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Pilgrim Nuclear Power Station  
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Ralph A. Dodds, III  
Director, Nuclear Safety Assurance

December 31, 2012

U.S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, DC 20555-0001

SUBJECT: Licensee Event Report 2012-003-00, "Both Trains of Standby Gas Treatment System Inoperable"  
Pilgrim Nuclear Power Station  
Docket No. 50-293  
License No. DPR-35

LETTER NUMBER 2.12.095

Dear Sir or Madam:

The enclosed Licensee Event Report (LER) 2012-003-00, "Both Trains of Standby Gas Treatment System Inoperable" is submitted in accordance with 10 CFR 50.73.

This letter contains no commitments.

Please do not hesitate to contact Mr. Joseph R. Lynch, (508) 830-8403, if there are any questions regarding this submittal.

Sincerely,

Ralph A. Dodds, III

RAD/mew

Enclosure: Licensee Event Report (LER) 2012-003-00, "Both Trains of Standby Gas Treatment System Inoperable"

cc: Mr. William M. Dean  
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IEZZ  
NRR



Enclosure 1 to  
PNPS Letter 2.12.095  
Licensee Event Report 2012-003-00  
(5 Pages)

**LICENSEE EVENT REPORT (LER)**

Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the FOIA/Privacy Service Branch (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to [infocollects.resource@nrc.gov](mailto:infocollects.resource@nrc.gov), and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

**1. FACILITY NAME**  
Pilgrim Nuclear Power Station

**2. DOCKET NUMBER**  
05000293

**3. PAGE**  
1 OF 5

**4. TITLE**  
Both Trains of Standby Gas Treatment System Inoperable

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
10	31	2012	2012	003	00	12	31	2012	N/A	
									N/A	

**9. OPERATING MODE**  
N

**10. POWER LEVEL**  
100%

**11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)**

<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.73(a)(2)(i)(C)	<input type="checkbox"/> 50.73(a)(2)(vii)
<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)
<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.73(a)(2)(ii)(B)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)
<input type="checkbox"/> 20.2203(a)(2)(i)	<input type="checkbox"/> 50.36(c)(1)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)(A)
<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(iv)(A)	<input type="checkbox"/> 50.73(a)(2)(x)
<input type="checkbox"/> 20.2203(a)(2)(iii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(v)(A)	<input type="checkbox"/> 73.71(a)(4)
<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.46(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(v)(B)	<input type="checkbox"/> 73.71(a)(5)
<input type="checkbox"/> 20.2203(a)(2)(v)	<input type="checkbox"/> 50.73(a)(2)(i)(A)	<input checked="" type="checkbox"/> 50.73(a)(2)(v)(C)	<input type="checkbox"/> OTHER
<input type="checkbox"/> 20.2203(a)(2)(vi)	<input type="checkbox"/> 50.73(a)(2)(i)(B)	<input checked="" type="checkbox"/> 50.73(a)(2)(v)(D)	Specify in Abstract below or in NRC Form 366A

**12. LICENSEE CONTACT FOR THIS LER**

NAME: Joseph R. Lynch, Licensing Manager  
TELEPHONE NUMBER (Include Area Code): (508)-830-8403

**13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT**

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX
X	BH			Y	B	BH	37	A020	Y

**14. SUPPLEMENTAL REPORT EXPECTED**  
 Yes (If yes, complete 15. EXPECTED SUBMISSION DATE)  NO

**15. EXPECTED SUBMISSION DATE**

MONTH	DAY	YEAR

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

On Wednesday, October 31, 2012 at 1200 hours, with the reactor mode switch in RUN at approximately 100 percent core thermal power and steady state conditions, Standby Gas Treatment (SBGT) System Train "B" was removed from service (made inoperable) for surveillance testing.

At 1441 hours, the control room staff declared the SBGT System Train "A" inoperable as a result of an engineering analysis that determined that 480 VAC feeder breaker to Motor Control Center (MCC) B15 had the potential to exceed its trip set point under the worst case bus loading.

The inoperability of both SBGT System Trains "A" and "B" could have prevented the fulfillment of the safety functions to "control the release of radioactive material" and "mitigate the consequences of an accident".

At 1510 hours, a compensatory measure was taken to preclude the potential overload condition on MCC B15 and the SBGT System Train "A" was restored to operable status to fulfill the safety functions to "control the release of radioactive material" and "mitigate the consequences of an accident".

This event had no impact on the health and/or safety of the public.

**LICENSEE EVENT REPORT (LER)  
CONTINUATION SHEET**

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Pilgrim Nuclear Power Station	05000293	YEAR	SEQUENTIAL NUMBER	REV NO.	2 OF 5
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NARRATIVE

**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 10CFR 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 10CFR 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 (SBGTS), and (4) the Main Stack. The Reactor Building completely encloses the primary containment system which 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 start the SBGTS in the event of a postulated Loss of Coolant Accident (LOCA) inside the Drywell or a postulated fuel handling accident in the Reactor Building. The safety function of the SBGTS is to reduce the reactor building pressure to a minimum subatmospheric pressure of 0.25 inches of water to limit the ground level release to the environs of airborne radioactive materials so that offsite doses from a design basis fuel handling or loss of coolant accident (LOCA) will be below the guideline values stated in 10CFR 100. The SBGTS 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 SBGTS consists of ductwork and instrumentation and includes two full capacity, parallel air filtration train assemblies that are located outside the Reactor Building. Each filter train assembly includes an in-series air-operated supply damper, demister, an electrical heating circuit, high efficiency particulate absorber (HEPA), two charcoal filter beds, a final HEPA filter, exhaust fan, motor-operated adjustable damper, fixed back draft damper, and an 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.

Each train of the SBGTS contains an electrical heating circuit prior to the filters. The electric heating circuit is designed to reduce the relative humidity of the air stream to 70 percent. An interlock with its associated exhaust fan prevents the heating circuit from operating when the fan is shut down. The electric heating circuit has three sensors which monitor the electric current to the heating coils for proper operation. If any of the sensors detect inadequate heating of the air stream, the sensors initiate a fan shutdown.

Pilgrim Station Technical Specification 3/4.7.B.1 governs the operability requirements of the SBGTS. The specification requires that with certain exceptions, the SBGTS 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. If both trains are inoperable, the specification requires the reactor be in cold shutdown within 36 hours.

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**EVENT DESCRIPTION:**

On Wednesday, October 31, 2012 at 1200 hours, with the reactor mode switch in RUN at approximately 100 percent core thermal power and steady state conditions, Standby Gas Treatment (SBGT) System Train "B" was removed from service (made inoperable) for surveillance testing per procedure PNPS 8.M.3-18 "Standby Gas Treatment System Exhaust Fan Logic Test and Instrument Calibration". During the surveillance testing, the current sensor (overcurrent relay 37-1416A1) that monitors the electric heating circuit current did not sense the required current and initiated a SBGT Train "B" fan shutdown. Troubleshooting of the circuit was initiated.

At 1441 hours, the control room staff declared the SBGT System Train "A" inoperable as a result of an engineering analysis that determined that 480 VAC feeder breaker to Motor Control Center (MCC) B15 had the potential to exceed its trip set point under the worst case bus loading. The engineering analysis was initiated as a follow-up activity related to a condition previously identified in May 2012 by Condition Report (CR)-PNP-2012-02015. CR-PNP-2012-02015 documented that 480 VAC feeder breaker to MCC B14 had the potential to exceed its trip set point under the worst case bus loading when a third Reactor Building Closed Cooling Water (RBCCW) Loop "B" pump is started. The loading on MCC B15 was also reviewed for a similar problem. At that time, the potential was not recognized because the Y-1 "Instrument 120 VAC Power Supply Panel" (a bus load normally supplied by 480 VAC MCC B10) was not being powered by B15. In September 2012, a relay in Panel Y-11 "Automatic Transfer Switch" failed which caused Y-1 to transfer to MCC B15. Thus, a condition now existed that when a third RBCCW Loop "A" pump is started the 480 VAC feeder breaker to Motor Control Center (MCC) B15 had the potential to exceed its trip set point under the worst case bus loading. This adverse condition was identified during the subsequent engineering analysis identified above. CR-PNP-2012-04884 was issued to track this newly identified adverse condition.

The inoperability of both SBGT System Trains "A" and "B" could have prevented the fulfillment of the safety functions to "control the release of radioactive material" and "mitigate the consequences of an accident".

At 1510 hours, a compensatory measure was taken to preclude the potential overload condition on MCC B15 and the SBGT System Train "A" was restored to operable status.

SBGT Train "B" electric heating circuit overcurrent relay 37-1416A1 was replaced with a new relay. Post work testing per surveillance procedure PNPS 8.M.3-18 was completed satisfactorily. SBGT Train "B" was returned to normal standby status and declared operable at 2200 hours.

**CAUSE:**

The most probable cause of the SBGT Train "B" electric heating circuit failure to sense the required current during the surveillance test is attributed to a loose/intermittent connection between overcurrent relay 37-1416A1 and the relay socket.

The root cause of the 480 VAC feeder breaker to Motor Control Center (MCC) B15 having the potential to exceed its trip set point under the worst case bus loading was determined to be "The design limitations of the 480V AC distribution system have not been promulgated through to operational procedures, training, and all applicable design documents".

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**CORRECTIVE ACTIONS:**

The following immediate corrective actions were completed.

- SBGT Train "B" heating circuit overcurrent relay 37-1416A1 replaced with a new relay – 10/31/2012.
- A compensatory measure (Salt Service Water Pump "B" control switch placed in the "Pull-to-Lock" position) was taken to preclude the potential overload condition on MCC B15 – 10/31/2012.

The following subsequent corrective action was completed.

- Operating procedures were revised to preclude the simultaneous operation of three RBCCW pumps in Loop "A" or "B" – 11/5/2012

The following Corrective Action to Preclude Recurrence (CAPR) is scheduled for completion:

- Develop and complete an Engineering Change (EC) that includes the design limitations of the electrical distribution system into the design basis document. This EC shall address operating procedure changes and training related to the system limitations.

The corrective actions above and additional corrective actions are addressed in the Corrective Action Program.

**ASSESSMENT OF SAFETY CONSEQUENCES:**

The event posed no threat to public health and safety.

The event occurred during normal power operation while at 100 percent core thermal power with the reactor mode switch in the "RUN" position and steady state conditions.

The Standby Gas Treatment System (SBGTS) consists of ductwork and instrumentation and includes two full capacity, parallel air filtration train assemblies that are located outside the Reactor Building. Each train is capable of performing the safety function to reduce the reactor building pressure to a minimum subatmospheric pressure of 0.25 inches of water to limit the ground level release to the environs of airborne radioactive materials so that offsite doses from a design basis fuel handling or loss of coolant accident (LOCA) will be below the guideline values stated in 10CFR100.

The loose/intermittent electrical connection between overcurrent relay 37-1416A1 and the relay socket which caused the SBGT Train "B" to be inoperable had no affect on the SBGT Train "A".

The determination that 480 VAC feeder breaker to Motor Control Center (MCC) B15 had the potential to exceed its trip set point under the worst case bus loading condition challenged plant operation since the SBGT Train "A" was declared inoperable based on plant procedures not matching plant design. There was no direct nuclear safety significance because the procedures that allowed the start of a third RBCCW pump in a single loop were never used. Upon discovery of the condition, a compensatory measure was implemented to ensure that MCC B15 bus loading would remain below the feeder breaker trip set point. This restored the SBGT Train "A" to operable status. The duration that both SBGT trains were declared inoperable was minimal and well within the allowed LCO out of service time.

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During and prior to the event, the SGBT Train "A" was available to perform its required safety function.

All other Engineered Safeguard System functions were operable during this event. Since no system functions that contribute to Core Damage Risk were impacted, there was no change in Core Damage Frequency (CDF) as a result of this event.

**REPORTABILITY**

This report is submitted in accordance with 10 CFR 50.73(a)(2)(v)(C) – Loss of safety function to control the release of radioactive material and 10 CFR 50.73(a)(2)(v)(D) – Loss of safety function to mitigate the consequences of an accident.

**SIMILARITY TO PREVIOUS EVENTS:**

A review was conducted of previously issued Pilgrim LERs. The review focused on LERs that involved similar events where the SGBT System function was lost. This review identified similar events documented in LER 2010-002-00 "Standby Gas Treatment Declared Inoperable After Discovery of Open Demister Door" and LER 2004-005-00 "Standby Gas Treatment System Inoperable due to Pneumatic Accumulator Leakage Rate".

A review of the plant configuration during the years 2003 to 2012 (excluding outage periods when SGBTs was not required to be operable) was performed for instances occurring where the combination of SGBT Train "B" was inoperable and SGBT Train "A" could be potentially made inoperable by Y-1 "Instrument 120 VAC Power Supply Panel" being powered from MCC B15 (since without this load, the B15 supply breaker trip set point would not be exceeded by the start of a third RBCCW pump). No instances of this combination were found.

**ENERGY INDUSTRY IDENTIFICATION SYSTEM (EIIS) CODES:**

SYSTEMS	CODES
Emergency/Standby Gas Treatment System	BH

**REFERENCES:**

- Condition Report, CR-PNP-2012-02015 – Potential to overload and trip the 480 VAC Bus B14 Feeder Breaker
- Condition Report, CR-PNP-2012-04884 – Potential to overload and trip the 480 VAC Bus B15 Feeder Breaker
- Condition Report, CR-PNP-2012-04887 – During the performance of procedure PNPS 8.M.3-18, SGBT Train "B" tripped on undercurrent condition