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FACIL:50-261 H.B. Robinson Plant, Unit 2, Carolina Power & Light C 05000261
AUTH.NAME AUTHOR AFFILIATION
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HERRELL,M.E. Carolina Power & Light Co.
RECIP.NAME RECIPIENT AFFILIATION

SUBJECT: LER 94-016-00:on 940802,control room operators initiated a manual reactor trip.Caused by component failure.Replaced fuse in main turbine governor valve circuitry.W/940901 ltr.

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10 CFR 50.73

Carolina Power & Light Company
Robinson Nuclear Plant
PO Box 790
Hartsville SC 29551

SEP 01 1994

Robinson File No.: 13510C
Serial: RNP/94-1553

United States Nuclear Regulatory Commission
Attn: Document Control Desk
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H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2
DOCKET NO. 50-261/LICENSE NO. DPR-23
LICENSEE EVENT REPORT NO. 94-016-00

Gentlemen:

The enclosed Licensee Event Report (LER), is submitted in accordance with 10 CFR 50.73.

Very truly yours,

M. E. Herrell
Acting Plant General Manager

RDC:rdc
Enclosure
c: Mr. S. D. Ebneter, Regional Administrator, USNRC, Region II
Ms. B. L. Mozafari, USNRC Project Manager, HBRSEP
Mr. W. T. Orders, USNRC Senior Resident Inspector, HBRSEP

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Enclosure to Serial: RNP/94-1553

NRC FORM 366 (5-92) — U.S. NUCLEAR REGULATORY COMMISSION — APPROVED BY OMB NO. 3150-0104 EXPIRES 5/31/95

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)	DOCKET NUMBER (2)	PAGE (3)
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TITLE (4) MANUAL REACTOR TRIP DUE TO MAIN TURBINE GOVERNOR VALVE CLOSURE

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	02	94	94	-- 016 --	00	09	01	94		05000
									FACILITY NAME	DOCKET NUMBER 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)

20.402(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)		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)	X	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)
K. R. Jury: Manager - Licensing/Regulatory Prog.	(803) 383-1363

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
X	TG	FU		Y						

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 15 single-spaced typewritten lines) (16)

On August 2, 1994, H. B. Robinson Steam Electric Plant (HBRSEP), Unit No. 2 was operating at 100% power. At 0541 hours, control room operators initiated a manual reactor trip in anticipation of an imminent automatic reactor trip due to rapidly decreasing turbine generator load. During the transient, operators received indication that a pressurizer power operated relief valve (PORV) had not completely reclosed after operating to relieve the pressure transient, and at 0554 hours, an Unusual Event was declared due to this configuration. Following the reactor trip, the plant was placed in normal hot shutdown status, with one PORV block valve shut. The Unusual Event was terminated at 0717 hours following verification that there was no leakage through the block valve. Subsequent investigation revealed that the PORV had, in fact, closed as required.

This event was caused by component failure. A fuse failure occurred in a control circuit that monitors the generator output breaker position, and closes the main turbine governor valves if the generator output breakers open with the unit operating at full load. Following fuse replacement and system testing, the plant was returned to 100 percent power. This report is submitted pursuant to 10 CFR 50.73 (a)(2)(vi) since this condition

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

I. DESCRIPTION OF EVENT

On August 2, 1994, H. B. Robinson Steam Electric Plant (HBRSEP), Unit No. 2 was operating at 100% power. At 0541 hours, in response to an anticipated imminent automatic reactor trip due to rapid unexplained decreasing turbine generator (EIIS Code: TB) load, control room operators initiated a manual reactor trip. In response to the event, the Auxiliary Feedwater (EIIS Code: BA) pumps started as required and supplied design flow to the Steam Generators (EIIS Code: SG). The load on the auxiliary transformer automatically transferred to the start-up transformer (EIIS Code: XMFR) as designed, and feedwater isolation occurred as required, with the exception of the "B" Feedwater Regulating Valve (EIIS Code: FCV) indicating dual position (i.e., dual indication means that the valve is between full open and full closed). During the Reactor Coolant System (RCS) (EIIS Code: AB) pressure reduction, control room operators received indication that pressurizer power operated relief valve (PORV) RC-455C (EIIS Code: RV) had not completely reclosed after operating to relieve the pressure transient when RCS pressure was low enough to result in the PORV being fully closed (i.e., below the reset pressure of 2000 psig). The PORV block valve (ESSI Code: SHV) (i.e., RC-536) was closed, and an Unusual Event was declared at 0554 hours due to the indication that the pressurizer PORV had not reclosed after lifting. The Unusual Event was terminated at 0717 hours following verification that there was no leakage through the block valve. All other plant equipment operated as required for plant conditions, and the plant was placed in the hot shutdown condition in accordance with plant procedures.

The NRC was notified at 0630 hours in accordance with 10 CFR 50.72(a)(1)(i) of the declaration of an Emergency Classification specified in the Emergency Plan (i.e., an Unusual Event). During the event investigation, plant staff discovered that the pressurizer PORV RC-455C position limit switch (EIIS Code: FIS) had provided inaccurate indication, and the PORV, in fact, had closed as required. This information was provided to the NRC on August 3, 1994 at 1112 hours via a followup notification to the NRC Operations Center.

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II. CAUSE OF EVENT

This event was caused by component failure. The main turbine governor valves (EIIS Code: FCV) closed while the unit was at full power, resulting in a loss of electrical load. The cause of the governor valve closure was an intermittent fuse (EIIS Code: FU) failure in a control circuit that monitors the main generator output breaker (EIIS Code: BKR) position and closes the governor valves if the generator output breakers open with the unit at full load. The fuse, which is used as a protective device for a relay in the Electro-Hydraulic Control System (EIIS Code: TG), was defective. Laboratory examinations have concluded that the fuse was not manufactured correctly. These conclusions are based on observation that the fuse element tab end was not wetted by the end cap solder. Although the fuse element was apparently in contact with the solder in the past, this connection was insufficient to provide reliable service in its intended application.

III. ANALYSIS OF EVENT

The operational transient associated with this event began when a reactor trip was manually initiated by control room operators due to a rapidly decreasing main turbine-generator load. This action was taken in anticipation of an automatic reactor trip since the operators recognized that a main generator lockout/turbine trip/reactor trip would occur following governor valves closure. Had the operators not taken this immediate action, the primary system temperature would have continued to rise and an automatic reactor trip would have occurred due to increased pressurizer pressure. Accordingly, the manually initiated reactor trip precluded certain challenges to the Reactor Protection System.

The Updated Final Safety Analysis Report (UFSAR) addresses postulated transients and accidents which could result in a reduction of the capacity of the secondary system to remove heat generated in the RCS. One of these postulated transients, Loss of Electrical Load, is addressed in UFSAR Section 15.2.2. The primary challenge of this transient is to the primary system overpressurization acceptance criterion (i.e., peak pressure less than 110 percent of the design value). The challenge to the specified acceptable fuel design limit is also evaluated because of the increasing core inlet temperature and the potential for the reactor core power to increase, assuming a positive moderator temperature coefficient, prior to the reactor trip.

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III. ANALYSIS OF EVENT (Continued)

The conclusion of the UFSAR Accident Analysis is that the maximum pressure that would occur is less than the acceptance limit of 110 percent of design pressure. With regard to the acceptable fuel design limit, the minimum Departure from Nucleate Boiling Ratio (DNBR) during this transient is greater than the approved fuel safety limit.

This report is submitted pursuant to 10 CFR 50.73 (a)(2)(vi) since this condition resulted in a manual reactor trip.

IV. CORRECTIVE ACTIONS

Following the manual reactor trip, the plant was placed in normal hot shutdown status, with one PORV block valve shut. The Unusual Event was terminated at 0717 hours on August 2, 1994, following verification that there was no leakage through the block valve.

Fuse replacement in the main turbine governor valve circuitry was performed and the system was tested satisfactorily. The plant returned to 100 percent power at 1600 hours on August 7, 1994.

V. ADDITIONAL INFORMATION

A. Component Failures

This event was caused by a Bussman MBO 10 fuse (Cause Code: X; System: TG; Component: FU.

B. Previous Similar Events

The following Licensee Event Reports (LERs) reported main turbine valve closure transients that resulted in reactor trips:

LER 94-006
LER 88-010