Commonwealth Edison
Dresden Nuclear Power Station
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August 24, 1993

GFSLTR 93-0056

U. S. Nuclear Regulatory Commission
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Licensee Event 92-034-02, Docket 0502375, is being submitted as required by Technical Specification 6.6, NUREG 1022 and 10 CFR 50.73(a) (2) (iii).

Gary F. Spedl
Station Manager
Dresden Station

GFS\BS:slb

enclosure

cc: T. Martin, Regional Administrator, Region III
NRC Resident Inspector's Office
File/NRC
File/Numerical

(L:WK_PROC\PLNTMGR\GFS93\0056.93)

IE22

LICENSEE EVENT REPORT (LER)

Form Rev 2.0

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

Title (4)

Standby Gas Treatment System Found Outside FSAR Design Limits Due to Flow Increasing Above Normal Limits Upon Loss of Instrument Air

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	2 3	9 2	9 2	--- 0 3 4	--- 0 2	0 6	1 1	9 3	N/A	
									Dresden	0 5 0 0 0 2 4 9

OPERATING MODE (9)		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIRMENTS OF 10CFR (Check one or more of the following) (11)							
POWER LEVEL (10)	0 0		20.402(b)		20.405(c)		50.73(a)(2)(iv)		73.71(b)
	9 8		20.405(a)(1)(i)		50.36(c)(1)		50.73(a)(2)(v)		73.71(c)
	3 8		20.405(a)(1)(ii)		50.36(c)(2)		50.73(a)(2)(vii)		Other (Specify in Abstract below and in Text)
			20.405(a)(1)(iii)		50.73(a)(2)(i)		50.73(a)(2)(viii) (A)		
			20.405(a)(1)(iv)	X	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)		

LICENSE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER
Brian Springer - SBGT System Engineer Ext. 3588	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		0 6	1 1	9 3

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

During a review of a Standby Gas Treatment System (SBGT) [BH] Technical Specification, on October 16, 1992 at Quad Cities Nuclear Power Station, it was revealed that a loss of instrument air would cause the SBGT flow control valve (FCV) to fail full open increasing the flow rate of the running train to 5100 cfm. Under this condition, the Control Room Dose limits defined in General Design Criterion (GDC) -19 could potentially be exceeded.

At 1820 hours on October 23, 1992, with Unit 2 at 93 percent power and Unit 3 at 88 percent power, the Nuclear Engineering Department (NED) notified the Dresden Station Control Room Engineer (SCRE) that if SBGT lost instrument air during operation, the FCV on the running train would fail full open potentially increasing the air flow to 5670 cfm. Under this condition, the system would be considered to be outside of its design basis. However, the system was declared operable based on preliminary engineering calculations. Final engineering calculations later proved that GDC-19 and 10 CFR100 limits would not be exceeded, primarily due to the methyl iodine removal efficiency of the charcoal adsorbers being higher than the required efficiency of 90%.

PLANT AND SYSTEM IDENTIFICATION:

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

Nuclear Tracking System (NTS) tracking code numbers are identified in the text as (XXX-XXX-XX-XXXXX)

EVENT IDENTIFICATION:

Standby Gas Treatment System Found Outside FSAR Design Limits Due to Flow Increasing Above Normal Limits Upon Loss of Instrument Air

A. CONDITIONS PRIOR TO EVENT:

Unit(s): 2(3) Event Date: October 23, 1992 Event Time: 1820 Hours

Reactor Mode(s): N(N) Mode Name(s): Run (Run) Power Level(s): 93 (88)%

Reactor Coolant System (RCS) Pressure(s): 1003 (996) psig

B. DESCRIPTION OF EVENT:

At 1820 hours on October 23, 1992, with Unit 2 at 93 percent power and Unit 3 at 88 percent power, the Nuclear Engineering Department (NED) determined that the Standby Gas Treatment (SBGT) system could potentially operate in an unanalyzed condition. Each SBGT train has a flow control valve upstream of the fan. Upon loss of instrument air to the flow control valve on the SBGT train, the valve will fail full open, potentially resulting in a flow of 5670 cfm through the running train. A review of design basis information indicated that SBGT was not analyzed to operate in this condition. An operability determination was immediately performed. Both trains of SBGT were determined to be operable based on preliminary calculations. Using actual radioactive iodine removal efficiency data, it was determined that the charcoal bed emissions were well within the General Design Criterion (GDC)-19 30-day control room thyroid dose limit of 30 rem.

C. APPARENT CAUSE OF EVENT:

This report is submitted in accordance with 10 CFR 50.73(a)(2)(ii), which requires the reporting of any condition that is outside the design basis of the plant. The apparent cause of the event was an inaccurate original SBGT flow control valve design analysis. The SBGT system is designed to provide an air flow of 4000 cfm ± 10% to achieve the optimum balance between the ability of the system to create a negative pressure in Secondary Containment [NG], and the amount of time contaminated air is held in the charcoal adsorber beds. At 5670 cfm flow, the methyl iodide removal efficiency of the charcoal adsorbers would have to be greater than 92% in order to maintain a 30-day control room thyroid dose within GDC-19 limits. Technical Specifications Section 3.7.B states that the methyl iodide removal efficiency as verified by laboratory carbon sample analysis shall show greater than or equal to 90% when tested at 130 degrees celsius and 95% relative humidity.

D. SAFETY ANALYSIS OF EVENT:

The SBGT system is designed to operate at 4000 cfm ± 10 percent flow with a charcoal adsorber methyl iodide removal efficiency of greater than or equal to 90% at 130°C and 95% relative humidity (RH). The actual efficiency of the existing charcoal in both trains of SBGT at 130°C and 95% RH was 99.838% when translated to an airflow of 5670 cfm. Testing results for the charcoal were

also obtained at 30°C and 70% RH resulting in an efficiency of 98.757%. The excess flow results in a 42% increase in bypass leakage around the charcoal. Therefore, a 1.42% bypass leakage was conservatively assumed in this calculation. Taking into account these conditions, a worst-case value of 97.337% overall adsorber efficiency was calculated, corresponding to a thirty-day control room thyroid dose of 14.02 rem which is considerably less than the GDC-19 limit of 30°C rem. Therefore, a SBGT train flow of 5670 cfm would not exceed GDC-19 limits.

A Special Procedure was performed on the SBGT 'A' train on January 10, 1993 to determine the actual SBGT flow when the flow control valve is full open. Flow through the 'A' train was found to be within the 4000 ± 10% cfm design criteria, therefore no safety concerns exist.

A special Procedure, similar to the procedure mentioned above, was performed on the SBGT 'B" train on February 19, 1993 to determine actual flow when the flow control valve is full open. Flow through the 'B' train was measured at 4600 cfm, which is 200 cfm higher than the 4000 cfm ± 10% design limits. However, since a flow of 5670 cfm was calculated to be acceptable, with respect to GDC-19 limits, a flow of 4600 cfm would allow the thirty-day control room thyroid dose to be well within GDC-19 limits.

The offsite dose calculation used to determine 10CFR100 compliance does not assume any hold-up time in Secondary Containment, and therefore is not a function of SBGT flow. Based on these calculations and test data, the safety significance of this event is considered to be minimal.

E. CORRECTIVE ACTIONS:

The immediate corrective action was to perform an operability determination based on a preliminary calculation on October 23, 1992. On November 6, 1992, a safety-related calculation was approved verifying the results of the original operability evaluation.

NED and Tech Staff have concluded that the most efficient method for limiting SBGT flow is to limit the mechanical stroke of the FCV. This is accomplished by adjusting a headless, hex socket set screw as part of the valve.

On August 2, 1993 the SBGT 'B' train was taken out of service and allowed to run with it's FCV full open. However, in this condition, flow did not exceed 4400 cfm. Actual flow measured 4350 cfm, therefore, no actions to adjust the set screw were needed.

Why the SBGT flow now falls under its design limits is still under investigation. The SBGT has been thoroughly examined and has been eliminated as suspect. Initial investigations lead to possible reactor building ventilation influence, but further investigation is needed. System Engineering (Tech. Staff) will submit another supplemental report detailing the findings on why there was a change in SBGT flow. This supplemental report will be written no later than 2-25-94.

NED determined the reason for the design not accounting for the higher flow rates resulting from the valve's full-open position upon a loss of instrument air. The results of this investigation were provided per NTS item 237-180-92-33002.

F. PREVIOUS OCCURRENCES:

No previous occurrences involving increased train flow rate were noted during a review of past reportable events related to the Standby Gas Treatment System.

G. COMPONENT FAILURE DATA:

A component failure did not occur during this event, therefore, this section is not applicable.