

**LICENSEE EVENT REPORT (LER)**

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

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.

FACILITY NAME (1) Browns Ferry Nuclear Plant (BFN) Unit 2		DOCKET NUMBER (2) 05000260	PAGE (3) 1 OF 5
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TITLE (4)  
Field measurements of the HPCI turbine speed indicated speed was lower than the speed displayed in Control Room. The cause was an improper evaluation of a valve leak which resulted in water intrusion into a unsealed junction box.

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
7	11	97	97	003	00	8	07	97	N/A	
									FACILITY NAME	DOCKET
									N/A	

OPERATING MODE (9) N	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)									
POWER LEVEL (10) 100	20.2201(b)			20.2203(a)(2)(v)			50.73(a)(2)(i)			50.73(a)
	20.2203(a)(1)			20.2203(a)(3)(i)			50.73(a)(2)(ii)			50.73(a)
	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)		TELEPHONE NUMBER (include Area Code)
NAME James E. Wallace, Licensing Engineer		(205) 729-7874

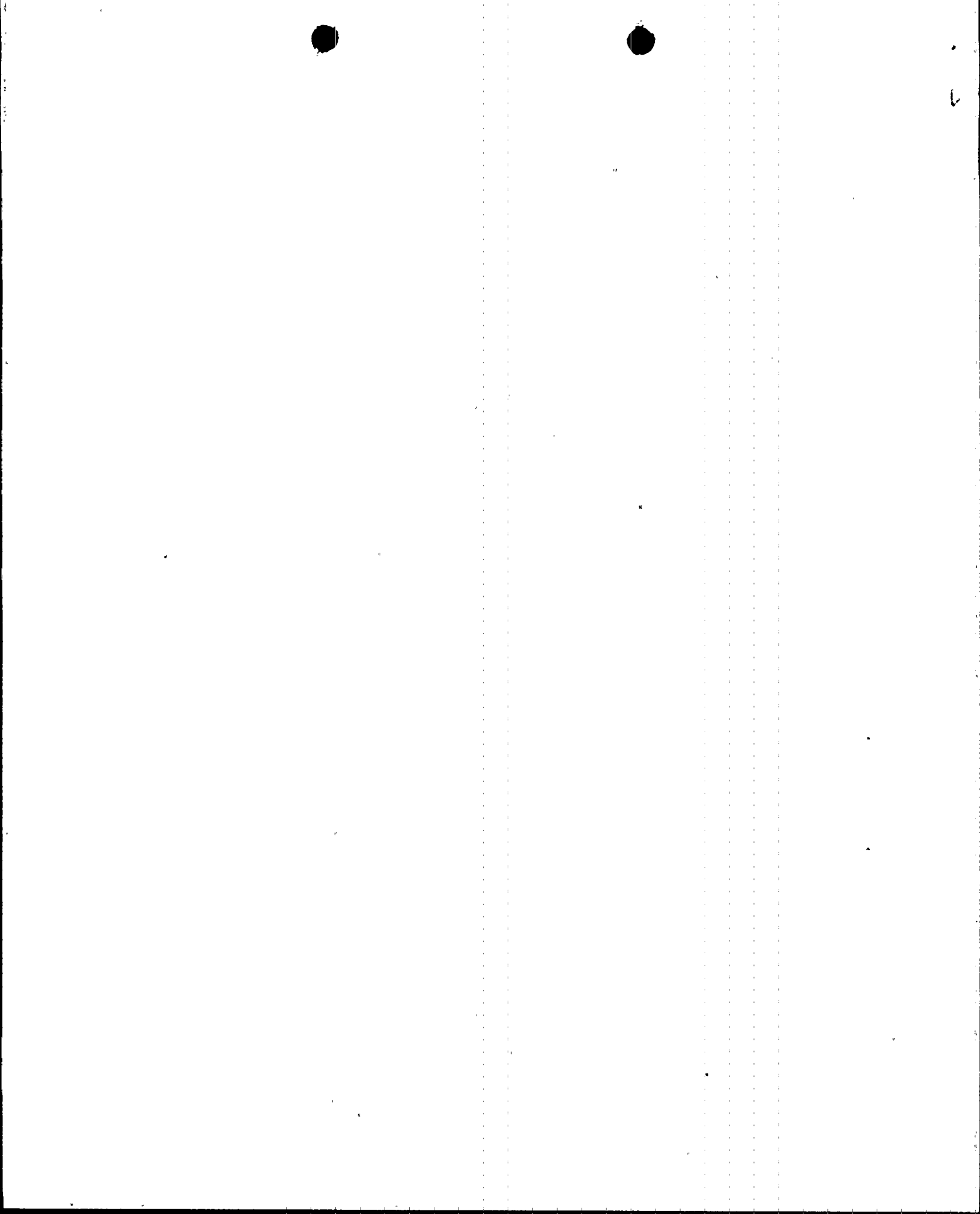
COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)										
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS

SUPPLEMENTAL REPORT EXPECTED (14)				EXPECTED SUBMISSION DATE (15)		
YES (If yes, complete EXPECTED SUBMISSION DATE).	X	NO		MONTH	DAY	YEAR

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

On July 11, 1997, at 1910 hours, with Units 2 and 3 at 100 percent power, and Unit 1 defueled, it was determined that the HPCI turbine speed was lower than indicated. Specifically, during the performance of a surveillance instruction (SI) for testing the HPCI flow rate at normal reactor vessel pressure, field measurements of the HPCI turbine speed identified that the HPCI turbine speed was lower than the speed displayed in the Unit 2 Control Room. Since the HPCI turbine speed did not meet its SI acceptance criteria, HPCI was declared inoperable. The root cause of this faulty display was due to an improper evaluation of a valve leak. The valve leak resulted in water intrusion in an unsealed junction box causing grounds to some HPCI cables. HPCI was declared inoperable. The immediate corrective actions included troubleshooting and sealing of the junction box. Corrective actions to preclude recurrence will be to perform and document a walkdown of the HPCI, RCIC, and Reactor Feedwater Pump rooms where steam condensate could leak on junction boxes and to seal those conduit terminations deemed to be unacceptable. This report is submitted in accordance with 10 CFR 50.73 (a)(2)(v) as any event or condition that alone could have prevented the fulfillment of the safety function of structures or systems needed to mitigate the consequences of an accident. No previous LER was identified where HPCI turbine speed was affected by water intrusion.

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

I. PLANT CONDITIONS

At the time of the discovery of the condition, Unit 2 and Unit 3 were at 100 percent power. Unit 1 was shutdown and defueled.

II. DESCRIPTION OF EVENT

A. Event

On July 11, 1997, at approximately 1910 hours during the testing of HPCI [BJ] turbine speed [TAC] at normal RPV pressure surveillance instruction (2-SI-4.5.E.1.d), field measurements identified that the HPCI turbine speed was lower than the speed displayed in the Unit 2 Control Room. Since the HPCI turbine speed did not meet its surveillance instruction acceptance criteria, HPCI was declared inoperable.

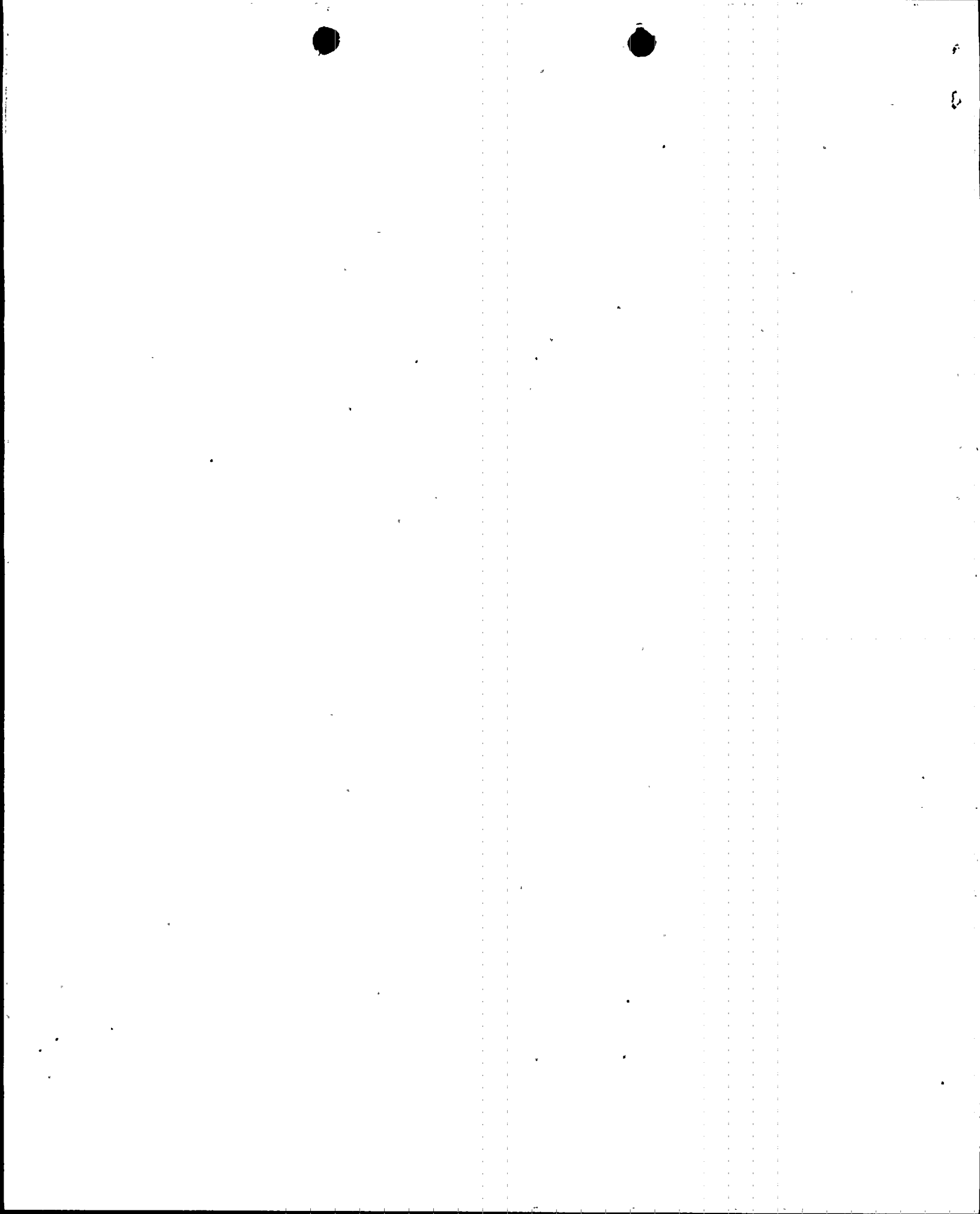
At 2200 hours, TVA made a four-hour notification to the NRC concerning the inoperability of HPCI in accordance with 10 CFR 50.72(b) (2) (iii).

Diagnostic data and observations made during HPCI testing indicated the presence of a station ground that was affecting the HPCI tachometer. Grounding tests of the tachometer to component cables indicated some but not all cables had ground shorts. A review of HPCI connection diagrams revealed potential inspection points for grounds within a junction box. This junction box was opened, and water intrusion and terminal box corrosion was evident. The junction box terminal strips were replaced and two conduit terminations were sealed to make them watertight. At 1501 hours on July 15, 1997, after the calibration of the tachometer, the flow rate testing was successfully reperformed. HPCI was declared operable, and HPCI was returned to service.

This report is submitted in accordance with 10 CFR 50.73 (a) (2) (v) as any event or condition that alone could have prevented the fulfillment of the safety function of structures or systems needed to mitigate the consequences of an accident.

B. Inoperable Structures, Components, or Systems that Contributed to the Event:

None.



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C. Dates and Approximate Times of Major Occurrences:

July 11, 1997

at 1910 hours CDT - During a Surveillance Instruction, HPCI turbine speed was lower than indicated on Unit 2 control Room instrumentation. Since the HPCI turbine speed did not meet its surveillance instruction acceptance criteria, HPCI was declared inoperable.

at 2200 hours CDT - A four-hour notification was made to the NRC in accordance with 10 CFR 50.73(b)(2)(iii).

July 15, 1997

at 1501 hours CDT - After troubleshooting efforts, HPCI was declared operable and was returned to service.

D. Other Systems or Secondary Functions Affected:

None.

E. Method of Discovery:

The condition was discovered when field measurements indicated that the HPCI turbine speed did not meet HPCI acceptance criteria.

F. Operator Actions:

Operators tripped HPCI and declared it inoperable.

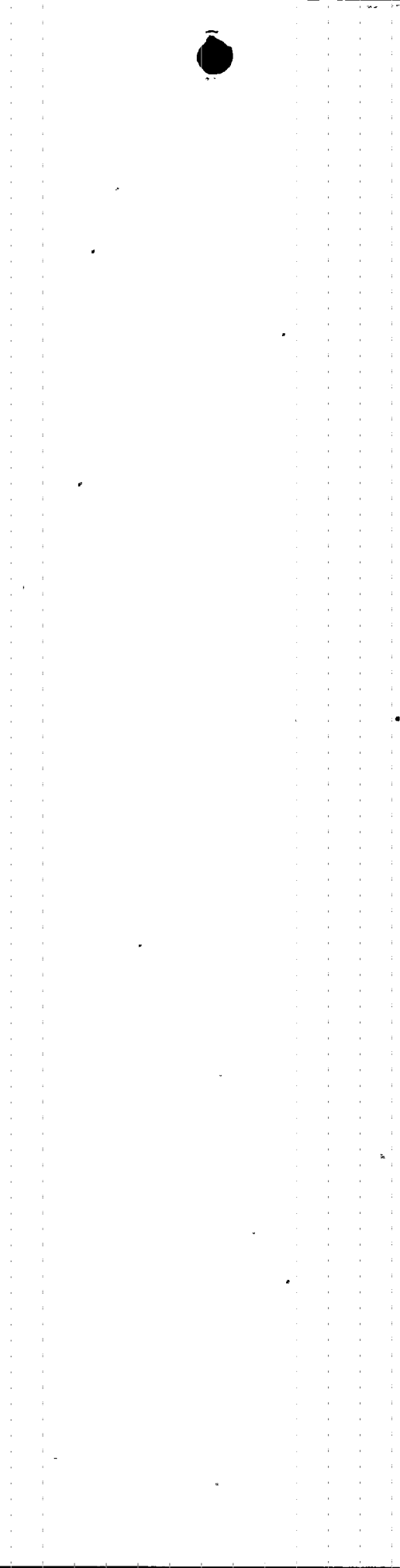
G. Safety System Responses:

None.

III. CAUSE OF THE EVENT

A. Immediate Cause:

The immediate cause of the condition was that the HPCI turbine speed did not meet its required acceptance criteria during an SI.



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**B. Root Cause:**

The root cause of this event was due to an improper evaluation of a valve leak: The valve leak resulted in water intrusion causing grounds on some HPCI cables in an unsealed junction box.

**C. CONTRIBUTING FACTOR**

The junction box involved in this event was not sealed, nor was it required to be sealed by TVA drawings. No weep hole was found to allow any water intrusion to drain. Since the conduit termination was not watertight and the conduit termination was over the center line of the terminal strips, water fell on the strips causing spurious grounds.

This conclusion is supported by the fact that an erratic tachometer reading disappeared after the junction box terminal strips were replaced and two conduit terminations were sealed to make them watertight.

**IV. ANALYSIS OF THE EVENT**

The HPCI system is provided to ensure that the reactor is adequately cooled to limit fuel cladding temperature in the event of a small line break in the nuclear system and loss of coolant which does not result in rapid depressurization of the reactor vessel. The HPCI system permits the plant to be shutdown while maintaining inventory until the reactor vessel is depressurized.

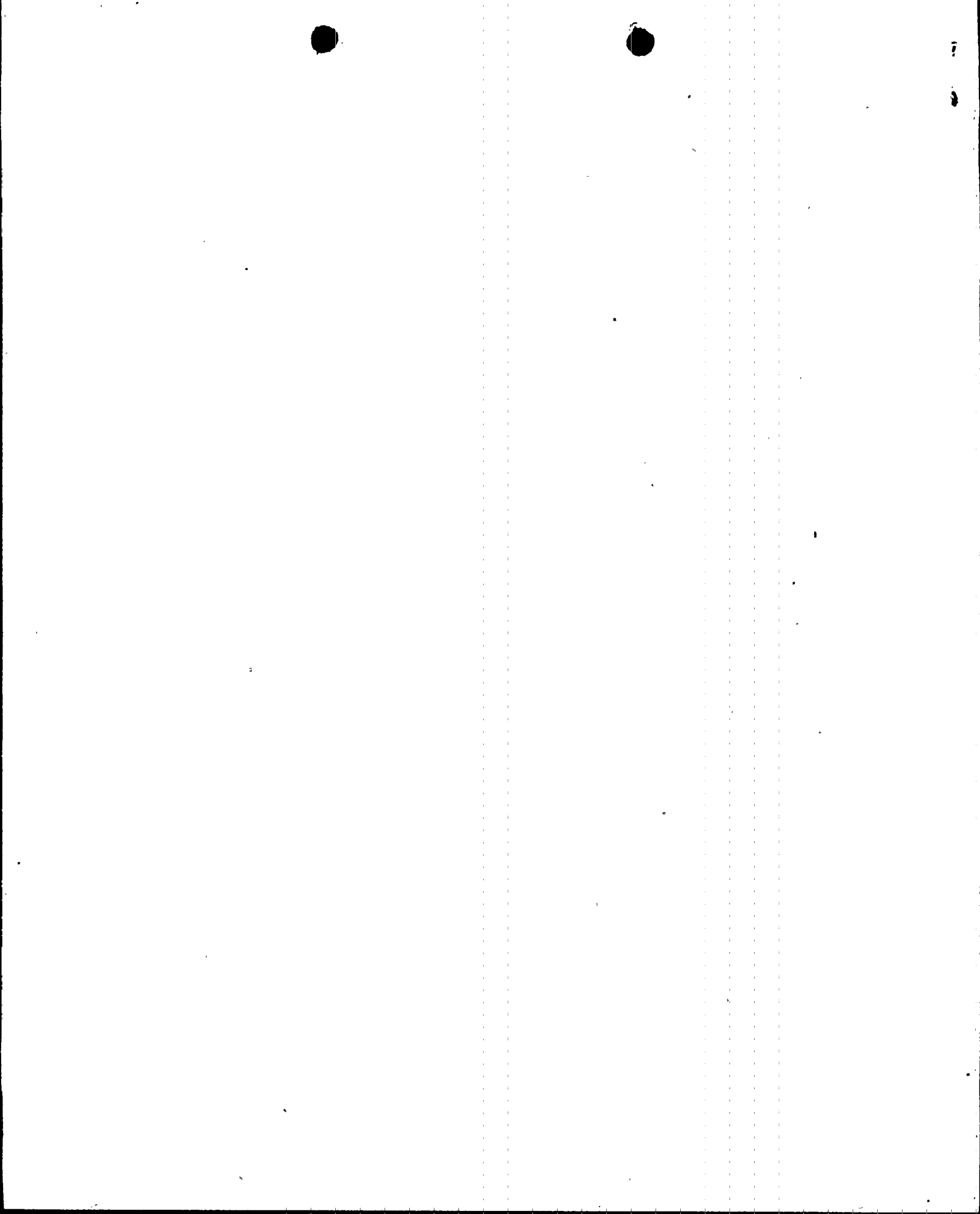
The grounds in the HPCI cables affected only the turbine speed indications and had no effect on the automatic operations of HPCI. HPCI would have been able to perform its safety function (e.g., rated flow, etc.). Therefore, the safety of the plant, its personnel or the public was not compromised.

**V. CORRECTIVE ACTIONS**

**A. Immediate Corrective Actions:**

Operations personnel tripped HPCI. Work orders to troubleshoot HPCI were initiated.

Calibrations were performed to ensure various subcomponents were within calibration criteria which could have resulted in the event. Troubleshooting continued until the root cause of the event was identified. Rework of the junction box and subsequent successful performance of the SI ensured that HPCI will be able to perform its intended safety function. HPCI was declared operable and returned to service.





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**B. Corrective Actions to Prevent Recurrence:**

Corrective actions to preclude recurrence will be: (1) to perform and document a walkdown of the HPCI, RCIC, and Reactor Feedwater Pump rooms where steam condensate could leak on junction boxes and to seal those conduit terminations deemed to be unacceptable, (2) to develop continuing training modules to address this event and management expectations on reviewing the effects of plant leaks and the reporting of such leaks, (3) to issue a Site Bulletin to heighten the awareness of plant personnel to this event.

**VI. ADDITIONAL INFORMATION**

**A. Failed Components:**

None.

**B. Previous LERs on Similar Events:**

TVA has previously issued LERs for an inoperable HPCI due to various design and equipment concerns. However, water intrusion was not the cause in any of the previous LERs. Therefore, no previous LER corrective actions would have precluded this event.

**VII. COMMITMENTS**

Junction box walkdowns will be performed and documented for the HPCI, RCIC, and reactor feedwater pump rooms where steam condensate could leak on junction boxes. Based on the walkdowns, conduit terminations deemed to be unacceptable will be sealed by September 8, 1997.

Training will develop continuing training modules to address this event and management expectations on reviewing the effects of plant leaks and the reporting of such leaks. These modules will be completed by December 22, 1997.

A Site Bulletin will be issued to heighten the awareness of plant personnel to this event. This bulletin will be issued by September 10, 1997.

Energy Industry Identification System (EIIS) system and component codes are identified in the text with brackets (e.g., [XX]).

