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United States Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2
DOCKET NO. 50-261/LICENSE NO. DPR-23

LICENSEE EVENT REPORT NO. 2001-001-00
REACTOR PROTECTION SYSTEM LOW REACTOR COOLANT
SYSTEM FLOW CHANNEL INOPERABLE FOR GREATER
THAN TECHNICAL SPECIFICATION ALLOWABLE TIME

Ladies and Gentlemen:

The attached Licensee Event Report is submitted in accordance with the requirements of 10 CFR 50.73. Should you have any questions regarding this matter, please contact Mr. H. K. Chernoff.

Sincerely,

Timothy P. Cleary
Plant General Manager

DJS/djs

Attachment

c: Mr. L. A. Reyes, NRC, Region II
Mr. R. Subbaratnam, NRC, NRR
NRC Resident Inspector, HBRSEP

Robinson Nuclear Plant
3581 W. Entrance Road
Hartsville, SC 29550

IE22

LER 2001-001-00

Reactor Protection System Low Reactor Coolant System Flow Channel Inoperable for Greater Than
Technical Specification Allowable Time

LICENSEE EVENT REPORT (LER)

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

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FACILITY NAME (1)

H. B. Robinson Steam Electric Plant Unit No. 2

DOCKET NUMBER (2)

05000261

PAGE (3)

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TITLE (4)

Reactor Protection System Low Reactor Coolant System Flow Channel Inoperable for Greater Than Technical Specification Allowable Time

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MO	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO	MO	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
01	22	2001	2001	- 001	- 00	03	20	2001	FACILITY NAME	DOCKET NUMBER
OPERATING MODE (9)			THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR : (Check all that apply) (11)							
1			20.2201(b)	20.2203(a)(3)(ii)		50.73(a)(2)(ii)(B)		50.73(a)(2)(ix)(A)		
POWER LEVEL (10)			20.2201(d)	20.2203(a)(4)		50.73(a)(2)(iii)		50.73(a)(2)(x)		
100			20.2203(a)(1)	50.36(c)(1)(i)(A)		50.73(a)(2)(iv)(A)		73.71(a)(4)		
			20.2203(a)(2)(i)	50.36(c)(1)(ii)(A)		50.73(a)(2)(v)(A)		73.71(a)(5)		
			20.2203(a)(2)(ii)	50.36(c)(2)		50.73(a)(2)(v)(B)		OTHER		
			20.2203(a)(2)(iii)	50.46(a)(3)(ii)		50.73(a)(2)(v)(C)		Specify in Abstract below or in NRC Form 366A		
			20.2203(a)(2)(iv)	50.73(a)(2)(i)(A)		50.73(a)(2)(v)(D)				
			20.2203(a)(2)(v)	X 50.73(a)(2)(i)(B)		50.73(a)(2)(vii)				
			20.2203(a)(2)(vi)	50.73(a)(2)(i)(C)		50.73(a)(2)(viii)(A)				
			20.2203(a)(3)(i)	50.73(a)(2)(ii)(A)		50.73(a)(2)(viii)(B)				

LICENSEE CONTACT FOR THIS LER (12)

NAME

Harold Chernoff

TELEPHONE NUMBER (Include Area Code)

(843) 857-1437

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX

SUPPLEMENTAL REPORT EXPECTED (14)

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

EXPECTED SUBMISSION DATE (15)

MONTH DAY YEAR

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

On January 22, 2001, while the plant was in MODE 1 operating at 100% RATED THERMAL POWER, technicians determined during a scheduled surveillance test that the Reactor Coolant System Loop 3 Channel Flow Comparator (FC-434) setting was not within the allowable value of Technical Specifications, Table 3.3.1-1, Low Reactor Coolant Flow. The flow comparator is part of the Reactor Protection System. The associated Loop 3 channel was inoperable for longer than the six or ten hour completion times required by TS 3.3.1, Required Actions N.1 or N.2. The ten turn vernier dial potentiometer (flow comparator) setting was lower than specified in test procedures. The comparator was recalibrated. Corrective actions include the revision of maintenance procedures and work practices by April 6, 2001. Because the channel was inoperable for greater than the allowed completion time, this condition is being reported in accordance with 10 CFR 50.73(a)(2)(i)(B) as a condition prohibited by the plant's Technical Specifications. The apparent cause of this event was inattention to detail by non-licensed utility personnel.

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

I. Description of Event

On January 22, 2001, at 21:31 hours EST, while the plant was in MODE 1 operating at 100% RATED THERMAL POWER (RTP), technicians concluded during a scheduled surveillance test that the Reactor Coolant System (RCS) [AB] Loop 3 Channel Flow Comparator (FC-434) [JC/CHA] setting was not within the required allowable value of the Technical Specifications (TS), Table 3.3.1-1, Low Reactor Coolant Flow. A ten turn vernier dial potentiometer [JC/RHE] setting indicated a value of 5.90, which is equal to 3.383 Volts dc (Vdc). The dial indication of 5.90 represents the "as found" condition. The calibration data sheet for the previous surveillance test recorded the ten turn vernier dial on the potentiometer setting as indicating 6.16, which equates to 3.493 Vdc. The dial indication of 6.16 represents the "as left" condition from the previous surveillance test. The "as found" setting corresponds to 92.62% of full RCS flow. The total loop uncertainty of the channel is 5.54% of RCS flow. After discovering this condition, the comparator was calibrated to an indicated setting of 6.15, equating to 3.49 Vdc and corresponding to approximately 94.68% of RCS flow. The TS low flow nominal trip setpoint is 94.26% of RCS flow and the allowable value is \geq 93.47% of RCS flow.

The TS require three Reactor Coolant Low Flow channels per loop to be OPERABLE in MODE 1 above 40% RTP. Surveillance tests are performed every quarter on FC-434. If an RCS Loop Low Flow trip channel is inoperable, the inoperable channel must be placed in the tripped condition within 6 hours in accordance with Required Action N.1, or the plant must reduce power to below 40% RTP within 10 hours in accordance with Required Action N.2. The previous quarterly surveillance test was in October 2000. Two maintenance activities were performed in Reactor Protection System (RPS) [JC] cabinet 2 in November and December 2000, respectively. Either activity may have inadvertently altered the potentiometer setting. Because these activities were performed in previous months, the resulting inoperability was likely in excess of the 6 hour completion time of Required Action N.1 and/or the 10 hour completion time of Required Action N.2, and therefore was a condition prohibited by the TS. This condition is being reported in accordance with 10 CFR 50.73(a)(2)(i)(B) as a condition prohibited by the plant's TS.

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

II. Cause of Event

The apparent cause of this event was inattention to detail by non-licensed utility personnel. A contributing cause was the lack of a procedural requirement for positive verification of potentiometer locking devices. The vernier dial lock on this potentiometer was found not fully engaged. The potentiometer setting was apparently disturbed during work performed in the cabinet on another module. In its "as found" state, the lock on the vernier dial allowed the potentiometer to be rotated with only minor resistance. The movement of the vernier dial on the potentiometer from the "as left" indicated setting of 6.16 to the "as found" indicated setting of 5.9 is approximately one quarter turn (90°) of the dial.

The potentiometer was either left with the lock not fully engaged after the previous surveillance test in October 2000, or it became unlocked during the work performed in the cabinet in November and December 2000. The work consisted of two maintenance activities performed on FM-424 [JC/MDR], which does not have a potentiometer. FM-424 is located one rack level above FC-434 and is one module to the right of FC-434. The face plate of each module is 3.37 inches by 9.5 inches.

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III. Analysis of Event

The unit was operating in MODE 1, at 100% RTP, prior to the discovery of the module's inoperable setting. The low RCS flow trip logic provides a trip signal to the RPS. The RPS monitors parameters related to safe operation of the reactor. The system is designed to trip the reactor to protect against fuel cladding damage, and to protect the RCS against over-pressurization.

Each of the three RCS loops has three flow channels to monitor flow. Process control equipment provides signal conditioning, comparable output signals for instruments located on the main control board, and comparison of measured input signals with setpoints established by safety analyses. The RCS Loop 3 Channel Flow Comparator, FC-434, performs this comparison. The low reactor coolant flow trip occurs when 2 out of 3 channels trip on one RCS loop at THERMAL POWER levels above 40% RTP.

The Nominal Trip Setpoint in the TS is the nominal values at which the setpoint is adjusted. A channel is considered to be properly adjusted to the Nominal Trip Setpoint when the "as left" value is within the calibration tolerance uncertainty band. A channel is considered inoperable if the setpoint is found outside of the required TS allowable value for the setpoint.

The "as found" setting for the low flow channel containing FC-434 was below the required allowable TS value and therefore inoperable. In the event of an accident involving low or no RCS flow, the inoperable channel would have performed its trip function at a RCS Loop 3 flow rate between 87.08% of RCS flow and 98.16% of RCS flow (conservatively including allowance for total loop uncertainties). The analytical value assumed in the Updated Final Safety Analysis Report safety analyses is 87% of RCS flow.

(1-2001)

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IV. Corrective Actions

After discovery of the out-of-tolerance condition on January 22, 2001, at 21:31 hours EST, the comparator setting was restored to within the calibration tolerance of the TS nominal trip setpoint on January 23, 2001, at 02:16 hours EST. Actions were taken to verify the other vernier dial correct settings in RPS cabinet 2, on January 23, 2001. An additional visual verification was performed on vernier dials in the remaining control and protection racks on January 29, 2001. On February 2, 2001, a maintenance management directive was implemented requiring indicated "as found" and "as left" checks of the vernier dial settings, and visual verification that the locking devices are fully locked, for potentiometers in racks that are opened for maintenance work. This verification is visual because a physical check of the locking mechanism may result in a change in the potentiometer setting.

In addition, administrative procedures will be revised by April 6, 2001 to: address reading of vernier dials on potentiometers; include the requirement for self/peer checking of vernier dial readings; require a physical check of locking device functionality on potentiometers when maintenance, surveillance, or calibration procedures require adjustment of the vernier dial; and, require engagement of the lock after adjustment of a vernier dial.

V. Previous Similar Events

LER 1998-005-00: The steam dump system failed to operate in the T_{avg} mode. A mispositioned potentiometer was found on module TC-408E.