

LICENSEE EVENT REPORT (LER)

Form Rev 2.0

Facility Name (1) Dresden Nuclear Power Station, Unit 2  
 Docket Number (2) 0 5 10 10 10 12 13 17  
 Page (3) 1 of 0 5

Title (4) Unsatisfactory Main Steam Relief Valve Pressure Setpoints Due to Instrument Drift and Limit Switch Failure

| 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              | 2   | 0    | 3              | 8                 | 9               | 8               | 9   | ---  | 0                             | 0                | 17  | --- | 0 | 0  | 0  | 3  | 0  | 6  | 8  | 9 | N/A | 0 | 5 | 10 | 10 | 10 | 12 | 13 | 17 |
|                |     |      |                |                   |                 |                 |     |      |                               |                  | N/A | 0   | 5 | 10 | 10 | 10 | 12 | 13 | 17 |   |     |   |   |    |    |    |    |    |    |

OPERATING MODE (9) N

POWER LEVEL (10) 0 0 0

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

|  |  |   |  |
|--|--|---|--|
| <input type="checkbox"/> 20.402(b)         | <input type="checkbox"/> 20.405(c)                 | <input type="checkbox"/> 50.73(a)(2)(iv)      | <input type="checkbox"/> 73.71(b)                                      |
| <input type="checkbox"/> 20.405(a)(1)(i)   | <input type="checkbox"/> 50.36(c)(1)               | <input type="checkbox"/> 50.73(a)(2)(v)       | <input type="checkbox"/> 73.71(c)                                      |
| <input type="checkbox"/> 20.405(a)(1)(ii)  | <input type="checkbox"/> 50.36(c)(2)               | <input type="checkbox"/> 50.73(a)(2)(vii)     | <input type="checkbox"/> Other (Specify in Abstract below and in Text) |
| <input type="checkbox"/> 20.405(a)(1)(iii) | <input checked="" type="checkbox"/> 50.73(a)(2)(i) | <input type="checkbox"/> 50.73(a)(2)(viii)(A) |  |
| <input type="checkbox"/> 20.405(a)(1)(iv)  | <input type="checkbox"/> 50.73(a)(2)(ii)           | <input type="checkbox"/> 50.73(a)(2)(viii)(B) |  |
| <input type="checkbox"/> 20.405(a)(1)(v)   | <input type="checkbox"/> 50.73(a)(2)(iii)          | <input type="checkbox"/> 50.73(a)(2)(x)       |  |

LICENSEE CONTACT FOR THIS LER (12)

Name: Joseph Welch, Technical Staff Engineer  
 Ext. 2666  
 TELEPHONE NUMBER: AREA CODE 8 1 5 9 4 2 -2 19 12 10

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

| CAUSE | SYSTEM | COMPONENT | MANUFAC-TURER | REPORTABLE TO NPRDS | CAUSE | SYSTEM | COMPONENT | MANUFAC-TURER | REPORTABLE TO NPRDS |
|-------|--------|-----------|---------------|---------------------|-------|--------|-----------|---------------|---------------------|
| X     | S   B  | P   C   0 | D   2   4   3 | Y                   | S     | S   B  | P   C   0 | D   2   4   3 | Y                   |
| X     | S   B  | P   C   0 | D   2   4   3 | Y                   |       |        |           |               |                     |

SUPPLEMENTAL REPORT EXPECTED (14)

Expected Submission Date (15) \_\_\_\_\_  
 [Yes (If yes, complete EXPECTED SUBMISSION DATE)] X | NO

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

On February 3, 1989 while performing Dresden Instrument Surveillance (DIS) 250-3, Electromatic Relief Valve (ERV)/Target Rock Valve Pressure Switch Calibration, the pressure switches for ERV 2-203-3A and 2-203-3E were found outside the Technical Specification 4.6.E setpoint tolerance limit of +/- 1%. Subsequently on February 4, 1989 during completion of the surveillance, the actuation setpoint of the pressure switch for ERV 2-203-3C was observed to be erratic. The ERV 2-203-3C pressure switch setpoint range was fluctuating between 1050 and 1150 psig. Unit 2 was in a refueling outage when these setpoint discrepancies were discovered. The root cause of the ERV 2-203-3A and 2-203-3E setpoint discrepancies has been attributed to setpoint drift, while the root cause of the ERV 2-203-3C setpoint discrepancy was attributed to a faulty snap-acting dual control limit switch in the pressure controller. As corrective action the pressure switches for ERV 2-203-3A and 2-203-3E were recalibrated to within Technical Specification limits in accordance with DIS 250-3. The pressure switch for ERV 2-203-3C was replaced and recalibrated to within Technical Specification limits per DIS 250-3. The safety significance of this event was minimal because the "as found" ERV setpoints were conservative, the main steam line Safety Valves were available to insure that the reactor coolant system pressure limit would not be exceeded, and the ERV setpoint discrepancies had no effect on operation of the Automatic Depressurization System (ADS). This is the first occurrence of this type at Dresden Station.

*ICQ2*  
*1/1*

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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|                               |                               | Year           | Sequential Number | Revision Number |       |          |       |  |
| Dresden Nuclear Power Station | 0   5   0   0   0   2   3   7 | 8   9          | -   0   0   7     | -   0   0       | 0   2 | OF       | 0   5 |  |

TEXT Energy Industry Identification System (EIIS) codes are identified in the text as [XX]

PLANT AND SYSTEM IDENTIFICATION:

General Electric - Boiling Water Reactor - 2527 Mwt rated core thermal power.

EVENT IDENTIFICATION:

The pressure switches for Electromatic Relief Valve (ERV) 2-203-2A and 2-203-2E were discovered out of tolerance due to setpoint drift, and the pressure switch setpoint for ERV 2-203-2C was discovered to be erratic due to a faulty limit switch within the pressure controller.

A. CONDITIONS PRIOR TO EVENT:

Unit: 2                                      Event Date: February 4, 1989                                      Event Time: 0600 hours

Reactor Mode: N                                      Mode Name: Shutdown                                      Power Level: 0%

Reactor Coolant System (RCS) Pressure: 0 psig

B. DESCRIPTION OF EVENT:

On February 4, 1989 at 0730 hours with Unit 2 in the Shutdown mode for a refueling outage, while performing Dresden Instrument Surveillance (DIS) 250-3, Electromatic Relief Valve (ERV)/Target Rock Valve [SB] Pressure Switches Calibration, the pressure switch setpoints for ERV 2-203-3A and 2-203-3E were discovered to exceed the Technical Specification 4.6.E ERV actuation setpoint tolerance of +/- 1%. The pressure switches for ERV 2-203-3A and 2-203-3E were then calibrated satisfactorily in accordance with DIS 250-3. Subsequently on February 4, 1989 at 0600 hours, during completion of the surveillance, the pressure switch for ERV 2-203-3C was discovered to have an actuation range of between 1050 and 1150 psig. This "as found" setpoint was outside of the Technical Specification 4.6.E limits, erratic, and not repeatable. Work Request 81982 was written to investigate and repair the pressure switch for ERV 2-203-3C. The "as found" setpoint of all the pressure switches was as follows:

| RELIEF VALVE  | SETPOINT  | +/-1% TOLERANCE | "AS FOUND"       | "AS LEFT" |
|---------------|-----------|-----------------|------------------|-----------|
| *ERV 2-203-3A | 1124 psig | 1113-1135 psig  | 1108 psig        | 1133 psig |
| ERV 2-203-3B  | 1101 psig | 1090-1112 psig  | 1096 psig        | 1110 psig |
| *ERV 2-203-3C | 1101 psig | 1090-1112 psig  | (1050-1150) psig | 1110 psig |
| ERV 2-203-3D  | 1124 psig | 1113-1135 psig  | 1118 psig        | 1134 psig |
| *ERV 2-203-3E | 1124 psig | 1113-1135 psig  | 1110 psig        | 1133 psig |

\* Outside Technical Specifications

Upon visual inspection of the ERV 2-203-3C pressure controller, the pressure trip micro switch was discovered to be partially charred and showed signs of electrical arcing. This is believed to be the cause of the erratic setpoint behavior observed on the pressure switch for ERV 2-203-3C. No systems or components were inoperable at the time of this event which could have contributed to the event. In addition, no manual or automatic Engineered Safety Feature (ESF) [JE] actuation occurred as a result of this event.

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| Dresden Nuclear Power Station | 0   5   0   0   0   2   3   7 | 8              | 9   | -                 | 0   0   7 | -               | 0   0 | 0        | 3 | OF | 0   5 |

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C. APPARENT CAUSE OF EVENT:

The ERVs are electrically actuated pressure relief devices. Figure 1 illustrates the manner in which the Electromatic and Target Rock Relief valve circuits are connected. The major difference in the Target Rock Relief valve is that it has the ability to function as a safety valve as well as a relief valve. The pressure controllers consist of a Bourdon Tube type pressure sensing element which actuates a snap-action dual control limit switch, which in turn energizes a heavy duty relay to switch the solenoid load. The pressure controller, in conjunction with the control switch and the Automatic Depressurization System (ADS) logic contacts, supplies 125V DC electrical power to the solenoid assembly in order to operate the pilot valve. The pilot valve in turn controls the opening and closing of the relief valve.

The root cause of the pressure switches for ERV 2-203-3A and 2-203-3E being out of tolerance has been attributed to setpoint drift. The setpoint is a mechanical type adjustment with spring tensioned screws. Time, in conjunction with pressure switch vibration, can lead to the setpoint drift described in this report. Adhesive had been applied to the pressure setpoint adjusting screws following the previous surveillance in an attempt to prevent any movement of the set screw. DIS 250-3 instructs the Instrument Maintenance Department personnel to isolate the pressure controller being tested and then obtain the "as found" trip and reset setpoints. This revealed the incorrect trip settings. The procedure then states to recalibrate the pressure switches and repeat the "as found" trip test to obtain the "as left" trip and reset setpoints.

The root cause of the pressure switch for ERV 2-203-3C being out of tolerance has been attributed to a faulty snap-acting dual control limit switch. Upon visual inspection of the pressure controller it was discovered that the limit switch was burnt with signs of electrical arcing, which burned through the side of the switch casing. This led to an unstable limit switch operation and the erratic setpoint actuations recorded during the initial surveillance. This event is being reported as required by 10CFR50.73(a)(2)(i)(B) which requires the reporting of any condition prohibited by the Technical Specifications.

D. SAFETY ANALYSIS OF EVENT:

Technical Specification 4.6.E states that all ERVs shall have the pressure switch setpoint checked each refueling outage. The allowable setpoint error for each pressure switch is +/- 1%. Although the setpoints were potentially out of tolerance at some time during the previous cycle, Unit 2 was in the midst of a refueling outage at the time of this event and all the pressure switch setpoints were recalibrated to within the Technical Specification limits prior to Unit startup.

The frequency and testing requirements for the ERVs are also specified in the In-Service Testing (IST) Program which is based on Section XI of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code. Adherence to these code requirements provides adequate assurance regarding the proper operational readiness of these valves. The tolerance is specified in Section III of the ASME Boiler and Pressure Vessel Code as +/- 1% of design pressure. The ASME overpressurization transient analysis, which verifies that the reactor coolant system pressure Safety Limit is not exceeded, does not take credit for ERV operation; the analysis is based only upon automatic operation of the main steam [SB] Safety Valves which open at higher pressure setpoints and discharge directly to the Primary Containment [NH]. Additionally, the "as found" ERV pressure switch setpoints were conservative in that they would have automatically relieved reactor pressure to the torus at a slightly lower reactor pressure than design.

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The ERVs also are the functioning components of the Automatic Depressurization System (ADS) [SB] which is provided as a backup for the High Pressure Coolant Injection (HPCI) [BJ] System to depressurize the reactor pressure vessel during a postulated design basis loss of coolant accident involving small area breaks within primary system piping. Automatic actuation of the ADS requires coincident occurrence of reactor water low-low level and drywell high pressure signals sustained for a period of two minutes. This time delay circuit is provided in order to allow for automatic initiation of the HPCI system. If the HPCI System failed to restore reactor inventory above the low-low reactor water level setpoint within the two minute time delay period, automatic initiation of ADS would open the ERVs and depressurize the reactor to provide for automatic injection of the Low Pressure Coolant Injection (LPCI) [BD] and Core Spray [BM] Systems in order to restore reactor inventory. The ERV pressure setpoint discrepancies would have had no affect on proper operation of the ADS function. For these reasons the safety significance of this event can be considered minimal.

E. CORRECTIVE ACTIONS:

As immediate corrective action the pressure switches for ERV 2-203-3A and 2-203-3E were recalibrated to within their Technical Specification limits in accordance with DIS 250-3. The entire pressure controller for ERV 2-203-3C was replaced and recalibrated on February 11, 1989 under Work Request 81982. This surveillance was last previously performed on April 3, 1987 during the previous refueling outage, with all of the pressure switches actuating within Technical Specification limits. DIS 250-3 will continue to be performed once a refueling outage to monitor any further setpoint problems.

F. PREVIOUS EVENTS:

This is the first reportable occurrence of this type at Dresden Station.

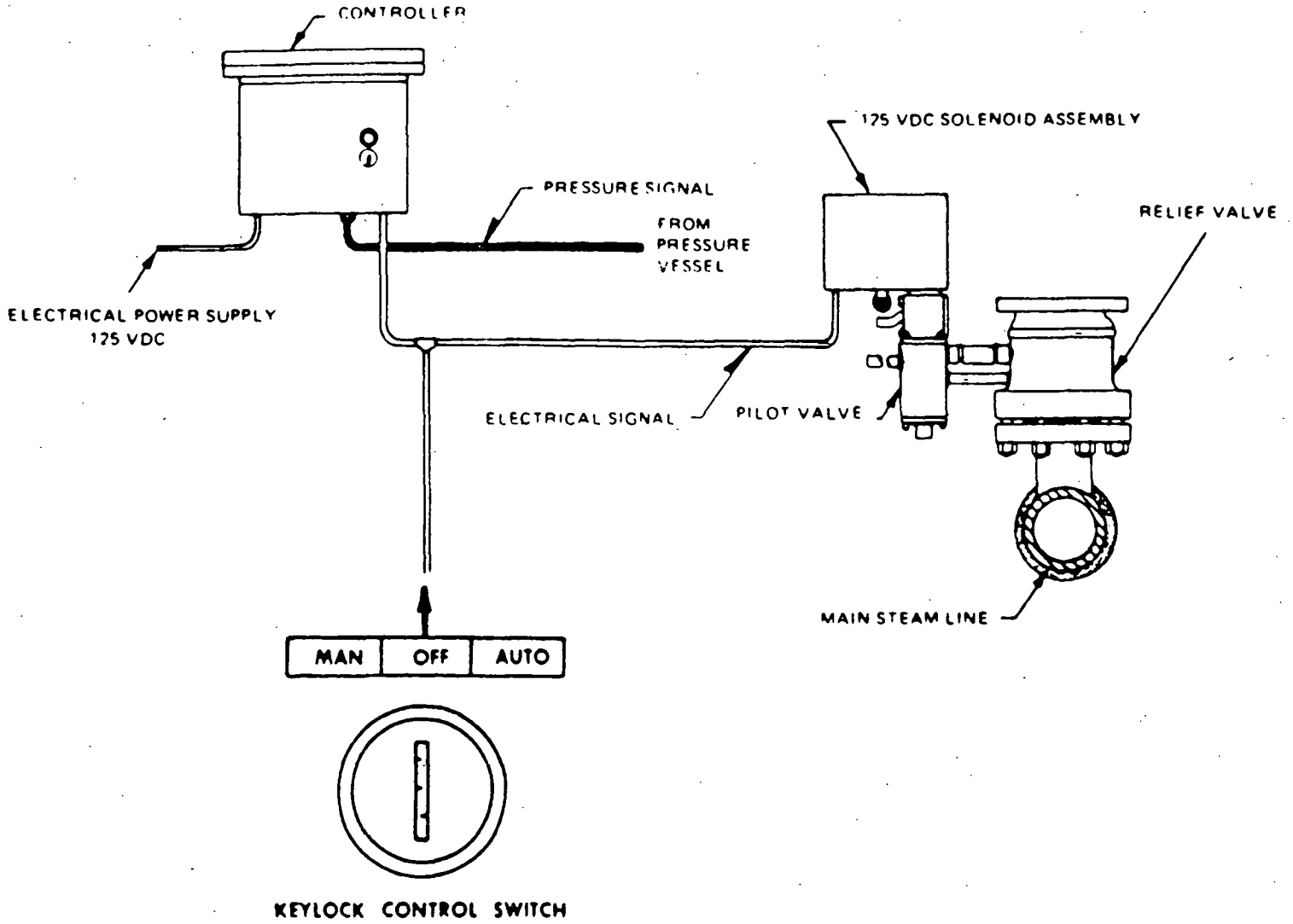
G. COMPONENT FAILURE DATA:

| <u>Manufacturer</u> | <u>Nomenclature</u> | <u>Model Number</u> | <u>MFG Part Number</u> |
|---------------------|---------------------|---------------------|------------------------|
| Dresser Industries  | Pressure Controller | 1539VX-DC-1-XCR     | 27597C                 |

An industry-wide NPRDS data search was performed on all Dresser Industries Model 1539 pressure controllers. A total of 44 events were identified of which 42 events were associated with instrument drift, while only two were attributed to a micro-switch failure.

|                               |                               |                |                   |                 |       |          |       |  |  |
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ELECTROMECANICAL RELIEF VALVE AND CONTROLS

Figure 1



**Commonwealth Edison**  
Dresden Nuclear Power Station  
R.R. #1  
Morris, Illinois 60450  
Telephone 815/942-2920

March 6, 1989

EDE LTR #89-183

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

Licensee Event Report #89-007-0, Docket #050237 is being submitted as required by Technical Specification 6.6, NUREG 1022 and 10 CFR 50.73(a)(2)(i)(B).

A handwritten signature in cursive script, appearing to read 'E. Eenigenburg'.

E.D. Eenigenburg  
Station Manager  
Dresden Nuclear Power Station

EDE/ade

Enclosure

cc: A. Bert Davis, Regional Administrator, Region III  
File/NRC  
File/Numerical

0500k

IE22  
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