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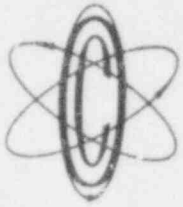
OYSTER CREEK  **NUCLEAR GENERATING STATION**

JCP&L GPU

Jersey Central Power & Light Company is a Member of the General Public Utilities System

(609)693-6000 P.O. BOX 388 • FORKED RIVER • NEW JERSEY • 08731

September 28, 1981

Mr. Ronald Haynes, Director
Office of Inspection and Enforcement
Region I
United States Nuclear Regulatory Commission
631 Park Avenue
King of Prussia, Pennsylvania 19406

Dear Mr. Haynes:

SUBJECT: Oyster Creek Nuclear Generating Station
Docket No. 50-219
Licensee Event Report
Reportable Occurrence No. 50-219/81-38/3L

This letter forwards three copies of a Licensee Event Report to report Reportable Occurrence No. 50-219/81-38/3L in compliance with paragraph 6.9.2.b.4 of the Technical Specifications.

Very truly yours,

J. T. Carroll, Jr. for
J. T. Carroll, Jr.
Acting Director Oyster Creek

JTC:dh
Enclosures

cc: Director (40 copies)
Office of Inspection and Enforcement
United States Nuclear Regulatory Commission
Washington, D.C. 20555

Director (3)
Office of Management Information
and Program Control
United States Nuclear Regulatory Commission
Washington, D. C. 20555

NRC Resident Inspector (1)
Oyster Creek Nuclear Generating Station
Forked River, N. J.

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OYSTER CREEK NUCLEAR GENERATING STATION
Forked River, NJ 08731

Licensee Event Report
Reportable Occurrence No. 50-219/81-38/3L

Report Date

September 28, 1981

Occurrence Date

August 27-28, 1981

Identification of Occurrence

On August 27, 1981, the "C" Shutdown Cooling Heat Exchanger developed a tube leak resulting in reactor water leaking into the Reactor Building Closed Cooling Water System (RBCCW). On August 28, 1981, a similar incident occurred while utilizing the "A" Shutdown Cooling Heat Exchanger.

This event is considered to be a reportable occurrence as defined in the Technical Specifications, paragraph 6.9.2.b.4.

Conditions Prior to Occurrence

The plant was subcritical and less than 212°F.

Description of Occurrence

On August 27, 1981, the Oyster Creek reactor was in the refuel mode with reactor water temperature being maintained at less than 212°F by use of the "C" Shutdown Cooling loop. At approximately 11:30 AM, the process radiation monitor on the RBCCW system alarmed in the Control Room giving the first indication of possible inleakage of reactor coolant. About two minutes later, reactor water level began to decrease. The level drop occurred over approximately 10 minutes, and resuted in an estimated leak rate of approximately 400 GPM. The Control Room operators recovered water level by making up to the vessel via the Feedwater and Condensate System. At approximately the same time, the "C" Shutdown Cooling loop was secured by stopping the pump and shutting heat exchanger "C" Shutdown Cooling loop inlet and outlet valves. Reactor temperature was maintained below 212°F by intermittently using the "A" Shutdown Cooling loop.

At approximately 3:35 PM on August 28, 1981, another RBCCW process radiation monitor alarm was received and almost simultaneously an individual reported to the Control Room that the RBCCW surge tank was overflowing. The "A" Shutdown Cooling loop was isolated immediately. The reactor water level indicator showed only a slight change due to quick operator action.

Apparent Cause of Occurrence

The cause of occurrence was found to be circumferential through wall cracks in one tube of the "A" shutdown heat exchanger and in one tube of the "C" shutdown heat exchanger. An investigation was initiated in order to ascertain the tube failure mechanism. This investigation included the laboratory examination of one end of the broken tube, and eddy current testing of selected tubes in the shutdown cooling heat exchangers. Additionally, an inquiry was made to another utility having the same heat exchangers. The preliminary evaluation of all data indicates that fatigue was the tube failure mechanism. The possibility of chloride stress corrosion failure was also considered since, approximately 5 days before the tube failures, chloride concentrations in the RBCCW were measured at 45 ppm due to sea water inleakage. This failure mechanism was discounted since, given the temperatures and oxygen concentrations, chloride stress corrosion cracking would take in excess of 20,000 hours.

Analysis of Occurrence

The function of the shutdown cooling system is to remove decay heat when the reactor is shutdown and below 350°F. Three loops (A, B, and C) are provided and under worst case conditions, two loops are required. The loss of two of the heat exchangers (A and C) posed no significant problem for the following reasons:

1. The reactor water temperature was 197°F at the time the "C" heat exchanger failed and the reactor had been shutdown for 13 days.

2. The "B" heat exchanger loop was out of service for maintenance but was made serviceable in a few hours.

3. Reactor temperature was maintained by using the reactor cleanup nonregenerative heat exchanger and letting down to the main condensers.

4. All ECCS systems were available.

5. The reactor was in such a condition that decay heat could have been removed by steaming to the main condensers or the isolation condensers.

No radioactive material was released to the environment as a result of the tube breaks.

In light of the above, the safety significance is considered minimal.

Corrective Action

The immediate corrective action was to isolate the affected shutdown cooling heat exchangers.

The following corrective action will be or has been completed in the A and C heat exchangers prior to plant start-up.

1. The broken tubes were plugged.

2. The bottom row of tubes on all heat exchangers were plugged to preclude possible future leakage.

3. All tubes showing indication of deterioration were plugged.

In addition to that mentioned above, an investigation is being conducted to determine if changes to operating procedures or modifications to equipment could reduce the likelihood or prevent further fatigue failures.

Failure Data

Manufacturer - Southwestern Engineering Company

Design Pressure:	Shell	- 150 PSIG
	Tube	- 1250 PSIG
Design Temperature:	Shell	- 350°F
	Tube	- 350°F