

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Pilgrim Nuclear Power Station - Unit No. 1	DOCKET NUMBER (2) 0 5 0 0 0 2 9 3	PAGE (3) 1 OF 0 3
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TITLE (4)  
Standby Gas Treatment System Deluge System Single Failure Mode

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 8	2 7	8 6	8 6	0 2 1	0 0						0 5 0 0 0
THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR § (Check one or more of the following) (11)											

OPERATING MODE (9) N	POWER LEVEL (10) 0 0 0	20.402(b)	20.405(c)	50.73(a)(2)(iv)	73.71(b)
		20.405(a)(1)(i)	50.36(c)(1)	X 50.73(a)(2)(v)	73.71(c)
		20.405(a)(1)(ii)	50.36(c)(2)	X 50.73(a)(2)(vii)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
		20.405(a)(1)(iii)	50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	
		20.405(a)(1)(iv)	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)(ix)	

LICENSEE CONTACT FOR THIS LER (12)

NAME Brian Lunn - Plant Engineer	TELEPHONE NUMBER
	AREA CODE: 6 1 7   7 4 6   - 7 9 0 0

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC
B	B,H		G 0 8 2	Y					

SUPPLEMENTAL REPORT EXPECTED (14)

YES (If yes, complete EXPECTED SUBMISSION DATE)	<input checked="" type="checkbox"/> NO	EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR

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

On 8/27/86, Boston Edison concluded that a single active failure of the Standby Gas Treatment (SBGT) Deluge System during a design basis loss of cooling accident (LOCA) or fuel handling accident could result in offsite radiation doses exceeding 10CFR100.11 limits. An automatic or manual initiation of the SBGT Deluge System would result in the charcoal beds of one SBGT filter train being water soaked. Soaking of the charcoal filters would significantly reduce their efficiency for retaining radioactive iodines.

The plant is currently in the cold shutdown condition and not conducting operations that require the SBGT System to be operable. Single failure and effects analysis on the SBGT system in its entirety is ongoing and is expected to be completed by October 31, 1986. This will identify any other active single failure which could prevent the SBGT from performing its safety function.

Prior to conducting operations which would require the SBGT System to be operable, the SBGT System will be verified to be operable in accordance with the Technical Specifications.

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LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
		8   6	-   0   2   1	-   0   0	0   2	OF	0   3

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

On 8/27/86, the Boston Edison Nuclear Engineering Department concluded that a single active failure of the Standby Gas Treatment (SBGT) Deluge System during a postulated design basis loss of cooling accident (LOCA) or fuel handling accident could result in offsite radiation doses exceeding 10CFR100.11 limits.

The NRC was notified of this conclusion by telephone on 8/29/86, and by letter on 8/30/86, pursuant to the requirements of 10CFR21.21(b)(2).

The cause of this condition is an inadequate SBGT System/Deluge System interaction which was included in the original design. The Energy Industry System, system name is "Emergency Standby Gas Treatment System". An Energy Industry System, component name is not included in this report as a specific component inadequacy has not been identified.

The SBGT System has two cross-connected filter trains consisting of HEPA filters for particulate removal and charcoal filters for iodine removal. The SBGT System will start automatically under the following circumstances: 1) upon receipt of high drywell pressure or low reactor water level signals or 2) upon a high radiation signal from the operation of the refueling floor ventilation exhaust duct monitors. Automatic initiation of the SBGT System starts both SBGT fans and opens the SBGT isolation dampers. Each fan draws air from the isolated Reactor Building at a flow rate of approximately 4,000 SCFM. After a preset time delay, one fan is stopped. Cross tie lines with "normally open/fail open" butterfly dampers between filter trains are provided to maintain the required decay heat removal cooling air flow through the charcoal beds in the inactive (back-up) treatment train. With one SBGT fan in operation, flow through the active treatment train is approximately 3,200 SCFM and 800 SCFM through the inactive (back-up) treatment train.

The SBGT Deluge System provides cooling and fire protection spray in response to high temperatures sensed in the SBGT charcoal filter beds. There are two charcoal filter beds in each of the SBGT filter trains. Each bed has an associated deluge solenoid valve and a temperature element. An electronic control system monitors the two temperature elements from one train and opens both solenoid valves when either temperature element senses temperature in excess of 280°F. This automatic functioning of the deluge system was defeated February 25, 1983, when it was discovered that the "B" SBGT charcoal filters had been soaked due to leakage past the Alison Control solenoid valve #191004 as reported in LER 83-011. At that time, the manual valve for the deluge system was closed and a fire watch was established. It was during the evaluation of a permanent fix to this problem that the subject scenario was postulated.

An automatic (prior to February 25, 1983) or manual initiation of the deluge system as a result of a real high temperature event or a single failure of either temperature sensor simulating a high temperature, or the automatic initiation (prior to February 25, 1983) as a result of the electronic control system erroneously tripping would result in the charcoal beds of one SBGT filter train being water soaked. It is known that soaking of the charcoal filters would significantly reduce their efficiency for retaining radioactive iodines. Control Room operators would be alerted to the deluge system operation by annunciation on the C7 Panel.

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

However, the only prompt action the operator could take to mitigate the release would be to align the deluged filter train as the inactive (back-up) train if it was not already aligned as the inactive (back-up) train. If non-safety related instrument air was not available to close the "normally open/fail open" butterfly dampers in the system cross tie lines, the minimum flow of approximately 800 SCFM must be assumed to pass through the deluged SBTG train unfiltered for radioactive iodines.

The susceptibility of the SBTG System to a single active failure resulting in elevated off-site releases is beyond the design basis of the plant and involves a reduction in the degree of protection provided to the public health and safety. Because the SBTG System has not been challenged to perform its design function, the health and safety of the public has not been compromised.

The plant is currently in the cold shutdown condition and not conducting operations that require the SBTG System to be operable. Single failure and effects analyses on the SBTG System in its entirety is ongoing and is expected to be completed by October 31, 1986. This will identify any other active single failure which could prevent the SBTG from performing its safety function. Prior to conducting operations which would require the SBTG System, the SBTG System will be verified to be operable in accordance with the Technical Specifications.



**BOSTON EDISON**

Executive Offices  
800 Boylston Street  
Boston, Massachusetts 02199

**James M. Lydon**  
Chief Operating Officer

September 29, 1986  
BECo Ltr. #86-151

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

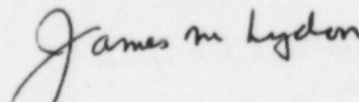
Docket No. 50-293  
License No. DPR-35

Dear Sir:

The attached Licensee Event Report 86-021 "Standby Gas Treatment System Deluge System Single Failure Mode" is hereby submitted in accordance with the requirements of 10CFR50.73.

If there are any questions on this subject, please do not hesitate to contact me.

Respectfully submitted,

  
James M. Lydon

BPL/ko

Enclosure: LER 86-021

cc: Dr. Thomas E. Murley  
Regional Administrator, Region 1  
U.S. Nuclear Regulatory Commission  
631 Park Avenue  
King of Prussia, PA 19406

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