NRC Form 366 (9-83)

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO. 3150-0104
EXPIRES: 8/31/88

# LICENSEE EVENT REPORT (LER)

| FACILITY NAME (1) | DOCKET NUMBER (2) | PAGE (3) |
|---|---|---|
| Calvert Cliffs, Unit 2 | 0 5 0 0 0 3 1 8 | 1 OF 0 5 |

TITLE (4)
Main Steam Safety Valve Setpoints Out of Specification

| 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) |
| 1 0 | 1 9 | 8 5 | 8 5 | 0 1 1 | 0 1 | 1 2 | 1 9 | 8 5 | NA | 0 5 0 0 0 |
| | | | | | | | | | | 0 5 0 0 0 |

OPERATING MODE (9): 3
POWER LEVEL (10): 0 0 0

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

| | | | |
|---|---|---|---|
| | | | 73.71(b) |
| | X | | 73.71(c) |
| | | X | OTHER (Specify in Abstract below and in Text, NRC Form 366A) |

LICENSEE CONTACT FOR THIS LER (12)

| NAME | TELEPHONE NUMBER |
|---|---|
| P. M. Knoetgen - Engineer - PMD | AREA CODE 3 0 1 — 2 6 0 - 4 8 6 9 |

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 |
|---|---|---|---|---|---|---|---|---|---|
| X | S B | R V | D 2 4 3 | Y | | | | | |
| | | | | | | | | | |

SUPPLEMENTAL REPORT EXPECTED (14)

| | | EXPECTED SUBMISSION DATE (15) | MONTH | DAY | YEAR |
|---|---|---|---|---|---|
| YES (If yes, complete EXPECTED SUBMISSION DATE) | X NO | | | | |

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

On 19 October 1985 Unit 2 was shutdown in MODE 3 in preparation for a refueling outage. A Surveillance Test Procedure (STP) was performed to determine Main Steam Safety Valve (MSSV) Setpoints on No. 21 and 22 Steam Generators. Eleven of sixteen MSSVs were determined to be out of specification, and Technical Specification action statement 3/4 7.1.1a was entered. The MSSVs were reset to within specifications by 2130, 19 October 1985. At the conclusion of testing, the plant was placed in cold shutdown for refueling.

Long term corrective action included full flow testing of two MSSVs. The testing device used in the STP was tested. All sixteen MSSVs were inspected and overhauled. Procedural enhancements were incorporated into the STP to improve reliability. During reactor coolant system heatup on 7 December, 1985, all 16 MSSV setpoints were tested and adjusted as required. Twelve hours later an independent check to verify a sample of four valves was performed satisfactorily.

Additionally, four more Unit 2 MSSVs will be checked after four months of operation, and all Unit 1 MSSVs will be checked during the next outage.

The causes of this event appear to be more attributable to measuring technique than to material condition.





IE22 1/1

On 19 October 1985, with Unit 2 reactor in MODE 3 in preparation for a refueling outage, Surveillance Test Procedure (STP) M-3-2, "Main Steam Safety Valves (SB-RV)" was performed on No. 21 and 22 Steam Generator (S/G) Main Steam Safety Valves (MSSV) to check and, if required, adjust the relief pressure setpoints. Unit 2 contains two Steam Generators (S/G), each with its own Main Steam (SB) header. Each steam header is served by eight Dresser Industries type C-3707RA maxiflow safety valves (RV). The STP was commenced at approximately 1530, 19 October, with reactor coolant (AB) temperature at 500°F. Eleven of the sixteen safety valves were determined to be out of specification, and TS action statement 3.7.1.1a was entered. The required lift setpoints and their as found condition are listed below:

| Valve | Required Setpoint (±10 psig) | As Found Setpoint |
|---|---|---|
| RV-3993 | 985 | 1015 |
| RV-3995 | 995 | 1035 |
| RV-3999 | 1035 | 1057 |
| RV-4000 | 985 | 1037 |
| RV-4001 | 985 | 1040 |
| RV-4002 | 995 | 1059 |
| RV-4003 | 995 | 1047 |
| RV-4004 | 1015 | 1070 |
| RV-4005 | 1015 | 1054 |
| RV-4006 | 1035 | 1104 |
| RV-4007 | 1035 | 1106 |

The immediate corrective action, as required by STP M-3-2, was to reset the safety valve setpoints to within their required tolerance bands. By approximately 2120, 19 October, the eleven relief valves had been reset. The setpoints of the valves were determined from 3 "simmers" of each valve using a Dresser Industries 1566 hydroset (a hydraulic testing device). After completion of testing, plant cooldown was continued, entering MODE 4 at 0200, 20 October, and MODE 5 at 1200, 20 October.

The following additional corrective actions were taken:

1. The hydroset used to perform STP-M-3-2 was sent to the vendor for testing. The hydroset was determined to have internal leakage. Test results showed the hydroset reading high but in specification for the range used during the MSSV STP. Because of the internal leakage, the hydroset could not be tested over its full range of operation.

2. All sixteen Unit 2 Main Steam Safety Valves (MSSV) were disassembled for inspection and overhaul.

   a. Nine of sixteen valves indicated varying degrees of vertical wear marks on the sliding surfaces of the disk holder and guide The wearing appeared primarily along the bottom one inch of the disk holder and along the top and bottom one to two inches of the guide. The manufacturer has stated that vertical abrasions are normal wear, and will cause valve hangup only if gross galling or spalling is experienced. Only one MSSV had high wear, but not sufficient to cause valve malfunction.

   b. Based on the manufacturer's recommendation, the disk guides were machined to allow more clearance for thermal expansion. The specification used for manufacture of the guides was increased by the vendor by 0.005 inches in December 1983. Baltimore Gas and Electric Co. was not notified of this change since it affected valves with set pressures above 1250 psig. Twelve of sixteen guides were at or slightly below the original minimum inside diameter of the guide. However, disk holder to guide clearances were within specifications, and would allow normal opening and closing.

   c. Four MSSVs had a heavy, black, crusty substance on the guide and disk holder. The substance was analyzed by X-ray analyses, and was determined to be the remains of Fryquel, the hydraulic fluid used in the Main Steam Isolation Valves (SB-ISV) (MSIV). Fryquel from a leak in the MSIV hydraulic system in late July 1985 had apparently entered the MSSV through the valve cover vent. The vendor has stated that Fryquel would not likely effect opening or closing of MSSVs.

   d. Thirteen of sixteen MSSVs had bent spindles However, all dimensions were less than half the minimum required to have any major effect on valve performance.

3. Two valves, RV 3992 and RV 3993, were tested under full flow conditions at Wyle Laboratories to determine: Lift setpoint and blowdown; Hydroset to lift setpoint correlation; and Thermal effects on lift setpoint.

   a. The lift setpoint of the valves was determined using full flow tests, and a curve developed which relates the setpoint determined from using the hydroset with the actual lift setpoint of the valve. This curve will be incorporated into STP-M-3-2.

   b. The MSSVs were determined to be thermally stable after four hours of heatup. A heatup transient test was performed to determine the effect of thermal non-equilibrium on lift setpoint. No effect was noted.

   c. Valve settings recommended by the manufacturer yielded 5.4% to 7.8% blowdown.

4. Several procedural enhancements have been incorporated into the surveillanace test procedure for MSSVs. They include:

   a. A requirement to maintain reactor coolant system (AB) temperature at $530^{\circ}F \pm 5^{\circ}F$ for four hours prior to testing, to more accurately reflect normal operating conditions.

   b. Use of pressure monitoring equipment for the hydroset which is easier to use and less subject to operator interpretation.

   c. A calculation of expected hydroset pressure at lift setpoint. This assists the operator by allowing him to approach the lift setpoint slowly and avoid overshoot.

   d. A requirement that three lift setpoints should be within 10 psig of each other to provide repeatable, valid data.

   e. Use of the lift setpoint-hydroset correlation curve developed from the full-flow testing at Wyle Laboratories to determine the actual lift setpoint measured.

   f. A requirement to watch for hydroset pressure decrease, as well as to listen for an audible simmer, to determine when the MSSV lifts, as recommended by the hydroset vendor.

g. A requirement to re-check the calibration of gauges after testing has been completed to ensure valid pressure measurement.

h. Mandatory QC coverage for all steps of the STP.

5. During the reactor coolant system heatup on 7 December, 1985, all sixteen MSSVs were tested and adjusted as required. Approximately twelve hours later, four MSSVs were independently tested by a different technician to verify the previous results and were found satisfactory.

6. During the first outage following four months of operation, the setpoints of four Unit 2 MSSVs will be verified.

7. During the next Unit 1 outage of sufficient duration, all Unit 1 MSSV setpoints will be checked. If any valves are adjusted, they will be re-checked during the first outage following three months of operation.

The safety consequences of this event were analyzed by the NSSS vendor, Combustion Engineering. Three analyses crediting MSSV operation were considered. The results of a Small Break Loss of Coolant Accident (SBLOCA) would be no worse than the current SBLOCA analysis results. The peak secondary pressure was determined not to exceed the upset limit during a Loss of Load or Loss of Load to One Steam Generator transient, and the as-found MSSV setpoints would not be expected to have any adverse effect on the radiation release consequences of either of these events.

Although material deficiencies were found during MSSV inspection, the apparent setpoint changes are not explained by the as-found material condition of the valves. The cause of this event appears to be attributed more to measuring technique than material condition. Based on the evaluation of Unit 2 MSSV material condition, it is felt that Unit 1 MSSVs will open, provide full capacity, and reseat as designed.

Similar events have occurred on Unit 1 (LERs 85-03, 79-16) and Unit 2 (LERs 84-04, 82-48).

The contact for further discussion of this event is Peter M. Knoetgen, (301) 260-4869.

Attachment 2
IN 86-56
July 10, 1986

LIST OF RECENTLY ISSUED
IE INFORMATION NOTICES

| Information Notice No. | Subject | Date of Issue | Issued to |
|---|---|---|---|
| 86-55 | Delayed Access To Safety-Related Areas And Equipment During Plant Emergencies | 7/10/86 | All power reactor facilities holding an OL or CP |
| 86-54 | Criminal Prosecution Of A Former Radiation Safety Officer Who Willfully Directed An Unqualified Individual To Perform Radiography | 6/27/86 | All holders of by-product, source, or special nuclear material |
| 86-53 | Improper Use Of Heat Shrinkable Tubing | 6/26/86 | All power reactor facilities holding an OL or CP |
| 86-52 | Conductor Insulation Degradation On Foxboro Model E Controllers | 6/26/86 | All power reactor facilities holding an OL or CP |
| 86-51 | Excessive Pneumatic Leakage In The Automatic Depressurization System | 6/18/86 | All BWR facilities holding an OL or CP |
| 86-50 | Inadequate Testing To Detect Failures Of Safety-Related Pneumatic Components Or Systems | 6/18/86 | All power reactor facilities holding an OL or CP |
| 86-49 | Age/Environment Induced Electrical Cable Failues | 6/16/86 | All power reactor facilities holding an OL or CP |
| 86-48 | Inadequate Testing Of Boron Solution Concentration In The Standby Liquid Control System | 6/13/86 | All BWR facilities holding an OL or CP |
| 86-47 | Feedwater Transient With Partial Failure Of The Reactor Scram System | 6/9/86 | All BWRs and PWRs facilities holding an OL or CP |

OL = Operating License
CP = Construction Permit