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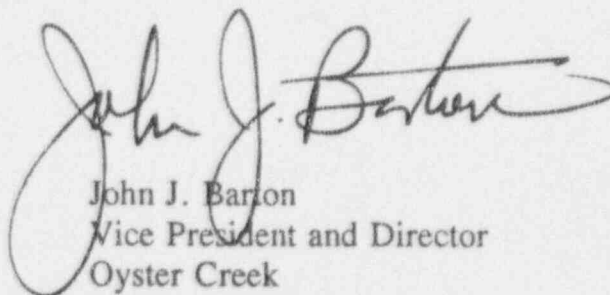
U. S. Nuclear Regulatory Commission
Att: Document Control Desk
Washington, DC 20555

Dear Sir:

Subject: Oyster Creek Nuclear Generating Station
Docket No. 50-219
Licensee Event Report 94-015

Enclosed is the Licensee Event Report 94-015.

If there are any questions please contact Mr. John Rogers at 609.971.4893.



John J. Barton
Vice President and Director
Oyster Creek

JJB/JJR
Attachment

cc: Administrator, Region I
Senior Resident Inspector
Oyster Creek NRC Project Manager

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LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)

Oyster Creek, Unit 1

DOCKET NUMBER (2)

05000219

PAGE (3)

1 OF 5

TITLE (4)

Reactor Shutdown Commenced due to Biological Plugging of Both Containment Spray Systems

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
08	08	94	94	-- 015 --	00	09	07	94	FACILITY NAME	DOCKET NUMBER
										05000
										05000

OPERATING MODE (9)	N	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)						
POWER LEVEL (10)	100	20.402(b)		20.405(c)		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)		50.73(a)(2)(vii)		OTHER
		20.405(a)(1)(iii)	X	50.73(a)(2)(i)		50.73(a)(2)(viii)(A)		(Specify in Abstract below and in Text, NRC Form 366A)
		20.405(a)(1)(iv)	X	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

John Galanto

TELEPHONE NUMBER (Include Area Code)

609.971.4349

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)

YES

(If yes, complete EXPECTED SUBMISSION DATE).

X

NO

EXPECTED
SUBMISSION
DATE (15)

MONTH

DAY

YEAR

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

On August 8, 1994 at approximately 1100 hours, both Containment Spray and Emergency Service Water systems were declared inoperable due to lower than expected flow rates for Emergency Service Water pumps due to a release of biological material within the system that plugged the flow sensing element. A 30 hour plant shutdown was commenced per Technical Specifications. System 2 was then started, run, and declared operable after continued operation raised the indicated flow to within the operability limit. The reactor was returned to full power prior to completion of the shutdown. The cause of this event was determined to be the release of Blue Mussel shells and other biological debris into the system.

Immediate corrective action was taken to clean, inspect, and return the systems to operability. Additional corrective actions are planned to inspect and clean Emergency Service Water piping during the upcoming refueling outage and install inspection ports in the affected systems to assist in the early detection of possible future biological concerns.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED BY OMB NO. 3150-0104
EXPIRES 5/31/95

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Oyster Creek, Unit 1	05000219	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	2 of 5
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DATE OF OCCURRENCE

The event occurred on August 8, 1994, at approximately 1100 hours.

IDENTIFICATION OF OCCURRENCE

While performing a scheduled monthly surveillance on Containment Spray (EIIS BO) and Emergency Service Water (EIIS BS) System 2, the "C" Emergency Service Water pump was below the procedural operability limit for flow rate. Additionally, the heat exchanger (EIIS HX) differential pressure was observed to be higher than expected but within the operability limit specified in the procedure. Containment Spray and Emergency Service Water System 1 was then run with similar results. Both systems were declared inoperable and a 30 hour plant shutdown was commenced per Technical Specifications. This event is considered reportable in accordance with 10 CFR 50.73(a)(2)(i), 10 CFR 50.73(a)(2)(ii), and 10 CFR 50.73(a)(2)(v).

CONDITIONS PRIOR TO OCCURRENCE

The Reactor was operating at approximately 100% power. Containment Spray and Emergency Service Water System 2 was being operated for a normal monthly surveillance.

DESCRIPTION OF OCCURRENCE

On August 8, the normal monthly system operability test for Containment Spray and Emergency Service Water system 2 was commenced. Shortly after the pumps were started (one Containment Spray pump and one Emergency Service Water pump) it was noticed that the Emergency Service Water pump flow rate was below the operability limit in the procedure. The operators checked the heat exchanger tubeside (seawater side) differential pressures and found them higher than expected, but within the operability limits. The indicated flow rate for system 2 was 3250 gallons per minute (gpm) for the "C" pump and 3400 gpm for the "D" pump. The operability limit is 3400 gpm. The heat exchanger tube side differential pressures were approximately 30 pounds per square inch differential (psid) with a procedural limit of 40 psid. System 2 was switched back to the "C" pump which showed some improvement in flow rate to 3400 gpm. The system was declared inoperable as a conservative measure while the data was being analyzed.

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DESCRIPTION OF OCCURRENCE (Cont.)

As a result of the problems in Containment Spray system 2, Containment Spray and Emergency Service Water System 1 was run to determine its operability. The indicated flow rate for the "A" pump was 3100 gpm which is below the operability limit of 3400 gpm and heat exchanger differential pressures were approximately 38 psid, just below the operability limit of 40 psid. The system was declared inoperable. As both Containment Spray systems had been declared inoperable, a reactor shutdown per plant Technical Specifications was commenced at 1133 hours.

After running the System 2 pumps and evaluating the data it was determined that the lower than normal indicated flow rate for the pumps was a result of plugging of the flow element. Flow rate began to recover during the continued operation of the pumps. System 2 was declared operable at 1503 hours and the shutdown was terminated. System 2 was run continuously to ensure the heat exchangers did not continue to plug while System 1 was taken out of service for system cleaning.

CAUSE OF THE OCCURRENCE

The cause of this event was a result of biological plugging consisting of blue mussel shells and other debris which caused the flow element to indicate lower flow rates than actual. Nearly all the mussels in the heat exchangers were found dead, with a very little tissue left in the shells. It is strongly believed that the mussel shells found in the heat exchangers had been growing inside the Emergency Service Water piping and were released when the Intake water exceeded the temperatures which can support life. This can occur each summer when the Intake water reaches approximately 80 °F or higher. The amount of biological plugging which occurred during this event may have been aggravated by a previous loss of the chlorination system.

ANALYSIS OF OCCURRENCE AND SAFETY SIGNIFICANCE

Oyster Creek has two Containment Spray and Emergency Service Water systems. Emergency Service Water pumps take suction at the Intake Structure (EIS-NN) and supply bay water to the tube side of the Containment Spray heat exchangers. Plugging of the heat exchangers is an event typically experienced during the summer months and causes tube side differential pressures to increase. Past experience has shown that differential pressures trend up from test to test during the normal monthly surveillance but have never exceeded an eleven psid increase from one test to the next. When differential pressures reach approximately 20 psid the heat exchangers are scheduled for cleaning.

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ANALYSIS OF OCCURRENCE AND SAFETY SIGNIFICANCE (Cont.)

The operability limit is 40 psid. Data have been collected in the past for several days of Emergency Service Water system operation during the summer months with typically very little increase in heat exchanger differential pressure (several psid). The Emergency Service Water systems are chlorinated when idle.

The Emergency Service Water systems provide for the long term heat removal of the energy released from the primary containment (EIS BD) during a design basis Loss of Coolant Accident. Partial plugging of the heat exchangers does not cause a problem for the heat removal capability because they are four pass heat exchangers and are over designed. Also the flow rates are not reduced significantly when the units are partially plugged. Although the indicated flow rates were 3250 gpm for System 2 and 3100 gpm for System 1, the discharge pressure of the pumps running at the time indicated a flow rate of approximately 3600 gpm for System 2 and 3300 gpm for System 1. The lower indicated flow was a result of a plugged flow sensing element causing an indicated flow rate lower than the actual flow rate. The required flow rate for a design basis accident is 3000 gpm. Flow rate through the heat exchangers was above the required flow.

The structural limit for differential pressure across the heat exchanger baffle plates has been calculated to be 70 psid. The System 2 heat exchangers reached a differential pressure of approximately 30 psid. The System 1 heat exchangers reached a differential of approximately 38 psid.

Emergency Service Water System 2 was continuously operated with the heat exchangers in the partially plugged condition while the System 1 units were out of service for cleaning. For approximately three days of continuous operation, heat exchanger differential pressures decreased slightly to approximately 25 psid from the original 30 psid. Previously, differential pressures have not significantly increased during Emergency Service Water pump operations for greater than one day.

The safety significance of this event is considered to be low. Although both Emergency Service Water Systems were conservatively declared inoperable for a short period of time, System 2 was demonstrated to be operable by being continuously run while maintenance was performed on System 1.

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CORRECTIVE ACTION

The shutdown was terminated and a return to full power was commenced when it was determined that Emergency Service Water System 2 was operable. System 2 was then continuously operated while the System 1 heat exchangers were cleaned and placed back in service on August 11, 1994. The System 2 heat exchangers were then cleaned, inspected, and placed back in service on August 13, 1994.

Additional corrective actions will include: 1) Performing an internal piping inspection on the Emergency Service Water system before the end of the upcoming refueling outage (15R) to determine if biological fouling of the piping still exists; 2) cleaning the Emergency Service Water piping in 15R if necessary to eliminate any growth that has occurred; 3) installing piping inspection ports during cycle 15 to assist in the early detection of any future biological growth inside the piping; and 4) determining, by the end of December 1994, the effectiveness of the chlorination system in each Emergency Service Water system.

SIMILAR OCCURRENCES

LER 85-018 Emergency Service Water Pipe Coating Failure
LER 94-010 Loss of both Containment Spray Heat Exchangers due to Biological Plugging