GPU Nuclear

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September 21, 1995
C321-95-2278

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 95-005

Enclosed is Licensee Event Report 95-005. This event did not impact the health and safety of the public.

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

Very truly yours,

for John J. Barton
Vice President and Director
Oyster Creek

JJB/TS/gl

Enclosure

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

280003

IE22

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 5

TITLE (4)
ANTICIPATORY SCRAM BYPASS SWITCHES' NON-CONSERVATIVE SETPOINT DUE TO ORIGINAL PLANT DESIGN

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	25	95	95	005	0				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)		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)	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)		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)
JAMES P.MUNLEY, SYSTEM ENGINEER	609-971-4252

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))

During a review of General Electric SIL 423 a non-conservative instrument setpoint for the anticipatory scram bypass pressure switches was identified. The design deficiency of this non-conservative setpoint had existed since the incorporation of the anticipatory scrams early in plant operation. This condition indicates that the turbine stop valve closure and turbine control valve fast closure scrams were still bypassed above 40% reactor thermal power, at worst case up to approximately 49% reactor thermal power, during plant power ascensions and reductions. The safety significance of the non-conservative setpoint is considered minimal. Subsequent analyses have shown that a bypass of these scrams at 50% reactor thermal power would not exceed fuel cladding integrity safety limits. The setpoint of the pressure switches was lowered to a conservative value with respect to 40% reactor thermal power. A comprehensive analysis of the instrument characteristics based upon historical data is being performed. The results will be incorporated into the existing setpoint determination and any necessary changes will be made. The plant operating procedures are being revised to provide clarification and improve awareness of plant manipulations which could impact this automatic bypass feature. Possible modifications to these features will be considered.

DATE OF DISCOVERY

The non-conservative setpoint of the anticipatory scram bypass switches (EIIS-JC) was identified on August 25, 1995. This condition has existed since the incorporation of anticipatory scrams early in plant operation, calendar year 1970, to support a reactor thermal power uprate.

IDENTIFICATION OF OCCURRENCE

During a review of General Electric Service Information Letter (SIL) 423, Erroneous Scram Bypass Setpoint, to determine its applicability to Oyster Creek, a possible non-conservative instrument setpoint for all four of the anticipatory scram bypass, turbine third stage extraction steam (EIIS-SE), pressure switches (CFI-PS) was identified. When operating the plant in the run mode with all three strings of high pressure and intermediate pressure feedwater heaters (EIIS-SN) out of service, the anticipatory scram features due to a turbine stop valve (EIIS-JJ) closure or a turbine control valve (EIIS-JJ) fast closure may not have been enabled until approximately 49% reactor thermal power. With all feedwater heating in service, these features may not have been enabled until approximately 45% reactor thermal power. This condition does not meet the bases of our Technical Specification Protective Instrumentation Requirements for having these features operable when greater than 40% reactor thermal power.

This condition is considered reportable under 10 CFR 50.73(a)(2)(i)(B).

CONDITIONS PRIOR TO DISCOVERY

The reactor was operating at 99% power at the time of discovery. This condition has existed since the incorporation of anticipatory scrams early in plant operation. The plant has been operated in all modes since 1970 with this design deficiency.

DESCRIPTION OF OCCURRENCE

While reviewing General Electric SIL 423 to determine applicability, a possible non-conservative setpoint of the anticipatory scram bypass pressure switches was identified. These four third stage turbine extraction steam pressure switches are designed to automatically bypass the turbine stop valve closure scram signals and the turbine control valve fast closure scram signals at below 40% reactor thermal power and enable these scrams at greater than 40% reactor thermal power. Third stage turbine extraction steam pressure data was collected on August 12, 1995, during a plant power reduction in order to determine if non-conservatism

DESCRIPTION OF OCCURRENCE (Cont'd)

of these pressure switches' setpoints existed when feedwater heaters are out of service. As a precaution, the pressure switches' setpoints were lowered to a more conservative value on August 11, 1995, prior to reducing power.

The evaluation of the data from the power reduction was completed against both the ambiguous design basis information and licensing descriptions for the anticipatory scram features. It was concluded that the setpoint from the incorporation of the anticipatory scrams early in plant operation was non-conservative. The data collected during the power reduction indicated that the pressure switches may not have actuated until a power level of approximately 45% reactor thermal power with all feedwater heaters in service and may not have actuated until a power level of approximately 49% reactor thermal power with all three strings of high pressure and intermediate pressure feedwater heaters out of service. This indicates that the setpoint was non-conservative and could bypass the anticipatory scrams beyond the bases of our Technical Specification Protective Instrumentation Requirements.

Turbine bypass valve openings with the turbine on-line can also influence the relationship between third stage turbine extraction steam pressure and reactor thermal power. Even though administrative controls do not presently exist to prevent opening bypass valves with the turbine on-line except during surveillance testing of the bypass valves, plant operation with the bypass valves open is not performed and does not occur.

APPARENT CAUSE OF OCCURRENCE

The cause of this design deficiency has been attributed to the original plant design utilizing turbine third stage extraction steam pressure as a measure of reactor thermal power due to the convenience of the existing pressure sensing taps on the turbine and not properly correlating turbine steam flow with reactor thermal power during all possible equipment configurations during plant operation.

ANALYSIS OF OCCURRENCE AND SAFETY ASSESSMENT

The Reactor Protection System (RPS) (EIIS-JC) monitors plant parameters and automatically initiates protective actions if established limits are exceeded. The RPS acts to protect the core against fuel rod cladding damage and to protect the reactor vessel from overpressure. The RPS initiates an anticipatory reactor scram for the following turbine/generator conditions: a) Turbine Stop Valve Closure; b) Turbine Control Valve Fast Closure (Generator Load Rejection).

ANALYSIS OF OCCURRENCE AND SAFETY ASSESSMENT (Cont'd.)

The turbine stop valve closure and turbine control valve fast closure scrams are presently designed to be automatically bypassed if reactor thermal power as measured by the four turbine third stage extraction steam line pressure switches is less than 40% reactor thermal power. The setpoint bases is that at low reactor thermal power levels up to 40% during unit heatup, these scrams are not necessary since no significant reactor thermal power disturbance can be created at such low reactor steam flows.

The non-conservative setpoint had existed since the incorporation of the anticipatory scrams early in plant operation. This condition indicates that the anticipatory scrams could be bypassed above 40% reactor thermal power, at worst case up to 49% reactor thermal power, during plant power ascensions and reductions. During this condition, if an anticipatory scram signal was required to occur anywhere between 40% and 49% reactor thermal power, other RPS protective actions are available and the reactor would scram on a reactor high pressure or neutron high flux condition. The Technical Specifications bases state that sufficient protection is provided by other scrams below 45% reactor thermal power to permit bypassing of the anticipatory scrams and that 40% reactor thermal power was selected for operational convenience.

The turbine trip without bypass (TTWOBP) transient was analyzed at 50% power without the anticipatory scram feature on turbine stop valve closure. The TTWOBP is the limiting delta critical power ratio (CPR) transient for Oyster Creek and relies on the turbine stop valve closure scram to terminate the transient. The 50% power level was selected since it bounds the previously acceptable as-found value for the scram bypass pressure switches' setpoint with an additional allowance for setpoint drift that may have occurred. The TTWOBP transient from 50% power without the scram on turbine stop valve closure was terminated by the reactor high pressure scram. The transient was analyzed using the currently approved transient model RETRAN.

The initial CPR for this transient is 2.130 and the minimum CPR is 1.593 for a delta CPR of 0.537. The minimum CPR for this transient is 1.37 if the initial CPR is at the operating limit of 1.84 for reduced flow based on the operating limit CPR of 1.50 and the K_f curve CPR multiplier. This transient has ample margin to the fuel cladding integrity safety limit of 1.07. The margin in these analyses ensure safe plant operation even when considering non-conservative instrument drift.

The safety significance of the non-conservative setpoint is considered minimal based upon the other RPS automatic scrams such as high reactor pressure and high neutron flux that provide ample margin to the fuel cladding integrity safety limit, and the infrequent operation of the plant between 40% to 50% reactor thermal power.

CORRECTIVE ACTION

Prior to the August 12, 1995, power reduction the setpoint of the turbine third stage extraction steam pressure switches was lowered to a conservative value with respect to 40% reactor thermal power. A comprehensive analysis of the instrument characteristics based upon historical data is being performed. The results will be incorporated into the existing setpoint determination and any necessary changes will be made.

The plant operating procedures are being revised to provide clarification and improve awareness of plant manipulations with the turbine bypass valve system which could impact this automatic scram bypass feature.

The ambiguous design bases descriptions contained in the plant's licensing documents, Tech Specs and UFSAR, are being reviewed and will be corrected to resolve discrepancies in the descriptions of the anticipatory scram bypass features.

Possible modifications to the anticipatory scram bypass features will be developed and reviewed which could enhance plant operation and equipment maintainability. These enhancements will be incorporated into Oyster Creek's Long Range Plan if determined beneficial.

FAILURE DATA

None

SIMILAR EVENTS

None