Entergy Nuclear Operations, Inc.
Palisades Nuclear Plant
27780 Blue Star Memorial Highway
Covert, MI 49043
Tel 269 764 2000

Thomas P Kirwin
Acting Site Vice President

PNP 2011-052

June 16, 2011

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

SUBJECT: Licensee Event Report 2011-003, Potential Condition Prohibited by Technical Specifications due to Jacket Water Pump Seal Leakage

Palisades Nuclear Plant
Docket 50-255
License No. DPR-20

REFERENCES: 10 CFR 50.73

Dear Sir or Madam:

Licensee Event Report (LER) 2011-003 is enclosed. The LER describes the discovery of leakage from a jacket water pump seal on an emergency diesel generator. Due to ongoing evaluations, this LER is being conservatively submitted in accordance with 10 CFR 50.73(a)(2)(i)(B) as a condition prohibited by the plant's Technical Specifications.

This letter contains no new commitments and no revisions to existing commitments.

Sincerely,

D. HAMILTON for T.P. KIRWIN

TPK/TAD

Enclosure (1)

CC Administrator, Region III, USNRC
Project Manager, Palisades, USNRC
Resident Inspector, Palisades, USNRC

ENCLOSURE

LER 2011-003

POTENTIAL CONDITION PROHIBITED BY TECHNICAL SPECIFICATIONS DUE TO JACKET WATER PUMP SEAL LEAKAGE

3 Pages Follow

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

LICENSEE EVENT REPORT (LER)

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

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

Estimated burden per response to comply with this mandatory information 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 Records Management Branch (T-6 E6), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to bjs1@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 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	2. DOCKET NUMBER	3. PAGE
PALISADES NUCLEAR PLANT	05000255	1 OF 3

4. TITLE

Potential Condition Prohibited by Technical Specifications due to Jacket Water Pump Seal Leakage

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
04	18	2011	2011	- 003	- 00	06	16	2011	FACILITY NAME	DOCKET NUMBER

9. OPERATING MODE

1

10. POWER LEVEL

100

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

☐ 20.2201(b)	☐ 20.2203(a)(3)(i)	☐ 50.73(a)(2)(i)(C)	☐ 50.73(a)(2)(vii)
☐ 20.2201(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(c)(1)(i)(A)	☐ 50.73(a)(2)(iii)	☐ 50.73(a)(2)(ix)(A)
☐ 20.2203(a)(2)(ii)	☐ 50.36(c)(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 Specify in Abstract below or in NRC Form 366A
☐ 20.2203(a)(2)(vi)	☒ 50.73(a)(2)(i)(B)	☐ 50.73(a)(2)(v)(D)	

12. LICENSEE CONTACT FOR THIS LER

FACILITY NAME	TELEPHONE NUMBER (Include Area Code)
Terry Davis	(269) 764-2117

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
B	EK	DG	F010	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 March 7, 2011, the 1-2 emergency diesel generator (EDG) was removed from service for planned maintenance. The 1-2 EDG jacket water pump was replaced as part of the planned maintenance activities. On March 12, 2011, during the post-maintenance Technical Specifications (TS) surveillance testing, Entergy Nuclear Operations, Inc. (ENO) personnel discovered water leaking from the jacket water pump seal tell-tale drain, in intermittent volumes, at approximately one milliliter per minute. The subsequent operability evaluation determined that the leakage rate would not affect the operability status of the EDG. On March 13, 2011, 1-2 EDG was returned to operable status.

On April 18, 2011, during the 1-2 EDG monthly TS surveillance test, increased leakage from the jacket water pump seal tell-tale drain hole was identified. The leakage was subsequently quantified at a rate of approximately ten milliliters per minute. Possible causes of the leakage are a manufacturing defect, damage to the pump seal during the manufacturing assembly process, damage during transport, or during the installation process.

Due to the leakage rate rise, on April 21, 2010, ENO concluded additional detailed evaluations were required to maintain reasonable assurance the 1-2 EDG would be able to operate satisfactorily for the required thirty-day mission time. Without reasonable assurance of past operability, this condition is reportable in accordance with 10 CFR 50.73(a)(2)(i)(B) as a condition prohibited by TS.

Due to the ongoing evaluation of the condition, ENO may request a cancellation of this LER, or a supplement will be submitted to provide additional details.

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
PALISADES NUCLEAR PLANT	05000255	2011	- 003 -	00	2 OF 3

PLANT CONDITIONS

The plant operated at approximately 100% power between March 7, 2011, and April 22, 2011, except for a period between March 15, 2011, and March 18, 2011, when reactor power was lowered to approximately 52% for unrelated equipment testing.

EVENT DESCRIPTION

The EDG system [EK] is comprised of two independent, physically separate, full capacity diesel generators [DG] which consist of a diesel engine [ENG], its auxiliary systems and a class 1E generator unit [GEN]. The diesel engines, manufactured by Fairbanks Morse, are 18 cylinder turbocharged ALCO model 251F engines.

On March 7, 2011, the 1-2 EDG was removed from service for planned maintenance. The 1-2 EDG jacket water pump [P] was replaced with a refurbished jacket water pump as part of the planned maintenance activities due to a previously identified small oil seal leak.

The jacket water pump is a gear driven centrifugal pump that is in continuous operation during diesel engine operation. A mechanical water seal is located between the impeller and stationary seal plate and an oil seal is located on the radial bearing in the bearing frame. A slinger ring is located between the water and oil seals. Fluid leaking past either seal is thrown off by the slinger ring and drains from a tell-tale hole.

On March 12, 2011, during the post-maintenance Technical Specifications (TS) surveillance testing, Entergy Nuclear Operations, Inc. (ENO) personnel discovered water leaking from the jacket water pump seal tell-tale drain hole, in intermittent volumes, at approximately one milliliter per minute. An operability evaluation determined that the leakage rate did not affect the operability of the EDG. On March 13, 2011, following satisfactory completion of TS surveillance testing, 1-2 EDG was returned to operable status.

On March 22, 2010, after completion of required special testing of the 1-2 EDG, a small amount of water leakage from the jacket water pump seal tell-tale drain hole was identified and recorded in the subsequent TS surveillance test. The leakage was not quantified at that time. On March 22, 2011, following satisfactory completion of TS surveillance testing, 1-2 EDG was returned to operable status.

On April 18, 2011, during routine monthly TS surveillance testing, increased leakage from the jacket water pump seal tell-tale drain hole was identified. The leakage was subsequently quantified at a rate of ten milliliters per minute. On April 21, 2011, due to the rise in leakage rate, ENO concluded additional detailed evaluations were required to maintain reasonable assurance the 1-2 EDG would be able to operate satisfactorily for the required thirty-day mission time. Without reasonable assurance of past operability, this situation is reportable in accordance with 10 CFR 50.73(a)(2)(i)(B) as a condition prohibited by TS.

On April 23, 2011, following replacement of the jacket water pump and satisfactory completion of TS surveillance testing, 1-2 EDG was returned to operable status.

Due to the ongoing evaluation of the condition, ENO may request a cancellation of this LER, or a supplement will be submitted to provide additional details.

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
PALISADES NUCLEAR PLANT	05000255	2011	- 003	- 00	3 OF 3

CAUSE OF THE EVENT

A failure mode analysis identified several potential manufacturing defects that could have caused this pump seal failure. These include:

- Particles embedded in the rotating seal face
- Seal faces not flat
- Broken rotating face
- Chipping of rotating face caused by seal faces sticking
- Rubber shaft and or stationary face gasket failure

Other potential causes of the leakage are pump seal damage during manufacturer assembly, damage during transport or during the installation process.

CORRECTIVE ACTIONS TAKEN

The leaking jacket water pump was replaced.

CORRECTIVE ACTIONS TO BE TAKEN

A review of the procurement testing criteria for the pump will be performed to ensure adequacy and if necessary, revised.

Final corrective actions have not been determined. One proposed corrective action includes installing the leaking jacket water pump in a test loop, operating the pump for thirty days at rated speed and capacity, measuring the water leakage rate from the pump seal over the thirty-day required mission time, and the development of a report documenting the results of the test and supporting calculations. The pump could then be disassembled, inspected, the findings documented and a follow-up analysis of the as-found data performed.

If the decision is made to forgo the thirty-day test operation, a proposed alternate corrective action would be to return the jacket water pump to the manufacturer for disassembly, inspection and analysis to determine the failure mechanism.

Due to the ongoing evaluation of the condition, ENO may request a cancellation of this LER, or a supplement will be submitted.

ASSESSMENT OF SAFETY CONSEQUENCES

An assessment of the safety significance is ongoing. ENO may request a cancellation of this LER, or a supplement will be submitted to include an assessment of the safety significance of the condition.