NRC Form 366
(9-83)

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO. 3150-0104
EXPIRES: 8/31/85

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
OYSTER CREEK, UNIT 1	0 5 0 0 0 2 1 9	1 OF 0 4

TITLE (4)
REACTOR SCRAM ON LOW WATER LEVEL

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)
										0 5 0 0 0
1 0	3 1	8 4	8 4	— 0 3 0	— 0 0	1 2	0 4	8 4		0 5 0 0 0

OPERATING MODE (9)	N	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)			
POWER LEVEL (10)	0 0 6	20.402(b)	20.405(c)	X 50.73(a)(2)(iv)	73.71(b)
		20.405(a)(1)(i)	50.36(c)(1)	50.73(a)(2)(v)	73.71(c)
		20.405(a)(1)(ii)	50.36(c)(2)	50.73(a)(2)(vii)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
		20.405(a)(1)(iii)	50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	
		20.405(a)(1)(iv)	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	TELEPHONE NUMBER
	AREA CODE
MICHAEL ALLEN, OPERATIONS ENGINEER	6 0 9 9 7 1 - 4 6 1 1

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)		EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
YES (If yes, complete EXPECTED SUBMISSION DATE)	X NO				

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

On October 31, 1984, an automatic reactor scram occurred due to low reactor water level. Following the refueling outage, startup activities involving a plant warmup had been in progress. Reactor feedwater pump 'C' had been tested earlier in the startup, but had tripped due to electrical problems and was tagged out for maintenance. The 'B' feed pump was suspect of having the same problems as the 'C' pump since maintenance similar to that conducted on the 'C' pump had been performed on this pump also. The 'A' feedwater string was isolated for valve repairs. Contrary to plant procedures, reactor pressure was allowed to exceed 300 psig before the 'A' feedwater string was returned to service and the 'A' feedwater pump started to maintain reactor vessel level. Problems developed with the 'A' feed pump after starting it which required that it be manually secured. Further attempts to maintain reactor vessel level were inadequate, and the decision was made to start the 'B' feed pump. The Reactor Protection System scrammed the reactor on low reactor water level just prior to the starting of the 'B' feed pump. Scram response was normal and reactor water level control was regained. The plant was placed in cold shutdown. Procedural inadequacies, personnel error, and inadequate post-maintenance testing all contributed to the occurrence of this event. Repair and testing of the reactor feed pumps has been completed, and other corrective actions will be implemented to prevent a similar occurrence in the future.

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

Date of Occurrence

The event occurred on October 31, 1984 at approximately 0349 hours.

Identification of Occurrence

The Reactor Protection System automatically scrammed the reactor due to a low reactor water level condition.

This event is considered to be a reportable event as defined in 10 CFR 50.73(a)(2)(iv).

Conditions Prior to Occurrence

A reactor heatup was in progress and the reactor mode switch was in the STARTUP position. Plant pressure was greater than 300 psig and power level was approximately 120 MW (thermal).

Description of Occurrence

On October 31, 1984, a plant heatup to increase reactor pressure was in progress. Reactor power was being maintained above the point of adding heat by control rod movement. Steam was being drawn from the reactor for main turbine warmup and the establishment of turbine shaft seals and condenser vacuum. One condensate pump was in operation to supply feedwater to the reactor vessel. An attempt to start the 'C' feedwater pump had been made earlier in the startup. However, the pump had tripped due to electrical problems and was tagged out for repairs. The 'B' feedwater pump was suspect of having the same problem as the 'C' pump since maintenance similar to that conducted on the 'C' feed pump had been conducted on this pump also. The 'A' feedwater string was isolated for valve repairs, and was not returned to service until reactor pressure reached a value above the condensate pump discharge shutoff head. Reactor water level had begun to decrease, and the 'A' feed pump was started to maintain feedwater to the reactor vessel. A heavy vibration was noticed in the Control Room after starting the feed pump. A burnt rubber smell and leakage from the inboard pump seal were also noted. Simultaneously, an electrician reported an overcurrent condition on one phase of the feed pump power supply. The Group Shift Supervisor (GSS) directed the Control Room Operator to secure the feed pump manually from the Control Room. Operators then reduced power with the control rods and opened bypass valves to

lower pressure enough to regain sufficient makeup flow from the operating condensate pump. They also increased flow from the Control Rod Drive System to the reactor vessel and shut the turbine stop valves. All of these measures were inadequate in regaining control of reactor water level. Accordingly, the GSS directed the Control Room Operator to start the 'B' reactor feed pump. However, reactor water level had decreased sufficiently such that the Reactor Protection System scrammed the reactor due to low reactor water level. This occurred just prior to the starting of the 'B' feed pump. The plant response to the scram was normal, all rods inserted fully, and operators followed the normal scram response procedure. Reactor water level was regained and the 'B' feed pump was secured, since reactor pressure was now low enough for the operating condensate pump to maintain reactor water level. The plant was then placed in cold shutdown. The suspected electrical problem with the 'B' feed pump was not present, since this pump operated satisfactorily during the event.

Apparent Cause of Occurrence

The apparent cause of the occurrence was operator error due to the failure to establish feedwater flow from a reactor feed pump during the plant heatup. Steam flow in excess of available water makeup was being supplied to various steam loads. This caused reactor water level to decrease to the low level setpoint. Contrary to plant procedures, reactor pressure was allowed to exceed 300 psig with no feed pump in service. Further, the 'A' feedwater string was not placed in service until reactor pressure reached a value above the condensate pump discharge shutoff head. Above this shut off head, makeup to the reactor vessel from the condensate and feedwater system was not available until the 'A' feed pump was started. Reactor water level subsequently fell due to the loss of condensate pump makeup between the time that reactor pressure exceeded the discharge shut off head of the condensate pump and the time that the 'A' feed pump was started. Other factors contributing to the failure to establish feedwater flow and the subsequent decreasing reactor water level were:

a. Procedures addressing the start of a feed pump did not include specific information or cautions about condensate pump discharge shutoff head.

b. Feedwater pump post-maintenance testing was inadequate. This testing did not include a pump operability check for feed pumps A, B, and C.

Analysis of Occurrence and Safety Assessment

Data from various sources was collected and reviewed following the event. Analysis shows that upon reaching the reactor low-level trip setpoint, the Reactor Protection System operated properly by inserting all rods to decrease reactor power level. Operation of the scram discharge volume vents, drains and alarm rod blocks, and scram functions were normal. Operator actions to raise reactor water level by reducing reactor pressure and starting the 'B' reactor feedwater pump were appropriate, but were not sufficient to stop the reactor water level decrease in time. The manual scram function was actuated according to plant procedures approximately six (6) seconds after the automatic scram occurred. The combination of automatic and manual operator actions following the scram were adequate to restore water level control and stabilize the plant.

The safety significance of this event is minimal due to the low initial reactor power level and the fact that the reactor properly scrammed at the low water level trip point. The minimum water level reached was only four (4) inches below the trip point. Safety system actuation was not required to recover reactor water level.

Corrective Action

The immediate corrective action was to restore reactor water level after the reactor scram occurred. A post trip review was conducted immediately following the event by plant management. Repair and testing of the reactor feedwater pumps has been completed. Future corrective actions to be implemented include:

a. Plant procedures will be revised to include cautions specifying the minimum number of feed pumps required to be operational prior to exceeding 300 psig, and a caution statement referencing the condensate pump discharge shutoff head.

b. GPUN management will investigate improved methods for specification of post-maintenance testing.

c. This event will be reviewed during operator training.

GPU Nuclear

GPU Nuclear Corporation
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Writer's Direct Dial Number:

December 4, 1984

U.S. Nuclear Regulatory Commission
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. 84-030.

Very truly yours,

Peter B. Fiedler
Vice President and Director
Oyster Creek

PBF:dam
Enclosures

cc: Dr. Thomas E. Murley, Administrator
Region I
U.S. Nuclear Regulatory Commission
631 Park Avenue
King of Prussia, PA 19406

NRC Resident Inspector
Oyster Creek Nuclear Generating Station
Forked River, NJ 08731

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