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 AUTH.NAME AUTHOR AFFILIATION  
 AUSTIN,S. Tennessee Valley Authority  
 MACHON,R.D. Tennessee Valley Authority  
 RECIP.NAME RECIPIENT AFFILIATION

SUBJECT: LER 94-007-02:on 940929,discovered that condition involving noncompliance w/10CFR50 App R,criterion III.L.2.d existed. Caused by failures to correctly interpret/implement requirements of caculations.Rept initiated.W/941031 ltr.

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

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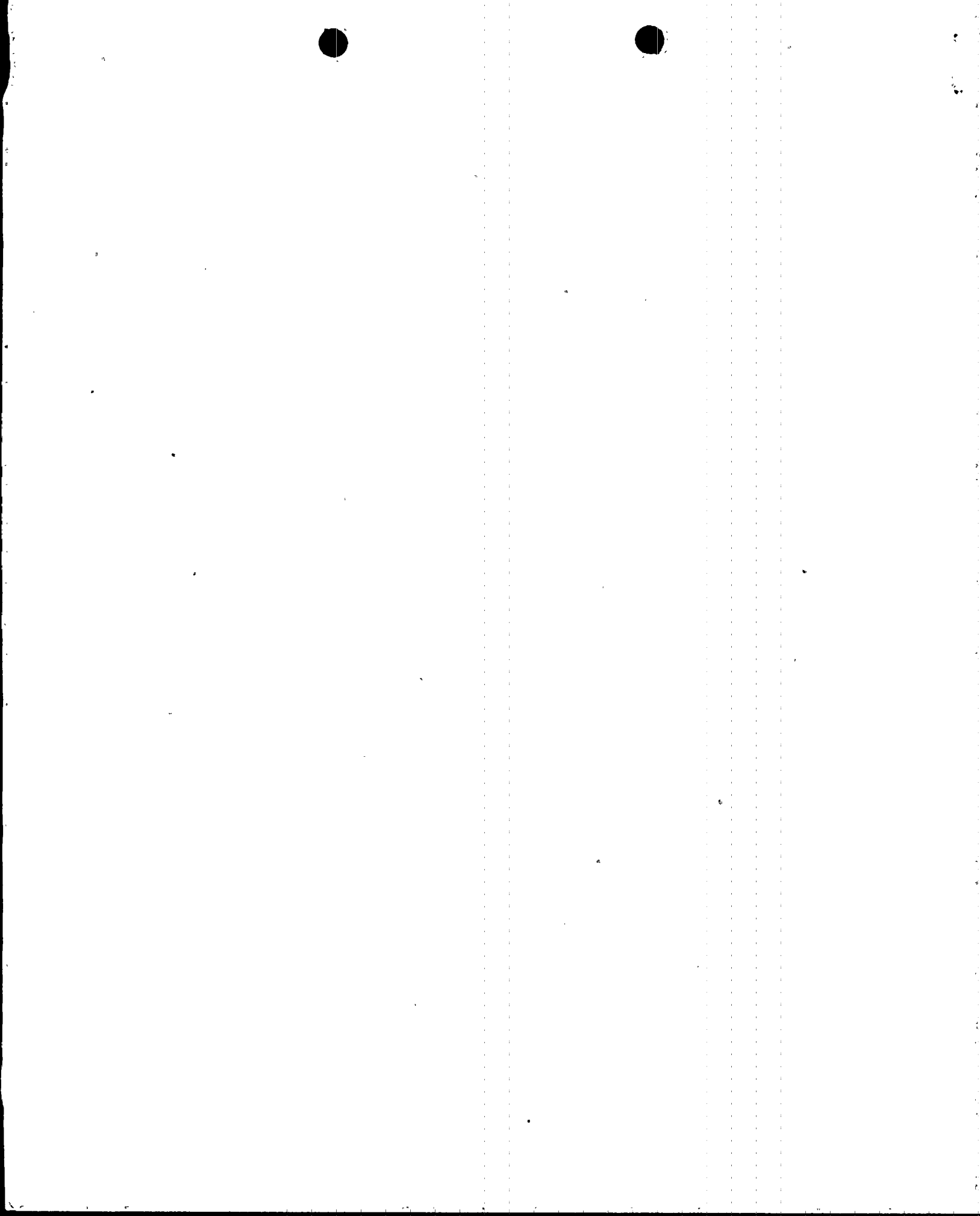
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Tennessee Valley Authority, Post Office Box 2000, Decatur, Alabama 35609-2000

R. D. (Rick) Machon  
Vice President, Browns Ferry Nuclear Plant

October 31, 1994

U.S. Regulatory Commission  
ATTN: Document Control Desk  
Washington, D.C 20555

10 CFR 50.73

Dear Sir:

**BROWNS FERRY NUCLEAR PLANT (BFN) - UNITS 1,2, AND 3 - DOCKET  
NOS. 50-259, 50-260, AND 296 - FACILITY OPERATING LICENSE  
DPR-33, 52, AND 68 - LICENSEE EVENT REPORT 50-260/94007**

The enclosed report provides details concerning a noncompliance with Appendix R resulting in Unit 2 being in a condition that was outside its design basis and in a condition not covered by the plant's operating instructions. This report is being submitted in accordance with 10 CFR 50.73(a)(2)(ii).

Sincerely,

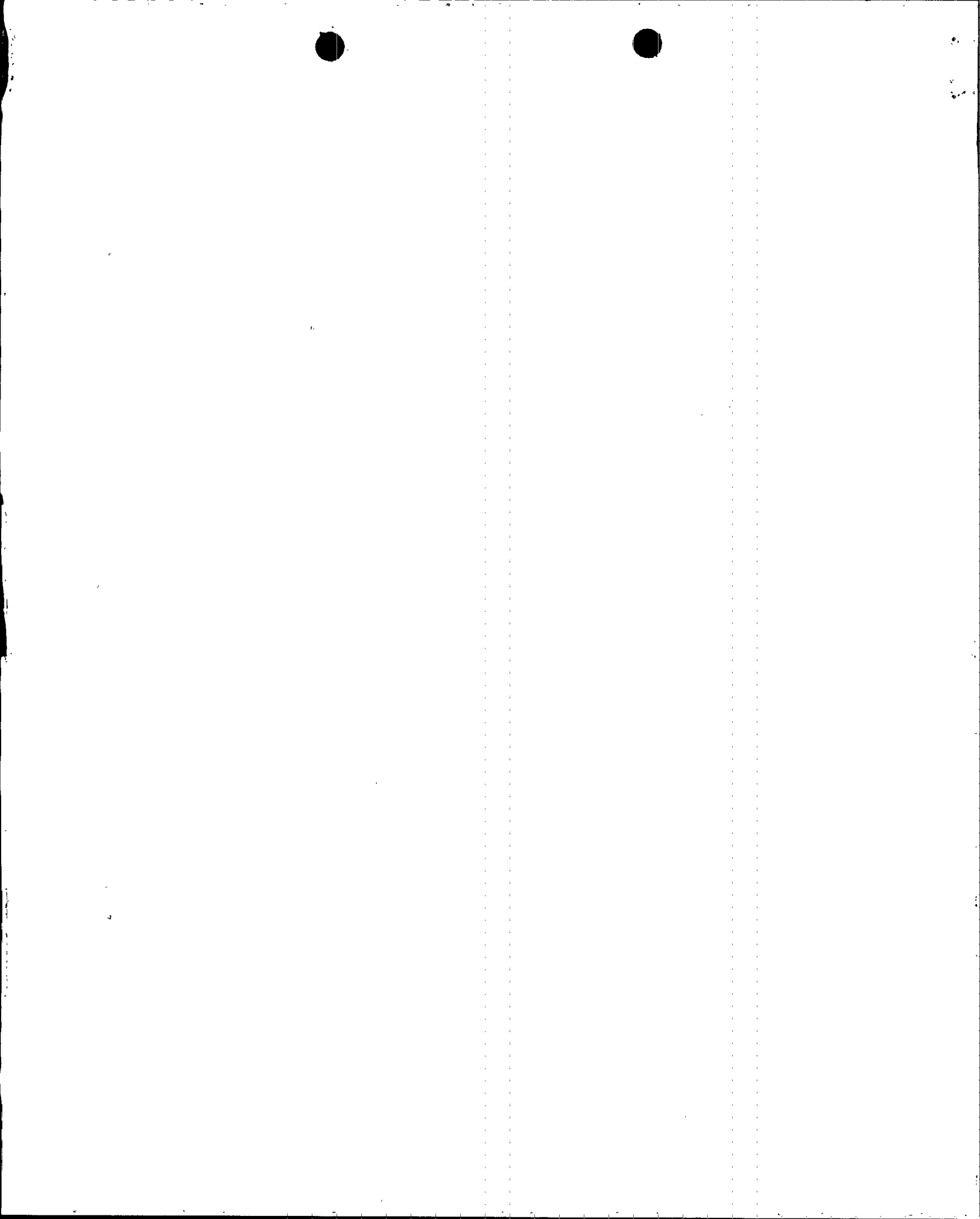
R. D. Machon  
Site Vice President

Enclosure  
cc: See page 2

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U.S. Nuclear Regulatory Commission

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October 31, 1994

cc (Enclosure):

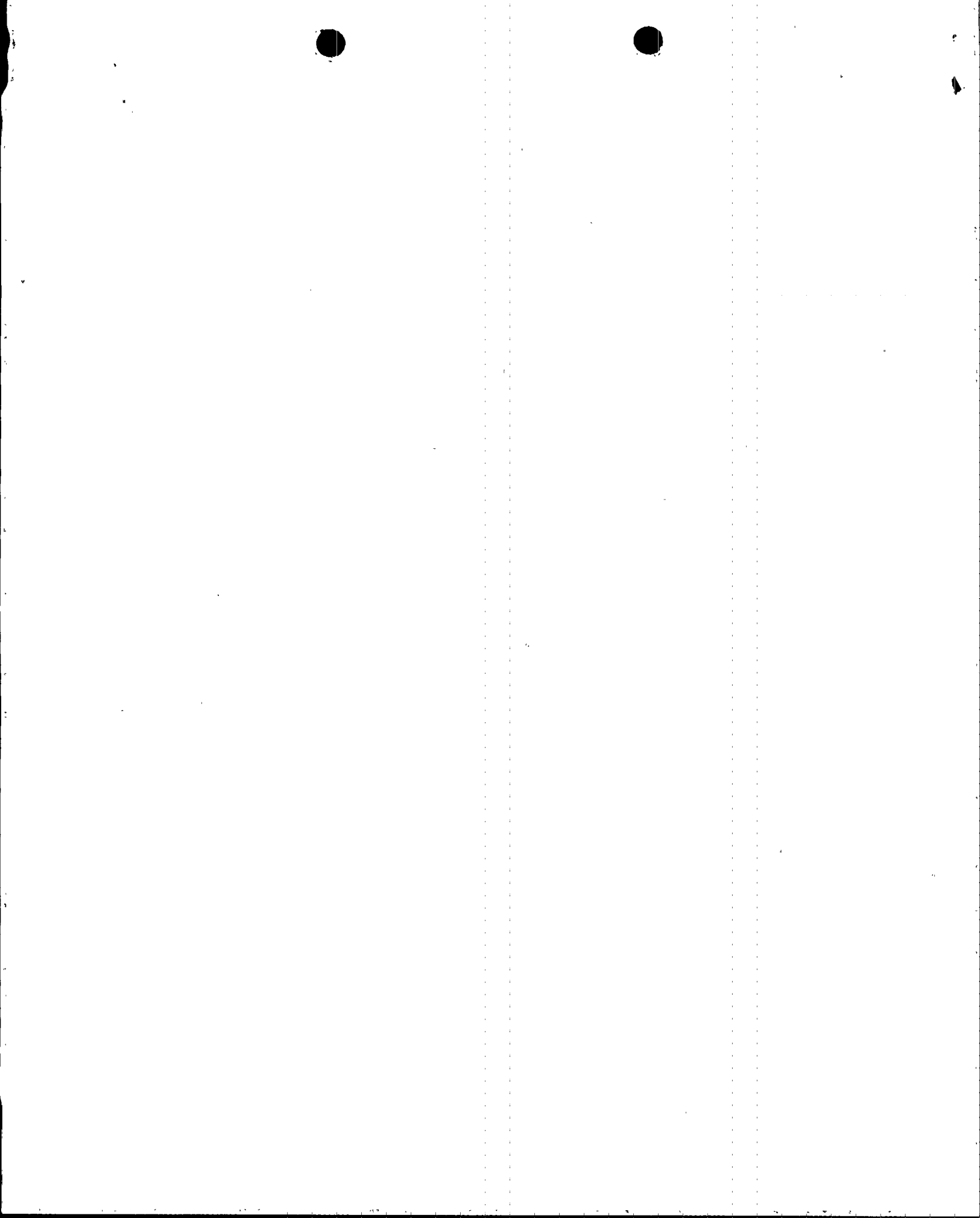
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Atlanta, Georgia 30323

Mr. J. F. Williams, Project Manager  
U.S. Nuclear Regulatory Commission  
One White Flint, North  
11555 Rockville Pike  
Rockville, Maryland 20852



**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 (MNB 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.

<b>FACILITY NAME (1)</b> Browns Ferry Nuclear Plant (BFN) Unit 2	<b>DOCKET NUMBER (2)</b> 05000260	<b>PAGE (3)</b> 1 OF 7
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**TITLE (4)** Noncompliance With 10 CFR 50 Appendix R Results in Unit 2 Being Outside Its Design Basis And In a Condition Not Covered By The Plants Operating Instructions

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 NA	DOCKET NUMBER
09	29	94	94	007	00				FACILITY NAME NA	DOCKET NUMBER

<b>OPERATING MODE (9)</b> N	<b>THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)</b>									
<b>POWER LEVEL (10)</b> 73	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)								

<b>LICENSEE CONTACT FOR THIS LER (12)</b>	
<b>NAME</b> Steve Austin, Compliance Licensing Engineer	<b>TELEPHONE NUMBER (Include Area Code)</b> (205) 729-2070

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

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

**ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)**  
 On September 29, 1994, at approximately 1300 hours TVA discovered that a condition involving noncompliance with 10 CFR Part 50 Appendix R, Criterion III.L.2.d. existed. Specifically, TVA discovered that the Unit 2 suppression pool level indication was not available due to a loss of the supporting power supply, which is fed from 480V Shutdown Board 2B. Additionally, the Appendix R Safe Shutdown Program did not require compensatory measures for Fire Area 18. This event is reportable pursuant to 10 CFR 50.73(a)(2)(ii)(B) as a condition outside the design basis of the plant, and 10 CFR 50.73(a)(2)(ii)(C) as a condition not covered by the plant's operating and emergency instructions. This event resulted from failures to correctly interpret/implement the applicable requirements of the calculations and/or design criteria used during the initial development of the Unit 2 Appendix R program.

TVA will revise the Safe Shutdown Program along with appropriate procedures and calculations. Finally, TVA will perform a comparative review of the Required Equipment Calculation against the Browns Ferry Unit 2 Safe Shutdown Program.





LICENSEE EVENT REPORT  
TEXT CONTINUATION

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 (MNB 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

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

I. PLANT CONDITIONS

Unit 2 was at 2333 megawatts thermal or approximately 73 percent power. Units 1 and 3 were defueled.

II. DESCRIPTION OF EVENT

A. Event:

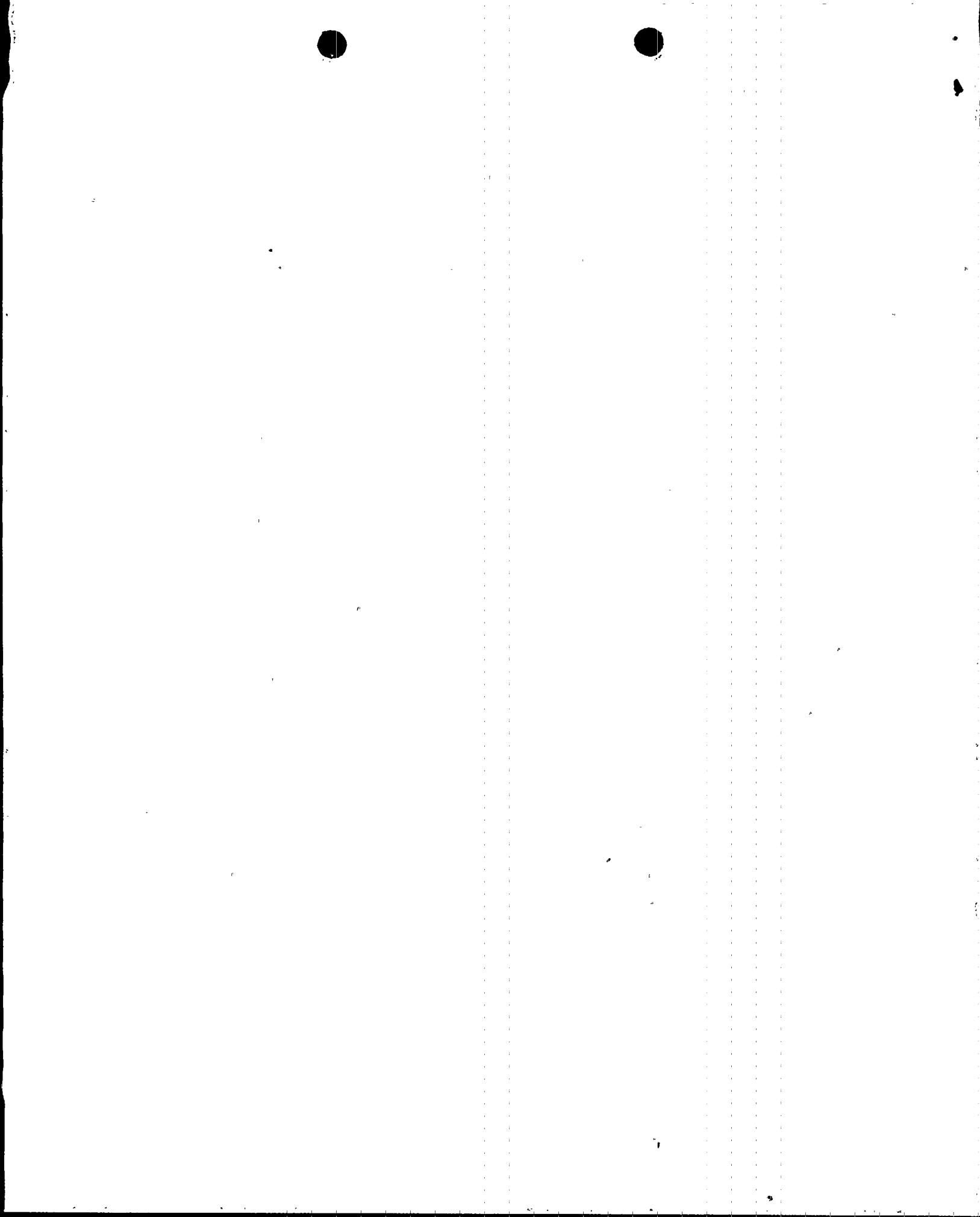
On September 29, 1994, at approximately 1300 hours, during development of the Unit 3 Appendix R program, TVA discovered that a condition involving noncompliance with 10 CFR Part 50 Appendix R, Criterion III.L.2.d, existed in that Unit 2 suppression pool level indication [LI] was not available for a loss of the supporting power supply in Fire Area 18. Specifically, the list of fire areas in which compensatory measures are required for a loss of Instrument and Control Bus (I&C) 2B [EF] contained in the Browns Ferry Nuclear Plant Unit 2 Safe Shutdown Program was not complete. During a review of Unit 2 Appendix R calculations, TVA determined that compensatory measures were not required by the Browns Ferry Nuclear Plant Unit 2 Safe Shutdown Program for a loss of Instrument and Control Bus 2B in the Unit 2 Battery Board Room portion of Fire Area 18. Fire Area 18 consists of the Unit 2 Battery [BTRY] and Battery Board Room located in the Control Building [NA].

Additionally, it was determined that I&C Bus 2B is not available for providing power to the suppression pool level indicator during an Appendix R fire in Fire Area 18. A postulated failure of cables in the normal supply power to the bus, 480V Shutdown Board 2B [EB], in conjunction with a current procedural requirement to de-energize the alternate source of power to I&C Bus 2B, 480V Shutdown Board 1B, will take the suppression pool indicator out of service.

Upon discovery of this event, TVA entered a Unit 2 Appendix R Limiting Condition of Operation which established compensatory measures as required by the Unit 2 Appendix R Safe Shutdown Program.

This condition has existed since Unit 2 returned to service in May 1991.

This event is reportable pursuant to 10 CFR 50.73(a)(2)(ii)(B), as a condition that was outside the design basis of the plant in that the suppression level monitoring capability was not available because of a potential loss of the supporting power supply in Fire Area 18. Additionally, because the procedural



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requirements did not take into account for the loss of I&C Bus 2B, TVA reports this event pursuant to 10 CFR 50.73(a)(2)(ii)(C), as a condition not covered by the plant's operating and emergency procedures.

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

None.

C. Dates and Approximate Times of Major Occurrences:

September 29, 1994 at 1300 CST      TVA identified noncompliance with 10 CFR Appendix R. A compensatory action firewatch in accordance with the Unit 2 Appendix R Safe Shutdown Program was established.

September 29, 1994 at 1353 CST      A one hour nonemergency notification was made in accordance with 10 CFR 50.72.(b)(1)(ii).

D. Other Systems or Secondary Function Affected:

None.

E. Method of Discovery:

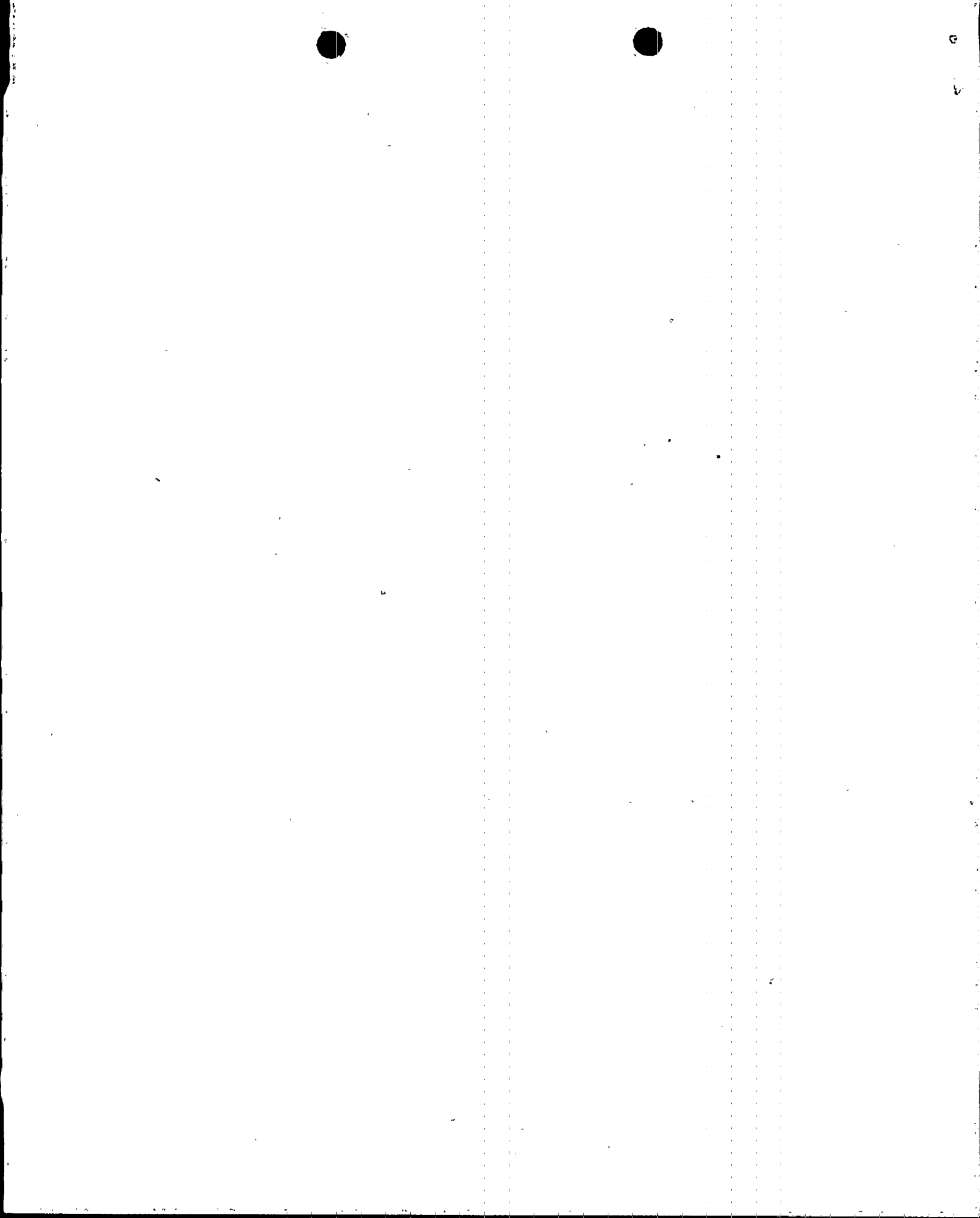
The condition of noncompliance with the requirement of Appendix R was identified during the development of the Unit 3 Appendix R Program.

F. Operator Actions:

None.

G. Safety System Responses:

None.



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III. CAUSE OF THE EVENT

A. Immediate Cause:

Noncompliance with 10 CFR 50 Appendix R.

B. Root Cause:

The event resulted from failures to correctly interpret/implement the applicable requirements of the calculations and/of design criteria used during the initial development of the Unit 2 Appendix R program. Specifically, the personnel involved in the development of the Unit 2 program failed to recognize that the normal feed to I&C Bus 2B was not available during an Appendix R fire in Fire Area 18.

C. Contributing Factors:

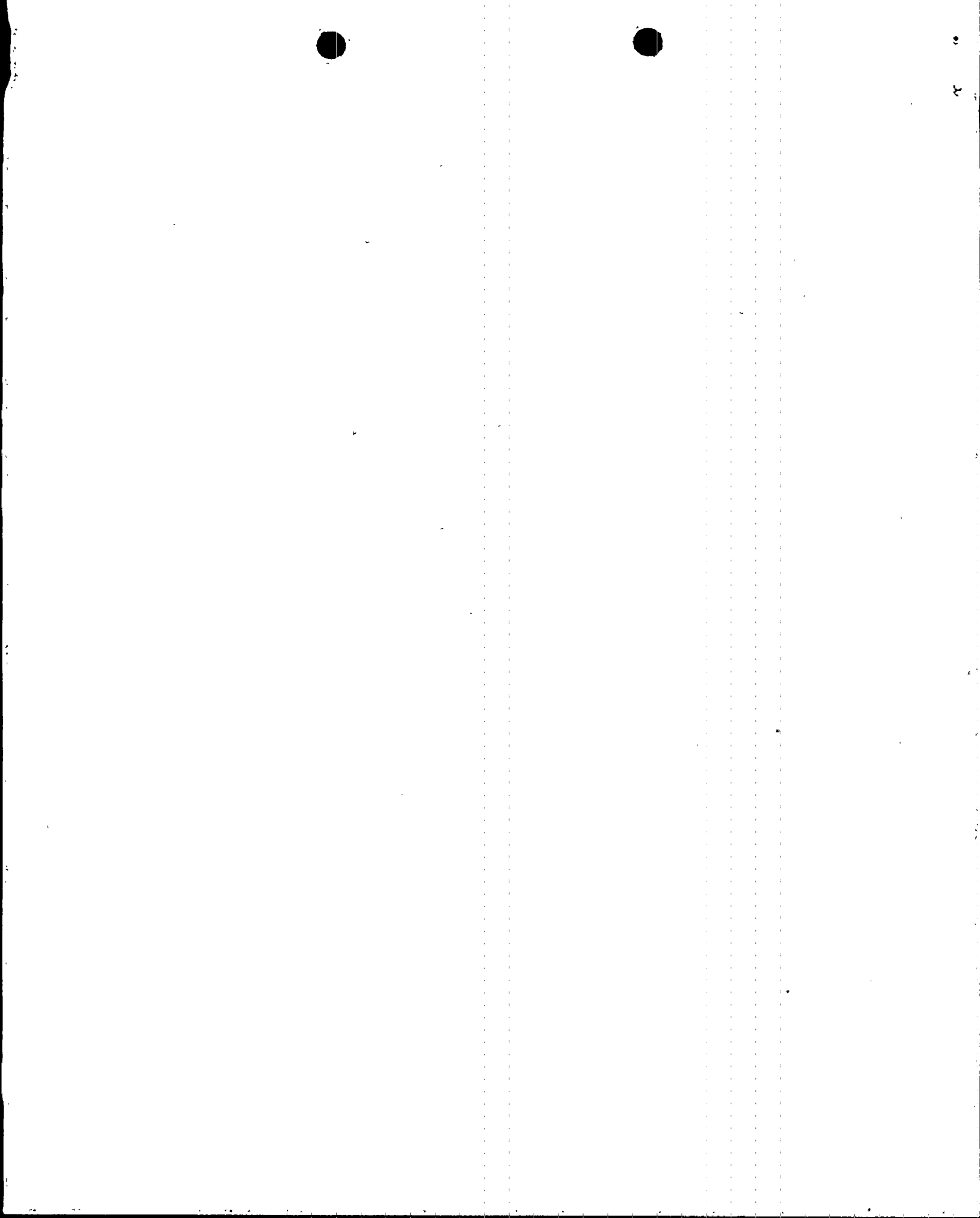
None.

IV. ANALYSIS OF THE EVENT

The Unit 2 Appendix R Safe Shutdown Program requires torus level monitoring from the main control room and the remote shutdown stations.

An Appendix R event in Fire Area 18 could result in loss of the power supply to the Suppression Pool Level Indicator. As noted in the Safe Shutdown Analysis, suppression pool water level instrumentation aids the operator in confirmation of the suppression pool as a heat sink. Additionally, the suppression pool level indicator could be used to ensure that adequate suppression pool level would be available for Reactor Pressure Vessel [RCT] Main Steam Relief Valve (MSRV)[SB] steam suppression and for Residual Heat Removal [BO] system pump net positive head. Furthermore, level indication would prevent overflow of the suppression pool.

The only sources of water that have the potential to overflow the suppression pool are the Condensate Storage Tank (CST) [KA] system, Wheeler Reservoir [BS], and the other Units' suppression pools. The interties between these have been evaluated and a single spurious operation will not result in overflow of the suppression pool.



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Additionally, the only connections from the CST to the suppression pool depending on electrically operated valves are the High Pressure Coolant Injection (HPCI) [BG] system and Reactor Core Isolation Cooling (RCIC) [BN] system minimum flow lines. If these systems are actuated, a 4 inch rise in suppression water level in three hours can be expected.

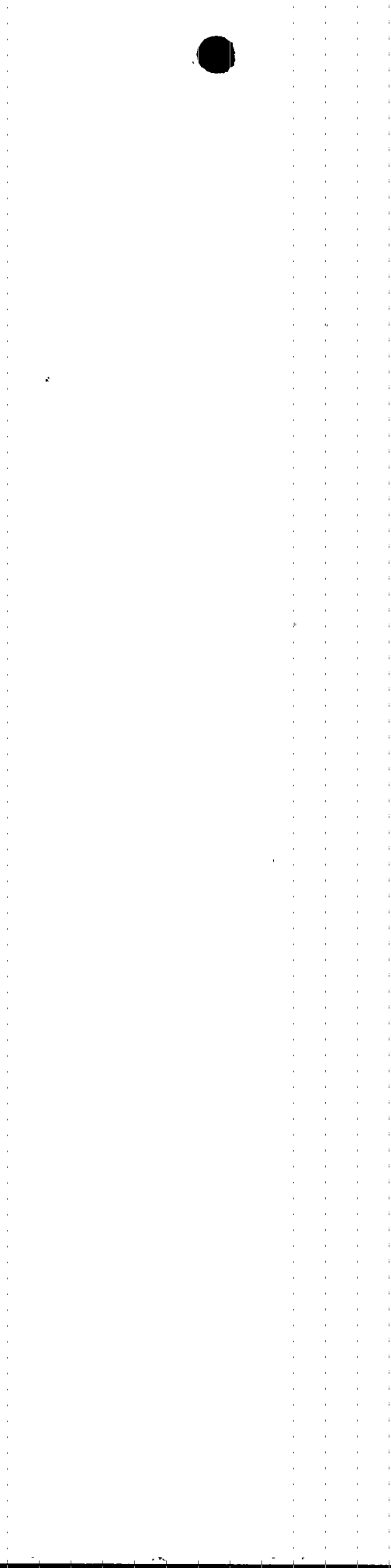
Draining of the torus level is not of a concern because the connections are either manually isolated or pump operation is required to affect the level. HPCI, RCIC, Residual Heat Removal system, and the Core Spray [BM] system all take suction from the suppression pool. A single spurious operation of the HPCI or RCIC will not cause the system to remove water to the CST. Also, if water is pumped into the RPV by one of these systems, it will eventually be returned to the suppression pool through the MSRVs.

Fire Area 18 has a combined combustibile loading of 39000 BTU/ft<sup>2</sup> with a fire severity of 29 minutes. The area is provided with an addressable area wide coverage smoke detection system. Additionally, the area is protected by a manually actuated sprinkler system. Fire hose stations and fire extinguishers are available in the general area to support manual suppression activities. The detection system provides an early warning in order to manually actuate the sprinkler system. Furthermore, TVA's administrative controls will limit hot work activities and limit the amount of combustibles allowed in the area.

A highly unlikely chain of events would have to take place in order to have a fire of the magnitude that would disable the normal feed and require the operator to trip the alternate feed to the suppression pool level indicator. Additionally, existing analysis indicates that suppression pool level is not significantly changed during emergency shutdown conditions.<sup>1</sup> Therefore, TVA concludes that the condition described above did not jeopardize the public health and safety.

<sup>1</sup>

NRC Generic Letter 86-10, Implementation of Fire Protection Requirements, Enclosure 2, Page 24, Appendix R Questions and Answers paragraph 5.3.7 Torus Level Indication





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V. CORRECTIVE ACTIONS

A. Immediate Corrective Actions:

A Problem Evaluation Report was initiated in accordance with the TVA Corrective Action Program.

TVA established compensatory actions in accordance with the BFN Unit 2 Appendix R Safe Shutdown Program.

B. Corrective Actions to Prevent Recurrence:

TVA will revise the Safe Shutdown Program to show compensatory measures for Fire Area 18. Additionally, TVA will revise applicable calculations to show that the alternate feed to I&C Bus is available for Fire Area 18 and delete the manual action to deenergize the alternate power source for I&C Bus 2B for Fire Area 18.

TVA will revise the Safe Shutdown Instruction for Fire Area 18 to support the alternate alignment for Fire Area 18 (480V Shutdown Board 1B).

TVA will perform a comparative review of the Required Equipment Calculation against the Browns Ferry Unit 2 Safe Shutdown Program to ascertain if any other technical inadequacies similar to the ones described in this report are present.

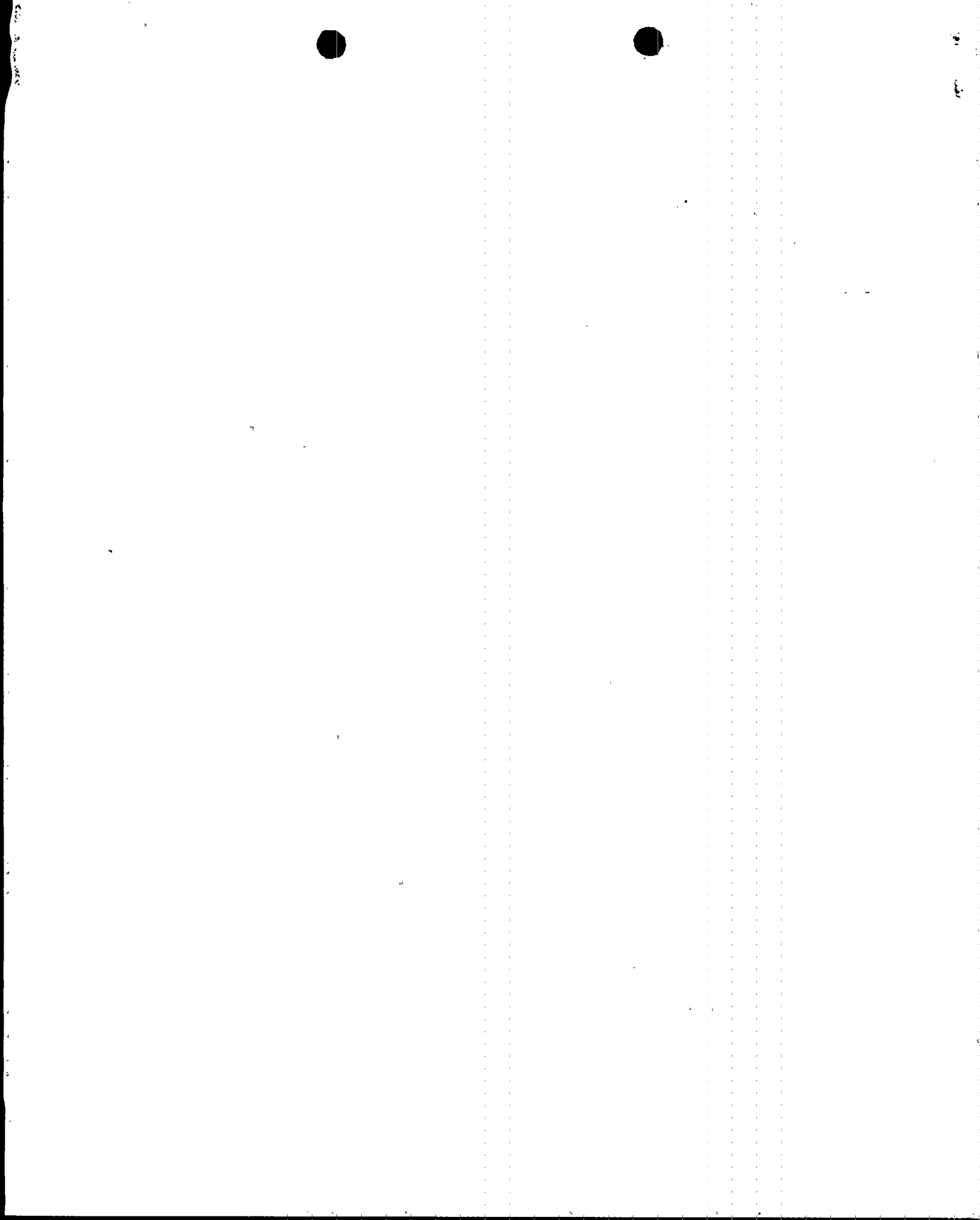
VI. ADDITIONAL INFORMATION

A. Failed Components:

None.

B. Previous LERs on Similar Events:

LER 260/94002 was issued for an event involving noncompliance with Appendix R that resulted from individuals failing to correctly interpret/implement the applicable requirements of the calculation and/or design criteria used during the original development of the Unit 2 Appendix R program. The corrective actions identified by this LER would not have prevented this event.



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VII. Commitments

1. TVA will revise the Safe Shutdown Program to show compensatory measures for Fire Area 18. The revision will be completed by January 5, 1995.
2. TVA will revise applicable calculations to show that the alternate feed to I&C Bus is available for Fire Area 18 and delete the manual action to de-energize the alternate power source for I&C Bus 2B for Fire Area 18. The revisions will be completed by December 16, 1994.
3. TVA will perform a comparative review of the Required Equipment Calculation against the Browns Ferry Unit 2 Safe Shutdown Program to ascertain if any other technical inadequacies similar to the ones described in this report are present. This evaluation will be completed by December 16, 1994.
4. TVA will revise the Safe Shutdown Instruction for fire area 18 to support the alternate alignment for Fire Area 18. The revision will be completed by December 30, 1994.

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

