

LICENSEE EVENT REPORT (LER)

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|---|--------------------------------------|----------------------|
| FACILITY NAME (1) VERMONT YANKEE NUCLEAR POWER CORPORATION | DOCKET NUMBER (2) 0 5 0 0 0 2 7 1 | PAGE (3) 1 OF 0 3 |
|---|--------------------------------------|----------------------|

TITLE (4)
MOTOR OPERATOR FAILURE DUE TO TORQUE SWITCH HYDRAULIC LOCKUP CAUSED BY IMPROPER GREASE

| 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 NAMES | | DOCKET NUMBER(S) |
| 0 6 | 1 1 | 8 6 | 8 6 | 0 1 2 | 0 2 0 | 0 1 2 | 8 8 | 7 | | | 0 5 0 0 0 |
| | | | | | | | | | | | 0 5 0 0 0 |

OPERATING MODE (9) N

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR § (Check one or more of the following) (11)

| | | | |
|-------------------|------------------|----------------------|--|
| 20.402(b) | 20.406(e) | 50.73(a)(2)(iv) | 73.71(b) |
| 20.406(a)(1)(i) | 50.36(e)(1) | 50.73(a)(2)(v) | 73.71(e) |
| 20.406(a)(1)(ii) | 50.36(e)(2) | 50.73(a)(2)(vii) | OTHER (Specify in Abstract below and in Text, NRC Form 366A) |
| 20.406(a)(1)(iii) | 50.73(a)(2)(i) | 50.73(a)(2)(viii)(A) | |
| 20.406(a)(1)(iv) | 50.73(a)(2)(ii) | 50.73(a)(2)(viii)(B) | |
| 20.406(a)(1)(v) | 50.73(a)(2)(iii) | 50.73(a)(2)(ix) | |

POWER LEVEL (10) 0 0 0

LICENSEE CONTACT FOR THIS LER (12)

| NAME | TELEPHONE NUMBER |
|-----------------------------------|---------------------------------|
| JAMES P. PELLETIER, PLANT MANAGER | AREA CODE 8 0 2 2 5 7 - 7 7 1 1 |

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

| CAUSE | SYSTEM | COMPONENT | MANUFACTURER | REPORTABLE TO NPDOS | CAUSE | SYSTEM | COMPONENT | MANUFACTURER | REPORTABLE TO NPDOS |
|-------|---------|-----------|--------------|---------------------|-------|--------|-----------|--------------|---------------------|
| B | A D M O | | L 2 0 0 | Y | | | | | |
| | | | | | | | | | |

SUPPLEMENTAL REPORT EXPECTED (14)

YES (If yes, complete EXPECTED SUBMISSION DATE) NO

EXPECTED SUBMISSION DATE (15)

| MONTH | DAY | YEAR |
|-------|-----|------|
| | | |

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

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On 6/4/86 with the plant shut down for refueling and recirculation pipe replacement, an operator in the Control Room attempted to reposition motor operated valve (MOV) V2-43B, (the recirc loop "B" pump suction valve). The motor operator is a Limitorque SMB-2. The valve failed to open (as determined by position indication lights) upon a signal from the Control Room. A second attempt was made to open the valve and the position indicating lights went out. An investigation into the cause of the valve's failure determined that a hydraulic lockup of the MOV's spring pack prevented the torque switch from opening causing the motor to fail. This lock-up was due to: 1) the replacement of less viscous new grease, Exxon, NEBULA-EP-0 into the operator, which was recommended by the manufacturer and 2) the failure of the manufacturer to provide information regarding the need to install a retrofit grease relief kit.

A total of 40 motor operators, 32 of which were safety related valves, were refurbished with the new grease during the outage. All 40 valves have had a grease relief tube added from the spring cartridge cap cover to a plug hole at the top of the operator. The tubing will allow any grease trapped in the spring pack to be relieved. This repair, recommended by the manufacturer, will prevent the possibility of a hydraulic lockup of the spring pack.

Valve V2-43B has no intended safety function (other than maintaining a pressure boundary).

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LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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| FACILITY NAME (1) VERMONT YANKEE NUCLEAR POWER CORP. | DOCKET NUMBER (2) 0 5 0 0 0 2 7 1 8 6 | LER NUMBER (8) | | | PAGE (3) | | |
| | | YEAR | SEQUENTIAL NUMBER | REVISION NUMBER | | | |
| | | 86 | 012 | 02 | 02 | OF | 03 |

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

DESCRIPTION OF EVENT

On June 4, 1986, with the plant shut down for refueling and recirculation piping replacement, an operator in the Control Room attempted to reposition valve V2-43B, the recirc Loop "B", pump suction valve. The valve failed to open (as determined by remote position indication lights) upon a signal from the Control Room. A second attempt was made to open the valve. This time the position indication lights went out. An investigation was made to determine the cause of the problem. The motor operator was disassembled and the rotor was found fused to the windings. Following the investigation a Potential Reportable Occurrence Form (PRO) was submitted to the Shift Supervisor on June 11, 1986.

CAUSE OF EVENT

The recirculation V2-43B valve motor failed as a result of a hydraulic lock of the MOV's spring pack.

1) The Immediate Cause - Equipment Failure

The hydraulic lockup resulted from the installation of Limitorque's recommended grease, Exxon, NEBULA-EP-0. The grease leaked past the spring pack seal, which effectively increased the torque setpoint. This caused the motor to stall and the valve became disabled when the rotor failed. Electrical indications were not affected by the failed rotor. When power was applied on 6/4/86 the electrical overload tripped the breaker and the valve indicator lights in the Control Room went out.

2) Root Cause - Personnel Error, Vendor

Limitorque recommended using Exxon, NEBULA-EP-0 grease via current revised technical manual. However, the vendor did not note in his manual or correspondence that "grease relief measures" (such as vent tubing or slotted spring pack cartridge assembly) were needed to ensure valve operation performance when using Exxon, NEBULA-EP-0 grease. VY originally used Exxon, NEBULA-EP-1 which was listed in the original vendor manuals and VY had encountered no problems. Since the valve operators had not been rebuilt until the 1985/86 outage, Exxon, NEBULA-EP-1 grease had always been used.

There are seven different Limitorque sizes that were refurbished. The following is a breakdown of the number of each type:

| <u>Operator Size</u> | <u>Number Refurbished</u> |
|----------------------|---------------------------|
| SMB 0 | 4 |
| SMB 00 | 9 |
| SMB 000 | 11 |
| SMB 1 | 3 |
| SMB 2 | 8 |
| SMB 3 | 3 |
| SMB 4 | 2 |

V2-43B has an SMB-2 operator.

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| | | 8 6 | - 0 1 2 | - 0 2 | 0 3 | OF | 0 3 |

TEXT (If more space is required, use additional NRC Form 388A's) (17)

The systems involved include: Recirculation, Residual Heat Removal, Reactor Water Cleanup, High Pressure Coolant Injection, Core Spray Reactor Core Isolation Cooling, Main Steam and Feedwater.

ANALYSIS OF EVENT

Valve V2-43B is not required to operate during an event and therefore no unanalyzed condition could occur if the valve had failed to operate. Each of the 32 safety related valves were successfully stroked prior to being declared operable. This phenomenon known as hydraulic lockup (which can occur on the Limitorque operators) was unknown to Vermont Yankee prior to this occurrence. Vermont Yankee was not informed by Limitorque of this improvement/fix until after this problem was discovered. Since Vermont Yankee was not aware of the potential for this event prior to the occurrence, no prediction or corrective action could have been made prior to the failure.

Assuming that the valve V2-43B failure could occur in all the affected valves, Vermont Yankee's ability to effectively cope with a design basis accident, could have been severely compromised.

Probability of all valves failing was very remote.

CORRECTIVE ACTION

After the discovery of the failed operator, the manufacturer was contacted. Limitorque recommended that grease relief kits be installed from the spring cartridge cap cover to an existing plug hole at the top of the operator. All 40 valves were repaired and retested prior to start up. The kits allow a flow path to prevent trapping grease and therefore eliminate the possibility of a hydraulic lockup.

No previous similar occurrences have been reported in the past five years.



VERMONT YANKEE NUCLEAR POWER CORPORATION

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

February 13, 1987

VYV 87-029

U.S. Nuclear Regulatory Commission
Document No. 50-271
Washington, D.C. 20555

REFERENCE: Operating License DPR-28
Docket No. 50-271
Reportable Occurrence No. LER 86-12, R-2

Dear Sirs:

As defined by 10CFR50.73, we are reporting the attached Reportable Occurrence as LER 86-12, R-2.

Very truly yours,

VERMONT YANKEE NUCLEAR POWER CORPORATION

James P. Pelletier
Plant Manager

PBC/mmh

cc: Regional Administrator
USNRC Office of Inspection and Enforcement
Region I
631 Park Avenue
King of Prussia, Pennsylvania 19406

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