GPU Nuclear

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Writer's Direct Dial Number:

December 15, 1994
C321-94-2308

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

Enclosed is Licensee Event Report 94-021.

If you should have any questions or require further information, please contact Mr. Terry Sensue, Oyster Creek Licensing Engineer at 609-971-4680.

Sincerely yours,

John J. Barton
Vice President and Director
Oyster Creek

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Enclosure

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

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NRC FORM 366N
(5-92)

LICENSEE EVENT REPORT (LER)

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

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Oyster Creek, Unit 1	05000219	1 OF 4

TITLE (4)
AUTOMATIC REACTOR SCRAM DUE TO HIGH REACTOR RECIRCULATION FLOW CAUSED BY PERSONNEL ERROR

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
11	19	94	94	021	0	12	15	94	FACILITY NAME	DOCKET NUMBER

OPERATING MODE (9)	N	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)							
POWER LEVEL (10)			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
			20.405(a)(1)(iii)		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)		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 (Include Area Code)
TOD FENTON - SYSTEM ENGINEER	609-971-4044

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 (16)

On November 19, 1994, during a refueling outage, an unexpected reactor scram occurred. While performing troubleshooting and a wiring repair on the Reactor Recirculation Flow Control System computer, an inadvertent introduction of a low speed demand succeeded by a high speed demand from the digital control system (DCS) led to total recirculation flow exceeding the high flow scram setpoint.

The cause of this event was personnel error due to misoperation of the DCS computer.

There is no safety significance to this event. The high flow scram feature was believed necessary to terminate a flow increase transient during power operation. GPUN has since proved that this limiting safety system setting is not necessary and has obtained NRC approval to remove this feature from the technical specifications.

Interim corrective action has been taken to ensure DCS maintenance activities have technical support and supervising personnel present during such activities. Also, the conduct of maintenance activities will be proceduralized to help minimize misoperation/misapplication of the DCS diagnostic tools.

DATE OF OCCURRENCE

This event occurred on November 19, 1994 at 1923 hours.

IDENTIFICATION OF OCCURRENCE

In the process of performing troubleshooting and a wiring repair of a computer (EIIS-DCC) watchdog circuit, an unexpected reactor scram occurred. This event is reportable based on 10 CFR 50.73(a)(2)(iv).

CONDITIONS PRIOR TO OCCURRENCE

A refueling outage was in progress. The reactor mode switch was in the SHUTDOWN position with all control rods fully inserted. Reactor coolant temperature was 185°F and the reactor vessel was vented. All five reactor recirculation system (EIIS-AD) pumps were running in preparation to perform the Nuclear Steam Supply System (NSSS) leak test.

DESCRIPTION OF OCCURRENCE

On November 19, 1994, Instrument and Control (I&C) technicians were assigned to troubleshoot and repair a wiring problem in the transfer of control logic (TOCL) circuit of the newly installed digital reactor recirculation flow control system (DCS)(EIIS-JA). DCS primary computer DCC-X was in control maintaining each recirculation pump speed at 35Hz. DCS backup computer DCC-Y was in the off-line diagnostic mode and being used as an aid in the troubleshooting activity.

While wiring repairs were in progress, the DCC-X computer tripped into the inactive mode. This transferred the recirculation pumps speed control to the Moore controllers (EIIS-SIK). This transfer was not noticed by either the Control Room Operators (CRO) or the technicians due to the bumpless nature of the control transfer function. The CRO also misinterpreted that the dual computer failure alarm was caused by the ongoing maintenance activity and had no potential affect on recirculation pump operation.

In order to support the NSSS leak test, a CRO adjusted the master recirculation flow controller (MRC) to 40Hz to increase recirculation pump speed to increase the reactor vessel temperature.

DESCRIPTION OF OCCURRENCE
(Continued)

While performing the post maintenance testing on the wiring repairs, the backup DCC-Y computer was inadvertently placed in control since the primary DCC-X computer had tripped. With the DCC-Y computer still being in the off-line diagnostic mode, normal control features were not in effect. A signal was sent to all the recirculation pumps to decrease speed to 35Hz. 35Hz was the last value retained by the computer before being taken off-line.

To support the NSSS leak test, the CRO made several attempts to adjust the speed back to 40Hz. These attempts were unsuccessful because DCC-Y was controlling in the off-line diagnostic mode.

The off-line diagnostic mode was exited on DCC-Y. This action led to a low speed demand of near zero Hz, succeeded by high speed demand of 40Hz which was previously set on the MRC by the CRO. This large error signal caused an overshoot of recirculation pump speed which resulted in total recirculation flow exceeding the high flow scram setpoint. The CRO attempted to reduce pump speed when it was recognized that 40Hz was being exceeded but this action was not taken soon enough to prevent the scram signal from being generated.

Immediately following the reactor scram, the CRO placed all five individual recirculation pump speed controllers in MANUAL and adjusted all speeds to approximately 34Hz. The reactor scram signals were reset, the DCS maintenance activities were halted, and the reactor vessel heatup process was continued to support the NSSS leak test.

APPARENT CAUSE OF OCCURRENCE

The cause of this event is attributed to personnel error due to misoperation of the DCS computers. DCC-X was not realized to be in the tripped condition and DCC-Y was allowed to control recirculation pump speed while in the off-line diagnostic mode. This lead to an inadvertent introduction of a large process error which increased recirculation flow to the high flow scram setpoint of 115% of rated.

ANALYSIS OF OCCURRENCE AND SAFETY ASSESSMENT

The high recirculation flow scram feature was provided to terminate a flow increase transient during power operation. Flow transients are normally protected against by employing the k_f factor and using mechanical stops on the recirculation pumps. Oyster Creek does not have mechanical stops on its recirculation pumps and maximum flow was believed to be beyond the limit for which the k_f factor provides protection. Thus this scram feature took the place of mechanical stops on the speed controller scoop tubes to limit the recirculation pump flow. GPUN previously performed a calculation to determine the maximum achievable total recirculation flow during power operations. This calculation revealed that the technical specification limiting safety system setting for the high flow scram setpoint could not be reached with all recirculation pumps running at maximum flow during power operations. GPUN prepared a technical specification change request, submitted it to the NRC, and it has recently been approved deleting the high recirculation flow scram setpoint.

Since the plant was shutdown with all control rods fully inserted, and the reactor coolant temperature was below 212°F with the reactor vessel vented, this event had no safety significance.

CORRECTIVE ACTIONS

Immediately following the reactor scram, the CRO placed all five individual recirculation pump speed controllers in MANUAL and adjusted all speeds to approximately 34Hz. The reactor scram signals were reset, the DCS maintenance activities were halted, and the reactor vessel heatup process was continued to support the NSSS leak test.

An interim action has placed increased administrative controls over all maintenance activities on the DCS. This includes ensuring that expert technical support and supervising personnel are present during such activities.

Development of a detailed maintenance procedure has been initiated. This will include prerequisites, precautions and limitations, and instructions to control the maintenance activities which will minimize the potential for personnel error from misoperation/misapplication of the DCS diagnostic tools.

Also, since the high flow scram feature has recently been removed from our technical specifications, a modification will be performed to remove this function from the active control circuitry.

SIMILAR EVENTS

None