any excess pressure. This has been completed.

ADDITIONAL INFORMATION

Vermont Yankee recognizes that this LER is late. An extension was requested from the NRC Resident Inspector and the extension was granted for 10/17/96.

SIMILAR LER'S

Similar events under 10CFR 50.73(a)(2)(ii), outside the design basis of the plant, have been reported as LER's 96-008, 96-013, 94-002 and 93-013