Post-examination Comments

(Green Paper)

1. Licensee Submitted Post-examination Comments

BROWNS FERRY
EXAM 2002-301
50-259, 50-260, & 50-296

DECEMBER 13, 16-19, 2002

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

Ashok S. Bhatnagar
Vice President, Browns Ferry Nuclear Plant

December 20,2002

Mr. Luis A. Reyes
Regional Administrator
Region II
U.S. Nuclear Regulatory Commission
Sam Nunn Atlanta Federal Center
61 Forsyth Street S.W., Suite 23T85
Atlanta, Georgia 30303-8931

Dear Sir:

In the Matter of	)	Docket Nos. 50-259
Tennessee Valley Authority	)	50-260
		50-296

BROWNS FERRY NUCLEAR PLANT (BFN) - COMMENTS TO NRC WRITTEN EXAMINATION QUESTIONS

Pursuant to the NRC Operator Licensing Examiner Standards (NUREG-1021), Examiner Standard (ES)-402, Attachment 3, TVA submits the attached comments on three questions administered during initial license examinations at BFN on December 13, 2002.

The Enclosure contains comments on questions 27, 44, and 50 in the Reactor Operator examination prepared by your staff. Pursuant to the ES, these comments were provided in draft form to the NRC Chief Examiner, Mr. Edwin Lea.

There are no new commitments in this submittal.

If you have any questions, please telephone Terry L. Chinn at (256) 729-3439.

Sincerely

Ashok S. Bhatnagar

(w/o Enclosures)
cc:
(Via NRC Electronic Distribution)
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ENCLOSURE 1

Question 27 RO Exam (K/A 223002K3.16)

Unit 3 is in a refueling outage with Shutdown Cooling in operation on RHR Sys II. A spurious Group II isolation is initiated by the Instrument Techs while performing a surveillance. All isolations occurred as designed.

Which ONE of the following describes the actions to take to allow re-opening *3-FCV-74-67, RHR SYS II LPCI INBD INJECT VLV?*

A. Isolation signal has been reset AND either Shutdown Cooling Suction Valve is fully closed.

B. RHR SYS II SD CLG INBD INJECT ISOL RESET pushbutton is depressed followed by the group II isolation signal being reset.

C. Either Shutdown Cooling Suction Valve fully closed followed by the RHR SYS II SD CLG INBD INJECT ISOL RESET pushbutton being depressed.

D. RHR SYS II SD CLG INBD INJECT ISOL RESET pushbutton is depressed followed by either Shutdown Cooling Suction Valve being fully closed.

Answer: C

Comment
In reviewing the question, we believe both "A" and "C" are correct. The basis is as follows:

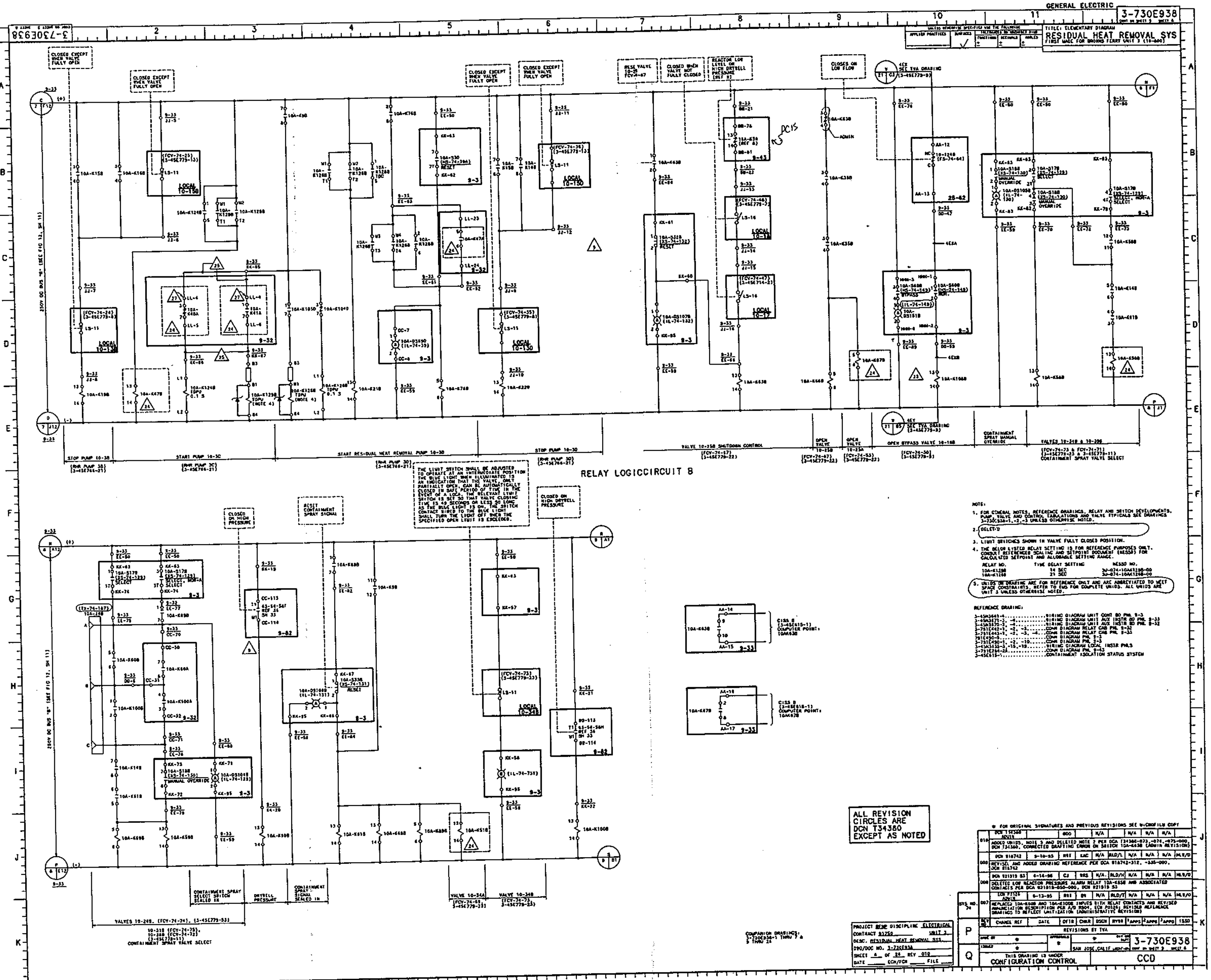
"A" and "C" are operationally the same correct answer.

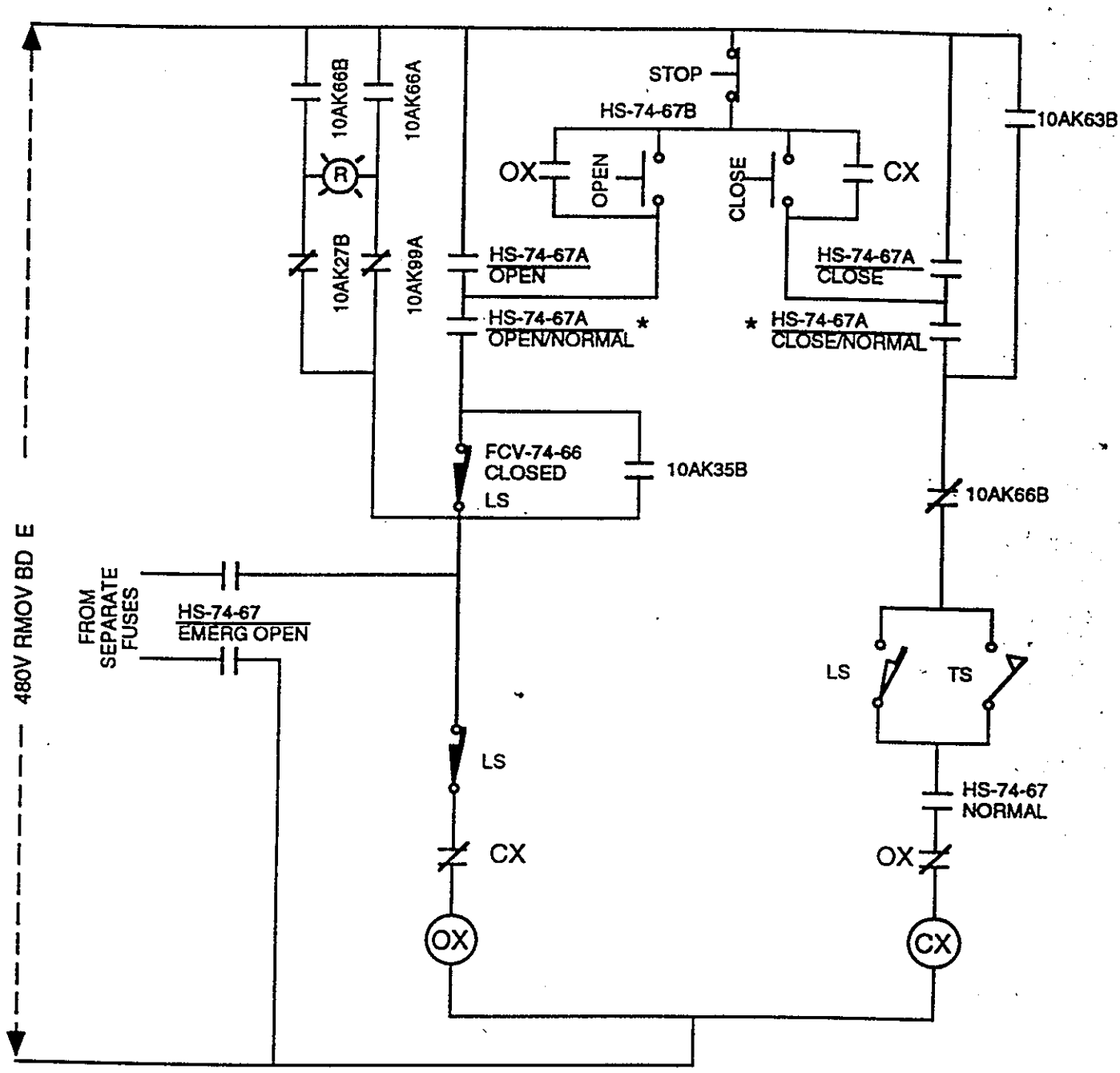
In order to manually re-open 3-FCV-74-67 following a Group 2 Isolation signal, at least one of the two Shutdown Cooling Suction Valves must be closed and the Isolation Signal must be reset.

The only method at BFN to reset a Group 2 Isolation Signal to the 3-FCV-74-67, RHR SYS II LPCI INBD INJECT VLV, is to use the RHR SYS II SD CLG INBD INJECT ISOL RESET pushbutton and answer "A" implies that this reset method has been performed.

Reference: 3-730E938, Sheet 8, Electrical diagram for Residual Heat Removal System, Circuit B relay logic. OPL171.044, TP-23, Hot License Certification training for the Residual Heat Removal system (RHR), Transparency #23,2-FCV-74-67 Control Circuit.
3-AOI-74-1, Section 4.2, Loss of Shutdown Cooling (Subsequent actions).

Proposed disposition: Accept either "A" or "C" as correct


GENERAL ELECTRIC
3-730E938
TITLE: ELEMENTARY DIAGRAM
RESIDUAL HEAT REMOVAL SYS
RELAY LOGICCIRCUIT B
250V DC BUS "B" (SEE FIG 12, SH 11)
STOP PUMP 10-3B
START PUMP 10-3C
START RESIDUAL HEAT REMOVAL PUMP 10-3D
STOP PUMP 10-3D
VALVE 10-25B SHUTDOWN CONTROL
OPEN VALVE 10-25B
OPEN VALVE 10-25A
OPEN BYPASS VALVE 10-16B
CONTAINMENT SPRAY MANUAL OVERRIDE
VALVES 10-31B & 10-39B
(FCV-74-73 & FCV-74-71)
(3-45E779-23 & 3-45E779-11)
CONTAINMENT SPRAY VALVE SELECT
CLOSED EXCEPT WHEN VALVE FULLY OPEN
CLOSED WHEN VALVE NOT FULLY CLOSED
CLOSES ON LOW FLOW
CLOSED ON HIGH PRESSURE
CLOSED ON HIGH DRYWELL PRESSURE
RESET CONTAINMENT SPRAY SIGNAL
THE LIMIT SWITCH SHALL BE ADJUSTED TO OPERATE AT AN INTERMEDIATE POSITION THE BLUE LIGHT WHEN ILLUMINATED IS AN INDICATION THAT THE VALVE, ONLY PARTIALLY OPEN, CAN BE AUTOMATICALLY CLOSED IN SAFE PERIOD OF TIME IN THE EVENT OF A LOCA. THE RELEVANT LIMIT SWITCH IS SET SO THAT VALVE CLOSING TIME IS 40 SECONDS OR LESS SO LONG AS THE BLUE LIGHT IS ON. THE SWITCH CONTACT WIRED TO THE BLUE LIGHT SHALL TURN THE LIGHT OFF WHEN THE SPECIFIED OPEN LIMIT IS EXCEEDED.
CONTAINMENT SPRAY SELECT SWITCH SEALED IN
DRYWELL PRESSURE
CONTAINMENT SPRAY SIGNAL SEALED IN
VALVE 10-34A
VALVE 10-34B
VALVES 10-26B, (FCV-74-74), (3-45E779-53)
CONTAINMENT SPRAY VALVE SELECT
CISS B
COMPUTER POINT: 10A630
COMPUTER POINT: 10A678
COMPANION DRAWINGS: 3-730E938-1 THRU 7 & 9 THRU 24
NOTE:
1. FOR GENERAL NOTES, REFERENCE DRAWINGS, RELAY AND SWITCH DEVELOPMENTS, PUMP, VALVE AND CONTROL TABULATIONS AND VALVE TYPICALS SEE DRAWINGS 3-730E938-1, -2, -3 UNLESS OTHERWISE NOTED.
2. DELETED
3. LIMIT SWITCHES SHOWN IN VALVE FULLY CLOSED POSITION.
4. THE BELOW LISTED RELAY SETTING IS FOR REFERENCE PURPOSES ONLY. CONSULT REFERENCED SCALING AND SETPOINT DOCUMENT (NESSD) FOR CALCULATED SETPOINT AND ALLOWABLE SETTING RANGE.
RELAY NO. / TIME DELAY SETTING / NESSD NO.
10A-K1298 / 14 SEC / 3U-074-10AK1298-00
10A-K1248 / 21 SEC / 3U-074-10AK1248-00
5. UNIDS ON DRAWING ARE FOR REFERENCE ONLY AND ARE ABBREVIATED TO MEET SPACE CONSTRAINTS. REFER TO EMS FOR COMPLETE UNIDS. ALL UNIDS ARE UNIT 3 UNLESS OTHERWISE NOTED.
REFERENCE DRAWING:
3-45N3641-4 ... WIRING DIAGRAM UNIT CONT BD PNL 9-3
3-45N3671-3, -4 ... WIRING DIAGRAM UNIT AUX INSTR BD PNL 9-33
3-45N3670-3, -4 ... WIRING DIAGRAM UNIT AUX INSTR BD PNL 9-32
3-731E442-1, -2, -3 ... CONN DIAGRAM RELAY CAB PNL 9-32
3-731E443-1, -2, -3, -4 ... CONN DIAGRAM RELAY CAB PNL 9-33
731E490-5 ... CONN DIAGRAM PNL 9-3
3-731E490-1, -2, -10 ... CONN DIAGRAM PNL 9-3
3-45N3135-3, -15, -19 ... WIRING DIAGRAM LOCAL INSTR PNLS
3-731E264-2A ... CONN DIAGRAM PNL 9-43
3-45E615-1 ... CONTAINMENT ISOLATION STATUS SYSTEM
ALL REVISION CIRCLES ARE DCN T34380 EXCEPT AS NOTED
* FOR ORIGINAL SIGNATURES AND PREVIOUS REVISIONS SEE MICROFILM COPY
010 ADDED UNIDS, NOTE 5 AND DELETED NOTE 2 PER DCA T34380-073, -074, -075-000, DCN T34380. CORRECTED DRAFTING ERROR ON SWITCH 10A-K630 (ADMIN REVISION)
009 REVISED AND ADDED DRAWING REFERENCE PER DCA W16742-312, -335-000, DCN W16742
008 DELETED LOW REACTOR PRESSURE ALARM RELAY 10A-K658 AND ASSOCIATED CONTACTS PER DCA W21919-050-000, DCN W21919 S3
007 REPLACED 10A-K608 AND 10A-K1008 INPUTS WITH RELAY CONTACTS AND REVISED ANNUNCIATION DESCRIPTION PER A/D 9304, ECN P0326; REVISED REFERENCE DRAWINGS TO REFLECT UNITIZATION (ADMINISTRATIVE REVISION)
CHANGE REF / DATE / DFTR / CHKR / DSGN / RVWR / APPD / APPD / APPD / ISSD
REVISIONS BY TVA
PROJECT BFNP DISCIPLINE ELECTRICAL
CONTRACT 81750 UNIT 3
DESC. RESIDUAL HEAT REMOVAL SYS.
DWG/DOC NO. 3-730E938
SHEET 6 OF 24 REV 010
SAN JOSE, CALIF
THIS DRAWING IS UNDER CONFIGURATION CONTROL
CCD



* On Unit 3 these say "AUTO/OPEN" and "AUTO/CLOSE"

TP-23: **2-FCV-74-67 CONTROL CIRCUIT**

JDC031895

4.2 Subsequent Actions (continued) (√)

4.2.5 **IF** Shutdown Cooling isolates on low RPV water level or high Drywell press (GROUP 2 ISOL) AND RPV water level needs restoring using LPCI, **THEN** (Otherwise N/A)

PERFORM the following before reaching -122 inches RPV water level:

4.2.5.1 **VERIFY CLOSED** the following valves on a Group 2 isolation:

- RHR SHUTDOWN COOLING SUCT OUTBD ISOL VLV, 3-FCV-74-47.
- RHR SHUTDOWN COOLING SUCT INBD ISOL VLV, 3-FCV-74-48.
- RHR SYS I LPCI INBD INJECT VALVE, 3-FCV-74-53.
- RHR SYS II LPCI INBD INJECT VALVE, 3-FCV-74-67.

_____

4.2.5.2 **DEPRESS** RHR SYS I(II) SD CLG INBD INJECT ISOL RESET, 3-XS-74-126 and 3-XS-74-132 AND **VERIFY** 3-IL-74-126 and 3-IL-74-132 extinguished.

_____

4.2.5.3 **IF** the RHR loop that was in shutdown cooling is needed for RPV water level makeup, **THEN**

PERFORM the following:

4.2.5.3.1 **CLOSE** RHR PUMP 3A(3B) and 3C(3D) SD COOLING SUCT VLVs, 3-FCV-74-2(25) and 3-FCV-74-13(36).

_____

****

CAUTION

[NER] Failure to have RHR SHUTDOWN COOLING SHUT OUTBD and INBD ISOL VLVs, 3-FCV-74-47 and 3-FCV-74-48, closed may result in inadvertent draining of the reactor vessel through the RHR PUMP 3A(3B) and 3C(3D) SUPPR POOL SUCT VLVs, 3-FCV-74-1(24) and 3-FCV-74-12(35). [INPO SOER 87-002]

****

4.2.5.3.2 **OPEN** RHR PUMP 3A(3B) and 3C(3D) SUPPR POOL SUCT VLVs, 3-FCV-74-1(24) and 3-FCV-74-12(35).

_____

4.2 Subsequent Actions (continued) (√)

4.2.5.3.3 **PLACE** RHR SYSTEM I(II) MIN FLOW INHIBIT switch, 3-HS-74-148(149), in NORM. _____

4.2.5.3.4 **VERIFY** RHR SYSTEM I(II) MIN FLOW VALVE, 3-FCV-74-7(30), opens. _____

4.2.6 **IF** Primary Containment Integrity is required, **THEN** (Otherwise N/A)

VERIFY RHR system discharge piping pressure is being maintained >TRM 3.5.4 Limits. **REFER TO** 3-OI-74, Section 8.1. _____

NOTES:

(1) With the Reactor in Cold Shutdown Condition (Mode 4 or Mode 5), reactor coolant stratification may be indicated by one of the following:

- Reactor pressure above 0 psig with any reactor coolant temperature indication reading at or below 212°F.
- Differential temperatures of 50°F or greater between either RX VESSEL BOTTOM HEAD (FLANGE DR LINE) 3-TE-56-29 (8) temperatures and RX VESSEL FW NOZZLE N4B END (N4B INBD) (N4B END) (N4D INBD) 3-TE-56-13(14)(15)(16) temperatures from the REACTOR VESSEL METAL TEMPERATURE recorder, 3-TR-56-4.
- With recirculation pumps and shutdown cooling out of service, a Feedwater sparger temperature of 200°F or greater on any RX VESSEL FW NOZZLE (N4B END (N4B INBD) (N4D END) (N4D INBD) 3-TE-56-13(14)(15)(16) temperatures from the REACTOR VESSEL METAL TEMPERATURE recorder, 3-TR-56-4.

(2) [NER/C] For purposes of thermal stratification monitoring, the bottom head drain line is more representative as long as there is flow in the line. [GE SIL 251 and 430]

4.2.7 **PLOT** heatup/cooldown rate as necessary. **REFER TO** 3-SR-3.4.9.1(A). _____

4.2 Subsequent Actions (continued) (√)

4.2.8 **DIRECT** the SRO to **ESTIMATE** the following times at least once per shift until a method of decay heat removal is restored:

4.2.8.1 **DETERMINE** the time since shutdown. _____

4.2.8.2 **DETERMINE** the current RPV heat-up rate from 3-SR-3.4.9.1(A), or, if reactor coolant stratification is suspected, use Illustration 1. If additional information is required to determine the heat-up rates, contact Reactor Engineer. _____

4.2.8.3 **DETERMINE** the reactor coolant temperature or use the last valid reactor coolant temperature available. _____

4.2.8.4 **ESTIMATE** the time for reactor coolant temperature to reach 212°F, using data obtained in Steps 4.2.8.1 through 4.2.8.3. _____

4.2.8.5 **IF** the Reactor Vessel head is removed and the cavity is flooded with the fuel pool gates installed, **THEN**

ESTIMATE the time for reactor coolant temperature to reach 125°F and 150°F using a plot of the actual heatup rate or Illustration 1. _____

4.2.9 **IF** the loss of Shutdown Cooling is due to inadequate RHRSW flow, **THEN** (Otherwise N/A)

START the standby RHRSW pump for the appropriate header. **REFER TO** 0-OI-23. _____

4.2.10 **IF** the loss of Shutdown Cooling is due to Group 2 PCIS isolation, **WHEN** conditions which permit resetting Group 2 PCIS isolation are met, **THEN** (Otherwise N/A)

PERFORM the following:

4.2.10.1 **RESET** Group 2 isolation by momentarily PLACING PCIS DIV I RESET, 3-HS-64-16A-S32, and PCIS DIV II RESET, 3-HS-16A-S33, in reset. _____

4.2.10.2 Momentarily **DEPRESS** RHR SYS I(II) SD CLG INBD INJECT ISOL RESET, 3-XS-74-126 and 3-XS-74-132. **VERIFY** 3-IL-74-126 and 3-IL-74-132 extinguished. _____

Question 44 RO Exam (K/A 264000A1.03)

Diesel Generator 3A is synchronized to 4KV Shut Down Board 3A. The instrumentation readings for the diesel generator are as follows:

voltage: 4160 VAC
frequency = 59.8
current = 340 amps
vars = 1600 Kvars
watts = 2585 KW
oil temp = 145°F

Which ONE of the following actions are required if the diesel is expected to operated for an extended period? (Supply OI-82 illustration #1)

A. The operator must take the voltage regulator control switch to raise to reduce field current.

B. The operator must take the voltage regulator control switch to lower to reduce field current.

C. The operator must take the governor control switch to lower to reduce stator amps.

D. The operator must take the governor control switch to raise to reduce stator amps.

Answer: C

Comment
In reviewing the question, we believe both "A" and "C" are correct. The basis is as follows:

"A" and "C" both reflect correct responses for these generator conditions. In accordance with OI-82, Standby Diesel Generator System, Step 8.1.12, the required 0.8 power factor may be achieved either by placing the Voltage Regulator Switch to the RAISE position or by placing the Governor Control Switch to the LOWER position in order to reach the diagonal line on Illustration 1, DG KW vs KVAR LOADING.

Since the question only asks for a correct required action (and not the supporting reason), both "A" and "C" are correct.

Note: All four RO candidates selected "A."

Question 44 RO Exam (continued)

Reference: 3-OI-82, Standby Diesel Generator System, Section 8.1 , Parallel with System Operation at Panel 9-23.

Proposed disposition: Accept either "A" or "C" as correct

8.1 Parallel with System Operation at Panel 9-23 (Continued)
NOTE:

Lagging VARS should be maintained when adjusting kW load (rising or lowering). This may require kW load adjustment to be stopped periodically to allow for adjusting kVAR load. Once desired kW load is achieved, Illustration 1 should be referred to for determination of kVAR loading required to obtain a power factor (pf) of 0.8 lagging. Diesel generator kVAR load should then be adjusted to obtain a 0.8 pf lagging. If system conditions will not permit the kVAR loading required to obtain a 0.8 pf lagging, kVAR load should be adjusted to the maximum kVAR lagging the system will allow.

8.1.12 USE the associated Diesel Generator's Governor Control switch and Voltage Regulator control switch to obtain desired kW and kVAR load:

Diesel	Instrument Name	Instrument No.	Panel
3A	DG 3A GOVERNOR CONTROL	3-HS-82-3A/3A	3-9-23
	DG 3A VOLT REGULATOR CONT	3-HS-82-3A/2A	
3B	DG 3B GOVERNOR CONTROL	3-HS-82-3B/3A	3-9-23
	DG 3B VOLT REGULATOR CONT	3-HS-82-3B/2A	
3C	DG 3C GOVERNOR CONTROL	3-HS-82-3C/3A	3-9-23
	DG 3C VOLT REGULATOR CONT	3-HS-82-3C/2A	
3D	DG 3D GOVERNOR CONTROL	3-HS-82-3D/3A	3-9-23
	DG 3D VOLT REGULATOR CONT	3-HS-82-3D/2A	

8.1.13 **RECORD** time/date loaded on Illustration 2.

8.1.14 **MONITOR** the offsite source that is paralleled with the diesel generator.

8.1.15 **IF** abnormal voltage or frequency transients are experienced, **THEN PERFORM** the following:

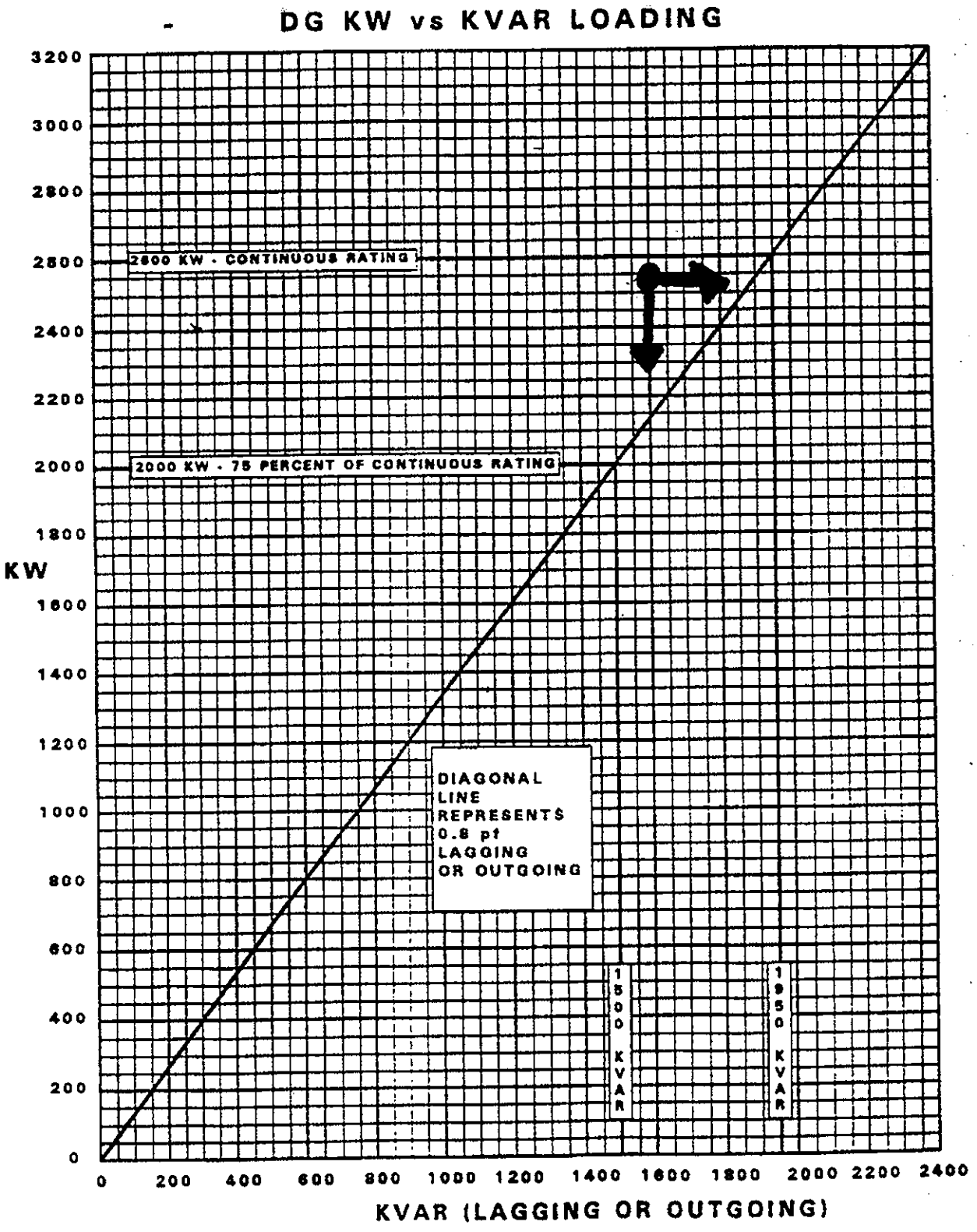
8.1.15.1 **VERIFY OPEN** DG 3A (3B, 3C, 3D) output Bkr 1838 (1842, 1832, 1836).

8.1.15.2 **PULL UP** and **RELEASE** the associated Diesel Generator control switch in the NORMAL position to initiate the shutdown sequence:

Diesel	Handswitch Name	Handswitch No.	Panel
3A	DG 3A CONTROL	3-HS-82-3A/1A	3-9-23
3B	DG 3B CONTROL	3-HS-82-3B/1A	3-9-23
3C	DG 3C CONTROL	3-HS-82-3C/1A	3-9-23
3D	DG 3D CONTROL	3-HS-82-3D/1A	3-9-23

8.1.15.3 REFER TO Section 7.1 and **CONTINUE** with Shutting down the diesel generator.

8.1.15.4 REFER TO 0-OI-57A and TRANSFER the 4kV shutdown bus to a stable offsite source as deemed appropriate by US.


DG KW vs KVAR LOADING
3200
3000
2800
2800 KW - CONTINUOUS RATING
2400
2200
2000
2000 KW - 75 PERCENT OF CONTINUOUS RATING
1800
KW
1600
1400
1200
1000
800
600
400
200
0
DIAGONAL LINE REPRESENTS 0.8 pf LAGGING OR OUTGOING
1500 KVAR
1950 KVAR
0 200 400 600 800 1000 1200 1400 1600 1800 2000 2200 2400
KVAR (LAGGING OR OUTGOING)

Question 50 RO Exam (K/A 290003G2.3.11)

Unit 3 is in a Refueling Outage with fuel movement in progress. The communicator on the phones notifies the Control Room that a fuel bundle was dropped and gas bubbles are visible in the pool. The following indications are received in the Control Room:

FUEL POOL FLOOR AREA RADIATION HIGH	in Alarm
REFUELING ZONE EXHAUST RADIATION HIGH	in Alarm
RX BLDG, TURB BLDG, RF ZONE EXH RAD HIGH	in Alarm
SGTS	Running
Control Room Ventilation	Normal lineup
PCIS Group 6	Refueling Zone isolated

Which ONE of the following describes the actions that should be taken for these conditions?

A. Stop all fuel moves; Isolate Reactor Zone Ventilation

B. Evacuate non-essential personnel from the Refuel floor; Isolate the Control Room Ventilation System

C. Stop all fuel moves; Secure SGTS.

D. Evacuate non-essential personnel from the Reactor Bldg; Obtain Operations Manager permission to resume fuel moves.

Answer: B

Comment
In reviewing the question, we believe both "A" and "B" are correct. The basis is as follows:

There is a high probability that this fuel handling accident would have also resulted in a Reactor Zone Isolation signal. The Reactor Zone HVAC Exhaust Radiation Detectors are physically located on the refuel floor in close proximity to the Refueling Zone HVAC Exhaust Radiation Detectors which was the cause of the REFUELING ZONE EXHAUST RADIATION HIGH alarm. Both Reactor and Refuel Zone HVAC radiation monitors have the same trip set-point. If this setpoint is exceeded, which is evidenced by the fact that the Refueling Zone is isolated, then it could be reasonably concluded that the Reactor Zone should have isolated. The Reactor Zone isolation is an automatic action that should occur if the Reactor Zone Exhaust Radiation Monitor setpoint is exceeded. (see attached drawing for relative location of detectors).

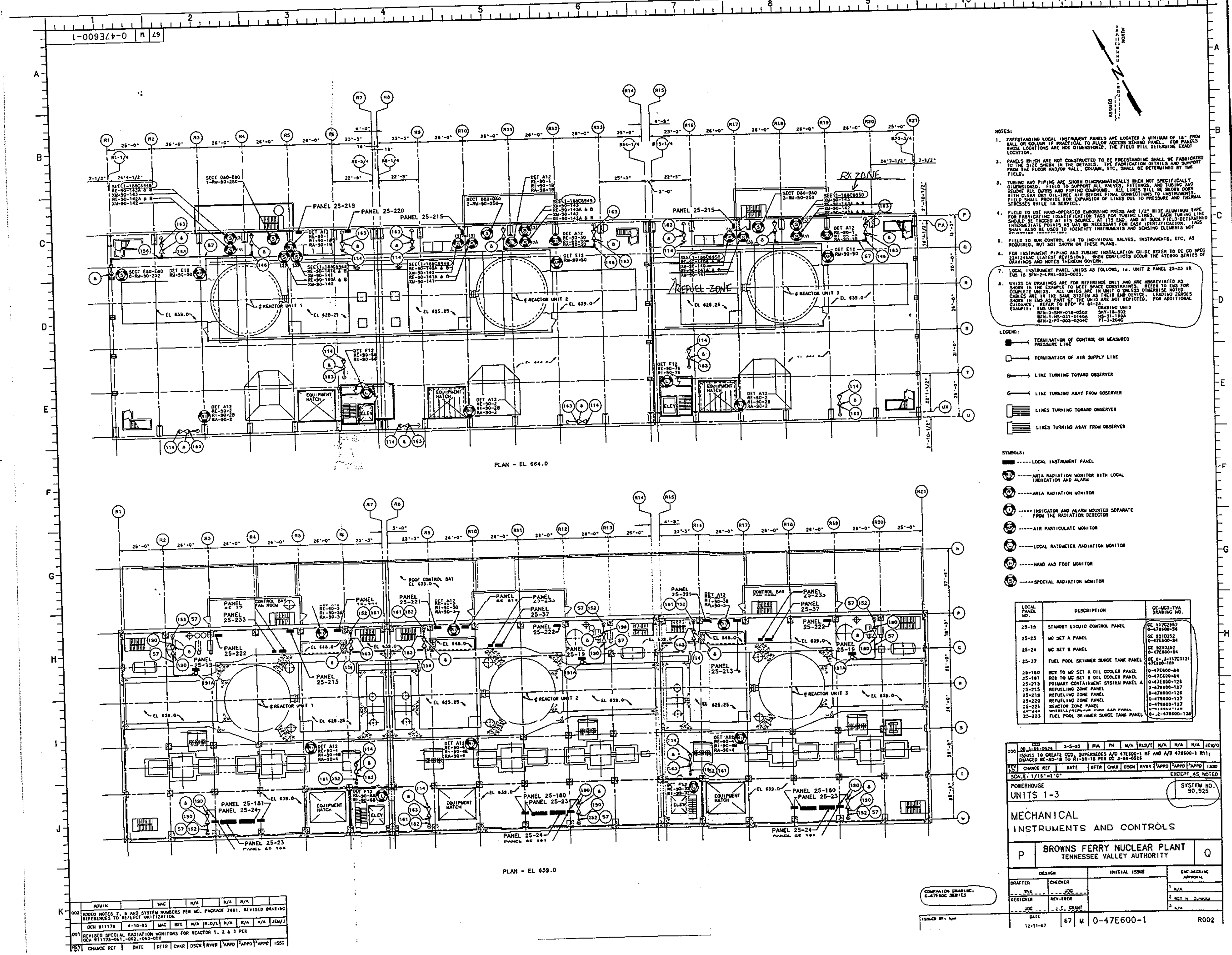
Question 50 RO Exam (continued) (K/A 290003G2.3.11)

Since the stem of the question does not provide radiation monitor equipment identification numbers (e.g., 3-RM-90-250); actual local dose rates; or Reactor Zone HVAC status, a trained operator would conclude that a high radiation condition exists at the Reactor Zone Radiation detectors. Therefore, verification of a Reactor Zone HVAC Isolation is a correct action.

Additionally, both "A" and "B" include valid immediate Operator required actions based on Abnormal Operating Instruction guidance (see 3-AOI-79-1 attached).

Reference: 3-AOI-79-1, Fuel Damage During Refueling, Section 3.0 (Automatic Actions), Section 4.1.1 and 4.1.2 (Immediate Actions). Mechanical Instrument and Control Drawing, 0-47E600-1, Refuel and Reactor Zone Exhaust Radiation Monitors, (relative location).

Proposed disposition: Accept either "A" or "B" as correct



PLAN - EL 664.0
PLAN - EL 639.0
POWERHOUSE
UNITS 1-3
MECHANICAL
INSTRUMENTS AND CONTROLS
BROWNS FERRY NUCLEAR PLANT
TENNESSEE VALLEY AUTHORITY
SYSTEM NO. 90,925
0-47E600-1
R002

TENNESSEE VALLEY AUTHORITY

BROWNS FERRY NUCLEAR PLANT

ABNORMAL OPERATING INSTRUCTION

3-AOI-79-1

FUEL DAMAGE DURING REFUELING

REVISION 6

PREPARED BY: Phillip C Chadwell PHONE: 7921

RESPONSIBLE ORGANIZATION: OPERATIONS

APPROVED BY: PHILLIP CHADWELL DATE: 08/21/2001

EFFECTIVE DATE: 08/22/2001

LEVEL OF USE: REFERENCE USE

QUALITY-RELATED

REVISION LOG

Procedure Number: 3-AOI-79-1 Revision Number: 006

Pages Affected: 2, 4

Pagination Pages: NONE

Description of Change: IC-007 - BFN PER 01-004639-000

The procedure was revised to replace immediate actions.

Page 2: Replaced the immediate action concerning the stopping of all fuel handling. This action now appears as the first immediate action of this procedure. Replaced the immediate action concerning the evacuation of all non-essential personnel from the Refuel Floor. This action now appears as the second immediate action of this procedure.

1.0 PURPOSE

This instruction provides the symptoms, automatic actions and operator actions for a fuel damage accident.

2.0 SYMPTOMS

2.1 Possible annunciators in alarm:

- FUEL POOL FLOOR AREA RADIATION HIGH (3-XA-55-3A, Window 1).
- AIR PARTICULATE MONITOR RADIATION HIGH (3-XA-55-3A, Window 2).
- RX BLDG, TURB BLDG, RF ZONE EXH RADIATION HIGH (3-XA-55-3A, Window 4).
- REACTOR ZONE EXHAUST RADIATION HIGH (3-XA-55-3A, Window 21).
- RX BLDG AREA RADIATION HIGH (3-XA-55-3A, Window 22).
- REFUELING ZONE EXHAUST RADIATION HIGH (3-XA-55-3A, Window 34).

2.2 Gas bubbles visible, in the Spent Fuel Storage Pool and/or Reactor Cavity, attributed to physical fuel damage.

2.3 Known dropped or physically damaged fuel bundle.

2.4 Portable CAM in alarm.

2.5 Radiation level on the Refuel Floor is greater than 25 mr/hr and cause is unknown.

3.0 AUTOMATIC ACTIONS

If annunciator REFUELING ZONE EXHAUST RADIATION HIGH (3-XA-55-3A, Window 34) or REACTOR ZONE EXHAUST RADIATION HIGH (3-XA-55-3A, Window 21) alarm, the following will occur:

- Control Room and Refuel Zone Ventilation isolates.
- SGTS initiates.
- Emergency Control Room Pressurization units start.
- PCIS Group 6 isolates (partial isolation only for Refueling Zone Exhaust High Radiation).
- Reactor Zone Ventilation isolates (initiates on Reactor Zone Exhaust High Radiation only).

4.0 OPERATOR ACTIONS

4.1 Immediate Actions

4.1.1 **STOP** all fuel handling.

4.1.2 **EVACUATE** all non-essential personnel from Refuel Floor.

4.2 Subsequent Actions

NOTE:

The release of iodine is of major concern.

4.2.1 **IF** any EOI entry condition is met, **THEN**

ENTER the appropriate EOI(s).

4.2.2 **VERIFY** automatic actions.

4.2.3 **NOTIFY** RADCON to perform the following:

- **EVALUATE** the radiation levels.
- **MAKE** recommendation for personnel access.
- **MONITOR** around the Reactor Building Equipment Hatch, at levels below the Refuel Floor, for possible spread of the release.

4.2.4 **REFER TO** EPIP-1 for proper notification.

4.2.5 **MONITOR** radiation levels, for the affected areas, using the following radiation recorders and indicators:

- 3-RR-90-1 (points 1 and 2), 3-CONS-90-50A (Address 16), 3-RR-90-142 and 3-RR-90-140 (Panel 3-9-2).
- 3-RM-90-142, 3-RM-90-140, 3-RM-90-143 and 3-RM-90-141 Detectors A and B (Panel 3-9-10).
- 3-RI-90-1A and 3-RI-90-2A (Panel 3-9-11).
- 0-CONS-90-362A (Address 09, 10, 08) for Unit 1, 2, 3-RM-90-250, respectively (Panel 1-9-44).

4.2 Subsequent Actions (Continued)

4.2.6 **MONITOR** portable CAMs & ARMs, if possible.

4.2.7 **REQUEST** Chemistry to perform 0-SI-4.8.B.2-1 to determine if iodine concentration has risen.

4.2.8 **NOTIFY** Reactor Engineering Supervisor, or his designee, and **OBTAIN** recommendation for movement and sipping of the damaged fuel assembly.

4.2.9 **OBTAIN** Plant Managers approval prior to resuming any fuel transfer operations.

4.2.10 **WHEN** condition has cleared AND if required, **THEN**

RETURN ventilation systems, including SGTS, to normal. **REFER TO** 3-OI-30A, 3-OI-30B, 0-OI-30F, 0-OI-31, and 0-OI-65.

5.0 REFERENCES

5.1 Technical Specifications

Section 5.4, Procedures/Section 5.5, Programs and Manuals.

5.2 Final Safety Analysis Report

Section 14.6.4, Refueling Accident.

5.3 Offsite Dose Calculation Manual

Section 1/2.1.2, Radioactive Gaseous Effluent Monitoring Instrumentation.

5.4 Plant Instructions

3-GOI-100-3, Refueling Operations.

3-ARP-9-3, Annunciator Response Procedures.

EPIP-1, Emergency Plan Classification Logic.

0-OI-30F, Common and DG Building Ventilation.

3-OI-30A, Refueling Floor Ventilation System.

3-OI-30B, Reactor Building Ventilation System.

5.4 Plant Instructions (Continued)

0-OI-31, Control Bay and Off-Gas Treatment Building Air Conditioning System.

0-OI-65, Standby Gas Treatment System.

SPP-3.1, Corrective Action Program.

SPP-5.8, Special Nuclear Material Control.

OPDP 8, Limiting Conditions for Operation Tracking.

ILLUSTRATIONS/ATTACHMENTS

None.