



Commonwealth Edison
Dresden Nuclear Power Station
6500 North Dresden Road
Morris, Illinois 60450
Telephone 815/942-2920

April 29, 1994

GFSLTR 94-143

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

Licensee Event Report 94-008, Docket 50-237 is being submitted as required by Technical Specification 6.6, NUREG 1022 and 10CFR50.50.73(a)(2)(vii).

Sincerely,

Gary F. Spedl
Station Manager
Dresden Station

GFS/JK:cfq

Enclosure

cc: J. Martin, Regional Administrator, Region III
NRC Resident Inspector's Office
File/NRC
File/Numerical

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NRC FORM 366 (5-92)	U.S. NUCLEAR REGULATORY COMMISSION	APPROVED BY OMB NO. 3150-0104 EXPIRES 5/31/95
LICENSEE EVENT REPORT (LER)		ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNBB 7714), 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.

FACILITY NAME (1) Dresden Nuclear Power Station, Unit 2	DOCKET NUMBER (2) 05000237	PAGE (3) 1 OF 6
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TITLE (4)
Yarway Reactor Water Level 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 NAME	DOCKET NUMBER
04	06	94	94	-- 008 --	00	04	18	94	None	
									FACILITY NAME	DOCKET NUMBER

OPERATING MODE (9)	N	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)								
POWER LEVEL (10)	099	20.402(b)			20.405(c)			50.73(a)(2)(iv)		73.71(b)
		20.405(a)(1)(i)			50.36(c)(1)			50.73(a)(2)(v)		73.71(c)
		20.405(a)(1)(ii)			50.36(c)(2)			X 50.73(a)(2)(vii)		OTHER
		20.405(a)(1)(iii)			50.73(a)(2)(i)			50.73(a)(2)(viii)(A)		(Specify in Abstract below and in Text, NRC Form 366A)
		20.405(a)(1)(iv)			50.73(a)(2)(ii)			50.73(a)(2)(viii)(B)		
20.405(a)(1)(v)			50.73(a)(2)(iii)			50.73(a)(2)(x)				

LICENSEE CONTACT FOR THIS LER (12)									
NAME John N. Kish, System Engineer						TELEPHONE NUMBER (Include Area Code) (815) 942-2920			
Ext. 2360									

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
B	JE	LS	Y005	Yes						

SUPPLEMENTAL REPORT EXPECTED (14)					EXPECTED SUBMISSION DATE (15)				
YES (If yes, complete EXPECTED SUBMISSION DATE).				X	NO		MONTH	DAY	YEAR

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

On April 09, 1994, at 1100 hours, with Unit 2 at 99% rated core thermal power, while performing Dresden Instrument Surveillance (DIS) 0500-03, Reactor Water Level ECCS Initiation Indicating Switch Calibration, level switch 2-263-72C contact 5-6 tripped outside of the Technical Specification (TS) limits. Level Indicating Switch (LIS) 2-263-72C is part of the High Pressure Coolant Injection (HPCI) [BJ] and Low Pressure Coolant Injection (LPCI) [BM] Loop 1, -59" RWL initiation one out of two/twice logic. The TS limit is 159.375" water column (WC), however, the switch was actuated closed at 159.8" WC. The switch was adjusted to a revised setpoint. The necessary redundant switches were available during the event allowing both systems to remain operable. Previous events involving the failure of similar Yarway configurations are documented in 'Operability Assessment' of February 17, 1994, (Chron 0124505) written in response to LER 93-031/050237 and LER 94-007/050249. Input to the Operability Assessment included two years of calibration data on the Yarway instruments.

NRC FORM 366A (5-92)		U.S. NUCLEAR REGULATORY COMMISSION		APPROVED BY OMB NO. 3150-0104 EXPIRES 5/31/95	
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FACILITY NAME (1)		DOCKET NUMBER (2)	LER NUMBER (6)		PAGE (3)
Dresden Nuclear Power Station		05000237	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER
			94	-- 008 --	00
					2 OF 6

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

EVENT IDENTIFICATION:

Yarway Reactor Water Level Switch Failure

A. PLANT CONDITIONS PRIOR TO EVENT:

Unit: 2 Event Date: 04/09/94 Event Time: 1100 hrs
 Reactor Mode: N Mode Name: Power Operation Power Level: 99%
 Reactor Coolant System Pressure: 1000 psig

B. DESCRIPTION OF EVENT:

On April 09, 1994, at 1100 hours, with Unit 2 at 99% rated core thermal power, while performing Dresden Instrument Surveillance (DIS) 0500-03, "Reactor Water Level ECCS Initiation Indicating Switch Calibration", level switch 2-263-72C contact 5-6 tripped outside of the Technical Specification (TS) limits. Level Indicating Switch (LIS) 2-263-72C is part of the High Pressure Coolant Injection (HPCI) and Low Pressure Coolant Injection (LPCI) Loop 1, -59" RWL initiation one out of two/twice logic. The TS limit is 159.375" water column (WC), however, the switch was actuated closed at 159.8" WC. The switch was adjusted to revised setpoints. The necessary redundant switches were available during the event allowing both systems to remain operable.

C. CAUSE OF EVENT:

This report is being submitted in accordance with 10CFR50.73(a)(2)(vii) which requires the reporting of any event or condition that caused at least one independent train or channel to become inoperable in multiple systems or two independent trains or channels to become inoperable in a single system designed to mitigate the consequences of an accident. It has been determined that this failure is one point of an unfavorable trend history that has developed during the two years since January 1992. A thorough review of the past two years of Yarway performance has been performed. Unit 2 Yarway contacts have been found at or "out of tolerance" 63 times out of a possible 306 calibrations. This particular instruments' contacts were found "out of tolerance" 9 of 12 times during 1993 (75%). For 1994 the instruments contacts have been found "out of tolerance" 1 out of 4 calibrations (25%). The continued "out of tolerance" events of Yarway setpoints has received heightened station attention.

The Yarway instruments have been found to have setpoint "drifts" that exceed both the Technical Specification and DIS 0500-03 limits. The Technical Specification restricts the setpoint to be within a tolerance of +4, -0" RWL, which is 3.33% of Full Scale. The calibration procedure dictates a setpoint tolerance of 2.82" RWL, which is 2.37% of Full Scale. The combined manufacturer's accuracy for the Yarway is identified as 5.19% of Full Scale or ± 3.11" RWL. Probable causal factors have been attributed to Mercoid switch aging (spring force degradation), mounting of the Mercoid switch, alignment of switch to actuating magnets, and/or defective jewelled bearings. However, the average "drifts" experienced during the past two years have been within the statistical 2σ failure values (± 6.42" RWL) documented in calculation NED-I-EIC-0100 Revision 2.

NRC FORM 366A (5-92)		U.S. NUCLEAR REGULATORY COMMISSION		APPROVED BY OMB NO. 3150-0104 EXPIRES 5/31/95	
LICENSEE EVENT REPORT (LER) TEXT CONTINUATION				ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNB 7714), 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.	
FACILITY NAME (1)		DOCKET NUMBER (2)	LER NUMBER (6)		PAGE (3)
Dresden Nuclear Power Station		05000237	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER
			94	-- 008 --	00
					3 OF 6

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

Performance of this Yarway has been evaluated and is summarized below.

2-263-72C (5-6)	March 8, 1993 thru April 9, 1994
Found "Out of Tolerance"/Calibrations	10/15 or 66.67%
Avg. Drift/Calibration (% Span)	2.929%

Instrument 2-263-72C (5-6) performance has improved from 1993 thru April 1994. In 1993, switch 72C (5-6) was found to be "out of tolerance" during 9 of 12 surveillances (i.e. 75%). Since December 22, 1993, the switch was found within tolerance for three consecutive months. However, the April 9 surveillance identified another out of tolerance of .8" WC with respect to the surveillance procedure tolerance. The presence of the consecutive acceptable "as founds" represent an improvement in instrument operation. This improvement occurred prior to changing of the setpoint. The present calculated 'out-of tolerance' occurrences yield a 66.67% out of tolerance occurrence rate for a rolling 12 month period. This represents an improvement over the 75% for the year 1993.

D. SAFETY ANALYSIS:

The safety significance of this event is minimal. The failure (out of tolerance) occurred in the non-conservative direction, thereby supplying an actuation permissive later than when the reactor water lower level of 84" top of active fuel would have been reached. However, this would have been actually at 83.40" TAF, and the necessary redundant switches were still available.

A review of the safety significance of non-conservative drifts was performed as part of the "Operability Assessment" of February 17, 1994, (Chron 0124505). A bounding PRA analysis, assuming one complete logic system failure with a duration of 10 days during the two year period resulted in a change to core damage frequency of only 1%. The worst case switch failure identified during the past two years would not have been considered a failure with respect to the Dresden specific PRA.

E. CORRECTIVE ACTIONS:

As documented in the "Operability Assessment" of February 17, 1994, the station has committed to numerous actions to improve Yarway operability. The following NTS items (partial listing) identify pertinent actions to be taken by the station to eliminate the continued performance deficiencies with the Yarway instruments:

Proposed "Corrective Actions" have been documented in the LER and Operability Assessment referenced above and are being tracked by NTS as the following items:

237-200-91-11901 Provide construction schedule for Yarway replacement. (action completed, Yarways are committed to be replaced during D2R14 and D3R14). Modification P12-3-94-224 has been approved for the current Unit 3 refueling outage. This mod will begin the replacement of the Yarways.

NRC FORM 366A (5-92)		U.S. NUCLEAR REGULATORY COMMISSION		APPROVED BY OMB NO. 3150-0104 EXPIRES 5/31/95	
LICENSEE EVENT REPORT (LER) TEXT CONTINUATION				ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNBB 7714), 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.	
FACILITY NAME (1)		DOCKET NUMBER (2)	LER NUMBER (6)		PAGE (3)
Dresden Nuclear Power Station		05000237	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER
			94	-- 008 --	00
					4 OF 6

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

- 237-180-93-03101 Develop action plan for the chronic failures of Yarway switches, (action in progress, Yarway Administrative Action Plan 'Draft' submitted for review, approval anticipated week of May 15, 1994).
- 237-180-93-03102 Provide feasibility assessment for Yarway replacement (action completed, Yarways are committed to be replaced during D2R14 and D3R14). Modification P12-3-94-224 has been approved for the current Unit 3 refueling outage. This mod will begin the replacement of the Yarways.
- 237-180-93-03103 Evaluate and provide appropriate revision to DIS 0500-03 (action in progress, Yarway Administrative Action Plan 'Draft' submitted for review, approval anticipated week of May 15, 1994).
- 237-200-93-03104 Provide supplement to LER 2-93-031 that identifies root causes and corrective actions (action in progress, Yarway Administrative Action Plan "Draft" submitted for review, approval anticipated by May 15, 1994).
- 237-201-94-30600 Provide Yarway operability assessment due to a high degree of drift (action completed February 17, 1994 Chron 0124505).
- 249-180-94-00301 Perform QE 40.1 Operability assessment for Yarways in response to LER 3-94-003 corrective action (action completed February 17, 1994, Chron 0124505).
- 237-225-94-R12-94018A Develop drift optimization actions and incorporate in DIS 0500-03 (action in progress).
- 237-225-94-R12-94018B Trend as-found calibration data per Dresden Yarway Administrative Action Plan and perform corrective actions as identified in the plan (actions on going until replacement).
- 237-225-94-R12-94018C Obtain setpoint tolerance Technical Specification change approval from NRC (Unit 2 new setpoints implemented, Unit 3 prior to completion of refueling outage).
- 249-225-94-R12-94018D Implement setpoint change on Unit 3 Yarways and revise Administrative Action Plan (action during D3R13).
- 237-225-94-R12-94018E Implement setpoint change on Unit 2 Yarways (action completed).
- 237-225-94-R12-94019A Develop characterization program for Yarways. Perform characterization and input to the Administrative Action Plan (action completed).

NRC FORM 366A (5-92)		U.S. NUCLEAR REGULATORY COMMISSION		APPROVED BY OMB NO. 3150-0104 EXPIRES 5/31/95	
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FACILITY NAME (1)		DOCKET NUMBER (2)	LER NUMBER (6)		PAGE (3)
Dresden Nuclear Power Station		05000237	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER
			94	-- 008 --	00
					5 OF 6

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

- 237-225-94-R12-94019B Develop Yarway Administrative Action Plan with the objective of achieving Yarway contact failure rates of 1×10^{-5} per operating hour or better (action in progress, Yarway Administrative Action Plan "Draft" submitted for review, approval anticipated by May 15, 1994).
- 249-225-94-R12-94019C Develop and implement inspection plan and preventative maintenance program for the Unit 3 Yarways during D3R13 (action in progress).
- 237-225-94-R12-94019D Update 3/29/93 NFS assessment for non-conservative instrument setpoint drift to support the Administrative Action Plan. (Action completed)
- 237-225-94-R12-94019E Evaluate the feasibility of installing switch contact arc suppressor (action completed).
- 237-225-94-R12-94019F Implement the requirements of the Inspection Plan on Unit 2 switches (actions ongoing).
- 237-225-94-R12-94019G Inspect and correct condition of Unit 2 Level indicating switch 2-263-72C during the next surveillance (actions ongoing).
- 237-225-94-R12-94019H Review available 1994 Surveillance data for additional information to potentially add further follow-up actions (action completed).
- 237-225-94-R12-94019I Communicate the need for the Operating Department to maintain a heightened awareness regarding the excessive non-conservative drift and failure history (action completed).

F. PREVIOUS OCCURRENCES:

Numerous occurrences of similar events have been documented. A detailed calibration history is contained in the "Operability Assessment" of February 17, 1994, which provides a chronology of all calibration during the past two years with indication of as-found and as-left setpoints. A partial listing of 'out of tolerances' and switch failures is as follows:

UNIT 2	LER 2-93-031-00	CDE 2-201-93-M337
	CDE 2-201-93-M175	CDE 2-201-93-M62
	LER 2-93-019	CDE 2-202-93-046
	CDE 2-201-93-827	CDE 2-201-93-803
	CDE 2-202-93-039	CDE 2-202-93-023
	DVR 12-2-92-103	DVR 12-2-92-97
	DVR 12-2-92-73	DVR 12-2-91-234
	DVR 12-2-91-202	DVR 12-2-91-176
	DVR 12-2-91-139	DVR 12-2-91-119
	DVR 12-2-91-103	DVR 12-2-91-83
	DVR 12-2-91-62	DVR 12-2-91-34
	DVR 12-2-91-19	DVR 12-2-90-119

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

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FACILITY NAME (1)		DOCKET NUMBER (2)		LER NUMBER (6)			PAGE (3)
Dresden Nuclear Power Station		05000237		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	6 OF 6
				94	-- 008 --	00	

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

DVR 12-2-90-100 DVR 12-2-90-46
 DVR 12-2-90-35 DVR 12-2-89-102
 DVR 12-2-89-76 DVR 12-2-88-123
 DVR 12-2-88-114 DVR 12-2-88-91

UNIT 3 LER 3-94-007-00 LER 3-94-002-00
 CDE 3-202-93-018 LER 3-93-018
 CDE 3-202-93-015 CDE 3-202-93-013
 CDE 3-202-93-07 LER 3-93-001
 CDE 2-3-92-186 CDE 12-3-92-164
 PIR 3-92-116 DVR 12-3-92-98
 DVR 12-3-92-87 DVR 12-3-92-86
 DVR 12-3-92-80 DVR 12-3-92-46
 DVR 12-3-91-88 DVR 12-3-86-64
 DVA 12-3-86-55 DVR 12-3-86-54
 DVR 12-3-86-46

G. COMPONENT FAILURE DATA:

<u>Manufacturer</u>	<u>Nomenclature</u>	<u>Model Number</u>	<u>Mfg. Part Number</u>
Yarway	Level Switch	4418C	DS551