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FACIL:50-316 Donald C. Cook Nuclear Power Plant, Unit 2, Indiana & 05000316
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RECIP.NAME RECIPIENT AFFILIATION

SUBJECT: LER 90-013-00:on 901215,during Tech Spec surveillance,plant battery declared inoperable when single cell voltage decreased below test limit.Caused by improper setpoint. Setpoints verified & corrected as needed.W/910111 ltr.

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TITLE: 50.73/50.9 Licensee Event Report (LER), Incident Rpt, etc.

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DCD

January 11, 1991

United States Nuclear Regulatory Commission
Document Control Desk
Rockville, Maryland 20852

Operating Licenses DPR-75
Docket No. 50-316

Document Control Manager:

In accordance with the criteria established by 10 CFR 50.73 entitled Licensee Event Reporting System, the following report is being submitted:

90-013-00

Sincerely,

A. Alan Blind

A.A. Blind
Plant Manager

AAB:sb

Attachment

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NRC FORM 366 (6-89)

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104
EXPIRES: 4/30/92

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
D. C. Cook Nuclear Plant - Unit 2	0 5 0 0 0 3 1 6	1 OF 0 4

TITLE (4) Reactor Protection System Actuation While Performing a TS Required Shutdown Due to a Decreased Plant Battery Cell Voltage

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 2	1 5	9 0	9 0	0 1 3	0 0	0 1	1 1	9 1		0 5 0 0 0

OPERATING MODE (9): 1

POWER LEVEL (10): 1 0 0

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

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)
X 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
P. F. Carteaux - Safety and Assessment Superintendent	6 1 6 4 6 5 - 5 9 0 1

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFAC-TURER	REPORTABLE TO NPRDS		CAUSE	SYSTEM	COMPONENT	MANUFAC-TURER	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 December 15, 1990, at 0840 hours during a Technical Specification (TS) Surveillance, the 2-AB plant battery was declared inoperable when a single cell's voltage decreased below a test limit. Efforts taken to restore the cell voltage were unsuccessful and a reactor shutdown was initiated. During the shutdown at approximately 35 percent rated thermal power, a reactor protection system actuation occurred due to a turbine trip from an unnecessary actuation of the Anticipated Transient Without Scram Mitigation System Actuation Circuitry (AMSAC). All equipment performed as expected and there were no component failures following the trip.

The reactor entered Mode 5 at 0600 hours on 12-16-90 to exit the battery TS Action Statement and the battery cell of concern was removed from service via a jumper. A proposed TS Amendment is being prepared to request changing the surveillance to align with industry standards and conform to Standard TS.

The AMSAC actuation occurred due to an improper setpoint. All AMSAC input setpoints were verified and corrected as needed.

Condition Prior to Occurrence

Unit 2 in Mode 1 at 100 percent Rated Thermal Power (RTP).

Description of Event

On December 15, 1990, at 0840 hours during a 92 day Technical Specification (TS) surveillance, the 2-AB plant battery (EIIS/EJ-BTRY) was declared inoperable when a single cell's voltage decreased by more than 0.05 volts from the original acceptance test value. The 2-AB plant battery consists of 116 connected cells. The TS 92-day surveillance requirements for the D.C. electrical power distribution system states, in part, the following:

> The voltage of each connected cell is greater than or equal to 2.10 volts under float charge and has not decreased more than 0.05 volts from the value observed during the original acceptance test.

All 2-AB battery cells were greater than the minimum 2.10 volt limit and all but one cell remained within the 0.05 volt decrease limit. Efforts taken to restore the cell voltage were unsuccessful and a conservative decision was made not to attempt repairs while at power. At 1245 hours a reactor shutdown was initiated in accordance with the TS Action Statement.

During the shutdown, at approximately 35 percent rated thermal power, a reaction protection system (EIIS/JE) actuation (reactor trip) occurred due to a turbine trip. The turbine trip resulted from the unnecessary actuation of the Anticipated Transient Without Scram (ATWS) Mitigation System Actuation Circuity (AMSAC). The AMSAC system is designed to protect against an ATWS coincident with a loss of main feedwater. It automatically trips the Main Turbine, initiates a feedwater conservation signal and starts all auxiliary feedwater pumps if less than 25 percent of full main feedwater flow is sensed (three out of four steam generator coincidence) with Turbine Impulse Pressure (TIP) greater than 40 percent of full power (P-20) or within 6 minutes after a TIP channel (1 out of 2 coincidence) is reduced below permissive P-20.

Following the AMSAC actuation the turbine trip/reactor trip sequence [turbine (EIIS/TA-TRB) trip, automatic starting of the motor-driven and turbine-driven auxiliary feedwater pumps (EIIS/BA-P), opening of the reactor trip breakers (EIIS/JE-BKR), insertion of reactor control rods and feedwater isolation (EIIS/JB)] the Operations Department personnel immediately performed Emergency

Operating Procedures (EOP) to verify proper response of the automatic protection system and to assess plant conditions for indicated appropriate recovery actions. All equipment performed as expected and there were no component failures following the trip.

The reactor entered Mode 5 (cold shutdown) at 0600 hours on 12-16-90 to exit the 2-AB plant battery TS Action Statement.

Cause of the Event

The Technical Specification requirement that the voltage must not decrease more than 0.05 volts from the acceptance test is an overly restrictive condition for battery operability and is not mentioned in:

Regulatory Guide 1.129, "Maintenance, Testing, and Replacement of Large Lead Storage Batteries for Nuclear Power Plants"

Westinghouse Standardized Technical Specifications

Manufacturer's Installation and Operating Instructions Manual (C&D Power Systems, #12-800)

IEEE Standards 450-1975, 1980 and 1987

The cause of the AMSAC actuation was that the 25 percent feedwater flow setpoints were set at approximately 35 percent feedwater flow (a conservative value for actuation of AMSAC). From the initial system implementation until the 1990 refueling outage, the feedwater flow setpoints were 25 percent of design flow. During this last refueling outage (ending in November) the feedwater flow values were changed, from the percent design value originally used, to an actual flow value to more accurately reflect plant operating conditions. The setpoints inserted were mistakenly set at approximately 35 percent flow due to a misinterpretation of the setpoint control document's calculated voltage input location. This feedwater flow setpoint in coincidence with a power decrease rate greater than approximately 0.8 percent of RTP per minute resulted in the AMSAC actuation. The plant is designed for a two percent per minute decrease with all systems in automatic in this operating range.

Analysis of Event

This event is being reported in accordance with 10 CFR 50.73(A)(2)(I) and 10 CFR 50.73(A)(2)(IV) as an event that resulted in the completion of a Technical Specification required shutdown and an unplanned automatic actuation of the engineered safety features, including the reactor protection system, respectively.

The Technical Specification Limiting Condition of Operation and the associated Action Statement were complied with and the automatic protection responses, including reactor trip and its associated actuations, were verified to have functioned properly as a result of the reactor trip signal. Based on the above, it is concluded that the event did not constitute an unreviewed safety question as defined in 10 CFR 50.59 nor did it adversely impact the health and safety of the public.

Corrective Action

The 2-AB battery was removed from service for repairs which included electrically removing (via jumpers) the cell of concern, as well as, another cell that experienced voltages approaching the 0.05 differential voltage limit.

A proposed Technical Specification Amendment is being prepared to request changing the related 92-day surveillance to that found in Standard Technical Specifications which would remove the requirement of having cells within 0.05 of the their individual acceptance test.

Methods to safely jumper battery cells in Modes 1-4 while complying with the current TS are being researched.

All setpoints in the AMSAC system were verified and the inappropriate setpoints on the feedwater flow portion of the circuit were corrected. Similar setpoint corrections were made to the Unit 1 circuit (which was in a refueling outage and never operated with the inappropriate setpoints).

Failed Components

None

Previous Similar Events

None