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Dresden Nuclear Power Station
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February 24, 1994

GFSLTR 94-0061

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Licensee Event 92-034-03, 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:maf

Enclosure

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

930609

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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 3	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 9 8 3 8		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)		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	MANUFACTURER	REPORTABLE TO NPRDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS

SUPPLEMENTAL REPORT EXPECTED (14)		Expected Submission Date (15)	Month	Day	Year
	Yes (If yes, complete EXPECTED SUBMISSION DATE)		0 6	1 1	9 3
X	NO				

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 absorbers 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.

Also, on February 10, 1994, SBGT 'B' train auto initiated as expected as part of a radiation monitor functional test, per DIS 1700-18. Due to a leaking equalizing valve on the 'B' train flow transmitter, the flow control valve remained full open. With the Flow Control Valve (FCV) full open, flow reached 4750 cfm, which is outside of its design basis but considerably less than the assumed 5670 cfm.

The 'B' train was then secured and the 'A' train started. Once the transmitter equalizing valve leak was stopped, the 'B' train was restarted and proved to maintain acceptable flow.

The flow of 4750 cfm includes approximately 300 cfm through the non-running train resulting in 4450 cfm through the running train.

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 absorber beds.

D. SAFETY ANALYSIS OF EVENT:

The SBGT system is designed to operate at 4000 cfm ± 10 percent flow with a charcoal absorber 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 absorber 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 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. Additional flow data was taken periodically over the next several months. Flow was found to vary between 4350 cfm and 4600 cfm. However, since a flow of 5670 cfm was found 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.

Studying the flow data has revealed that flow will vary (assuming the SBGT flow control valve has failed open) due to changes in external resistances on both the supply and discharge sides of the SBGT system. For instance, the reactor building ventilation ductwork, which feeds SBGT, contain dampers that modulate depending on area dP variations and area dP controls tolerances. These variations change the resistance of the flow path, thus, changing the air flow through SBGT. Also, as the pressure of the discharge chimney changes, due to changes in turbine building ventilation and radwaste ventilation, the resistance of the flow path changes, thus, changing air flow through SBGT.

Because of the above phenomenon, Systems Engineering and On-Site Engineering have determined that adjusting the stroke of the FCV to achieve a maximum flow of 4400 cfm may not be appropriate. Since flow may vary from day to day, limiting the valve stroke to achieve 4400 cfm today may result in a different flow tomorrow. Further investigation is needed in order to determine an acceptable resolution of maintaining SBGT flow within its design basis under all conditions and failure modes. Systems Engineering will provide another supplemental report detailing corrective actions no later than October 31, 1994.

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.