LICENSEE EVENT REPORT (LER)

Facility Name (1)	Docket Number (2)	Page (3)
Dresden Nuclear Power Station, Unit 3	0 5 0 0 0 2 4 9	1 of 0 7

Title (4) Primary Containment Group I Isolation and Reactor Scram Due to Apparent Personnel Error

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)
									N/A	0 5 0 0 0
0 9	2 8	8 7	8 7	0 1 6	0 0	1 0	2 6	8 7	N/A	0 5 0 0 0

OPERATING MODE (9)	N
POWER LEVEL (10)	0 7 8

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

___ 20.402(b)	___ 20.405(c)	X 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)	___ 50.73(a)(2)(vii)	___ Other (Specify
___ 20.405(a)(1)(iii)	___ 50.73(a)(2)(i)	___ 50.73(a)(2)(viii)(A)	in Abstract
___ 20.405(a)(1)(iv)	___ 50.73(a)(2)(ii)	___ 50.73(a)(2)(viii)(B)	below and in
___ 20.405(a)(1)(v)	___ 50.73(a)(2)(iii)	___ 50.73(a)(2)(x)	Text)

LICENSEE CONTACT FOR THIS LER (12)

Name	TELEPHONE NUMBER
Ronald Jackson Technical Staff Engineer (X-483)	AREA CODE 8 1 5 9 4 2 - 2 9 2 0

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

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 September 28, 1987 at 0231 hours with the Unit 3 reactor operating at 78% rated power, a primary containment Group I isolation and subsequent reactor scram occurred while an Instrument Mechanic (IM) was performing a calibration procedure for the Main Steam Line (MSL) high flow switches.

The root cause of the Group I isolation has been attributed to apparent personnel error by the IM in not properly isolating MSL high flow switch DPIS 3-261-2N during the surveillance. Prior to loading the pressure switch for calibration, the IM vented the high and low side legs of the pressure switch. During the venting process, an unexpected increase in differential pressure occurred. The IM immediately closed the equalizing valve in an attempt to stop the pressure increase. This action caused a pressure spike in the common header, in which three other pressure switches are connected, and resulted in the Group I isolation and subsequent reactor scram on Main Steam Isolation Valve (MSIV) closure. Corrective action included discussion of this event with the IM, and testing/inspection of the instrument valve manifold. The instrument valve manifold, which contains the high and low isolation valves and equalizing valve, was replaced and pressure switch DPIS 3-261-2N was calibrated. The surveillance procedure will also be revised.

The safety significance of this event was minimal since the instrument high side isolation valve is open during power operation and all four pressure switches operated as designed, thus initiating the Group I isolation. The last occurrence of an instrument valve manifold failure was reported by Licensee Event Report #86-001 on Docket #050237.

IE22
1/1

PLANT AND SYSTEM IDENTIFICATION:

General electric boiling water reactor - 2527 MWt rated core thermal power. Energy industry identification systems (EIIS) codes are identified in the text as [XX].

EVENT IDENTIFICATION:

Unit 3 Primary Containment Group I Isolation [JM] and Subsequent Reactor Scram During Main Steam [SB] Line High Flow Isolation Surveillance Due to Apparent Personnel Error.

A. PLANT CONDITIONS PRIOR TO EVENT:

Unit: 3 Event Date: September 28, 1987 Event Time: 0231 hours
Reactor Mode: N Mode Name: Run Power Level: 78%
Reactor Coolant System (RCS) Pressure: 1005 psig

B. DESCRIPTION OF EVENT:

On September 28, 1987, at 0231 hours with the Unit 3 reactor operating at 78% power, a primary containment Group I isolation occurred while an Instrument Mechanic (IM) was performing Dresden Instrument Surveillance (DIS) 250-1, Main Steam Line High Flow Isolation Switches Calibration and Functional Test. The Group I isolation signal initiated an automatic closure of the Main Steam Isolation Valves (MSIVs) which resulted in an automatic reactor scram on MSIV closure.

A second Group I isolation signal occurred approximately 18 minutes later while an Instrument Maintenance Foreman was assisting with troubleshooting the cause of the previous occurrence. The reactor pressure increased to 1045 psig because the main condenser was unavailable to dissipate the reactor decay heat load as a result of the MSIVs closing. The Reactor Operator manually initiated the isolation condenser [BL] to control reactor pressure. The isolation condenser was secured at 0310 hours when reactor pressure had been reduced to 750 psig. At 0315 hours the MSIVs were reopened and the reactor scram was subsequently reset at 0356 hours.

While performing the post-scram review, Operating Department personnel observed that the Control Room alarm typer [IB] had failed in process of printing the alarm sequence data. Prior to the Group I isolation there were no systems or components inoperable that contributed to this event.

C. APPARENT CAUSE OF EVENT:

This event is being reported in accordance with Title 10 of the Code of Federal Regulations Part 50 Section 73(a)(2)(iv), which states that any event that resulted in manual or automatic actuation of any Engineering Safety Feature, including the Reactor Protection (RPS) system, must be reported.

The IM performed the calibration per DIS 250-1 which consists of testing each of the 16 MSL high flow switches, DPIS 3-261-2A through -2S, that are associated with the MSL high flow Group I isolation initiation circuitry. The basic sequence followed by the IM is as follows (refer to Figure 1):

1. The instrument isolation valves are closed.

2. The equalizing valve is opened to equalize the high and low side instrument legs.

3. The vent cap on the low side leg is opened to bleed down the isolated instrument lines.

4. Test equipment is installed on the high side leg for loading of the differential pressure switch. Loading of the pressure switch initiates a half Group I signal and associated Control Room alarm.

While the IM was bleeding down pressure switch DPIS 3-261-2N, which had previously been isolated and equalized, the IM noticed a substantial increase in differential pressure. In an attempt to stop the increase in pressure, the IM immediately closed the equalizing valve. Shortly after closing the equalizing valve, the IM was informed that a Group I isolation and subsequent reactor scram had occurred. The IM then noticed that pressure switches DPIS 3-261-2P, 2R and 2S, which are located on the same instrument rack as pressure switch DPIS 3-261-2N, had pegged high.

During the investigation of this event, it was initially postulated that the IM did not close the low side isolation valve to pressure switch DPIS 3-261-2N. Failure to close this valve would have allowed an increase in differential pressure to occur on all four switches since they are tied to a common header, thereby causing a full Group I isolation and a subsequent reactor scram. However, while interviewing the IM, he stated that the isolation valves were properly closed. Additionally, an Instrument Maintenance Foreman was able to duplicate the event while attempting to repeat the procedure process in order to troubleshoot the system for the cause of the primary containment Group I isolation. The Foreman closed the instrument rack low side isolation valve and left the equalizing valve slightly open. He then loaded pressure switch DPIS 3-261-2N to 1000 psig and began bleeding down the instrument high and low side legs by opening the low side vent. Once the switch was bled down to 300 psig, the Foreman slowly cracked open the high side instrument isolation valve. Immediately following the opening of the high side isolation valve, a second Group I isolation and subsequent reactor scram occurred. This resulted in further investigation into the possibility of leakage through the high side instrument isolation valve.

In an attempt to determine the root cause of this event, the MSL high flow sensing lines were inspected for possible vibration and the instrument valve manifold for pressure switch DPIS 3-261-2N was inspected for wear and proper seating contact. The walkdown inspection of the MSL sensing lines was conducted on September 29, 1987 by Technical Staff and Nutech Engineers. There were no system piping or piping supports in contact with the four MSL sensing lines in the Low Pressure Coolant Injection (LPCI) west corner room. However, there were points of contact on the four MSL sensing lines in the east LPCI [BO] corner room. These sensing lines were found in contact with piping supports for the LPCI, High Pressure Coolant Injection (HPCI) [BJ] and Drywell Floor Drain Sump [WK] systems. The sensing lines feed the "A" and "B" MSL high flow switches DPIS 3-261-2A through -2H

at instrument rack 2203-9. Since the sensing lines were not connected to the pressure switches (DPIS 3-261-2N, 2P, 2R and 2S) that initiated the Group I isolation, it was concluded that they were not a contributing factor in causing the reactor scram. Although the sensing lines configuirations were not a factor in this event, the station plans to modify the instrument lines with additional piping supports.

An inspection of the instrument valve manifold was also conducted on September 29, 1987. This inspection was performed on two separate occasions, once by the Instrument Maintenance Department and once by the Quality Control Department. In addition to the valve manifold inspection, a blue check test was performed to determine if adequate contact existed between the ball on the valve stem and the valve seat. The results of the two independent inspection and test activities revealed that all three valves (high side, low side and equalize valves) exhibited an alignment problem between the ball and the seat. Additionally, the high side valve seat in the manifold block was scratched, the high side ball was nicked in one area, and the high side ball valve randomly would only obtain 95% seat contact. The combination of abnormalities found with the high side valve may have caused a certain amount of through leakage. However, since the seating surfaces were not significantly degraded, it is believed that the root cause of the insufficient isolation was an incognitive personnel error on the part of the IM. This resulted in an increase in differential pressure accross the switch during the bleed down period. In an attempt to stop the increase in pressure, the IM immediately closed the equalizing valve. This action is believed to have caused a pressure spike on the high side leg to the other three pressure switches since all four switches are commonly connected together as noted in Figure 1. Because the differential pressure for all four switches increased beyond the setpoint of 110 psid, a Group I isolation occurred and the reactor scrammed on MSIV closure.

Following the Unit 3 reactor scram it was noted that the Control Room alarm typer had failed to print alarm sequence data. The cause of the alarm typer failure has been determined to be a data interface problem with the Safety Parameter Display System [ID].

D. SAFETY ANALYSIS OF EVENT:

The MSL high flow Group I isolation logic is arranged in a 1 out of 2 twice logic. There are two safety system channels with each one consisting of two subchannels which contain four differential pressure switches. See Figure 2 for logic arrangement. In order to initiate a Group I isolation at least one of the pressure switches must trip in each safety system channel. The pressure switches actuate on high differential pressure. Since pressure switch DPIS 3-261-2N was the only switch being calibrated at the time of the scram, a half Group I isolation should have occurred after loading of the switch. However, because of the through leakage from the high side isolation valve on pressure switch DPIS 3-261-2N, all four switches actuated and caused the Group I isolation. The safety significance of this event was minimal since the instrument high side isolation valve is normally open during normal operation and all four pressure switches operated as designed, thus initiating the primary containment Group I isolation.

E. CORRECTIVE ACTIONS:

The instrument valve manifold was replaced per Work Request #69237 and pressure switch DPIS 3-261-2N was calibrated in accordance with DIS 250-1. The corrective action to the alarm typer failure consisted of modifying the Safety Parameter Display System software. A human factors walkdown of DIS 250-1 was also performed, and improvements suggested will be incorporated into the procedure. As a long term corrective action, installation of an analog MSL high flow trip system not requiring isolation valve manipulation during surveillance will be investigated.

F. PREVIOUS OCCURRENCE:

The last occurrence of an instrument valve manifold failure was reported by Licensee Event Report #86-001 on Docket #050237.

G. COMPONENT FAILURE DATA:

Manufacturer: Anderson Greenwood Company

Nomenclature: Instrument Valve Manifold

Model Number: M1HS-4

The failure of the high side isolation valve to the MSL high flow pressure switch is not reportable to NPRDS.

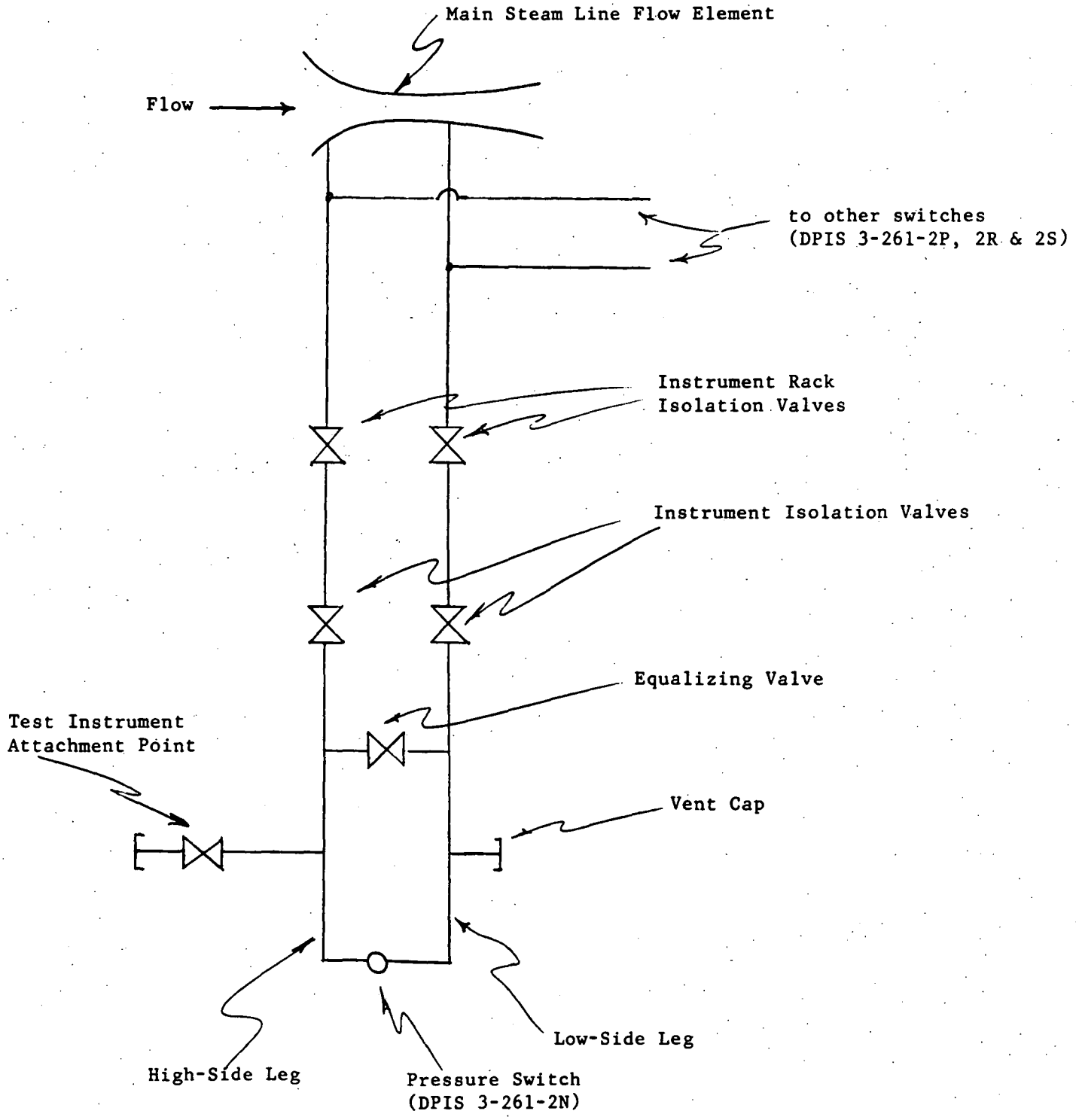
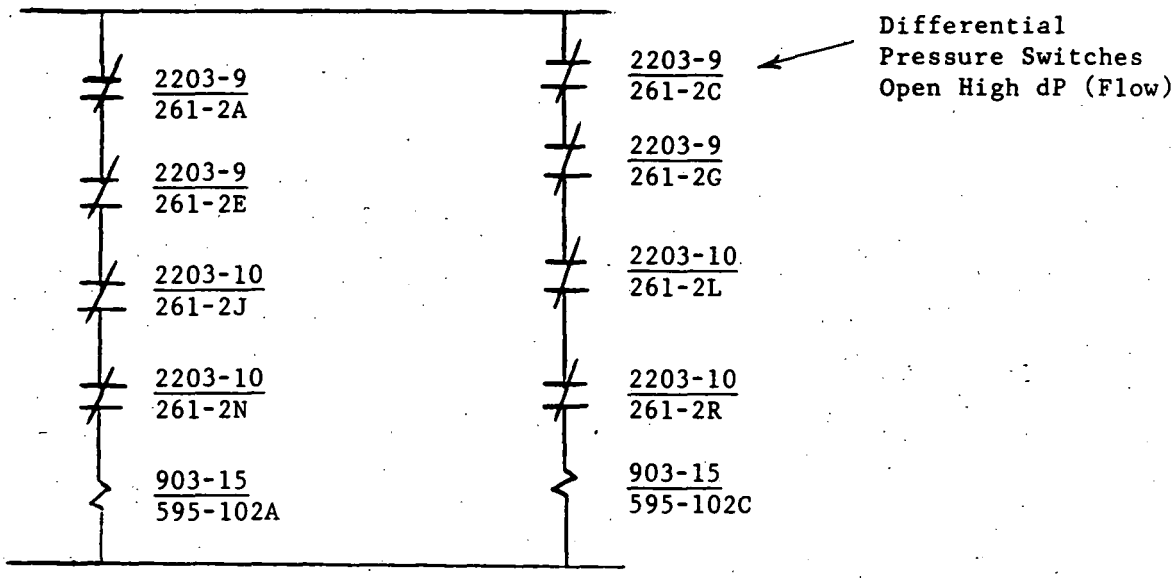
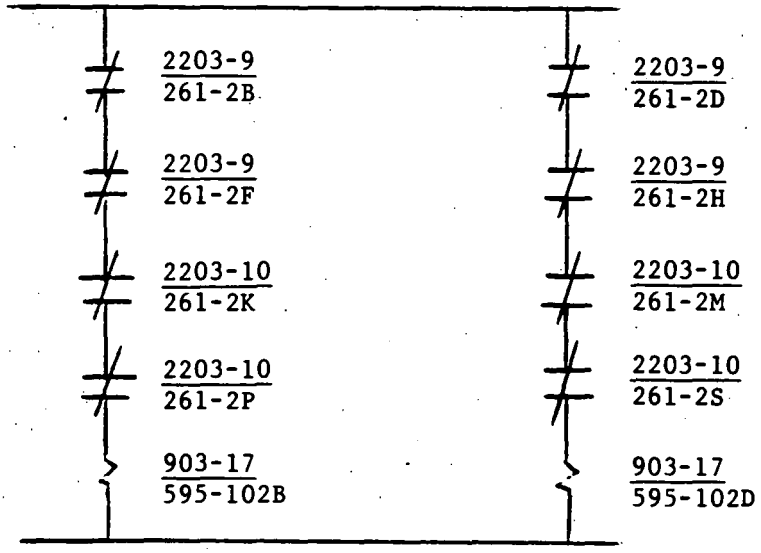

Main Steam Line Flow Element
Flow
to other switches
(DPIS 3-261-2P, 2R & 2S)
Instrument Rack
Isolation Valves
Instrument Isolation Valves
Equalizing Valve
Test Instrument
Attachment Point
Vent Cap
High-Side Leg
Pressure Switch
(DPIS 3-261-2N)
Low-Side Leg

Figure 1



Main Steam Line High Flow
Channel A



Main Steam Line High Flow
Channel B

Figure 2

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

October 26, 1987

EDE LTR #87-714

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

Licensee Event Report #87-016-0, Docket #050249 is being submitted as required by Technical Specification 6.6, NUREG 1022 and 10 CFR 50.73(a)(2)(iv).

E.D. Eenigenburg
Station Manager
Dresden Nuclear Power Station

EDE/kjl

Enclosure

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

0056k

IE22
1/1