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December 4, 2002
NL-02-150

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Mail Stop O-P1-17
Washington, D.C. 20555-0001

SUBJECT: Indian Point Nuclear Power Plant Unit 2
Docket No. 50-247
License No. DPR-26
Licensee Event Report # 2002-006-00
**Two of Three Emergency Diesel Generators Inoperable Due to
Component Failures; A Condition Prohibited by Technical Specifications**

Dear Sir:

The attached Licensee Event Report (LER) 2002-006-00 is hereby submitted in accordance with the requirements of 10 CFR 50.73. This event is of the type defined in 10CFR50.73(a)(2)(i)(B) and 10 CFR 50.73(a)(2)(v)(D), for events recorded in Entergy's corrective action process as Condition Report CR-IP2-2002-09072 and CR-IP2-2002-09083.

Entergy is making no new commitments in this LER.

Sincerely yours,

A handwritten signature in cursive script that reads "Fred Dacimo".

Fred Dacimo
Vice President - Operations
Indian Point 2

cc: See next page

IE22

cc: Mr. Hubert J. Miller
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Estimated burden per response to comply with this mandatory information collection request. 50 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

LICENSEE EVENT REPORT (LER)

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

1 FACILITY NAME Indian Point Unit 2	2 DOCKET NUMBER 05000- 247	3 PAGE 1 OF 5
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4 TITLE
Two of Three Emergency Diesel Generators Inoperable Due to Component Failures; a Condition Prohibited by Tech Specs

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MO	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO	MO	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
10	09	2002	2002	006	00	12	04	2002	FACILITY NAME	DOCKET NUMBER
										05000
										05000

9. OPERATING MODE 1	11 THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 6. (Check all that apply)									
10. POWER LEVEL 100	20 2201(b)		20.2203(a)(3)(II)		50 73(a)(2)(II)(B)		50 73(a)(2)(IX)(A)			
	20 2201(d)		20.2203(a)(4)		50 73(a)(2)(III)		50.73(a)(2)(X)			
	20 2203(a)(1)		50.36(c)(1)(I)(A)		50 73(a)(2)(V)(A)		73.71(a)(4)			
	20.2203(a)(2)(I)		50.36(c)(1)(II)(A)		50 73(a)(2)(V)(A)		73.71(a)(5)			
	20 2203(a)(2)(II)		50.36(c)(2)		50.73(a)(2)(V)(B)		OTHER			
	20.2203(a)(2)(III)		50.46(a)(3)(II)		50 73(a)(2)(V)(C)		Specify in Abstract below or in NRC Form 366A			
	20.2203(a)(2)(IV)		50.73(a)(2)(I)(A)		X 50 73(a)(2)(V)(D)					
	20 2203(a)(2)(V)		X 50.73(a)(2)(I)(B)		50.73(a)(2)(VII)					
20 2203(a)(2)(VI)		50 73(a)(2)(I)(C)		50 73(a)(2)(VIII)(A)						
20 2203(a)(3)(I)		50.73(a)(2)(II)(A)		50 73(a)(2)(VIII)(B)						

12. LICENSEE CONTACT FOR THIS LER

NAME Tom McCaffrey, System Engineering Supervisor	TELEPHONE NUMBER (Include Area Code) (914) 734-5782
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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
X	EK	65	W290	Y	X	EK	ENG	A152	Y

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

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

On October 9, 2002, at 1518 hours, a controlled shutdown commenced per Technical Specification (TS) 3.0.1. TS 3.0.1 was entered because Emergency Diesel Generators (EDG) 21 and 23 were declared inoperable. EDG 23 was declared inoperable on October 8, 2002, at 2152 hours, due to a failure of monthly surveillance test PT-M21C. EDG 23 failed the test due to unexpected load swings. Testing of the remaining EDGs per TS identified that EDG 21 had jacket water in a cylinder leak-off line to the fuel oil drip tank. Thermograph inspection confirmed that EDG 21 had a cylinder breach and it was declared inoperable at 1359 hours. TS require three operable EDGs during power operation with a 7 day allowed outage time (AOT) for one inoperable EDG. As a result of two inoperable EDGs, TS 3.0.1 was entered. Reactor power was reduced to approximately 97% when at 1635 hours, EDG 23 was declared operable and TS 3.0.1 was exited. Potential causes of EDG 23 inoperability were identified but no specific cause could be determined. An Operability Determination concluded the 23 EDG was operable. The cause of EDG 21 inoperability was an internal defect to the 3L piston power head. Corrective actions included increased testing of the 23 EDG, and replacement of EDG 21 engine powerhead. The event had no effect on public health and safety.

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NARRATIVE (If more space is required, use additional copies of NRC Form 366A) (17)

DESCRIPTION OF EVENT

Note: The Energy Industry Identification System Codes are identified within the brackets {}

On October 9, 2002, at 1500 hours, operations entered Technical Specification (TS) 3.0.1. and commenced plant shutdown. At 1518 hours, reactor shutdown was initiated by inserting control Bank D {AA} two steps to lower reactor coolant system {AB} average temperature. TS 3.0.1 was entered because Emergency Diesel Generators (EDG){EK} 21 and 23 were declared inoperable. TS 3.7 requires three operable EDGs during power operation with a 7 day allowed outage time (AOT) for one inoperable EDG. EDG 23 was declared inoperable on October 8, 2002, at 2152 hours, due to a failure of monthly surveillance test PT-M21C. While performing the test, the operator was unable to successfully complete the test due to unexpected load swings while the EDG was connected to its assigned 480 VAC bus 6A {ED} in the parallel mode. The operator realized that the load swings were not the expected response and terminated the test by tripping the EDG using the emergency stop button. The inoperable EDG 23 was recorded in the corrective action program (CAP) as condition report CR-IP2-2002-09072. As a result of the inoperable EDG 23, testing of the remaining two EDGs was initiated in accordance with TS 3.7.B. During the testing of EDG 21, operations discovered that the EDG 21 fuel oil (FO) drip tank overflowed and the jacket water (JW) {LB} expansion tank had dropped to approximately 20 percent. The condition was recorded in the CAP as condition report CR-IP2-2002-09083. Troubleshooting of EDG 21 revealed engine {ENG} JW in a cylinder leak-off line to the drip tank. System Engineering (SE) identified a defect in one of the EDG 21 powerheads. Thermographic inspection of the powerhead tell-tales confirmed a comparative temperature spike in the tell-tale of cylinder 3L, which was subsequently verified as the breached head. Based on Engineering's findings, operations declared EDG 21 inoperable at 1359 hours.

Immediate post troubleshooting runs could not duplicate the anomaly with EDG 23. Active surveillance of the input and output signals to the electronic governor control (EG-A) demonstrated expected results with the EDG operating in three specified modes (unloaded Unit/Parallel, loaded parallel). Based on troubleshooting results and recommendations from the manufacturer, SE concluded the most probable cause was increased resistance at the Unit/Parallel relay, which could defeat actuation of the parallel circuitry within the EG-A. A breakdown of the Unit/Parallel circuitry within the EG-A remained a potential cause. On October 9, 2002, following troubleshooting and testing, SE prepared operability determination OD-02-003 and EDG 23 was declared operable (OD-02-003) at 1635 hours, at which time TS 3.0.1 was exited. The shutdown per TS 3.0.1 reduced reactor power to approximately 97%. To ensure the assessment accounted for the anomaly in EDG 23, OD-02-003 increased monitored surveillance to weekly on an interim basis.

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On October 10, EDG 21 cylinder head 3L replacement was completed and after testing, EDG 21 was returned to service. The EDG 21 3L piston and cylinder were inspected for potential damage from water intrusion. An inspection of the piston crown and cylinder liner revealed no evidence of water intrusion or damage. Samples of lube oil were analyzed for JW content and the analysis results were negative. Each EDG engine has 16 identical and separate powerheads (16 cylinders). A defect in one cylinder will not affect the integrity of other cylinders. EDG 21 post maintenance testing found all functional parameters within expected range. All cylinder leak-off lines were checked for excessive temperatures and FO drip tank spoils checked for JW intrusion. JW inventory remained steady.

Based on the findings, the balance of the engine powerheads was determined to be free of a similar defect. Engineering review of the running parameters for EDG 22 and EDG 23 found these EDGs to be within normal operating parameters, with no noted loss of JW inventory, and the FO drip spoils had no JW. Accordingly, EDG 22 and EDG 23 were determined to be free of powerhead leakage discovered on EDG 21.

On October 24, at 0933 hours, TS 3.7.B.1.a was entered for EDG 23 to perform test PT-M21C per the increased surveillance activities of OD-02-003. During the test, the anomaly with EDG 23 was again demonstrated. Testing showed that the output signals from the electronic governor control (EG-A) fluctuated uncontrolled thereby demonstrating that the EG-A was defective. Per the TS, with EDG 23 inoperable, operability runs of EDG 21 and 22 were performed. EDG 21 and 22 successfully completed their operability runs and did not demonstrate similar failures from their electronic governor control (EG-A). On October 24 a contingency Work Order was implemented and the EG-A for EDG 23 was replaced. EDG 23 was returned to service after successful testing on October 25, 2002.

The failed electronic governor control {65} for EDG 23 is a Woodward Governor Company {W290} EG-A, serial No. 830056. The 21 EDG {DG} engine {ENG} containing cylinder head 3L is an ALCO {A152}, Model 16-251-E.

CAUSE OF EVENT

The cause of the reportable condition was two inoperable Emergency Diesel Generators (EDG-21 and EDG-23). Two inoperable EDGs would prevent the onsite emergency AC power source from meeting its system safety function of providing minimum design emergency power to required safety loads with a loss of offsite power and safety injection actuation. The cause of the inoperability of EDG 23 was a defective electronic governor control (EG-A). The cause of the inoperability of EDG 21 was a defect of the powerhead of cylinder 3L which breached the powerhead's internal cooling labyrinths and provided a pathway to a powerhead drain cavity utilized for FO weepage. The EG-A and cylinder head are being evaluated (EFE) for the cause of the failures.

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CORRECTIVE ACTIONS

The following corrective actions have been or will be performed under the CAP to address the causes of this event and prevent recurrence.

1. OD-02-003 was prepared concluding EDG 23 was operable on October 9, 2002, and a weekly monitored surveillance action implemented on an interim basis. The increased monitoring action was terminated when the EG-A was determined to be defective on October 24, 2002.
2. The 23 EDG electronic governor control EG-A was replaced on October 24, 2002, and EDG 23 was returned to service after successful testing on October 25, 2002.
3. The EDG 21 3L cylinder head was replaced and EDG 21 returned to service after successful testing on October 10, 2002.
4. The defective 23 EDG EG-A was sent to an independent laboratory for an equipment failure evaluation (EFE). Upon completion of the EFE, System Engineering will assess the EFE report and any root cause identified and provide recommendations. Scheduled completion is January 15, 2003.
5. The defective 21 EDG powerhead was sent to an independent laboratory for an EFE. Upon completion of the EFE, System Engineering will assess the EFE report and any root cause identified and provide recommendations. Scheduled completion is January 30, 2003.

EVENT ANALYSIS

The event is reportable under 10 CFR 50.73 (a) (2) (i) (B), any operation or condition prohibited by the plant's TS. Reportability per NUREG-1022 indicates that any entry into STS 3.0.3 or its equivalent (TS 3.0.1) should be considered operating in a condition prohibited by TS if it is not exited within one hour. This event is also reportable under 10CFR50.73(a)(2)(v)(D), any event or condition that could have prevented the fulfillment of the safety function of structures or systems that are needed to; (D) mitigate the consequences of an accident, i.e., as a safety system functional failure (SSFF). The on-site AC power supply requires two operable EDGs to perform the safety function. On October 9, only EDG 22 was operable for two (2) hours and thirty six minutes (36). A four (4) hour non-emergency notification per 10CFR50.72(b)(2)(i) was provided to the NRC (Event No. 39264) for initiation of a plant shutdown required by the plant's TS. At 1518 hours, plant shutdown was initiated by inserting control rod bank D two steps followed by turbine load decrease at 1521 hours. Reactor power was reduced to approximately 97 percent when at 1635 hours, EDG 23 was declared operable and TS 3.0.1 was exited.

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PAST SIMILAR EVENTS

A review of previous Licensee Event Reports (LER) in the past three years for multiple EDGs out of service identified LER 2002-001. Two EDGs were unavailable as a result of mistakenly actuating the over speed trip lever for EDG 21 while EDG 23 was being tagged out as part of a planned maintenance. The corrective actions for LER 2002-001 did not prevent this event because LER 2002-001 was due to human error while the cause of this event was equipment failure.

EVENT SAFETY SIGNIFICANCE

This event had no significant effect on the health and safety of the public. There were no actual safety consequences for the event because there were no conditions or events requiring the standby emergency AC power (i.e., EDGs). Normal offsite power was available and providing power in accordance with TS requirements.

There were no significant potential safety consequences of this event under reasonable and credible alternative conditions (i.e., loss of offsite power requiring the EDGs). A risk assessment of the condition concluded that it was insignificant. Assuming a condition with two EDGs simultaneously inoperable, the Conditional Core Damage Frequency (CCDF) was determined to be $2.14E-4$ /year. Using the two (2) hour, thirty six (36) minute duration when both EDG 21 and EDG 23 were declared to be inoperable gave a Conditional Core Damage Probability (CCDP) of $6.35E-8$ ($2.14E-4$ /yr x 2.6 hrs/8760 hrs/yr). The CCDP of $6.35E-8$ is well below the quantitative screening criteria of $1E-6$ and is therefore considered non-risk significant.