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RA-13-062 10 CFR 50.73

June 26, 2013

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

Oyster Creek Nuclear Generating Station
Renewed Facility Operating License No. DPR-16
NRC Docket No. 50-219

Subject: Licensee Event Report (LER) 2012-002-01, Loss of Offsite Power During Hurricane Sandy

Enclosed is LER 2012-002-01, Loss of Offsite Power during Hurricane Sandy. The LER was revised to add supplemental information as required by Revision 0.This event did not affect the health and safety of the public or plant personnel. This event did not result in a safety system functional failure. There are no regulatory commitments made in this LER submittal.

Should you have any questions concerning this letter, please contact Mike McKenna, Regulatory Assurance Manager, at (609) 971-4389.

Respectfully,

Russell R. Peak
Plant Manager
Oyster Creek Nuclear Generating Station

Enclosure: NRC Form 366, LER 2012-002-01

cc: Administrator, NRC Region 1
NRC Senior Resident Inspector - Oyster Creek Nuclear Generating Station
NRC Project Manager - Oyster Creek Nuclear Generating Station

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

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

Estimated burden per response to comply with this mandatory 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 FOIA/Privacy Section (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects.resource@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 an 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)

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4. TITLE

Loss of Offsite Power During Hurricane Sandy

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
									N/A	N/A
10	29	2012	2012	- 002 -	01	06	20	2013	FACILITY NAME: N/A	DOCKET NUMBER: N/A

9. OPERATING MODE

N

10. POWER LEVEL

0

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

- ☐ 20.2201(b)
- ☐ 20.2201(d)
- ☐ 20.2203(a)(1)
- ☐ 20.2203(a)(2)(i)
- ☐ 20.2203(a)(2)(ii)
- ☐ 20.2203(a)(2)(iii)
- ☐ 20.2203(a)(2)(iv)
- ☐ 20.2203(a)(2)(v)
- ☐ 20.2203(a)(2)(vi)
- ☐ 20.2203(a)(3)(i)
- ☐ 20.2203(a)(3)(ii)
- ☐ 20.2203(a)(4)
- ☐ 50.36(c)(1)(i)(A)
- ☐ 50.36(c)(1)(ii)(A)
- ☐ 50.36(c)(2)
- ☐ 50.46(a)(3)(ii)
- ☐ 50.73(a)(2)(i)(A)
- ☐ 50.73(a)(2)(i)(B)
- ☐ 50.73(a)(2)(i)(C)
- ☐ 50.73(a)(2)(ii)(A)
- ☐ 50.73(a)(2)(ii)(B)
- ☐ 50.73(a)(2)(iii)
- ☒ 50.73(a)(2)(iv)(A)
- ☐ 50.73(a)(2)(v)(A)
- ☐ 50.73(a)(2)(v)(B)
- ☐ 50.73(a)(2)(v)(C)
- ☐ 50.73(a)(2)(v)(D)
- ☐ 50.73(a)(2)(vii)
- ☐ 50.73(a)(2)(viii)(A)
- ☐ 50.73(a)(2)(viii)(B)
- ☐ 50.73(a)(2)(ix)(A)
- ☐ 50.73(a)(2)(x)
- ☐ 73.71(a)(4)
- ☐ 73.71(a)(5)
- ☐ OTHER

Specify in Abstract below or in NRC Form 366A

12. LICENSEE CONTACT FOR THIS LER

FACILITY NAME	TELEPHONE NUMBER *(Include Area Code)*
Mike McKenna, Regulatory Assurance Manager	(609) 971-4389

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
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

14. SUPPLEMENTAL REPORT EXPECTED

☐ YES *(If yes, complete 15. EXPECTED SUBMISSION DATE)* ☒ NO

15. EXPECTED SUBMISSION DATE

MONTH	DAY	YEAR
N/A	N/A	N/A

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

At 20:18 on October, 29, 2012, while the reactor was in the Cold Shutdown Condition during a planned refueling outage, Oyster Creek experienced a Loss of Offsite Power (LOOP) event. The LOOP resulted in a valid automatic actuation signal for both the Emergency Diesel Generators (EDGs) to start, a valid Reactor Protection System (RPS) actuation with automatic containment isolations, and a trip of Shutdown Cooling to the reactor. Shutdown Cooling was expeditiously restored, following the initial EDG loading sequence, with electrical power from the EDGs.

The primary cause of the LOOP is attributed to equipment damage caused by the winds associated with Hurricane Sandy. Prior to reactor startup from the Refueling Outage, Oyster Creek verified that all required electrical distribution power lines and equipment required by Technical Specifications were available, operable, and functioning as required.

There were no Emergency Plan (EP) Emergency Action Levels (EALs) applicable for this event.

A detailed investigation was performed and found that the root cause of this event was a wall falling in the switchyard causing a ground fault on the 34.5KV system. Contributing to this event was a stuck breaker which allowed the ground fault to propagate to the 34.5KV system resulting in a local loss of the 34.5KV system. To prevent recurrence, the wall was removed and a stuck breaker modification was performed.

This event is being reported pursuant to 10CFR50.73(a)(2)(iv)(A) due to automatic actuation of the EDGs, RPS actuation, and containment isolation.

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NARRATIVE

Plant Conditions Prior To Event

Event Date: October 29, 2012 Event Time: 2018 EDT
Unit 1 Mode: Cold Shutdown Power Level: 0%

Description of Event

On October 22, 2012, Oyster Creek completed a plant shutdown to the Cold Shutdown Condition for the 1R24 Refueling Outage. On October 28, 2012, prior to the arrival of Hurricane Sandy; refueling activities were suspended, all switchyard work was secured, and full power supply redundancy was reestablished. The reactor and cavity were flooded to 585 inches above the top of the fuel.

On 10/29/12 at 20:18 hours, a dividing wall between Startup Transformer Banks 5 and 6 voltage regulators fell on the 'C' phase of the Bank 6 Voltage Regulator during high winds from Hurricane Sandy. The damage to the 'C' phase of the voltage regulator resulted in a phase to ground fault at the regulator. Upon sensing the fault, the secondary side of Bank 6, the S1B 4160V, breaker opened as designed. However, the primary side of Bank 6, the 34.5KV Oil Circuit Breaker (OCB) stuck and failed to clear the fault as required.

Oyster Creek's switchyard consists of two 230KV busses which power two 34.5KV busses through 230KV /34.5KV transformers: 230KV bus C powers 34.5KV bus B though the Bank 7 Transformer; 230KV bus D powers 34.5KV bus A through the Bank 8 Transformer. The normal configuration for Oyster Creek is that the A and B 34.5KV busses are tied together through a bus tie OCB. In addition, there are 2 express feeders that power the 34.5KV busses should the 230KV power be lost: The 34.5KV Q121 line is connected to the B 34.5KV bus; the 34.5KV Z52 line is connected to the A 34.5KV bus.

Oyster Creek's Startup (S/U) Transformers are 34.5KV / 4160v transformers that are normally powered by the 34.5KV busses through single phase voltage regulators: Bank 5 S/U Transformer is connected to 34.5KV bus B; Bank 6 S/U Transformer is connected to 34.5KV bus A. The S/U Transformers and their associated voltage regulators can be isolated via 34.5KV OCB's (Bank 5 and Bank 6 OCBs for the primary side) and 4160V air circuit breakers (S1A and S1B for the secondary side, respectively).

Since the 34.5KV Bus Tie OCB is not designed to trip during a ground fault condition and the bus tie is normally closed, the sustained fault on the 34.5KV system was detected by the Bank 7 and Bank 8 (230KV / 34.5KV) Transformers neutral ground fault protection relays. Additionally, since the fault was 'close-in' to Bank 7 and Bank 8, the transformer neutral ground fault relays actuated prior to the A and B 34.5KV Bus Backup Protection relays, which are set at 3.5 seconds to protect the bus from any associated line stuck breaker condition. Therefore, the Bank 7 and Bank 8 Transformer neutral ground fault protection relays tripped the 230KV bus breakers connected to the C and D 230KV buses, respectively, to clear the 34.5KV fault.

In addition, since the 34.5KV Bus Tie OCB is not designed to trip during a ground fault condition and the bus tie is normally closed, the protective relay systems (remote backup) for the Q121 and Z52 express feeder lines opened the remote 34.5KV breakers located at Whiting and Manitou Substations, respectively. As a result of losing the Q121 and Z52 express feeders combined with the previously mentioned trip of the 230KV bus breakers, power to the Oyster Creek Bank 5 and Bank 6 S/U Transformers was lost- creating a Loss of Offsite Power (LOOP) condition.

Upon the loss of power to Banks 5 and 6, both Emergency Diesel Generators (EDGs) responded as expected, and reenergized their respective safety buses. The LOOP caused a valid Reactor Protection System (RPS) actuation with automatic containment isolations, and resulted in a trip of Shutdown Cooling to the reactor and a trip of Fuel Pool Cooling. Shutdown Cooling and Fuel Pool Cooling were both expeditiously restored with power provided by

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the EDGs. Emergency Plan (EP) Emergency Action Levels (EALs) were reviewed by the Shift Manager and found to be not applicable in the Cold Shutdown mode of operation since both EDGs started and loaded as required.

At 10:39 on October 30, 2012, power was restored to Startup Transformer Bank 5 and EDG #1 was secured. Due to equipment damage to the Bank 6 Voltage Regulator, Startup Transformer Bank 6 was not returned to service at that time. At 3:46 on October 31, 2012, a planned contingency offsite power backfeed path was established to repower plant loads associated with EDG#2 and EDG #2 was secured. At 21:32 on November 1, 2012, with the Bank 6 Voltage Regulator repair complete and power restored to Startup Transformer Bank 6, the planned contingency offsite power backfeed was secured.

Analysis of Event

This event was of low significance since Oyster Creek was in Cold Shutdown with reactor water level at 585 inches above the fuel, and both EDGs fast started as designed repowering all required emergency loads.

Prior to the arrival of Hurricane Sandy, Oyster Creek ensured that both EDGs and the associated safety system electrical buses were available and operable. Oyster Creek also ensured that an adequate amount of fuel oil was available for sustained EDG operation. The Operations Department was prepared and briefed for the oncoming storm. The Operators were prepared for and briefed for the LOOP, loss of Shutdown Cooling, as well as the loss of Fuel Pool Cooling. The Operators took appropriate actions and expeditiously recovered Shutdown Cooling and Fuel Pool Cooling following the initial EDG loading sequence. There were no significant equipment problems noted related to maintaining the reactor in a safe Cold Shutdown Condition during the LOOP. There were no safety consequences impacting the plant or public safety as a result of this event.

Cause of Event

A detailed root cause investigation was performed and found that the wall falling onto the 'C' phase of the Bank 6 Voltage Regulator was the root cause of the event. When the wall fell onto the 'C' phase of the Bank 6 Voltage Regulator a ground fault condition occurred, and due to the Bank 6 OCB failing to clear the fault, resulted in isolation of the local 34.5KV system, resulting in the Oyster Creek LOOP. The wall was installed as part of a modification, performed in the mid 1980s, and was not built to withstand the winds experienced during the storm. Oyster Creek license conditions require that switchyard equipment be inspected under the 'Structures Monitoring Program' every 4 years. The wall has been regularly inspected without detection of any structural deficiencies- with the last inspection being performed in September 2012. No deficiencies with the wall were documented.

Contributing to the LOOP was the stuck breaker condition on the Bank 6 OCB, which failed to clear the fault as designed. Corrective maintenance on Bank 6 OCB after the event discovered that the trip coil had failed which would have prevented the breaker from opening. With the Bank 6 OCB stuck, the fault was propagated throughout the local 34.5KV system resulting in the LOOP.

Corrective Actions

Prior to reactor startup from the Refueling Outage, Oyster Creek verified that all required electrical distribution power lines and equipment required by Technical Specifications were available, operable, and functioning as required. This verification included ensuring that the transmission owner/operator completed the replacement and testing of the failed trip coil and the Bank 6 OCB.

In order to prevent recurrence it was verified that the defective wall was not part of Oyster Creek's current license or design basis and the wall was removed. Additionally, the transmission system owner/operator has performed a modification in the Oyster Creek switchyard to provide stuck breaker protection for the 34.5KV breakers.