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U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO. 3150-0104
EXPIRES: 8/31/88

APR 22 1987

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Perry Nuclear Power Plant, Unit 1	0 5 0 0 0 4 4 0	1 OF 0 4

TITLE (4)

Degraded Solenoid Valves Result In Inoperable Diesel Generators

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 NAMES	DOCKET NUMBER(S)
0 2	2 7	8 7	8 7	0 0 9	0 0	0 3	2 7	8 7		0 5 0 0 0
										0 5 0 0 0

OPERATING MODE (9): 5

POWER LEVEL (10): 0 2 9

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)

20.402(b)	20.405(c)	X 50.73(a)(2)(iv)	73.71(b)
20.405(a)(1)(i)	50.36(c)(1)	X 50.73(a)(2)(v)	73.71(c)
20.405(a)(1)(ii)	50.36(c)(2)	X 50.73(a)(2)(vii)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
20.405(a)(1)(iii)	50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	
20.405(a)(1)(iv)	50.73(a)(2)(ii)	50.73(a)(2)(viii)(B)	
20.405(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(x)	

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER
Gregory A. Dunn, Compliance Engineer, ext. 6484	AREA CODE 2 1 6 2 5 9 - 3 7 3 7

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	
E	L C	F S V	T 2 7 4	N							
X	L C	F G	T 2 7 4	N							

SUPPLEMENTAL REPORT EXPECTED (14)

		EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
	X NO				

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

On February 27, 1987 at 1905, a failure of two control air solenoid valves rendered Division I and II Diesel Generators (DG) inoperable. In addition at 0100 on February 28, 1987 while returning Division I Diesel Generator to standby status an unexpected autostart of the Diesel Generator Building Ventilation System occurred. The two control air solenoids were discovered failed during the performance of Diesel Generator testing. The valves were replaced and the Diesel Generators retested satisfactorily by 0142 on February 28.

No conclusive cause of failure for the solenoid valves could be identified. Both leaking solenoid valves had previously been identified for replacement due to leakage, with work requests initiated but not yet implemented. The cause of the immediate DG failures was the accelerated degraded condition of the leaking solenoid valves. At discovery, the conditions were evaluated not to require immediate action, thus expeditious replacement did not occur.

To prevent recurrence, the administrative procedure for DG reports and records will be revised to require a review of DG work orders to ensure the appropriate priority is assigned. Additionally, an evaluation will be performed to better define the service life for the air control solencid valves.

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MAY 14 '87

NRC Form 366
(9-83)

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
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Perry Nuclear Power Plant, Unit 1	0 5 0 0 0 4 4 0	8 7	— 0 0 9	— 0 0	0 2 OF 0 4

TEXT (If more space is required, use additional NRC Form 366A's) (17)

On February 27, 1987 at 1905, a failure of two control air solenoid valves rendered Division I and II Diesel Generators (DG) inoperable. In addition, at 0100 on February 28, 1987 while returning Division I Diesel Generator to standby status after maintenance, an unexpected autostart of the Diesel Generator Building Ventilation System (DGBVS)[VJ] supply fan [FAN] for the Division I Diesel Generator occurred. At the time of these events, the plant was in Operational Condition 1 (Power Operation) with reactor thermal power approximately 29% of rated. Reactor coolant temperature was approximately 510 degrees and reactor vessel [RPV] pressure was approximately 935 psig.

On February 27, 1987 a Special Test Instruction (SXI-0007) "Diesel Generator Start on a Single Admission Valve-Division I" was being performed to demonstrate the diesel generator ability to start on a single starting air admission valve. During performance of the test the generator field did not flash. The failure to flash was believed to be due to the special configuration required by the SXI, and the Diesel Generator was still considered operable. Subsequently, the Division I Diesel Generator was stopped and restarted in accordance with the System Operating Instruction (SOI)-R43 "Division I and II Diesel Generator System" to verify operability. At 1708 the Division I Diesel Generator did not perform as expected by the SOI and was declared inoperable because the field did not flash until approximately 2 minutes after starting. Troubleshooting of the failure was initiated immediately.

Technical Specification 3.8.1.1 action statement b. requires demonstration of operability of the remaining OPERABLE diesel generators by performing Surveillance Requirements 4.8.1.1.2 a.4 and 4.8.1.1.2.a.5 separately for each diesel generator within 24 hours. At 1738 Surveillance Instruction (SVI)-R43-T1318 "Diesel Generator Start and Load Division II" was initiated. The Division II Diesel Generator also failed the SVI due to an overspeed trip and subsequent failure of its field to flash. The Division II Diesel Generator was declared inoperable at 1905.

Troubleshooting of the Division I/II DG identified the problem as excessive air leakage past the 3 way energized air solenoid valves (Delaval Part #F-586-061: Humphrey Products Model No. T0G2E1-3-10-35). The valves were replaced and surveillance testing initiated. At 2234 on February 27 and 0142 on February 28 the Surveillances were completed on Division I and II Diesel respectively. Division 1 was declared operable at 0135 and Division II at 0345 on February 28, 1987. The cause of the overspeed trip on Division II was due to an inproper adjustment of the mechanical governor. This incorrect adjustment was not considered as a factor in Operability and was subsequently readjusted on March 14, 1987. Additionally at 0100 while securing the Division I Diesel Generator following its surveillance run, a DGBVS (Division 1) supply fan autostarted unexpectedly.

The cause of the DGBVS is believed to be a result of electrical noise within the tachometer circuitry. Substantial troubleshooting and investigation has been performed on previous similar events (see Licensee Event Reports 86-019, 86-031, 86-042 and 86-082).

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TEXT (If more space is required, use additional NRC Form 366A's) (17)

No conclusive cause of failure for the solenoid valves could be identi ied. The valve manufacturer was contacted and responded that failures seldom occurred and that the most common failure developed when the poppets, made from BUNA-N, were subjected to an incompatible lubricant or excessive heat. These valves are subjected to temperatures near the upper end of the qualified operating range and are continuously energized. These factors are believed to eventually cause degradation of the material within the valve resulting in air leakage and eventual failure. Both leaking solenoid valves had previously been identified for replacement due to leakage, with work requests initiated but not yet implemented. In addition, several Surveillance Tests had been run successfully subsequent to identifying the leaking valves. The cause of the immediate diesel failures was the accelerated degraded condition of the leaking solenoid valves. At discovery, the conditions were evaluated not to require immediate action, thus expeditious replacement did not occur. Subsequently it was determined that the control air pressure regulators which supply air to these solenoid valves were malfunctioning and may have contributed to the diesel failure (Delaval Part #F-579-061; Bellofram Model No. 241-960-069 Type 50). 8171

The Standby Diesel Generator System provides an independent source of AC power to the Division 1, 2, 3 Class 1E buses in the event of loss of the redundant offsite power supply. During the time period Class 1E Power was available from at least two physically independent circuits from the transmission network to the onsite electric distribution system. Additionally, the High Pressure Core Spray diesel generator and system were verified operable during this timeframe. However, the event is considered safety significant because the loss of Division I and II backup power supplies results in conditions outside of the design basis under certain accident scenarios. No previous similar events were identified.

The following corrective actions have been or will be completed to prevent recurrence:

1. Those diesel generators air control solenoid valves which have been in service and continuously energized for over 6 months will be replaced.

2. Plant Administrative Procedure (PAP)-1705 "Diesel Generator Reports and Records" will be revised to require a periodic review of diesel generator work order priorities with the Work Review Committee to ensure the appropriate work priority is assigned.

3. An engineering evaluation will be performed to establish a better defined service life for the air control solenoid valves.

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4. A design review will be conducted to minimize the application of continuously energized solenoid valves in the diesel generator control air panel and to evaluate replacement of solenoid valves containing BUNA-N material with Viton material.

5. An engineering design change will be implemented to upgrade the control tachometer.

6. The failed control air solenoid valves will be returned to the vendor for performance of failure analysis.

Energy Industry Identification Systems Codes are identified in the text as [XX].

THE CLEVELAND ELECTRIC ILLUMINATING COMPANY

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MURRAY R. EDELMAN
SR. VICE PRESIDENT
NUCLEAR

March 27, 1987
PY-CEI/NRR-0620 L

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

Perry Nuclear Power Plant
Docket No. 50-440
LERs 87-009-00 and 87-010-00

Dear Sir:

Enclosed are Licensee Event Reports 87-009-00 and 87-010-00 for the Perry Nuclear Power Plant.

Very truly yours,

Murray R. Edelman
Senior Vice President
Nuclear Group

MRE:njc

Enclosure: LERs 87-009-00 and 87-010-00

cc: Paul Leech
K. Connaughton

U.S. Nuclear Regulatory Commission
799 Roosevelt Road
Glen Ellyn, IL. 60137

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