

CATEGORY 1

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR: 9605280078 DOC.DATE: 96/05/20 NOTARIZED: NO DOCKET #
 FACIL: 50-387 Susquehanna Steam Electric Station, Unit 1, Pennsylv 05000387
 AUTH.NAME AUTHOR AFFILIATION
 SGARRO, R.R. Pennsylvania Power & Light Co.
 KUCZYNSKI, G.T. Pennsylvania Power & Light Co.
 RECIP.NAME RECIPIENT AFFILIATION

SUBJECT: LER 94-015-01: on 940912, postulated failures of SGTS components occurred. Caused by dampers failing in open position. Mod performed to add time delay relay to SGTS Outside Air Damper circuitry. W/960520 ltr.

DISTRIBUTION CODE: IE22T COPIES RECEIVED: LTR 1 ENCL 1 SIZE: 6
 TITLE: 50.73/50.9 Licensee Event Report (LER), Incident Rpt, etc.

NOTES:

05000387

	RECIPIENT ID CODE/NAME	COPIES		RECIPIENT ID CODE/NAME	COPIES	
	PDL-2 PD	LTR	ENCL		LTR	ENCL
		1	1	POSLUSNY, C	1	1
INTERNAL:	ACRS	1	1	AEOD/SPD/RAB	2	2
	AEOD/SPD/RRAB	1	1	<u>FILE CENTER</u>	1	1
	NRR/DE/ECGB	1	1	NRR/DE/EELB	1	1
	NRR/DE/EMEB	1	1	NRR/DRCH/HHFB	1	1
	NRR/DRCH/HICB	1	1	NRR/DRCH/HOLB	1	1
	NRR/DRCH/HQMB	1	1	NRR/DRPM/PECB	1	1
	NRR/DSSA/SPLB	1	1	NRR/DSSA/SRXB	1	1
	RES/DSIR/EIB	1	1	RGN1 FILE 01	1	1
EXTERNAL:	L ST LOBBY WARD	1	1	LITCO BRYCE, J H	2	2
	NOAC MURPHY, G.A	1	1	NOAC POORE, W.	1	1
	NRC PDR	1	1	NUDOCS FULL TXT	1	1
NOTES:		1	1			

NOTE TO ALL "RIDS" RECIPIENTS:
 PLEASE HELP US TO REDUCE WASTE! CONTACT THE DOCUMENT CONTROL DESK,
 ROOM OWFN 5D-5 (EXT. 415-2083) TO ELIMINATE YOUR NAME FROM
 DISTRIBUTION LISTS FOR DOCUMENTS YOU DON'T NEED!

FULL TEXT CONVERSION REQUIRED
 TOTAL NUMBER OF COPIES REQUIRED: LTR 27 ENCL 27

A04

C
A
T
E
G
O
R
Y
1
D
O
C
U
M
E
N
T

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 RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1)
Susquehanna Steam Electric Station - Unit 1

DOCKET NUMBER (2) PAGE (3)
0 5 0 0 0 3 8 7 1 OF 0 5

TITLE (4)
Postulated Failures of SGTS Components are Outside of Design Basis

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	9	1	2	9	4	9	4	0	1	5	0	1	0	5	2	0	9	6	Susquehanna - Unit 2	0 5 0 0 0 3 8 8
											0	5	0	0	0					

OPERATING MODE (9)	1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR : (Check one or more of the following) (11)									
POWER LEVEL (10)	1	0	0	20.402(b)		20.405(c)		50.73(a)(2)(M)		73.71(b)	
				20.405(a)(1)(X)		50.36(c)(1)		50.73(a)(2)(N)		73.71(c)	
				20.405(a)(1)(X)		50.36(c)(2)		50.73(a)(2)(W)			
				20.405(a)(1)(X)(a)		50.73(a)(2)(X)		50.73(a)(2)(W)(A)			
				20.405(a)(1)(X)(b)	X	50.73(a)(2)(Y)		50.73(1)(2)(W)(B)			
				20.405(a)(1)(X)(c)		50.73(a)(2)(Z)		50.73(a)(2)(X)			

OTHER (Specify in Abstract below and in Text, NRC Form 366A)

(LICENSEE CONTACT FOR THIS LER (12))

NAME	ROCCO R. SGARRO - Sr. Project Engineer, Licensing	TELEPHONE NUMBER	6 1 0 7 7 4 - 7 5 5 2
------	---	------------------	-----------------------

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)										
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NFRDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NFRDS	

SUPPLEMENTAL REPORT EXPECTED (14)

YES (if yes, complete EXPECTED SUBMISSION DATE) NO

EXPECTED SUBMISSION DATE (15)

MONTH	DAY	YEAR

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

On September 12, 1994, at 1640 hours with Unit 1 and Unit 2 in Condition 1 at 100% power, it was concluded that either of two postulated single failure event types in conjunction with a design basis Loss Of Coolant Accident (LOCA) could cause the plant to be outside of its design basis. The postulated single failure event types are associated with the Standby Gas Treatment System and the Reactor Building recirculation system. The first event type would result in either the Division I or Division II outside air supply damper of the SGTS being in the open position during a "draw-down" of secondary containment. This would result in doses that are within the 10 CFR 100 and 10 CFR 50 G.D.C. 19 limits but exceed the design limits described in the station's Final Safety Analysis Report. The second postulated event type involves either Reactor Building recirculation fan damper being in the open position while its respective recirculation fan is not operating. The probabilities of these events are low and must be in existence at the time of a design basis accident in order to exceed the design basis doses. In January, 1995, the postulated failure of the Reactor Building recirculation system damper was determined to be non-credible. In March, 1996, the postulated SGTS single failures were dispositioned by a modification. Separate from this report, PP&L is continuing to pursue whether or not the SGTS single failures should have been included in the original plant design basis. This action is being tracked in our corrective action program.



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 RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1) Unit 1 Susquehanna Steam Electric Station	DOCKET NUMBER (2) 0 5 0 0 0 3 8 7	LER NUMBER (8)						PAGE (3)		
		YEAR		SEQUENTIAL NUMBER		REVISION NUMBER				
		9 4 —		0 1 5		0 1		2	OF	5

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

DESCRIPTION OF EVENT

On September 12, 1994, at 1640 hours with Unit 1 and Unit 2 in Condition 1 (Power Operation) at 100% power, it was concluded that either of two postulated single failure event types in conjunction with a design basis Loss Of Coolant Accident (LOCA) could cause the plant to be outside of its design basis. The postulated event types are associated with the Standby Gas Treatment System (SGTS, EISS Code: BH) and the Reactor Building recirculation system (EISS Code: VA) (see figure 1).

The SGTS is designed to exhaust sufficient filtered air from the reactor building to maintain a negative pressure of about 0.25 in. wg in the affected volumes following Secondary Containment (EISS Code: VA) isolation due to a Loss Of Coolant Accident (LOCA) design basis accident along with any postulated single failure. The SGTS is also designed to filter the exhausted air to remove radioactive particulates and iodine to limit the offsite dose to the guidelines of 10CFR100. In order to limit post accident doses to these values, upon initiation of the SGTS the outside air supply damper needs to remain closed so that the system can "draw-down" secondary containment within a three minute time period. After this initial "draw-down" period the outside air damper then opens to allow proper system control.

The first event type involves two postulated failure events which are 1) the failure of the SGTS outside air damper pressure differential transmitter in the low position and 2) failure of its controller in the high position. Either of these failures would result in either the Division I (FD-07551A2) or Division II (FD-07551B2) outside air supply damper of the SGTS being in the open position during a "draw-down" of secondary containment. The resulting draw-down time would then be 9 minutes. Analysis of this increased draw-down time results in increased doses due to the increased unfiltered leakage that is assumed to occur for the 9 minutes it takes to draw-down secondary containment. These doses are within the 10 CFR 100 limits of 300 rem two hour thyroid dose at the site boundary and 25 rem two hour whole body at the site boundary. They are also within the 10CFR50 G.D.C. 19 limits of 30 rem to the thyroid, 5 rem to the whole body, and 75 rem beta to the skin for thirty day control room doses, but exceed the design limits described in the station's FSAR.

A design feature of the Reactor Building recirculation system is to mix the atmosphere in the reactor building to obtain a lesser and more uniform concentration of radioactivity following a design basis LOCA. This mixing of air within the entire Reactor Building is an important factor in maintaining the design basis dose limits because it also provides a hold-up time to allow for radioactive decay prior to its filtration and discharge through the SGTS.

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)						PAGE (3)					
Unit 1		YEAR		SEQUENTIAL NUMBER		REVISION NUMBER							
Susquehanna Steam Electric Station	0 5 0 0 0 3 8 7	9	4	—	0	1	5	—	0	1	3	OF	5

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

The second postulated event type involves a conductor-to conductor short within the circuitry for either Reactor Building recirculation fan damper (HD-07545A or HD-0745B) causing either to be in the open position while its respective recirculation fan is not operating. If this failure were to cause either recirculation fan damper to open while its respective recirculation fan was not operating (i.e. the standby fan), this would result in the air not being mixed properly throughout the Reactor Building and essentially short cycle the air within the recirculation fan plenum (as indicated by dashed line on figure 1). This decreased mixing would then result in doses that are within 10 CFR 100 and 10 CFR 50 G.D.C. 19 limits but exceed the limits shown in the FSAR.

These previously unanalyzed single failure event types were discovered by Engineers (utility, non licensed) while resolving an Engineering Deficiency Report (EDR). On 9/12/94 analysis of the conditions described in the EDR was finalized. A reportability evaluation for the conditions described above showed that these events were reportable per 10CFR50.72(b)(1)(ii)(B) as being conditions that are outside the design basis of the plant.

The above described single failure event types are distinct and separate events. The probabilities of these event types are low and must be in existence at the time of a design basis accident in order to exceed the design basis doses. In January, 1995, the postulated failure of the Reactor Building recirculation system damper was determined to be non-credible. In March, 1996, the postulated SGTS single failures were dispositioned by a modification.

CAUSE OF EVENT

The above described events involve dampers failing to the open position. The design of all the dampers in question is that the damper position is controlled by a damper actuator and the actuator is controlled via an electrical control circuit. The postulated causes for the failures are different in each case. The premature opening of either outside air supply damper (FD-07551A2 or B2) could be caused by two distinct events. Failure of its associated pressure differential transmitter in its control circuit to the low position would cause the dampers' control circuit to send a full open signal to the outside air damper. Likewise if the controller associated with the outside air supply damper were to fail high, the result would be to send a full open signal to the damper. A modification has been performed to add a time delay relay which will ensure that Reactor Building draw-down requirements are not impacted by these postulated single failures. For either of the recirculation fan dampers (HD-07545A or B) the postulated failure mode is a conductor-to-conductor short in a control circuit cable. This type of failure has been determined to be non-credible based on an engineering calculation.

**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 RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1) Unit 1 Susquehanna Steam Electric Station	DOCKET NUMBER (2) 0 5 0 0 0 3 8 7	LER NUMBER (6)						PAGE (3)		
		YEAR		SEQUENTIAL NUMBER		REVISION NUMBER				
		9 4	—	0 1 5	—	0 1	4	OF	5	

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

REPORTABILITY / ANALYSIS

This event was determined to be reportable per 10CFR50.73(a)(2)(ii)(B) in that several postulated failures of dampers in the SGTS and Reactor Building recirculation system in conjunction with a design basis LOCA would cause the plant to be outside its design basis. All of the above described single failure events are distinct and separate events. The probabilities of these events are low and must be in existence at the time of a design basis accident in order to exceed the design basis doses. Should any of the postulated events occur concurrent with a design basis accident, the result would be doses higher than those described in the FSAR but still within 10 CFR 100 and 10 CFR50 G.D.C. 19 limits. In January, 1995, subsequent to the above determination, the postulated single failure of the Reactor Building recirculation system damper was determined to be non-credible, and therefore not reportable. PP&L is continuing to review whether or not the SGTS postulated single failures should have been considered as part of the original plant design basis. This item is being tracked under our corrective action program.

CORRECTIVE ACTIONS

In January, 1995, the postulated single failure of the Reactor Building recirculation system damper was determined to be non-credible based on an engineering calculation. In March, 1996, a modification was performed to add a time delay relay to the SGTS Outside Air Damper circuitry that will ensure that the postulated single failures in that system will not impact Reactor Building draw-down requirements.

ADDITIONAL INFORMATION

Failed Component Identification: Not Applicable

Past Similar Events:

A review of past Licensee Event Reports (LERs) for the station identified one event where SGTS was outside of its design basis.

Unit 1 LER 83-152-01

"FSAR post LOCA Assumptions did not agree with actual draw down times."

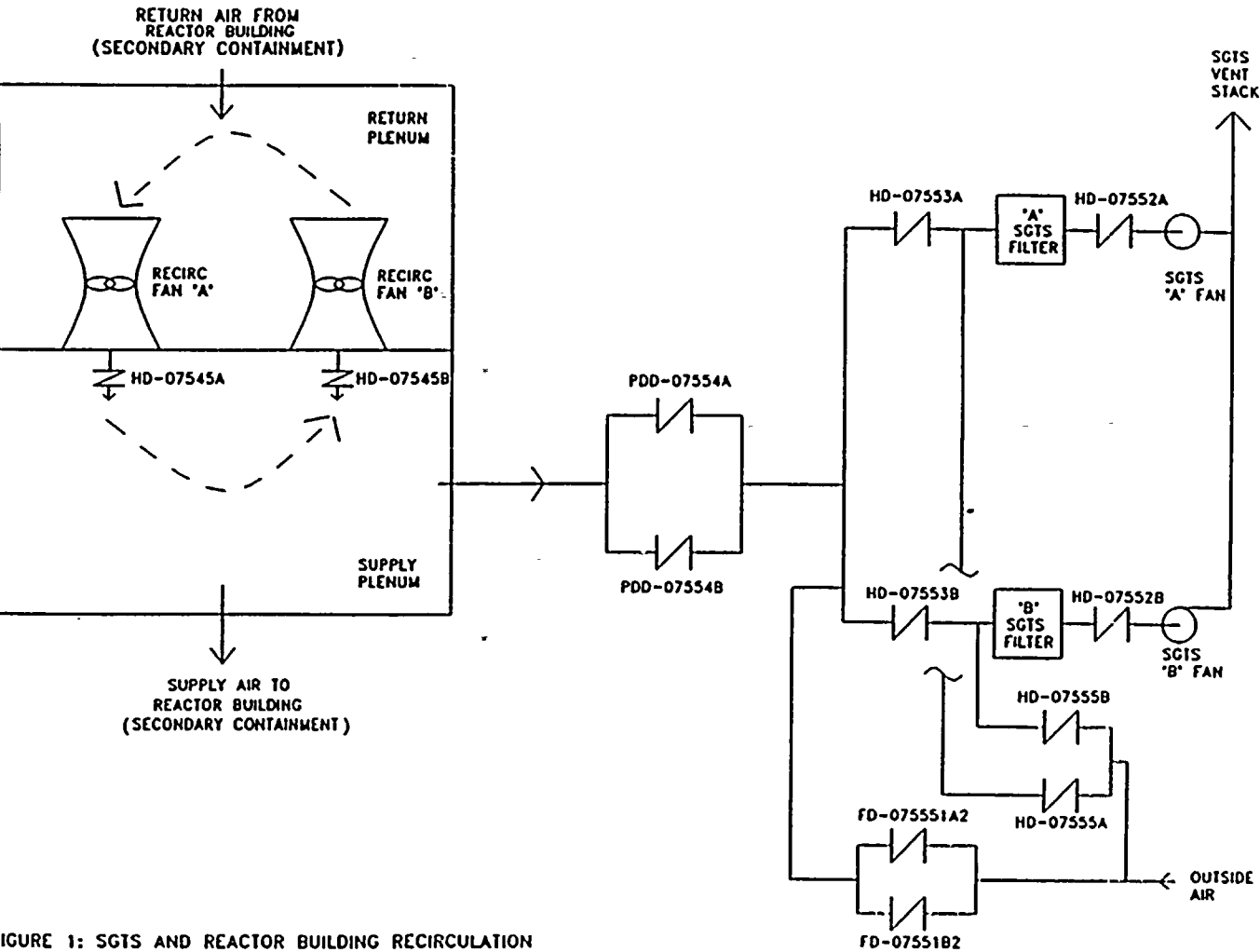


FIGURE 1: SGTS AND REACTOR BUILDING RECIRCULATION

NOTE: SKETCH NOT TO SCALE AND NOT ALL SYSTEM COMPONENTS INCLUDED

TEXT (if more space is required, use additional NRC Form 368a's) (17)

FACILITY NAME (1) Unit 1 Susquehanna Steam Electric Station		DOCKET NUMBER (2) 0 5 0 0 0 0 3 8 7		LER NUMBER (6) YEAR: 9 4 SEQUENTIAL NUMBER: 0 1 5 REVISION NUMBER: 0 1		PAGE (3) 5 OF 5	
U.S. NUCLEAR REGULATORY COMMISSION LICENSEE EVENT REPORT (LER) TEXT CONTINUATION				APPROVED OMB NO. 3150-0104 EXPRES: 420022 ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 500 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-330), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.			