Entergy

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Michael A. Balduzzi
Site Vice President

September 29, 2004

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

Subject: Entergy Nuclear Operations, Inc.
Pilgrim Nuclear Power Station
Docket No.: 50-293
License No.: DPR-35

Licensee Event Report 2004-005-00

Letter Number: 2.04.085

Dear Sir:

The enclosed Licensee Event Report (LER) 2004-005-00, "Standby Gas Treatment System Inoperable due to Pneumatic Accumulator Leakage Rate," is submitted in accordance with 10 CFR 50.73

This letter contains no commitments.

Please feel free to contact Bryan Ford, (508) 830-8403, if there are any questions regarding this subject.

Sincerely,

Michael A. Balduzzi

DWE/dm

Enclosure: LER 2004-005-00

cc: Mr. Samuel J. Collins
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INPO Records

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1. NRC Form 366 U.S. NUCLEAR REGULATORY COMMISSION

LICENSEE EVENT REPORT (LER)

(See reverse for number of digits/characters for each block)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
PILGRIM NUCLEAR POWER STATION	05000-293	1 of 6

TITLE (4)
Standby Gas Treatment System Inoperable due to Pneumatic Accumulator Leakage Rate

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 NAME	DOCKET NUMBER
									N/A	05000
08	10	2004	2004	005	00	09	29	2004	FACILITY NAME N/A	DOCKET NUMBER 05000

OPERATING MODE (9)	N	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR: (Check one or more) (11)							
POWER LEVEL (10)	100		20.2201(b)		22.2203(a)(3)(i)		50.73(a)(2)(i)(C)		50.73(a)(2)(vii)
			22.2202(d)		20.2203(a)(3)(ii)		50.73(a)(2)(ii)(A)		50.73(a)(2)(viii)(A)
			20.2203(a)(1)		20.2203(a)(4)		50.73(a)(2)(ii)(B)		50.73(a)(2)(viii)(B)
			20.2203(a)(2)(i)		50.36(3)(1)(i)(A)		50.73(a)(2)(iii)		50.73(a)(2)(ix)(A)
			20.2203(a)(2)(ii)		50.36(3)(1)(ii)(A)		50.73(a)(2)(iv)(A)		50.73(a)(2)(x)
			20.2203(a)(2)(iii)		50.36(c)(2)		50.73(a)(2)(v)(A)		73.71(a)(4)
			20.2203(a)(2)(iv)		50.46(a)(3)(ii)		50.73(a)(2)(v)(B)		73.71(a)(5)
			20.2203(a)(2)(v)		50.73(a)(2)(i)(A)		50.73(a)(2)(v)(C)		OTHER
			20.2203(a)(2)(vi)	X	50.73(a)(2)(i)(B)	x	50.73(a)(2)(v)(D)		Specify in Abstract below or in NRC Form 366A
							50.73(a)(2)(vii)(D)		

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (Include Area Code)
Bryan Ford – Licensing Manager	508-830-8403

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX
D	BH	V	A610	Y					

SUPPLEMENTAL REPORT EXPECTED (14)				EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
	YES (If yes, complete EXPECTED SUBMISSION DATE)	X	NO				

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

On August 12, 2004, it was determined that both trains of the Standby Gas Treatment System (SGTS) had been inoperable on August 10, 2004. This was based on train 'A' being made inoperable on August 10, 2004 for planned maintenance, and identification on August 12, 2004 of an SGTS accumulator bank leakage rate greater than design resulting in train 'B' also being inoperable.

The direct cause was leakage through the closed exhaust port of a solenoid-operated valve that provides air to an SGTS train 'A' air-operated damper.

Corrective action taken included replacement of the solenoid-operated valve and post work testing with satisfactory results. Corrective actions planned include development of a methodology to monitor and trend SGTS instrument air system leakage.

The condition was identified while operating at 100 percent reactor power, and posed no threat to public health and safety.

BACKGROUND

The Pilgrim Station secondary containment system is designed, in conjunction with other engineered safeguards and nuclear safety systems, to limit the release of radioactive material during normal plant operations within the limits of 10 CFR 20 and to limit the release of radioactive material so that offsite doses from a postulated design basis accident will be below the guideline values in 10 CFR 100.

The secondary containment system consists of four subsystems: (1) the reactor building, (2) the reactor building isolation control system (RBICS), (3) the standby gas treatment system (SGTS), and (4) the main stack. The reactor building completely encloses the primary containment system that includes the drywell (containing the reactor) and torus (containing the suppression pool). The function of the RBICS is to trip the reactor building ventilation supply and exhaust fans, isolate the normal reactor building ventilation system, and provide initiation signals to the SGTS in the event of a postulated LOCA inside the drywell or a postulated fuel handling accident in the reactor building. The SGTS discharges processed gases to the main stack via underground piping. The main stack provides an elevated release point for the processed gases. The mission time for the secondary containment system is 30 days.

The SGTS consists of ductwork and instrumentation and includes two, similar, full capacity, parallel air filtration assemblies that are located outside the reactor building. Each filter assembly includes an in-series air-operated supply damper, demister (optional), an electrical heating coil, high efficiency particulate absorber (HEPA), two charcoal filter beds, a final HEPA filter, exhaust fan, motor-operated adjustable damper, fixed back draft damper, and air-operated discharge damper. Cross connections between the trains and a restricting orifice are provided to maintain the required decay heat removal cooling air flow through the charcoal filter assembly in the inactive train.

The SGTS air-operated dampers are pneumatically operated. This energy is supplied to each air-operated damper from the Class I (essential) bank of accumulators via tubing containing a solenoid-operated valve that functions to control the pneumatic supply to the respective actuator. The damper is controlled manually by a control switch located in the main control room or automatically from the RBICS initiation circuitry. The bank of accumulators is sized to provide two complete actuations of each of the four SGTS air-operated dampers.

The SGTS train 'A' air-operated dampers are normally closed and are designed to fail open (actuator spring action) due to a loss of pneumatic energy, i.e. the dampers do not require pneumatic energy for operation of train 'A'. In contrast, the SGTS train 'B' air-operated dampers are normally closed and are designed to fail closed (actuator spring action) if a loss of pneumatic energy occurs, i.e. the dampers require pneumatic energy for operation of train 'B'. This arrangement is part of the SGTS single failure design that includes the energy stored in the dedicated, self-contained, bank of (passive) safety-related SGTS accumulators.

The SGTS accumulator bank is equipped with instrumentation that includes local pressure indicators and a pressure switch. Except for the pressure boundary function, the pressure indicators and pressure switch provide no safety function. The pressure switch functions to initiate a control room alarm if the accumulator bank pressure decreases to a preset pressure. The accumulator bank pressure is routinely checked and recorded in accordance with a procedure, and gas is added to the accumulator bank if necessary.

During normal reactor power operation, the SGTS train 'A' is maintained in a standby status with the train 'A' control switch in the AUTO position, and train 'B' is maintained in a standby status with the train 'B' control switch in the STANDBY position. In this configuration and if an RBIS initiation signal occurs, the train 'A' heater and fan starts, the train 'A' supply and discharge air-operated dampers open, train 'B' starts (fan and heater) and the train 'B' supply and discharge air-operated dampers open. Train 'B' automatically shuts down if sufficient train 'A' flow exists after a preset time delay. If a failure of the train 'A' heater or fan occurs during train 'A' operation, train 'B automatically starts. If the SGTS train 'A' is removed from standby service with the control switch in the OFF position and train 'B' control switch in the MAINTENANCE position and an RBICS initiation signal occurs, train 'B' starts (heater and fan) and the train 'B' air-operated supply and discharge dampers open.

Pilgrim Station Technical Specification 3/4.7.B.1 governs the operability requirements of the SGTS. The specification requires that with certain exceptions, the SGTS shall be operable during periods that include reactor power operation (RUN, STARTUP, and HOT SHUTDOWN modes), during movement of irradiated fuel assemblies in secondary containment, during movement of new fuel over the spent fuel pool, during CORE ALTERATIONS, and during operations with a potential for draining the reactor vessel. For reactor power operation, the specification allows a 7-day limiting condition for operation (LCO) if one train is made or found to be inoperable for any reason provided the other train and associated diesel generator is operable and that if the system is not fully made operable within 7 days, the specification requires the initiation of a reactor shutdown and cold shutdown within the next 36 hours, and that if both trains are inoperable, the specification requires a reactor shutdown and cold shutdown within the next 36 hours.

Licensed operators monitor drywell-torus differential pressure, and the SGTS is manually operated as necessary to maintain the differential pressure required by Technical Specifications.

A pressure switch functions to initiate a control room alarm if the SGTS accumulator bank pressure decreases to a preset value. The alarm occurs occasionally, depending on air usage resulting from SGTS operation. On August 5, 2004 a control room alarm occurred indicating the SGTS accumulator bank pressure was 115 psig. By procedure, the amber alarm light should have lit but the light did not illuminate. Compressed gas was added to the SGTS accumulator bank, the bulb for the amber light was checked with satisfactory results, a work document was written for the amber light, and a corrective action program document was initiated. On August 7, 2004 the same alarm occurred and actions similar to those on August 5, 2004 were taken, including the addition of compressed gas to the accumulator bank. Engineering and Operations personnel investigated the cause of the alarms. The investigation identified no excessive air leakage in the SGTS instrument air system. The conclusion was based on inspection of the SGTS instrument air system that identified no leaks in the system and that the air system charging frequency had not changed. The number of SGTS damper actuations and consequent air usage incurred during SGTS operation to maintain the drywell-torus differential pressure was considered in determining an acceptable charging frequency. Based on the investigation and available information at that time, the status of the system remained operable. The acquisition of additional data continued and assessment of the additional data would later impact operability, on August 11, 2004.

On August 10, 2004 at 0334 hours, SGTS train 'A' was removed from service and made inoperable for planned maintenance. For this activity, the train 'A' control switch was put in the OFF position, train 'B' was operable with the control switch put in the MAINTENANCE position, and an active 7-day LCO was entered in accordance with Technical Specification 3.7.B.1. After the completion of maintenance and testing, the LCO for train 'A' was terminated at 1715 hours on August 10, 2004, with the SGTS in its normal standby status.

On August 11, 2004, as a result of the assessment of additional SGTS instrument air system charging data, it was identified that the SGTS air accumulator bank had experienced a pressure decrease that was greater than the design limit of 1.99 psi/day (at 130 psig accumulator bank pressure) on August 7th and August 8th. During that period (30.9 hours beginning on August 7th) the SGTS was not operated and for that period the SGTS instrument air system data indicated a pressure decrease rate that was greater than the design limit. As a result of this new information, train 'B' of the SGTS was declared inoperable and a 7-day Technical Specification 3.7.B.1 LCO was entered at 1130 hours on August 11, 2004. This action was taken due to the SGTS design (train 'B' air-operated dampers normally closed and require pneumatic energy to open) and because the SGTS accumulator bank pressure decrease was greater than the design limit of 1.99 psi/day (at 130 psig accumulator bank pressure). A maintenance work document was written for repair, a corrective action program document was initiated, and efforts were initiated to determine the reason for the pressure decrease rate.

On August 12, 2004, the investigation identified a leak in the pneumatic supply to the SGTS train 'A' discharge damper actuator AON-108. A corrective action program document was initiated to document the discovery. The leakage was eliminated by closing a hand-operated valve that is part of the pneumatic supply for the damper actuator. The 7-day LCO entered on August 11, 2004 was terminated at 2200 hours on August 12, 2004 as a result of eliminating the leak (air not required to open damper AON-108) and ensuring the SGTS accumulator bank was sufficiently pressurized.

EVENT DESCRIPTION

On August 12, 2004, it was determined that both trains 'A' and 'B' of the SGTS had been inoperable on August 10, 2004 based on train 'A' being made inoperable on August 10, 2004 for planned maintenance and identification on August 12, 2004 of an SGTS accumulator bank leakage rate that was greater than design and for which train 'B' was declared inoperable.

The condition was identified during power operation while at 100 percent reactor power. The reactor mode selector switch was in the RUN position. The reactor vessel pressure was approximately 1030 psig with the reactor vessel water temperature at the saturation temperature for that pressure.

CAUSE

The direct cause was leakage through the closed exhaust port of solenoid-operated valve SV-L-67 that provides air to the train 'A' air-operated exhaust damper AON-108. Valve SV-L-67 is a 125-volt DC ASCO model NP8320A184E solenoid-operated valve.

All four of the solenoid-operated valves installed in the SGTS instrument air system were tested for leakage. Each valve was tested when pressurized to system pressure. No leakage was found except at the fittings and exhaust port of valve SV-L-67 and at a tubing end cap. During an as-found pressure drop test with the air supply to valve SV-L-67 isolated, the SGTS instrument air system pressure drop rate was nearly zero psi/day.

A contributing cause was the process for determining the SGTS accumulator bank leakage rate. The installed instrumentation does not provide sufficient accuracy, and leakage may be masked by periodic accumulator bank charging and/or air usage during periodic operation of the SGTS air-operated dampers.

CORRECTIVE ACTION

The following corrective actions have been taken. Valve SV-L-67 was replaced on August 27, 2004. The replacement work included replacement of the valve's inlet fittings, which exhibited some minor leakage. A pressure drop test was subsequently performed at system pressure with satisfactory results.

The corrective actions planned include the following:

- Developing a methodology to periodically monitor and trend leakage in the SGTS instrument air system.
- Developing preventive maintenance tasks to periodically inspect/repair/replace the solenoid-operated valves installed in the SGTS instrument air system.
- Revising the procedure that tests the pressure drop (leakage rate) of the SGTS instrument air system. The focus of this action is to decrease the acceptance criteria of the pressure drop test and thereby provide margin over the fuel operating cycle, and add steps to check for leaks during the test.
- Evaluating test requirements when the SGTS instrument air system is breached for maintenance, surveillance testing, or other processes.

These planned actions may be modified in accordance with the corrective action program.

EXTENT OF PROBLEM

The SGTS air accumulators (accumulator bank) function to store sufficient pneumatic energy for operation of the SGTS for the 30-day mission time. The source of pneumatic energy for the accumulators is from nonsafety-related compressed air cylinders and/or air compressor. Including valve SV-L-67 there are four solenoid-operated valves installed in the SGTS instrument air system. All of these valves are 3-way, 125-volt DC ASCO model NP8320A184E solenoid-operated valves.

SAFETY CONSEQUENCES

The condition posed no threat to public health and safety.

The SGTS air accumulator bank is safety-related, and the system design includes environmental qualification (mild environment) and seismic considerations. The accumulator bank is sized to store sufficient pneumatic energy for two complete actuations of the four SGTS air-operated supply and discharge dampers.

The air accumulator bank can be supplied by either or both of two Class II (non-essential) air sources: (1) compressed gas cylinders and related restraints, tubing, normally closed hand operated valves, safety valve, and pressure reducing device; and, (2) an air compressor, tubing, air dryer, and normally closed hand operated valves. Although these air sources are designed as Class II, the compressed gas cylinders and related tubing, valves, and pressure reducing device are installed and connected, are supported, and are adjacent to the accumulator bank, where the environment is mild during post-accident conditions. The compressed gas cylinders are removable and can be replaced by spare compressed gas cylinders.

In the event of an accident that could have occurred (i.e. during power operation or refueling) while the SGTS accumulator bank pressure decrease was greater than design, it would likely have been necessary to add compressed gas to the accumulator bank in order for the SGTS to fulfill the 30-day mission time. Compressed gas could have been added to the accumulator bank from the installed gas cylinders and/or after replacement of the gas cylinders with spare gas cylinders.

REPORTABILITY

This report was submitted in accordance with 10 CFR 50.73(a)(2)(i)(B) because SGTS instrument air system data indicated the accumulator pressure decrease was greater than 1.99 psi/day for a period that potentially existed on August 3, 2004 (about 6.6 psi/day at about 129 psig), and possibly earlier, when the leakage was about 6.6 psi/day (at about 129 psig) and the SGTS train 'A' was operated to maintain the drywell-torus atmosphere differential pressure. The accumulator bank pressure decrease was also greater than 1.99 psi/day on August 7, 2004 (beginning at 0406 hours for a 30.9 hour period) when the SGTS was not operated and the accumulator pressure decrease was about 6.2 psi/day (at about 129 psig). The August 3, 2004 leakage rate means that a 7-day Technical Specification 3.7.B.1 LCO for SGTS train 'B' should have been entered on August 3, 2004 and would have been exceeded on August 10, 2004.

This report was also submitted in accordance with 10 CFR 50.73(a)(2)(v)(D) because the condition could have prevented the fulfillment of the SGTS safety function if a design basis accident had occurred while the SGTS train 'A' was inoperable (August 10, 2004) and SGTS train 'B' operation would have been required during the subsequent 30-day mission time of the system.

SIMILARITY TO PREVIOUS EVENTS

A review was conducted of Pilgrim Station LERs issued since 2001. The review focused on LERs that involved a similar event or condition involving the SGTS or similar cause. The review identified no similar event or condition.

ENERGY INDUSTRY IDENTIFICATION SYSTEM (EIIS) CODES

The EIIS codes for this report are as follows:

COMPONENTS	CODES
Accumulator	ACC
Damper	DMP
Tubing	TBG
Valve (SV-L-67)	V
SYSTEMS	
Standby Gas Treatment System (SGTS)	BH