



Illinois Power Company
Clinton Power Station
P.O. Box 678
Clinton, IL 61727
Tel 217 935-5623
Fax 217 935-4632

Wilfred Connell
Vice President

U-602652
2C 220
WC-332-96
October 30, 1996

Docket No. 50-461

10CFR50.73

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

Subject: Clinton Power Station - Unit 1
Licensee Event Report No. 96-011-00

Dear Sir:

Enclosed is Licensee Event Report No. 96-011-00: Priming of Emergency Diesel Generators During Performance of Certain Surveillance Tests Determined to be Preconditioning. This report is being submitted in accordance with the requirements of 10CFR50.73.

Sincerely yours,

Wilfred Connell
Vice President

MRS/csm

Enclosure

cc: NRC Clinton Licensing Project Manager
NRC Resident Office, V-690
Regional Administrator, Region III, USNRC
Illinois Department of Nuclear Safety
INPO Records Center

JE221

9611050319 961030
PDR ADDCK 05000461
S PDR

050014

LICENSEE EVENT REPORT (LER)

(See reverse for required number of
digits/characters for each block)ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS MANDATORY
INFORMATION COLLECTION REQUEST: 60.0 HRS. REPORTED LESSONS
LEARNED ARE INCORPORATED INTO THE LICENSING PROCESS AND FED BACK
TO INDUSTRY. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE
INFORMATION AND RECORDS MANAGEMENT BRANCH (T-8 F33), U.S.
NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND
TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF
MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1)

Clinton Power Station

DOCKET NUMBER (2)

05000461

PAGE (3)

1 OF 5

TITLE (4)

Priming of Emergency Diesel Generators During Performance of Certain Surveillance
Tests Determined to be Preconditioning

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 NAME	DOCKET NUMBER
10	02	96	96	011	00	10	30	96	None	05000
									FACILITY NAME	DOCKET NUMBER
									None	05000
OPERATING MODE (9)			THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)							
4			20.2201(b)			20.2203(a)(2)(v)		<input checked="" type="checkbox"/>	50.73(a)(2)(i)	50.73(a)(2)(viii)
POWER LEVEL (10)			20.2203(a)(1)			20.2203(a)(3)(i)			50.73(a)(2)(ii)	50.73(a)(2)(x)
		0	20.2203(a)(2)(i)			20.2203(a)(3)(ii)			50.73(a)(2)(iii)	73.71
			20.2203(a)(2)(ii)			20.2203(a)(4)			50.73(a)(2)(iv)	OTHER
			20.2203(a)(2)(iii)			50.36(c)(1)			50.73(a)(2)(v)	Specify in Abstract below or in NRC Form 366A
			20.2203(a)(2)(iv)			50.36(c)(2)			50.73(a)(2)(vii)	

LICENSEE CONTACT FOR THIS LER (12)

NAME

J. C. Golding, Engineer

TELEPHONE NUMBER (Include Area Code)

(217) 935-8881, Extension 4049

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

SUPPLEMENTAL REPORT EXPECTED (14)

EXPECTED
SUBMISSION
DATE (15)

MONTH DAY YEAR

YES
(If yes, complete EXPECTED SUBMISSION DATE).☒ NO

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

On October 2, 1996, Illinois Power determined that the emergency diesel generator (EDG) surveillance test procedures written to satisfy Technical Specification Surveillance Requirements (SR) 3.8.1.7, 3.8.1.12, and 3.8.1.19 were inadequate. The surveillance procedures contained a prerequisite to prime the EDGs prior to performing the required test and did not restrict the amount of barring over the EDGs. Investigation determined that a degraded condition could be masked by priming the EDGs prior to performance of these surveillances. The cause of the use of the fuel oil priming pump to prime the EDGs has been attributed to failure to adequately evaluate the effect of priming the EDGs when resolving a condition report. The cause of the excessive barring of the emergency diesel generator was a lack of guidance in the surveillance procedures on what is the maximum amount of barring that should be allowed. Corrective action for this event includes revising the appropriate surveillance procedures, reviewing all other EDG surveillance procedures for other steps that may precondition the EDGs, and briefing appropriate plant personnel on this event.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Clinton Power Station	05000461	96	011	00	2 OF 5

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

DESCRIPTION OF EVENT

During an Operational Safety Team Inspection (OSTI) at Clinton Power Station (CPS), a concern was raised with the practice of priming the emergency diesel generator's [DG] fuel system [EK] by excessively barring the engine and by using the fuel oil priming pump to prime the fuel system prior to performing the emergency diesel generator "quick-start" surveillance test for each of the three emergency diesel generators. This surveillance test is required to be performed at least once per 184 days by Technical Specification Surveillance Requirement (SR) 3.8.1.7. The acceptance criteria for this SR requires that each emergency diesel generator start from a standby condition and achieves in less than or equal to 12 seconds, voltage greater than or equal to 3740 volts and less than or equal to 4580 volts, and frequency greater than 58.8 hertz and less than or equal to 61.2 hertz.

During the review of this concern the emergency diesel generator system engineer determined that the surveillance procedure that performs the "quick-start" test did not contain the prerequisite to prime the emergency diesel generator using the fuel oil transfer pump until it was revised on October 5, 1994. This procedure revision combined the monthly manual start surveillance procedure steps with the "quick-start" surveillance steps into separate sections of a single procedure. The monthly start surveillance procedure contained a prerequisite to prime the emergency diesel engine fuel system prior to October 5, 1994, as allowed by the CPS Technical Specifications. Further investigation into the concern revealed that priming of all three emergency diesel generators was originally added to the monthly start procedure on December 26, 1989 as part of the corrective action to condition report 1-89-10-069. When the step to prime the emergency diesel generators was added, the Technical Specifications for the monthly procedure required that the start of each emergency diesel generator be timed to ensure that it reaches the required voltage and frequency in less than or equal to 12 seconds. The Technical Specifications allow an exception to this requirement if it was "conducted in accordance with the warmup and loading procedures as recommended by the manufacturer." The Division I and II were modified on October 15 and July 30, 1992, respectively to incorporate the engine manufacturer's warmup and loading procedures. This modification started the engine at a slow speed so that it could be warmed prior to bringing it up to rated speed and loaded. Because the emergency diesel generators were started at a slow speed and warmed up as recommended by the manufacturer, the start time for the monthly test was no longer required or capable of being determined. Whenever the emergency diesel generator is started using this modification, priming of the engine does not influence the test results. However, the modification to allow warmup and loading of the emergency diesel generator was not installed on the Division III engine. Therefore, the Technical Specification requirement for reaching the required voltage and frequency in less than or equal to 12 seconds continues to be a requirement for the Division III emergency diesel generator and must be observed without first priming the engine.

Also, each emergency diesel generator is barred over at least one revolution each time it is started by plant operators. The practice of barring over an emergency diesel engine at least one revolution is an industry accepted practice. The engine is barred over with the drains to each engine cylinder open to detect any leakage of fluid into the engine cylinders. If the engine were started with fluid in the cylinders, significant damage to the engine could occur. The surveillance procedure requires that the engine be barred over

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Clinton Power Station	05000461	96	011	00	3 OF 5

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

at least one revolution, but does not specify a maximum amount of barring that was to occur during the performance of the procedure. In the last six to seven years, on many occasions, an air-driven barring tool was used to bar over the emergency diesel generators. When the air-driven tool is used, the operators routinely rotate the engine more than one revolution, but the exact amount for each test performance varies. Barring the engine over turns the engine shaft driven fuel oil pump which may prime the emergency diesel generator fuel system. The fuel pump vendor believes that because the engine is barred over at a very slow rate, very little, if any, fuel is actually discharged from the shaft driven fuel pump due to fluid slippage through the fuel pump. Prior to using the practice of barring over the emergency diesel generators with the air-driven tool, they were manually barred over only one to two revolutions.

On September 21, 1996, the system engineer wrote condition report 1-96-09-145 to investigate the implications of priming the emergency diesel generator fuel system as a prerequisite for the "quick-start" surveillance. As part of the response to the condition report, the system engineer requested that the Operations staff perform the emergency diesel generator "quick-start" surveillance procedure without priming the emergency diesel generator fuel system with the fuel oil priming pump. On September 21, 1996, at 1245 hours, Operations personnel began the "quick-start" surveillance testing for the emergency diesel generators. On September 22, 1996, at 1738 hours, the last of the three emergency diesel generators had been tested without priming the fuel system with the fuel oil priming pump. The results of these surveillance tests demonstrated that the acceptance criteria for Technical Specification SR 3.8.1.7 were met without priming the fuel system with the fuel oil priming pump. The air-driven barring tool was used to bar over the emergency diesel generator before starting the engine. The number of revolutions the emergency diesel generators were barred over was evaluated and was determined to have an insignificant impact on diesel start times.

On October 2, 1996, the system engineer determined that under certain circumstances priming the emergency diesel generator fuel system could mask a problem that would affect the time that the emergency diesel generator takes to reach the required voltage and frequency. Because a degraded condition could be masked by priming the emergency diesel generator fuel system, it has been concluded that the surveillance procedure did not satisfy the intent of the requirements of Technical Specification SR 3.8.1.7 during the period that the "quick-start" surveillance test was conducted with the prerequisite to prime the fuel system. The first emergency diesel generator "quick-start" surveillance tests performed after adding the prerequisite to prime the fuel system was February 2, 1995, November 17, 1994, and October 28, 1994, for the Division I, II, and III emergency diesel generators, respectively. The system engineer also determined that excessive barring over of the engine may be a concern with the diesel generator Emergency Core Cooling System (ECCS) integrated surveillance test in addition to the "quick-start" surveillance test because excessive barring of the engine may prime the engine's fuel system. The diesel generator ECCS integrated surveillance test is required once every 18 months, during refueling outages, by Technical Specification SR 3.8.1.12 and SR 3.8.1.19. These Technical

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Clinton Power Station	05000461	96	011	00	4 OF 5

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

Specification SRs also verify that the emergency diesel generators start from a standby condition and achieve in less than or equal to 12 seconds, voltage greater than or equal to 3740 volts and less than or equal to 4580 volts, and frequency of greater than 58.8 hertz and less than or equal to 61.2 hertz. The review by the system engineer indicated that the only surveillance test procedures performed where excessive barring over of the engine prior to performing the test may have potentially masked a problem are the "quick-start" and diesel generator ECCS integrated surveillance test procedures. The manual barring of the engine one to two revolutions is not sufficient to prime the emergency diesel generator fuel system and is necessary to ensure that the emergency diesel generator is not damaged. The plant has been in Modes 1, 2, 3, 4, and 5 and a range of reactor power levels from zero to one hundred percent since the emergency diesel generator surveillance procedures were performed which may have primed the fuel system.

CAUSE OF EVENT

The cause of the priming of the emergency diesel using the fuel oil priming pump has been attributed to failure to adequately evaluate the effect of priming the emergency diesel generators as part of the corrective action to condition report 1-89-10-069. Also, at the time the emergency diesel generator "quick-start" surveillance test procedure was combined with the monthly operability surveillance, the individual preparing and reviewing the surveillance procedure failed to realize that only the monthly manual start portion of the procedure was to be preceded by priming of the fuel system.

The cause of the excessive barring of the emergency diesel generator was a lack of guidance in the surveillance procedures on what is the maximum amount of barring that should be allowed. The only guidance given in the surveillance procedures was to bar the engine over at least one revolution. The movement of the shaft driven fuel oil pump and the potential of that movement to prime the engine was not considered when the step to bar over the engine was included in the surveillance procedure.

CORRECTIVE ACTION

All surveillance procedures that operate the emergency diesel generators were reviewed and no other instances of prerequisites or other procedure steps that may mask a potential problem or precondition the emergency diesel generators were discovered. CPS procedures 9080.01, "Diesel Generator 1A(B) Operability - Manual and Quick Start Operability," and 9080.02, "Diesel Generator 1C Operability - Manual and Quick Start Operability," will be revised to remove the prerequisite to prime the emergency diesel generator fuel system. All procedures that bar over the emergency diesel generator will be revised to limit the barring over to a maximum of two revolutions. Also, appropriate Plant Engineering and procedure writers will be briefed on this event.

ANALYSIS OF EVENT

This event is reportable under the provisions of 10CFR50.73(a)(2)(i)(B) due to the failure to perform adequate surveillance testing in accordance with the plant's Technical Specifications.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET	YEAR	LER NUMBER (6) SEQUENTIAL NUMBER	REVISION NUMBER	PAGE (3)
Clinton Power Station	05000461	96	011	00	5 OF 5

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

Assessment of the safety consequences and implications of this event indicates that this event was not nuclear safety significant. As previously identified, the emergency diesel generator "quick-start" surveillance test was successfully performed on all three emergency diesel generators without priming the fuel system. A review of the maintenance history of all three emergency diesel generators for the last seven years revealed that no degraded or failed components have been repaired or replaced that would have impacted whether the fuel lines were maintained full.

ADDITIONAL INFORMATION

No equipment or components failed as a result of this event.

Illinois Power has not reported any other events in recent history related to preconditioning of equipment during the performance of a surveillance test.

For further information regarding this event, contact J. C. Golding, Engineer, at (217) 935-8881, extension 4049.