CATEGORY 1

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR:9608130307 DOC.DATE: 96/08/05 NOTARIZED: NO DOCKET #
FACIL:50-270 Oconee Nuclear Station, Unit 2, Duke Power Co. 05000270
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SUBJECT: LER 96-002-00:on 960706,Failure to reset reactor protective system paramenters results in operating outside design basis.Caused by inappropriate action/deficient communications.Operating guidelines revised.W/960805 ltr.

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CATEGORY 1 DOCUMENT

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DUKE POWER

August 5, 1996

U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, D.C. 20555

Subject: Oconee Nuclear Station
Docket Nos. 50-269, -270, -287
Licensee Event Report 270/96-02

Gentlemen:

Pursuant to 10 CFR 50.73 Sections (a) (1) and (d), attached is Licensee Event Report, 270/96-02, concerning the failure to reset the Reactor Protective System parameters resulting in operating outside the design basis due to inappropriate action.

This report is being submitted in accordance with 10 CFR 50.73 (a)(2)(ii)(B). This event is considered to be of no significance with respect to the health and safety of the public.

Very truly yours,

J. W. Hampton, Vice President
Oconee Nuclear Site

/fts

Attachment 120081

9608130307 960805
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Document Control Desk
August 5, 1996

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NRC FORM 366 (4-95) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0104
EXPIRES 04/30/98
ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS MANDATORY INFORMATION COLLECTION REQUEST: 50.0 HRS. REPORTED LESSONS LEARNED ARE INCORPORATED INTO THE LICENSING PROCESS AND FED BACK TO INDUSTRY. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (T-6 F33), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Oconee Nuclear Station, Unit Two	05000 270	1 OF 8

TITLE (4) Failure To Reset Reactor Protective System Parameters Results In Operating Outside Design Basis Due To Inappropriate Action

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
										05000
07	06	96	96	02	00	08	05	96		05000

OPERATING MODE (9)	N
POWER LEVEL (10)	100

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)

20.2201(b)	20.2203(a)(2)(v)	50.73(a)(2)(i)	50.73(a)(2)(viii)
20.2203(a)(1)	20.2203(a)(3)(i)	X 50.73(a)(2)(ii) (B)	50.73(a)(2)(x)
20.2203(a)(2)(i)	20.2203(a)(3)(ii)	50.73(a)(2)(iii)	73.71
20.2203(a)(2)(ii)	20.2203(a)(4)	50.73(a)(2)(iv)	OTHER
20.2203(a)(2)(iii)	50.36(c)(1)	50.73(a)(2)(v)	Specify in Abstract below or in NRC Form 366A
20.2203(a)(2)(iv)	50.36(c)(2)	50.73(a)(2)(vii)	

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (Include Area Code)
L. V. Wilkie, Safety Review Manager	(864) 885-3518

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)

	YES (If yes, complete EXPECTED SUBMISSION DATE).	X	NO

EXPECTED SUBMISSION	MONTH	DAY	YEAR

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

On July 6, 1996, at 0210 hours, Unit 2 was operating at 100% full power when control rod 3 of group 7 dropped from approximately 95% withdrawn to approximately 84% withdrawn. During the recovery attempt at 0320 hours, the rod dropped to fully inserted. Technical Specifications require a power reduction to less than 60% and a reset of high flux and flux/flow/imbalance trip setpoints. Due to mis-communications the flux/flow/imbalance setpoint was not reset. The root cause of the event is Inappropriate Action; Deficient Communications; verbal instructions were not transmitted accurately. Corrective action includes revising operations guidelines and procedures.

FACILITY NAME (1)	DOCKET	LER NUMBER (6)			PAGE (3)
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Oconee Nuclear Station, Unit Two	270	96	02	00	

TEXT *(If more space is required, use additional copies of NRC Form 366A)* (17)

BACKGROUND

The Unit 2 core design has 69 control rods that are divided into eight groups. Group seven is one of the three groups which make up the regulating rods.

Technical Specification (TS) 3.5.2.2 requires all control rods to be operable and positioned within nine inches of their group average position. A control rod shall be declared inoperable if certain conditions exist for that rod. The TS requires if an inoperable control rod exists, certain actions must be taken within specified time frames. One of the actions is to reduce power, within two hours, to less than 60% of the maximum power allowed for the number of operating Reactor Coolant Pumps. Another action is to reset the Nuclear Overpower Trip Setpoints, based on flux and flux/flow/ imbalance, to 65.5% of thermal power value allowable for the operating Reactor Coolant Pump combination.

EVENT DESCRIPTION

On July 6, 1996, at approximately 0210 hours, while operating at 100% full power, Unit 2 Control Rod 3 in group 7 dropped from 95% withdrawn to approximately 84% withdrawn. The Secondary System Protection Test was in progress at the time of the rod drop. It was suspended immediately upon receiving the alarm for Control Rod Drive (CRD) [EIIS:AA] position error. No other abnormal events, testing, or maintenance were in progress before or at the time of the rod drop.

The Control Room Operators (CRO) notified the Control Room Senior Reactor (CRSRO), Unit Supervisor (US), Operations Shift Manager (OSM) and verified the validity of the Control Rod Drive fault. They noted a Reactor power decrease and changes in quadrant power tilt, imbalance, and average Reactor Coolant System [EIIS:AB] temperature.

The Shift Work Manager (SWM) was notified and initiated an investigation into the cause of the rod drop.

At 0240 hours, a shutdown margin calculation at power was performed.

At 0303 hours, a 10 megawatt electrical power reduction was initiated for re-aligning rod 3 group 7 with its group average. At 0308 hours, the rod dropped to approximately 76% withdrawn. After discussions with the CRSRO, US, and OSM, Operators placed the Integrated Control System (ICS) [EIIS:JA] in manual at 0316 hours. At 0320 hours, while the operators were attempting to insert Control Rod Group 7 manually, rod 3 group 7 dropped to the in limit. Operators stabilized the resulting reactor transient at 95% full power.

Operation personnel could not realign the rod with the group average, and at 0344 hours, a manual power reduction to less than 60% full power was initiated per the Technical Specification Limiting Condition For Operation for an inoperable control rod. The US informed the Shift Work Manager (SWM) to reduce trip setpoints per the TS. The SWM notified the maintenance supervisor (MS) that "high flux trip setpoints need to be reset to 65.5%". The MS repeated the instructions to the SWM "reset the high flux trip setpoints to 65.5%". The MS initiated a work request to reset the high flux trip setpoints.

At 0358 hours, the reactor power was less than 60% full power and the reactor was stabilized at approximately 55% full power at 0435 hours. The US gave maintenance the clearance to begin work on resetting the Reactor Protective System (RPS) [EIIS:JC] high flux trip setpoint to 65.5%.

At 0523 hours, the Reactor Protective System [EIIS:JC] (RPS) high flux trip setpoints were reset to 65.5% utilizing the "Procedure For Setting High Flux Trip and Reactor Building

Evacuation Alarm". The purpose of this procedure is to calibrate the high flux trip and Reactor Building evacuation alarm bistable setpoints per Operations request. There is another procedure that resets the high flux trip with a stated purpose of readjusting the flux/flow/imbalance trip and high flux trip for operation with a quadrant power tilt above the steady-state limit or other conditions required in TS 3.5.2. Since the verbal instructions were specific that the high flux trip be reset to 65.5%, the "Procedure for Setting High Flux Trip and Reactor Building Evacuation Alarm" was utilized.

At 0653 hours, the ICS was placed in manual to take rod 3 group 7 to the auxiliary power supply for maintenance to investigate the rod drop. Maintenance determined that a fuse had blown on one of the power supplies and replaced it. No shorted circuits or defective components were noted.

At 1045 hours the rod recovery was initiated. The maintenance engineer responsible for the Control Rod Drive System questioned the absence of the test equipment for changing the flux/flow/imbalance trip setpoint. The maintenance personnel indicated that no flux/flow/imbalance setpoint change had been performed. At 1215 hours, it was confirmed that the TS requirement to reset the flux/flow/imbalance had not been performed. Only the high flux trip was reset to 65.5%.

At 1245 hours, Operations had completed the required post maintenance testing and aligned rod 3 group 7 with the remainder of the group 7 rods. At 1254 hours the ICS was returned to automatic.

At 1300 hours, a phone notification was made to the NRC concerning the failure to reset the flux/flow/imbalance setpoints within the TS time requirements.

The conditions were met to begin increasing power to 100% at 1440 hours. The Unit was returned to 100% full power.

On July 13, 1996, rod 3 group 7 dropped again and it was determined that one phase of the CRD motor was shorted. Unit 2 was shut down and the CRD motor was replaced.

CONCLUSIONS

An investigation into the missed Technical Specification (TS) requirement was initiated. It was determined that the verbal instructions from the Shift Work Manager to the Maintenance Supervisor were not in enough detail to determine that the flux/flow/imbalance setpoints also needed to be reset. The root cause is determined to be Inappropriate Action; Deficient Communication; verbal instructions were not transmitted accurately.

There are several initiatives currently in progress at Oconee to improve verbal instructions and questioning attitude. One of these is a six-part communication on "Improving Human Performance Results". This initiative is to be used by all site supervisors and managers to re-communicate both management's expectation for using the tools and to provide an additional opportunity to make sure everyone understands how the tools must be used.

A review of events over the past two years indicates there have been no missed TS compensatory actions following equipment problems. Also, no events were noted which had a root cause of Inappropriate Action; Deficient Communication. Therefore, this event is considered to be non-recurring.

There were no personnel injuries and there was no release of radioactive materials or overexposures involved.

CORRECTIVE ACTIONS

Immediate

1. The Technical Specification Limiting Condition for Operation was exited by recovering the rod and restoring the plant to steady state conditions.

Subsequent

None

Planned

1. Revise the Abnormal Procedure for a dropped control rod (AP/1,2,3/A/1700/15) to include independent steps for resetting the high flux and flux/flow/imbalance trip setpoints.

2. Revise the Alarm Response Guide for the Quadrant Power Tilt statalarm to include separate steps for changing the high flux and flux/flow/imbalance setpoints.

SAFETY ANALYSIS

The Reactor Protective System (RPS) includes the high flux, the flux/flow/imbalance and the pump power monitor trip functions to provide core protection by preventing fuel damage during certain design basis accidents. The pump power monitor trip function trips the reactor on the loss of two or more reactor coolant pumps (RCPS) only if the reactor power is greater than 2% rated power. Per Technical Specification 3.5.2,2.d, when a control rod is declared inoperable, within the next four hours the high flux and the flux/flow/imbalance trip setpoints should be reduced to 65.5% of the thermal power

value allowable for the RCP combination. The design basis accidents that are influenced by the flux/flow/imbalance trip function are the loss of flow accident and the locked rotor accident. These events are evaluated from an initial condition of 50% thermal power, 4 RCPs in operation, and with control rod group 7 rod 3 in the fully inserted position (dropped rod). The consequence of the dropped rod is higher core power tilts in two of the core quadrants (approximately 8% in one and 7% in the other quadrant) which increases core power peaking and therefore results in a potential DNB concern.

The loss of flow accident resulting from any single RCP coastdown results in Reactor Coolant System (RCS) flow equivalent to 3 RCP flow. With thermal power at approximately 50% Full Power (FP), this is an allowable mode of operation because the maximum allowable thermal power level with 3 RCPs in operation is 75% FP. The dropped control rod results in increased core power tilts in two of the quadrants which resulted in higher core power peaking, however the peaking is less than that assumed in the licensing basis analysis and therefore there is no DNB concern.

The loss of flow accident resulting from any 2 RCPs (one in each loop or both in a single loop) coastdown results in RCS flow of approximately 55% design flow (based on 4 RCP flow of 112% design flow) which corresponds to a flux/flow/imbalance trip setpoint of approximately 53% FP. If a single failure results in the pump power monitor not recognizing one of the RCPs has tripped, this would result in a reactor trip on flux/flow/imbalance since the measured NI power indication on two of the four NI channels would indicate greater than 53% FP due to the increased core power tilt. Therefore, the reactor will trip following a two RCP coastdown.

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TEXT *(If more space is required, use additional copies of NRC Form 366A)* (17)

The loss of flow accident resulting from any 3 or 4 RCPs coastdown results in a reactor trip on pump monitor, even if a single failure results in the pump monitor not recognizing one of the RCPs has tripped. Therefore, the reactor will trip following a 3 or 4 RCP coastdown.

For the locked rotor accident resulting from the instantaneous seizure of one of the RCPs rotor results in RCS flow equivalent to 3 RCP flow. With thermal power at approximately 50% FP, this is an allowable mode of operation because the maximum allowable thermal power level with 3 RCPs in operation is 75% FP. The dropped control rod results in increased core power tilts in two of the quadrants which resulted in higher core power peaking, however the peaking is less than that assumed in the licensing basis analysis and therefore there is no DNB concern.

In summary, the FSAR Chapter 15 events which would potentially be affected by operating at 50% thermal power with control rod group 7 rod 3 in the fully inserted position and without reducing the flux/flow/imbalance trip setpoint, have been evaluated. The potential transients will still be protected by a reactor trip, or the transient conditions will not result in exceeding the DNBR limit due to the reduction in core power. It is therefore concluded that the health and safety of the public was not affected by this event.