Entergy

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

July 20, 2012

U.S. Nuclear Regulatory Commission
Attn: 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 2012-002-00, Manual Reactor Scram Due to Degraded Condenser Vacuum

LETTER NUMBER: 2.12.055

Dear Sir or Madam:

The enclosed Licensee Event Report (LER) 2012-002-00, " Manual Reactor Scram Due to Degraded Condenser Vacuum" 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,

R Dodds III

Ralph A. Dodds, III

WGL
Enclosure: Licensee Event Report 2012-02-00, "Manual Reactor Scram Due to Degraded Condenser Vacuum"

cc: Mr. William M. Dean
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USNRC Senior Resident Inspector
Pilgrim Nuclear Power Station

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NRR

Enclosure
Letter Number 2.12.055

Licensee Event Report 2012-002-00

"Manual Reactor Scram Due to Degraded Condenser Vacuum"
(4 Pages)

NRC FORM 366 (10-2010) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB: NO. 3150-0104 EXPIRES: 10/31/2013

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, 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.

LICENSEE EVENT REPORT (LER)

1. FACILITY NAME	2. DOCKET NUMBER	3. PAGE
Pilgrim Nuclear Power Station	05000293	1 OF 4

4. TITLE

Manual Reactor Scram Due to Degraded Condenser Vacuum

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
									N/A	
05	22	2012	2012	002	00	07	20	2012	FACILITY NAME: N/A	DOCKET NUMBER

9. OPERATING MODE

N

10. POWER LEVEL

35%

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

- [ ] 20.2201(b)
- [ ] 20.2201(d)
- [ ] 20.2203(a)(1)
- [ ] 20.2203(a)(2)(i)
- [ ] 20.2203(a)(2)(ii)
- [ ] 20.2203(a)(2)(iii)
- [ ] 20.2203(a)(2)(iv)
- [ ] 20.2203(a)(2)(v)
- [ ] 20.2203(a)(2)(vi)
- [ ] 20.2203(a)(3)(i)
- [ ] 20.2203(a)(3)(ii)
- [ ] 20.2203(a)(4)
- [ ] 50.36(c)(1)(i)(A)
- [ ] 50.36(c)(1)(ii)(A)
- [ ] 50.36(c)(2)
- [ ] 50.46(a)(3)(ii)
- [ ] 50.73(a)(2)(i)(A)
- [ ] 50.73(a)(2)(i)(B)
- [ ] 50.73(a)(2)(i)(C)
- [ ] 50.73(a)(2)(ii)(A)
- [ ] 50.73(a)(2)(ii)(B)
- [ ] 50.73(a)(2)(iii)
- [X] 50.73(a)(2)(iv)(A)
- [ ] 50.73(a)(2)(v)(A)
- [ ] 50.73(a)(2)(v)(B)
- [ ] 50.73(a)(2)(v)(C)
- [ ] 50.73(a)(2)(v)(D)
- [ ] 50.73(a)(2)(vii)
- [ ] 50.73(a)(2)(viii)(A)
- [ ] 50.73(a)(2)(viii)(B)
- [ ] 50.73(a)(2)(ix)(A)
- [ ] 50.73(a)(2)(x)
- [ ] 73.71(a)(4)
- [ ] 73.71(a)(5)
- [ ] OTHER

Specify in Abstract below or in NRC Form 366A

12. LICENSEE CONTACT FOR THIS LER

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

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

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX

14. SUPPLEMENTAL REPORT EXPECTED

[ ] Yes (If yes, complete 15. *EXPECTED SUBMISSION DATE*) [X] NO

15. EXPECTED SUBMISSION DATE

MONTH	DAY	YEAR

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

On Tuesday, May 22, 2012 at 1311 hours, with the reactor at approximately 35% core thermal power, during a planned power reduction to support thermal backwash of the main condenser, a manual reactor scram was inserted due to degrading main condenser vacuum. The direct cause of the degraded vacuum is attributed to loss of the Steam Jet Air Ejector (SJAE) inter-condenser loop seal due to a partially open SJAE steam supply valve (1-HO-163). The root cause of the 1-HO-163 valve being partially open was due to inadequate processing of an emergent work order related to the reach rod position indication versus the actual valve position.

Following the reactor scram, all rods were verified to be fully inserted and the Primary Containment Isolation System Group II (Reactor Building) and Group VI (Reactor Water Cleanup System) actuations occurred as designed due to the expected reactor water level shrink associated with the scram signal. Standby Gas Treatment System Train 'B,' which is designed to shutdown 65 seconds after the Group II signal is received if the Standby Gas Treatment Train 'A' is in service, continued to operate until manually secured. With this exception all other plant systems responded as designed.

This event had no impact on the health and/or safety of the public because emergency core cooling systems were operable and available to perform their required safety functions.

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NARRATIVE

BACKGROUND:

Thermal backwashes of the main condenser are routinely performed approximately 4 or 5 times a year to control macrofouling (primarily Blue Mussel growth) in the main condenser water boxes, the intake bays in the screen house and all piping associated with the Circulating (or Sea) Water System (CWS) using Pilgrim Procedure 2.2.94.5, "Main Condenser Backwash". In order to perform a thermal backwash, reactor power is reduced to approximately 50% and sea water from a single operating Circulating Water Pump is sent in the normal (forward) direction through half of the CWS and is redirected backwards through the idle pump's condenser water boxes by repositioning valves in the CWS. Once the backwash lineup is established, reactor power is carefully raised to achieve sufficiently high temperatures in the intake bay of the secured Circulating water pump (105-110°F for 40-45 minutes) to kill the blue mussels. The timing for a thermal backwash should coincide with high tide to obtain maximum coverage of hot water against elevated intake surfaces.

During the evolution, it is expected that the Main Condenser vacuum will be reduced due to the effect of the warmer circulating water flow through the main condenser.

Pilgrim Procedure 2.4.36, "Decreasing Condenser Vacuum", requires manual scram of the reactor to avoid automatic turbine trip, if the condenser vacuum approaches 20" Hg with no indications of recovering.

EVENT DESCRIPTION:

On Tuesday, May 22, 2012 at 1311 hours, with the reactor at approximately 35% core thermal power, during a planned power reduction to support thermal backwash of the main condenser, a manual reactor scram was inserted due to degrading main condenser vacuum. The direct cause of the degraded vacuum is attributed to loss of the Steam Jet Air Ejector (SJAE) inter-condenser loop seal due to a partially open SJAE steam supply valve (1-HO-163). The root cause of the 1-HO-163 valve being partially open was due to inappropriate processing of an emergent work order several months earlier to address a reach rod and valve position discrepancy on valve. The maintenance was inadequate to correct the position discrepancy resulting in a partially open valve.

Following the reactor scram, all rods were verified to be fully inserted and the Primary Containment Isolation System Group II (Reactor Building) and Group VI (Reactor Water Cleanup System) actuations occurred as designed due to the expected reactor water level shrink associated with the scram signal. Standby Gas Treatment System Train 'B,' which is designed to shutdown 65 seconds after the Group II signal is received if the Standby Gas Treatment Train 'A' is in service, continued to operate until manually secured. With this exception all other plant systems responded as designed.

As a result of the scram, the planned backwash was aborted. A complete backwash of both sides of the condenser water boxes was completed on June 25, 2012.

CAUSE:

The direct cause of the degraded vacuum is attributed to loss of the Steam Jet Air Ejector (SJAE) inter-condenser loop seal due to a partially open SJAE steam supply valve (1-HO-163).

The root cause of the 1-HO-163 valve being partially open was due to inadequate processing of an emergent work order related to the reach rod position indication versus the actual valve position.

The following direct and contributing causes are included in the Condition Report, CR-PNP-2012-2304:

- Main Condenser Vapor Valves-A direct cause of the event was the Operations practice of not closing the vapor valves whenever cooling water is secured to a main condenser quadrant.

  A contributing cause to this operational practice involved a latent procedure (PNPS 2.2.94.5) inadequacy with respect to the operational requirement contained within a caution statement to close the vapor valves.

- Main Condenser Parameter Stabilization- A direct cause of the event was not allowing main condenser parameters (hotwell temperature, vacuum, off-gas flow) to stabilize prior to securing from the back wash alignment.

  A contributing cause of the event was a latent procedural inadequacy with respect to the absence of steps/criteria to require hotwell temperatures to be below a certain value and lowering prior to opening the water box outlet valves.

- Ineffective Operating Experience (OE) Evaluation- A direct cause of the event was the unreliable operation of reach rod valve S-1-8 (1-HO-163).

  A contributing cause of this event was an ineffective Operating Experience evaluation conducted for INPO Operations and Maintenance Recommendation (O&MR) 433, "Inadequate Operation and Maintenance of Reach-Rod Operated Valves".

CORRECTIVE ACTIONS:

The following immediate corrective actions were completed.

- A caution tag was applied to 1-HO-163 stating to verify position locally when position is changed.
- Inspected and repaired as necessary the reach rods for the remaining SJAE and AOG jet compressors.
- Revised Pilgrim Procedure 2.2.94.5, Attachment 6 to include steps to close the vapor valves when the respective Seawater pump is secured and to establish hotwell parameters/trends in order to secure from a thermal backwash.

The following Corrective Actions to Preclude Recurrence (CAPR) are scheduled for completion:

- Incorporate into Pre-Outage Training a case study that will enforce the expectation for effective work order screening in accordance with the requirements for EN-WM-100, "Work Request (WR), Screening and Classification," based upon the lessons learned from this event.
- Review PM classification/schedules and establish PMs for all safety related and generation risk significant reach rod operated valves.
- Revise the remaining attachments of Pilgrim Procedure 2.2.94.5 to include steps to close the vapor valves when the respective Seawater pump is secured and to establish hotwell parameters/trends in order to secure from a thermal backwash.

Additional corrective actions are included in the Root Cause Evaluation Report.

SAFETY CONSEQUENCES:

There was no adverse impact to the general safety of the public, nuclear safety, industrial safety, or radiological safety. During and prior to the event all emergency core cooling systems were available. Following the event the residual heat removal system was available. Since no systems were impacted that contribute to Core Damage Risk, there was no appreciable change in Core Damage Frequency (CDF) as a result of this event. During the evolution a benchmark for condenser vacuum was set and properly executed. The manual scram was a conservative action taken in anticipation of reaching the low condenser vacuum automatic turbine trip setpoint. Reactor Scram was entered and successfully completed. With the exception of SBGT 'B' failure to automatically secure, the plant operated in accordance with design. SBGT 'B' failure to automatically secure had neither risk significance nor impact on the general safety of the public, since they would not have caused any nuclear safety, industrial safety or radiological safety issues.

This report is submitted in accordance with 10 CFR 50.73(a)(2)(iv)(A) based on the following. Prior to the manual reactor scram, the reactor was critical. Following the manual reactor scram, the Primary Containment Isolation System Group II (Reactor Building) and Group VI (Reactor Water Cleanup System) actuations occurred as designed due to the expected reactor water level shrink associated with the scram signal.

PREVIOUS EVENTS:

LER 1999-009-00: Pilgrim, Manual Reactor Scram Due to Degrading Main Condenser Vacuum On September 13, 1999, at 6:25 p.m., Pilgrim was manually scrammed from 27 percent power due to degrading condenser vacuum. The degrading condenser vacuum was caused by failure of the augmented off-gas (AOG) system train B condenser level control system in conjunction with an AOG air purge. The failure created a flow path for the purge gas to enter the main condenser. The 24 SCFM purge gas was greater than the capacity of the main condenser air ejector system to maintain condenser vacuum.

ENERGY INDUSTRY IDENTIFICATION SYSTEM (EIIS) CODES:

SYSTEMS	CODES
Condenser Vacuum System	SH

REFERENCES:

Condition Report, CR-PNP-2012-2304, Manual Reactor Scram due to Degrading Condenser Vacuum