



Tennessee Valley Authority, Post Office Box 2006, Decatur, Alabama 35602

O. J. "Ike" Zeringue  
Vice President, Browns Ferry Operations

MAR 30 1992

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

Dear Sir:

TVA - BROWNS FERRY NUCLEAR PLANT (BFN) UNIT 1 - DOCKET NO. 50-259 - FACILITY  
OPERATING LICENSE DPR-33 - LICENSEE EVENT REPORT LER-50-259/92001

The enclosed report provides details concerning unplanned engineered safety  
feature actuations because of a reactor protection system circuit protector  
fuse cleared resulting from a short in an indicating light socket. This  
report is submitted in accordance with 10 CFR 50.73(a)(2)(iv).

Sincerely,

O. J. Zeringue

Enclosure

cc: see page 2

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PDP ADOCK 05000259  
S PDR

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U.S. Nuclear Regulatory Commission

~~NR~~ 30 1992

cc (Enclosure):

INPO Records Center  
Suite 1500  
1100 Circle 75 Parkway  
Atlanta, Georgia 30339

Paul Krippner  
American Nuclear Insurers  
The Exchange, Suite 245  
270 Farmington Avenue  
Farmington, Connecticut 06032

NRC Resident Inspector  
Browns Ferry Nuclear Plant  
Route 12, P.O. Box 637  
Athens, Alabama 35609-2000

Regional Administrator  
U.S. Nuclear Regulatory Commission  
Region II  
101 Marietta Street, Suite 2900  
Atlanta, Georgia 30323

Thierry M. Ross  
U.S. Nuclear Regulatory Commission  
One White Flint, North  
11555 Rockville Pike  
Rockville, Maryland 20852

PDR

NRC FORM 255  
(10-76)

DIVISION OF CONTRACTS  
U.S. NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555

NOTIFICATION OF CONTRACT EXECUTION

TO: Gerald F. Cranford, Director  
(Title)  
  
Office of Information Resources Management  
  
(Organization)

FROM: Mary E. Ross MAR 19 1992  
Diana Clark (Date)  
for Contract Administrator  
  
Contract Administration Branch  
Division of Contracts & Property Management, ADM

CONTRACTOR (Name & Location)  
Analytical & Research Technology, Inc.  
10565 Lee Highway - Suite 300  
Fairfax, VA 22030

PROJECT TITLE  
"Advice and Assistance to Microcomputer and  
LAN Users"  
  
9204060408 920319  
PDR CONTR  
NRC-33-91-183 PDR

FUNDING	B&R NUMBER	FIN NUMBER
	NEW NRC FUNDS	
	TOTAL FY ____ FUNDING	
	TOTAL NRC OBLIGATIONS	

GOVERNMENT PROPERTY  
630128

CONTRACT NUMBER  
NRC-33-91-183  
MODIFICATION NUMBER  
Four (4)  
☐ NEW ☒ MODIFICATION  
OTHER (Specify)

CONTRACT BASED ON:  
AUTHORIZATION NUMBER  
  
DATE

CONTRACT CHANGES PER THIS ACTION  
Assignment of claims

EXECUTION DATE  
MAR 19 1992

TYPE OF CONTRACT  
CPFF

PERIOD OF PERFORMANCE  
4/26/91 - 4/28/93

PRINCIPAL INVESTIGATOR  
Arthur Roth

NRC AUTHORIZED REPRESENTATIVE  
Phyllis Smith

AMOUNT
S -0-
S 556,066.00
S 556,066.00

ATTACHMENT(S)  
Modification No. 4  
CONTRACT DOCUMENT (

PDR

1. CONTRACT ID CODE		PAGE OF PAGES 1 1 2	
AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT			
2. AMENDMENT/MODIFICATION NO. Four (4)	3. EFFECTIVE DATE MAR 19 1992	4. REQUISITION/PURCHASE REQ. NO.	5. PROJECT NO. (If applicable)
6. ISSUED BY U.S. Nuclear Regulatory Commission Division of Contracts Washington, D.C. 20555	7. ADMINISTERED BY (If other than Item 6)	CODE	

8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and ZIP Code)  Analytical & Research Technology, Inc. 10565 Lee Highway - Suite 300 Fairfax, VA 22030		9A. AMENDMENT OF SOLICITATION NO.
		9B. DATED (SEE ITEM 11)
		10A. MODIFICATION OF CONTRACT/ORDER NO. X NRC-33-91-1.1
		10B. DATED (SEE ITEM 11) 4/26/91
CODE		FACILITY CODE

### 11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

☐ The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offers ☐ is extended, ☐ is not extended.

Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods:

(a) By completing Items 8 and 15, and returning \_\_\_\_\_ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

### 12. ACCOUNTING AND APPROPRIATION DATA (If required)

### 13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS. IT MODIFIED THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.

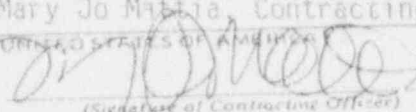
<input checked="" type="checkbox"/>	A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.
<input checked="" type="checkbox"/>	B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).
<input type="checkbox"/>	C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:
<input type="checkbox"/>	D. OTHER (Specify type of modification and authority)

F. IMPORTANT: Contractor ☒ not, ☐ is required to sign this document and return \_\_\_\_\_ copies to the issuing office.

### 14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.)

SEE FOLLOWING PAGE - ASSIGNMENT OF CLAIMS

Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.

15A. NAME AND TITLE OF SIGNER (Type or print)		16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print) Mary Jo Mattia, Contracting Officer	
15B. CONTRACTOR/OFFEROR	15C. DATE SIGNED	16B. UNITED STATES OF AMERICA BY 	16C. DATE SIGNED MAR 19 1992
(Signature of person authorized to sign)		(Signature of Contracting Officer)	



Contract No. NRC-33-91-183  
Modification No. 4  
Page 2 of 2

In accordance with Billing Instruction for NRC Cost-Type Contracts, the section entitled "preparation and Itemization of the Voucher - Payee's name and address", and by virtue of the executed instrument of assignment of claims dated January 7, 1992, the contract is hereby modified as follows:

1. In accordance with the assignment of claims dated November 29, 1991, payment of monies due unto this contract will be made to:

Signet Bank/Virginia  
Government Contract Department  
P.O. Box 2329  
Merrifield, VA 22116-2329

2. This assignment of claims shall remain in effect unless or until released in accordance with FAR 32.805(e).

## LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Browns Ferry Nuclear Plant (BFN)										DOCKET NUMBER (2)   PAGE (3) 050102   5   9101015														
TITLE (4) Unplanned Engineered Safety Features Actuation Because a Reactor Protection System Circuit Protector Fuse Cleared Resulting from a Short in an Indicator Light Socket																								
EVENT DAY (5)					LER NUMBER (6)					REPORT DATE (7)					OTHER FACILITIES INVOLVED (8)									
					SEQUENTIAL   REVISION					FACILITY NAMES					DOCKET NUMBER(S)									
MONTH   DAY   YEAR   YEAR					NUMBER   NUMBER					MONTH   DAY   YEAR					BFN Unit 2					050102060				
0   3   10   2   9   2   9   2					0   0   1   0   0					0   3   3   0   9   2					BFN Unit 3					050102096				
OPERATING   THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5: MODE   (Check one or more of the following)(11)																								
(9)   N   20.402(b)   20.405(c)   X   50.73(a)(2)(iv)   73.71(b)																								
POWER   20.405(a)(1)(i)   50.36(c)(1)   50.73(a)(2)(v)   73.71(c)																								
LEVEL   20.405(a)(1)(ii)   50.36(c)(2)   50.73(a)(2)(vii)   OTHER (Specify in																								
(10)   0   0   0   20.405(a)(1)(iii)   50.73(a)(2)(i)   50.73(a)(2)(viii)(A)   Abstract below and in																								
20.405(a)(1)(iv)   50.73(a)(2)(ii)   50.73(a)(2)(viii)(B)   Text, NRC Form 366A)																								
20.405(a)(1)(v)   50.73(a)(2)(iii)   50.73(a)(2)(x)																								
LICENSEE CONTACT FOR THIS LER (12)																								
NAME										TELEPHONE NUMBER														
James E. Wallace, Compliance Licensing Engineer										2   0   5   7   2   9   -   7   8   7   4														
COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)																								
CAUSE   SYSTEM   COMPONENT   MANUFACTURER   TO NPD'S					REPORTABLE					CAUSE   SYSTEM   COMPONENT   MANUFACTURER   TO NPD'S					REPORTABLE									
SUPPLEMENTAL REPORT EXPECTED (14)																				EXPECTED   MONTH   DAY   YEAR				
																				SUBMISSION				
YES (If yes, complete EXPECTED SUBMISSION DATE)   X   NO																				DATE (15)				
ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)																								

On March 2, 1992, with Units 1 and 3 defueled and Unit 2 at 64 percent power, an assistant unit operator (AUO) cleared a control power fuse for a circuit protector in the reactor protection system (RPS) while attempting to pull an indicating light, thereby causing the actuation of BFN's engineered safety features (ESFs). This challenge to the ESFs is reportable in accordance with 10 CFR 50.73(a)(2)(iv).

The root cause for the event is a less than adequate design requirement in the RPS circuit protector circuitry. The indicating lights do not have a separate fuse from the control circuit which has the undervoltage, overvoltage, and underfrequency relays for the circuit protectors.

The immediate corrective actions were: to place the affected RPS Bus on alternate power which uses two different circuit protectors, to reset ESFs to their normal configuration, and to place an operator aid in the field. The long-term corrective actions are to implement three design change notices previously written to ensure that the indicating lights have their own fuses and are not common with the fuse for an undervoltage, overvoltage, or underfrequency control circuit.

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (5)			PAGE (3)		
		SEQUENTIAL	REVISION				
Browns Ferry Unit 1		YEAR	NUMBER	NUMBER			
		05	02	15	02	01	05

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

I. PLANT CONDITIONS

Unit 2 was at approximately 64 percent power (Power Operations). Units 1 and 3 were shutdown and defueled.

II. DESCRIPTION OF EVENT

A. Event:

On March 1, 1992 at 2300 hours, an assistant unit operator (AUO) (utility, non-licensed) began a normal equipment inspection and record readings tour through the Control Bay Building. At 0025 hours, the AUO entered battery board room #1 and noticed that an indicating light for reactor protection systems (RPS) [JC] circuit protector 1B1 was not illuminating. The AUO attempted to pull the light bulb to see if it was blown and replace it if needed. While pulling the light bulb from the socket, a blue arc was observed. This AUO activity cleared a circuit protector control power fuse in the RPS causing a loss of power to RPS bus and initiated engineered safety feature (ESF) actuations. The AUO ceased to pull the light bulb. The AUO then called the Unit 1 control room operator (utility, licensed). An assistant shift operations supervisor (ASOS) (utility, licensed) was sent to the battery board room to initiate an investigation.

The tripping of the circuit protector resulted in a group 6 and group 2 primary containment isolation system (PCIS) actuation [JM]. Due to the shutdown and defueled condition of Unit 1, the action was limited to Reactor Building and refuel zone ventilation systems [VA] isolation; A, B, and C standby gas treatment (SGTS) systems [BH] starting; A and B control room emergency ventilation (CREV) system [VI] started and, Unit 1 drywell equipment and floor drain sump outboard isolation valve [WK] closed. Required alarms and ESF actuations acted as designed.

RPS Bus B was placed on alternate power, and ESF actuations were returned to normal by 0715 hours.

As a result of the ESF actuations, this event is reportable in accordance with 10 CFR 50.73(a)(2)(iv) as an event or condition that resulted in manual or automatic actuation of any ESF.

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

None



LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)				PAGE (3)								
Browns Ferry Unit 1			SEQUENTIAL		REVISION									
		YEAR	NUMBER		NUMBER									
	0500021319	9	12	--	0	0	1	--	0	0	0	3	OF	0

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

C. Dates and Approximate Times of Major Occurrences:

March 2, 1992 at 0025 CST	AUO noticed indicating light for RPS system not illuminating, and started to pull the light bulb, thereby causing the circuit protection control power fuse to clear resulting in ESF actuations
March 2, 1992 at 0304 CST	A four-hour notification was made to the NRC in accordance with 10 CFR 50.72(b)(2)(ii)

D. Other Systems or Secondary Functions Affected:

None

E. Method of Discovery:

This event was immediately known to the control room operator upon receiving indication of an isolation of the Reactor Building and refuel zone ventilation systems.

F. Operator Actions:

The AUO immediately released the indicating light bulb. The control room operator sent an ASOS to the battery board room to investigate the event. RPS Bus B was placed on alternate power which uses two different circuit protectors, and ESF isolations returned to normal.

G. Safety System Responses:

loss of power to the RPS bus 1B resulted in a partial group 6 and group 2 PCIS actuation. The PCIS actuation included the Reactor Building and refuel zone ventilation system isolation; A, B, and C SCTS starting; A and B CREV system starting; and, drywell equipment and floor drain sump outboard isolation valves closed.

III. CAUSE OF THE EVENT

A. Immediate Cause:

AUO was pulling a non-illuminating indicating light bulb from the 1B1 circuit protector of the RPS, thereby causing a fuse to clear resulting in a loss of power to RPS Bus 1B. A mark was found in the light socket. This mark appears to have provided a shorting path to the metallic holder of the light bulb socket.



LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)										PAGE (3)									
Browns Ferry Unit 1		SEQUENTIAL					REVISION														
		YEAR					NUMBER					NUMBER									
	1500021599	9	2	---	0	0	1	---	0	0	0	4	0	0	5						

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

**B. Root Cause:**

The root cause of this event resulted from a less than adequate design requirement. The indicating light does not have a separate fuse from the control circuit which has the undervoltage, overvoltage, and underfrequency relays for the circuit protectors.

**IV. ANALYSIS OF THE EVENT**

**A. Safety Analysis:**

Since all equipment performed as designed during this event, the inadvertent actuation of several ESF related components did not adversely affect the health and safety of the public.

**V. CORRECTIVE ACTIONS**

**A. Immediate Corrective Actions:**

RPS Bus 1B was placed on its alternate supply; PCIS was reset; the drywell floor equipment drain sump pump outboard isolation valves were opened; Reactor Building and refueling zone ventilations were placed in service; A, B, and C SCTSS and CKEV systems were placed in standby. The associated alarms were reset.

TVA placed an operator aid on the circuit protector to identify the bulb as a bayonet type and to make personnel aware of the possibility of tripping a RPS bus if bulb is not properly removed.

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

TVA is implementing three design change notices (DCNs) which will ensure that the indicating lights are separately fused. Implementation of these DCNs will preclude a recurrence of this type of event.

**VI. ADDITIONAL INFORMATION**

**A. Failed Components:**

None.

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (3)			PAGE (3)		
		YEAR	NUMBER	REVISION			
Browns Ferry Unit 1	10310000215191912	0	0	1	0	0	30151015

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

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

LER 50-259/88052 event resulted from a damaged indication light socket. Although, in the March 2, 1992 event, the socket was investigated and no defects in the socket were identified, less than adequate design requirement (common fuse) was the root cause of both events. Therefore, LER 50-259/88052 is a similar previous event and one of its corrective actions was to evaluate the need to modify the existing circuitry for the addition of a separate fuse for the indication circuit.

**VII. Comments**

TVA is implementing a DCN for Unit 1 which will ensure that the indicating lights are separately fused. This corrective action will be completed by August 1, 1992.

TVA is implementing a DCN for Unit 2 which will ensure that the indicating lights are separately fused. This corrective action will be completed by August 1, 1992.

TVA is implementing a DCN for Unit 3 which will ensure that the indicating lights are separately fused. This corrective action will be completed by August 1, 1992.

Energy Industry Identification System (EIIS) codes are identified in the text as [XX].