Exelon Generation®

Clinton Power Station
8401 Power Road
Clinton, IL 61727

U-604667
August 11, 2017

10CFR50.73
SRRS 5A.108

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

Clinton Power Station, Unit 1
Facility Operating License No. NPF-62
NRC Docket No. 50-461

Subject: Licensee Event Report 2017-008-00

Enclosed is Licensee Event Report (LER) 2017-008-00: Division 3 Shutdown Service Water Pump Start Failure. This report is being submitted in accordance with the requirements of 10 CFR 50.73.

There are no regulatory commitments contained in this report.

Should you have any questions concerning this report, please contact Mr. Dale Shelton, Regulatory Assurance Manager, at (217) 937-2800.

Respectfully,

Theodore R. Stoner
Site Vice President
Clinton Power Station

KP/cac

Attachment: Licensee Event Report 2017-008-00

cc:
Regional Administrator— NRC Region III
NRC Senior Resident Inspector - Clinton Power Station
Office of Nuclear Facility Safety — Illinois Emergency Management Agency

IE22
NRR

NRC FORM 366 (04-2017) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB: NO. 3150-0104 EXPIRES: 03/31/2020

LICENSEE EVENT REPORT (LER)

(See Page 2 for required number of digits/characters for each block)

(See NUREG-1022, R.3 for instruction and guidance for completing this form http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1022/r3/)

1. FACILITY NAME	2. DOCKET NUMBER	3. PAGE
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4. TITLE

Division 3 Shutdown Service Water Pump Start Failure

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
										05000
06	15	2017	2017	- 008	- 00	08	11	2017	FACILITY NAME	DOCKET NUMBER 05000

9. OPERATING MODE	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: *(Check all that apply)*			
1	☐ 20.2201(b)	☐ 20.2203(a)(3)(i)	☐ 50.73(a)(2)(ii)(A)	☐ 50.73(a)(2)(viii)(A)
	☐ 20.2201(d)	☐ 20.2203(a)(3)(ii)	☐ 50.73(a)(2)(ii)(B)	☐ 50.73(a)(2)(viii)(B)
	☐ 20.2203(a)(1)	☐ 20.2203(a)(4)	☐ 50.73(a)(2)(iii)	☐ 50.73(a)(2)(ix)(A)
	☐ 20.2203(a)(2)(i)	☐ 50.36(c)(1)(i)(A)	☐ 50.73(a)(2)(iv)(A)	☐ 50.73(a)(2)(x)
10. POWER LEVEL	☐ 20.2203(a)(2)(ii)	☐ 50.36(c)(1)(ii)(A)	☐ 50.73(a)(2)(v)(A)	☐ 73.71(a)(4)
	☐ 20.2203(a)(2)(iii)	☐ 50.36(c)(2)	☐ 50.73(a)(2)(v)(B)	☐ 73.71(a)(5)
	☐ 20.2203(a)(2)(iv)	☐ 50.46(a)(3)(ii)	☐ 50.73(a)(2)(v)(C)	☐ 73.77(a)(1)
097	☐ 20.2203(a)(2)(v)	☐ 50.73(a)(2)(i)(A)	☒ 50.73(a)(2)(v)(D)	☐ 73.77(a)(2)(i)
	☐ 20.2203(a)(2)(vi)	☐ 50.73(a)(2)(i)(B)	☐ 50.73(a)(2)(vii)	☐ 73.77(a)(2)(ii)
		☐ 50.73(a)(2)(i)(C)	☐ OTHER Specify in Abstract below or in NRC Form 366A	

12. LICENSEE CONTACT FOR THIS LER

LICENSEE CONTACT	TELEPHONE NUMBER *(Include Area Code)*
Mr. Dale Shelton	(217)937-2800

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	15. EXPECTED SUBMISSION DATE	MONTH	DAY	YEAR
☒ YES *(If yes, complete 15. EXPECTED SUBMISSION DATE)* ☐ NO		10	16	2017

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

On June 15, 2017, Clinton Power Station (CPS) commenced procedure CPS 9069.01, Shutdown Service Water Operability Test. The purpose of this procedure is to verify operability of the Division 3 Shutdown Service Water (SX) System Pump 1SX01PC and selected valves per the Inservice Testing program on a quarterly basis. At 0958, SX pump 1SX01PC was started and after approximately 30 seconds, it tripped due to thermal overload. The pump was declared inoperable and operations entered Technical Specifications (TS) Limiting Condition for Operation (LCO) 3.7.2, Condition A which requires the High Pressure Core Spray (HPCS) system to be declared inoperable and enter TS LCO 3.5.1 Condition B which requires verification by administrative means that the Reactor Core Isolation Cooling (RCIC) system is operable and within 14 days restore the HPCS system to operable status. The cause of the event is under investigation. A supplemental report will be provided when the cause has been established. An ENS notification was made at 1214 (EN 52806). Because the HPCS system is a single train safety system, this event is reportable under 10 CFR 50.73(a)(2)(v)(D) as a condition that could have prevented the fulfilment of a safety function to mitigate the consequences of an accident.

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Clinton Power Station, Unit 1	05000461	2017	- 008	- 00

NARRATIVE

PLANT AND SYSTEM IDENTIFICATION

General Electric -- Boiling Water Reactor, 3473 Megawatts Thermal Rated Core Power
Energy Industry Identification System (EIIS) codes are identified in text as [XX].

EVENT IDENTIFICATION

Division 3 Shutdown Service Water Pump Start Failure

A. Plant Operating Conditions Before the Event

Unit: 1 Event Date: 6/15/17 Event Time: 0958
Mode: 1 Mode Name: Power Operation Reactor Power: 97 percent

B. Description of Event

On June 15, 2017, Clinton Power Station (CPS) attempted to perform the quarterly surveillance test of the Division 3 shutdown service water (SX) [BI] pump [P] (1SX01PC). The pump ran for approximately 30 seconds before thermal overloads tripped the pump motor [M]. A second pump run was attempted with video recording that showed the motor spinning the shaft more quickly for the first rotation, then immediately slowed down to approximately 70 RPM. The run lasted approximately 8 seconds before the pump was manually secured.

At 0958, Operators declared the Division 3 SX, Division 3 Emergency Diesel Generator (EDG) [EK], Division 3 Inverter [EF], Division 3 Direct Current Distribution [EJ], Division 3 Alternating Current Distribution [ED] systems, and the High Pressure Core Spray (HPCS) [BG] system inoperable due to the pump trip. Operators entered the Technical Specification Actions Requirements for Limiting Conditions for Operation (LCO) 3.7.2 and LCO 3.5.1, ECCS - Operating. Operators verified within one hour that the RCIC system was operable, and entered the action to restore HPCS to Operable status within 14 days.

At 2220 hours, Operators completed an 8-hour non-emergency notification to the NRC (Event Notification Number 52806) under 10 CFR 50.72(b)(3)(v)(D) due to the loss of a single train safety system, that is, the loss of the HPCS system function. This event is reportable under 10 CFR 50.73(a)(2)(v)(D) due to a condition that could have prevented the fulfillment of the safety function needed to mitigate the consequences of an accident.

C. Cause of the Event

A decoupled run of the motor was performed with no issue. The motor was then sent to an off-site vendor for analysis, and pump disassembly commenced. The disassembled pump was inspected with the help of the pump vendor and site SMEs. No abnormalities were noted that were deemed significant enough to cause the motor to fail to accelerate the pump.

The Root Cause Evaluation has not been completed. A supplement is to be submitted once this information is available.

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NARRATIVE

D. Safety Consequences

The purpose for the Division 3 SX system is to provide cooling water to Division 3 cooling loads including the HPCS pump room coolers [CLR], the Division 3 EDG and the Division 3 Switchgear Heat Removal System (VX). The Division 3 SX header is normally supplied by cooling water from the non-safety related Plant Service Water System (WS) [KG]. Under design basis event conditions such as Loss of Offsite Power (LOOP) or Loss of Coolant Accidents (LOCAs), a Division 3 SX pump start signal is generated and the cross-tie valve [V] (1SX014C) from the plant service water system closes. At this point the Division 3 SX pump would be providing cooling water flow from the lake to the Division 3 SX cooling loads.

Divisions 1 and 2 safety-related equipment are fully capable of mitigating the consequences of an accident and were available during the period of this event.

The failure of the Division 3 Shutdown Service Water Pump results in loss of Division 3 Emergency Diesel Generator safety function and a loss of the High Pressure Core Spray System safety function.

The cause of the failure of the pump has not been determined. Once determined, this information will be provided.

E. Corrective Actions

In parallel with the testing described above, several component changes were made to the overall pump/motor assembly. A new motor with higher starting torque characteristics was approved and installed. The pump breaker and thermal overloads were replaced with new units. The pump shaft sleeves were replaced and the pump packing was replaced with a flexible style equivalent.

On June 23, 2017, following a successful uncoupled run of the new motor, a coupled run was performed with no abnormalities noted. All monitored points showed normal starting characteristics for the pump. The baseline and surveillance test procedures were performed without incident.

The Division 3 SX system, including the Division 3 EDG and HPCS system were declared operable at 2345 hours on 6/23/17.

Additional corrective actions for this event will be provided in the follow-up LER

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NARRATIVE

F. Previous Similar Occurrences

LER 2014-005-01 Failure of Shutdown Service Water Pump Results in Loss of Division 3 Emergency Diesel Generator and High Pressure Core Spray Safety Functions

On 9/16/14 at approximately 1905 hours, Operators were performing an operability test of the Shutdown Service Water (SX) system. The Division 3 SX pump (1SX01PC) was started to support the 2-year Comprehensive Pump Test and the motor thermal overload protection tripped off the pump after approximately 36 seconds. The cause of the event was that procedures used to develop plant modification change packages contained an inadequate process to identify the need for further reviews and the level of design detail required by those reviews. A new pump was installed and the pump was restored to operable status on 9/21/14. (ML16006A047)).

G. Component Failure Data

The Division 3 SX pump is a Sulzer model 8X14A VCM pump with a Siemens-Allis type RGV motor. The pump is a vertical two-stage deep well pump that consists of a discharge head, six columns, and a bowl assembly to extend 30 feet below the floor elevation. The pump is driven by a 75 horsepower, 1800 RPM, 480-volt motor.