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June 12, 1997

Mr. Howard Bundy
U.S. Nuclear Regulatory Commission
611 Ryan Plaza Drive, Suite 400
Arlington, Tex. 76011-8064

Dear Howard:

This letter accompanies material discussed via telcon on June 12 concerning the Callaway RO Retake Exam scheduled for June 27, 1997. The following material is enclosed with this letter per your request:

1) Revised reference sheets for questions 1,5,6,10,16,17,20,32,66 and 93 to reflect changes as discussed.
2) Revised examination key.
3) Lesson plan objectives to support questions 6 and 11.
4) Revised Outline to reflect replacement question 5.
5) A copy of the exam as it will be administered.

If you have any questions concerning this material, or if additional information is needed to support your exam review, please call me at 573-676-8194.

Sincerely,

Bruce Moody

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QUESTION #1

A Safety Injection has occurred due to a Steam Generator Tube Rupture. The crew has just completed verifying that both NB01 and NB02 are energized per Step 3 of E-0, Reactor Trip or Safety Injection. Which one of the following describes the HVAC flowpath for the Fuel Building at this time?

A. Fuel Building supply and normal exhaust stops; emergency exhaust dampers align to the Aux Building.

B. Fuel Building supply and normal exhaust stops; emergency exhaust dampers align to Fuel and Aux Building.

C. Fuel Building supply keeps running or starts; normal and emergency Fuel Building exhaust isolates.

D. Fuel Building supply and exhaust keeps running or starts; emergency exhaust dampers align to the Fuel Building.

ANSWER:

A. Fuel Building supply and normal exhaust stops; emergency exhaust dampers align to the Aux Building.

K/A #:	013K113 2.8/3.1
KA DESCRIPTION:	FB Ventilation on SIS

OBJECTIVE #:	011039OD
REFERENCES:	T61.0110.6 LP 39, Page 40

AUTHOR:	RBM
SOURCE:	BANK Modified Y - L

DISTRACTER EXPLANATION:
Response B is incorrect because the emergency exhaust does not align to the Fuel Bldg. Response C is incorrect because the Fuel Bldg supply does not keep running. Response D is incorrect because the Fuel Bldg supply and exhaust does not keep running and the dampers do not align to the Fuel Bldg.

RO Outline #32

QUESTION #5

The following plant conditions exist:

- Reactor power is 1 x 10E-8 amps
- A reactor startup is in progress
- N-35 Intermediate Range channel fails LOW

Which ONE of the following actions is correct per Technical Specification 3.3.1, "Reactor Trip System Instrumentation"?

A. Restore inoperable channel prior to exceeding P-6.

B. Restore inoperable channel prior to exceeding 5% power.

C. Restore inoperable channel prior to exceeding 10% power.

D. Bypass the inoperable channel and continue with reactor startup.

ANSWER:

B. Restore inoperable channel prior to exceeding 5% power.

K/A #:	015A201 3.5/3.9
KA DESCRIPTION:	NIS Failure

OBJECTIVE #:	003B500C
REFERENCES:	T61.003B.6 LP-#50

AUTHOR:	RBM
SOURCE:	BANK

DISTRACTER EXPLANATION:

A. Alpha is not correct since power is already above P-6.
C. Would be correct if power was above 5%.
D. Delta is incorrect because both intermediate ranges are required to perform a reactor startup.

RO Outline #51

QUESTION #6

The plant is operating at 100% power with all equipment in its normal lineup. A spurious SI occurs during some I&C testing. All equipment functions as designed.

Which ONE of the following procedures will the CRS transition to upon completing ES-1.1, SI Termination?

A. OTG-ZZ-0001A, Shutdown Bank Withdrawal

B. OTG-ZZ-00002, Reactor Startup

C. OTG-ZZ-00005, Plant Shutdown 20% Power to Hot Standby

D. OTG-ZZ-00006, Plant Cooldown Hot Standby to Cold Shutdown

ANSWER:

C. OTG-ZZ-00005, Plant Shutdown 20% Power to Hot Standby

K/A #:	E02EA2.2 3.5/4.0
KA DESCRIPTION:	Procedural Guidance Following SI Termination

OBJECTIVE #:	003D09OG
REFERENCES:	ES-1.1

AUTHOR:	PJM
SOURCE:	NEW - L

DISTRACTER EXPLANATION:
Upon a Reactor Trip and Safety Injection, E-0 will be entered. ES-1.1 will be transitioned to from there. Upon completion of ES-1.1, the guidance is to perform OTG-ZZ-00005 or 8.
A. Incorrect
B. Incorrect
C. Correct
D. Incorrect

RO Outline #87

QUESTION #10

The crew is responding to a plant transient and are currently in procedure ECA-1.2, "LOCA Outside Containment".

Why should operators wait some amount of time during each valve repositioning per this procedure?

A. Prevents overcurrent trips on valve motor breakers.

B. Allows system pressure to respond to repositioning.

C. Prevent valve motor overheating due to excessive operation.

D. To allow check on indications of leak in auxiliary building.

ANSWER:

B. Allows system pressure to respond to repositioning.

K/A #:	E04EK1.2 3.7/4.0
KA DESCRIPTION:	Precaution During Valve Strokes in ECA-1.2

OBJECTIVE #:	003D14OD
REFERENCES:	T61.003D.6 LP 14

AUTHOR:	FXB
SOURCE:	BANK - Modified N - L

DISTRACTER EXPLANATION:

A. Breakers overcurrent trips are jumpered

C. Valve motor overheating is not a concern.

D. No remote indication required, but note on page 2 has personnel searching

RO Outline #86

QUESTION #16

The plant is at 8% power preparing to synchronize the main generator to the grid when the running main feed pump trips. As the Balance of Plant operator you observe the following steam generator narrow range levels:

A indicates 16%
B indicates 15%
C indicates 14%
D indicates 17%

All other plant parameters are normal.

Which one of the following correctly describes the status of the Auxiliary Feedwater (AFW) System?

A. No AFW pumps are running

B. Only the turbine driven AFW pump is running

C. Only the motor driven AFW pumps are running

D. All the AFW pumps are running

ANSWER:

C. Only the motor driven AFW pumps are running

K/A #:	054AA2.03 4.1/4.2
KA DESCRIPTION:	AFW PP Start Signals

OBJECTIVE #:	011025OH
REFERENCES:	T61.0110.6 LP 25 OTO-SA-00001

AUTHOR:	RBM
SOURCE:	NEW - HO

DISTRACTER EXPLANATION:
All answers are plausible, depending on whether a MDAFAS or TDAFAS signal has been actuated. With the given conditions, only a MDAFAS signal would be generated, therefore C is the correct answer.

RO Outline #84

QUESTION #17

The following conditions exist:

- PRZR Relief Tank Level Hi/Lo -- ALARMING on HIGH LEVEL
- PRZR Relief Tank Pressure -- ALARMING on HIGH PRESSURE

Which ONE of the below combinations contain sources, ALL of which should be monitored for leakage into the PRT?

A. RHR Pump Suction Reliefs (EJ8708A/B), RCP Seal Leakoff Relief (BG8121), and CVCS Letdown Relief (BG8117).

B. ECCS Accumulator Reliefs (8855A-D), RHR Pump Suction Relief (EJ8708A/B), and CVCS Letdown Relief (BG8117).

C. RCP Seal Leakoff Relief (BG8121), CVCS Letdown Relief (BG8117) and RHR Discharge Reliefs (EJ8856A/B).

D. Safety Injection Pump Suction Reliefs (EM8858A), RHR Pump Suction Reliefs (EJ8708A/B), and RCP Seal Leakoff Relief (BG8121).

ANSWER:

A. RHR Pump Suction Reliefs (EJ8708A/B), RCP Seal Leakoff Relief (BG8121), and CVCS Letdown Relief (BG8117).

K/A #:	007A205 3.2/3.6
KA DESCRIPTION:	Impact of Pressure ↑ on PRT

OBJECTIVE #:	011009OI
REFERENCES:	M22BB02

AUTHOR:	FXB
SOURCE:	NEW - HO

DISTRACTER EXPLANATION:
B- ECCS Reliefs go to atmosphere
C- RHR Discharge Reliefs go to RHUT
D- Safety Injection Suction Relief to RHUT

RO Outline #38

QUESTION #20

Callaway Plant is in Mode 4. "B" RHR is in service. A plant cooldown is in progress. The Reactor Operator is directed to stop the cooldown. EGHV102, "B" CCW to "B" RHR heat exchanger is CLOSED.

Which ONE of the following events occur?

A. "B" CCW flashes in the "B" RHR heat exchanger causing the "B" CCW surge tank level to increase.

B. "B" ESW flashes in the "B" CCW heat exchanger causing water hammer in the "B" ESW.

C. "B" RHR flashes in the "B" RHR heat exchanger causing the "B" RHR suction relief to lift.

D. "B" ESW flashes in the "B" CCW heat exchanger causing the heat exchanger tube side relief valve to lift.

ANSWER:

A. "B" CCW flashes in the "B" RHR heat exchanger causing the "B" CCW surge tank level to increase.

K/A #:	005A103 2.5/2.6
KA DESCRIPTION:	Flashing in RHR HX

OBJECTIVE #:	011010OE
REFERENCES:	SOS 86-0054

AUTHOR:	PJM
SOURCE:	BANK Modified Y - HO

DISTRACTER EXPLANATION:
A. When CCW flow was stopped in the plant to the RHR heat exchanger, CCW flashed to steam in the RHR heat exchanger upon heating up.
B. ESW cools CCW. ESW is at a higher pressure so should not flash.
C. B RHR is pressurized so should not flash.
D. ESW cools CCW. ESW is at a higher pressure so should not flash.

RO Outline #27

QUESTION #32

Which one of the following posted areas must be deposted before plant personnel may be permitted to enter?

A. CHRA, Caution High Radiation Area

B. DHRA, Danger High Radiation Area

C. DREA, Danger High Radiation Area Radiological Exclusion Area

D. VHRA, Very High Radiation Area

ANSWER:

D. VHRA, Very High Radiation Area

K/A #:	2.3.1 2.5/2.9
KA DESCRIPTION:	Radiological Posting Requirements

OBJECTIVE #:	003A31OD 003A31OF

AUTHOR:	RBM
SOURCE:	NEW - L

DISTRACTER EXPLANATION:
All of the areas listed have special entry requirements. The entry requirement for a VHRA is that it must be deposted before entry can be authorized.

RO Outline #96

QUESTION #66

Which one of the following conditions would require action to be taken within 15 minutes to avoid violating the plant Technical Specifications?

A. The plant is at 40% power with AFD outside its specified target band.

B. The plant is at 2% power with Tavg at 550°.

C. The plant is at 40% power when 120-volt AC bus NN01 loses power.

D. The plant is at 2% power when SR channel N31 fails.

ANSWER:

B. The plant is at 2% power with Tavg at 550°.

K/A #:	2.1.11 3.0/3.8
KA DESCRIPTION:	TS 3.1.1.4 - Minimum Temp for Criticality

OBJECTIVE #:	003A03OC
REFERENCES:	TS 3.1.1.4

AUTHOR:	RBM
SOURCE:	NEW - HO

DISTRACTER EXPLANATION:
A would be a 15 min response if above 50% power.
B is a 15 min response.
C requires action within 2 hours.
D would require immediate action if below P-6.

RO Outline #88

QUESTION #93

A plant startup is in progress. Power level is 1E-7 amps. The Reactor is tripped when PA02 is deenergized by Relay Test.

Which ONE of the following is the approximate length of time before the Source Range NI's automatically energize ?

A. 2 minutes

B. 5 minutes

C. 10 minutes

D. 15 minutes

ANSWER:

C. 10 minutes

K/A #:	007EK1.05 3.3/3.8
KA DESCRIPTION:	How Long for Source Ranges to Energize on Rx Trip

OBJECTIVE #: 003D06OE

AUTHOR: PJM
SOURCE: NEW - LO

DISTRACTER EXPLANATION:
SUR following a Reactor trip is -1/3 DPM.
Source Range NI's automatically energize at 6E-11.
1E-7 to 6E-11 is 3.4 Decades
3.4 Decades at .33 DPM = 10.3 minutes

RO Outline #76

Objectives
URO-SBB-04W

A. State the chemistry analytical sampling and trending requirements for response to reactor coolant system high activity.

Procedure
Review Group 1 EAL's from EIP-ZZ-00101.

Using OTA-SP-RM011 (attachment 1), review plant radiation monitoring locations and functions.

Review TS 3.4.8

Cover latest revision of procedure with students.

Summary

OTO-BB-00005 provides guidance for responding to RCS high activity. Directions are provided to have Chemistry start sampling and take actions as directed by Tech Specs.

References

A. OTO-BB-00005

B. EIP-ZZ-00101

C. OTA-SP-RM011

OBJECTIVES

NOTE: OBJECTIVES INDICATED WITH AN "*" ARE APPLICABLE TO T61.0520.6.

URO-CRK-02Z
000009G.12
4.1/4.3

A. STATE THE PURPOSE OF ES-1.1

URO-CRK-02AA
000009G.11
4.2/4.4

B. STATE THE TRANSITIONS FROM ES-1.1 BACK TO E-1, THE PARAMETERS USED, AND THEIR BASIS.

URO-CRK-02AB
000009G.11
4.2/4.4

C. STATE THE PLANT PARAMETERS WHICH ARE EVALUATED TO TRANSITION FROM ES-1.1 TO E-1. INCLUDE TRANSITION CRITERIA AND BASIS.

URO-CRK-02AC
010000A1.07
3.7/3.7

D. GIVEN THE CORRECT ORDER OF PRESSURIZER PRESSURE CONTROL PER ES-1.1, EXPLAIN THE BASIS FOR THIS ORDER.

URO-CRK-02AD
000017A1.21
4.4/4.5

E. DESCRIBE THE INDICATIONS USED TO VERIFY NATURAL CIRCULATION PER ES-1.1.

URO-CRK-02AE
000007EA1.05
4.0/4.1

F. PREDICT WHEN SOURCE RANGE DETECTORS SHOULD BE ENERGIZED FOLLOWING A REACTOR TRIP.

URO-CRK-02AF
000011EA2.08
3.4/3.9

G. STATE THE PROCEDURE THAT SHOULD BE TRANSITIONED TO ON COMPLETION OF ES-1.1.

URO-CRK-02AG
011000A2.01
3.2/3.1

H. DESCRIBE IN CORRECT ORDER THE METHODS OF ESTABLISHING EXCESS LETDOWN PER ES-1.1.

URO-CRK-02AH
013000K1.02
3.2/3.6

I. EXPLAIN THE CAUTION AND BASIS FOR RESETTING SI PRIOR TO STARTING RCP "C" OR "D".

URO-CRK-02AI
079000K1.02
2.2/2.2

J. DESCRIBE HOW ESW IS SUPPLIED TO THE AIR COMPRESSORS AFTER A LOSS OF INSTRUMENT AIR.

ES-401	Callaway RO June 1997 Re-Examination Outline Plant Systems - Tier 2 / Group 1											Form ES-401-4		
E/APE # / Name / Safety Function	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	Imp.	Q #
001 Control Rod Drive					X							K565 Power Mismatch Effect on Rod Control	3.2/3.6	7
							X					A102 Plant Response to Pimp Failure	3.1/3.4	13
					X							K504 Rod Insertion Limit w/P-A Conv. Malfunct	4.3/4.7	49
003 Reactor Coolant Pump										X		A404 Monitor #1 Seal DP on RCP	3.1/3.0	48
	X											K112 RCS Leak Thermal Barrier Isolation	3.0/3.3	50
004 Chemical and Volume Control	X											K107 Plant response to Flux Doubling	2.6/2.9	3
	X											K106 Response to VCT Level Channel Failure	3.1/3.1	6
								X				A227 RWST Operability in Mode 6	3.5/4.2	25
013 Engineered Safety Features Actuation	X											K113 Fuel Bldg Ventilation on a SIS	2.8/3.1	32
		X										K201 Downpower cross-trip blocks	3.6/3.8	33
										X		A402 Reset of ESFAS Channels	4.3/4.4	47
015 Nuclear Instrumentation			X									K302 Response to Power Range NI Failure	3.3/3.5	8
						X						K604 Source Range NI Failure	3.1/3.2	14
								X				A201 NIS Failure	3.5/3.9	51
017 In-core Temperature Monitor				X								K401 Incore Thermocouple Inputs	3.4/3.7	21
022 Containment Cooling									X			A301 Flow to Containment Coolers on SI	4.1/4.3	30
056 Condensate	X											K103 Feedwater Temp Response to Feedwater Heater Isolation	2.6/2.6	19
059 Main Feedwater										X		A403 FRV/Feed ΔP on Power Increase	2.9/2.9	22
								X				A212 MFP trips from FRV failure	3.1/3.4	44
061 Auxiliary/Emergency Feedwater				X								K401 AFAS/LSP Actuation Requirements	3.9/4.2	12
				X								K404 Flow Control Valve Operations	3.1/3.4	44
068 Liquid Radwaste				X								K401 Auto Isolation of Radwaste Discharge	3.4/4.1	28
072 Area Radiation Monitoring										X		A403 Area Rad MON Source Check	3.1/3.1	46
K/A Category Totals:	5	1	1	4	2	1	1	3	1	4	0	Group Point Total: 23 Target: 23		

CALLAWAY PLANT
IPE/PRA Referenced to Callaway Plant Retake RO Exam of 6/27/97

Individual Plant Evaluation Major Event (% CDF)	RO Written Question #	TOPIC
Internal Flooding (30.5%)	40	Monitor NK lineup in the Control Room (Effect of Flooding)
	57	Immediate Actions for Loss of NN02 (Effect of Flooding)
Station Blackout (30.3%)	54	ECA-0.0 Actions for ESW Pump
	58	Plant Equip Response during Loss of All AC
	69	Natural Circ Cooldown following Loss of All AC
LOCAs(19.0%)	62	Subcooling requirements following a LOCA
	72	ECCS water sources available in ECA-1.1
	79	Decay heat removal following a LOCA in E-1
	83	Basis for blocking low Steamline Pressure in ES-1.2
	86	Precaution during valve strokes in ECA-1.2
Transients (17.7%)	21	RTD failure effects on plant instrumentation
	66	Uncontrolled depressurization of all Steam Generators
	71	Loss of steam dumps following a loss of condenser vacuum
	78	Loss of Secondary Heat Sink (FR-H.1)
	87	Recovery from a spurious Safety Injection
	90	CSF implementation following a steamline rupture
SGTR (1.4%)	55	Response to SG Overpressure following a SGTR
	80	Preferred order of depressurizing RCS following a SGTR
ATWS (0.7%)	5	Basis for Turbine Trip in Response to ATWS
	81	Operation of the AMSAC System
PRA Risk Significant Systems (% Contributing)		
KJ/NE (30%)	2	HVAC operability for DGs
	68	Basis for alternating ECCS trains during recovery actions
ESW (23%)	54	ECA-0.0 Actions for ESW Pump
AFW (12%)	12	AFAS/LSP Actuation Requirements
	44	AFW flow control valves operation
	84	AFW pump start signals
RHR (7%)	11	RHR valve interlocks
	27	Flashing in RHR Hex
	70	Air entrainment during RHR operation
CCW (4%)	4	Response to CCW rad monitor alarm
	10	Source of CCW leakage
	60	Immediate Actions for loss of CCW Pump
	94	P&L for CCW supply to Radwaste