



Commonwealth Edison

Dresden Nuclear Power Station
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June 7, 1991

EDE LTR #91-355

U.S. Nuclear Regulatory Commission
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Licensee Event Report #91-009-0, Docket #050237 is being submitted as required by Technical Specification 6.6, NUREG 1022 and 10 CFR 50.73(a)(2)(v)(c).

E. D. Eenigenburg
Station Manager
Dresden Nuclear Power Station

EDE/ade

Enclosure

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

(ZDVR/133)

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LICENSEE EVENT REPORT (LER)

Form Rev 2.0

Facility Name (1) Dresden Nuclear Power Station, Unit 2	Docket Number (2) 0 5 0 0 0 2 3 7	Page (3) 1 of 0 6
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Title (4)
Failure of Standby Gas Treatment System Charcoal Adsorber Leak Test Due to Seal Leakage

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	5	17	9	1	9	1	0	0	19	0	0	0	0	2	4	19

OPERATING MODE (9) N

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

POWER LEVEL (10) 0 8 8	<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 checked="" 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 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 Thomas C. Wolz, Technical Staff System Engineer	Ext. 2567	TELEPHONE NUMBER AREA CODE 8 1 5 9 4 2 - 2 9 2 0
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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	B	H	F	L	T	B	0	7	5	Y

SUPPLEMENTAL REPORT EXPECTED (14)

YES (If yes, complete EXPECTED SUBMISSION DATE) | NO

Expected Submission Date (15) 0 | 7 | 3 | 1 | 9 | 1

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

On May 17, 1991 with Unit 2 at 88 percent power and Unit 3 at 56 percent power while performing Dresden Technical Surveillance (DTS) 7500-7, Standby Gas Treatment (SBGT) System Charcoal Leak Test, the leakage around the charcoal trays of the B Train of SBGT was found to be 1.15 percent, exceeding the Technical Specification requirement of less than 1 percent leakage. Post testing maintenance on the B Train revealed inadequate sealing between the charcoal trays and the B Train housing, slight settling of the charcoal in the trays, and broken sealing mechanisms. The B Train was repaired, successfully retested, and returned to service. An as-found test performed on the A Train revealed leakage around the charcoal trays of 2.32 percent. Maintenance on the A Train revealed failures on the A Train similar to the failures found on the B Train. The A Train was promptly repaired and returned to service. The gaskets on all twelve trays in the A Train and on two of the trays in the B Train were replaced. Charcoal was also added to each tray to compensate for any settling that has occurred. The sealing mechanisms were also repaired on both trains. The A and B Trains of SBGT were left at 0.71 and 0.57 percent leakage respectively. A preliminary Engineering review indicates that 10CFR100 site boundary exposure limits would not have been exceeded under design basis accident conditions; a further analysis of the safety significance will be provided in a supplemental report. Two previous failures of this test were reported by LER 82-003/050237 and LER 75-021/050237.

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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

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

EVENT IDENTIFICATION:

Failure of Standby Gas Treatment System [BH] Charcoal Adsorber Leak Test Due to Seal Leakage

A. CONDITIONS PRIOR TO EVENT:

Unit(s): 2(3) Event Date: May 17, 1991 Event Time: 2130 Hours

Reactor Mode(s): N(N) Mode Name(s): Run(Run) Power Level(s): 88(56)%

Reactor Coolant System (RCS) Pressure(s): 984(984) psig

B. DESCRIPTION OF EVENT:

On May 16, 1991 at 0910 hours, Dresden Technical Surveillance (DTS) 7500-7, Standby Gas Treatment System Charcoal Leakage Test, was begun as required by Technical Specification 3.7.B.1 to verify less than 1 percent leakage of flow around the charcoal adsorbers in the Standby Gas Treatment System after any maintenance or testing that could affect the leak tight integrity of the charcoal adsorber banks. The test was being performed after a sample canister was removed from the sample canister tray to be analyzed for iodine removal efficiency. The leak test is performed by injecting a small amount of freon upstream, detecting the concentration of freon before it enters the charcoal adsorber, and monitoring the concentration of freon downstream of the charcoal adsorber. Leakage percentage is determined by the percentage of the freon concentration that is found downstream. The B Train was found to have 1.21 percent leakage. The sample canister tray was removed and inspected for leakage. An O-ring gasket under a blank flange on the canister was found to be missing. A spring pin holding the actuating lever on one of the sealing mechanisms was also found to be broken. The spring pin was replaced. The O-ring was replaced and the test was performed again. The leakage was found to be 1.04 percent. The sample tray was removed again and the blank flange mounting screws on several flanges were found to be bottomed out. This allowed a gap between the blank flanges and the O-ring gasket. Lock washers were installed to secure the blank flanges. At 2130 hours on May 17, the B Train leakage was found to be 1.15 percent. At this point it was decided that a problem other than leakage induced by removal of the sample canister existed within the system. An Emergency Notification System (ENS) telephone call was then made at 0113 hours on May 18, 1991. The NRC Resident Inspector was also notified at this time. All twelve charcoal trays were consequently removed and replaced with new trays. The old trays were inspected for damage. The screening on one of the trays had developed a small leak due to corrosion and a small amount of charcoal had leaked out of the tray. The gaskets on all of the trays were unevenly compressed, indicating inadequate sealing. The new trays were installed and the system was retested. The leakage was found to be 1.60 percent. The 12 trays were removed again and inspected. Several of these trays were out of square. Some of the old trays that were in good condition were installed in place of the new trays that were out of square and charcoal was added to the trays as a precaution. The test was performed again and the leakage was found to be 1.08 percent. The trays were removed again and the gaskets were replaced on the old trays. At 1520 hours on May 18, the leakage was reduced to within acceptable limits at 0.57 percent leakage.

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Preparations were promptly made to test the A Train of Standby Gas Treatment. At 1147 hours on May 19, the A Train leakage was found to be 2.32 percent prior to any maintenance to the filters. A second ENS phone call was made at 1237 hours on 5/19/91. The charcoal adsorber trays were removed from the A Train, the trays were all topped off with charcoal, and the gaskets on all of the trays were replaced. Two of the four sealing mechanisms were found to have broken travel limiting spring pins. The pins were replaced and the charcoal trays were reinstalled. The A Train was then retested and was found to have 0.71 percent leakage, which was satisfactory.

C. APPARENT CAUSE OF EVENT:

This report is being submitted in accordance with the requirements of 10CFR50.73(a)(2)(v)(c) which requires the reporting of any event or condition that alone could have prevented the fulfillment of the safety function of structures or systems that are needed to control the release of radioactive material.

Since the test results improved dramatically when the sealing gaskets were replaced on each of the charcoal trays, the leakage was attributed primarily to degradation of the gaskets (see Figure 1). The B Train exhibited only 0.12 percent leakage and the A Train exhibited .01 percent leakage in their most recent leakage tests on December 18, 1989. No significant change has occurred in the operating conditions of Standby Gas Treatment since the last test. Therefore, the cause of the gasket degradation is unknown at this time.

Several contributing factors were identified during corrective maintenance on the system. The internal latching mechanisms on each train were found to be in disrepair. These mechanisms are responsible for maintaining pressure between the gaskets on each charcoal tray and their sealing surfaces. The primary cause of the damage to these mechanisms is improper operation of the latching lever due to a lack of a procedure. The latching lever is designed to be moved to a certain position for removal of the trays and a different position for operation. There is no labeling that indicates these positions.

One tray used in the B Train was found to have a small hole in the screen containing the charcoal in the tray. A small amount of charcoal apparently leaked out of this tray. However, the amount of charcoal leakage was not significant enough to result in a reduction of the depth of the charcoal bed in the tray. The hole in the tray was caused by minor corrosion of the screen material. No corrosion was observed on any other tray in either train.

A maintenance history review revealed that none of the trays in either train (except for the canister trays) had been disturbed since the present trays were installed in 1982. They were last tested on December 18, 1989, at which time leakages of 0.01 and 0.12 percent were recorded for the A and B trains, respectively. Testing for the present set of trays prior to that time recorded leakages of less than .1 percent. There has been no apparent reason for the latches to have been operated since the last round of testing.

D. SAFETY ANALYSIS OF EVENT:

The purpose of the Standby Gas Treatment System is to maintain a small negative pressure in the Reactor Building to prevent the ground level release of airborne radioactivity under design basis accident conditions, or isolation of the Reactor Building Ventilation [VA] system on increasing radiation

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signals. Filters are provided in the system to remove radioactive particulates, and charcoal adsorbers are provided to remove the radioactive halogens which may be present in concentrations significant to environmental dose criteria. Any radioactive noble gases passing through the filter/adsorbers are diluted with air and dispersed into the atmosphere from the plant chimney.

The charcoal adsorber in each train consists of twelve trays containing two separate two inch deep charcoal beds. The adsorber is capable of removing 90 percent of iodine. Technical Specification 4.7.B.3.b. requires that halogenated hydrocarbon tests be performed after maintenance or testing that could affect the charcoal adsorber leak tight integrity to show less than 1 percent penetration. The most recent test prior to this event on the B Train indicated a .12 percent leakage. Since the B Train was not tested prior to maintenance, the extent of leakage while the system was in operation between December 18, 1989 and May 16, 1991 cannot be determined. The A Train indicated .01 percent leakage on December 18, 1989. The point between December 18, 1989 and May 19, 1991 where the leakage crossed the 1 percent limit also cannot be determined.

The Final Safety Analysis Report only credits a 90 percent efficiency of Standby Gas Treatment. A preliminary Engineering review indicates that 10CFR100 site boundary exposure limits would not have been exceeded under design basis accident conditions. A further evaluation of the safety significance will be provided in a supplemental report.

E. CORRECTIVE ACTIONS:

The primary source of leakage was identified as the seal between the charcoal trays and the housing of the trays. The gaskets were replaced on each tray and the sealing mechanisms were repaired. Much of the damage could have been avoided by proper installation and removal of the charcoal trays. A detailed illustration and instructions for the operation of the latching mechanism will be added to Dresden Maintenance Procedure (DMP) 7500-01, Removal and Installation of Standby Gas Treatment Charcoal Filters by the Maintenance Department (237-200-91-08401). This will be completed by December 31, 1991. The open and closed positions of the latching lever will be labeled at the Standby Gas Treatment trains along with a reference to DMP 7500-01; the System Engineer will submit a request for this labeling change by June 30, 1991 (237-200-91-08402).

The current design of the charcoal trays contributed to the leakage. Since the trays are designed with two sealing surfaces 90 degrees apart, it is difficult to achieve an adequate seal between the trays and the housing of the trays. The design currently does not require corrosion resistant materials to be used for the construction of the trays. Therefore, an evaluation of an improved design of the charcoal trays and latching method will be performed by the System Engineer (237-200-91-08403). This will be completed by December 31, 1991 also.

The amount of flow leakage around the charcoal adsorbers has apparently been in excess of the leakage allowed by Technical Specification 3.7.B.3.b. during the operation of Units 2 and 3 for some period since their last successful tests on December 18, 1989. An evaluation of effects to 10CFR100 offsite doses after an accident is therefore being performed by Engineering; this will be completed by June 30, 1991 (237-200-91-08404). A supplemental LER will then be written by the System Engineer to report the results of this evaluation by July 31, 1991 (237-200-91-08405).

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F. PREVIOUS OCCURRENCES:

LER/Docket Numbers Title

82-003/050237 Freon Test Failure of Standby Gas Treatment System "B" Train

During normal operations while performing DTS 7500-7, Standby Gas Treatment System Charcoal Adsorber Leak Test, on the B Train, a leakage of 1.7 percent was detected. The cause of the event was attributed to a leak in the charcoal bed due to improper packing of the charcoal. The charcoal trays were replaced and the system was retested satisfactorily. The A Train was successfully tested prior to the failure of the B Train.

75-021/050237 Failure of Standby Gas Treatment "A" Train Freon Leakage Test

The results of the semi-annual freon leak test on the A Train of Standby Gas Treatment indicated 1.8 percent leakage. The sealing gasket on one charcoal adsorber cell was found to be completely ripped off on one side and was torn elsewhere. The torn gasket was replaced and the charcoal cell was reinstalled. The A Train was satisfactorily retested. The B Train was successfully tested prior to this event.

G. COMPONENT FAILURE DATA:

<u>Manufacturer</u>	<u>Nomenclature</u>	<u>Model Number</u>	<u>Mfg. Part Number</u>
Barnebey-Cheney	Charcoal Adsorber	FC-SP1889	N/A

An industry wide NPRDS data base search revealed 3 failures of type FC filters. Two of these events are recorded at Dresden.

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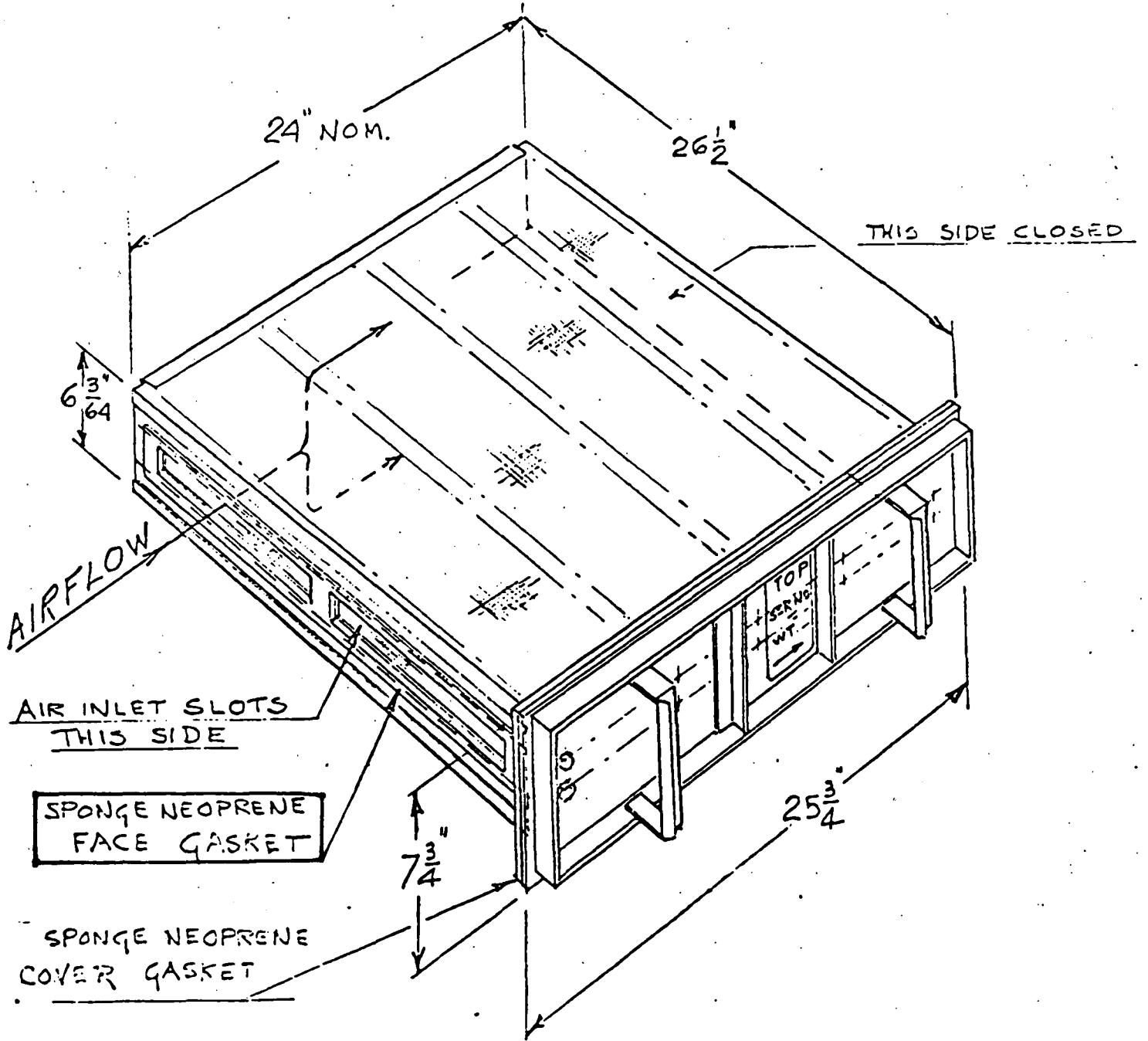


Figure 1

Charcoal Adsorber Tray