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ACCESSION NBR: 9411250092	DOC. DATE: 94/11/17	NOTARIZED: NO	DOCKET #
FACIL: 50-270 Oconee Nuclear Station, Unit 2, Duke Power Co.			05000270
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RECIP. NAME	RECIPIENT AFFILIATION		

SUBJECT: LER 94-004-00: on 941021, invalid actuation of ES occurred while defueled due to technicians manipulating ES sys analog channel A instead of channel B. Operators secured ES sys equipment & ES channel A reset. W/941117 ltr.

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**DUKE POWER**

November 17, 1994

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

Subject: Oconee Nuclear Station  
Docket Nos. 50-269, -270, -287  
LER 270/94-04

Gentlemen:

Pursuant to 10 CFR 50.73 Sections (a)(1) and (d), attached is Licensee Event Report (LER) 270/94-04, concerning an inadvertent Engineered Safeguards actuation while defueled.

This report is being submitted in accordance with 10 CFR 50.73 (a)(2)(iv). 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

/ftr

Attachment

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Mr. P. E. Harmon  
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## LICENSEE EVENT REPORT (LER)

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

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNBB 7714), 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.

FACILITY NAME (1)

Oconee Nuclear Station, Unit 2

DOCKET NUMBER (2)

05000 270

PAGE (3)

1 OF 4

TITLE (4) Inadequate Work Practices Result In Advertent Engineered Safeguards Actuation While Defueled

EVENT DATE (5)			LER NUMBER (6)			REPORT NUMBER (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
10	21	94	94	04	00	11	17	94	FACILITY NAME	DOCKET NUMBER
										05000
									FACILITY NAME	DOCKET NUMBER
										05000

  

OPERATING MODE (9)	N	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)				
POWER LEVEL (10)	000	20.402(b)	20.405(c)	<input checked="" type="checkbox"/>	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

Lanny V. Wilkie, Safety Review Manager

TELEPHONE NUMBER (Include Area Code)

(803) 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)

☒

NO

EXPECTED  
SUBMISSION  
DATE (15)

MONTH DAY YEAR

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

On October 21, 1994, Unit 2 was in a refueling outage with no fuel in the core. Instrument and Control Maintenance technicians were performing Engineered Safeguards (ES) System Analog Channel B Reactor Coolant Pressure Channel Calibration. At 1320 hours, an invalid actuation of ES occurred due to the technicians manipulating channel A instead of B while performing this calibration. When this actuation occurred, ES channels 1 through 4 started the ES related equipment that was in service. The other ES channel 1-4 related equipment was out of service due to the outage. Operators verified the actuation was invalid and secured the systems/components that had started. The root cause of the ES actuation is Work Practices; Error detection practices; Self-checking not applied to ensure correct train. A contributing cause is Written procedures and documents; Omission of relevant information. Corrective actions include training personnel, revising procedures, and adding labels.

**LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION**

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FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
Oconee Nuclear Station, Unit 2	05000 270	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	2 OF 4
		94	- 04 -	00	

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

**BACKGROUND**

The Engineered Safeguards (ES) [EIIS:JE] system is designed to function under accident conditions to reduce the severity of a serious loss of coolant accident.

There are three identical analog channels (A, B, and C). The system logic requires 2 out of 3 analog channels to trip to actuate a particular safeguards action (ES 1, 2 and/or 3, 4). When an ES channel is placed in test it effectively trips that channel.

There are 3 control cabinets for the analog channels, each housing a number of modules which make up the logic systems of each channel. The cabinets are mounted in rows at the back of the control room and each individual cabinet door is locked.

**EVENT DESCRIPTION**

On October 20, 1994, with Unit 2 in a refueling outage and no fuel in the core, Instrument and Control Technicians (ICT) A and B began calibrating the Engineered Safeguards (ES) System Analog Channel A Reactor Coolant [EIIS:AB] Pressure Channel using procedure IP/0/A/0310/003B. ICT A was qualified to the calibration procedure and ICT B was in the process of qualifying. Both technicians had previously been involved with performing this procedure. ICT A was reading the procedure and ICT B was performing the work. This calibration was completed successfully.

In the morning of October 21, 1994, ICT's A and B began calibrating the ES System Analog Channel B Reactor Coolant Pressure Channel using procedure IP/0/A/0310/004B. ICT B was reading the procedure and ICT A was performing the work. At various steps in the calibration procedure, it was necessary to connect to output jacks in the bottom of the channel A cabinet. At approximately 1245 hours, the ICTs returned to the control room, from a lunch break, to continue the calibration. Step 10.6.3 was performed to verify the recorder channel selection plug was plugged into jack J3 which is located in the bottom of channel A cabinet. This step has the technicians independently verify the condition. Step 10.7.2.i is a step, with no sign off, that connects the Digital Volt Meter to recorder output jack 1-7-J4 and records the as found readings. The procedure does not mention the jack is located in the channel A cabinet. ICT A completed this step and recorded the meter readings in the appropriate place in the procedure.

At approximately 1320 hours, ICT B read step 10.7.3.a "Place Pressure Test Circuit in RANGE position". ICT A, still being positioned at the channel A cabinet, went to the channel A Buffer Amplifier and switched the channel A pressure test circuit switch, causing the channel A to trip. Because channel B was in test, this satisfied the logic and actuated the ES systems. Only the ES components that were in service started. The Low Pressure Service Water [EIIS:BI] Pumps that were not running started, the

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				94	04	00	

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

emergency generators [EIIS:EK] started, (but supply breakers did not close in, since normal power was still available) and the Reactor Building Purge was isolated.

Operators secured and realigned the systems/components that had actuated after verifying the actuation was inadvertent. They confirmed that no adverse conditions had occurred as a result of the systems/components starting. The calibration was completed satisfactorily.

At 1536 hours, the event was reported to the Nuclear Regulatory Commission.

CONCLUSIONS

The root cause of this event is determined to be Work Practices; Error detection practices; Self-Checking not applied to ensure correct train. A contributing cause is Written procedures and documents; Omission of relevant information. It is recognized that a human factors design deficiency exists with one Engineered Safeguards (ES) channel requiring tasks performed in the cabinet of another ES channel. A pre-job briefing was conducted, however there was no specific reference to the fact that work is performed in the channel A cabinet even though the calibration would be performed on channel B. Instrument and Control technician (ICT) A verified the correct component by touching the label; however, ICT A did not verify the correct train. The buffer amplifier in the channel A cabinet is labeled channel 1. The procedure step wording to place the Pressure Test Circuit in RANGE position is not specific in that it does not caution or reference the specific channel. Since the previous step involved work in the channel A cabinet, the technicians were in a physical position to make the incorrect action. No specific procedural wording directed ICT A to go to channel B Buffer Amplifier. However, the calibration has been performed successfully in the past during refueling outages. This could be due to having two qualified technicians with one performing the work and the other observing and verifying the proposed actions.

In the past five years two incidents occurred where ES systems actuated inadvertently. An event documented by LER 287/89-05 was caused by momentary loss of power to one channel when an operator performed procedure steps out of sequence. A second event documented by LER 269/90-07 involved ES channels 1 through 6 actuating unexpectedly as a result of a pneumatic pressure test that was being performed during the implementation of a modification. These two events involved human factors, but were not attributed to the wrong unit/train/component. Therefore, the error involved in this report is considered not recurring. However, there have been recent less significant events involving various systems/components associated with the wrong unit/train/component due to the use of poor self checking techniques. These events have been identified as adverse trends in a Problem Investigation Process (PIP) report.

There were no equipment failures associated with this event.

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There were no personnel injuries, radiation overexposures, or releases of radioactive materials associated with this event.

CORRECTIVE ACTIONS

## Immediate

1. Operators secured the Engineered Safeguards (ES) system equipment that started due to the inadvertent actuation.

## Subsequent

1. Instrument and Control Technicians (ICT) reset the ES channel A Pressure Test Circuit and placed it in the operate position.
2. ICT training was conducted on October 24, 1994 to reinforce/communicate management expectations relating to procedure use and adherence.

## Planned

1. Revise procedure IP/O/A/0310/004B to caution or instruct technicians when working in a different cabinet than the channel being calibrated.
2. Determine the ES and Reactor Protective System (RPS) [EIIS:JC] Instrument Procedures that contain multiple tasks which change trains, cabinets, etc., and revise as necessary.
3. Label the ES and RPS cabinets on the inside so that the proper channel can be readily determined with the doors open.

SAFETY ANALYSIS

The Engineered Safeguards (ES) system actuated, as designed, when the 2 out of 3 logic was inadvertently satisfied. There was no fuel in the core at the time of the actuation. Even if fuel had been in the core, there would have been no detrimental affects due to the inadvertent actuation. There were no safety concerns due to this inadvertent actuation of the ES system.

The health and safety of the public was not affected by this event.