

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Oyster Creek, Unit I	DOCKET NUMBER (2) 050002119	PAGE (3) 1 OF 014
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TITLE (4)
Design Deficiency Causes Non-Compliance with 10CFR50 Appendix R Criteria

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 NAMES		DOCKET NUMBER(S)																																			
03	16	89	89	0110	00	04	14	89			05000																																			
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td colspan="2">OPERATING MODE (9)</td> <td colspan="10">THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 50 (Check one or more of the following) (11)</td> </tr> <tr> <td rowspan="5">POWER LEVEL (10) 000</td> <td>20.402(b)</td> <td>20.406(c)</td> <td>50.73(a)(2)(iv)</td> <td>73.71(b)</td> </tr> <tr> <td>20.405(a)(1)(i)</td> <td>50.36(e)(1)</td> <td>50.73(a)(2)(v)</td> <td>73.71(e)</td> </tr> <tr> <td>20.406(a)(1)(ii)</td> <td>50.36(e)(2)</td> <td>50.73(a)(2)(vii)</td> <td rowspan="3">OTHER (Specify in Abstract below and in Text, NRC Form 366A)</td> </tr> <tr> <td>20.406(a)(1)(iii)</td> <td>50.73(a)(2)(i)</td> <td>50.73(a)(2)(viii)(A)</td> </tr> <tr> <td>20.406(a)(1)(iv)</td> <td>X 50.73(a)(2)(ii)</td> <td>50.73(a)(2)(viii)(B)</td> </tr> <tr> <td>20.406(a)(1)(v)</td> <td>50.73(a)(2)(iii)</td> <td>50.73(a)(2)(k)</td> <td></td> </tr> </table>												OPERATING MODE (9)		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 50 (Check one or more of the following) (11)										POWER LEVEL (10) 000	20.402(b)	20.406(c)	50.73(a)(2)(iv)	73.71(b)	20.405(a)(1)(i)	50.36(e)(1)	50.73(a)(2)(v)	73.71(e)	20.406(a)(1)(ii)	50.36(e)(2)	50.73(a)(2)(vii)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)	20.406(a)(1)(iii)	50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	20.406(a)(1)(iv)	X 50.73(a)(2)(ii)	50.73(a)(2)(viii)(B)	20.406(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(k)	
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LICENSEE CONTACT FOR THIS LER (12)
NAME: Paul F. Cervenka, Plant Engineering
TELEPHONE NUMBER: AREA CODE 610 917 111-1418 914

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC

SUPPLEMENTAL REPORT EXPECTED (14)

YES (If yes, complete EXPECTED SUBMISSION DATE) NO

EXPECTED SUBMISSION DATE (15): MONTH 10, DAY 15, YEAR 89

ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single space typewritten lines) (16)

Two concerns have been identified with respect to the isolation condenser system availability during a fire condition. This non-compliance with 10CFR50 Appendix R is considered reportable in accordance with 10CFR50.73(a)(2)(ii)(b).

As a result of an unrelated task, an engineer identified a postulated failure mechanism for cabling associated with the isolation condenser valves. While reviewing the circuitry for the above concern, additional concerns were identified regarding isolation condenser (IC) system availability. A fire condition in any one of four areas can cause damage to the high flow sensors or associated logic circuits thereby causing spurious closure of all the IC valves. The power and control cables to the AC powered valves were not protected since it was determined they did not have to operate to achieve safe shutdown. Therefore, the subsequent failure of power or control cables for the AC powered valves after their spurious closure prevents reopening of the valves. The cause of this occurrence has been determined to be a design deficiency - failure to identify spurious closure of the AC powered valves due to high flow sensor logic damage.

Corrective action for the first concern consisted of a modification which added a coordinated fuse arrangement to protect the control circuitry for the affected valve. Corrective action for the second concern will consist of hourly fire watches while the plant is operated until final resolution is determined.

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		89	0110	00	02	OF 04

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

DATE OF DISCOVERY

As a result of a Preliminary Safety Concern (PSC 89-004) two conditions were determined reportable on 03/16/89 and 03/20/89, respectively.

IDENTIFICATION OF OCCURRENCE

Two concerns have been identified with respect to the isolation condenser system availability during a fire condition. This non-compliance with 10CFR50 Appendix R is considered reportable in accordance with 10CFR50.73(a)(2)(ii)(b).

CONDITIONS PRIOR TO THE OCCURRENCE

At the time of discovery the plant was shutdown for a refueling outage. The conditions being reported have been present since December 1986.

DESCRIPTION OF OCCURRENCE

As a result of an unrelated task, an engineer identified a postulated failure mechanism for cabling associated with isolation condenser (IEEE-BL) valves (CFI-V) V-14-1, 19, and 35. Valves V-14-1 and 19 are vent valves and are not required to operate for a fire condition. Valve V-14-35 is the condensate return valve and is required to operate. Valves V-14-1, 19 and 35 share a common control circuit (IEEE-FA). Two cables associated with the vent valves are not protected for a fire on the 51' elevation in the reactor building. These cables contain the positive leg of the 125 volt DC power source. It is postulated that there could be another cable routed in the same tray in this fire zone which contains the negative leg of the 125 volt DC battery source. A fire condition could cause both the positive and the negative conductors to short to ground opening a common fuse thus rendering V-14-35 inoperable.

While reviewing the circuitry for the above concern, additional concerns were identified regarding isolation condenser (IC) system availability. The isolation condenser is a decay heat removal system which in the standby mode only requires one DC powered valve to open in order to be placed into service. The system contains two AC and two DC motor operated valves. The isolation condensers have an automatic isolation logic which will isolate all the system valves upon a high flow signal. A fire condition in any one of four areas may cause damage to the high flow sensors or associated logic circuits thereby causing spurious closure of all the IC valves. The power and control cables to the AC powered valves were not protected since it was determined they did not have to operate to achieve safe shutdown. The following are the areas involved; the reactor building 51' elevation fire zone (RB-FZ-1D), the reactor building 23' elevation fire zone (RB-FZ-1E), the 480 volt switchgear room fire zone (OB-FZ-6A), and the A/B battery room fire zone (OB-FZ-8C).

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

APPARENT CAUSE OF OCCURRENCE

The cause of this occurrence is attributed to a design deficiency.

The first condition related to V-14-35, the condensate return valve, resulted from the failure to identify a common fuse between a non-Appendix R circuit and an Appendix R circuit in conjunction with a power supply modification to the isolation condenser condensate valves.

The second condition related to the isolation condenser high flow logic resulted from the failure to identify the spurious closure of the isolation condenser valves due to a fire that would affect the high flow sensor logic circuitry. This event followed by a loss of the power cables would render the bypass feature ineffective.

ANALYSIS OF OCCURRENCE AND SAFETY ASSESSMENT

The objectives of the 10CFR50 Appendix R Fire Protection Program are to prevent fires from starting; rapidly detect, control and extinguish fires that do occur; and to provide protection for structures, systems, and components important to safety so that a fire that is not promptly extinguished by the fire suppression activities will not prevent the safe shutdown of the plant.

The first concern identified would require two separate but specific hot shorts to ground in order to cause fuse failure and subsequent loss of the isolation condenser. This is not considered a high probability event.

The second concern would require an open circuit or a deenergization of the high flow logic by multiple short circuits to ground. The control switches in the control room can override the high flow isolation signal, however, if the power and control circuits for the normally open valves are damaged in the interim, the capability to open the valves will be lost.

Both of the above events would result in a loss of the designated decay heat removal system for the affected fire area. In this condition the emergency operating procedures would provide direction, however it is doubtful the operators could execute the required actions in the time permitted to assure adequate core cooling.

Although the probability for the above events is very low, a fire condition in the areas involved could have placed the plant in an unanalyzed condition.

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TEXT (If more space is required, use additional NRC Form 386A's) (17)

CORRECTIVE ACTIONS

Correction action for the first concern consisted of a modification which added a coordinated fuse arrangement to protect the control circuitry for V-14-35. The modification is complete.

For the second concern, affected circuits will be analyzed for rerouting, repower or protection with a one hour rated fire barrier, as needed to address the sequential failure of high flow logic circuitry along with valve power and control circuitry. In the interim, hourly fire watches will be established during periods of plant operation.

Furthermore, an extensive evaluation is being conducted in all applicable fire areas/zones to assure capability to mitigate undesirable spurious isolation condenser isolation due to high steam flow logic initiation. GPUN is evaluating the implications of these findings. If further actions are determined to be warranted, a followup LER will be submitted detailing those actions to be taken.

SIMILAR OCCURRENCES

LER 88-12 Electromatic Relief Valves and Cleanup System Valve Circuitry Does Not Meet Appendix R Criteria Due To Design Deficiency.



GPU Nuclear Corporation
Post Office Box 388
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Forked River, New Jersey 08731-0388
609 971-4000
Writer's Direct Dial Number

April 14, 1989

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

Dear Sir:

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

This letter forwards one (1) copy of Licensee Event Report (LER)
No. 89-010.

Very truly yours,

E. E. Fitzpatrick
Vice President & Director
Oyster Creek

EEF:MH:aa
(0705A:01)
Enclosures

cc: Mr. William T. Russell, Administrator
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NRC Resident Inspector
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