



UNITED STATES
NUCLEAR REGULATORY COMMISSION

REGION IV

611 RYAN PLAZA DRIVE, SUITE 400
ARLINGTON, TEXAS 76011-8064

April 16, 1997

NOTE TO: NRC Document Control Desk
Mail Stop 0-5-D-24

FROM: Laura Hurley, Licensing Assistant
Operations Branch, Region IV

SUBJECT: OPERATOR LICENSING EXAMINATIONS ADMINISTERED ON FEBRUARY 24-28,
1997, AT CALLAWAY PLANT, UNIT 1

DOCKET #50-483

On February 24-28, 1997, Operator Licensing Examinations were administered at the referenced facility. Attached you will find the following information for processing through NUDOCS and distribution to the NRC staff, including the NRC PDR:

- Item #1 - a) Facility submitted outline and initial exam submittal, designated for distribution under RIDS Code A070.
- b) As given operating examination, designated for distribution under RIDS Code A070.
- Item #2 - Examination Report with the as given written examination attached, designated for distribution under RIDS Code IE42.

If you have any questions, please contact Laura Hurley, Licensing Assistant, Operations Branch, Region IV at (817) 860-8253.

220045

4-23-97



9704220342 XA

Attachment 2

Written Exam - RO

RO Matrix

Question #001	RO #19	Question #051	RO #90
Question #002	RO #41	Question #052	RO #58
Question #003	RO #12	Question #053	RO #35
Question #004	RO #4	Question #054	RO #22
Question #005	RO #96	Question #055	RO #97
Question #006	RO #33	Question #056	RO #82
Question #007	RO #1	Question #057	RO #64
Question #008	RO #75	Question #058	RO #47
Question #009	RO #71	Question #059	RO #32
Question #010	RO #44	Question #060	RO #5
Question #011	RO #23	Question #061	RO #38
Question #012	RO #63	Question #062	RO #74
Question #013	RO #87	Question #063	RO #68
Question #014	RO #13	Question #064	RO #53
Question #015	RO #36	Question #065	RO #28
Question #016	RO #48	Question #066	RO #10
Question #017	RO #27	Question #067	RO #93
Question #018	RO #94	Question #068	RO #72
Question #019	RO #86	Question #069	RO #54
Question #020	RO #43	Question #070	RO #26
Question #021	RO #8	Question #071	RO #6
Question #022	RO #57	Question #072	RO #42
Question #023	RO #95	Question #073	RO #81
Question #024	RO #39	Question #074	RO #29
Question #025	RO #60	Question #075	RO #62
Question #026	RO #20	Question #076	RO #77
Question #027	RO #2	Question #077	RO #91
Question #028	RO #40	Question #078	RO #51
Question #029	RO #76	Question #079	RO #25
Question #030	RO #98	Question #080	RO #14
Question #031	RO #85	Question #081	RO #45
Question #032	RO #55	Question #082	RO #16
Question #033	RO #37	Question #083	RO #56
Question #034	RO #21	Question #084	RO #66
Question #035	RO #100	Question #085	RO #73
Question #036	RO #3	Question #086	RO #59
Question #037	RO #52	Question #087	RO #80
Question #038	RO #30	Question #088	RO #83
Question #039	RO #67	Question #089	RO #89
Question #040	RO #99	Question #090	RO #69
Question #041	RO #50	Question #091	RO #15
Question #042	RO #70	Question #092	RO #79
Question #043	RO #34	Question #093	RO #65
Question #044	RO #9	Question #094	RO #11
Question #045	RO #61	Question #095	RO #84
Question #046	RO #31	Question #096	RO #88
Question #047	RO #24	Question #097	RO #92
Question #048	RO #18	Question #098	RO #78
Question #049	RO #7	Question #099	RO #17
Question #050	RO #49	Question #100	RO #46

RO Matrix

RO #1	Question #007	RO #51	Question #078
RO #2	Question #027	RO #52	Question #037
RO #3	Question #036	RO #53	Question #064
RO #4	Question #004	RO #54	Question #069
RO #5	Question #060	RO #55	Question #032
RO #6	Question #071	RO #56	Question #083
RO #7	Question #049	RO #57	Question #022
RO #8	Question #021	RO #58	Question #052
RO #9	Question #044	RO #59	Question #086
RO #10	Question #066	RO #60	Question #025
RO #11	Question #094	RO #61	Question #045
RO #12	Question #003	RO #62	Question #075
RO #13	Question #014	RO #63	Question #012
RO #14	Question #080	RO #64	Question #057
RO #15	Question #091	RO #65	Question #093
RO #16	Question #082	RO #66	Question #084
RO #17	Question #099	RO #67	Question #039
RO #18	Question #048	RO #68	Question #063
RO #19	Question #001	RO #69	Question #090
RO #20	Question #026	RO #70	Question #042
RO #21	Question #034	RO #71	Question #009
RO #22	Question #054	RO #72	Question #068
RO #23	Question #011	RO #73	Question #085
RO #24	Question #047	RO #74	Question #062
RO #25	Question #079	RO #75	Question #008
RO #26	Question #070	RO #76	Question #029
RO #27	Question #017	RO #77	Question #076
RO #28	Question #065	RO #78	Question #098
RO #29	Question #074	RO #79	Question #092
RO #30	Question #038	RO #80	Question #087
RO #31	Question #046	RO #81	Question #073
RO #32	Question #059	RO #82	Question #056
RO #33	Question #006	RO #83	Question #088
RO #34	Question #043	RO #84	Question #095
RO #35	Question #053	RO #85	Question #031
RO #36	Question #015	RO #86	Question #019
RO #37	Question #033	RO #87	Question #013
RO #38	Question #061	RO #88	Question #096
RO #39	Question #024	RO #89	Question #089
RO #40	Question #028	RO #90	Question #051
RO #41	Question #002	RO #91	Question #077
RO #42	Question #072	RO #92	Question #097
RO #43	Question #020	RO #93	Question #067
RO #44	Question #010	RO #94	Question #018
RO #45	Question #081	RO #95	Question #023
RO #46	Question #100	RO #96	Question #005
RO #47	Question #058	RO #97	Question #055
RO #48	Question #016	RO #98	Question #030
RO #49	Question #050	RO #99	Question #040
RO #50	Question #041	RO #100	Question #035

CALLAWAY PLANT - WRITTEN EXAM OUTLINE
REACTOR OPERATOR

	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	SG	
Systems I	1	2	2	3	3	1	3	1	3	1	3	23
Systems II	4	1	3	1	1	2	0	2	1	3	2	20
Systems III	1	0	0	1	1	0	0	2	1	2	0	8
Emer/Abn I	2	1	4	--	--	--	3	4	--	--	2	16
Emer/Abn II	1	1	3	--	--	--	4	3	--	--	5	17
Emer/Abn III	0	0	1	--	--	--	0	1	--	--	1	3
TOTALS	9	5	13	5	5	3	10	13	5	6	13	87
Plant Generics =												13
TEST TOTAL												100

Knowledge and Abilities Record Form
PLANT SYSTEMS
PWR - Reactor Operator - 51%

Check if included	194001 K/A #	Statement	Rating
X	K1.01	1. Knowledge of how to conduct and verify valve lineups.	3.6
X	K1.02	2. Knowledge of tagging and clearance procedures.	3.7
X	K1.03	3. Knowledge of 10 CFR 20 and related facility radiation control requirements.	2.8
X	K1.07	4. Knowledge of safety procedures related electrical equipment.	3.6*
X	K1.16	5. Knowledge of facility protection requirements, including fire brigade and portable fire-fighting equipment usage.	3.5
X	A1.02	6. Ability to execute procedural steps.	4.1*
X	A1.03	7. Ability to locate and use procedures and station directives related to shift staffing and activities.	2.5
X	A1.05	8. Ability to make accurate, clear, and concise verbal reports.	3.6
X	A1.06	9. Ability to maintain accurate, clear and concise logs, records, status boards and reports.	3.4
X	A1.08	10. Ability to obtain and interpret station reference material such as graphs, monographs, and tables which contain system performance data.	2.6
X	A1.13	11. Ability to locate control room switches, controls, and indications, and to determine that they are correctly reflecting the desired plant lineup.	4.3*
X	A1.15	12. Ability to use plant computer to obtain and evaluate parametric information on system and component status.	3.1
X	A1.16	13. Ability to take actions called for in the Facility Emergency Plan, including (if required) supporting or acting as the Emergency Coordinator.	3.1

Knowledge and Abilities Record Form
PLANT SYSTEMS
PWR - Reactor Operator - 51%

Plant Specific Priorities

System #	K/A #	K/A Topic	Rating
013		MSFIS - Modification Purpose and Operations	
059		LER 96-03 FWIS due to Trip of MFP	

Group I Plant Systems - 23%

001	Control Rod Drive System	022	Containment Cooling System
003	Reactor Coolant Pump System	056	Condensate System
004	Chemical and Volume Control System	059	Main Feedwater System
013	ESFAS	061	Auxiliary/Emergency Feedwater System
015	Nuclear Instrumentation System	068	Liquid Radwaste System
017	In-Core Temperature Monitor System	071	Waste Gas Disposal System
		072	Area Radiation Monitoring System

System #	K/A #	K/A Topic	Rating	UE Task
001	010K5.21	14. Prediction in change in boron concentration due to power operation, dilution, or boration.	3.4	CTK-03
001	000K2.02	15. Power supply flowpath to Reactor Trip Breakers	3.6	SSB-02A
001	000K4.02	16. CRDS interlocks for control rod mode select.	3.8	SSF-01A
003	000A1.07	17. Predict changes in RCS temperature and pressure associated with operating a RCP.	3.4	SBB-02A
003	000G.10	18. Recognize abnormal RCP indications as entry level conditons for OTO procedure.	4.1	SBB-04B
004	000K6.01	19. Spray/Heater performance requirements for Boron Mixing.	3.1	SBB-02F
004	000K2.02	20. Knowledge of bus power supply operation to a CCP	3.3	SBG-00
013	000K4.03	21. ESFAS design feature which provides MSLIS.	3.9	SAB-05A
001	000GK.04	22. Purpose and function of major components and controls in the AMSAC system	3.7	SSS-01
013	000K5.02	23. ESFAS system logic and reliability.	2.9	SSA-02
013	000A2.01	24. Predict the impact of a LOCA on the ESFAS	4.6	SSA-03A
015	000A3.03	25. NIS permissives status during plant startup.	3.9	CTK-02
015	000K4.02	26. NIS interlocks to ROD control	3.7	SSE-02
017	020A4.02	27. Temperature values used for RCP operations in Inadequate Core Cooling	3.8	CRK-08
022	000A1.01	28. Monitor CTMT temp while operating Cont. Cooling	3.6	SGN-02
022	000A3.01	29. Auto operation of the Cont. Cooling due to SIS	4.1	SGN-04
056	020G.10	30. Recognize abnormal indications for Condensate Pump Operation	3.2	SAD-03
059	000K1.04	31. Operation of the Feedwater Level Control Sys.	3.4	SAE-02C
059	000K3.02	32. Effect of Loss of MFP on the AFW system.	3.6	SAE-04
061	000K5.01	33. AFW flowrates required for RCS heat transfer	3.6	SAE-02K
061	000A1.04	34. Predict change in CST level for AFW operation	3.9	SAL-02
061	000A3.03	35. Operation of AFW system on Auto Start	3.9	SAL-03
072	000K3.02	36. Loss of ARM effect on fuel handling	3.1	SKE-01

Knowledge and Abilities Record Form

PLANT SYSTEMS

PWR - Reactor Operator - 51%

Group II Plant Systems - 20%

002	Reactor Coolant System	039	Main and Reheat Steam System
006	Emergency Core Cooling System	055	Condenser Air Removal System
010	Pressurizer Pressure Control System	062	AC Electrical Distribution System
011	Pressurizer Level Control System	063	DC Electrical Distribution System
012	Reactor Protection System	064	Emergency Diesel Generator System
014	Rod Position Indication System	073	Process Radiation Monitoring System
026	Containment Spray System	075	Circulating Water System
029	Containment Purge System	079	Station Air System
033	Spent Fuel Pool Cooling System	086	Fire Protection System
035	Steam Generator System		

System #	K/A #	K/A Topic	Rating	UE Task
035	010K3.01	37. Effect of a loss of Steam Generators on the RCS	4.4	SAB-04
039	000A4.04	38. Monitor operations of the TD AFP Turbine	3.8	SAL-02B
002	000K5.09	39. Relationship between Pres and Temp for Saturation and Subcooled Conditions	3.7	SBB-00
011	000A2.03	40. Loss of PZR Level effect on PZR Level Control	3.8	SBB-04G
033	000G.11	41. Immediate actions for loss of SFP level	3.6	SEC-02
075	000A4.01	42. Manual operation of the ESW pumps	3.2	SEF-02C
006	000K6.03	43. Performance capability of SI pumps.	3.6	SEM-03
026	000K4.01	44. Interlocks associated with Cont. Spray Ops in LOCA	4.2	SEP-02
029	000K1.03	45. Cause/effect of CPIS on Containment Purge	3.6	SGT-02A
079	000K1.01	46. Cause/Effect relationship between SA and IAS	3.0	SKA-00
086	000A4.02	47. Operate/Monitor KC008 Panel in the Control Room	3.5	SKC-01
062	000K2.01	48. Knowledge of NB/NG Power Supply to Major Loads	3.3	SNB-01
064	050G.07	49. Explain limits and precautions of DG operation.	3.6	SNE-01B
064	000A3.07	50. Monitor Load Sequencer Operation on DG	3.6	SNE-02C
010	000K1.02	51. Effect of a load shed signal on PZR Press. Control	3.9	SNF-04
063	000K3.02	52. Effect of Loss of DC Control Power to Components	3.5	SNK-01
012	000K6.03	53. Design of RPS Trip Logic Circuitry	3.1	SSB-00
012	000A4.03	54. Monitor Bypass Breaker Operation	3.6	SSB-04
014	000A2.03	55. Respond to a Dropped Rod / OTO-SF-0000x	3.6	SSF-02C
073	000K1.01	56. Cause/effect relationship between Process RAD Monitoring to Steam Generator Sampling	3.6	SSP-04B

Knowledge and Abilities Record Form

PLANT SYSTEMS

PWR - Reactor Operator - 51%

Group III Plant Systems - 8%

005	Residual Heat Removal System	034	Fuel Handling Equipment System
007	Pressurizer Relief Tank/Quench Tank	041	Steam Dump System
008	Component Cooling Water System	045	Main Turbine Generator
027	Containment Iodine Removal System	076	Service Water System
028	Hydrogen Recombiner and Purge Control	078	Instrument Air System
		103	Containment System

System #	K/A #	K/A Topic	Rating	UE Task
041	020K4.18	57. Steam Dump operation with Turbine Trip	3.4	SAB-04
007	000A2.01	58. Predict Impact of Stuck Open PORV on PRT	3.9	SBB-02
045	000A4.01	59. Turbine SV,CV,CIV operation and indication	3.1	SCH-03
076	000K1.19	60. Physical Connections between Serv. water and emergency heat loads.	3.6	SEA-02A
008	010A3.01	61. Monitor Operation of the CCW pump / interlocks	3.2	SEG-02B
005	000A2.02	62. Impact of Press Transient on RHR in MODE 5	3.5	SEJ-03
028	000K5.01	63. Explosive H2 Limits applied to H2 Recombiner	3.4	SGS-01D
078	000K3.02	64. Effect on plant systems on loss of Inst. Air	3.4	SKA-02A

Knowledge and Abilities Record Form
EMERGENCY PLANT EVOLUTIONS
PWR - Reactor Operator - 36%

Plant Specific Priorities

<u>System #</u>	<u>K/A #</u>	<u>K/A Topic</u>	<u>Rating</u>

Group I Emergency and Abnormal Plant Evolutions - 16%

000005	Inoperable/Stuck Control Rod	000055	Loss of Offsite and Onsite Power
000015	RCP Motor Malfunction	000057	Loss of Vital AC Electrical Instrument Bus
000024	Emergency Boration	000067	Plant Fire On Site
000026	Loss of Component Cooling Water	000068	Control Room Evacuation
000027	Pressurizer Pressure Control System Malfunction	000069	Loss of Containment Integrity
000040	Steam Line Rupture	000074	Inadequate Core Cooling
000051	Loss of Condenser Vacuum	000076	High Reactor Coolant Activity

<u>K/A #</u>	<u>K/A Topic</u>	<u>Rating</u>	<u>UE Task</u>
000005EK3.01	65. Basis for Emergency Boration Stuck Rod on Rx Trip	4.0	CRK-01A
000040EA1.03	66. Isolation of one Steam Line from Header on Steam Break	4.3	CRK-03E
000055EK1.01	67. Effect of Batt Disch Rates on Capacity -Loss of AC	3.3	CRK-05B
000055EK3.02	68. Basis for actions on loss of all AC in ECA-0.0	4.3	CRK-05C
000074EA1.01	69. Monitor RCS water inventory for Inadequate Core Cooling	4.2	CRK-08B
000040EK1.01	70. Steam line rupture consequences of PTS on the RCS	4.1	CRK-10B
000067EK3.04	71. Reasons for Actions for Fire in CR	3.3	CTS-02A
000068EK2.01	72. Knowledge of the ASP layout	3.9	CTS-02B
000051EA2.02	73. Determine when to Trip Turbine on Loss of Vacuum	3.9	SAC-04
000027EA1.01	74. Operation of PZR Heaters , Sprays, and PORVs	4.0	SBB-02G
000015EA2.10	75. Determine when to Trip RCP on loss of seal inj or cooling	3.7	SBB-04B
000076G.08	76. Determine Tech Spec Actions for High RCS Activity	3.1	SBB-04E
000026EK3.02	77. Auto actions of CCW system from an ESFAS actuation	3.6	SEG-04
000069EA2.02	78. Evaluate Containment Integrity meets requirements	3.7	SGT-03E
000057EA2.19	79. Auto Actions that occur on loss of Vital AC In t Bus	4.0	SNB-04B
000024G.10	80. Recognize entry conditions for Loss of Shutdown Margin	4.1	SSF-02G

Knowledge and Abilities Record Form
EMERGENCY PLANT EVOLUTIONS

PWR - Reactor Operator - 36%

Group II Emergency and Abnormal Plant Evolutions - 17%

000001	Continuous Rod Withdrawal	000033	Loss of Intermediate-Range
000003	Dropped Control Rod	000037	Steam Generator Tube Leak
000007	Reactor Trip	000038	Steam Generator Tube Rupture
000008	Pressurizer Vapor Space Accident	000054	Loss of Main Feedwater
000009	Small Break LOCA	000058	Loss of DC Power
000011	Large Break LOCA	000059	Liquid Radioactive-Waste Release
000022	Loss of Reactor Coolant Makeup	000060	Gaseous-Waste Release
000025	Loss of Residual Heat Removal System	000061	Area Radiation Monitoring System Alarms
000029	Anticipated Transient Without Scram		
000032	Loss of Source-Range Nuclear		

K/A #	K/A Topic	Rating	UE Task
000008EA1.06	81. Pressurizer level response to a Vapor Space Leak	3.6	CRK-02
000009EK3.24	82. Basis for SI Terminations on Small Break LOCA	4.2	CRK-02A
000011G.11	83. Immediate actions for Large Break LOCA	4.5	CRK-02E
000038EA1.32	84. Isolation of ruptured S/G per E-3	4.6	CRK-04
000038EK3.06	85. Actions contained in E-3 for inventory balance, SGTR, and plant shutdown.	4.2	CRK-04B
000029EK3.12	86. Basis for actions in EOPs for ATWS	4.4	CRK-07A
000001EK1.03	87. Relationship between reactivity and power to rod movement	4.0	CTK-04
000054G.09	88. Verify System alarm setpoints per OTA for Feedwater loss	3.6	SAE-04
000037EA2.12	89. Determine flow rate of S/G tube leak	3.3	SBB-04A
000022EA1.01	90. CVCS letdown and charging Operation for loss of Charging	3.4	SBG-06A
000025G.10	91. Recognize abnormal indications for Loss of RHR	4.2	SEJ-03A
000058EA1.01	92. Cross tie NK bus to alternate supply	3.4	SNK-01
000007EK2.03	93. Knowledge of the Rx Trip Status Panel SB069	3.5	SSB-04
000061G.09	94. Respond to an Area Radiation Monitor Actuation	3.5	SSD-02A
000033EA2.02	95. Determine unreliable IR channel based on indications	3.3	SSE-02C
000032G.11	96. Actions for Source Range Channel Failure	4.1	SSE-03A
000059EA2.01	97. Determine failure mode for a liquid process monitor	3.2	SSP-04C

Knowledge and Abilities Record Form
EMERGENCY PLANT EVOLUTIONS
PWR - Reactor Operator - 36%

Group III Emergency and Abnormal Plant Evolutions - 3%

000028 Pressurizer Level Malfunction

000056 Loss of Offsite Power

000036 Fuel Handling Incident

000065 Loss of Instrument Air

<u>K/A #</u>	<u>K/A Topic</u>	<u>Rating</u>	<u>UE Task</u>
000028EA2.01	98. Determine PZR level as a function of Power	3.4	SBB-02
000056K3.02	99. Basis for actions contained in EOPs for loss of Offsite Power	4.4	SPA-02
000065G.10	100. Respond to a loss of Inst Air per OTO-KA-00001	3.8	SKA-02

<u>System #</u>	<u>K/A #</u>	<u>K/A Topic</u>	<u>Rating</u>	<u>UE Task</u>
		1.		
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		22.		
		23.		

CALLAWAY PLANT
EXAMINATION COVER SHEET
TRAINING DEPARTMENT

COURSE NO.: NRC Initial Exam SESSION NO.: _____

COURSE TITLE: Reactor Operator

NAME (Print): _____ SSN: _____ QUESTIONS: 100

SIGNATURE: _____ DATE: 2/24/97 TEST #: 1 BOOKLET #: _____

DIRECTIONS: BLACK OUT CORRECT ANSWERS

	T	F		
1.	<input type="checkbox"/> A	<input type="checkbox"/> B	<input type="checkbox"/> C	<input type="checkbox"/> D
2.	<input type="checkbox"/> A	<input type="checkbox"/> B	<input type="checkbox"/> C	<input type="checkbox"/> D
3.	<input type="checkbox"/> A	<input type="checkbox"/> B	<input type="checkbox"/> C	<input type="checkbox"/> D
4.	<input type="checkbox"/> A	<input type="checkbox"/> B	<input type="checkbox"/> C	<input type="checkbox"/> D
5.	<input type="checkbox"/> A	<input type="checkbox"/> B	<input type="checkbox"/> C	<input type="checkbox"/> D
6.	<input type="checkbox"/> A	<input type="checkbox"/> B	<input type="checkbox"/> C	<input type="checkbox"/> D
7.	<input type="checkbox"/> A	<input type="checkbox"/> B	<input type="checkbox"/> C	<input type="checkbox"/> D
8.	<input type="checkbox"/> A	<input type="checkbox"/> B	<input type="checkbox"/> C	<input type="checkbox"/> D
9.	<input type="checkbox"/> A	<input type="checkbox"/> B	<input type="checkbox"/> C	<input type="checkbox"/> D
10.	<input type="checkbox"/> A	<input type="checkbox"/> B	<input type="checkbox"/> C	<input type="checkbox"/> D
11.	<input type="checkbox"/> A	<input type="checkbox"/> B	<input type="checkbox"/> C	<input type="checkbox"/> D
12.	<input type="checkbox"/> A	<input type="checkbox"/> B	<input type="checkbox"/> C	<input type="checkbox"/> D
13.	<input type="checkbox"/> A	<input type="checkbox"/> B	<input type="checkbox"/> C	<input type="checkbox"/> D
14.	<input type="checkbox"/> A	<input type="checkbox"/> B	<input type="checkbox"/> C	<input type="checkbox"/> D
15.	<input type="checkbox"/> A	<input type="checkbox"/> B	<input type="checkbox"/> C	<input type="checkbox"/> D
16.	<input type="checkbox"/> A	<input type="checkbox"/> B	<input type="checkbox"/> C	<input type="checkbox"/> D
17.	<input type="checkbox"/> A	<input type="checkbox"/> B	<input type="checkbox"/> C	<input type="checkbox"/> D
18.	<input type="checkbox"/> A	<input type="checkbox"/> B	<input type="checkbox"/> C	<input type="checkbox"/> D
19.	<input type="checkbox"/> A	<input type="checkbox"/> B	<input type="checkbox"/> C	<input type="checkbox"/> D
20.	<input type="checkbox"/> A	<input type="checkbox"/> B	<input type="checkbox"/> C	<input type="checkbox"/> D

	T	F		
21.	<input type="checkbox"/> A	<input type="checkbox"/> B	<input type="checkbox"/> C	<input type="checkbox"/> D
22.	<input type="checkbox"/> A	<input type="checkbox"/> B	<input type="checkbox"/> C	<input type="checkbox"/> D
23.	<input type="checkbox"/> A	<input type="checkbox"/> B	<input type="checkbox"/> C	<input type="checkbox"/> D
24.	<input type="checkbox"/> A	<input type="checkbox"/> B	<input type="checkbox"/> C	<input type="checkbox"/> D
25.	<input type="checkbox"/> A	<input type="checkbox"/> B	<input type="checkbox"/> C	<input type="checkbox"/> D
26.	<input type="checkbox"/> A	<input type="checkbox"/> B	<input type="checkbox"/> C	<input type="checkbox"/> D
27.	<input type="checkbox"/> A	<input type="checkbox"/> B	<input type="checkbox"/> C	<input type="checkbox"/> D
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SCORING

EXAM PREPARER: _____ POINTS POSSIBLE 100

POINTS MISSED _____

EXAM REVIEWER: _____ / _____

Date

POINTS SCORED _____

GRADE _____

CALLAWAY PLANT
EXAMINATION COVER SHEET
TRAINING DEPARTMENT

COURSE NO.: NRC Initial Exam SESSION NO.: _____
COURSE TITLE: Reactor Operator
NAME (Print): _____ SSN: _____ - _____ - _____ QUESTIONS: 100
SIGNATURE: _____ DATE: 2/24/97 TEST #: 1 BOOKLET #: _____

DIRECTIONS: BLACK OUT CORRECT ANSWERS

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RO Test

QUESTION #001

When performing a boration to the reactor coolant system for a down power transient, the PZR heaters should be turned on in manual to:

- A. Maintain PZR pressure in the normal operating range during the down power.
- B. Allow an increased ramp rate for the down power.
- C. Equalize the reactor coolant system and PZR boron concentrations.
- D. Ensure positive PZR control is established prior to starting the down power.

ANSWER:

- C. Equalize the reactor coolant system and PZR boron concentrations.

RO #19

SRO #21

K/A #004000K601

OBJECTIVE #003AA4B1

REFERENCES: OTN-BG-00002, "Reactor Makeup Control and Boron Thermal Regeneration System"

RO Test

QUESTION #002

The plant experiences a sustained loss of all AC power.

Which ONE of the below would be used to makeup to the spent fuel pool due to low spent fuel pool level?

- A. Pressurizer VCT and use Reactor Makeup
- B. Diesel Fire Pump and fire hose
- C. Gravity drain condensate storage tank
- D. Essential service water emergency makeup

ANSWER:

- B. Diesel Fire Pump and fire hose

RO #41

SRO #44

K/A #033000G11

OBJECTIVE #003D220Z

REFERENCES: ECA-0.0, Step 23

RO Test

QUESTION #003

Which ONE of the below computer data quality codes indicates that the alarm function is still operable?

A. DALM

B. DEL

C. SUB

D. LRL

ANSWER:

D. LRL

RO #12

SRO #11

K/A #194001A115

OBJECTIVE #003A02D4

REFERENCES: OOA-RJ-00001

RO Test

QUESTION #004

Preventive Maintenance is scheduled on the 'A' Condensate Pump Motor and its supply breaker PB0304. Which ONE of the following locations MUST be tagged in accordance with the Workman's Protection Assurance Program?

- A. Breaker PB0304 local handswitch
- B. Condensate Pump Discharge Valve
- C. Racking Mechanism for Breaker PB0304
- D. Main Control Board Switch AD-HIS-1

ANSWER:

- C. Racking Mechanism for Breaker PB0304

RO #4

SRO #4

K/A #194001K107

OBJECTIVE #003A330F

REFERENCES: APA-ZZ-00310 Page 20

RO Test

QUESTION #005

A Reactor Startup is in progress with Control Bank B at 50 steps and Reactor Power at 10^2 CPS.

Which ONE of the following is required if Source Range Nuclear Channel N32 fails high?

- A. Place N32 in the tripped condition within 6 hours.
- B. Verify all Rod Bottom Lights lit.
- C. Verify Shutdown Margin within one hour.
- D. Insert all Control Banks and repair channel N32.

ANSWER:

- B. Verify all Rod Bottom Lights lit.

RO #96

SRO #88

K/A #000032G11

OBJECTIVE #0110280E

REFERENCES: OTO-SE-00001

E-0

Tech Spec 3.3.1

RO Test

QUESTION #006

The reactor tripped 5 minutes ago.

Which one of the following completes the statement concerning the heat transfer relationship between the RCS and Steam Generators?

The heat transfer rate between the RCS and the S/Gs will:

- A. decrease as RCS temperature increases and AFW flow increases.
- B. decrease as AFW temperature decreases and AFW flow increases.
- C. increase as AFW temperature increases and RCS flow decreases.
- D. increase as RCS temperature increases and AFW flow increases.

ANSWER:

- D. increase as RCS temperature increases and AFW flow increases.

RO #33

SRO #33

K/A #061000K501

OBJECTIVE #003D260R

REFERENCES: T61.003D.6

RO Test

QUESTION #007

Which ONE of the following is NOT an allowable relaxation for Independent Verification when restoring a system requiring IV?

- A. Comparing the tagout control sheet to current plant reference material (flow diagrams, procedures, etc.) to ensure adequacy of the tagout.
- B. Verifying status lights, annunciators, meter indications, etc. on the main control board that unequivocally depicts the equipment status.
- C. Performing a functional test that verifies that the component is in the specified configuration.
- D. When the concept of ALARA would be violated.

ANSWER:

- A. Comparing the tagout control sheet to current plant reference material (flow diagrams, procedures, etc.) to ensure adequacy of the tagout.

RO #1

SRO #1

K/A #194001K101

OBJECTIVE #003A33A6

REFERENCES: APA-ZZ-00310

RO Test

QUESTION #008

From the circumstances listed below, IDENTIFY which one correctly describes when CCW should be considered lost to a RCP?

- A. CCW flow is low for >10 minutes or RCP motor bearing temperature is >195°F
- B. CCW flow is low for >10 minutes or RCP motor bearing temperature is <195°F.
- C. CCW flow is interrupted for >10 minutes or RCP motor bearing temperature is >195°F.
- D. CCW flow is interrupted for >10 minutes or RCP motor bearing temperature is <195°F.

ANSWER:

- C. CCW flow is interrupted for >10 minutes or RCP motor bearing temperature is >195°F.

RO #75

K/A #000015A210

OBJECTIVE #003D040H

REFERENCES: E-0, Foldout

RO Test

QUESTION #009

OTO-ZZ-00001, Control Room Inaccessibility, operate three 'Control Room Isolation Transfer' switches provided on RP-118B which isolate control and indication of the associated devices from the control room.

Which ONE of the following describes the reason for this?

- A. Prevent inadvertent actuation of components which are necessary to safely shutdown the plant.
- B. Initiates a reactor trip and transfer control of the plant to the auxiliary shutdown panel.
- C. Required by Technical Specifications action to ensure that auxiliary shutdown Operability is satisfied.
- D. Transfers alarm and control of pressurizer heaters from the Control Room.

ANSWER:

- A. Prevent inadvertent actuation of components which are necessary to safely shutdown the plant.

RO #71

SRO #69

K/A #000067K304

OBJECTIVE #0110480D

REFERENCES: T61.0110.6 LP-#48

RO Test

QUESTION #010

Containment Spray actuates, and is still required, following a large break LOCA in containment. Cold Leg Recirculation alignment per ES-1.3 has been completed earlier for the ECCS pumps. The "RWST LO/LO 2" annunciator alarms with RWST level at 9% and decreasing.

Which ONE of the following actions should be performed on the Containment Spray System?

- A. Stop the Containment Spray Pumps at 5% RWST level if the pump suctions do not automatically swap from the RWST to the containment recirc sumps at 9% level.
- B. Open containment spray suctions from the containment sumps, reset the CSAS actuation, close pump suctions from the RWST while allowing the Containment Spray Pumps to continue to run.
- C. Stop the Containment Spray Pumps, open containment spray suctions from the containment sumps, reset the CSAS actuation, close pump suctions from the RWST, and then restart the Containment Spray Pumps.
- D. Immediately reset the CSAS actuation and stop one Containment Spray Pump, verify all containment coolers in service, then stop the other Containment Spray Pump at 5% RWST level.

ANSWER:

- B. Open containment spray suctions from the containment sumps, reset the CSAS actuation, close pump suctions from the RWST while allowing the Containment Spray Pumps to continue to run.

RO #44

K/A #026000K491

OBJECTIVE #0110180F

REFERENCES: ES-1.3

RO Test

QUESTION #011

The following conditions exist:

- Containment pressure transmitter PT-937 declared inoperable
- Required Technical Specification Actions have been taken for channel 937

Which ONE of the following statements describes the coincidence for a Containment Spray Actuation to occur and the actions that will result in this coincidence?

- A. 2/3 coincidence after the channel is placed in the TRIP condition, by placing bistable (PB-937A) in the TEST position.
- B. 2/3 coincidence after the channel is placed in the BYPASS condition, by placing bistable (PB-937A) in the TEST position.
- C. 1/3 coincidence after the channel is placed in the TRIP condition, by placing bistable (PB-937A) in the TEST position.
- D. 1/3 coincidence after the channel is placed in the BYPASS condition, by placing bistable (PB-937A) in the TEST position.

ANSWER:

- B. 2/3 coincidence after the channel is placed in the BYPASS condition, by placing bistable (PB-937A) in the TEST position.

RO #23

SRO #24

K/A #013000K502

OBJECTIVE #003A02I2

REFERENCES: T/S 3.3.2 ACTION c, Table 3.3-3 FU 2.c ACTION 16
PRINT 7250D64 S008

RO Test

QUESTION #012

Following a LOCA, hydrogen concentration in the containment has increased slowly over several days, reaching 1.0 volume per cent.

Which ONE of the following actions should be taken?

- A. One train of the electric hydrogen recombiner system should be placed in service.
- B. Electric hydrogen recombiners should be placed in service when hydrogen concentration reaches 4.0 volume per cent.
- C. Electric hydrogen recombiners cannot be placed in service. Heater operating temperature on the recombiner exceeds ignition temperature for hydrogen at this concentration.
- D. Both trains of electric hydrogen recombiners should be placed in service in conjunction with a containment purge.

ANSWER:

- A. One train of the electric hydrogen recombiner system should be placed in service.

RO #63

SRO #42

K/A #028000K501

OBJECTIVE #0110400J

REFERENCES: OTN-GS-00001

E-1

RO Test

QUESTION #013

Which ONE of the below trips does the RPS generate to protect the reactor from an uncontrolled RCCA bank withdrawal from a subcritical condition?

- A. Overtemperature Delta T
- B. Overpower Delta T
- C. Source Range High Flux Trip
- D. High Neutron Flux (High Setpoint)

ANSWER:

- C. Source Range High Flux Trip

RO #87

K/A #000001K103

OBJECTIVE #0110270D

REFERENCES: T61.0110.6 LP-#27

RO Test

QUESTION #014

With the plant in MODE 1 the Shift Supervisor is notified by security that a confined penetration has occurred by unauthorized personnel into the NE01 switchgear room. The Plant Emergency Alarm is sounded and the CODE RED is announced over the Gai-tronics.

Which ONE of the below may be included in the initial response by Control Room personnel?

- A. Trip the reactor, perform Control Room evacuation, and commence RCS cooldown from the Aux Shutdown Panel.
- B. Shut the Control Room missile door, trip the reactor, and commence RCS cooldown from the Control Room.
- C. Shut the Control Room missile door, increase monitoring of MCB indications, and have all Equipment Operators report to the Field Office.
- D. Trip the reactor, commence RCS cooldown from the Control Room, and evacuate all non-essential personnel.

ANSWER:

- B. Shut the Control Room missile door, trip the reactor, and commence RCS cooldown from the Control Room.

RO #13

K/A #194001A116

OBJECTIVE #003B280B

REFERENCES: EIP-ZZ-00102, Att. 1
OTO-SK-00001

RO Test

QUESTION #015

Which ONE of the following Area Radiation Monitors is required by Technical Specifications?

- A. Containment Area Radiation Monitor SDRE0041
- B. New Fuel Storage Area Radiation Monitor SDRE0035
- C. Control Room Area Radiation Monitor SDRE0033
- D. Cask Handling Area Radiation Monitor SDRE0034

ANSWER:

B. New Fuel Storage Area Radiation Monitor SDRE0035.

RO #36

SRO #34

K/A #072000K302

OBJECTIVE #0110360G

REFERENCES: T/S 3.3.1, Table 3.3-6 FU 2.b.(2)
Callaway Bank

RO Test

QUESTION #016

Which of the following flow paths correctly describes how power is normally supplied to a typical reactor protection instrument bus?

- A. 480V AC from the safeguard bus, rectified to 125V DC, inverted to 120V AC, and supplied to the instrument bus.
- B. 480V AC from the safeguard bus, transformed to 120V AC, and supplied to the instrument bus.
- C. 125V DC from the battery, supplied to the battery bus, and supplied to the instrument bus.
- D. 480V AC from the safeguards bus, rectified to 120V DC, and supplied to the instrument bus.

ANSWER:

- A. 480V AC from the safeguard bus, rectified to 125V DC, inverted to 120V AC, and supplied to the instrument bus.

RO #48

K/A #062000K201

OBJECTIVE #0110060A

REFERENCES: T61.0110.6 LP-#6

RO Test

QUESTION #017

The crew implemented FR-C.1, Response to Inadequate Core Cooling.

Which one of the following combinations of core exit thermocouples and indicated temperatures would require starting RCP's, even if the normally required support conditions could not be met?

	# of TC's	Indicated Temp
A.	2	2450°F
B.	4	1750°F
C.	6	1350°F
D.	8	750°F

ANSWER:

C. 6 1350°F

RO #27

SRO #27

K/A #017020A402

OBJECTIVE #003D250E

REFERENCES: FR-C.1 Background

RO Test

QUESTION #018

Callaway Plant is preparing for Reactor Core Offload with Refueling Pool Level at 391 inches (2046 ft. level). The polar crane operator inadvertently lifts the Reactor Vessel Upper Internals out of the water and causes a Hi Hi alarm on Containment Building Area Radiation Monitor SDRE0040.

Which ONE of the following is a required Immediate Action?

- A. Close ECV0995, Fuel Transfer Tube Isolation Valve.
- B. Initiate a Containment Purge Isolation Signal (CPIS).
- C. Transfer the Charging Pump suction to the RWST and increase flow.
- D. Evacuate personnel from containment.

ANSWER:

- D. Evacuate personnel from containment.

RO #94

SRO #91

K/A #000061G09

OBJECTIVE #003E0514

REFERENCES: OTO-KE-00001
OTA-RL-RK062, Att. A

RO Test

QUESTION #019

FR-S.1 "Response to Nuclear Power Generation/ATWS" Step 2 requires a turbine trip. Why would it be desirable to trip the turbine if a reactor trip had not been achieved? (Choose ONE)

- A. The reactor will be subcritical due to manual rod insertion before the turbine is tripped.
- B. Tripping the turbine will conserve SG inventory and limit the pressure transient that would result from a loss of all feedwater.
- C. Tripping the turbine will insert negative reactivity from moderator temperature coefficient, thus assisting in reactor shutdown.
- D. Tripping the turbine will generate an additional reactor trip signal and suppress core void formation by increasing RCS pressure.

ANSWER:

- B. Tripping the turbine will conserve SG inventory and limit the pressure transient that would result from a loss of all feedwater.

RO #86

SRO #61

K/A #000029K312

OBJECTIVE #003D290C

REFERENCES: T61.003D.6 LP-#29

RO Test

QUESTION #020

Which ONE (1) of the following is the HIGHEST RCS pressure at which the Safety Injection Pumps will deliver water to the RCS?

- A. 1050 psig
- B. 1250 psig
- C. 1450 psig
- D. 1650 psig

ANSWER:

- C. 1450 psig

RO #43

SRO #38

K/A #006000K603

OBJECTIVE #0110170A

REFERENCES: E-0

T61.0110.6 LP-#17

RO Test

QUESTION #021

While performing actions in E-3, "Steam Generator Tube Rupture" the Control Room Supervisor asks the Balance of Plant Operator to check intact Steam Generator narrow range levels greater than 4%. Which ONE of the following BOI responses would satisfy Callaway Plant Communication Guidelines?

- A. Yes, intact Steam Generator narrow range levels are greater than 4%.
- B. Yes, intact Steam Generator narrow range levels are 50% and stable.
- C. Yes, intact Steam Generator narrow range levels are increasing.
- D. Yes, intact Steam Generator narrow range levels are 10%.

ANSWER:

- B. Yes, intact Steam Generator narrow range levels are 50% and stable.

RO #8

SRO #7

K/A #194001A105

OBJECTIVE #003A060H

REFERENCES: Callaway Plant Policy 2.3.4, Guidelines for Verbal Communications
Pages 2 and 4

RO Test

QUESTION #022

Given the following:

- The Main Turbine tripped from 95% power.
- All systems responded normally to the trip.

Which ONE (1) of the following is the expected position of the steam dump valves with Tavg at 575°F?

	Full Open	Modulating	Full Closed
A.	12	0	0
B.	9	3	0
C.	6	3	3
D.	3	3	6

ANSWER:

C.	6	3	3
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RO #57

SRO #55

K/A #041020K418

OBJECTIVE #0110200J

REFERENCES: T61.0110.6 LP-#20

RO Test

QUESTION #023

A plant startup is in progress with power indicating 1E-6% on both IR channels. Which one of the following will occur if IR channel N36 fails to 21%?

- A. IR high flux reactor trip
- B. Manual and automatic rod stop
- C. PZR low pressure reactor trip is unblocked
- D. PR low flux reactor trip

ANSWER:

- B. Manual and automatic rod stop

RO #95

SRO #87

K/A #000033A202

OBJECTIVE #0110260J

REFERENCES: OTO-SE-00002

RO Test

QUESTION #024

Given the following conditions:

- RCS WR Pressure = 1635 psig
- Pressurizer Pressure = 1710 psig
- RCS Coolant Temperature = 560°F
- Core Exit TC = 568°F

Which one of the following is the correct amount of subcooling for the above conditions?

- A. 38
- B. 41
- C. 47
- D. 49

ANSWER:

- B. 41

RO #39

SRO #37

K/A #002000K509

OBJECTIVE #003D070S

REFERENCES: Steam Table

RO Test

QUESTION #025

The Callaway Plant is performing a Plant Startup following a Refueling Outage. While transferring Feedwater Control to the Main Feedwater Reg Valves, a Reactor Trip occurs on Low S/G Level. The resulting Aux Feedwater Actuation has caused RCS Tavg to decrease to 475°F. All systems operate as designed.

Which one of the following components would be cooled by the Service Water System?

- A. 'A' Class 1E Air Conditioner
- B. 'B' Containment Spray Pump Room Cooler
- C. 'A' Component Cooling Water Heat Exchanger
- D. 'B' Closed Cooling Water Heat Exchanger

ANSWER:

- D. 'B' Closed Cooling Water Heat Exchanger

RO #60

K/A #076000K119

OBJECTIVE #0110040G

0110040H

REFERENCES: T61.0110.6 LP-#4

RO Test

QUESTION #026

With the plant in MODE 1, AND either safety related CCP INOPERABLE, RCP Seal Injection should be provided by the _____ which will maintain seal cooling in the event of a _____.

- A. Non-safety related charging pump, CCW thermal barrier leak.
- B. Non-safety related charging pump, loss of a single electrical bus.
- C. Opposite train safety related CCP, CCW thermal barrier leak.
- D. Opposite train safety related CCP, loss of a single electrical bus.

ANSWER:

- B. Non-safety related charging pump, loss of a single electrical bus.

RO #20

SRO #22

K/A #004000K202

OBJECTIVE #003A04A1

REFERENCES: OTN-BG-00001

RO Test

QUESTION #027

Which ONE of the following describes the tagout control used for the temporary operation of equipment that is protected under a Hold Off.

- A. The tags shall be cleared prior to operation then a new tagout written and new tags hung.
- B. The tags may be lifted and reused after operation providing a briefing is held and the individual signed on the WPA is present at the component to be checked.
- C. With Shift Supervisor and Requester approval and equipment may be operated without clearing the tags, if the requester is in the equipment area and operation completed in the same shift.
- D. The tags which must be cleared to allow for the operation can be temporarily cleared, replaced with Caution Tags until the operation is complete, then the Caution Tags replaced with new Hold Off Tags.

ANSWER:

- B. The tags may be lifted and reused after operation providing a briefing is held and the individual signed on the WPA is present at the component to be checked.

RO #2

SRO #2

K/A #194001K102

OBJECTIVE #003A330L

REFERENCES: ODP-ZZ-00310 Page 10

RO Test

QUESTION #028

During operations at 95% power and pressurizer level at 48%, the Tave input to the pressurizer level controller fails low. What INDICATIONS does the operator have that the Tave input failed low?

- A. Backup heaters are energized, charging flow control valve slowly closes, high level deviation alarm actuates.
- B. Backup heaters are deenergized, charging flow control valve slowly opens, low level deviation alarm actuates.
- C. Backup heaters are energized, charging flow control valve slowly opens, low level deviation alarm actuates.
- D. Backup heaters are deenergized, charging flow control valve slowly closes, high level deviation alarm actuates.

ANSWER:

- A. Backup heaters are energized, charging flow control valve slowly closes, high level deviation alarm actuates.

RO #40

SRO #39

K/A #011000A203

OBJECTIVE #0110090C

REFERENCES: OTO-BB-00004

RO Test

QUESTION #029

Plant conditions:

- Operating in MODE 1, at 100% power.
- SJ-RE-01, CVCS Letdown Monitor, Alarming Hi/Hi
- SD-RE-20, AB 2000 Area, Alarming Hi/Hi

Which ONE of the following operator actions is required per OTO-BB-00005, RCS High Activity?

- A. Reduce power
- B. Isolate letdown
- C. Increase letdown to 120 gpm
- D. Initiate hourly sampling of the RCS

ANSWER:

- C. Increase letdown to 120 gpm

RO #76

SRO #73

K/A #000076G008

OBJECTIVE #003B180A

REFERENCES: OTO-BB-00005

RO Test

QUESTION #030

Given the following conditions:

- Tavg is 576°F
- Pressurizer Pressure is 2240 psig
- Charging Flow is being controlled in MANUAL
- The BACKUP HEATERS have just ENERGIZED

Which ONE of the following is the actual pressurizer level?

- A. 37%
- B. 42%
- C. 47%
- D. 52%

ANSWER:

- D. 52%

RO #98

SRO #98

K/A #000028A201

OBJECTIVE #0110300K

REFERENCES: T61.0110.6 LP-#30

RO Test

QUESTION #031

A Ruptured Steam Generator has been cooled down and depressurized. ECCS pumps have been secured and Normal Charging and Letdown have been established.

Plant Conditions:

- PZR Level 30% and DECREASING
- Ruptured S/G NR Level INCREASING

Which ONE of the following is required to balance inventory?

- A. Depressurize the RCS
- B. Increase RCS Makeup Flow
- C. Turn on Pressurizer Heaters
- D. Decrease RCS Makeup Flow

ANSWER:

- A. Depressurize the RCS

RO #85

SRO #90

K/A #000038K306

OBJECTIVE #003D17JJ

REFERENCES: T61.003D.6 LP-#17

RO Test

QUESTION #032

I&C Technicians are troubleshooting a Rod Control Urgent Failure alarm that was received during Physics testing. When the technicians pull a Stationary Gripper Firing Card in Power Cabinet 1BD, the Control Bank D, Group 1 Control Rods drop to the bottom of the core.

Which ONE of the following describes the required action of the Control Room Operators?

- A. Adjust Turbine Load to maintain TAVG and TREF ΔT less than 3°F.
- B. Trip the Reactor and proceed to E-0, Reactor Trip or Safety Injection.
- C. Recover the dropped Control Rods within one hour or be in HOT STANDBY within the next 6 hours.
- D. Initiate boration to restore SHUTDOWN MARGIN to greater than or equal to 1.3% $\Delta K/K$.

ANSWER:

- E. Trip the Reactor and proceed to E-0, Reactor Trip or Safety Injection.

RO #55

K/A #014000A203

OBJECTIVE #003B260D

REFERENCES: LER 95-01

RO Test

QUESTION #033

A complete loss of all circulating water pumps occurs from 100% steady state power.

Assuming no operator actions and all systems function as designed, which ONE of the following corresponds to plant conditions 10 minutes after the loss of all circulating water pumps?

RCS TAVG S/G Pressures

- A. 557°F 1092 psig
- B. 557°F 1125 psig
- C. 561°F 1092 psig
- D. 561°F 1125 psig

ANSWER:

- D. 561°F 1125 psig

RO #37

K/A #035010K301

OBJECTIVE #0110200E

REFERENCES: Steam Table

RO Test

QUESTION #034

A normal plant heatup is in progress per OTG-ZZ-00001 with the following plant conditions:

- RCS pressure 1835 psig
- RCS pressurization rate 15 psig/min
- RCS temperature 485°F
- RCS heat up rate 10°F/hr
- S/G pressure 575 psig

If the current trend continues, which ONE of the following occur FIRST?

- A. Main Steam Isolation Valves close.
- B. Pressurizer PORV's open.
- C. Low Pressurizer Pressure Safety Injection.
- D. First group of steam dumps throttle open.

ANSWER:

- A. Main Steam Isolation Valves close.

RO #21

SRO #25

K/A #013000K403

OBJECTIVE #0110520B

REFERENCES: OTG-ZZ-00001, "Plant Heatup Cold Shutdown to Hot Standby"

Page 25

RO Test

QUESTION #035

Which ONE of the following will occur upon a decreasing Instrument Air System pressure due to a break at the condensate polishers?

- A. The Lag air compressor loads at 117 psig; and all compressors "Fail-Safe" start at 115 psig.
- B. The Standby compressor loads at 117 psig; the Service Air Header Isolation valve KA-PV-11 "Fail-Safe" close at 110 psig.
- C. The Standby air compressor loads at 117 psig; and all compressors will be running at 110 psig.
- D. Service Air header isolation valve KA-PV-11 will close at 117 psig; the Lag air compressor loads at 115 psig.

ANSWER:

- A. The Lag air compressor loads at 117 psig; and all compressors "Fail-Safe" start at 115 psig.

RO #100

K/A #000065G10

OBJECTIVE #0110140D

REFERENCES: OTO-KA-00001
Callaway Bank

RO Test

QUESTION #036

A surveillance to be performed on a piece of equipment having a contact reading of 50 R/hr in a room with a general area radiation reading of 125 mR/hr, would require entry into a:

- A. Danger High Radiation Area
- B. Caution High Radiation Area
- C. Danger High Radiation Area Radiological Exclusion Area
- D. Very High Radiation Area.

ANSWER:

- B. Caution High Radiation Area

RO #3

SRO #3

K/A #194001K103

OBJECTIVE #003A31F3

REFERENCES: APA-ZZ-01000 Page 6

RO Test

QUESTION #037

Which ONE of the following statements describes the effect of a loss of DC control power to 4160 VAC breaker NB0112, NB01 MN FDR BKR FROM XNB01? (Assume that the breaker is the only component affected by the loss of DC power.)

- A. The breaker will fail in its current position and cannot be tripped or closed from the MCB.
- B. The breaker will fail in its current position and can be tripped but not closed from the MCB.
- C. The breaker will trip and can be closed but not tripped from the MCB.
- D. The breaker will trip and cannot be tripped or closed from the MCB.

ANSWER:

- A. The breaker will fail in its current position and cannot be tripped or closed from the MCB.

RO #52

K/A #063000K302

OBJECTIVE #0110060E

REFERENCES: T61.0110.6 LP-#6

RO Test

QUESTION #038

The Callaway Plant is operating at 60% Reactor Power, increasing at 3% per hour. MCB Annunciator 106A, "Cond Hotwell Lvl Lo Lo" alarms. The Lo Lo level condition is verified on MCB indicator AD-LI-114.

Which one of the following is a required immediate action for this plant condition?

- A. Run the remaining feed pump speed to the Hi Speed Stop to restore S/G level.
- B. Start the Motor Driven Auxiliary Feedwater Pumps PAL01A and PAL01B.
- C. Drive Control Rods to reduce Reactor Power to less than 2%.
- D. Trip the Reactor and refer to E-0, Reactor Trip or Safety Injection.

ANSWER:

- D. Trip the Reactor and refer to E-0, Reactor Trip or Safety Injection.

RO #30

K/A #056020G10

OBJECTIVE #0110220M

REFERENCES: OTA-RL-RK106, Att. A

RO Test

QUESTION #039

During a loss of all AC while performing ECA-0.0, Loss of All A.C. NK11 battery discharge amps is at 300 amps.

Which ONE of the following is the MAXIMUM time that NK01 could be predicted to be Operable assuming the battery was fully charged initially?

- A. 2 hours
- B. 4 hours
- C. 6 hours
- D. 8 hours

ANSWER:

- B. 4 hours

RO #67

SRO #65

K/A #000055K101

OBJECTIVE #003D220V

REFERENCES: E21NK01

RO Test

QUESTION #040

A Reactor Trip has just occurred. The following conditions are found while performing Step 3 of E-0, Reactor Trip or Safety Injection:

- NB01 energized from Emergency Diesel NE-01
- NB02 deenergized (no lockout)

Which ONE of the following describes the required action and basis for that action?

- A. Transition to ECA-0.0, Loss of all AC Power because E-0 assumes that Offsite Power is Available.
- B. Attempt to restore power to NB02 while continuing with E-0 because it is desirable to have power to all AC Emergency buses.
- C. Attempt to restore Off Site Power to BOTH NB buses because E-0 assumes that Off Site Power is Available.
- D. Do not make attempts to restore NB02 because it will delay the operator action and only one NB bus is assumed energized by E-0.

ANSWER:

- B. Attempt to restore power to NB02 while continuing with E-0 because it is desirable to have power to all AC Emergency buses.

RO #99

SRO #99

K/A #000056K302

OBJECTIVE #003D040E

REFERENCES: T61.003D.6 LP-#4

RO Test

QUESTION #041

A periodic load test is being performed on NE02, Standby Diesel Generator 'B' in accordance with OSP-NE-0001B. NE02 has been paralleled with 4160V Bus NB02 and is carrying 6 MW of real load. A Main Steamline break occurs and containment pressure increases to 20 (twenty) psig.

Which ONE of the following describes the response of the Load Shedding Emergency Load Sequencing System (LSELS)?

- A. The LOCA Sequencer starts the Containment Spray Pumps at Step 3 (Time 15 seconds).
- B. The Shutdown Sequencer starts the 'A' Essential Service Water Pump at Step 5 (Time 25 seconds).
- C. The LOCA Sequencer starts the Safety Injection Pumps at Step 1 (Time 5 seconds).
- D. The Shutdown Sequencer starts the Residual Heat Removal Pumps at Step 2 (Time 10 seconds).

ANSWER:

- C. The LOCA Sequencer starts the Safety Injection Pumps at Step 1 (Time 5 seconds).

RO #50

SRO #46

K/A #064000A307

OBJECTIVE #0110510F

REFERENCES: T61.0110.6 LP-#51

RO Test

QUESTION #042

WHICH of the following red paths is MOST LIKELY to occur for a steam line break on a single S/G outside containment, resulting in a reactor trip and SI? (Assume that all safeguards equipment functions as designed.)

- A. Response to Inadequate Core Cooling (FR-C.1)
- B. Response to Loss of Secondary Heat Sink (FR-H.1)
- C. Response to Imminent Pressurized Thermal Shock Condition (FR-P.1)
- D. Response to High Containment Pressure (FR-Z.1)

ANSWER:

- C. Response to Imminent Pressurized Thermal Shock Condition (FR-P.1)

RO #70

SRO #63

K/A #000040K101

OBJECTIVE #003D280A

REFERENCES: T61.003D.6

RO Test

QUESTION #043

A plant cooldown is initiated following a reactor trip using the AUX FEED system and S/G PORV's. The CST level is initially at 87% (407,000 gal).

Which ONE of the following is the time available until CST level decreases to the MODE 3 Technical Specification limit with AUX feed flow at 300,000 lbm/hr. (8.345 lbm/gal)

- A. 3.5 hr.
- B. 4.0 hr.
- C. 4.5 hr.
- D. 5.0 hr.

ANSWER:

- A. 3.5 hr.

RO #34

SRO #31

K/A #061000A104

OBJECTIVE #0110250E

REFERENCES: T/S 3.7.1.3
Tank Book TDB-001

RO Test

QUESTION #044

Which ONE of the following events is required to be recorded in the RO Narrative Logs?

- A. Chemical addition to the condensate system.
- B. Security Event due to Security System (SAS) malfunction.
- C. Annunciator switchyard carrier potential/tone loss, alarms.
- D. Unexpected ESFAS alarm on ESW system.

ANSWER:

- D. Unexpected ESFAS alarm on ESW system.

RO #9

SRO #8

K/A #194001A106

OBJECTIVE #003A02B1

REFERENCES: ODP-ZZ-00006, Section 4.3

RO Test

QUESTION #045

Conditions:

- Reactor Power = 100%
- CCW Pump 'D' Running and 'B' in Standby
- A Lockout occurs on the Startup Transformer

Which one of the following describes the design response of the CCW System?

- A. 'D' CCW Pump continues to run and 'B' CCW Pump does not start.
- B. 'D' CCW Pump is shed and 'B' CCW Pump is started by the Shutdown Sequencer.
- C. 'D' CCW Pump continues to run and 'B' CCW Pump is started by the Shutdown Sequencer.
- D. 'D' CCW Pump is shed and 'B' CCW Pump does not start.

ANSWER:

- B. 'D' CCW Pump is shed and 'B' CCW Pump is started by the Shutdown Sequencer.

RO #61

K/A #008010A301

OBJECTIVE #0110100E

REFERENCES: T61.0110.6 LP-#10

RO Test

QUESTION #046

The plant is at 6 % power with feed system control in automatic on the bypass feed reg valves. Main turbine chest and shell warming are in progress. Steam header pressure transmitter ABPT507 is high.

Which ONE of the following describes the INITIAL plant response?

- A. Steam dumps CLOSE, MFW Pump Speed INCREASES, Bypass FRVs OPEN
- B. Steam dumps OPEN, MFW Pump Speed UNCHANGED, Bypass FRVs CLOSE
- C. Steam dumps CLOSE, MFW Pump Speed UNCHANGED, Bypass FRVs OPEN
- D. Steam dumps OPEN, MFW Pump Speed INCREASES, Bypass FRVs CLOSE

ANSWER:

- D. Steam dumps OPEN, MFW Pump Speed INCREASES, Bypass FRVs CLOSE

RO #31

K/A #059000K104

OBJECTIVE #0110230F

REFERENCES: OTO-AB-00004
8756D37 S025

RO Test

QUESTION #047

The plant has experienced a large break RCS loss of coolant accident.

Which ONE of the following must be reset to allow opening KAHV0029, Instrument Air Control Isolation?

- A. CISA
- B. CISB
- C. SIS
- D. FBVIS

ANSWER:

- A. CISA

RO #24

SRO #23

K/A #013000A201

OBJECTIVE #003B480A

REFERENCES: E-0, Reactor Trip/Safety Injection
M22KA01

RO Test

QUESTION #048

Callaway Plant is in MODE 1, 30% Reactor Power on a Chemistry hold. Annunciator 70B, "RCP VIB/SYS ALERT" alarms. The Reactor Operator checks vibrations on RP312 and finds 'C' RCP shaft vibration indicating 15 mils and steady.

Which one of the following is the required action.

- A. Trip the Reactor, Trip 'C' RCP and go to E-0, Reactor Trip or SI.
- B. Continue to monitor vibration on the 'C' RCP.
- C. Trip the 'C' RCP and declare the Loop 3 RTD channel inoperable.
- D. Increase Component Cooling Water temperature to reduce 'C' RCP vibration.

ANSWER:

- B. Continue to monitor vibration on the 'C' RCP.

RO #18

SRO #20

K/A #003000G10

OBJECTIVE #003B150B

REFERENCES: OTO-BB-00002

RO Test

QUESTION #049

A Reactor Operator (normally working a 12-hour shift) has worked the following hours (excluding turnover) on the dates indicated:

Date	Hours Worked
2/13/94	0600 through 2000
2/14/94	0600 through 1900
2/15/94	0600 through 2200
2/16/94	0600 through 2000
2/17/94	0600 through 2400

Which one of the following lists the date on which this operator FIRST violated the overtime requirements of APA-ZZ-00905, Limitations of Callaway Plant Staff Working Hours?

- A. 2/13/94
- B. 2/14/94
- C. 2/15/94
- D. 2/17/94

ANSWER:

- B. 2/14/94

RO #7

K/A #194001A103

OBJECTIVE #003A390E

REFERENCES: APA-ZZ-00905, Page 2

RO Test

QUESTION #050

Which ONE of the following sets of conditions will permit the Standby Diesel Generators to continue to run following an Emergency Start?

- A. Lube Oil pressure 57 psig and Jacket Water temperature 192°F
- B. Crankcase pressure 8 psig and Engine speed 54 rpm
- C. Lube Oil pressure 57 psig and Crankcase pressure 8 psig
- D. Engine speed 541 rpm and Jacket Water temperature 192°F

ANSWER:

- D. Engine speed 541 rpm and Jacket Water temperature 192°F

RO #49

K/A #064050G07

OBJECTIVE #0110030J

REFERENCES: T61.0110.6 LP-#3

RO Test

QUESTION #051

A 30 gpm leak has developed on the charging line between BG-HCV-182 (CVCS CHG PMPS TO REGEN HX HCV) and the regenerative heat exchanger. When the Control Room isolates the leak and completes the applicable Off-Normal procedures, the reactor makeup flowpath will be via _____, and the reactor letdown flowpath will be via _____.

Choose ONE of the following to fill in the blanks.

- A. normal charging; normal letdown
- B. normal charging; excess letdown
- C. seal injection; excess letdown
- D. seal injection; normal letdown

ANSWER:

- C. seal injection; excess letdown

RO #90

SRO #84

K/A #000022A101

OBJECTIVE #003B220B

REFERENCES: OTO-BG-00002
OTO-BB-00003

RO Test

QUESTION #052

Given the following conditions:

- RCS at NOP/NOT for 100% RTP,
- PORV 456A has seat leakage to the PRT,
- PRT pressure is 20 PSIG
- Use steam tables provided.

Which ONE of the following is the approximate tailpipe temperature?

- A. 212°F
- B. 228°F
- C. 248°F
- D. 258°F

ANSWER:

- D. 258°F

RO #58

SRO #54

K/A #007000A201

OBJECTIVE #0070130B

REFERENCES: Steam Table

RO Test

QUESTION #053

The Callaway Plant is in MODE 3 at NOP and NOT. An earthquake ruptures the Condensate Storage Tank and causes a steam break on 'C' S/G. The following conditions exist:

SG A, B & D NR Level	45%
SG C NR Level	10%
SG A, B, & D Press	900 psig
SG C Press	300 psig
AFW Suction Press	4 psig

Which one of the following describes the flow of feedwater to the Steam Generators?

- A. CST to 'A' MDAFP to 'C' S/G
- B. UHS to 'B' MDAFP to 'A' S/G
- C. CST to TDAFP to 'B' S/G
- D. UHS to 'A' MDAFP to 'D' S/G

ANSWER:

- B. UHS to 'B' MDAFP to 'A' S/G

RO #35

SRO #32

K/A #061000A303

OBJECTIVE #0110250D

REFERENCES: T61.0110.6

RO Test

QUESTION #054

With the plant at 40% power which one of the below would be TRUE regarding operation of the ATWS Mitigation Actuation Circuitry (AMSAC)?

- A. If S/G Levels decrease to less than 5% on 2 of 3 AMSAC logic circuits, then a Turbine Trip and MD AFAS, are actuated 25 seconds later.
- B. If S/G Levels decrease to less than 5% on 1 of 2 AMSAC logic circuits, then a Turbine Trip and MD AFAS, are actuated 232 seconds later.
- C. If S/G Levels decrease to less than 14.8% on 2 of 3 AMSAC logic circuits, then a Turbine Trip and MD AFAS, are actuated 25 seconds later.
- D. If S/G Levels decrease to less than 14.8% on 1 of 2 AMSAC logic circuits, then a Turbine Trip and MD AFAS, are actuated 232 seconds later.

ANSWER:

- A. If S/G Levels decrease to less than 5% on 2 of 3 AMSAC logic circuits, then a Turbine Trip and MD AFAS, are actuated 25 seconds later.

RO #22

SRO #30

K/A #001000GK04

OBJECTIVE #0110540B

REFERENCES: OTA-RL-0083A
E23AC11

RO Test

QUESTION #055

Liquid Radwaste Discharge Monitor (HDRE18) alarms on the RM-11 in dark blue condition.

Which ONE of the below could be the cause?

- A. Loss of Sample Flow
- B. Loss of Process Flow
- C. Monitor Purging
- D. Channel No Pulses Received

ANSWER:

- D. Channel No Pulses Received

RO #97

SRO #68

K/A #000059A201

OBJECTIVE #0110360B

REFERENCES: OTN-SP-00002
OTA-SP-RM011

RO Test

QUESTION #056

Following a safety injection due to a RCS leak in containment, plant conditions are established that meet the SI termination criteria of E-1, Loss of Reactor or Secondary Coolant.

Which ONE of the below is true regarding these plant conditions?

- A. All safety related equipment is Operable as required by Technical Specifications.
- B. Reactor core decay heat is being removed by the steam generators.
- C. If SI is NOT terminated, core uncover and subsequent loss of cooling may occur.
- D. Steam Generator pressure are approximately equal to RCS pressure.

ANSWER:

- B. Reactor core decay heat is being removed by the steam generators.

RO #82

SRO #83

K/A #000009K324

OBJECTIVE #003D090J

REFERENCES: ES-1.1 SI Termination

RO Test

QUESTION #057

Which ONE of the following valves fail open on a loss of instrument air?

- A. Steam Generator Atmospheric Relief
- B. Main Feed Regulating Bypass Valves
- C. Main Feed Pump Recirc Valve
- D. Heater Drain Pump Recirc Valve

ANSWER:

- D. Heater Drain Pump Recirc Valve

RO #64

SRO #56

K/A #078000K302

OBJECTIVE #003B330A

REFERENCES: OTO-KA-00001

RO Test

QUESTION #058

An automatic preaction sprinkler system "trouble" alarm would indicate:

- A. a deluge valve actuation
- B. an alarm check valve operation
- C. a fire detector in alarm condition
- D. an open sprinkler head

ANSWER:

- 1) D. an open sprinkler head

RO #47

SRO #50

K/A #086000A402

OBJECTIVE #0110350C

REFERENCES: T61.0110.6 LP-#35
Callaway Bank

RO Test

QUESTION #059

The Callaway Plant is in MODE 3, NOT, NOP, performing a plant shutdown. Steam Generator levels are being maintained by the 'A' Main Feedwater Pump and the AFP ESFAS BLOCK switches are in PERMIT.

While making preparations to open the Reactor Trip Breakers, the Main Feedwater Pump Discharge pressure increases to 1980 psig.

Which one of the following describes the immediate plant response?

- A. 'A' MFP Trip, MDAFAS, SGBSIS
- B. 'A' MFP Trip, MDAFAS, TDAFAS
- C. 'A' MFP Trip, TDAFAS, SGBSIS
- D. MDAFAS, TDAFAS, SGBSIS

ANSWER:

- A. 'A' MFP Trip, MDAFAS, SGBSIS

RO #32

K/A #059000K302

OBJECTIVE #0110230D

REFERENCES: LER 96-02
OTO-SA-00001

RO Test

QUESTION #060

Which ONE of the following should be performed by any individual discovering a fire?

- A. Notify Control Room, then use any available fire fighting equipment, then report to Fire Brigade Leader.
- B. First attempt extinguishment using closest available extinguisher, then call Control Room if unsuccessful.
- C. First attempt extinguishment using closest available extinguisher then report to Fire Brigade Staging Area.
- D. Notify Control Room, then use closest available extinguisher, if practical, then report to Fire Brigade Leader.

ANSWER:

- D. Notify Control Room, then use closest available extinguisher, if practical, then report to Fire Brigade Leader.

RO #5

SRO #5

K/A #194001K116

OBJECTIVE #003A30F3

REFERENCES: EIP-ZZ-00226, Att. 2

RO Test

QUESTION #061

Which ONE of the below shows the correct speed settings for the TD AFW pump?

	IDLE SPEED	NCRMAL OPERATING SPEED	OVERSPEED
A.	1200 rpm	3850 rpm	4235 rpm
B.	1200 rpm	3550 rpm	4435 rpm
C.	1500 rpm	3850 rpm	4235 rpm
D.	1500 rpm	3550 rpm	4435 rpm

ANSWER:

A.	1200 rpm	3850 rpm	4235 rpm
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RO #38

SRO #45

K/A #039000A404

OBJECTIVE #0110250C

REFERENCES: OSP-AL-P0002

RO Test

QUESTION #062

The plant is in MODE 3 at Normal operating pressure and temperature, Train 'A' COPS has inadvertently been left ARMED for Cold Overpressure Protection.

The selected pressurizer pressure channel, BBPT455 subsequently fails high.

With no operator actions, which ONE of the following is TRUE?

- A. PORV 455 initially opens, then closes when actual FZR Pressure decreases to <2185 psig.
- B. PORV 455 stays closed initially but will function as required for COPS.
- C. PORV 455 initially opens and stays open when actual PZR pressure decreases to <2185 psig.
- D. PORV 455 stays closed initially and PORV BLOCK VALVE(8000A) closes when actual PZR pressure decreases to <2185 psig.

ANSWER:

- A. PORV 455 initially opens, then closes when actual PZR Pressure decreases to <2185 psig.

RO #74

SRO #86

K/A #00027A101

OBJECTIVE #003B190A

REFERENCES: 7250D64

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RO Test

QUESTION #063

Which ONE of the following is the reason for depressurizing the Steam Generators at the maximum rate during ECA-0.0, "Loss of All AC Power"?

- A. To prevent inadvertent reactor re-start.
- B. To minimize RCS inventory loss.
- C. To enhance restoration of SG level from TD AFW Pump.
- D. To prevent lifting PZR PORVs.

ANSWER:

- B. To minimize RCS inventory loss.

RO #68

SRO #66

K/A #000055K302

OBJECTIVE #003D220S

REFERENCES: T61.003D.6

RO Test

QUESTION #064

Given the following:

- Callaway is operating at 30% steady state reactor power.
- I&C technician receives permission to perform a calibration on Power Range Channel N-41.
- The I&C technician mistakenly pulls the control power fuses on N-42; then, realizing his mistake, he reinserts the fuses for N-42 and pulls the control power fuses for the correct channel, N-41, causing a reactor trip.

Which ONE (1) of the following describes the reason for the reactor trip?

- A. Pk neutron flux low setpoint trip.
- B. Overpower Delta T trip.
- C. PR neutron flux high setpoint trip.
- D. PR positive rate trip.

ANSWER:

- D. PR positive rate trip.

RO #53

SRO #41

K/A #012000K603

OBJECTIVE #0110270D

REFERENCES: T61.0110.6 LP-#27

RO Test

QUESTION #065

Which ONE of the below conditions would require containment coolers to be operated in SLOW speed?

- A. Service Water Temperature <60°F
- B. ESW Supplying Containment
- C. Emergency Diesel Supplying NB Bus
- D. Containment Temperature <80°F

ANSWER:

- A. Service Water Temperature <60°F

RO #28

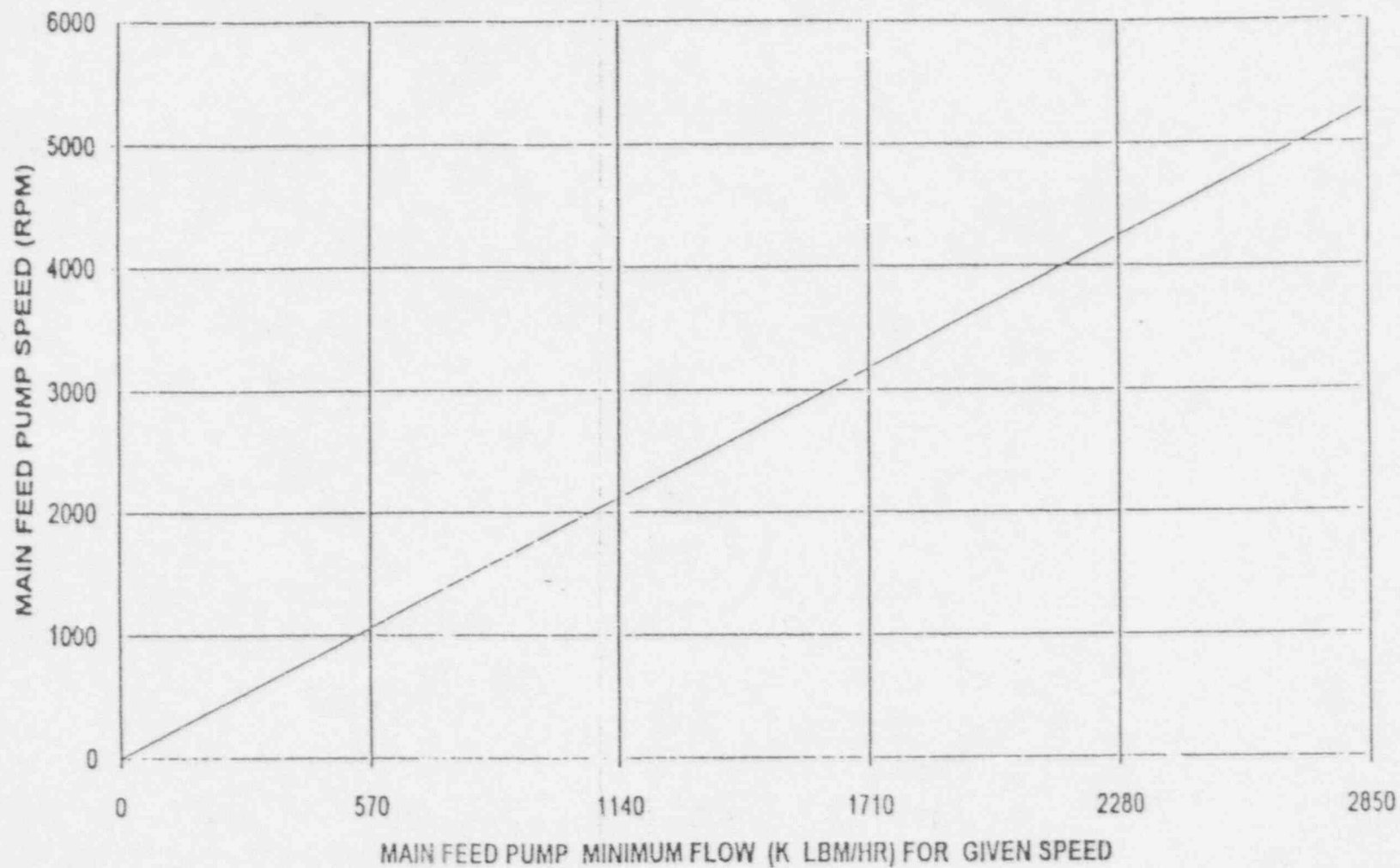
SRO #29

K/A #022000A101

OBJECTIVE #003A200I

REFERENCES: OTN-GN-00001

MAIN FEED PUMP MINIMUM FLOW (LBM/HR VS. RPM)--MINIMUM FLOW AT DESIGN
SPEED OF 5300 RPM IS 6000 GPM OR APPROX. 2800 K LBM/HR.



RO Test

QUESTION #066

Prior to opening the Reactor Trip Breakers during a plant shutdown, the crew is directed to reduce the inservice MFP speed to 3650 RPM in anticipation of a Feedwater Isolation Signal.

Using the attached graph, determine which one of the following is the minimum flowrate required to provide pump protection for this speed.

- A. 1500 Klbm/hr
- B. 1750 Klbm/hr
- C. 2000 Klbm/hr
- D. 2250 Klbm/hr

ANSWER:

- C. 2000 Klbm/hr

RO #10

SRO #9

K/A #194001A108

OBJECTIVE #003A040E

REFERENCES: OTN-AE-00001, Att. 4

RO Test

QUESTION #067

ES-1.1, SI Termination, Step 1 directs that the SI be reset using BOTH SI reset switches, SBHS42A and SBHS43A.

Which ONE of the following describes the effect of operating only ONE switch at this step instead of both?

- A. SI actuate light on SB069 would extinguish and automatic SI would reinitiate after 60 seconds.
- B. SI actuate light on SB069 would extinguish since either switch resets both SI trains.
- C. SI actuate light on SB069 would blink and automatic SI would reinitiate after 60 seconds.
- D. SI actuate light on SB069 would blink since reset switches are train specific.

ANSWER:

- D. SI actuate light on SB069 would blink since reset switches are train specific.

RO #93

K/A #000007K203

OBJECTIVE #0110270C

REFERENCES: E-0 Step 4

RO Test

QUESTION #068

WHICH of the following groups of parameters read out at the Auxiliary Shutdown Panel?

- A. RCS WR pressure, S/G pressure, S/G level, containment pressure
- B. RCS Tavg, S/G pressure, S/G level, containment pressure
- C. RCS hot leg temp, S/G level, TDAFWP flow, containment pressure
- D. RCS cold leg temp, RCS hot leg temp, S/G level, S/G pressure

ANSWER:

- D. RCS cold leg temp, RCS hot leg temp, S/G level, S/G pressure

RO #72

SRO #70

K/A #000068K201

OBJECTIVE #0110480B

REFERENCES: T61.0110.6

RO Test

QUESTION #069

The signal from the 'A' train SSPS to cause a reactor trip will:

- A. open the 'A' reactor trip breaker and the 'A' reactor trip bypass breaker.
- B. open the 'B' reactor trip breaker and the 'B' reactor trip bypass breaker.
- C. open the 'A' reactor trip breaker and the 'B' reactor trip bypass breaker.
- D. open the 'B' reactor trip breaker and the 'A' reactor trip bypass breaker.

ANSWER:

- C. open the 'A' reactor trip breaker and the 'B' reactor trip bypass breaker.

RO #54

SRO #40

K/A #012000A403

OBJECTIVE #0110270C

REFERENCES: T61.0110.6 LP-#27
Callaway Bank

RO Test

QUESTION #070

During a reactor startup, the Intermediate Range Rod Stop is _____ blocked when two of the four power range channels reach the _____ setpoint.

- A. Manually, C-5
- B. Manually, P-10
- C. Automatically, C-5
- D. Automatically, P-10

ANSWER:

- B. Manually, P-10

RO #26

K/A #015000K452

OBJECTIVE #003A23A4

REFERENCES: OTG-ZZ-00003
OTO-SA-00001

RO Test

QUESTION #071

A spurious SI causes a plant trip and SI. Which one of the below actions is acceptable to be performed while performing E-0 steps 1 through 14?

- A. Securing NE01 due to ESW pump A tripping.
- B. Securing RHR Train 'A' due to RCS pressure at 2235.
- C. Stopping one CCP to minimize injection to RCS.
- D. Starting a SFP pump to restore Fuel Pool Cooling.

ANSWER:

- A. Securing NE01 due to ESW pump A tripping.

RO #6

SRO #6

K/A #194001A102

OBJECTIVE #003A29C4

REFERENCES: ODP-ZZ-00025

RO Test

QUESTION #072

Both trains of Essential Service Water (ESW) are placed into service to reduce containment temperature. Shortly after placing ESW into service, reactor power is noted to be slowly increasing.

Which ONE of the following is the probable cause of the power increase?

- A. Change in containment air temperature affecting operation of the power range detectors.
- B. Change in main feedwater temperature due to flow variations in the S/G Blowdown system.
- C. Change in the CVCS letdown temperature causing deboration in the letdown demineralizers.
- D. Change in main condenser vacuum causing increasing main steam flow through the main turbine.

ANSWER:

- C. Change in the CVCS letdown temperature causing deboration in the letdown demineralizers.

RO #42

SRO #48

K/A #075000A401

OBJECTIVE #003A09A1

REFERENCES: OTN-EF-00001
OTN-EG-00001

RO Test

QUESTION #073

Given the following plant conditions:

- SAFETY INJECTION ACTUATED
- PZR PRESSURE 1800 PSIG Slowly Decreasing
- RCS TEMPERATURE 550°F Slowly Decreasing
- S/G NR LEVELS 1% Slowly Increasing
- PRT Pressure 3 psig Stable
- S/G PRESSURE 1000 PSIG STABLE
- PZR Level 28% INCREASING
- RM-11 GTRE31 & 32 Alarming
- CTMT Temperature 140°F Slowly Increasing
- CTMT Pressure 8 psig
- CTMT Humidity Increasing

Which ONE of the following could be the cause of the above conditions?

- A. Steam Generator Safety Valve failed open.
- B. Pressurizer PORV failed open.
- C. RCS Leak from a cold leg.
- D. Pressurizer steam space leak.

ANSWER:

- D. Pressurizer steam space leak.

RO #81

SRO #82

K/A #000008A106

OBJECTIVE #003D030F

REFERENCES: E-0 Reactor Trip/Safety Injection

RO Test

QUESTION #074

The Callaway Plant is operating at 94% power with all four containment cooling fans running in fast speed.

A simultaneous Safety Injection and loss of the normal power supply to NB01 occurs. All systems function as designed.

Which one of the following describes the response of the Containment Cooling fans?

- A. Fans A and C start in FAST speed, B & D continue to run in FAST speed.
- B. Fans A & C start in SLOW speed, fans B & D shift to SLOW speed.
- C. Fans A & C start in FAST speed, fans B & D shift to SLOW speed.
- D. Fans A & C start in SLOW speed, fans B & D continue to run in FAST speed.

ANSWER:

- B. Fans A & C start in SLOW speed, fans B & D shift to SLOW speed.

RO #29

SRO #28

K/A #022000A301

OBJECTIVE #0110400D

REFERENCES: E210010

RO Test

QUESTION #075

The plant is at 190°F and 350 psig with BOTH RHR trains in service in the cooldown mode.

With both RHR suction reliefs and Pressurizer PORVs lined up for COPS, which ONE of the following describes RCS overpressure control on increasing pressure?

- A. Pressurizer PORVs open sequentially first, then BOTH RHR suction reliefs would lift.
- B. Both RHR suction reliefs would lift first, then Pressurizer PORVs open sequentially.
- C. Pressurizer PORVs and RHR suction reliefs would lift at the same time.
- D. BOTH RHR suction reliefs would lift first, then both Pressurizer PORVs open simultaneously.

ANSWER:

- B. BOTH RHR suction reliefs would lift first, then Pressurizer PORVs open sequentially.

RO #62

K/A #005000A202

OBJECTIVE #003A210A

REFERENCES: Curve Book Fig 14.3
OSP-BB-00003

RO Test

QUESTION #076

The plant is in the injection phase of Safety Injection due to a RCS LOCA. Containment Pressure has reached a maximum of 25 psig.

Which ONE of the following indicates the loads being cooled by CCW?

- A. RHR Pumps, RHR Heat Exchangers, Sample systems
- B. Fuel Pool, Reactor Coolant Pumps, Excess Letdown Heat Exchangers
- C. Containment Spray Pumps, Charging Pumps, Reactor Coolant Pumps
- D. Reactor Coolant Pumps, Charging Pumps, RHR Pumps

ANSWER:

- D. Reactor Coolant Pumps, Charging Pumps, RHR Pumps

RO #77

SRO #60

K/A #000026K302

OBJECTIVE #0110100C

REFERENCES: M22EG01
E210010

RO Test

QUESTION #077

The Callaway Plant is in a Reduced Inventory condition and has suffered a Loss of RHR Cooling.

Which ONE of the following would cause a reduction in T-Boil (Time to Boil)?

- A. Fewer Effective Full Power Days (EFPD)
- B. Longer Time since Shutdown
- C. Lower Steam Generator Level
- D. Lower RCS Loop Level

ANSWER:

- D. Lower RCS Loop Level

RO #91

SRO #85

K/A #000025G10

OBJECTIVE #003EE20B

REFERENCES: OTN-BB-00002
T-Boil Calc

RO Test

QUESTION #078

Which one of the following describes the effect of an LSELS Load Shed signal on Pressurizer Pressure Control?

- A. Both Backup and Proportional Heaters are shed upon receipt of a Safety Injection.
- B. Only Backup Heaters are shed on an NB Bus undervoltage condition.
- C. Both Backup and Proportional Heaters are shed on an NB Bus undervoltage condition.
- D. Only Proportional Heaters are shed upon receipt of a Safety Injection.

ANSWER:

- B. Only Backup Heaters are shed on an NB Bus undervoltage condition.

RO #51

K/A #010000K102

OBJECTIVE #0110050A

REFERENCES: T61.0110.6 LP-#5

RO Test

QUESTION #079

Plant startup is in progress with main turbine roll commencing and reactor power at 6%. Power range N-44 is out of service due to a failed detector.

Which one of the below is UNBLOCKED under these conditions?

- A. Intermediate Range High Flux Reactor Trip
- B. Pressurizer Low Pressure Reactor Trip
- C. Reactor Trip from Turbine Trip
- D. Pressurizer High Level Reactor Trip.

ANSWER:

- A. Intermediate Range High Flux Reactor Trip

RO #25

SRO #26

K/A #015000A303

OBJECTIVE #003A24A2

REFERENCES: OTG-ZZ-00002
OTO-SA-00001

RO Test

QUESTION #080

Use the attached Figure 7-5 to answer the following question.

The plant is in MODE 3, 557°F, 2235 psig. Which one of the following is the amount of water needed to reduce the RCS boron concentration from 1150 ppm to 1100 ppm?

- A. 1167 gal.
- B. 1195 gal.
- C. 2688 gal.
- D. 2752 gal.

ANSWER:

- D. 2752 gal.

RO #14

SRO #19

K/A #001010K521

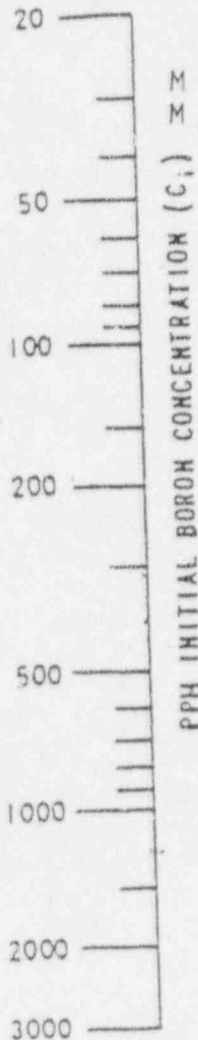
OBJECTIVE #003AA40E

REFERENCES: Plant Curve Book

REACTOR MAKEUP CONTROL SYSTEM NOMOGRAPHS

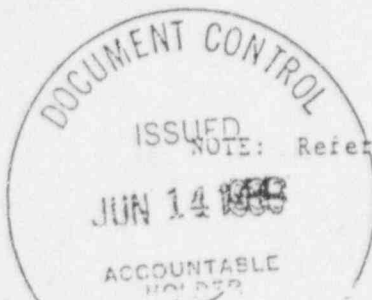
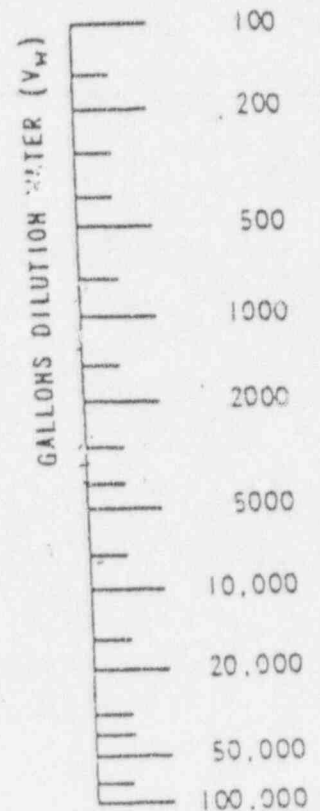
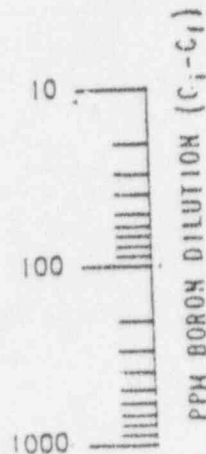
BORON DILUTION

$$V_w = \frac{M}{8.33} \ln \left(\frac{C_i}{C_f} \right)$$



M at 0% power = 515676 lbm * Superintendent, Engineering Date
M at 100% power = 503624 lbm *

*The values for M, mass of the RCS, are only valid while pressurizer level is in its target band.



NOTE: Refer to Table 7-1 for correction factors.

RO Test

QUESTION #081

The plant is in MODE 5 with the containment purge exhaust fan operating and containment purge supply off. The Containment Coordinator identifies a positive air flow condition from containment to outside atmosphere through the equipment hatch with the containment personnel hatch open.

Which ONE of the below actions should be performed for this condition?

- A. Activate a Containment Purge Isolation
- B. Start either Fuel Bldg/Aux Bldg Emergency Exhaust train
- C. Activate a Control Room Ventilation Isolation
- D. Shift the Aux Building Normal Exhaust to FAST

ANSWER:

- D. Shift the Aux Building Normal Exhaust to FAST

RO #45

SRO #43

K/A #029000K103

OBJECTIVE #003A120B

REFERENCES: OTN-GT-00001

RO Test

QUESTION #082

Which one of the following will prevent outward control rod motion in both automatic and manual control?

- A. Selected Turbine Impulse Pressure channel is reading 13% equivalent power.
- B. Two ΔT channels are within 3% of the overtemperature ΔT trip setpoint.
- C. Control Bank D rods are positioned at 224 steps.
- D. One Power Range NI is reading 102%.

ANSWER:

- B. Two ΔT channels are within 3% of the overtemperature ΔT trip setpoint.

RO #16

K/A #001000K402

OBJECTIVE #0110260H

REFERENCES: OTO-SA-00001, Table II

RO Test

QUESTION #083

A Hi Hi Radiation signal from SJ-RE-02, Steam Generator Blowdown System Radiation Monitor, will automatically close which ONE of the following valves?

- A. BM-HV-21, S/G 'C' Blowdown Nuclear Sampling System Upper Isolation Valve.
- B. BM-FV-54, S/G Blowdown Discharge Pumps Discharge Flow Control Valve.
- C. BM-HV-6, S/G 'B' Blowdown Nuclear Sampling System Line Downstream Isolation Valve.
- D. BM-HV-38, S/G 'D' Blowdown Nuclear Sampling System Lower Isolation Valve.

ANSWER:

- C. BM-HV-6, S/G 'B' Blowdown Nuclear Sampling System Line Downstream Isolation Valve.

RO #56

SRO #47

K/A #073000K101

OBJECTIVE #0110120D

REFERENCES: T61.0110.6 LP-#12

RO Test

QUESTION #084

Given the following plant conditions:

- Steam Break in AREA 5
- All MSIVs closed
- 'A', 'B', and 'D' Steam Generator Pressures Stable
- 'C' Steam Generator Pressure Decreasing
- Performing actions of E-2, "Faulted Steam Generator Isolation"
- TD AFW pump is the only AFW pump available

Which ONE of the following actions would be performed during completion of E-2?

- A. Close ABHV0006, 'C' Steam Supply to the TD AFW pump.
- B. Open all S/G Common Sample Isolation Valves, BMHV0065 through 68.
- C. Reduce Aux Feedwater flow to 15,000 lbm/hr to each Steam Generator.
- D. Close ABLV0007, Main Steam Low Point Drain SG 'C'.

ANSWER:

- B. Open all S/G Common Sample Isolation Valves, BMHV0065 through 68.

RO #66

SRO #62

K/A #000040E103

OBJECTIVE #003D150C

REFERENCES: E-2

RO Test

QUESTION #085

Main Turbine exhaust pressure is 4" Hga and increasing at a rate of 0.5" Hga per minute. Which of the following is the minimum amount of time that could elapse before an automatic low vacuum turbine trip occurs?

- A. 5 minutes
- B. 7 minutes
- C. 9 minutes
- D. 12 minutes

ANSWER:

- B. 7 minutes

RO #73

SRO #64

K/A #000051A202

OBJECTIVE #003BB90A

REFERENCES: OTO-AD-00001

RO Test

QUESTiON #086

Which one of the following describes the operation of the Main Turbine Steam Valves during Control Valve Chest Warming?

- A. Main Stop Valve #2 Bypass is Open
- B. All Intermediate Stop Valves are Shut
- C. Control Valves #1, #2, and #3 are Open
- D. All Main Stop Valves are Open

ANSWER:

- A. Main Stop Valve #2 Bypass is Open

RO #59

K/A #045000A401

OBJECTIVE #0110380E

REFERENCES: T61.0110.6 LP-#38, Pg. 63

RO Test

QUESTION #087

Which one of the following is an entry condition for OTO-ZZ-00003, Loss of Shutdown?

- A. Reactor Trip at 0950 and RCS Tavg 545°F at 1115.
- B. Reactor Power at 5% and Control Bank C at 35 steps.
- C. RCS temperature decrease of 100°F in 20 minutes with ECCS operating in the Injection phase.
- D. A constant startup rate of 1 decade per minute following control rod withdrawal.

ANSWER:

- B. Reactor Power at 5% and Control Bank C at 35 steps.

RO #80

SRO #59

K/A #000024G10

OBJECTIVE #003B610A

REFERENCES: T61.003B 6 LP-#B-61

RO Test

QUESTION #088

Which one of the following containment conditions would require the use of Adverse Containment values when responding to a Large Break LOCA?

- A. Temperature had been 180°F and has decreased to 150°F.
- B. Radiation had been 2.0E5 R/HR and has decreased to 500 R/HR.
- C. Pressure had been 30 psig and has decreased to 5 psig.
- D. Recirculation Sump Level is greater than 138 inches.

ANSWER:

- B. Radiation had been 2.0E5 R/HR and has decreased to 500 R/HR.

RO #83

K/A #000011G11

OBJECTIVE #003D040R

REFERENCES: T61.003D.6 LP-#4

RO Test

QUESTION #089

A steam generator tube leak causes a high radiation alarm on condenser air removal. Data is taken to determine the steam generator leakrate.

	Time=0	Time=1 minute	Time=2 minute
Reactor Power	99	99	99
Tave	588.3	588.3	588.3
Charging Flowrate	100	100	100
Letdown Flowrate	80	80	80
Total Seal Injection Flowrate	33	33	33
Pressurizer Level	55%	54.8%	54.6%
Total Seal Leakoff Flowrate	12	12	12

(Assume 1% Pressurizer Level = 60 gallons)

Which ONE of the following is the approximate steam generator leakrate?

- A. 5 gpm
- B. 10 gpm
- C. 15 gpm
- D. 20 gpm

ANSWER:

- D. 20 gpm

RO #89

K/A #000037A212

OBJECTIVE #0110110P

REFERENCES: T61.0110.6 LP-#11

RO Test

QUESTION #090

A void exists in the reactor vessel during natural circulation cooldown. Which ONE of the following actions is used to collapse an excessive void, according to ES-0.3, "Natural Circulation Cooldown with Steam Voids"?

- A. Decrease RCS temperature while maintaining RCS pressure constant.
- B. Fill the Pressurizer solid and vent the reactor vessel head.
- C. Increase RCS pressure using pressurizer heaters while maintaining pressurizer level.
- D. Start an SI pump to increase RCS pressure while maintaining temperature constant.

ANSWER:

- C. Increase RCS pressure using pressurizer heaters while maintaining pressurizer level.

RO #69

SRO #72

K/A #000074A101

OBJECTIVE #003D070K

REFERENCES: T61.003D.6

RO Test

QUESTION #091

The plant is in MODE 1 with all systems in normal except that I&C is performing corrective maintenance in the Rod Control Power Cabinet 1BD. Group 1 of Control Bank D is being energized from the DC Hold Bus.

Breaker PG1902, Motor Circuit Breaker to Rod Drive Motor-Generator SF01, is inadvertently opened. All plant systems respond as designed.

Which ONE of the below is true regarding power to the control rods?

- A. Power continues to all control rods.
- B. Power is interrupted to all control rods.
- C. Power is interrupted to all rods except Control Bank D, Group 1.
- D. Power continues to all rods except Control Bank D, Group 1.

ANSWER:

- A. Power continues to all rods.

RO #15

SRO #18

K/A #001000K202

OBJECTIVE #0110260G

REFERENCES: E21

RO Test

QUESTION #092

Which one of the following could be a direct result of a loss of Vital AC Instrument bus NN03?

- A. Charging Pump suction swaps to the RWST
- B. Source Range Hi Flux Reactor Trip
- C. Intermediate Range High Flux Reactor Trip
- D. CVCS Letdown Isolation

ANSWER:

- D. CVCS Letdown Isolation

RO #79

SRO #67

K/A #000057A219

OBJECTIVE #003B450A

REFERENCES: OTO-NN-00001

RO Test

QUESTION #093

A reactor trip has occurred and the operating crew is responding in accordance with ES-0.1, Reactor Trip Response.

- Reactor trip and bypass breakers open
- NIS power is 1% and decreasing
- Bank D, Group 2 rods indicate 188 steps withdrawn. All other rods are fully inserted

Which one of the following is TRUE for the above conditions?

- A. An emergency boration of 450 ppm must be performed to ensure the minimum shutdown margin is maintained.
- B. An emergency boration of 150 ppm must be performed to limit fission gas release and maintain fuel pellet temperature within design limits.
- C. No immediate action is required since the core is designed for these conditions, and the reactor has been verified tripped by diverse indications.
- D. A safety injection signal (SIS) must be actuated to maintain the reactor core in a safe shutdown condition.

ANSWER:

- A. An emergency boration of 450 ppm must be performed to ensure the minimum shutdown margin is maintained.

RO #65

SRO #58

K/A #000005K301

OBJECTIVE #003D060C

REFERENCES: ES-0.1

RO Test

QUESTION #094

During a Reactor Startup, the Reactor Operator verifies one decade of overlap between the source and Intermediate Range Nuclear Instruments. This verification is defined as a(n) _____.

- A. Source Check
- B. Analog Channel Operational Test
- C. Channel Calibration
- D. Channel Check

ANSWER:

D. Channel Check

RO #11

SRO #10

K/A #194001A113

OBJECTIVE #003A02I1

REFERENCES: Tech Spec Definitions

RO Test

QUESTION #095

Which ONE of the following components is manually (or automatically) isolated and remains isolated for a Faulted 'B' Steam Generator, but NOT necessarily for a 'B' Steam Generator Tube Rupture? (NOTE: Assume all equipment actuated as required.)

- A. Main Steam Isolation Valve (AB-HV-17)
- B. Main Feedwater Isolation Valve (AE-FV-40)
- C. Auxiliary Feedwater Flow Control Valve (AL-HV-10)
- D. Main Steam Supply Valve to T/D AFW Pump (AB-V085)

ANSWER:

- C. Auxiliary Feedwater Flow Control Valve (AL-HV-10)

RO #84

SRO #89

K/A #000038A132

OBJECTIVE #003D17NN

REFERENCES: T61.003D.6 LP-#17

RO Test

QUESTION #096

Which one of the following sets of conditions would result in a LoLo S/G Level Reactor Trip?

	S/G NR Level (%)	CTMT Press (psig)	LOOP ΔT (%)	TIME (sec)
A.	12	0	17	110
B.	18	2	8	10
C.	17	0.5	23	180
D.	10	1	2	210

ANSWER:

B.	18	2	8	10
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RO #88

K/A #000054G09

OBJECTIVE #0110270D

REFERENCES: T61.0110.6 LP-#27

RO Test

QUESTION #097

Which of the following should be performed if a 125VDC Vital Battery Charger fails?

- A. Place the swing battery charger in service to replace the normal battery charger's function.
- B. Declare that train 125VDC Vital system inoperable and commence plant shutdown.
- C. Align the maintenance supply to power that trains vital 120V AC instrument loads directly.
- D. Align that trains inverter rectifier to perform the required battery charger function.

ANSWER:

- A. Place the swing battery charger in service to replace the normal battery charger's function.

RO #92

K/A #000058A103

OBJECTIVE #0110060A

REFERENCES: OTN-NK-00001
OTO-NK-00001

RO Test

QUESTION #098

Which ONE of the following situations violates a requirement for containment integrity or containment closure?

- A. A containment vent is performed with the plant operating at 100% power.
- B. The plant is in refueling mode with the refueling cavity flooded. Steam generator safeties have been removed; secondary manways are also removed. No fuel movement is in progress.
- C. The plant is in refueling mode with fuel movement in progress. Containment Shutdown purge is initiated.
- D. The plant is in hot standby. The "A" steam generator blowdown isolation valve BM-HV-1 is stuck open.

ANSWER:

- D. The plant is in hot standby. The "A" steam generator blowdown isolation valve BM-HV-1 is stuck open.

RO #78

SRO #71

K/A #000069A202

OBJECTIVE #003E014A

REFERENCES: TS 3.9.4

RO Test

QUESTION #099

The Callaway Plant is operating at 30% power and it is necessary to secure the 'B' Reactor Coolant Pump due to high vibration. After the RCP is tripped, the 'B' Loop ΔT _____ and the other Loop ΔT 's _____. (Assume unit load is held constant.)

- A. Increases; Decrease
- B. Increases; Increase
- C. Decreases; Decrease
- D. Decreases; Increase

ANSWER:

- D. Decreases; Increase

RO #17

K/A #003000A107

OBJECTIVE #01100901

REFERENCES: OTO-BB-00002

RO Test

QUESTION #100

Which ONE of the following components has its air supply AUTOMATICALLY isolated if air pressure decreases to 108 psig?

- A. Closed Cooling Water Temperature Controller
- B. First Stage RHDT Level Control Valves
- C. Main Feedwater Reg Valve Bypass Valves
- D. Auxiliary Feedwater Pump Room Sump Pumps

ANSWER:

- D. Auxiliary Feedwater Pump Room Sump Pumps

RO #46

SRO #49

K/A #079000K101

OBJECTIVE #0110140C

REFERENCES: OTO-KA-00001

CHIEF EXAMINER WRITTEN EXAM COMMENTS - CA: LAWAY 2/24/97

<u>Test Question #</u>	<u>Comment</u>
RO 7/SRO 7	Need to justify use of negative question format. Resolution: Rewrote.
RO 8	Reword as follows: "Which statement describes loss of CCW flow to a RCP as defined in emergency procedures." Resolution: Incorporated.
RO 9/SRO 9	Wording in stem is not clear. Resolution: Rewrote.
RO 11/SRO 11	Distractors C and D are not plausible for an applicant with rudimentary knowledge of the ESFAS system. Resolution: Withdrew comment.
RO 13	None of the three distractors are plausible. Replace or improve distractors. Resolution: Replaced distractors.
SRO 13	Justify negative stem. Resolution: Rewrote.
RO 14/SRO 33	This appears to be an SRO level question and is shown on the matrix as outline numbers RO 13 in one place and SRO 13 in another place. It appears an RO level question is needed for KA 194001A116. Resolution: Withdrew comment. Answer is different for RO.
SRO 14	Why is this an SRO level question? Resolution: Retain. CRS makes this determination.
RO 26/SRO 26	Change to read, "... in MODE 1 AND one safety related CCP INOPERABLE, ..." Resolution: Incorporated.
RO 27/SRO 27	Correct wording in Distractor C to "... Requestor approval, equipment ..." Resolution: Incorporated.
RO 51/SRO 51	Distractors A and B are implausible. Resolution: Replaced distractors.
RC 52/SRO 52	The condition "Use steam tables provided," is a cue. Delete this statement from the stem. Resolution: Incorporated.
RO 53/SRO 53	The statement that the condensate storage tank is ruptured eliminates Distractors A and C from consideration. Rewrite. Resolution: Rewrote distractors.
RO 56/SRO 56	Distractor C is implausible. Resolution: Rewrote.
RO 63/SRO 63	Distractor A is implausible. Resolution: Rewrote.

SRO 75	This does not appear to be an SRO level question. Resolution: Retain. This is important design change information. Overlap criteria is still satisfied.
RO 76/SRO 76	Reword as follows: "... indicates ONLY loads being ..." Resolution: Incorporated.
RO 82	Distractor A appears implausible. Resolution: Retain. Distractor is plausible.
RO 87/SRO 87	Question should read, "... entry condition for OTO-ZZ-00003, Loss of Shutdown Margin?" Distractor D is implausible. Resolution: Rewrote distractor.
RO 96	Reword to state, "Which one of the following sets of conditions should have resulted in a Lo Lo S/G Level Reactor Trip?" Resolution: Incorporated.
SRO 96	Why is this an SRO level question? Resolution: Rewrote to SRO level.
RO 100/SRO 100	Answer refers to pumps, while distractors refer to valves and controller. This appears to be a cue. Resolution: Retain. Air supply for air driven pumps is not a cue.
Other	<p>The exam instructions must incorporate ES-402, Attachment 2, "Policies and Guidelines for Taking NRC Written Examinations." Also, above the applicant's signature the following statement should be inserted:</p> <p style="padding-left: 40px;">All work done on this examination is my own. I have neither given nor received aid.</p> <p>Resolution: Incorporated.</p>

CHIEF EXAMINER RO DIFFICULTY ANALYSIS - CALLAWAY 2/24/97 EXAM

Legend: L - Level of knowlege required A - Knowledge at the comprehension/analysis level

K - Fundamental knowledge only D - Overall difficulty of question on a scale of 1 to 5, with 5 being the most difficult

<u>Test Question</u>	<u>Outline #</u>	<u>L/D</u>	<u>Comment</u>
Question #001	RO #19	K/2	
Question #002	RO #41	A/2.5	
Question #003	RO #12	K/2	
Question #004	RO #4	K/2	
Question #005	RO #96	A/2.5	
Question #006	RO #33	A/2	
Question #007	RO #1	K/2	Yes
Question #008	RO #75	K/2	Yes
Question #009	RO #71	K/3	Yes
Question #010	RO #44	A/3	
Question #011	RO #23	K/3	Yes
Question #012	RO #63	A/2	
Question #013	RO #87	K/1	Yes
Question #014	RO #13	K/3	Yes
Question #015	RO #36	K/2	
Question #016	RO #48	K/2.5	
Question #017	RO #27	A/2.5	
Question #018	RO #94	K/2	
Question #019	RO #86	K/3	
Question #020	RO #43	K/2	
Question #021	RO #8	K/2	
Question #022	RO #57	A/3.5	
Question #023	RO #95	A/2.5	
Question #024	RO #39	A/2.5	
Question #025	RO #60	A/3	
Question #026	RO #20	K/2.5	Yes
Question #027	RO #2	K/2	Yes
Question #028	RO #40	A/2.5	
Question #029	RO #76	A/2.5	
Question #030	RO #98	A/3.5	
Question #031	RO #85	A/2.5	
Question #032	RO #55	K/2	
Question #033	RO #37	A/2.5	
Question #034	RO #21	A/3	
Question #035	RO #100	K/2.5	
Question #036	RO #3	A/2.5	
Question #037	RO #52	K/2.5	
Question #038	RO #30	A/3	
Question #039	RO #67	A/2.5	

Question #040	RO #99	K/2.5	
Question #041	RO #50	A/3	
Question #042	RO #70	A/3	
Question #043	RO #34	A/2.5	
Question #044	RO #9	K/2	
Question #045	RO #61	A/3	
Question #046	RO #31	A/3.5	
Question #047	RO #24	K/2	
Question #048	RO #18	A/2.5	
Question #049	RO #7	A/2.5	
Question #050	RO #49	A/3.5	
Question #051	RO #90	A/1.5	Yes
Question #052	RO #58	A/2.5	Yes
Question #053	RO #35	A/2	Yes
Question #054	RO #22	K/2.5	
Question #055	RO #97	K/2.5	
Question #056	RO #82	K/2.5	Yes
Question #057	RO #64	K/2.5	
Question #058	RO #47	K/2.5	
Question #059	RO #32	A/3.5	
Question #060	RO #5	K/2	
Question #061	RO #38	K/2.5	
Question #062	RO #74	A/2.5	
Question #063	RO #68	K/3	Yes
Question #064	RO #53	A/3	
Question #065	RO #28	K/2.5	
Question #066	RO #10	A/2	
Question #067	RO #93	K/3	
Question #068	RO #72	K/3	
Question #069	RO #54	K/2	
Question #070	RO #26	K/2	
Question #071	RO #6	A/2.5	
Question #072	RO #42	A/3.5	
Question #073	RO #81	A/2.5	
Question #074	RO #29	A/2.5	
Question #075	RO #62	A/3	
Question #076	RO #77	K/2.5	Yes
Question #077	RO #91	K/2.5	
Question #078	RO #51	K/2.5	
Question #079	RO #25	K/2	
Question #080	RO #14	A/2	
Question #081	RO #45	A/2.5	
Question #082	RO #16	K/3.0	Yes
Question #083	RO #56	K/2.5	
Question #084	RO #66	A/3	
Question #085	RO #73	A/2.5	

Question #086	RO #59	K/2.5	
Question #087	RO #80	A/2.5	Yes
Question #088	RO #83	K/2.5	
Question #089	RO #89	A/2.5	
Question #090	RO #69	K/2.5	
Question #091	RO #15	A/2.5	
Question #092	RO #79	K/3	
Question #093	RO #65	K/2.5	
Question #094	RO #11	K/2	
Question #095	RO #84	A/2.5	
Question #096	RO #88	A/3.5	Yes
Question #097	RO #92	K/2	
Question #098	RO #78	A/2.5	
Question #099	RO #17	A/2	
Question #100	RO #46	A/3	Yes

Summary:

- Questions rated "A" equal 51.
- Average difficulty equals 2.52
- 26 questions are different than those on SRO exam.

Attachment 3

Written Exam - SRO

SRO Matrix

Question #001	SRO #21	Question #051	SRO #84
Question #002	SRO #44	Question #052	SRO #54
Question #003	SRO #11	Question #053	SRO #32
Question #004	SRO #4	Question #054	SRO #30
Question #005	SRO #88	Question #055	SRO #68
Question #006	SRO #33	Question #056	SRO #83
Question #007	SRO #1	Question #057	SRO #56
Question #008	SRO #51	Question #058	SRO #50
Question #009	SRO #69	Question #059	SRO #35
Question #010	SRO #92	Question #060	SRO #5
Question #011	SRO #24	Question #061	SRO #45
Question #012	SRO #42	Question #062	SRO #86
Question #013	SRO #77	Question #063	SRO #66
Question #014	SRO #74	Question #064	SRO #41
Question #015	SRO #34	Question #065	SRO #29
Question #016	SRO #36	Question #066	SRO #9
Question #017	SRO #27	Question #067	SRO #78
Question #018	SRO #91	Question #068	SRO #70
Question #019	SRO #61	Question #069	SRO #40
Question #020	SRO #38	Question #070	SRO #17
Question #021	SRO #7	Question #071	SRO #6
Question #022	SRO #55	Question #072	SRO #48
Question #023	SRO #87	Question #073	SRO #82
Question #024	SRO #37	Question #074	SRO #28
Question #025	SRO #15	Question #075	SRO #81
Question #026	SRO #72	Question #076	SRO #60
Question #027	SRO #2	Question #077	SRO #85
Question #028	SRO #39	Question #078	SRO #100
Question #029	SRO #73	Question #079	SRO #26
Question #030	SRO #98	Question #080	SRO #19
Question #031	SRO #90	Question #081	SRO #43
Question #032	SRO #52	Question #082	SRO #57
Question #033	SRO #13	Question #083	SRO #47
Question #034	SRO #25	Question #084	SRO #62
Question #035	SRO #79	Question #085	SRO #64
Question #036	SRO #3	Question #086	SRO #12
Question #037	SRO #76	Question #087	SRO #59
Question #038	SRO #93	Question #088	SRO #16
Question #039	SRO #65	Question #089	SRO #95
Question #040	SRO #99	Question #090	SRO #72
Question #041	SRO #46	Question #091	SRO #18
Question #042	SRO #63	Question #092	SRO #67
Question #043	SRO #31	Question #093	SRO #58
Question #044	SRO #8	Question #094	SRO #10
Question #045	SRO #53	Question #095	SRO #89
Question #046	SRO #80	Question #096	SRO #97
Question #047	SRO #23	Question #097	SRO #75
Question #048	SRO #20	Question #098	SRO #71
Question #049	SRO #14	Question #099	SRO #96
Question #050	SRO #94	Question #100	SRO #49

SRO Matrix

SRO #1	Question #007	SRO #51	Question #008
SRO #2	Question #027	SRO #52	Question #032
SRO #3	Question #036	SRO #53	Question #045
SRO #4	Question #004	SRO #54	Question #052
SRO #5	Question #060	SRO #55	Question #022
SRO #6	Question #071	SRO #56	Question #057
SRO #7	Question #021	SRO #57	Question #082
SRO #8	Question #044	SRO #58	Question #093
SRO #9	Question #066	SRO #59	Question #087
SRO #10	Question #094	SRO #60	Question #076
SRO #11	Question #003	SRO #61	Question #019
SRO #12	Question #086	SRO #62	Question #084
SRO #13	Question #033	SRO #63	Question #042
SRO #14	Question #049	SRO #64	Question #085
SRO #15	Question #025	SRO #65	Question #039
SRO #16	Question #088	SRO #66	Question #063
SRO #17	Question #070	SRO #67	Question #092
SRO #18	Question #091	SRO #68	Question #055
SRO #19	Question #080	SRO #69	Question #009
SRO #20	Question #048	SRO #70	Question #068
SRO #21	Question #001	SRO #71	Question #098
SRO #22	Question #026	SRO #72	Question #090
SRO #23	Question #047	SRO #73	Question #029
SRO #24	Question #011	SRO #74	Question #014
SRO #25	Question #034	SRO #75	Question #097
SRO #26	Question #079	SRO #76	Question #037
SRO #27	Question #017	SRO #77	Question #013
SRO #28	Question #074	SRO #78	Question #067
SRO #29	Question #065	SRO #79	Question #035
SRO #30	Question #054	SRO #80	Question #046
SRO #31	Question #043	SRO #81	Question #075
SRO #32	Question #053	SRO #82	Question #073
SRO #33	Question #006	SRO #83	Question #056
SRO #34	Question #015	SRO #84	Question #051
SRO #35	Question #059	SRO #85	Question #077
SRO #36	Question #016	SRO #86	Question #062
SRO #37	Question #024	SRO #87	Question #023
SRO #38	Question #020	SRO #88	Question #005
SRO #39	Question #028	SRO #89	Question #095
SRO #40	Question #069	SRO #90	Question #031
SRO #41	Question #064	SRO #91	Question #018
SRO #42	Question #012	SRO #92	Question #010
SRO #43	Question #081	SRO #93	Question #038
SRO #44	Question #002	SRO #94	Question #050
SRO #45	Question #061	SRO #95	Question #089
SRO #46	Question #041	SRO #96	Question #099
SRO #47	Question #083	SRO #97	Question #096
SRO #48	Question #072	SRO #98	Question #030
SRO #49	Question #100	SRO #99	Question #040
SRO #50	Question #058	SRO #100	Question #078

CALLAWAY PLANT - WRITTEN EXAM OUTLINE
SENIOR REACTOR OPERATOR

	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	SG	
Systems I	0	2	2	2	3	1	2	0	4	1	2	19
Systems II	3	0	0	1	2	3	0	1	1	4	2	17
Systems III	0	0	1	1	0	0	0	1	1	0	0	4
Emer/Abn I	2	1	6	--	--	--	4	6	--	--	5	24
Emer/Abn II	1	0	2	--	--	--	5	4	--	--	4	16
Emer/Abn III	1	0	1	--	--	--	0	1	--	--	0	3
TOTALS	7	3	12	4	5	4	11	13	6	5	13	83
Plant Generics =												17
TEST TOTAL												100

Knowledge and Abilities Record Form
 GENERIC RESPONSIBILITIES
 PWR - Senior Reactor Operator - 17%

Check if 194001

included	K/A #	Statement	Rating	UE TASK
X	K1.01 1.	Knowledge of how to conduct and verify valve lineups.	3.7	
X	K1.02 2.	Knowledge of tagging and clearance procedures.	4.1	
X	K1.03 3.	Knowledge of 10 CFR 20 and related facility radiation control requirements.	3.4	
X	K1.07 4.	Knowledge of safety procedures related electrical equipment.	3.7*	
X	K1.16 5.	Knowledge of facility protection requirements, including fire brigade and portable fire-fighting equipment usage.	4.2	
X	A1.02 6.	Ability to execute procedural steps.	3.9	
X	A1.05 7.	Ability to make accurate, clear, and concise verbal reports.	3.8	
X	A1.06 8.	Ability to maintain accurate, clear and concise logs, records, status boards and reports.	3.4	
X	A1.08 9.	Ability to obtain and interpret station reference material such as graphs, monographs, and tables which contain system performance data.	3.1	
X	A1.13 10.	Ability to locate control room switches, controls, and indications, and to determine that they are correctly reflecting the desired plant lineup.	4.1	
X	A1.15 11.	Ability to use plant computer to obtain and evaluate parametric information on system and component status.	3.4	
X	A1.03 12.	Ability to locate and use procedures and station directives related to shift staffing and activities.	3.4	
X	A1.16 13.	Ability to take actions called for in the Facility Emergency Plan, including acting as the Emergency Coordinator.	4.4	
X	K1.05 14.	Knowledge of facility requirements for controlling access to vital/control areas.	3.4*	
X	K1.13 15.	Knowledge of safety procedures related to oxygen-deficient environment.	3.6	
X	A1.01 16.	Ability to obtain and verify control procedure copy.	3.4	
X	A1.12 17.	Ability to direct personnel activities outside the control room.	4.1*	

Knowledge and Abilities Record Form
PLANT SYSTEMS
PWR - Senior Reactor Operator - 40%

Plant Specific Priorities

System #	K/A #	K/A Topic	Rating
013		MSFIS - Modification Purpose and Operations	
059		LER 96-03 FWIS due to Trip of MFP	

Group I Plant Systems - 19%

001	Control Rod Drive System	026	Containment Spray System
003	Reactor Coolant Pump System	056	Condensate System
004	Chemical and Volume Control System	059	Main Feedwater System
013	Engineered Safety Features Actuation System	061	Auxiliary/Emergency Feedwater System
014	Rod Position Indication System	063	DC Electrical Distribution System
015	Nuclear Instrumentation System	068	Liquid Radwaste System
017	In-Core Temperature Monitor System	071	Waste Gas Disposal System
022	Containment Cooling System	072	Area Radiation Monitoring System

System	K/A #	K/A Topic	Rating	UE TASK
001	000K2.02	18. Power supply flowpath to Reactor Trip Breakers	3.6	
001	010K5.21	19. Prediction in change in boron concentration due to power operation, dilution, or boration.	3.9	
003	000G.10	20. Recognize abnormal RCP indications as entry level conditons for OTO procedure.	4.4	
004	000K6.01	21. Spray/Heater performrance requirements for Boron Mixing.	3.3	
004	000K2.02	22. Knowledge of bus power supply operation to a CCP	3.5	
013	000A2.01	23. Predict the impact of a LOCA on the ESFAS	4.8	
013	000K5.02	24. ESFAS system logic and reliability.	3.3	
013	000K4.03	25. ESFAS design feature which provides MSLIS.	4.5	
015	000A3.03	26. NIS permissives status during plant startup.	3.9	
017	020A4.02	27. Temperature values used for RCP operations in Inadequate Core Cooling	4.1	
022	000A3.01	28. Auto operation of the Cont. Cooling due to SIS	4.3	
022	000A1.01	29. Monitor CTMT temp while operating Cont. Cooling	3.7	
001	000GK.04	30. Purpose and function of major components and controls in the AMSAC system	4.0	SSS-01
061	000A1.04	31. Predict change in CST level for AFW operation	3.9	
061	000A3.03	32. Operation of AFW system on Auto Start	3.9	
061	000K5.01	33. AFW flowrates required for RCS heat transfer	3.9	
072	000K3.02	34. Loss of ARM effect on fuel handling	3.5	
026	000A3.01	35. Monitor Auto Operation of CS Pump & Valves	4.5	
063	000K4.02	36. Interlocks/Permissives for NK Bus Operation	3.2	

Knowledge and Abilities Record Form
PLANT SYSTEMS
PWR - Senior Reactor Operator - 40%

Group II Plant Systems - 17%

002	Reactor Coolant System	034	Fuel Handling Equipment System
006	Emergency Core Cooling System	035	Steam Generator System
010	Pressurizer Pressure Control System	039	Main and Reheat Steam System
011	Pressurizer Level Control System	055	Condenser Air Removal System
012	Reactor Protection System	062	AC Electrical Distribution System
016	Non-Nuclear Instrumentation System	064	Emergency Diesel Generator System
028	Hydrogen Recombiner and Purge Control	073	Process Radiation Monitoring System
029	Containment Purge System	075	Circulating Water System
033	Spent Fuel Pool Cooling System	079	Station Air System
		086	Fire Protection System

System	K/A #	K/A Topic	Rating	UE TASK
002	000K5.09	37. Relationship between Pres and Temp for Saturation and Subcooled Conditions	4.2	
006	000K6.03	38. Performance capability of SI pumps.	3.9	
011	000A2.03	39. Loss of PZR Level effect on PZR Level Control	3.9	
012	000A4.03	40. Monitor Bypass Breaker Operation	3.6	
012	000K6.03	41. Design of RPS Trip Logic Circuitry	3.5	
028	000K5.01	42. Explosive H2 Limits applied to H2 Recombiner	3.9	
029	000K1.03	43. Cause/effect of CPIS on Containment Purge	3.8	
033	000G.11	44. Immediate actions for loss of SFP level	3.8	
039	000A4.04	45. Monitor operations of the TD AFP Turbine	3.9	
064	000A3.07	46. Monitor Load Sequencer Operation on DG	3.7	
073	000K1.01	47. Cause/effect relationship between Process RAD Monitoring to Steam Generator Sampling	3.9	
075	000A4.01	48. Manual operation of the ESW pumps	3.2	
079	000K1.01	49. Cause/Effect relationship between SA and IAS	3.1	
086	000A4.02	50. Operate/Monitor KC008 Panel in the Control Room	3.5	
010	000K4.03	51. PZR Design for Overpressure Control	4.1	
035	010K6.01	52. Performance & Design Attributes of MSIVs	3.6	
062	000G.08	53. Recognize entry actions for AC Dist per Tech Specs	4.3	

Knowledge and Abilities Record Form
 PLANT SYSTEMS
 PWR - Senior Reactor Operator - 40%

Group III Plant Systems - 4%

005 Residual Heat Removal System	041 Steam Dump System/
007 Pressurizer Relief Tank System	045 Main Turbine Generator System
008 Component Cooling Water System	076 Service Water System
	078 Instrument Air System

<u>System</u>	<u>K/A #</u>	<u>K/A Topic</u>	<u>Rating</u>	<u>UE TASK</u>
007	000A2.01	54. Predict Impact of Stuck Open PORV on PRT	4.2	
041	020K4.18	55. Steam Dump operation with Turbine Trip	3.6	
078	000K3.02	56. Effect on plant systems on loss of Inst. Air	3.6	
008	010A3.03	57. Requirements for CCW system for different plant conditions	3.2	

Knowledge and Abilities Record Form
EMERGENCY PLANT EVOLUTIONS
PWR - Senior Reactor Operator - 43%

Group I Emergency and Abnormal Plant Evolutions -24%

000001	Continuous Rod Withdrawal	000051	Loss of Condenser Vacuum
000003	Dropped Control Rod	000055	Loss of Offsite and Onsite Power
000005	Inoperable/Stuck Control Rod	000057	Loss of Vital AC Electrical Instrument Bus
000011	Large Break LOCA	000059	Accidental Liquid Radioactive - Release
000015	RCP Motor Malfunction	000067	Plant Fire On Site
000024	Emergency Boration	000068	Control Room Evacuation
000026	Loss of Component Cooling Water	000069	Loss of Containment Integrity
000029	Anticipated Transient Without Scram	000074	Inadequate Core Cooling
000040	Steam Line Rupture	000076	High Reactor Coolant Activity

<u>K/A</u>	<u>K/A Topic</u>	<u>Rating</u>	<u>UE TASK</u>
000005EK3.01	58. Basis for Emergency Boration Stuck Rod on Rx Trip	4.3	
000024G.10	59. Recognize entry conditions for Loss of Shutdown Margin	4.2	
000026EK3.02	60. Auto actions of CCW system from an ESFAS actuation	3.9	
000029EK3.12	61. Basis for actions in EOPs for ATWS	4.7	
000040EA1.03	62. Isolation of one Steam Line from Header on Steam Break	4.3	
000040EK1.01	63. Steam line rupture consequences of PTS on the RCS	4.4	
000051EA2.02	64. Determine when to Trip Turbine on Loss of Vacuum	4.1	
000055EK1.01	65. Effect of Batt Disch Rates on Capacity -Loss of AC	3.7	
000055EK3.02	66. Basis for actions on loss of all AC in ECA-0.0	4.7	
000057EA2.19	67. Auto Actions that occur on loss of Vital AC Inst Bus	4.3	
000059EA2.01	68. Determine failure mode for a liquid process monitor	3.5	
000067EK3.04	69. Reasons for Actions in Procedures for Fire on Site	4.1	
000068EK2.01	70. Knowledge of the ASP layout	4.0	
000069EA2.02	71. Evaluate Containment Integrity meets requirements	4.4	
000074EA1.01	72. Monitor RCS water inventory for Inadequate Core Cooling	4.4	
000076G.08	73. Determine Tech Spec Actions for High RCS Activity	4.0	
000015EA2.10	74. Determine when to Trip RCP on loss of seal inj or cooling	3.7	
000001EK3.02	75. Basis for Tech Spec Limit on control rod operability	4.3	
000003G.07	76. Explain limits and precautions for Dropped Rod Procedure	4.2	
000011EA1.14	77. Monitor Subcooling Meters during Large Break LOCA	4.1	
000011G.07	78. Apply precautions and limitations during LOCA	4.2	
000024EA2.04	79. Determine the availability of Borated water sources	4.2	
000029G.11	80. Ability to perform immediate actions for ATWS	4.7	
000057EA1.01	81. Monitor Inverter Swapping on Loss of Vital AC	3.7	

Emergency Plant Evolutions (Continued)

Group II Emergency and Abnormal Plant Evolutions - 16%

000007	Reactor Trip	000037	Steam Generator Tube Leak
000008	Pressurizer Vapor Space Accident	000038	Steam Generator Tube Rupture
000009	Small Break LOCA	000054	Loss of Main Feedwater
000022	Loss of Reactor Coolant Makeup	000058	Loss of DC Power
000025	Loss of Residual Heat Removal System	000060	Accidental Gaseous-Waste Release
000027	PZR Pressure Cont System Malfunction	000061	ARM System Alarms
000032	Loss of Source-Range Instrumentation	000065	Loss of Instrument Air
000033	Loss of I-R Instrumentation		

<u>K/A</u>	<u>K/A Topic</u>	<u>Rating</u>	<u>UE TASK</u>
000008EA1.06	82. Pressurizer level response to a Vapor Space Leak	3.6	
000009EK3.24	83. Basis for SI Terminations on Small Break LOCA	4.6	
000022EA1.01	84. CVCS letdown and charging Operation for loss of Charging	3.3	
000025G.10	85. Recognize abnormal indications for Loss of RHR	4.4	
000027EA1.01	86. Operation of PZR Heaters , Sprays, and PORVs	3.9	
000033EA2.02	87. Determine unreliable IR channel based on indicaitons	3.6	
000032G.11	88. Actions for Source Range Channel Failure	4.2	
000038EA1.32	89. Isolation of ruptured S/G per E-3	4.7	
000038EK3.06	90. Actions contained in E-3 for inventory balance, SGTR, and plant shutdown.	4.5	
000061G.09	91. Respond to an Area Radiation Monitor Actuation	3.6	
000007EA1.03	92. Monitor RCS pressure and temp on Reactor Trip	4.1	
000037G.05	93. Tech Spec Basis for S/G Tube Leaks and LCO	4.0	
000054EK1.02	94. Knowledge of Effect of Feeding a Dry S/G	4.2	
000058EA2.01	95. Determine a loss of DC power has occurred	4.1	
000065EA2.06	96. Determine when to Trip Reactor on Decreasing IA Pressure	4.2	
000022EA2.01	97. Determine failure of flow control valve in CVCS	3.6	

Emergency Plant Evolutions (Continued)

Group III Emergency and Abnormal Plant Evolutions - 3%

000028 Pressurizer Level Malfunction

000056 Loss of Offsite Power

000036 Fuel Handling Incident

<u>K/A</u>	<u>K/A Topic</u>	<u>Rating</u>	UE TASK
000028EA2.01	98. Determine PZR level as a function of Power	3.6	
000056K3.02	99. Basis for actions contained in EOPs for loss of Offsite Power	4.7	
000036EK1.01	100. Knowledge of Criticality during Fuel Handling.	4.3	

Knowledge and Abilities Record Form
PWR - Supplemental Item Sheet

<u>K/A</u>	<u>K/A Topic</u>	<u>Rating</u>	UE TASK
	1.		
	2.		
	3.		
	4.		
	5.		
	6.		
	7.		
	8.		
	9.		
	10.		

CALLAWAY PLANT
EXAMINATION COVER SHEET
TRAINING DEPARTMENT

COURSE NO.: NRC Initial Exam SESSION NO.: _____
COURSE TITLE: Senior Reactor Operator
NAME (Print): _____ SSN: _____ - _____ - _____ QUESTIONS: 100
SIGNATURE: _____ DATE: 2/24/97 TEST #: 1 BOOKLET #: _____

DIRECTIONS: BLACK OUT CORRECT ANSWERS

	T	F	
1.	<input type="checkbox"/> A	<input type="checkbox"/> B	<input type="checkbox"/> C <input type="checkbox"/> D
2.	<input type="checkbox"/> A	<input type="checkbox"/> B	<input type="checkbox"/> C <input type="checkbox"/> D
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SCORING

EXAM PREPARER: _____ POINTS POSSIBLE 100
EXAM REVIEWER: _____ / _____ Date
POINTS MISSED _____
POINTS SCORED _____
GRADE _____

CALLAWAY PLANT
EXAMINATION COVER SHEET
TRAINING DEPARTMENT

COURSE NO.: NRC Initial Exam SESSION NO.: _____
COURSE TITLE: Senior Reactor Operator
NAME (Print): _____ SSN: _____ - _____ - _____ QUESTIONS: 100
SIGNATURE: _____ DATE: 2/24/97 TEST #: 1 BOOKLET #: _____

DIRECTIONS: BLACK OUT CORRECT ANSWERS

	T	F		
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SRO Test

QUESTION #001

When performing a boration to the reactor coolant system for a down power transient, the PZR heaters should be turned on in manual to:

- A. Maintain PZR pressure in the normal operating range during the down power.
- B. Allow an increased ramp rate for the down power.
- C. Equalize the reactor coolant system and PZR boron concentrations.
- D. Ensure positive PZR control is established prior to starting the down power.

ANSWER:

- C. Equalize the reactor coolant system and PZR boron concentrations.

RO #19

SRO #21

K/A #004000K601

OBJECTIVE #003AA4B1

REFERENCES: OTN-BG-00002, "Reactor Makeup Control and Boron Thermal Regeneration System"

SRO Test

QUESTION #002

The plant experiences a sustained loss of all AC power.

Which ONE of the below would be used to makeup to the spent fuel pool due to low spent fuel pool level?

- A. Pressurizer VCT and use Reactor Makeup
- B. Diesel Fire Pump and fire hose
- C. Gravity drain condensate storage tank
- D. Essential service water emergency makeup

ANSWER:

- B. Diesel Fire Pump and fire hose

RO #41

SRO #44

K/A #033000G11

OBJECTIVE #003D220Z

REFERENCES: ECA-0.0, Step 23

SRO Test

QUESTION #003

Which ONE of the below computer data quality codes indicates that the alarm function is still operable?

- A. DALM
- B. DEL
- C. SUB
- D. LRL

ANSWER:

D. LRL

RO #12

SRO #11

K/A #194001A115

OBJECTIVE #003A02D4

REFERENCES: OOA-RJ-00001

SRO Test

QUESTION #004

Preventive Maintenance is scheduled on the 'A' Condensate Pump Motor and its supply breaker PB0304. Which ONE of the following locations MUST be tagged in accordance with the Workman's Protection Assurance Program?

- A. Breaker PB0304 local handswitch
- B. Condensate Pump Discharge Valve
- C. Racking Mechanism for Breaker PB0304
- D. Main Control Board Switch AD-HIS-1

ANSWER:

- C. Racking Mechanism for Breaker PB0304

RO #4

SRO #4

K/A #194001K107

OBJECTIVE #003A330F

REFERENCES: APA-ZZ-00310 Page 20

SRO Test

QUESTION #005

A Reactor Startup is in progress with Control Bank B at 50 steps and Reactor Power at 10^2 CPS.

Which ONE of the following is required if Source Range Nuclear Channel N32 fails high?

- A. Place N32 in the tripped condition within 6 hours.
- B. Verify all Rod Bottom Lights lit.
- C. Verify Shutdown Margin within one hour.
- D. Insert all Control Banks and repair channel N32.

ANSWER:

- B. Verify all Rod Bottom Lights lit.

RO #96

SRO #88

K/A #000032G11

OBJECTIVE #0110280E

REFERENCES: OTO-SE-00001

E-0

Tech Spec 3.3.1

SRO Test

QUESTION #006

The reactor tripped 5 minutes ago.

Which one of the following completes the statement concerning the heat transfer relationship between the RCS and Steam Generators?

The heat transfer rate between the RCS and the S/Gs will:

- A. decrease as RCS temperature increases and AFW flow increases.
- B. decrease as AFW temperature decreases and AFW flow increases.
- C. increase as AFW temperature increases and RCS flow decreases.
- D. increase as RCS temperature increases and AFW flow increases.

ANSWER:

- D. increase as RCS temperature increases and AFW flow increases.

RO #33

SRO #33

K/A #061000K501

OBJECTIVE #003D260R

REFERENCES: T61.003D.6

SRO Test

QUESTION #007

Which ONE of the following is NOT an allowable relaxation for Independent Verification when restoring a system requiring IV?

- A. Comparing the tagout control sheet to current plant reference material (flow diagrams, procedures, etc.) to ensure adequacy of the tagout.
- B. Verifying status lights, annunciators, meter indications, etc. on the main control board that unequivocally depicts the equipment status.
- C. Performing a functional test that verifies that the component is in the specified configuration.
- D. When the concept of ALARA would be violated.

ANSWER:

- A. Comparing the tagout control sheet to current plant reference material (flow diagrams, procedures, etc.) to ensure adequacy of the tagout.

RO #1

SRO #1

K/A #194001K101

OBJECTIVE #003A33A6

REFERENCES: APA-ZZ-00310

SRO Test

QUESTION #008

The Callaway Plant is entering MODE 4 from MODE 3 with the following conditions:

- RCS pressure is being controlled at 650 psig.
- All wide range Cold Leg temperatures are 350°F.
- Cold Overpressure Protection is in ARMED.
- Loop 1 Wide Range Cold Leg temperature sensor, TE413B, fails low.

Which ONE of the following describes the plant response to this failure?

- A. Only PORV 455A will open.
- B. Only PORV 456A will open.
- C. Both PORV 455A and 456A will open.
- D. Neither PORV 455A or 456A will open.

ANSWER:

- B. Only PORV 456A will open.

SRO #51

K/A #010000K403

OBJECTIVE #0110300C

REFERENCES: DWG 8756D37 Sheet 6

SRO Test

QUESTION #009

OTO-ZZ-00001, Control Room Inaccessibility, operate three 'Control Room Isolation Transfer' switches provided on RP-118B which isolate control and indication of the associated devices from the control room.

Which ONE of the following describes the reason for this?

- A. Prevent inadvertent actuation of components which are necessary to safely shutdown the plant.
- B. Initiates a reactor trip and transfer control of the plant to the auxiliary shutdown panel.
- C. Required by Technical Specifications action to ensure that auxiliary shutdown Operability is satisfied.
- D. Transfers alarm and control of pressurizer heaters from the Control Room.

ANSWER:

- A. Prevent inadvertent actuation of components which are necessary to safely shutdown the plant.

RO #71

SRO #69

K/A #000067K304

OBJECTIVE #0110480D

REFERENCES: T61.0110.6 LP-#48

SRO Test

QUESTION #010

The plant is in MODE 3 when a loss of PA02 occurs.

Reactor coolant system pressure will be controlled by:

- A. Steady state heaters and pressurizer spray.
- B. Backup heaters only.
- C. Steady state heater only.
- D. Backup heaters and pressurizer spray.

ANSWER:

- B. Backup heaters only.

SRO #92

K/A #000007A103

OBJECTIVE #0110090J

REFERENCES: OTN-BB-00003
E21001

SRO Test

QUESTION #011

The following conditions exist:

- Containment pressure transmitter PT-937 declared inoperable
- Required Technical Specification Actions have been taken for channel 937

Which ONE of the following statements describes the coincidence for a Containment Spray Actuation to occur and the actions that will result in this coincidence?

- A. 2/3 coincidence after the channel is placed in the TRIP condition, by placing bistable (PB-937A) in the TEST position.
- B. 2/3 coincidence after the channel is placed in the BYPASS condition, by placing bistable (PB-937A) in the TEST position.
- C. 1/3 coincidence after the channel is placed in the TRIP condition, by placing bistable (PB-937A) in the TEST position.
- D. 1/3 coincidence after the channel is placed in the BYPASS condition, by placing bistable (PB-937A) in the TEST position.

ANSWER:

- B. 2/3 coincidence after the channel is placed in the BYPASS condition, by placing bistable (PB-937A) in the TEST position.

RO #23

SRO #24

K/A #013000K502

OBJECTIVE #003A02I2

REFERENCES: T/S 3.3.2 ACTION c, Table 3.3-3 FU 2.c ACTION 16
PRINT 7250D64 S008

SRO Test

QUESTION #012

Following a LOCA, hydrogen concentration in the containment has increased slowly over several days, reaching 1.0 volume per cent.

Which ONE of the following actions should be taken?

- A. One train of the electric hydrogen recombiner system should be placed in service.
- B. Electric hydrogen recombiners should be placed in service when hydrogen concentration reaches 4.0 volume per cent.
- C. Electric hydrogen recombiners cannot be placed in service. Heater operating temperature on the recombiner exceeds ignition temperature for hydrogen at this concentration.
- D. Both trains of electric hydrogen recombiners should be placed in service in conjunction with a containment purge.

ANSWER:

- A. One train of the electric hydrogen recombiner system should be placed in service.

RO #63

SRO #42

K/A #C28000K501

OBJECTIVE #0110400J

REFERENCES: OTN-GS-00001

E-1

SRO Test

QUESTION #013

Which ONE (1) of the following indications DOES NOT have a revised limit during adverse containment?

- A. S/G wide range level
- B. RCS subcooling meters
- C. S/G pressure
- D. Pressurizer level

ANSWER:

- C. S/G pressure

SRO #77

K/A #000011A114

OBJECTIVE #003D040N

REFERENCES: E-0

SRO Test

QUESTION #014

The following plant conditions exist:

- Reactor Power at 100%.
- RCS pressure 2235 psig.
- Tavg is 584°F.
- Thermal bearing cooling water inlet temperature is 104°F.
- Seal Injection flow is lost.

Which ONE (1) of the following describes a condition which would require tripping a RCP?

- A. #1 seal leakoff rate 5.5 gpm
- B. Shaft Vibration 14 mils
- C. #2 Seal Delta P of 35 psid
- D. #1 Seal and Bearing Inlet temperature 239°F

ANSWER:

- D. #1 Seal and Bearing Inlet temperature 239°F

SRO #74

K/A #000015A210

OBJECTIVE #003B150B

REFERENCES: OTO-BB-00002

SRO Test

QUESTION #015

Which ONE of the following Area Radiation Monitors is required by Technical Specifications?

- A. Containment Area Radiation Monitor SDRE0041
- B. New Fuel Storage Area Radiation Monitor SDRE0035
- C. Control Room Area Radiation Monitor SDRE0033
- D. Cask Handling Area Radiation Monitor SDRE0034

ANSWER:

- B. New Fuel Storage Area Radiation Monitor SDRE0035.

RO #36

SRO #34

K/A #072000K302

OBJECTIVE #0110360G

REFERENCES: T/S 3.3.1, Table 3.3-6 FU 2.b.(2)
Callaway Bank

SRO Test

QUESTION #016

Which ONE of the following class 1E 125VDC Electrical System Lineups can be performed to satisfy MODE 1 Technical Specification LCO?

- A. LC NG01 to Swing Charger NK25 to bus NK04
- B. LC NG04 to Swing Charger NK26 to bus NK02
- C. LC NG01 to Swing Charger NK26 to bus NK03
- D. LC NG04 to Swing Charger NK25 to bus NK01

ANSWER:

- B. LC NG04 to Swing Charger NK26 to bus NK02

SRO #36

K/A #063000K402

OBJECTIVE #0110060A

REFERENCES: OTN-NK-00001

SRO Test

QUESTION #017

The crew implemented FR-C.1, Response to Inadequate Core Cooling.

Which one of the following combinations of core exit thermocouples and indicated temperatures would require starting RCP's, even if the normally required support conditions could not be met?

	# of TC's	Indicated Temp
A.	2	2450°F
B.	4	1750°F
C.	6	1350°F
D.	8	750°F

ANSWER:

C. 6 1350°F

RO #27

SRO #27

K/A #017020A402

OBJECTIVE #003D250E

REFERENCES: FR-C.1 Background

SRO Test

QUESTION #018

Callaway Plant is preparing for Reactor Core Offload with Refueling Pool Level at 391 inches (2046 ft. level). The polar crane operator inadvertently lifts the Reactor Vessel Upper Internals out of the water and causes a Hi Hi alarm on Containment Building Area Radiation Monitor SDRE0040.

Which ONE of the following is a required Immediate Action?

- A. Close ECV0995, Fuel Transfer Tube Isolation Valve.
- B. Initiate a Containment Purge Isolation Signal (CPIS).
- C. Transfer the Charging Pump suction to the RWST and increase flow.
- D. Evacuate personnel from containment.

ANSWER:

- D. Evacuate personnel from containment.

RO #94

SRO #91

K/A #000061G09

OBJECTIVE #003E05I4

REFERENCES: OTO-KE-00001
OTA-RL-RK062, Att. A

SRO Test

QUESTION #019

FR-S.1 "Response to Nuclear Power Generation/ATWS" Step 2 requires a turbine trip. Why would it be desirable to trip the turbine if a reactor trip had not been achieved? (Choose ONE)

- A. The reactor will be subcritical due to manual rod insertion before the turbine is tripped.
- B. Tripping the turbine will conserve SG inventory and limit the pressure transient that would result from a loss of all feedwater.
- C. Tripping the turbine will insert negative reactivity from moderator temperature coefficient, thus assisting in reactor shutdown.
- D. Tripping the turbine will generate an additional reactor trip signal and suppress core void formation by increasing RCS pressure.

ANSWER:

- B. Tripping the turbine will conserve SG inventory and limit the pressure transient that would result from a loss of all feedwater.

RO #86

SRO #61

K/A #000029K312

OBJECTIVE #003D290C

REFERENCES: T61.003D.6 LP-#29

SRO Test

QUESTION #020

Which ONE (1) of the following is the HIGHEST RCS pressure at which the Safety Injection Pumps will deliver water to the RCS?

- A. 1050 psig
- B. 1250 psig
- C. 1450 psig
- D. 1650 psig

ANSWER:

- C. 1450 psig

RO #43

SRO #38

K/A #006000K603

OBJECTIVE #0110170A

REFERENCES: E-0

T61.0110.6 LP-#17

SRO Test

QUESTION #021

While performing actions in E-3, "Steam Generator Tube Rupture" the Control Room Supervisor asks the Balance of Plant Operator to check intact Steam Generator narrow range levels greater than 4%. Which ONE of the following BOP responses would satisfy Callaway Plant Communication Guidelines?

- A. Yes, intact Steam Generator narrow range levels are greater than 4%.
- B. Yes, intact Steam Generator narrow range levels are 50% and stable.
- C. Yes, intact Steam Generator narrow range levels are increasing.
- D. Yes, intact Steam Generator narrow range levels are 10%.

ANSWER:

- B. Yes, intact Steam Generator narrow range levels are 50% and stable.

RO #8

SRO #7

K/A #194001A105

OBJECTIVE #003A060H

REFERENCES: Callaway Plant Policy 2.3.4, Guidelines for Verbal Communications
Pages 2 and 4

SRO Test

QUESTION #022

Given the following:

- The Main Turbine tripped from 95% power.
- All systems responded normally to the trip.

Which ONE (1) of the following is the expected position of the steam dump valves with Tavg at 575°F?

	Full Open	Modulating	Full Closed
A.	12	0	0
B.	9	3	0
C.	6	3	3
D.	3	3	6

ANSWER:

C.	6	3	3
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RO #57

SRO #55

K/A #041020K418

OBJECTIVE #0110200J

REFERENCES: T61.0110.6 LP-#20

SRO Test

QUESTION #023

A plant startup is in progress with power indicating 1E-6% on both IR channels. Which one of the following will occur if IR channel N36 fails to 21%?

- A. IR high flux reactor trip
- B. Manual and automatic rod stop
- C. PZR low pressure reactor trip is unblocked
- D. PR low flux reactor trip

ANSWER:

- B. Manual and automatic rod stop

RO #95

SRO #87

K/A #000033A202

OBJECTIVE #0110260J

REFERENCES: OTO-SE-00002

SRO Test

QUESTION #024

Given the following conditions:

- RCS WR Pressure = 1635 psig
- Pressurizer Pressure = 1710 psig
- RCS C.L. Temperature = 560°F
- Core Exit TC = 568°F

Which one of the following is the correct amount of subcooling for the above conditions?

- A. 38
- B. 41
- C. 47
- D. 49

ANSWER:

- B. 41

RO #39

SRO #37

K/A #002000K509

OBJECTIVE #003D070S

REFERENCES: Steam Table

SRO Test

QUESTION #025

A permit required confined space entry is to be conducted at the Water Treatment Plant blowdown line manhole.

Which ONE of the below is true regarding this entry?

- A. The attendant may enter the space if necessary, to rescue the entrant.
- B. The work supervisor must be present whenever personnel are in the confined space.
- C. Each entrant shall use a chest or full body harness.
- D. The Medical Emergency Response Team will perform any emergency rescue if necessary.

ANSWER:

- C. Each entrant shall use a chest or full body harness.

SRO #15

K/A #194001K113

OBJECTIVE #003A30G3

REFERENCES: APA-ZZ-00802

SRO Test

QUESTION #026

With the plant in MODE 1, AND either safety related CCP INOPERABLE, RCP Seal Injection should be provided by the _____ which will maintain seal cooling in the event of a _____.

- A. Non-safety related charging pump, CCW thermal barrier leak.
- B. Non-safety related charging pump, loss of a single electrical bus.
- C. Opposite train safety related CCP, CCW thermal barrier leak.
- D. Opposite train safety related CCP, loss of a single electrical bus.

ANSWER:

- B. Non-safety related charging pump, loss of a single electrical bus.

RO #20

SRO #22

K/A #004000K202

OBJECTIVE #003A04A1

REFERENCES: OTN-BG-00001

QUESTION #027

Which ONE of the following describes the tagout control used for the temporary operation of equipment that is protected under a Hold Off.

- A. The tags shall be cleared prior to operation then a new tagout written and new tags hung.
- B. The tags may be lifted and reused after operation providing a briefing is held and the individual signed on the WPA is present at the component to be checked.
- C. With Shift Supervisor and Requester approval and equipment may be operated without clearing the tags, if the requester is in the equipment area and operation completed in the same shift.
- D. The tags which must be cleared to allow for the operation can be temporarily cleared, replaced with Caution Tags until the operation is complete, then the Caution Tags replaced with new Hold Off Tags.

ANSWER:

- B. The tags may be lifted and reused after operation providing a briefing is held and the individual signed on the WPA is present at the component to be checked.

RO #2

SRO #2

K/A #194001K102

OBJECTIVE #003A330L

REFERENCES: ODP-ZZ-00310 Page 10

SRO Test

QUESTION #028

During operations at 95% power and pressurizer level at 48%, the Tave input to the pressurizer level controller fails low. What INDICATIONS does the operator have that the Tave input failed low?

- A. Backup heaters are energized, charging flow control valve slowly closes, high level deviation alarm actuates.
- B. Backup heaters are deenergized, charging flow control valve slowly opens, low level deviation alarm actuates.
- C. Backup heaters are energized, charging flow control valve slowly opens, low level deviation alarm actuates.
- D. Backup heaters are deenergized, charging flow control valve slowly closes, high level deviation alarm actuates.

ANSWER:

- A. Backup heaters are energized, charging flow control valve slowly closes, high level deviation alarm actuates.

RO #40

SRO #39

K/A #011000A203

OBJECTIVE #0110090C

REFERENCES: OTO-BB-00004

SRO Test

QUESTION #029

Plant conditions:

- Operating in MODE 1, at 100% power.
- SJ-RE-01, CVCS Letdown Monitor, Alarming Hi/Hi
- SD-RE-20, AB 2000 Area, Alarming Hi/Hi

Which ONE of the following operator actions is required per OTO-BB-00005, RCS High Activity?

- A. Reduce power
- B. Isolate letdown
- C. Increase letdown to 120 gpm
- D. Initiate hourly sampling of the RCS

ANSWER:

- C. Increase letdown to 120 gpm

RO #76

SRO #73

K/A #000076G008

OBJECTIVE #003B180A

REFERENCES: OTO-BB-00005

SRO Test

QUESTION #030

Given the following conditions:

- Tavg is 576°F
- Pressurizer Pressure is 2240 psig
- Charging Flow is being controlled in MANUAL
- The BACKUP HEATERS have just ENERGIZED

Which ONE of the following is the actual pressurizer level?

- A. 37%
- B. 42%
- C. 47%
- D. 52%

ANSWER:

- D. 52%

RO #98

SRO #98

K/A #000028A201

OBJECTIVE #0110300K

REFERENCES: T61.0110.6 LP-#30

SRO Test

QUESTION #031

A Ruptured Steam Generator has been cooled down and depressurized. ECCS pumps have been secured and Normal Charging and Letdown have been established.

Plant Conditions:

- PZR Level 30% and DECREASING
- Ruptured S/G NR Level INCREASING

Which ONE of the following is required to balance inventory?

- A. Depressurize the RCS
- B. Increase RCS Makeup Flow
- C. Turn on Pressurizer Heaters
- D. Decrease RCS Makeup Flow

ANSWER:

- A. Depressurize the RCS

RO #85

SRO #90

K/A #000038K306

OBJECTIVE #003D17JJ

REFERENCES: T61.003D.6 LP-#17

SRO Test

QUESTION #032

Which of the following is NOT an event the MSIVs are used to protect against?

- A. Steam Line Break inside Containment
- B. Feedwater Line Break upstream of check valve
- C. Steam Line Break outside Containment
- D. Steam Generator Tube Rupture

ANSWER:

- B. Feedwater Line Break upstream of check valve

SRO #52

K/A #035010K601

OBJECTIVE #0110200A

REFERENCES: T61.0110.6 LP-#20

SRO Test

QUESTION #033

With the plant in MODE 1 the Shift Supervisor is notified by Security that a confirmed penetration has occurred by unauthorized personnel into the NB01 switchgear room. The Plant Emergency Alarm is sounded and a CODE RED is announced over the Gai-tronics.

Which ONE of the below may be performed during the initial response by Control Room personnel?

- A. Evacuate all unnecessary personnel, shut the Control Room Missile Door, and notify the NRC of 10CFR50.54(x) implementation within ONE hour.
- B. Trip the Reactor, commence RCS cooldown at the Technical Specification limit, and declare an Unusual Event.
- C. Shut the Control Room Missile Door, have all Equipment Operators report to the Field Office, and declare an ALERT.
- D. Declare an ALERT, trip the Reactor, and notify the NRC of 10CFR50.54(x) implementation within ONE hour.

ANSWER:

- D. Declare an ALERT, trip the Reactor, and notify the NRC of 10CFR50.54(x) implementation within ONE hour.

SRO #13

K/A #194001A116

OBJECTIVE #003B280B

REFERENCES: EIP-ZZ-00102, Att. 1
OTO-SK-00001

SRO Test

QUESTION #034

A normal plant heatup is in progress per OTG-ZZ-00001 with the following plant conditions:

- RCS pressure 1835 psig
- RCS pressurization rate 15 psig/min
- RCS temperature 485°F
- RCS heat up rate 10°F/hr
- S/G pressure 575 psig

If the current trend continues, which ONE of the following occur FIRST?

- A. Main Steam Isolation Valves close.
- B. Pressurizer PORV's open.
- C. Low Pressurizer Pressure Safety Injection.
- D. First group of steam dumps throttle open.

ANSWER:

- A. Main Steam Isolation Valves close.

RO #21

SRO #25

K/A #013000K403

OBJECTIVE #0110520B

REFERENCES: OTG-ZZ-00001, "Plant Heatup Cold Shutdown to Hot Standby"

SRO Test

QUESTION #035

Which ONE of the following conditions satisfies the Technical Specification 3.5.5, "Refueling Water Storage Tank", requirement for an operable RWST in MODE 1?

	Borated Water Volume	Boron Concentration	Solution Temperature
A.	375,000 gallons	2400 ppm	80°F
B.	375,000 gallons	2000 ppm	95°F
C.	395,000 gallons	2400 ppm	40°F
D.	395,000 gallons	2500 ppm	105°F

ANSWER:

C.	395,000 gallons	2400 ppm	40°F
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SRO #79

K/A #000024A204

OBJECTIVE #0110560J

REFERENCES: TS 3.5.5

SRO Test

QUESTION #036

A surveillance to be performed on a piece of equipment having a contact reading of 50 R/hr in a room with a general area radiation reading of 125 mR/hr, would require entry into a:

- A. Danger High Radiation Area
- B. Caution High Radiation Area
- C. Danger High Radiation Area Radiological Exclusion Area
- D. Very High Radiation Area.

ANSWER:

- B. Caution High Radiation Area

RO #3

SRO #3

K/A #194001K103

OBJECTIVE #003A31F3

REFERENCES: APA-ZZ-01000 Page 6

SRO Test

QUESTION #037

Technical Specification 3/4.2.4 "Quadrant Power Tilt Ratio" (QPTR) lists required actions that must be accomplished if QPTR exceeds specified limits for more than 2 hours. Which of the following is the basis for the 2 hour time limit?

- A. To allow time for identification and correction of a dropped/misaligned control rod.
- B. To allow time for identification and correction of a malfunctioning power range instrument.
- C. To allow time for testing, identification and correction of power cabinet multiplexing circuits.
- D. To allow sufficient time for control rod response time testing of the malfunctioning solid state protection circuits.

ANSWER:

- A. To allow time for identification and correction of a dropped/misaligned control rod.

SRO #76

K/A #000003G07

OBJECTIVE #003AA3A2

REFERENCES: TS 3/4.2.4 Bases

SRO Test

QUESTION #038

Which ONE of the following is the basis for the Technical Specification limit on total steam generator tube leakage of 600 gpd for all steam generators?

- A. A limited amount of leakage is expected and this threshold value is sufficiently low to ensure early detection of additional leakage.
- B. To ensure that the dosage contribution from the tube leakage will be acceptable in the event of either a steam generator tube rupture or steam line break.
- C. This is a known source which can be readily detected by radiation monitors on steam generator blowdown so it will not interfere with detection of leakage from other sources.
- D. To ensure that the steam generator tube integrity is maintained in the event of a main steam line rupture or under LOCA conditions.

ANSWER:

- B. To ensure that the dosage contribution from the tube leakage will be acceptable in the event of either a steam generator tube rupture or steam line break.

SRO #93

K/A #000037G05

OBJECTIVE #003AA2I3

REFERENCES: TS 3/4.4.6.2 Bases

SRO Test

QUESTION #039

During a loss of all AC while performing ECA-0.0, Loss of All A.C. NK11 battery discharge amps is at 300 amps.

Which ONE of the following is the MAXIMUM time that NK01 could be predicted to be Operable assuming the battery was fully charged initially?

- A. 2 hours
- B. 4 hours
- C. 6 hours
- D. 8 hours

ANSWER:

- B. 4 hours

RO #67

SRO #65

K/A #000055K101

OBJECTIVE #003D220V

REFERENCES: E21NK01

SRO Test

QUESTION #040

A Reactor Trip has just occurred. The following conditions are found while performing Step 3 of E-0, Reactor Trip or Safety Injection:

- NB01 energized from Emergency Diesel NE-01
- NB02 deenergized (no lockout)

Which ONE of the following describes the required action and basis for that action?

- A. Transition to ECA-0.0, Loss of all AC Power because E-0 assumes that Offsite Power is Available.
- B. Attempt to restore power to NB02 while continuing with E-0 because it is desirable to have power to all AC Emergency buses.
- C. Attempt to restore Off Site Power to BOTH NB buses because E-0 assumes that Off Site Power is Available.
- D. Do not make attempts to restore NB02 because it will delay the operator action and only one NB bus is assumed energized by E-0.

ANSWER:

- B. Attempt to restore power to NB02 while continuing with E-0 because it is desirable to have power to all AC Emergency buses.

RO #99

SRO #99

K/A #000056K302

OBJECTIVE #003D040E

REFERENCES: T61.003D.6 LP-#4

SRO Test

QUESTION #041

A periodic load test is being performed on NE02, Standby Diesel Generator 'B' in accordance with OSP-NE-0001B. NE02 has been paralleled with 4160V Bus NB02 and is carrying 6 MW of real load. A Main Steamline break occurs and containment pressure increases to 20 (twenty) psig.

Which ONE of the following describes the response of the Load Shedding Emergency Load Sequencing System (LSELS)?

- A. The LOCA Sequencer starts the Containment Spray Pumps at Step 3 (Time 15 seconds).
- B. The Shutdown Sequencer starts the 'A' Essential Service Water Pump at Step 5 (Time 25 seconds).
- C. The LOCA Sequencer starts the Safety Injection Pumps at Step 1 (Time 5 seconds).
- D. The Shutdown Sequencer starts the Residual Heat Removal Pumps at Step 2 (Time 10 seconds).

ANSWER:

- C. The LOCA Sequencer starts the Safety Injection Pumps at Step 1 (Time 5 seconds).

RO #50

SRO #46

K/A #064000A307

OBJECTIVE #0110510F

REFERENCES: T61.0110.6 LP-#51

SRO Test

QUESTION #042

WHICH of the following red paths is MOST LIKELY to occur for a steam line break on a single S/G outside containment, resulting in a reactor trip and SI? (Assume that all safeguards equipment functions as designed.)

- A. Response to Inadequate Core Cooling (FR-C.1)
- B. Response to Loss of Secondary Heat Sink (FR-H.1)
- C. Response to Imminent Pressurized Thermal Shock Condition (FR-P.1)
- D. Response to High Containment Pressure (FR-Z.1)

ANSWER:

- C. Response to Imminent Pressurized Thermal Shock Condition (FR-P.1)

RO #70

SRO #63

K/A #000040K101

OBJECTIVE #003D280A

REFERENCES: T61.003D.6

SRO Test

QUESTION #043

A plant cooldown is initiated following a reactor trip using the AUX FEED system and S/G PORV's. The CST level is initially at 87% (407,000 gal).

Which ONE of the following is the time available until CST level decreases to the MODE 3 Technical Specification limit with AUX feed flow at 300,000 lbm/hr. (8.345 lbm/gal)

- A. 3.5 hr.
- B. 4.0 hr.
- C. 4.5 hr.
- D. 5.0 hr.

ANSWER:

- A. 3.5 hr.

RO #34

SRO #31

K/A #061000A104

OBJECTIVE #0110250E

REFERENCES: T/S 3.7.1.3
Tank Book TDB-001

SRO Test

QUESTION #044

Which ONE of the following events is required to be recorded in the RO Narrative Logs?

- A. Chemical addition to the condensate system.
- B. Security Event due to Security System (SAS) malfunction.
- C. Annunciator switchyard carrier potential/tone loss, alarms.
- D. Unexpected ESFAS alarm on ESW system.

ANSWER:

- D. Unexpected ESFAS alarm on ESW system.

RO #9

SRO #8

K/A #194001A106

OBJECTIVE #003A02B1

REFERENCES: ODP-ZZ-00006, Section 4.3

SRO Test

QUESTION #045

Given the following information:

- Train A Emergency Diesel Generator became inoperable one hour ago.
- 92% Power Operation.

Which ONE (1) of the following statements describes the operability of the other A train equipment?

- A. All systems, equipment, components, or devices which normally receive emergency power from the train A Emergency Diesel Generator are also inoperable.
- B. All systems, equipment, components, or devices which normally receive emergency power from the train A Emergency Diesel Generator are also inoperable, except those which are powered by an operable battery.
- C. The operability of the remaining train A equipment is not impacted, but the train B equipment and the TDAFP are required to be verified operable per Technical Specification 3.8.1.1.
- D. The operability of the remaining train A equipment is not impacted, except for the ESF electrical bus that the Emergency Diesel Generator supports.

ANSWER:

- C. The operability of the remaining train A equipment is not impacted, but the train B equipment and the TDAFP are required to be verified operable per Technical Specification 3.8.1.1.

SRO #53

K/A #062000G008

OBJECTIVE #0110060G

REFERENCES: TS 3.8.1.1
TSI 48

SRO Test

QUESTION #046

Which ONE of the following is the preferred method of injecting highly borated water into the RCS during an ATWS?

- A. Manually align Charging Pump suction to the RWST.
- B. Borate through BGV0177, Alternate Immediate Boration Valve.
- C. Manually initiate a Safety Injection from RL001.
- D. Borate through BG-HV-8104, Emergency Borate to Charging Pumps Suction Valve.

ANSWER:

- D. Borate through BG-HV-8104, Emergency Borate to Charging Pumps Suction Valve.

SRO #80

K/A #000029G11

OBJECTIVE #003D290B

REFERENCES: FR-S.1

SRO Test

QUESTION #047

The plant has experienced a large break RCS loss of coolant accident.

Which ONE of the following must be reset to allow opening KAHV0029, Instrument Air Ctmnt Isolation?

- A. CISA
- B. CISB
- C. SIS
- D. FBVIS

ANSWER:

- A. CISA

RO #24

SRO #23

K/A #013000A201

OBJECTIVE #003B480A

REFERENCES: E-0, Reactor Trip/Safety Injection
M22KA01

SRO Test

QUESTION #048

Callaway Plant is in MODE 1, 30% Reactor Power on a Chemistry hold. Annunciator 70B, "RCP VIB/SYS ALERT" alarms. The Reactor Operator checks vibrations on RP312 and finds 'C' RCP shaft vibration indicating 15 mils and steady.

Which one of the following is the required action.

- A. Trip the Reactor, Trip 'C' RCP and go to E-0, Reactor Trip or SI.
- B. Continue to monitor vibration on the 'C' RCP.
- C. Trip the 'C' RCP and declare the Loop 3 RTD channel inoperable.
- D. Increase Component Cooling Water temperature to reduce 'C' RCP vibration.

ANSWER:

- B. Continue to monitor vibration on the 'C' RCP.

RO #18

SRO #20

K/A #003000G10

OBJECTIVE #003B150B

REFERENCES: OTO-BB-00002

SRO Test

QUESTION #049

Which one of the following areas does NOT have restricted access as part of RCS Reduced Inventory Controls?

- A. Electrical Penetration Rooms on the AB 2026'
- B. Switchyard
- C. Around the MA cabinets on TB 2033' level
- D. NB Switchgear Rooms

ANSWER:

- A. Electrical Penetration Rooms on the AB 2026'

SRO #14

K/A #194001K105

OBJECTIVE #003EE20B

REFERENCES: OTN-BB-00002, Step 5.2.1.3

SRO Test

QUESTION #050

In FR-H.5, Response to Steam Generator Low Level, AFW flowrate is procedurally restricted to 50,000 lbm/hr when recovering a steam generator level if the level has fallen below 24% wide range indication?

Which ONE of the following indicates why?

- A. Minimize thermal stress conditions on steam generator components.
- B. Minimize RCS cooldown rate and prevent resultant thermal stress on RCS components.
- C. Ensure RCS inventory demand does not exceed normal charging pump capacity.
- D. Ensure pressurizer level transient does not result in pressure transient that would actuate SI.

ANSWER:

- A. Minimize thermal stress conditions on steam generator components.

SRO #94

K/A #000054K102

OBJECTIVE #0110260S

REFERENCES: T61.0110.6, LP-#26

SRO Test

QUESTION #051

A 30 gpm leak has developed on the charging line between BG-HCV-182 (CVCS CHG PMPS TO REGEN HX HCV) and the regenerative heat exchanger. When the Control Room isolates the leak and completes the applicable Off-Normal procedures, the reactor makeup flowpath will be via _____, and the reactor letdown flowpath will be via _____.

Choose ONE of the following to fill in the blanks.

- A. normal charging; normal letdown
- B. normal charging; excess letdown
- C. seal injection; excess letdown
- D. seal injection; normal letdown

ANSWER:

- C. seal injection; excess letdown

RO #90

SRO #84

K/A #000022A101

OBJECTIVE #003B220B

REFERENCES: OTO-BG-00002
OTO-BB-00003

SRO Test

QUESTION #052

Given the following conditions:

- RCS at NOP/NOT for 100% RTP,
- PORV 456A has seat leakage to the PRT,
- PRT pressure is 20 PSIG
- Use steam tables provided.

Which ONE of the following is the approximate tailpipe temperature?

- A. 212°F
- B. 228°F
- C. 248°F
- D. 258°F

ANSWER:

- D. 258°F

RO #58

SRO #54

K/A #007000A201

OBJECTIVE #0070130B

REFERENCES: Steam Table

SRO Test

QUESTION #053

The Callaway Plant is in MODE 3 at NOP and NOT. An earthquake ruptures the Condensate Storage Tank and causes a steam break on 'C' S/G. The following conditions exist:

SG A, B & D NR Level	45%
SG C NR Level	10%
SG A, B, & D Press	900 psig
SG C Press	300 psig
AFW Suction Press	4 psig

Which one of the following describes the flow of feedwater to the Steam Generators?

- A. CST to 'A' MDAFP to 'C' S/G
- B. UHS to 'B' MDAFP to 'A' S/G
- C. CST to TDAFP to 'B' S/G
- D. UHS to 'A' MDAFP to 'D' S/G

ANSWER:

- B. UHS to 'B' MDAFP to 'A' S/G

RO #35

SRO #32

K/A #061000A303

OBJECTIVE #0110250D

REFERENCES: T61.0110.6

QUESTION #054

With the plant at 40% power which one of the below would be TRUE regarding operation of the ATWS Mitigation Actuation Circuitry (AMSAC)?

- A. If S/G Levels decrease to less than 5% on 2 of 3 AMSAC logic circuits, then a Turbine Trip and MD AFAS, are actuated 25 seconds later.
- B. If S/G Levels decrease to less than 5% on 1 of 2 AMSAC logic circuits, then a Turbine Trip and MD AFAS, are actuated 232 seconds later.
- C. If S/G Levels decrease to less than 14.8% on 2 of 3 AMSAC logic circuits, then a Turbine Trip and MD AFAS, are actuated 25 seconds later.
- D. If S/G Levels decrease to less than 14.8% on 1 of 2 AMSAC logic circuits, then a Turbine Trip and MD AFAS, are actuated 232 seconds later.

ANSWER:

- A. If S/G Levels decrease to less than 5% on 2 of 3 AMSAC logic circuits, then a Turbine Trip and MD AFAS, are actuated 25 seconds later.

RO #22

SRO #30

K/A #001000GK04

OBJECTIVE #0110540B

REFERENCES: OTA-RL-0083A
E23AC11

SRO Test

QUESTION #055

Liquid Radwaste Discharge Monitor (HDRE18) alarms on the RM-11 in dark blue condition.

Which ONE of the below could be the cause?

- A. Loss of Sample Flow
- B. Loss of Process Flow
- C. Monitor Purging
- D. Channel No Pulses Received

ANSWER:

- D. Channel No Pulses Received

RO #97

SRO #68

K/A #000059A201

OBJECTIVE #0110360B

REFERENCES: OTN-SP-00002
OTA-SP-RM011

SRO Test

QUESTION #056

Following a safety injection due to a RCS leak in containment, plant conditions are established that meet the SI termination criteria of E-1, Loss of Reactor or Secondary Coolant.

Which ONE of the below is true regarding these plant conditions?

- A. All safety related equipment is Operable as required by Technical Specifications.
- B. Reactor core decay heat is being removed by the steam generators.
- C. If SI is NOT terminated, core uncover and subsequent loss of cooling may occur.
- D. Steam Generator pressure are approximately equal to RCS pressure.

ANSWER:

- B. Reactor core decay heat is being removed by the steam generators.

RO #82

SRO #83

K/A #000009K324

OBJECTIVE #003D090J

REFERENCES: ES-1.1 SI Termination

SRO Test

QUESTION #057

Which ONE of the following valves fail open on a loss of instrument air?

- A. Steam Generator Atmospheric Relief
- B. Main Feed Regulating Bypass Valves
- C. Main Feed Pump Recirc Valve
- D. Heater Drain Pump Recirc Valve

ANSWER:

D. Heater Drain Pump Recirc Valve

RO #64

SRO #56

K/A #078000K302

OBJECTIVE #003B330A

REFERENCES: OTO-KA-00001

SRO Test

QUESTION #058

An automatic preaction sprinkler system "trouble" alarm would indicate:

- A. a deluge valve actuation
- B. an alarm check valve operation
- C. a fire detector in alarm condition
- D. an open sprinkler head

ANSWER:

- D. an open sprinkler head

RO #47

SRO #50

K/A #086000A402

OBJECTIVE #0110350C

REFERENCES: T61.0110.6 LP-#35
Callaway Bank

SRO Test

QUESTION #059

Given the following conditions:

- A low-pressure SI has occurred due to a LOCA in containment.
- Containment pressure is at 10 psig and increasing at 1 psig/minute.
- Normal Feeder breaker NB0209 was inadvertently opened causing a loss of power on ESF bus NB02.
- ESF bus NB01 has remained energized from Normal Feeder NB0112
- The original SI signal has not been reset.

AT THE SAME TIME that breaker NB0211 closed in, reenergizing bus NB02 from NE02 diesel generator, a containment spray (CS) actuation signal was generated.

Assuming all interlocks are met, WHICH ONE of the following combinations states the times at which the CS pumps will start?

A CS Pump B CS Pump

- A. Immediately Immediately
- B. Immediately 15 seconds
- C. 15 seconds 15 seconds
- D. 15 seconds 40 seconds

ANSWER:

- B. Immediately 15 seconds

SRO #35

K/A #026000A301

OBJECTIVE #0110510F

REFERENCES: E22NF01

SRO Test

QUESTION #060

Which ONE of the following should be performed by any individual discovering a fire?

- A. Notify Control Room, then use any available fire fighting equipment, then report to Fire Brigade Leader.
- B. First attempt extinguishment using closest available extinguisher, then call Control Room if unsuccessful.
- C. First attempt extinguishment using closest available extinguisher then report to Fire Brigade Staging Area.
- D. Notify Control Room, then use closest available extinguisher, if practical, then report to Fire Brigade Leader.

ANSWER:

- D. Notify Control Room, then use closest available extinguisher, if practical, then report to Fire Brigade Leader.

RO #5

SRO #5

K/A #194001K116

OBJECTIVE #003A30F3

REFERENCES: EIP-ZZ-00226, Att. 2

SRO Test

QUESTION #061

Which ONE of the below shows the correct speed settings for the TD AFW pump?

	IDLE SPEED	NORMAL OPERATING SPEED	OVERSPEED
A.	1200 rpm	3850 rpm	4235 rpm
B.	1200 rpm	3550 rpm	4435 rpm
C.	1500 rpm	3850 rpm	4235 rpm
D.	1500 rpm	3550 rpm	4435 rpm

ANSWER:

A.	1200 rpm	3850 rpm	4235 rpm
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RO #38

SRO #45

K/A #039000A404

OBJECTIVE #0110250C

REFERENCES: OSP-AL-P0002

SFO Test

QUESTION #062

The plant is in MODE 3 at Normal operating pressure and temperature, Train 'A' COPS has inadvertently been left ARMED for Cold Overpressure Protection.

The selected pressurizer pressure channel, BBPT455 subsequently fails high.

With no operator actions, which ONE of the following is TRUE?

- A. PORV 455 initially opens, then closes when actual PZR Pressure decreases to <2185 psig.
- B. PORV 455 stays closed initially but will function as required for COPS.
- C. PORV 455 initially opens and stays open when actual PZR pressure decreases to <2185 psig.
- D. PORV 455 stays closed initially and PORV BLOCK VALVE(8000A) closes when actual PZR pressure decreases to <2185 psig.

ANSWER:

- A. PORV 455 initially opens, then closes when actual PZR Pressure decreases to <2185 psig.

RO #74

SRO #86

K/A #00027A101

OBJECTIVE #003B190A

REFERENCES: 7250D64

Sheet 17

SRO Test

QUESTION #063

Which ONE of the following is the reason for depressurizing the Steam Generators at the maximum rate during ECA-0.0, "Loss of All AC Power"?

- A. To prevent inadvertent reactor re-start.
- B. To minimize RCS inventory loss.
- C. To enhance restoration of SG level from TD AFW Pump.
- D. To prevent lifting PZR PORVs.

ANSWER:

- B. To minimize RCS inventory loss.

RO #68

SRO #66

K/A #000055K302

OBJECTIVE #003D220S

REFERENCES: T61.003D.6

SRO Test

QUESTION #064

Given the following:

- Callaway is operating at 30% steady state reactor power.
- I&C technician receives permission to perform a calibration on Power Range Channel N-41.
- The I&C technician mistakenly pulls the control power fuses on N-42; then, realizing his mistake, he reinserts the fuses for N-42 and pulls the control power fuses for the correct channel, N-41, causing a reactor trip.

Which ONE (1) of the following describes the reason for the reactor trip?

- A. PR neutron flux low setpoint trip.
- B. Overpower Delta T trip.
- C. PR neutron flux high setpoint trip.
- D. PR positive rate trip.

ANSWER:

- D. PR positive rate trip.

RO #53

SRO #41

K/A #012000K603

OBJECTIVE #0110270D

REFERENCES: T61.0110.6 LP-#27

SRO Test

QUESTION #065

Which ONE of the below conditions would require containment coolers to be operated in SLOW speed?

- A. Service Water Temperature <60°F
- B. ESW Supplying Containment
- C. Emergency Diesel Supplying NB Bus
- D. Containment Temperature <80°F

ANSWER:

- A. Service Water Temperature <60°F

RO #28

SRO #29

K/A #022000A101

OBJECTIVE #003A200I

REFERENCES: OTN-GN-00001

SRO Test

QUESTION #066

Prior to opening the Reactor Trip Breakers during a plant shutdown, the crew is directed to reduce the inservice MFP speed to 3650 RPM in anticipation of a Feedwater Isolation Signal.

Using the attached graph, determine which one of the following is the minimum flowrate required to provide pump protection for this speed.

- A. 1500 Klbm/hr
- B. 1750 Klbm/hr
- C. 2000 Klbm/hr
- D. 2250 Klbm/hr

ANSWER:

- C. 2000 Klbm/hr

RO #10

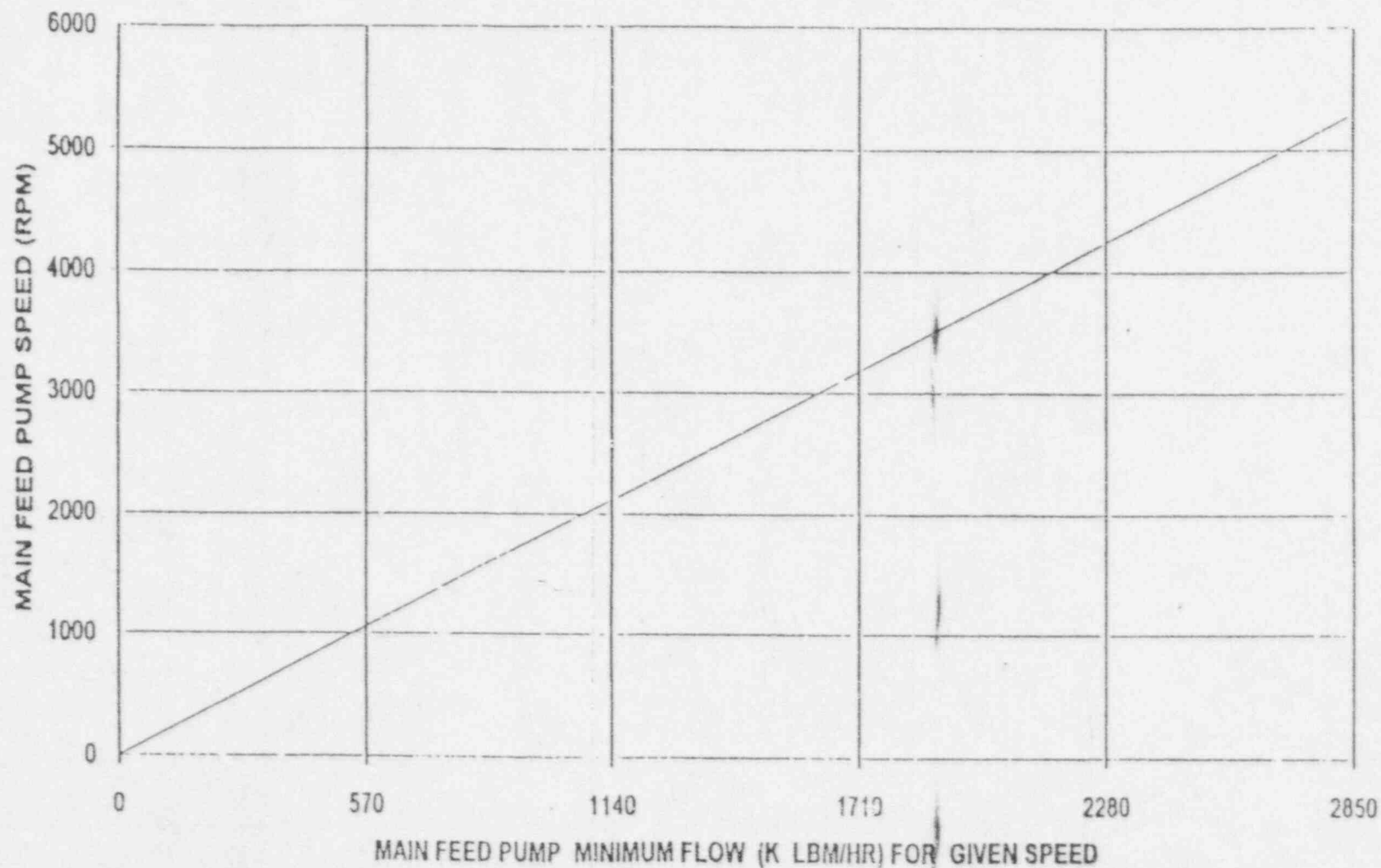
SRO #9

K/A #194001A108

OBJECTIVE #003A040E

REFERENCES: OTN-AE-00001, Att. 4

MAIN FEED PUMP MINIMUM FLOW (LBM/HR VS. RPM)--MINIMUM FLOW AT DESIGN
SPEED OF 5300 RPM IS 6000 GPM OR APPROX. 2800 K LBM/HR.



SRO Test

QUESTION #067

The plant experienced a Primary LOCA due to an earthquake. Both the CCW and ESW systems are Inoperable. All CCP and SI pumps are in operation in response to the Safety Injection.

Which ONE of the following describes the operation of the CCP and SI pumps?

- A. Continued operation of all CCP and SI pumps is acceptable.
- B. Secure all CCP and SI pumps until CCW or ESW is restored.
- C. Alternate CCP and SI pumps so that only ONE train is injecting.
- D. Operate CCPs only while securing the SI pumps.

ANSWER:

- C. Alternate CCP and SI pumps so that only ONE train is injecting.

SRO #78

K/A #000011G007

OBJECTIVE #003A0100

REFERENCES: OTN-BG-00001, 2.21
OTN-EM-00001

SRO Test

QUESTION #068

WHICH of the following groups of parameters read out at the Auxiliary Shutdown Panel?

- A. RCS WR pressure, S/G pressure, S/G level, containment pressure
- B. RCS Tavg, S/G pressure, S/G level, containment pressure
- C. RCS hot leg temp, S/G level, TDAFWP flow, containment pressure
- D. RCS cold leg temp, RCS hot leg temp, S/G level, S/G pressure

ANSWER:

- D. RCS cold leg temp, RCS hot leg temp, S/G level, S/G pressure

RO #72

SRO #70

K/A #000068K201

OBJECTIVE #0110480B

REFERENCES: T61.0110.6

SRO Test

QUESTION #069

The signal from the 'A' train SSPS to cause a reactor trip will:

- A. open the 'A' reactor trip breaker and the 'A' reactor trip bypass breaker.
- B. open the 'B' reactor trip breaker and the 'B' reactor trip bypass breaker.
- C. open the 'A' reactor trip breaker and the 'B' reactor trip bypass breaker.
- D. open the 'B' reactor trip breaker and the 'A' reactor trip bypass breaker.

ANSWER:

- C. open the 'A' reactor trip breaker and the 'B' reactor trip bypass breaker.

RO #54

SRO #40

K/A #012000A403

OBJECTIVE #0110270C

REFERENCES: T61.0110.6 LP-#27
Callaway Bank

SRO Test

QUESTION #070

During a refueling outage welding is being performed in a high radiation area. No fire watch will be used due to ALARA considerations.

Which ONE of the below would approve the hot work permit as the designated management representative?

- A. Shift Supervisor
- B. Outage Shift Manager
- C. Maintenance Work Supervisor
- D. Health Physics Supervisor

ANSWER:

- A. Shift Supervisor

SRO #17

K/A #194001A116

OBJECTIVE #003A30A4

REFERENCES: APA-ZZ-00010, 4.3.3.6
APA-ZZ-00742, 3.2.1

SRO Test

QUESTION #071

A spurious SI causes a plant trip and SI. Which one of the below actions is acceptable to be performed while performing E-0 steps 1 through 14?

- A. Securing NE01 due to ESW pump A tripping.
- B. Securing RHR Train 'A' due to RCS pressure at 2235.
- C. Stopping one CCP to minimize injection to RCS.
- D. Starting a SFP pump to restore Fuel Pool Cooling.

ANSWER:

- A. Securing NE01 due to ESW pump A tripping.

RO #6

SRO #6

K/A #194001A102

OBJECTIVE #003A29C4

REFERENCES: ODP-ZZ-00025

SRO Test

QUESTION #072

Both trains of Essential Service Water (ESW) are placed into service to reduce containment temperature. Shortly after placing ESW into service, reactor power is noted to be slowly increasing.

Which ONE of the following is the probable cause of the power increase?

- A. Change in containment air temperature affecting operation of the power range detectors.
- B. Change in main feedwater temperature due to flow variations in the S/G Blowdown system.
- C. Change in the CVCS letdown temperature causing deboration in the letdown demineralizers.
- D. Change in main condenser vacuum causing increasing main steam flow through the main turbine.

ANSWER:

- C. Change in the CVCS letdown temperature causing deboration in the letdown demineralizers.

RO #42

SRO #48

K/A #075000A401

OBJECTIVE #003A09A1

REFERENCES: OTN-EF-00001
OTN-EG-00001

SRO Test

QUESTION #073

Given the following plant conditions:

- SAFETY INJECTION ACTUATED
- PZR PRESSURE 1800 PSIG Slowly Decreasing
- RCS TEMPERATURE 550°F Slowly Decreasing
- S/G NR LEVELS 1% Slowly Increasing
- PRT Pressure 3 psig Stable
- S/G PRESSURE 1000 PSIG STABLE
- PZR Level 28% INCREASING
- RM-11 GTRE31 & 32 Alarming
- CTMT Temperature 140°F Slowly Increasing
- CTMT Pressure 8 psig
- CTMT Humidity Increasing

Which ONE of the following could be the cause of the above conditions?

- A. Steam Generator Safety Valve failed open.
- B. Pressurizer PORV failed open.
- C. RCS Leak from a cold leg.
- D. Pressurizer steam space leak.

ANSWER:

- D. Pressurizer steam space leak.

RO #81

SRO #82

K/A #000008A106

OBJECTIVE #003D030F

REFERENCES: E-0 Reactor Trip/Safety Injection

SRO Test

QUESTION #074

The Callaway Plant is operating at 94% power with all four containment cooling fans running in fast speed.

A simultaneous Safety Injection and loss of the normal power supply to NB01 occurs. All systems function as designed.

Which one of the following describes the response of the Containment Cooling fans?

- A. Fans A and C start in FAST speed, B & D continue to run in FAST speed.
- B. Fans A & C start in SLOW speed, fans B & D shift to SLOW speed.
- C. Fans A & C start in FAST speed, fans B & D shift to SLOW speed.
- D. Fans A & C start in SLOW speed, fans B & D continue to run in FAST speed.

ANSWER:

- B. Fans A & C start in SLOW speed, fans B & D shift to SLOW speed.

RO #29

SRO #28

K/A #022000A301

OBJECTIVE #0110400D

REFERENCES: E210010

SRO Test

QUESTION #075

Which one of the following describes the operation of 7.5 KVA Inverter NN12 when the 125VDC supply from NK0211 is interrupted?

- A. The Static Transfer switch will AUTOMATICALLY transfer to the Bypass Transformer and will AUTOMATICALLY transfer back to the inverter when 125VDC is restored.
- B. The Static Transfer switch will AUTOMATICALLY transfer to the Bypass Transformer, but must be MANUALLY transferred back to the inverter when 125VDC is restored.
- C. The Static Transfer switch must be MANUALLY transferred to the Bypass Transformer, but will AUTOMATICALLY transfer back to the inverter when 125VDC is restored.
- D. The Static Transfer switch must be MANUALLY transferred to the Bypass Transformer and MANUALLY transferred back to the inverter when 125VDC is restored.

ANSWER:

- B. The Static Transfer switch will AUTOMATICALLY transfer to the Bypass Transformer, but must be MANUALLY transferred back to the inverter when 125VDC is restored.

SRO #81

K/A #000057A101

OBJECTIVE #0110060E

REFERENCES: OTN-NN-00001

SRO Test

QUESTION #076

The plant is in the injection phase of Safety Injection due to a RCS LOCA. Containment Pressure has reached a maximum of 25 psig.

Which ONE of the following indicates the loads being cooled by CCW?

- A. RHR Pumps, RHR Heat Exchangers, Sample systems
- B. Fuel Pool, Reactor Coolant Pumps, Excess Letdown Heat Exchangers
- C. Containment Spray Pumps, Charging Pumps, Reactor Coolant Pumps
- D. Reactor Coolant Pumps, Charging Pumps, RHR Pumps

ANSWER:

- D. Reactor Coolant Pumps, Charging Pumps, RHR Pumps

RO #77

SRO #60

K/A #000026K302

OBJECTIVE #0110100C

REFERENCES: M22EG01
E210010

SRO Test

QUESTION #077

The Callaway Plant is in a Reduced Inventory condition and has suffered a Loss of RHR Cooling.

Which ONE of the following would cause a reduction in T-Boil (Time to Boil)?

- A. Fewer Effective Full Power Days (EFPD)
- B. Longer Time since Shutdown
- C. Lower Steam Generator Level
- D. Lower RCS Loop Level

ANSWER:

- D. Lower RCS Loop Level

RO #91

SRO #85

K/A #000025G10

OBJECTIVE #003EE20B

REFERENCES: OTN-BB-00002
T-Boil Calc

SRO Test

QUESTION #078

The plant is in MODE 6, performing CRDM drag testing when Source Range Channel N-31 fails.

CRDM drag testing may continue:

- A. For 12 hours with only Source Range Channel N-32 Operable.
- B. Using Gamma Metrics Flux Monitor and Source Range N-32.
- C. After determining the Reactor Coolant System boron concentration.
- D. Only for those CRDMs that are adjacent to Source Range N-32.

ANSWER:

- B. Using Gamma Metrics Flux Monitor and Source Range N-32.

SRO #100

K/A #000036K101

OBJECTIVE #003E040A

REFERENCES: TS 3.9.2 Int. #42

SRO Test

QUESTION #079

Plant startup is in progress with main turbine roll commencing and reactor power at 6%. Power range N-44 is out of service due to a failed detector.

Which one of the below is UNBLOCKED under these conditions?

- A. Intermediate Range High Flux Reactor Trip
- B. Pressurizer Low Pressure Reactor Trip
- C. Reactor Trip from Turbine Trip
- D. Pressurizer High Level Reactor Trip.

ANSWER:

- A. Intermediate Range High Flux Reactor Trip

RO #25

SRO #26

K/A #015000A303

OBJECTIVE #003A24A2

REFERENCES: OTG-ZZ-00002

OTO-SA-00001

SRO Test

QUESTION #080

Use the attached Figure 7-5 to answer the following question.

The plant is in MODE 3, 557°F, 2235 psig. Which one of the following is the amount of water needed to reduce the RCS boron concentration from 1150 ppm to 1100 ppm?

- A. 1167 gal.
- B. 1195 gal.
- C. 2688 gal.
- D. 2752 gal.

ANSWER:

- D. 2752 gal.

RO #14

SRO #19

K/A #001010K521

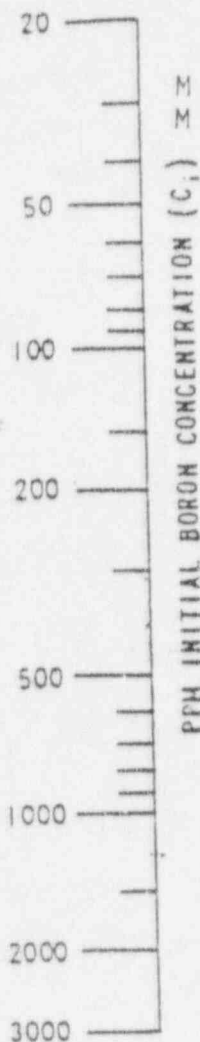
OBJECTIVE #003AA40E

REFERENCES: Plant Curve Book

REACTOR MAKEUP CONTROL SYSTEM NOMOGRAPHS

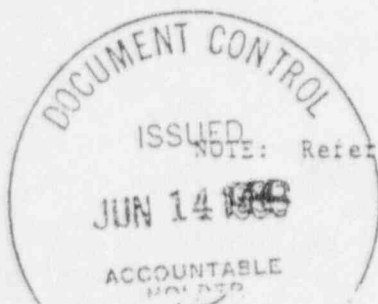
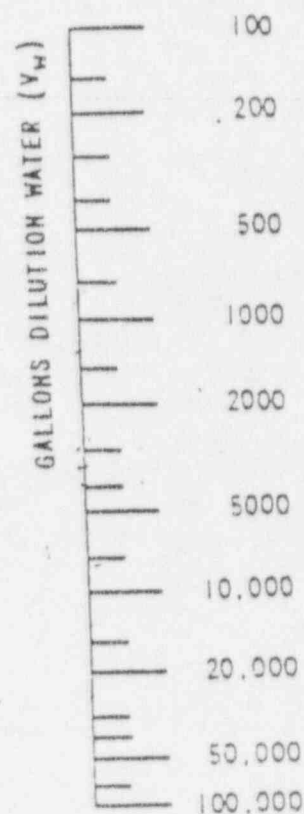
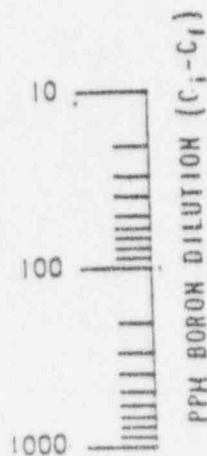
BORON DILUTION

$$V_w = \frac{M}{8.33} \ln \left(\frac{C_i}{C_f} \right)$$



M at 0% power = 515676 lbm * Superintendent, Engineering Date
 M at 100% power = 503624 lbm *

*The values for M, mass of the RCS, are only valid while pressurizer level is in its target band.



NOTE: Refer to Table 7-1 for correction factors.

SRO Test

QUESTION #081

The plant is in MODE 5 with the containment purge exhaust fan operating and containment purge supply off. The Containment Coordinator identifies a positive air flow condition from containment to outside atmosphere through the equipment hatch with the containment personnel hatch open.

Which ONE of the below actions should be performed for this condition?

- A. Activate a Containment Purge Isolation
- B. Start either Fuel Bldg/Aux Bldg Emergency Exhaust train
- C. Activate a Control Room Ventilation Isolation
- D. Shift the Aux Building Normal Exhaust to FAST

ANSWER:

- D. Shift the Aux Building Normal Exhaust to FAST

RO #45

SRO #43

K/A #029000K103

OBJECTIVE #003A120B

REFERENCES: OTN-GT-00001

SRO Test

QUESTION #082

Given the following plant conditions:

- Operating at 100% power at MOL.
- All systems are operable.
- While in AUTO rod control, Control Bank "D" starts stepping in slowly, but at a noticeable rate.

Which ONE of the following events will cause this response?

- A. A tube leak in the Regenerative Heat Exchanger.
- B. A tube leak in the Seal Water Heat Exchanger.
- C. A tube leak in the Letdown Heat Exchanger.
- D. A tube leak in the Excess Letdown Heat Exchanger.

ANSWER:

- B. A tube leak in the Seal Water Heat Exchanger.

SRO #57

K/A #008010A303

OBJECTIVE #0110100H

SRO Test

QUESTION #083

A Hi Hi Radiation signal from SJ-RE-02, Steam Generator Blowdown System Radiation Monitor, will automatically close which ONE of the following valves?

- A. BM-HV-21, S/G 'C' Blowdown Nuclear Sampling System Upper Isolation Valve.
- B. BM-FV-54, S/G Blowdown Discharge Pumps Discharge Flow Control Valve.
- C. BM-HV-6, S/G 'B' Blowdown Nuclear Sampling System Line Downstream Isolation Valve.
- D. BM-HV-38, S/G 'D' Blowdown Nuclear Sampling System Lower Isolation Valve.

ANSWER:

- C. BM-HV-6, S/G 'B' Blowdown Nuclear Sampling System Line Downstream Isolation Valve.

RO #56

SRO #47

K/A #073000K101

OBJECTIVE #0110120D

REFERENCES: T61.0110.6 LP-#12

SRO Test

QUESTION #084

Given the following plant conditions:

- Steam Break in AREA 5
- All MSIVs closed
- 'A', 'B', and 'D' Steam Generator Pressures Stable
- 'C' Steam Generator Pressure Decreasing
- Performing actions of E-2, "Faulted Steam Generator Isolation"
- TD AFW pump is the only AFW pump available

Which ONE of the following actions would be performed during completion of E-2?

- A. Close ABHV0006, 'C' Steam Supply to the TD AFW pump.
- B. Open all S/G Common Sample Isolation Valves, BMHV0065 through 68.
- C. Reduce Aux Feedwater flow to 15,000 lbm/hr to each Steam Generator.
- D. Close ABLV0007, Main Steam Low Point Drain SG 'C'.

ANSWER:

- B. Open all S/G Common Sample Isolation Valves, BMHV0065 through 68.

RO #66

SRO #62

K/A #000040E103

OBJECTIVE #003D150C

REFERENCES: E-2

SRO Test

QUESTION #085

Main Turbine exhaust pressure is 4" Hga and increasing at a rate of 0.5" Hga per minute. Which of the following is the minimum amount of time that could elapse before an automatic low vacuum turbine trip occurs?

- A. 5 minutes
- B. 7 minutes
- C. 9 minutes
- D. 12 minutes

ANSWER:

- B. 7 minutes

RO #73

SRO #64

K/A #000051A202

OBJECTIVE #003BB90A

REFERENCES: OTO-AD-00001

SRO Test

QUESTION #086

Which one of the following situations will require completing a "Request to Exceed NRC Overtime Restrictions" form?

- A. An I&C Computer Technician is called out to work the OWL shift immediately preceding his scheduled AM shift.
- B. An Operating Supervisor works 7 a.m. to 3 p.m. in Training, then starts the Night Shift at 6 p.m. the same day and works until 6 a.m. the following morning.
- C. An Equipment Operator works 25 hours in a 48 hour period due to a change from Daylight Savings Time.
- D. A Rad-Chem Technician works 7 a.m. to 7 p.m. for six continuous days.

ANSWER:

- B. An Operating Supervisor works 7 a.m. to 3 p.m. in Training, then starts the Night Shift at 6 p.m. the same day and works until 6 a.m. the following morning.

SRO #12

K/A #194001A103

OBJECTIVE #003A290E

REFERENCES: APA-ZZ-00905

SRO Test

QUESTION #087

Which one of the following is an entry condition for OTO-ZZ-00003, Loss of Shutdown?

- A. Reactor Trip at 0950 and RCS Tavg 545°F at 1115.
- B. Reactor Power at 5% and Control Bank C at 35 steps.
- C. RCS temperature decrease of 100°F in 20 minutes with ECCS operating in the Injection phase.
- D. A constant startup rate of 1 decade per minute following control rod withdrawal.

ANSWER:

- B. Reactor Power at 5% and Control Bank C at 35 steps.

RO #80

SRO #59

K/A #000024G10

OBJECTIVE #003B610A

REFERENCES: T61.003B.6 LP-#B-61

SRO Test

QUESTION #088

A working copy of a procedure is taken from the "Working File" in the Field Office on 9/21/96 at 0900. Which one of the following would allow this procedure to be used in the plant on 9/25/96 at 1700?

- A. The procedure copy was verified to be the correct revision and signed by the Operating Supervisor on 9/21/96.
- B. The procedure is marked "Controlled Copy" and was signed and dated by the Shift Supervisor on 9/23/96.
- C. The procedure is marked "Working File" and has been initialed and dated on each shift since issue.
- D. The procedure is marked "Working Copy" and was signed by the Shift Clerk on 9/24/96 at 2359.

ANSWER:

- D. The procedure is marked "Working Copy" and was signed by the Shift Clerk on 9/24/96 at 2359.

SRO #16

K/A #194001A101

OBJECTIVE #003AA6B2

REFERENCES: ODP-ZZ-00009

Modified from 1994 NRC Exam.

SRO Test

QUESTION #089

The secondary equipment operator notes that Annunciator 6E, D.C. Control Power Failure Alarm" is on for diesel NE01 local alarm panel. On Panel KJ121 IL1 and IL2 lights are OFF, IL3 and IL4 lights are ON.

Which ONE of the following describes the effect on the diesel generator?

- A. NE01 is OPERABLE if starting air pressure is maintained 610 to 640 psig.
- B. NE01 is INOPERABLE since diesel start circuits are disabled.
- C. NE01 is OPERABLE as long as outside air temp is less than or equal to 65°F.
- D. NE01 is INOPERABLE since the fuel oil transfer pump is disabled.

ANSWER:

- B. NE01 is INOPERABLE since diesel start circuits are disabled.

SRO #95

K/A #000058A201

OBJECTIVE #011003DD

REFERENCES: OTA-KJ-00122

SRO Test

QUESTION #090

A void exists in the reactor vessel during natural circulation cooldown. Which ONE of the following actions is used to collapse an excessive void, according to ES-0.3, "Natural Circulation Cooldown with Steam Voids"?

- A. Decrease RCS temperature while maintaining RCS pressure constant.
- B. Fill the Pressurizer solid and vent the reactor vessel head.
- C. Increase RCS pressure using pressurizer heaters while maintaining pressurizer level.
- D. Start an SI pump to increase RCS pressure while maintaining temperature constant.

ANSWER:

- C. Increase RCS pressure using pressurizer heaters while maintaining pressurizer level.

RO #69

SRO #72

K/A #000074A101

OBJECTIVE #003D070K

REFERENCES: T61.003D.6

SRO Test

QUESTION #091

The plant is in MODE 1 with all systems in normal except that I&C is performing corrective maintenance in the Rod Control Power Cabinet 1BD. Group 1 of Control Bank D is being energized from the DC Hold Bus.

Breaker PG1902, Motor Circuit Breaker to Rod Drive Motor-Generator SF01, is inadvertently opened. All plant systems respond as designed.

Which ONE of the below is true regarding power to the control rods?

- A. Power continues to all control rods.
- B. Power is interrupted to all control rods.
- C. Power is interrupted to all rods except Control Bank D, Group 1.
- D. Power continues to all rods except Control Bank D, Group 1.

ANSWER:

- A. Power continues to all rods.

RO #15

SRO #18

K/A #001000K202

OBJECTIVE #0110260G

REFERENCES: E21

SRO Test

QUESTION #092

Which one of the following could be a direct result of a loss of Vital AC Instrument bus NN03?

- A. Charging Pump suction swaps to the RWST
- B. Source Range Hi Flux Reactor Trip
- C. Intermediate Range High Flux Reactor Trip
- D. CVCS Letdown Isolation

ANSWER:

- D. CVCS Letdown Isolation

RO #79

SRO #67

K/A #000057A219

OBJECTIVE #003B450A

REFERENCES: OTO-NN-00001

SRO Test

QUESTION #093

A reactor trip has occurred and the operating crew is responding in accordance with ES-0.1, Reactor Trip Response.

- Reactor trip and bypass breakers open
- NIS power is 1% and decreasing
- Bank D, Group 2 rods indicate 188 steps withdrawn. All other rods are fully inserted

Which one of the following is TRUE for the above conditions?

- A. An emergency boration of 450 ppm must be performed to ensure the minimum shutdown margin is maintained.
- B. An emergency boration of 150 ppm must be performed to limit fission gas release and maintain fuel pellet temperature within design limits.
- C. No immediate action is required since the core is designed for these conditions, and the reactor has been verified tripped by diverse indications.
- D. A safety injection signal (SIS) must be actuated to maintain the reactor core in a safe shutdown condition.

ANSWER:

- A. An emergency boration of 450 ppm must be performed to ensure the minimum shutdown margin is maintained.

RO #65

SRO #58

K/A #000005K301

OBJECTIVE #003D060C

REFERENCES: ES-0.1

SRO Test

QUESTION #094

During a Reactor Startup, the Reactor Operator verifies one decade of overlap between the source and Intermediate Range Nuclear Instruments. This verification is defined as a(n) _____.

- A. Source Check
- B. Analog Channel Operational Test
- C. Channel Calibration
- D. Channel Check

ANSWER:

D. Channel Check

RO #11

SRO #10

K/A #194001A113

OBJECTIVE #003A02I1

REFERENCES: Tech Spec Definitions

SRO Test

QUESTION #095

Which ONE of the following components is manually (or automatically) isolated and remains isolated for a Faulted 'B' Steam Generator, but NOT necessarily for a 'B' Steam Generator Tube Rupture? (NOTE: Assume all equipment actuated as required.)

- A. Main Steam Isolation Valve (AB-HV-17)
- B. Main Feedwater Isolation Valve (AE-FV-40)
- C. Auxiliary Feedwater Flow Control Valve (AL-HV-10)
- D. Main Steam Supply Valve to T/D AFW Pump (AB-V085)

ANSWER:

- C. Auxiliary Feedwater Flow Control Valve (AL-HV-10)

RO #84

SRO #89

K/A #000038A132

OBJECTIVE #003D17NN

REFERENCES: T61.003D.6 LP-#17

SRO Test

QUESTION #096

Given the following:

- Unit 1 is operating at 100% power.
- All controls are in the normal power operation lineup.
- Pressurizer level is DECREASING.
- VCT level is INCREASING.
- SEAL INJECTION TO RCP FLOW LO alarm is lit.
- REGEN HX HI TEMP alarm is lit.
- LETDN HX DISCHARGE HI TEMP alarm is lit.
- CHARGING LINE FLOW HI/LO alarm is lit.

Which ONE of the following explains the given conditions?

- A. Pressurizer PORV failed open.
- B. Loss of charging.
- C. Small break LOCA.
- D. Letdown isolation.

ANSWER:

- B. Loss of charging.

SRO #97

K/A #000022A201

OBJECTIVE #003B220A

REFERENCES: OTA-RL-RK042, Att. A

SRO Test

QUESTION #097

The Technical Specification bases for observing that the RCCAs are positioned above their respective insertion limits during normal operation include which one of the following?

- A. Ensures that the moderator temperature coefficient is within its analyzed range.
- B. Ensures that the trip instrumentation is within its normal operating range.
- C. Ensures that the pressurizer is capable of being Operable with a steam bubble.
- D. Ensures that acceptable power distribution limits are maintained.

ANSWER:

- D. Ensures that acceptable power distribution limits are maintained.

SRO #75

K/A #000001K302

OBJECTIVE #003AA3E2

REFERENCES: TS 3/4.1.3 Bases

SRO Test

QUESTION #098

Which ONE of the following situations violates a requirement for containment integrity or containment closure?

- A. A containment vent is performed with the plant operating at 100% power.
- B. The plant is in refueling mode with the refueling cavity flooded. Steam generator safeties have been removed; secondary manways are also removed. No fuel movement is in progress.
- C. The plant is in refueling mode with fuel movement in progress. Containment Shutdown purge is initiated.
- D. The plant is in hot standby. The "A" steam generator blowdown isolation valve BM-HV-1 is stuck open.

ANSWER:

- D. The plant is in hot standby. The "A" steam generator blowdown isolation valve BM-HV-1 is stuck open.

RO #78

SRO #71

K/A #000069A202

OBJECTIVE #003E014A

REFERENCES: TS 3.9.4

SRO Test

QUESTION #099

The Callaway Plant is operating at 100% power, with 'B' CCP in service. Assuming no operator action, which ONE of the following components could suffer a sustained loss of Instrument Air and NOT cause an AUTOMATIC Reactor Trip? Consider each component individually.

- A. BGLCV0459, RCS Loop 3 letdown to regen hx level control valve
- B. BGHV8141B, RCP B #1 seal water outlet isolation valve
- C. BGFCV121, CVCS CCP A & B discharge to regen heat exchanger flow control valve
- D. KAFV0029 Reactor Building instrument air supply flow control valve

ANSWER:

- B. BGHV8141B, RCP B #1 seal water outlet isolation valve

SRO #96

K/A #000065A206

OBJECTIVE #003B330A

REFERENCES: OTO-KA-00001

SRO Test

QUESTION #100

Which ONE of the following components has its air supply AUTOMATICALLY isolated if air pressure decreases to 108 psig?

- A. Closed Cooling Water Temperature Controller
- B. First Stage RHDT Level Control Valves
- C. Main Feedwater Reg Valve Bypass Valves
- D. Auxiliary Feedwater Pump Room Sump Pumps

ANSWER:

- D. Auxiliary Feedwater Pump Room Sump Pumps

RO #46

SRO #49

K/A #079000K101

OBJECTIVE #0110140C

REFERENCES: OTO-KA-00001

CHIEF EXAMINER WRITTEN EXAM COMMENTS - CALLAWAY 2/24/97

<u>Test Question #</u>	<u>Comment</u>
RO 7/SRO 7	Need to justify use of negative question format. Resolution: Rewrote.
RO 8	Reword as follows: "Which statement describes loss of CCW flow to a RCP as defined in emergency procedures." Resolution: Incorporated.
RO 9/SRO 9	Wording in stem is not clear. Resolution: Rewrote.
RO 11/SRO 11	Distractors C and D are not plausible for an applicant with rudimentary knowledge of the ESFAS system. Resolution: Withdrew comment.
RO 13	None of the three distractors are plausible. Replace or improve distractors. Resolution: Replaced distractors.
SRO 13	Justify negative stem. Resolution: Rewrote.
RO 14/SRO 33	This appears to be an SRO level question and is shown on the matrix as outline numbers RO 13 in one place and SRO 13 in another place. It appears an RO level question is needed for KA 194001A116. Resolution: Withdrew comment. Answer is different for RO.
SRO 14	Why is this an SRO level question? Resolution: Retain. CRS makes this determination.
RO 26/SRO 26	Change to read, ". . . in MODE 1 AND one safety related CCP INOPERABLE, . . ." Resolution: Incorporated.
RO 27/SRO 27	Correct wording in Distractor C to ". . . Requestor approval, equipment . . ." Resolution: Incorporated.
RO 51/SRO 51	Distractors A and B are implausible. Resolution: Replaced distractors.
RO 52/SRO 52	The condition "Use steam tables provided," is a cue. Delete this statement from the stem. Resolution: Incorporated.
RO 53/SRO 53	The statement that the condensate storage tank is ruptured eliminates Distractors A and C from consideration. Rewrite. Resolution: Rewrote distractors.
RO 56/SRO 56	Distractor C is implausible. Resolution: Rewrote.
RO 63/SRO 63	Distractor A is implausible. Resolution: Rewrote.

SRO 75	This does not appear to be an SRO level question. Resolution: Retain. This is important design change information. Overlap criteria is still satisfied.
RO 76/SRO 76	Reword as follows: "... indicates ONLY loads being ..." Resolution: Incorporated.
RO 82	Distractor A appears implausible. Resolution: Retain. Distractor is plausible.
RO 87/SRO 87	Question should read, "... entry condition for OTO-ZZ-00003, Loss of Shutdown Margin?" Distractor D is implausible. Resolution: Rewrote distractor.
RO 96	Reword to state, "Which one of the following sets of conditions should have resulted in a Lo Lo S/G Level Reactor Trip?" Resolution: Incorporated.
SRO 96	Why is this an SRO level question? Resolution: Rewrote to SRO level.
RO 100/SRO 100	Answer refers to pumps, while distractors refer to valves and controller. This appears to be a cue. Resolution: Retain. Air supply for air driven pumps is not a cue.
Other	The exam instructions must incorporate ES-402, Attachment 2, "Policies and Guidelines for Taking NRC Written Examinations." Also, above the applicant's signature the following statement should be inserted:

All work done on this examination is my own. I have
neither given nor received aid.

Resolution: Incorporated.

CHIEF EXAMINER SRO DIFFICULTY ANALYSIS - CALLAWAY 2/24/97 EXAM

Legend: L - Level of knowlege required A - Knowledge at the comprehension/analysis level

K - Fundamental knowledge only D - Overall difficulty of question on a scale of 1 to 5, with 5 being the most difficult

<u>Test Question</u>	<u>Outline #</u>	<u>L/D</u>	<u>Comment</u>
Question #001	SRO #21	K/2	
Question #002	SRO #44	A/2.5	
Question #003	SRO #11	K/2	
Question #004	SRO #4	K/2	
Question #005	SRO #88	A/2.5	
Question #006	SRO #33	A/2	
Question #007	SRO #1	K/2	Yes
Question #008	SRO #51	A/3.5	
Question #009	SRO #69	K/3	Yes
Question #010	SRO #92	A/3	
Question #011	SRO #24	K/3	Yes
Question #012	SRO #42	A/2	
Question #013	SRO #77	K/3	Yes
Question #014	SRO #74	A/2.5	Yes
Question #015	SRO #34	K/2	
Question #016	SRO #36	K/3	
Question #017	SRO #27	A/2.5	
Question #018	SRO #91	K/2	
Question #019	SRO #61	K/3	
Question #020	SRO #38	K/2	
Question #021	SRO #7	K/2	
Question #022	SRO #55	A/3.5	
Question #023	SRO #87	A/2.5	
Question #024	SRO #37	A/2.5	
Question #025	SRO #15	K/2	
Question #026	SRO #22	K/2.5	Yes
Question #027	SRO #2	K/2	Yes
Question #028	SRO #39	A/2.5	
Question #029	SRO #73	A/2.5	
Question #030	SRO #98	A/3.5	
Question #031	SRO #90	A/2.5	
Question #032	SRO #52	K/2.5	
Question #033	SRO #13	K/3	Yes
Question #034	SRO #25	A/3	
Question #035	SRO #79	K/2.5	
Question #036	SRO #3	A/2.5	
Question #037	SRO #76	K/2.5	
Question #038	SRO #93	K/2.5	
Question #039	SRO #65	A/2.5	

Question #040	SRO #99	K/2.5	
Question #041	SRO #46	A/3	
Question #042	SRO #53	A/3	
Question #043	SRO #31	A/2.5	
Question #044	SRO #8	K/2	
Question #045	SRO #53	K/2.5	
Question #046	SRO #80	K/2.5	
Question #047	SRO #23	K/2	
Question #048	SRO #20	A/2.5	
Question #049	SRO #14	K/2.5	
Question #050	SRO #94	K/2.5	
Question #051	SRO #84	A/1.5	Yes
Question #052	SRO #54	A/2.5	Yes
Question #053	SRO #32	A/2	Yes
Question #054	SRO #30	K/2.5	
Question #055	SRO #68	K/2.5	
Question #056	SRO #83	K/2.5	Yes
Question #057	SRO #56	K/2.5	
Question #058	SRO #50	K/2.5	
Question #059	SRO #35	A/3.5	
Question #060	SRO #5	K/2	
Question #061	SRO #45	K/2.5	
Question #062	SRO #86	A/2.5	
Question #063	SRO #66	K/3	Yes
Question #064	SRO #41	A/3	
Question #065	SRO #29	K/2.5	
Question #066	SRO #9	A/2	
Question #067	SRO #78	A/3.5	
Question #068	SRO #70	K/3	
Question #069	SRO #40	K/2	
Question #070	SRO #17	K/2	
Question #071	SRO #6	A/2.5	
Question #072	SRO #48	A/3.5	
Question #073	SRO #82	A/2.5	
Question #074	SRO #28	A/2.5	
Question #075	SRO #81	A/3	Yes
Question #076	SRO #60	K/2.5	Yes
Question #077	SRO #85	K/2.5	
Question #078	SRO #100	A/2.5	
Question #079	SRO #26	K/2	
Question #080	SRO #19	A/2	
Question #081	SRO #43	A/2.5	
Question #082	SRO #57	A/3	
Question #083	SRO #47	K/2.5	
Question #084	SRO #62	A/3	
Question #085	SRO #64	A/2.5	

Question #086	SRO #12	A/2	
Question #087	SRO #59	A/2.5	Yes
Question #088	SRO #16	K/2.5	
Question #089	SRO #95	A/3.5	
Question #090	SRO #72	K/2.5	
Question #091	SRO #18	A/2.5	
Question #092	SRO #67	K/3	
Question #093	SRO #58	K/2.5	
Question #094	SRO #10	K/2	
Question #095	SRO #89	A/2.5	
Question #096	SRO #97	A/2.5	Yes
Question #097	SRO #75	K/2	
Question #098	SRO #71	A/2.5	
Question #099	SRO #96	A/3	
Question #100	SRO #49	A/3	Yes

Summary:

- Questions rated "A" equal 50.
- Average difficulty equals 2.54.
- 26 questions are different than RO exam.

Attachment 4

Simulator Scenarios

CHIEF EXAMINER SCENARIO COMMENTS - CALLAWAY 2/24/97 EXAM

Legend: D - Difficulty on 1 to 5 scale, 5 being the most difficult

Form ES-301-5

- RO applicant must be in the primary position to take credit for a reactivity manipulation. Therefore, he cannot receive credit for a reactivity manipulation in Scenario 1, Event B.
- The SRO(U) cannot take credit for a reactivity manipulation in Scenario 2 because he is the BOP operator. A reactivity manipulation is not required for upgrade applicants.
- Although the SRO(I) applicant is given credit for a normal evolution in Scenario 1, Event A, as the primary operator, it appears the BOP operator would perform the associated actions.
- It appears the SRO(I) applicant should respond to a component failure as the primary operator in Scenario 1, Event E.
- The BOP operator cannot receive credit for a reactivity manipulation in Scenario B/U.

Scenario 1

D - 3.5

- It is unlikely that there will be time to run the scenario to a RWST to containment sump swa.pover. Therefore, the component failure in Event H will probably not occur.
- Event B and Overview - We may want to start this scenario at less than 100% RTP to minimize the time required to reduce power to $\leq 48\%$ to secure "C" RCP. Although the vibration is related to "C" RCP, reference is made to securing "B" RCP in both places.
- Why are we tripping "C" RCP on high vibration and tripping the reactor if we stopped it in Event B at $\leq 48\%$ power?
- Expected Operator/Plant Response actions show very little, if any, discrimination for which operator is actually expected to respond. For instance, in Event A expected RO and BOP actions are identical.

Scenario 2

D - 3.0

- The validation time of 90 minutes is too long. We need to look at making scenario shorter without deleting required examination characteristics.
- Event FGH, Expected Operator/Plant Response - List criteria OS/RO should evaluate in arriving at decision to trip the reactor.

- Same comment as Scenario 1 - There appears to be no distinction between the expected operator actions for RO and BOP operators.

Scenario B/U

D - 2.5

- Expected operator actions listed are the same for all three applicants.

SCENARIO EVENTS

Callaway Plant Initial License Exam - February 1997	
	SCENARIO # 1
EXAMINERS:	APPLICANTS:
INITIAL CONDITIONS	100% Steady State / BOL/ Equilibrium Xenon
TURNOVER	Ultimate Heat Sink (UHS) Level HI Alarm IN - Need to Pump Down

EVENT No.	Event Type *	Event Description	KA Number
A	N	UHS Pump Down Essential Service Water to Service Water	076000A404 (3.5/3.5)
B	R	'C' RCP High Vibration / Power Reduction to < 48% Power	000015A123 (3.1/3.2)
C	I	Steam Pressure Channel Failure	035010K401 (3.6/3.8)
D	I	PZR Pressure Channel 455 Failure	010000A203 (4.1/4.2)
E	C	'C' RCP Shaft Break - Partial Loss of Flow Reactor Trip - Failure of Main Turbine AUTO Trip.	045010A301 (3.5/3.6)
F	M	Large Break LOCA	C00011K312 (4.4/4.6)
G	C	LOCA Sequencer Failure	000011A113 (4.1/4.2)
H	C	Failure of AUTO Swap of RHR Suction Valves from RWST to CTMT Sump	006020A402 (3.9/3.8)

* (N) Normal (R) Reactivity (I) Instrument (C) Component (M) Major

UNION ELECTRIC COMPANY
CALLAWAY PLANT TRAINING DEPARTMENT

DYNAMIC SIMULATOR SCENARIO

SIMULATOR SCENARIO: ILEDS1
REVISION DATE: 970106

WRITTEN BY: _____

REVIEWED BY: _____
STS-OPERATIONS TRAINING

APPROVED BY: _____
SUPERINTENDENT OPERATIONS

SCENARIO TITLE:	EXAM #: ILED51
------------------------	--------------------------

INITIAL CONDITIONS:

The plant is operating at 100% steady state.

<u>Event - TITLE</u>	<u>KSA #</u>	<u>(RATING)</u>	<u>UE TASK #</u>
A) Pump down UHS	076000A404	3.5/3.5	URO-SEF-01
B) 'C' reactor coolant pump high vibration	000015A123	3.1/3.2	URO-SBB-04 STA-ADM-03
C) Steam Pressure Channel Failure	035010K401 035010A203 035010A301	3.6/3.8 3.4/3.6 4.0/3.9	URO-SAE-02
D) Pressurizer Pressure Channel Failure	010000A203	4.1/4.2	URO-SBB-04 STA-ADM-03
E) RCP Trip with Failure of Automatic Turbine Trip	045010A301 045050A101	3.5/3.6 3.8/4.1	URO-CRK-01 SRO-NOP-10
F) Large Break LOCA	000011K312	4.4/4.6	URO-CRK-02 STA-TAA-07
G) Failure of safeguards (LOCA) sequencer	000011A113	4.1/4.2	URO-CRK-01 STA-TAA-02
H) AUTO RWST Swapover Failure	006020A402	3.9/3.8	URO-CRK-02C

SCENARIO LENGTH:

Approximately 60 minutes

SCENARIO COMPLETION CRITERIA:

This scenario is completed upon completion of transfer to cold leg recirc per ES-1.3.

SCENARIO OVERVIEW	EXAM #: ILED51
--------------------------	--------------------------

The plant is initially at 100% steady state power, beginning of life, equilibrium xenon conditions. The UHS level is high and needs to be pumped down to the cooling tower.

The crew will receive a high vibration alarm on the 'C' RCP. In accordance with OTO-BB-00002, and while monitoring pump vibration, reactor power should be reduced to less than 48% and then RCP 'B' should be stopped.

Steam Pressure Channel, AB-PT-534 fails low. The selected steam flow channel, AB-FT-532, fails low as a result. Feed flow decreases to the 'C' S/G. The crew should respond per OTO-AB-00003, "Steam Generator Pressure Channel Failure", identifying the failed channel, select the alternate steam flow channel, and then ensure S/G level stabilizes at 50%. I&C should be contacted to trip bistables for the failed channel per Technical Specification 3.3.2, "ESFAS Instrumentation", Action 33, Within six (6) hours. I&C should be requested to investigate the failure.

Controlling pressurizer pressure channel BBPT455 fails high. The crew should enter OTO-BB-00006 and take action to transfer controls and stabilize primary pressure and temperature.

Following the safety injection, the 'B' train LOCA sequencer will hang-up at time 10, requiring operator action to manually start the remaining loads ('B' ESW pump, 'B' MD-AFP, 'B' and 'D' CTMT coolers). Upon completion of E-0, the crew transitions to E-1, "Loss of Primary or Secondary Coolant".

During completion of E-1, the RWST level decreases to 36%. Auto swapover of RHR suction to CTMT sumps fails to actuate automatically. The crew should transition to ES-1.3, "Cold Leg Recirc" and complete actions to transfer ECCS pumps to the recirc lineup.

This scenario is complete upon completing transfer to cold leg recirc per ES-1.3.

1) Initialize

UHS Level High

ANNUNCIATORS:

- ANN AND055 = 1 (UHS LEVEL HI/LO)

Cooling Tower Level Reduced for pumpdown

2) Set RWST level decrease for AUTO Swapover to be required following SI:

- SET ZMLAUX11 = ASISRW

- MALF AUX11

Set = 200,000

2400 sec ramp

COND = JPPLSI

180 sec delay

< activate >

SCENARIO SEQUENCE OF EVENTS GUIDE

EXAM #:
ILED51

<u>INSERT TIME</u>	<u>EVENT</u>	<u>MALF</u>	<u>DESCRIPTION</u>
N/A	A		UHS Pump down
5	B	N/A	RCP High Vibration Set ANB070 = 1
10	C	MSS-1	Steam Pressure Detector Failure <ul style="list-style-type: none"> • Channel 534 • Fail Value 0 PSIA • Ramp Time 30 sec
20	D	PRS1	Pzr pressure channel failure <ul style="list-style-type: none"> • Channel 455 • 2500 psi • 60 sec ramp • 0 delay
≈35	E	RCS 4	RCP DANGER (ANN 70A) Vibration RCP Trip (TRIP WITH RCP DANGER VIB) <ul style="list-style-type: none"> • Select C • 60 sec delay Auto turbine trip fail <ul style="list-style-type: none"> • TUR8 • SET=B
P	F	RCS-6	Large Break LOCA <ul style="list-style-type: none"> • C loop • 100,000 gpm • 300 sec Ramp • XØ4090 • 10 sec delay
P	G	PCS9	Failure of 'B' train LOCA sequencer <ul style="list-style-type: none"> • LOCA SEQ=SELECT 1 • STEP 1 (SET=5)
P	H	BST	RWST Auto Swapover Failure Bistables - BST <ul style="list-style-type: none"> • BNL1 = 2 • BNL2 = 2 • BNL3 = 2 (Leave BNL4 normal so RWST Level L ₀ Swap alarms at 36%)

SCENARIO SEQUENCE OF EVENTS GUIDE

EXAM #:
ILED51

EVENT

INITIATING CUE (Instructor enters times ACTUATED)

INSTRUCTOR TURNOVER INFORMATION	EXAM #: ILED1
--	-------------------------

PRESENT CONDITIONS:

100%

Bank D @ 219

Cb=1345

MWe=1229

POWER HISTORY:

100% - 2 months

EQUIPMENT STATUS:

All in service

ABNORMAL CONDITIONS:

- UHS level Hi/Lo
- Computer Point N/A
- I/O at UHS Monitoring Level

SURVEILLANCES DUE/IN PROGRESS:

'B' Train Week

ADDITIONAL INSTRUCTIONS:

Need to pump down UHS

EVENTADDITIONAL INFORMATION

A

I/O at UHS Monitor Level as requested 80% → 75%.

B

Act as the WPA RO and report that the high RCP vibration is on the C RCP. Inform the crew that vibration on C pump is 3.0 mils on the frame, and 15.5 mils on the shaft. Report that it appears that the vibration is increasing very slowly. If asked to determine a rate, wait approx. 5 minutes, then report that it appears to be increasing at about 2 mils/hr. on the frame, and 2-3 mils/hr. on the shaft. Report that all other RCP vibrations are normal. If contacted as engineering, acknowledge the problem with a C RCP and report that you will be up to investigate.

C

Act as I&C, if contacted, and acknowledge the failure of AB-PT-534. If requested, inform the Control Room that plans will be made to investigate the failure and trip bistables.

Trip bistables for AB-PT-534 as follows:

- Run "FILE AB07.2"

Complete Attachment 1 for AB-PT-534 and return to Control Room.

D

Acknowledge as I&C for Pressurizer Pressure Channel Failure and trip B/S's as required.

"FILE BB01.2"

BST

BBP6 = 1

BBP21 = 1

BBP 9 = 1

BBP7 = 1

BBP 8 = 1

BBT33 = 1

BBT41 = 1

E

Report as the WPA RO that the DANGER VIBRATION is on the C RCP 4.0 mils on the frame and 21 mils on the shaft.

EVENT:	A	POSITION:	OS	EXAM #	ILED1
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BRIEF DESCRIPTION: Pump Down UHS

EXPECTED OPERATOR / PLANT RESPONSE	SAT	UNSAT	NA
------------------------------------	-----	-------	----

1) Refer to OTN-EF-00001, Section 5.6 for Pumping Down UHS to Service Water.

- Ensure EFHV0052 OPEN
- Ensure EFHH0060 OPEN
- Plant Announcement
- Start ESW Pump
- Close EFHV0024 & 26
- Monitor Cooling Tower Basin Level

COMMENTS:

EVENT:	B	POSITION:	OS	EXAM #	ILED51
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BRIEF DESCRIPTION: 'C' RCP HIGH VIBRATION

EXPECTED OPERATOR / PLANT RESPONSE	SAT	UNSAT	NA
------------------------------------	-----	-------	----

ANNUNCIATORS: RCP VIB/SYS ALERT 70B

1) Ensure implementation of OTO-BB-00002, "RCP Off-Normal"

- Check RCP vibrations
- Commence Load Reduction per OTG-ZZ-00004 to <48%.
- RO/BOP Coordinate Load Decrease
- Check AEHV38 closed
- Reduce Speed of MFP in Manual
- When power is <48%, secure the 'B' RCP per OTN-BB-00003

COMMENTS:

EVENT: C	POSITION: OS	EXAM #	ILED1
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BRIEF DESCRIPTION: STEAM PRESSURE CHANNEL FAILURE

EXPECTED OPERATOR / PLANT RESPONSE	SAT	UNSAT	NA
------------------------------------	-----	-------	----

ANNUNCIATORS: SG 'C' LEV DEV 110C
 SG 'C' FLOW MISMATCH 110D

- | | | | |
|--|-------|-------|-------|
| 1) Identify failure of AB-PT-534 | _____ | _____ | _____ |
| 2) Ensure implementation of OTO-AB-00003, "Steam Generator Pressure Channel Failure" | _____ | _____ | _____ |
| • Identify failed channel | _____ | _____ | _____ |
| • Select alternate steam flow channel or take manual control of 'C' S/G level to avoid a Reactor Trip on S/G LOLO Level | _____ | _____ | _____ |
| • Ensure S/G level is stabilized at program 50% | _____ | _____ | _____ |
| 3) Determine that Technical Specification 3.3.2 for ESFAS Instrumentation, Action 33, requires the failed channel to be placed in the tripped condition within six (6) hours | _____ | _____ | _____ |
| 4) Ensure/notify I&C to have the instrument failure investigated, including tripping of bistables | _____ | _____ | _____ |

COMMENTS:

EVENT:	D	POSITION:	OS	EXAM #	ILED51
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BRIEF DESCRIPTION: PRESSURIZER PRESSURE CHANNEL FAILURE

EXPECTED OPERATOR / PLANT RESPONSE	SAT	UNSAT	NA
------------------------------------	-----	-------	----

ANNUNCIATORS: PZR HI PRESS DEV 33B
PZR PRESS HI 34B
RX PARTIAL TRIP 83C

1) Ensure implementation of OTO-BB-00006, "Pressurizer Pressure Channel Failure"

- | | | | |
|---|-------|-------|-------|
| • Identify pressurizer pressure channel BB-PT-455 failure | _____ | _____ | _____ |
| • Select alternate channel or take manual control of pressurizer pressure to prevent a Reactor Trip on OTΔT | _____ | _____ | _____ |
| • Ensure plant condition stable and any pressure transient terminated | _____ | _____ | _____ |
| • Select a valid pressure channel on the Pressurizer Pressure Recorder | _____ | _____ | _____ |
| • Return PZR heaters, sprays, and PORV's to normal and verify correct control response | _____ | _____ | _____ |
| • Change digital display to valid channel | _____ | _____ | _____ |

COMMENTS:

EVENT:	D	POSITION:	OS	EXAM #	ILED51
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BRIEF DESCRIPTION: PRESSURIZER PRESSURE CHANNEL FAILURE

EXPECTED OPERATOR / PLANT RESPONSE	SAT	UNSAT	NA
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2) Refer to Technical Specifications and ensure compliance
with minimum channel requirements and action statements

- T/S 3.3.1 Action 6 - 6 hours
- T/S 3.3.2 Action 33 - 6 hours
- T/S 3.3.5 Action a - 7 days

COMMENTS:

EVENT:	E	POSITION:	OS	EXAM #	ILED51
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BRIEF DESCRIPTION: RCP TRIP WITH AUTO TURBINE TRIP FAILURE

EXPECTED OPERATOR / PLANT RESPONSE	SAT	UNSAT	NA
------------------------------------	-----	-------	----

ANNUNCIATORS: RCP VIBRATION ALERT 70B
RCO VIBRATION DANGER 70A
PZR LO LEVEL DEVIATION 32C
PZR PRESS LO HTRS ON 33C

- | | | | |
|--|-------|-------|-------|
| 1) Identify High Vibration and ensure implementation of OTO-BB-00002, RCP OFF NORMAL | _____ | _____ | _____ |
| • Trip reactor/turbine and C RCP when upon verification of danger vibrations | | | |
| 2) Implement E-0, "Reactor Trip or Safety Injection" | _____ | _____ | _____ |
| 3) Implement E-0, "Reactor Trip or Safety Injection", and direct actions of RO/BOP | _____ | _____ | _____ |
| • Verify Rx trip | | | |
| • Manually trip turbine due to Auto trip failure | | | |
| • Verify NB01/NB02 energized | | | |
| • Identify primary LOCA is in progress | | | |

COMMENTS:

EVENT:	FGH	POSITION:	OS	EXAM #	ILED51
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BRIEF DESCRIPTION: **LOCA WITH SEQUENCER FAILURE AND RWST AUTO SWAPOVER FAILURE**

EXPECTED OPERATOR / PLANT RESPONSE	SAT	UNSAT	NA
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1) Continue with actions of E-0

- Ensure the following 'B' train components are manually started
 - RHR Pump
 - ESW Pump
 - CTMT Coolers
- Ensure AFW Flow > 300,000 lbm/hr
- Ensure AFW Valve Alignment
- Ensure SI Valve Alignment
- Check RCS Avg Temperature
- Check PZR PORV's and Spray Valves
- Check if RCPs should be stopped - Trip RCPs when RCS pressure < 1400 psig
- Manually Start 'B' train Class 1E and Control Room AC. (requires Manual reset of SI and CSAS)
- Check if SG's are not faulted
- Check if SG tubes are not ruptured
- Check if RCS is intact

COMMENTS:

EVENT:	FGH	POSITION:	OS	EXAM #	ILED51
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BRIEF DESCRIPTION: **LOCA WITH SEQUENCER FAILURE AND RWST AUTO SWAPOVER FAILURE**

EXPECTED OPERATOR / PLANT RESPONSE	SAT	UNSAT	NA
---	------------	--------------	-----------

- | | | | |
|---|-------|-------|-------|
| 2) Ensure transition to E-1, "Loss of Reactor or Secondary Coolant" | _____ | _____ | _____ |
| • Ensure implementation of CSF Status Monitoring | | | |
| 3) Identify Adverse Containment Conditions and apply appropriate parameter values | _____ | _____ | _____ |
| 4) Perform the actions of E-1, "Loss of Reactor or Secondary Coolant" | _____ | _____ | _____ |
| • Check if RCP's should be stopped | | | |
| • Check if SG's are not faulted | | | |
| • Check Intact SG levels | | | |
| • Check Secondary Radiation | | | |
| • Check PZR PORVs and block valves - ARM 'A' Train | | | |
| • Check if SI flow should be reduced | | | |
| • Check if Containment spray should be stopped | | | |
| • Check if RHR pumps should be stopped | | | |
| • Check RCS and SG pressure | | | |
| • Check if DG's should be stopped | | | |
| • Initiate evaluation of plant status | | | |

COMMENTS:

EVENT:	FGH	POSITION:	OS	EXAM #	ILED51
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BRIEF DESCRIPTION: **LOCA WITH SEQUENCER FAILURE AND RWST AUTO SWAPOVER FAILURE**

EXPECTED OPERATOR / PLANT RESPONSE	SAT	UNSAT	NA
------------------------------------	-----	-------	----

- | | | | |
|---|-------|-------|-------|
| 5) Ensure transition to ES-1.3, "Transfer To Cold Leg Recirculation", when RWST reaches 36% | _____ | _____ | _____ |
| 6) Ensure implementation of ES-1.3 <ul style="list-style-type: none">• Reset SI• Align CCW cooling/SFP cooling• Align ECCS systems for cold leg recirc | _____ | _____ | _____ |
| 7) Ensure transfer to cold leg recirc (CAPABILITY) by opening the following valve prior to RWST EMPTY ANNUNCIATOR (47B) alarming <ul style="list-style-type: none">• Open EJHV8811A/11B• Close EJHV8812A/12B | _____ | _____ | _____ |
| 8) Realign SI Pump/CCP Pump | _____ | _____ | _____ |
| 9) Swap Containment Spray Suction to Containment Sump | _____ | _____ | _____ |

COMMENTS:

EVENT:	A	POSITION:	RO	EXAM #	ILED51
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BRIEF DESCRIPTION: Pump Down UHS

EXPECTED OPERATOR / PLANT RESPONSE	SAT	UNSAT	NA
------------------------------------	-----	-------	----

1) Refer to OTN-EF-00001, Section 5.6 for Pumping Down UHS to Service Water.

- Ensure EFHV0052 OPEN
- Ensure EFHH0060 OPEN
- Plant Announcement
- Start ESW Pump
- Close EFHV0024 & 26
- Monitor Cooling Tower Basin Level

COMMENTS:

EVENT:	B	POSITION:	RO	EXAM #	ILED51
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BRIEF DESCRIPTION: 'C' RCP HIGH VIBRATION

EXPECTED OPERATOR / PLANT RESPONSE	SAT	UNSAT	NA
------------------------------------	-----	-------	----

ANNUNCIATORS: RCP VIB/SYS ALERT 70B

1) Ensure implementation of OTO-BB-00002, "RCP Off-Normal"

- Check RCP vibrations
- Commence Load Reduction per OTG-ZZ-00004 to <48%.
- RO/BOP Coordinate Load Decrease
- Check AEHV38 closed
- Reduce Speed of MFP in Manual
- When power is <48%, secure the 'B' RCP per OTN-BB-00003

COMMENTS:

EVENT: C	POSITION: RO	EXAM #	ILED51
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BRIEF DESCRIPTION: STEAM PRESSURE CHANNEL FAILURE

EXPECTED OPERATOR / PLANT RESPONSE	SAT	UNSAT	NA
------------------------------------	-----	-------	----

ANNUNCIATORS: SG 'C' LEV DEV 110C
 SG 'C' FLOW MISMATCH 110E

- | | | | |
|--|-------|-------|-------|
| 1) Identify failure of AB-PT-534 | _____ | _____ | _____ |
| 2) Ensure implementation of OTO-AB-00003, "Steam Generator Pressure Channel Failure" | _____ | _____ | _____ |
| • Identify failed channel | _____ | _____ | _____ |
| • Select alternate steam flow channel or take manual control of 'C' S/G level to avoid a Reactor Trip on S/G LOLO Level | _____ | _____ | _____ |
| • Ensure S/G level is stabilized at program 50% | _____ | _____ | _____ |
| 3) Determine that Technical Specification 3.3.2 for ESFAS Instrumentation, Action 33, requires the failed channel to be placed in the tripped condition within six (6) hours | _____ | _____ | _____ |
| 4) Ensure/notify I&C to have the instrument failure investigated, including tripping of bistables | _____ | _____ | _____ |

COMMENTS:

EVENT:	D	POSITION:	RO	EXAM #	ILED51
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BRIEF DESCRIPTION: PRESSURIZER PRESSURE CHANNEL FAILURE

EXPECTED OPERATOR / PLANT RESPONSE	SAT	UNSAT	NA
------------------------------------	-----	-------	----

ANNUNCIATORS: PZR HI PRESS DEV 33B
PZR PRESS HI 34B
RX PARTIAL TRIP 83C

1) Ensure implementation of OTO-BB-00006, "Pressurizer Pressure Channel Failure"

- | | | | |
|---|-------|-------|-------|
| • Identify pressurizer pressure channel BB-PT-455 failure | _____ | _____ | _____ |
| • Select alternate channel or take manual control of pressurizer pressure to prevent a Reactor Trip on OTAT | _____ | _____ | _____ |
| • Ensure plant condition stable and any pressure transient terminated | _____ | _____ | _____ |
| • Select a valid pressure channel on the Pressurizer Pressure Recorder | _____ | _____ | _____ |
| • Return PZR heaters, sprays, and PORV's to normal and verify correct control response | _____ | _____ | _____ |
| • Change digital display to valid channel | _____ | _____ | _____ |

COMMENTS:

EVENT:	D	POSITION:	RO	EXAM #	ILED51
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BRIEF DESCRIPTION: PRESSURIZER PRESSURE CHANNEL FAILURE

EXPECTED OPERATOR / PLANT RESPONSE	SAT	UNSAT	NA
------------------------------------	-----	-------	----

2) Refer to Technical Specifications and ensure compliance
with minimum channel requirements and action statements

- T/S 3.3.1 Action 6 - 6 hours
- T/S 3.3.2 Action 33 - 6 hours
- T/S 3.3.5 Action a - 7 days

COMMENTS:

EVENT:	E	POSITION:	RO	EXAM #	ILED51
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BRIEF DESCRIPTION: RCP TRIP WITH AUTO TURBINE TRIP FAILURE

EXPECTED OPERATOR / PLANT RESPONSE	SAT	UNSAT	NA
------------------------------------	-----	-------	----

ANNUNCIATORS: RCP VIBRATION ALERT 70B
RCO VIBRATION DANGER 70A
PZR LO LEVEL DEVIATION 32C
PZR PRESS LO HTRS ON 33C

- | | | | |
|--|-------|-------|-------|
| 1) Identify High Vibration and ensure implementation of OTO-BB-00002, RCP OFF NORMAL | _____ | _____ | _____ |
| • Trip reactor/turbine and C RCP when upon verification of danger vibrations | | | |
| 2) Implement E-0, "Reactor Trip or Safety Injection" | _____ | _____ | _____ |
| 3) Implement E-0, "Reactor Trip or Safety Injection", and direct actions of RO/BOP | _____ | _____ | _____ |
| • Verify Rx trip | | | |
| • Manually trip turbine due to Auto trip failure | | | |
| • Verify NB01/NB02 energized | | | |
| • Identify primary LOCA is in progress | | | |

COMMENTS:

EVENT:	FGH	POSITION:	RO	EXAM #	ILED51
BRIEF DESCRIPTION:		LOCA WITH SEQUENCER FAILURE AND RWST AUTO SWAPOVER FAILURE			

EXPECTED OPERATOR / PLANT RESPONSE	SAT	UNSAT	NA
------------------------------------	-----	-------	----

1) Continue with actions of E-0

- Ensure the following 'B' train components are manually started
 - RHR Pump
 - ESW Pump
 - CTMT Coolers
- Ensure AFW Flow > 300,000 lbm/hr
- Ensure AFW Valve Alignment
- Ensure SI Valve Alignment
- Check RCS Avg Temperature
- Check PZR PORV's and Spray Valves
- Check if RCPs should be stopped - Trip RCPs when RCS pressure < 1400 psig
- Manually Start 'B' train Class 1E and Control Room AC. (requires Manual reset of SI and CSAS)
- Check if SG's are not faulted
- Check if SG tubes are not ruptured
- Check if RCS is intact

COMMENTS:

EVENT:	FGH	POSITION:	RO	EXAM #	ILED51
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BRIEF DESCRIPTION: **LOCA WITH SEQUENCER FAILURE AND RWST AUTO SWAPOVER FAILURE**

EXPECTED OPERATOR / PLANT RESPONSE	SAT	UNSAT	NA
---	------------	--------------	-----------

- | | | | |
|---|-------|-------|-------|
| 2) Ensure transition to E-1, "Loss of Reactor or Secondary Coolant" | _____ | _____ | _____ |
| • Ensure implementation of CSF Status Monitoring | | | |
| 3) Identify Adverse Containment Conditions and apply appropriate parameter values | _____ | _____ | _____ |
| 4) Perform the actions of E-1, "Loss of Reactor or Secondary Coolant" | _____ | _____ | _____ |
| • Check if RCP's should be stopped | | | |
| • Check if SG's are not faulted | | | |
| • Check Intact SG levels | | | |
| • Check Secondary Radiation | | | |
| • Check PZR PORVs and block valves - ARM 'A' Train | | | |
| • Check if SI flow should be reduced | | | |
| • Check if Containment spray should be stopped | | | |
| • Check if RHR pumps should be stopped | | | |
| • Check RCS and SG pressure | | | |
| • Check if DG's should be stopped | | | |
| • Initiate evaluation of plant status | | | |

COMMENTS:

EVENT:	FGH	POSITION:	RO	EXAM #	ILED51
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BRIEF DESCRIPTION: **LOCA WITH SEQUENCER FAILURE AND RWST AUTO SWAPOVER FAILURE**

EXPECTED OPERATOR / PLANT RESPONSE	SAT	UNSAT	NA
<hr/>			
5) Ensure transition to ES-1.3, "Transfer To Cold Leg Recirculation", when RWST reaches 36%	_____	_____	_____
6) Ensure implementation of ES-1.3	_____	_____	_____
• Reset SI			
• Align CCW cooling/SFP cooling			
• Align ECCS systems for cold leg recirc			
7) Ensure transfer to cold leg recirc (CAPABILITY) by opening the following valve prior to RWST EMPTY ANNUNCIATOR (47B) alarming	_____	_____	_____
• Open EJHV8811A/11B			
• Close EJHV8812A/12B			
8) Realign SI Pump/CCP Pump	_____	_____	_____
9) Swap Containment Spray Suction to Containment Sump	_____	_____	_____

COMMENTS:

EVENT:	A	POSITION:	BOP	EXAM #	ILED51
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BRIEF DESCRIPTION: Pump Down UHS

EXPECTED OPERATOR / PLANT RESPONSE	SAT	UNSAT	NA
------------------------------------	-----	-------	----

1) Refer to OTN-EF-00001, Section 5.6 for Pumping Down UHS to Service Water. _____

- Ensure EFHV0052 OPEN
- Ensure EFHH0060 OPEN
- Plant Announcement
- Start ESW Pump
- Close EFHV0024 & 26
- Monitor Cooling Tower Basin Level

COMMENTS:

EVENT:	B	POSITION:	BOP	EXAM #	ILED51
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BRIEF DESCRIPTION: 'C' RCP HIGH VIBRATION

EXPECTED OPERATOR / PLANT RESPONSE	SAT	UNSAT	NA
------------------------------------	-----	-------	----

ANNUNCIATORS: RCP VIB/SYS ALERT 70B

1) Ensure implementation of OTO-BB-00002, "RCP Off-Normal"

- Check RCP vibrations
- Commence Load Reduction per OTG-ZZ-00004 to <48%.
- RO/BOP Coordinate Load Decrease
- Check AEHV38 closed
- Reduce Speed of MFP in Manual
- When power is <48%, secure the 'B' RCP per OTN-BB-00003

COMMENTS:

EVENT:	C	POSITION:	BOP	EXAM #	ILED51
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BRIEF DESCRIPTION: STEAM PRESSURE CHANNEL FAILURE

EXPECTED OPERATOR / PLANT RESPONSE	SAT	UNSAT	NA
------------------------------------	-----	-------	----

ANNUNCIATORS:	SG 'C' LEV DEV	110C
	SG 'C' FLOW MISMATCH	110D

- | | | | |
|--|-------|-------|-------|
| 1) Identify failure of AB-PT-534 | _____ | _____ | _____ |
| 2) Ensure implementation of OTO-AB-00003, "Steam Generator Pressure Channel Failure" | _____ | _____ | _____ |
| • Identify failed channel | _____ | _____ | _____ |
| • Select alternate steam flow channel or take manual control of 'C' S/G level to avoid a Reactor Trip on S/G LOLO Level | _____ | _____ | _____ |
| • Ensure S/G level is stabilized at program 50% | _____ | _____ | _____ |
| 3) Determine that Technical Specification 3.3.2 for ESFAS Instrumentation, Action 33, requires the failed channel to be placed in the tripped condition within six (6) hours | _____ | _____ | _____ |
| 4) Ensure/notify I&C to have the instrument failure investigated, including tripping of bistables | _____ | _____ | _____ |

COMMENTS:

EVENT:	D	POSITION:	BOP	EXAM #	ILED51
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BRIEF DESCRIPTION: PRESSURIZER PRESSURE CHANNEL FAILURE

EXPECTED OPERATOR / PLANT RESPONSE	SAT	UNSAT	NA
------------------------------------	-----	-------	----

ANNUNCIATORS: PZR HI PRESS DEV 33B
PZR PRESS HI 34B
RX PARTIAL TRIP 83C

1) Ensure implementation of OTO-BB-00006, "Pressurizer Pressure Channel Failure"

- | | | | |
|---|-------|-------|-------|
| • Identify pressurizer pressure channel BB-PT-455 failure | _____ | _____ | _____ |
| • Select alternate channel or take manual control of pressurizer pressure to prevent a Reactor Trip on OTΔT | _____ | _____ | _____ |
| • Ensure plant condition stable and any pressure transient terminated | _____ | _____ | _____ |
| • Select a valid pressure channel on the Pressurizer Pressure Recorder | _____ | _____ | _____ |
| • Return PZR heaters, sprays, and PORV's to normal and verify correct control response | _____ | _____ | _____ |
| • Change digital display to valid channel | _____ | _____ | _____ |

COMMENTS:

EVENT:	D	POSITION:	BOP	EXAM #	ILED51
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BRIEF DESCRIPTION: PRESSURIZER PRESSURE CHANNEL FAILURE

EXPECTED OPERATOR / PLANT RESPONSE	SAT	UNSAT	NA
------------------------------------	-----	-------	----

2) Refer to Technical Specifications and ensure compliance
with minimum channel requirements and action statements

- T/S 3.3.1 Action 6 - 6 hours
- T/S 3.3.2 Action 33 - 6 hours
- T/S 3.3.5 Action a - 7 days

COMMENTS:

EVENT: E	POSITION: BOP	EXAM #	ILED51
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BRIEF DESCRIPTION: RCP TRIP WITH AUTO TURBINE TRIP FAILURE

EXPECTED OPERATOR / PLANT RESPONSE	SAT	UNSAT	NA
------------------------------------	-----	-------	----

ANNUNCIATORS: RCP VIBRATION ALERT 70B
 RCO VIBRATION DANGER 70A
 PZR LO LEVEL DEVIATION 32C
 PZR PRESS LO HTRS ON 33C

- | | | | |
|--|-------|-------|-------|
| 1) Identify High Vibration and ensure implementation of OTO-BB-00002, RCP OFF NORMAL | _____ | _____ | _____ |
| <ul style="list-style-type: none"> • Trip reactor/turbine and C RCP when upon verification of danger vibrations | | | |
| 2) Implement E-0, "Reactor Trip or Safety Injection" | _____ | _____ | _____ |
| 3) Implement E-0, "Reactor Trip or Safety Injection", and direct actions of RO/BOP | _____ | _____ | _____ |
| <ul style="list-style-type: none"> • Verify Rx trip • Manually trip turbine due to Auto trip failure • Verify NB01/NB02 energized • Identify primary LOCA is in progress | | | |

COMMENTS:

EVENT:	FGH	POSITION:	BOP	EXAM #	ILED51
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BRIEF DESCRIPTION: **LOCA WITH SEQUENCER FAILURE AND RWST AUTO SWAPOVER FAILURE**

EXPECTED OPERATOR / PLANT RESPONSE	SAT	UNSAT	NA
---	------------	--------------	-----------

1) Continue with actions of E-0

- Ensure the following 'B' train components are manually started
 - RHR Pump
 - ESW Pump
 - CTMT Coolers
- Ensure AFW Flow > 300,000 lbm/hr
- Ensure AFW Valve Alignment
- Ensure SI Valve Alignment
- Check RCS Avg Temperature
- Check PZR PORV's and Spray Valves
- Check if RCPs should be stopped - Trip RCPs when RCS pressure < 1400 psig
- Manually Start 'B' train Class 1E and Control Room AC. (requires Manual reset of SI and CSAS)
- Check if SG's are not faulted
- Check if SG tubes are not ruptured
- Check if RCS is intact

COMMENTS:

EVENT:	FGH	POSITION:	BOP	EXAM #	ILED51
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BRIEF DESCRIPTION: **LOCA WITH SEQUENCER FAILURE AND RWST AUTO SWAPOVER FAILURE**

EXPECTED OPERATOR / PLANT RESPONSE	SAT	UNSAT	NA
---	------------	--------------	-----------

- | | | | |
|---|-------|-------|-------|
| 2) Ensure transition to E-1, "Loss of Reactor or Secondary Coolant" | _____ | _____ | _____ |
| • Ensure implementation of CSF Status Monitoring | | | |
| 3) Identify Adverse Containment Conditions and apply appropriate parameter values | _____ | _____ | _____ |
| 4) Perform the actions of E-1, "Loss of Reactor or Secondary Coolant" | _____ | _____ | _____ |
| • Check if RCP's should be stopped | | | |
| • Check if SG's are not faulted | | | |
| • Check Intact SG levels | | | |
| • Check Secondary Radiation | | | |
| • Check PZR PORVs and block valves - ARM 'A' Train | | | |
| • Check if SI flow should be reduced | | | |
| • Check if Containment spray should be stopped | | | |
| • Check if RHR pumps should be stopped | | | |
| • Check RCS and SG pressure | | | |
| • Check if DG's should be stopped | | | |
| • Initiate evaluation of plant status | | | |

COMMENTS:

EVENT:	FGH	POSITION:	BOP	EXAM #	ILED51
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BRIEF DESCRIPTION: **LOCA WITH SEQUENCER FAILURE AND RWST AUTO SWAPOVER FAILURE**

EXPECTED OPERATOR / PLANT RESPONSE	SAT	UNSAT	NA
------------------------------------	-----	-------	----

5) Ensure transition to ES-1.3, "Transfer To Cold Leg Recirculation", when RWST reaches 36%

6) Ensure implementation of ES-1.3

- Reset SI
- Align CCW cooling/SFP cooling
- Align ECCS systems for cold leg recirc

7) Ensure transfer to cold leg recirc (CAPABILITY) by opening the following valve prior to RWST EMPTY ANNUNCIATOR (47B) alarming

- Open EJHV8811A/11B
- Close EJHV8812A/12B

8) Realign SI Pump/CCP Pump

9) Swap Containment Spray Suction to Containment Sump

COMMENTS:

SCENARIO EVENTS

Callaway Plant Initial License Exam - February 1997	
EXAMINERS:	SCENARIO # 2
	APPLICANTS:
INITIAL CONDITIONS	30% Power Steady State IC-16
TURNOVER	Need To Remove NCP from Service For WPA MD AFP Out Of Service

EVENT No.	Event Type *	Event Description	KA Number
A	N	Shift from the NCP to a CCP	004010A404 (3.8/3.4)
B	I	PZR Level Channel Failure	000028A101 (3.8/3.9)
C	I	S/G Level Channel Failure	035010A203 (3.4/3.6)
D	C	S/G Tube Leak / Power Reduction for S/G Tube Leak	038027A101 (4.0/3.9)
E	C/R	Failure of Control Rod Bank D to Move / Auto and Manual / Perform Plant Shutdown using Boration Only	001050A201 (3.7/3.9)
F	M	S/G Tube Rupture (~400 gpm) - Plant Trip	038038A101 (4.5/4.4)
G	C	Turbine Driven AFP Fails to Start Automatically	045061A204 (3.4/3.8)
H	C	Failure of High Head Injection (CCP Lockout / BI Header Valve)	045006A306 (3.9/4.2)

* (N) Normal (R) Reactivity (I) Instrument (C) Component (M) Major

UNION ELECTRIC COMPANY
CALLAWAY PLANT TRAINING DEPARTMENT

DYNAMIC SIMULATOR SCENARIO

SIMULATOR SCENARIO: ILEDS2
REVISION DATE: 970106

WRITTEN BY: _____

REVIEWED BY: _____
STS-OPERATIONS TRAINING

APPROVED BY: _____
SUPERINTENDENT OPERATIONS

SCENARIO TITLE:

SGTR WITH FAILURE OF CONTROL RODS TO MOVE

EXAM #:

ILED2

INITIAL CONDITIONS:

30% power, raising power at 3%/hr, BOL

<u>Event - TITLE</u>	<u>KSA #</u>	<u>(RATING)</u>	<u>UE TASK #</u>
A) Shift from a CCP to the NCP	004010A404	3.8/3.4	URO-SBG-02
B) PZR Level Channel Failure	000028A101	3.8/3.9	URO-SBB-04
C) S/G Level Channel Failure	035010A203	3.4/3.6	URO-SAE-04
D) S/G Tube Leak - Power Reduction	038027A101	4.0/3.9	URO-SBB-04
E) Failure of a Control Bank to Move	001050A201	3.7/3.9	URO-SSF-02
F) Steam generator tube rupture	038038A101	4.5/4.4	URO-CRK-04 SRO-ERI-02
G) Failure of TDAFP to auto start	045061A204	3.4/3.8	URO-SAL-02
H) Charging Pump Start Failure/BIH Valve Failure	045006A306	3.9/4.2	URO-CRK-01

SCENARIO LENGTH:

Approximately 90 minutes

SCENARIO COMPLETION CRITERIA:

The scenario is complete when step 17 (RCS Depressurization) of E-3 is complete.

SCENARIO OVERVIEW

EXAM #:
ILED2

A power ascension is in progress from 30% power at 3% per hour, BOL. The 'B' MD-AFW pump is OOS to repair oil leaks. Need to shift charging to the NCP for post maintenance inspections.

Shortly after shifting to the NCP, Pressurizer Level Channel 459 will fail high. The crew should enter OTO-BB-00007 and select away from the channel. Bistables should be tripped within 6 hours in accordance with Tech. Specs 3.3.1.

After the bistables are tripped for the failed Pressurizer Level Channel, The controlling Level Channel for the 'B' S/G fails high. The crew should enter OTO-AE-00003 and select away from the failed channel. The level transient causes a Tube Leak in the 'B' S/G. The crew should enter OTO-BB-00001 and determine that a plant shutdown is required. When the shutdown is commenced, an urgent failure in the Rod Control System causes the rods to lock up. The crew should enter OTO-SF-00006 and determine that the plant shutdown must be continued with RCS boration and the unit tripped at 2% power. During the shutdown, the tube leak in the 'B' S/G worsens and a Reactor Trip and Safety Injection is occurs.

Due to a slave relay failure, the turbine driven AFW pump will fail to automatically start. The crew should manually start the TDAFP. When the Safety Injection occurs, the 'A' CCP fails to automatically start and BIH inlet valve EM-HV-8803B fails to open. The crew should start the 'A' CCP and open EM-HV-8803B.

The scenario should be terminated when Step 17 of E-3, "RCS Depressurization" is complete.

- 1) Initialize at IC-16; BOL, 30% power
- 2) Ensure a CCP is running
- 3) Preload event D, S/G Tube Leak
- 4) Set RRMSRCS=0.1
- 5) Preload Event G, TDAFP Start Failure
- 6) Preload Event H CCP/BIH Valve Failure
- 7) "FILE AL02.1". This places MD-AFW pump 'B' OOS.
- 8) Place the handswitch for the 'B' MD-AFW pump in pull-to-lock and attach hold-off tag.
- 9) Start a DI Water Transfer Pump

SCENARIO SEQUENCE OF EVENTS GUIDE

EXAM #:
ILED S2

<u>INSERT TIME</u>	<u>EVENT</u>	<u>TYPE</u>	<u>DESCRIPTION</u>
	A	N	Shift to NCP
	B	I	MALF PRS2 Pzr Level Channel Failure Ch. 459, 100%, 20 second ramp
	C	I	MALF FWM2 Controlling S/G Level Channel Failure Ch. 529, 100%, 60 second ramp
P	D	C	MALF RCS2 'B' Steam Generator Tube Leak 20 gpm, 60 second ramp, 10 second delay Cond=JMLFWM2
	E	C/R	MALF CRF1 Failure of a Control Bank to Move G, CD1, Cond=X03I115I
	F	M	MALF RCS2 'B' SGTR 450 gpm, 120 second ramp
P	G	C	MALF LOA TDAFP Auto Start Failure • LOA SBI6=1
P	H	C	MALF LOA CCP Start Failure with BIT Valve Failure • LOA SBI8=4 • SET VAOPN10E(2)=7

SCENARIO SEQUENCE OF EVENTS GUIDE**EXAM #:**
ILED2EVENT INITIATING CUE (Instructor enters times ACTUATED)

N/A _____ Time 0, completion of shift turnover

B _____ Time after shift to NCP

C/D _____ Time after trip of Pzr Level Bistables.

E _____ Time when power reduction started

F _____ Time of SGTR/SI

G _____ Time of TDAFP start

H _____ Time of CCP start

N/A _____ Time of scenario completion

INSTRUCTOR TURNOVER INFORMATION**EXAM #:**
ILED2**PRESENT CONDITIONS:**

30% power
BOL
Raising power at 3%/hr
Rods @ 146 on D
RCS Boron 1611 ppm
Turbine load = 347 MWe

POWER HISTORY:

Returning to 100% following load reduction to repair the 'A' MFIV Accumulator.

EQUIPMENT STATUS:

- 1) 'B' MD-AFW pump OOS (see ABNORMAL CONDITIONS)

ABNORMAL CONDITIONS:

'B' MD-AFW Pump is OOS to fix oil leaks.

SURVEILLANCES DUE/IN PROGRESS:

None.

ADDITIONAL INSTRUCTIONS:

ITEM	TS	OUT	ALLOW
MDAFW PUMP 'B'	3.7.1.2	(- 2 HRS)	72 HRS

EVENT**ADDITIONAL INFORMATION**

B Act as I&C to trip bistables and troubleshoot

FILE BB05.2

C Act as I&C to trip bistables and troubleshoot

FILE AE07.2

D/F Act as Chemistry Tech and report activity in 'B' S/G (if asked to sample and sample valves are open). Report steam from sample sink if CCW is not restored to Radwaste.

Act as Primary EO to isolate steam supply to TDAFP from 'B' S/G.

LOA ABV23=0

E Act as Primary EO and report that an Urgent Failure exists on Power Cabinet 1BD.

Act as I&C and report that the cause is not obvious and a work package will be written up to troubleshoot

H Act as Primary Equipment Operator and investigate failure of EM-HV-8803B. Report that there is no apparent damage. If requested to open the valve,

SET VAOPN10E(2) = 26580

and

Override P18058C = 1

EVENT:	A	POSITION:	OS	EXAM #	ILED2
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BRIEF DESCRIPTION: Shift from CCP to NCP

EXPECTED OPERATOR / PLANT RESPONSE	SAT	UNSAT	NA
------------------------------------	-----	-------	----

ANNUNCIATORS: None

1) Direct the Reactor Operator to shift charging from the CCP to the NCP per OTN-BG-00001, "Chemical and Volume Control System".

2) Ensure the Reactor Operator performs the following.

- Reviews the precautions and limitations
- BG-FK-124 in MANUAL and set at minimum
- BG-HV-8109 is Open
- Start the NCP
- Place BG-FK-121 in MANUAL
- INCREASE NCP flow and DECREASE CCP flow
- When BG-FK-121 indicates zero, STOP the CCP
- If letdown is 120 gpm, CLOSE BG-HV-8109
- Adjust BG-FK-124 to obtain the desired flowrate
- OPEN BG-FK-121 to 25% and place in AUTO
- PLACE BG-FK-124 in AUTO
- VERIFY 8 gpm seal injection per RCP

COMMENTS:

EVENT:	B	POSITION:	OS	EXAM #	ILED2
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BRIEF DESCRIPTION: Pressurizer Level Channel Failure

EXPECTED OPERATOR / PLANT RESPONSE	SAT	UNSAT	NA
------------------------------------	-----	-------	----

ANNUNCIATORS: PZR HI LEV DEV HTRS ON 32D
RX PARTIAL TRIP 83C

1) Implement OTO-BB-00007, "Pressurizer Level Channel Failure"

- Identify pressurizer level channel BB-LT-459 failure
- Select alternate channel
- Restore PZR level to program level
- Select a valid level channel on the Pressurizer Program Level Recorder using switch BB-LS-459E

2) Refer to Technical Specifications and ensure compliance with minimum channel requirements and action statements

- T/S 3.3.1 Action 6 - 6 hours

3) Notify I&C to have instrument failure investigated, including tripping of bistable

- Direct I&C to trip B/S
LB459A PZR HI WTR LEV

4) Ensure status board is updated and EOSL is generated

COMMENTS:

EVENT:	C	POSITION:	OS	EXAM #	ILED2
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BRIEF DESCRIPTION: **Steam Generator Level Channel Failure**

EXPECTED OPERATOR / PLANT RESPONSE	SAT	UNSAT	NA
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ANNUNCIATORS: S/G B LEV DEV 109C
 RX PARTIAL TRIP 83C

- | | | | |
|---|-------|-------|-------|
| 1) Implement OTO-AE-00003, "Steam Generator Level Channel Failure" | _____ | _____ | _____ |
| • Identify the failed channel | _____ | _____ | _____ |
| • Select the alternate level channel | _____ | _____ | _____ |
| • Stabilize S/G Level at 50% | _____ | _____ | _____ |
| 2) Notify I&C to have instrument failure investigated, including tripping of bistables within six (6) hours | _____ | _____ | _____ |
| • T/S 3.3.1 Action 6 | | | |
| • T/S 3.3.2 Action 33 | | | |

COMMENTS:

EVENT:	E	POSITION:	OS	EXAM #	ILED2
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BRIEF DESCRIPTION: Failure of a Control Bank to Move

EXPECTED OPERATOR / PLANT RESPONSE	SAT	UNSAT	NA
------------------------------------	-----	-------	----

ANNUNCIATORS: ROD CTRL URG FAIL 79A

- | | | | |
|---|-------|-------|-------|
| 1) DO NOT attempt to move rods, contact I&C | _____ | _____ | _____ |
| 2) Implement OTO-SF-00006, "Failure of Control Bank to Move" | _____ | _____ | _____ |
| <ul style="list-style-type: none">• Adjust Turbine Load and/or Boron Concentration to maintain Tavg and Tref within 3 degrees F.• Refer to Tech Spec 3.1.3.1 (No action required until surveillance expired)• Dispatch an operator to the rod control cabinets to determine the cause of the Urgent failure• Shutdown the plant by borating the RCS and reducing Turbine Load• When 2% Reactor power is reached, TRIP the Reactor and proceed according to E-0, Reactor Trip or Safety Injection. | | | |

COMMENTS:

EVENT:	FGH	POSITION:	OS	EXAM #	ILED2
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BRIEF DESCRIPTION: SGTR, TDAFP & BIH Flow Failure

EXPECTED OPERATOR / PLANT RESPONSE	SAT	UNSAT	NA
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- | | | | |
|---|-------|-------|-------|
| 1) Manually Trip the Reactor and Implement E-0, "Reactor Trip or Safety Injection" | _____ | _____ | _____ |
| <ul style="list-style-type: none">• Verify reactor trip• Verify turbine trip• Verify power to NB01/NB02• Determine SI is required and manually initiate SI or ensure automatic SI has occurred and continue in E-0 | | | |

- | | | | |
|---|-------|-------|-------|
| 2) Continue with the actions of E-0, "Reactor Trip or Safety Injection" | _____ | _____ | _____ |
| <ul style="list-style-type: none">• Ensure Feedwater Isolation• Ensure CISA• Ensure AFW Actuation• Start the TDAFP• Establish High Head ECCS Injection flow<ul style="list-style-type: none">– Start 'A' CCP– Open EM-HV-8803B• Ensure One CCW Pump Running In Each Train• Ensure ESW Pumps Running• Check CTMT Coolers | | | |

COMMENTS:

EVENT:	FGH	POSITION:	OS	EXAM #	ILED2
BRIEF DESCRIPTION: SGTR, TDAFP & BIH Flow Failure					
EXPECTED OPERATOR / PLANT RESPONSE				SAT	UNSAT
				NA	

2) (Continued)

- Ensure CPIS
- Check if Main Steamlines Should Be Isolated
- Check if CTMT Spray Required
- Ensure CRVIS
- Ensure ECCS Flow (see critical task above)
- Ensure Total AFW Flow > 300,000 lbm/hr (see critical task above)
- Ensure AFW Valve Alignment
- Ensure SI Valve Alignment
- Check RCS Average Temperature
- Check PZR PORVs and Sprays
- Check if RCPs Should Be Stopped - Trip RCPs if RCS Pressure < 1400 psig
- Check if SG's Are Not Faulted
- Check if SG's Are Not Ruptured

COMMENTS:

EVENT: FGH

POSITION: OS

EXAM #

ILED2

BRIEF DESCRIPTION: SGTR, TDAFP & BIH Flow Failure

EXPECTED OPERATOR / PLANT RESPONSE

SAT

UNSAT

NA

3) Transition to E-3, "Steam Generator Tube Rupture"

- Ensure CSF monitoring is implemented when E-0 is exited
- Monitor for Adverse Containment and apply appropriate parameter values

4) Direct performance of E-3, "Steam Generator Tube Rupture"

- Check if RCPs Should Be Stopped
- Identify 'B' SG as Ruptured
- Isolate steam flow from 'B' S/G
- Isolate feedwater flow to 'B' S/G

COMMENTS:

EVENT:	FGH	POSITION:	OS	EXAM #	ILED2
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BRIEF DESCRIPTION: SGTR, TDAFP & BIH Flow Failure

EXPECTED OPERATOR / PLANT RESPONSE	SAT	UNSA1	NA
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5) Continue with actions of E-3

- Arm cold overpressure protection
- Ensure S/Gs not faulted
- Intact S/G levels
- Reset SI
- Reset CIS 'A' and CIS 'B'
- Establish instrument air to containment
- Off-Site power available
- Stop RHR pumps
- Check 'B' SG Pressure > 430 psig
- Initiate RCS Cooldown
 - Block low steamline pressure SI
 - Obtain desired thermocouple temperature from Table 3
 - Dump steam to condenser
- Maintain Core Exit Thermocouples below the required temperature
- Check 'B' SG Pressure - Stable or Increasing
- Check Subcooling
- Depressurize the RCS to minimize break flow and refill PZR

COMMENTS:

EVENT:	A	POSITION:	RO	EXAM #	ILED2
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BRIEF DESCRIPTION: Shift from CCP to NCP

EXPECTED OPERATOR / PLANT RESPONSE	SAT	UNSAT	NA
------------------------------------	-----	-------	----

ANNUNCIATORS: None

1) Shift charging from the CCP to the NCP per OTN-BG-00001, "Chemical and Volume Control System".

2) Perform the following.

- Review the precautions and limitations
- BG-FK-124 in MANUAL and set at minimum
- BG-HV-8109 is Open
- Start the NCP
- Place BG-FK-121 in MANUAL
- INCREASE NCP flow and DECREASE CCP flow
- When BG-FK-121 indicates zero, STOP the CCP
- If letdown is 120 gpm, CLOSE BG-HV-8109
- Adjust BG-FK-124 to obtain the desired flowrate
- OPEN BG-FK-121 to 25% and place in AUTO
- PLACE BG-FK-124 in AUTO
- VERIFY 8 gpm seal injection per RCP

COMMENTS:

EVENT: B POSITION: RO EXAM # ILEDS2

BRIEF DESCRIPTION: Pressurizer Level Channel Failure

EXPECTED OPERATOR / PLANT RESPONSE SAT UNSAT NA

ANNUNCIATORS: PZR HI LEV DEV HTRS ON 32D
RX PARTIAL TRIP 83C

1) Implement OTO-BB-00007, "Pressurizer Level Channel Failure"

- Identify pressurizer level channel BB-LT-459 failure
- Select alternate channel
- Restore PZR level to program level
- Select a valid level channel on the Pressurizer Program Level Recorder using switch BB-LS-459E

2) Refer to Technical Specifications and ensure compliance with minimum channel requirements and action statements

- T/S 3.3.1 Action 6 - 6 hours

3) Notify I&C to have instrument failure investigated, including tripping of bistable

- Direct I&C to trip B/S
LB459A PZR HI WTR LEV

4) Ensure status board is updated and EOSL is generated

COMMENTS:

EVENT:	C	POSITION:	RO	EXAM #	ILED2
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BRIEF DESCRIPTION: **Steam Generator Level Channel Failure**

EXPECTED OPERATOR / PLANT RESPONSE	SAT	UNSAT	NA
---	------------	--------------	-----------

ANNUNCIATORS: S/G B LEV DEV 109C
 RX PARTIAL TRIP 83C

- | | | | |
|---|-------|-------|-------|
| 1) Implement OTO-AE-00003, "Steam Generator Level Channel Failure" | _____ | _____ | _____ |
| • Identify the failed channel | _____ | _____ | _____ |
| • Select the alternate level channel | _____ | _____ | _____ |
| • Stabilize S/G Level at 50% | _____ | _____ | _____ |
| 2) Notify I&C to have instrument failure investigated, including tripping of bistables within six (6) hours | _____ | _____ | _____ |
| • T/S 3.3.1 Action 6 | | | |
| • T/S 3.3.2 Action 33 | | | |

COMMENTS:

EVENT:	D	POSITION:	RO	EXAM #	ILED2
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BRIEF DESCRIPTION: Steam Generator Tube Leak

EXPECTED OPERATOR / PLANT RESPONSE	SAT	UNSAT	NA
------------------------------------	-----	-------	----

ANNUNCIATORS: PROCESS RAD HI 61B
PROCESS RAD HI HI 61A

- | | | | |
|---|-------|-------|-------|
| 1) Identify that a steam generator tube leak has occurred | _____ | _____ | _____ |
| 2) Implement OTO-BB-00001, "Steam Generator Tube Leak" | _____ | _____ | _____ |
| <ul style="list-style-type: none"> • Determine leak rate to be less than 50 GPM • Contact Chemistry to sample S/G's • Apply to Tech Spec 3.4.6.2, action b • Notify Power Dispatch • Commence Load Reduction | | | |

COMMENTS:

EVENT:	E	POSITION:	RO	EXAM #	ILED2
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BRIEF DESCRIPTION: Failure of a Control Bank to Move

EXPECTED OPERATOR / PLANT RESPONSE	SAT	UNSAT	NA
------------------------------------	-----	-------	----

ANNUNCIATORS: ROD CTRL URG FAIL 79A

- | | | | |
|---|-------|-------|-------|
| 1) DO NOT attempt to move rods, contact I&C | _____ | _____ | _____ |
| 2) Implement OTO-SF-00006, "Failure of Control Bank to Move" | _____ | _____ | _____ |
| <ul style="list-style-type: none">• Adjust Turbine Load and/or Boron Concentration to maintain Tavg and Tref within 3 degrees F.• Refer to Tech Spec 3.1.3.1 (No action required until surveillance expired)• Dispatch an operator to the rod control cabinets to determine the cause of the Urgent failure• Shutdown the plant by borating the RCS and reducing Turbine Load• When 2% Reactor power is reached, TRIP the Reactor and proceed according to E-0, Reactor Trip or Safety Injection. | | | |

COMMENTS:

EVENT:	FGH	POSITION:	RO	EXAM #	ILED2
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BRIEF DESCRIPTION: SGTR, TDAFP & BIH Flow Failure

EXPECTED OPERATOR / PLANT RESPONSE	SAT	UNSAT	NA
------------------------------------	-----	-------	----

- | | | | |
|---|-------|-------|-------|
| 1) Manually Trip the Reactor and Implement E-0, "Reactor Trip or Safety Injection" | _____ | _____ | _____ |
| <ul style="list-style-type: none">• Verify reactor trip• Verify turbine trip• Verify power to NB01/NB02• Determine SI is required and manually initiate SI or ensure automatic SI has occurred and continue in E-0 | | | |

- | | | | |
|---|-------|-------|-------|
| 2) Continue with the actions of E-0, "Reactor Trip or Safety Injection" | _____ | _____ | _____ |
| <ul style="list-style-type: none">• Ensure Feedwater Isolation• Ensure CISA• Ensure AFW Actuation• Start the TDAFP• Establish High Head ECCS Injection flow<ul style="list-style-type: none">- Start 'A' CCP- Open EM-HV-8803B• Ensure One CCW Pump Running In Each Train• Ensure ESW Pumps Running• Check CTMT Coolers | | | |

COMMENTS:

EVENT:	FGH	POSITION:	RO	EXAM #	ILED2
BRIEF DESCRIPTION: SGTR, TDAFP & BIH Flow Failure					
EXPECTED OPERATOR / PLANT RESPONSE				SAT	UNSAT
				NA	

2) (Continued)

- Ensure CPIS
- Check if Main Steamlines Should Be Isolated
- Check if CTMT Spray Required
- Ensure CRVIS
- Ensure ECCS Flow (see critical task above)
- Ensure Total AFW Flow > 300,000 lbm/hr (see critical task above)
- Ensure AFW Valve Alignment
- Ensure SI Valve Alignment
- Check RCS Average Temperature
- Check PZR PORVs and Sprays
- Check if RCPs Should Be Stopped - Trip RCPs if RCS Pressure < 1400 psig
- Check if SG's Are Not Faulted
- Check if SG's Are Not Ruptured

COMMENTS:

EVENT:	FGH	POSITION:	RO	EXAM #	ILED2
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BRIEF DESCRIPTION: SGTR, TDAFP & BIH Flow Failure

EXPECTED OPERATOR / PLANT RESPONSE	SAT	UNSAT	NA
------------------------------------	-----	-------	----

3) Transition to E-3, "Steam Generator Tube Rupture" _____

- Ensure CSF monitoring is implemented when E-0 is exited
- Monitor for Adverse Containment and apply appropriate parameter values

4) Direct performance of E-3, "Steam Generator Tube Rupture" _____

- Check if RCPs Should Be Stopped
- Identify 'B' SG as Ruptured
- Isolate steam flow from 'B' S/G
- Isolate feedwater flow to 'B' S/G

COMMENTS:

EVENT:	FGH	POSITION:	RO	EXAM #	ILED2
--------	-----	-----------	----	--------	-------

BRIEF DESCRIPTION: SGTR, TDAFP & BIH Flow Failure

EXPECTED OPERATOR / PLANT RESPONSE	SAT	UNSAT	NA
------------------------------------	-----	-------	----

5) Continue with actions of E-3

- Arm cold overpressure protection
- Ensure S/Gs not faulted
- Intact S/G levels
- Reset SI
- Reset CIS 'A' and CIS 'B'
- Establish instrument air to containment
- Off-Site power available
- Stop RHR pumps
- Check 'B' SG Pressure > 430 psig
- Initiate RCS Cooldown
 - Block low steamline pressure SI
 - Obtain desired thermocouple temperature from Table 3
 - Dump steam to condenser
- Maintain Core Exit Thermocouples below the required temperature
- Check 'B' SG Pressure - Stable or Increasing
- Check Subcooling
- Depressurize the RCS to minimize break flow and refill PZR

COMMENTS:

EVENT:	A	POSITION:	BOP	EXAM #	ILED2
--------	---	-----------	-----	--------	-------

BRIEF DESCRIPTION: Shift from CCP to NCP

EXPECTED OPERATOR / PLANT RESPONSE	SAT	UNSAT	NA
------------------------------------	-----	-------	----

ANNUNCIATORS: None

1) Shift charging from the CCP to the NCP per
OTN-BG-00001, "Chemical and Volume Control System".

2) Perform the following.

- Review the precautions and limitations
- BG-FK-124 in MANUAL and set at minimum
- BG-HV-8109 is Open
- Start the NCP
- Place BG-FK-121 in MANUAL
- INCREASE NCP flow and DECREASE CCP flow
- When BG-FK-121 indicates zero, STOP the CCP
- If letdown is 120 gpm, CLOSE BG-HV-8109
- Adjust BG-FK-124 to obtain the desired flowrate
- OPEN BG-FK-121 to 25% and place in AUTO
- PLACE BG-FK-124 in AUTO
- VERIFY 8 gpm seal injection per RCP

COMMENTS:

EVENT:	B	POSITION:	BOP	EXAM #	ILED2
--------	---	-----------	-----	--------	-------

BRIEF DESCRIPTION: Pressurizer Level Channel Failure

EXPECTED OPERATOR / PLANT RESPONSE	SAT	UNSAT	NA
------------------------------------	-----	-------	----

ANNUNCIATORS: PZR HI LEV DEV HTRS ON 32D
RX PARTIAL TRIP 83C

1) Implement OTO-BB-00007, "Pressurizer Level Channel Failure"

- | | | | |
|--|--|--|--|
| • Identify pressurizer level channel BB-LT-459 failure | | | |
| • Select alternate channel | | | |
| • Restore PZR level to program level | | | |
| • Select a valid level channel on the Pressurizer Program Level Recorder using switch BB-LS-459E | | | |

2) Refer to Technical Specifications and ensure compliance with minimum channel requirements and action statements

- | | | | |
|--------------------------------|--|--|--|
| • T/S 3.3.1 Action 6 - 6 hours | | | |
|--------------------------------|--|--|--|

3) Notify I&C to have instrument failure investigated, including tripping of bistable

- | | | | |
|---|--|--|--|
| • Direct I&C to trip B/S
LB459A PZR HI WTR LEV | | | |
|---|--|--|--|

4) Ensure status board is updated and EOSL is generated

COMMENTS:

EVENT:	C	POSITION:	BOP	EXAM #	ILED2
--------	---	-----------	-----	--------	-------

BRIEF DESCRIPTION: Steam Generator Level Channel Failure

EXPECTED OPERATOR / PLANT RESPONSE	SAT	UNSAT	NA
------------------------------------	-----	-------	----

ANNUNCIATORS:	S/G B LEV DEV	109C
	RX PARTIAL TRIP	83C

1) Implement OTO-AE-00003, "Steam Generator Level Channel Failure"

- Identify the failed channel
- Select the alternate level channel
- Stabilize S/G Level at 50%

2) Notify I&C to have instrument failure investigated, including tripping of bistables within six (6) hours

- T/S 3.3.1 Action 6
- T/S 3.3.2 Action 33

COMMENTS:

EVENT:	D	POSITION:	BOP	EXAM #	ILED2
--------	---	-----------	-----	--------	-------

BRIEF DESCRIPTION: Steam Generator Tube Leak

EXPECTED OPERATOR / PLANT RESPONSE	SAT	UNSAT	NA
------------------------------------	-----	-------	----

ANNUNCIATORS: PROCESS RAD HI 61B
PROCESS RAD IHI HI 61A

- | | | | |
|---|-------|-------|-------|
| 1) Identify that a steam generator tube leak has occurred | _____ | _____ | _____ |
| 2) Implement OTO-BB-00001, "Steam Generator Tube Leak" | _____ | _____ | _____ |
| <ul style="list-style-type: none">• Determine leak rate to be less than 50 GPM• Contact Chemistry to sample S/G's• Apply to Tech Spec 3.4.6.2, action b• Notify Power Dispatch• Commence Load Reduction | | | |

COMMENTS:

EVENT:	E	POSITION:	BOP	EXAM #	ILED2
--------	---	-----------	-----	--------	-------

BRIEF DESCRIPTION: Failure of a Control Bank to Move

EXPECTED OPERATOR / PLANT RESPONSE	SAT	UNSAT	NA
------------------------------------	-----	-------	----

ANNUNCIATORS: ROD CTRL URG FAIL 79A

1) DO NOT attempt to move rods, contact I&C

2) Implement OTO-SF-00006, "Failure of Control Bank to Move"

- Adjust Turbine Load and/or Boron Concentration to maintain Tavg and Tref within 3 degrees F.
- Refer to Tech Spec 3.1.3.1 (No action required until surveillance expired)
- Dispatch an operator to the rod control cabinets to determine the cause of the Urgent failure
- Shutdown the plant by borating the RCS and reducing Turbine Load
- When 2% Reactor power is reached, TRIP the Reactor and proceed according to E-0, Reactor Trip or Safety Injection.

COMMENTS:

EVENT:	FGH	POSITION:	BOP	EXAM #	ILED2
--------	-----	-----------	-----	--------	-------

BRIEF DESCRIPTION: SGTR, TDAFP & BIH Flow Failure

EXPECTED OPERATOR / PLANT RESPONSE	SAT	UNSAT	NA
------------------------------------	-----	-------	----

- | | | | |
|---|-------|-------|-------|
| 1) Manually Trip the Reactor and Implement E-0, "Reactor Trip or Safety Injection" | _____ | _____ | _____ |
| <ul style="list-style-type: none">• Verify reactor trip• Verify turbine trip• Verify power to NB01/NB02• Determine SI is required and manually initiate SI or ensure automatic SI has occurred and continue in E-0 | | | |

- | | | | |
|---|-------|-------|-------|
| 2) Continue with the actions of E-0, "Reactor Trip or Safety Injection" | _____ | _____ | _____ |
| <ul style="list-style-type: none">• Ensure Feedwater Isolation• Ensure CISA• Ensure AFW Actuation• Start the TDAFP• Establish High Head ECCS Injection flow<ul style="list-style-type: none">– Start 'A' CCP– Open EM-HV-8803B• Ensure One CCW Pump Running In Each Train• Ensure ESW Pumps Running• Check CTMT Coolers | | | |

COMMENTS:

EVENT:	FGH	POSITION:	BOP	EXAM #	ILED2
--------	-----	-----------	-----	--------	-------

BRIEF DESCRIPTION: SGTR, TDAFP & BIH Flow Failure

EXPECTED OPERATOR / PLANT RESPONSE	SAT	UNSAT	NA
------------------------------------	-----	-------	----

2) (Continued)

- Ensure CPIS
- Check if Main Steamlines Should Be Isolated
- Check if CTMT Spray Required
- Ensure CRVIS
- Ensure ECCS Flow (see critical task above)
- Ensure Total AFW Flow > 300,000 lbm/hr (see critical task above)
- Ensure AFW Valve Alignment
- Ensure SI Valve Alignment
- Check RCS Average Temperature
- Check PZR PORVs and Sprays
- Check if RCPs Should Be Stopped - Trip RCPs if RCS Pressure < 1400 psig
- Check if SG's Are Not Faulted
- Check if SG's Are Not Ruptured

COMMENTS:

EVENT: FGH POSITION: BOP EXAM # ILEDS2

BRIEF DESCRIPTION: SGTR, TDAFP & BIH Flow Failure

EXPECTED OPERATOR / PLANT RESPONSE SAT UNSAT NA

3) Transition to E-3, "Steam Generator Tube Rupture"

- Ensure CSF monitoring is implemented when E-0 is exited
- Monitor for Adverse Containment and apply appropriate parameter values

4) Direct performance of E-3, "Steam Generator Tube Rupture"

- Check if RCPs Should Be Stopped
- Identify 'B' SG as Ruptured
- Isolate steam flow from 'B' S/G
- Isolate feedwater flow to 'B' S/G

COMMENTS:

• ⁰⁴ EVENT:	FGH	POSITION:	BOP	EXAM #	ILED2
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BRIEF DESCRIPTION: SGTR, TDAFP & BIH Flow Failure

EXPECTED OPERATOR / PLANT RESPONSE	SAT	UNSAT	NA
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5) Continue with actions of E-3

- Arm cold overpressure protection
- Ensure S/Gs not faulted
- Intact S/G levels
- Reset SI
- Reset CIS 'A' and CIS 'B'
- Establish instrument air to containment
- Off-Site power available
- Stop RHR pumps
- Check 'B' SG Pressure > 430 psig
- Initiate RCS Cooldown
 - Block low steamline pressure SI
 - Obtain desired thermocouple temperature from Table 3
 - Dump steam to condenser
- Maintain Core Exit Thermocouples below the required temperature
- Check 'B' SG Pressure - Stable or Increasing
- Check Subcooling
- Depressurize the RCS to minimize break flow and refill PZR

COMMENTS:

SCENARIO EVENTS

Callaway Plant Initial License Exam - February 1997	
EXAMINERS:	SCENARIO # B/U
	APPLICANTS:
INITIAL CONDITIONS	100% Steady State / BOL/ Equilibrium Xenon
TURNOVER	MD AFW Out of Service

EVENT No.	Event Type *	Event Description	KA Number
A	I	VCT Level Channel Failure (112)	064020A305 (3.2/3.0)
B	N	Place Excess Letdown Into Service	094010A402 (3.6/3.1)
C	I	Feed Flow Channel Failure	035010A204 (3.6/3.8)
D	R	SG PORV Failure Open in Automatic	041020A405 (3.1/3.3)
E	C	MFP Oil Leak / Downpower to Remove MFP From Service	059000K416 (3.1/3.2)
F	C/M	MFP Trip with AUTO Reactor Trip Failure / RO Handswitch Works	059000A207 (3.0/3.3)
G	C/M	Overspeed Trip of Turbine Driven AFP / Loss of Heatsink	010000A403 (4.0/3.8)

* (N) Normal (R) Reactivity (I) Instrument (C) Component (M) Major

UNION ELECTRIC COMPANY

CALLAWAY PLANT TRAINING DEPARTMENT

DYNAMIC SIMULATOR SCENARIO

SIMULATOR SCENARIO: ILEDS3

REVISION DATE: 970107

WRITTEN BY: _____

REVIEWED BY: _____
STS-OPERATIONS TRAINING

APPROVED BY: _____
SUPERINTENDENT OPERATIONS

SCENARIO TITLE:	EXAM #: ILED3
------------------------	-------------------------

INITIAL CONDITIONS:

The plant is operating at 100% Steady State.

<u>Event - TITLE</u>	<u>KSA #</u>	<u>(RATING)</u>	<u>UE TASK #</u>
A) VCT Level Channel Failure	004020A305	3.2/3.0	URO-SBG-06
E) Place Excess Letdown Into Service	004010A402	3.6/3.1	URO-SBG-02
C) Feed Flow Channel Failure	035010A204 035010A301	3.6/3.8 4.0/3.9	URO-SAE-04
D) 'D' S/G Relief Valve Failure	041020A405 041020A302	3.1/3.3 3.3/3.4	URO-SAB-04 STA-ADM-03
E) MFP Oil Leak	059000K416	3.1/3.2	URO-SAE-04
F) MFP Trip Failure of Reactor Auto Trip	059000A207	3.0/3.3	URO-SAE-04
G) TD AFP Overspeed - Loss of Heat Sink	010000A403	4.0/3.8	URO-CRK-09 SRO-ERI-02 STA-TAA-02

SCENARIO LENGTH:

Approximately 60 minutes.

SCENARIO COMPLETION CRITERIA:

This scenario is completed upon restoration of feedflow from 'B' MFP per FR-H.1.

SCENARIO OVERVIEW

EXAM #:
ILED3

The plant is initially at 100% steady state power, beginning of life, equilibrium xenon conditions. The 'A' MD Auxiliary Feedwater Pump is out of service for pump oil leaks.

They will experience a failure of VCT level channel 112 which will cause the charging pump suction to realign to the RWST and borate the RCS. The crew should respond per OTO-BG-00004, "VCT Level Channel Failure", by minimizing charging while removing power from the valves and swapping them back to the VCT. This will render the 'A' Train of ECCS inoperable and Technical Specification 3.5.2 applies.

The controlling feed flow channel on 'D' S/G, AE-FT-540, fails low. This results in an increase in feed flow to the 'D' S/G and a subsequent increase in level. The crew should respond per OTO-AE-00002, "Feedwater Flow Channel Failure", identifying the failed channel, selecting the alternate feedwater flow channel, and then stabilize S/G level at program 50%.

The "D" Steam Generator Atmospheric fails open. Action should be taken per OTO-AB-00001, "Steam Dump Malfunction". Technical Specification 3.7.1.7 for Steam Generator Atmospheric Steam Dumps should be checked to determine that compliance with the Limiting Condition for Operation still exists. I&C should be contacted to investigate the failure.

The Secondary Equipment Operator will report a large oil leak on the 'A' MFP. The crew should respond by commencing a power reduction to secure the MFP.

When reactor power reaches 88% (1060 MWe) the 'A' MFP will trip. The crew may respond per OTO-AE-00001, "Feedwater System Malfunction", by reducing turbine load and starting Aux Feed Pumps as necessary.

An automatic reactor trip will NOT occur requiring a manual trip. The crew responds to the Reactor Trip by entering E-0, "Reactor Trip or Safety Injection".

The crew should complete the immediate actions of E-0, then transition to ES-0.1, "Reactor Trip Response". When the crew transitions to ES-0.1, the CSF's should be monitored and direct the crew to FR-H.1.

While in FR-H.1, main feedwater should be restored using the "B" MFP and adequate feedflow established. This scenario is complete upon establishing >300 klb/hr feedflow.

SCENARIO SETUP GUIDE

EXAM #:
ILED3

- 1) Initialize at IC20, 100% Steady State
- 2) Run "**FILE AL01.1**" for 'A' MDAFP
- 3) Place Hold Off Tags on 'A' MDAFP and update status board.

ITEM	TS	OUT	ALLOW
'A' MDAFP	3.7.1.2	(- 8 HOURS)	72 HOURS

SCENARIO SEQUENCE OF EVENTS GUIDE

EXAM #:
ILED3

<u>INSERT</u> <u>TIME</u>	<u>EVENT</u>	<u>MALF</u>	<u>DESCRIPTION</u>
	A	I	VCT LEVEL Channel Failure Malf - CVC23 <ul style="list-style-type: none"> • Select Channel 112 (A) • Set = 0 • Ramp = 0 • Delay = 0
	B	N	Place Excess Letdown Into Service
15	C	I	Feedwater Flow Transmitter Failure Malf FWM-4 <ul style="list-style-type: none"> • Select Channel 540 • Set = 0 • Ramp = 15 sec
20	D	C	Steam Generator Relief Valve Failure MALF MSS-7 <ul style="list-style-type: none"> • OPTION = D1 • Set = 100 • Ramp = 30.0
30	E	R	MFP Oil Leak - MALF TUR9, <ul style="list-style-type: none"> • Select A • Size = 20 • Ramp = 60
P	F	C/M	MFP Trip MALF FWM1, <ul style="list-style-type: none"> • Select A • Conditional = SAC.LE.1060.0.0
P			AUTO Reactor Trip Failure - MALF CRF 13 <ul style="list-style-type: none"> • Set = A
P			BOP Handswitch Broken <ul style="list-style-type: none"> • OVERRIDE • Set P06008A = 2
P	G	C/M	Loss of Heat Sink - MALF FWM12 <ul style="list-style-type: none"> • Select TD AFP • Conditional SAC.LE.5.0 • Delay = 30

SCENARIO SEQUENCE OF EVENTS GUIDE

EXAM #:
ILED3

EVENT

INITIATING CUE (Instructor enters times ACTUATED)

INSTRUCTOR TURNOVER INFORMATION**EXAM #:**
ILED3**PRESENT CONDITIONS:**

100% power, steady state equilibrium xenon.
1229 MWe
Cb = 1345 ppm
Bank D at 219 steps

POWER HISTORY:

100% power for past 20 days.

EQUIPMENT STATUS:

'A' MD AFP is out of service due to oil leaks. The pump was declared inoperable 16 hours ago. Repairs are expected to be complete in 24 hours.

ABNORMAL CONDITIONS:

None

SURVEILLANCES DUE/IN PROGRESS:

None

ADDITIONAL INSTRUCTIONS:

ITEM	TS	OUT	ALLOW
'A' MD AFP	3.7.1.2	16 hrs ago	72 hours

SIMULATOR INSTRUCTOR SCENARIO RUN AID**EXAM #:**
ILED3**EVENT****ADDITIONAL INFORMATION**

A/B PEO Perform Attachment 3 to OTO-BG-00004

- LOA BGV44=1
- LOA BNV12=2

I&C Perform attachment 1 to OTO-BG-00004

C Act as I&C, if contacted, and acknowledge the failure of AE-FT-530. If requested, inform the Control Room that plans will be made to investigate.

E Act as Secondary EO and report large oil leak on 'A' MFP. If requested, investigate as Field Supervisor and report that leak is large and pump is starting to make noise.

F Act as Secondary Operator and investigate the trip of the TD AFP. Report back the mechanical linkage is bent and will not reset.

WPA RO to Reopen FWIV from SA075A or 75B

SAS12=(1=D) (2=C) (4=B) (8=A)

SEO to reopen selected FRV to establish feedwater

S/G LOA

D AEV16=T
C AEV15=T
B AEV14=T
A AEV13=T

D AEV20=0.1
C AEV19=0.1
B AEV18=0.1
A AEV17=0.1

EVENT:	A/B	POSITION:	OS	EXAM #	ILED3
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BRIEF DESCRIPTION: VCT LEVEL CHANNEL FAILURE PLACE EXCESS LETDOWN INTO SERVICE

EXPECTED OPERATOR / PLANT RESPONSE	SAT	UNSAT	NA
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ANNUNCIATORS: SA066X and SA066Y Alarms

- | | | | |
|--|-------|-------|-------|
| 1) Identify the failure of BGLT112 | _____ | _____ | _____ |
| 2) Implement OTO-BG-00004, VCT Level Channel Failure | _____ | _____ | _____ |
| 3) Dispatch PEO to perform attachment 3 <ul style="list-style-type: none"> • Invoke Tech Spec action 3.5.2 • Deenergize 112B and 112D valves • Manually reposition valves | _____ | _____ | _____ |
| 4) Align Charging to the RCP seals with flow as low as possible. | _____ | _____ | _____ |
| 5) Place excess letdown into service per OTN-BG-00001 | _____ | _____ | _____ |
| 6) Remove normal letdown from service IAW OTN-BG-00001 | _____ | _____ | _____ |

COMMENTS:

EVENT:	A/B	POSITION:	OS	EXAM #	ILED3
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BRIEF DESCRIPTION: VCT LEVEL CHANNEL FAILURE PLACE EXCESS
LETDOWN INTO SERVICE

EXPECTED OPERATOR / PLANT RESPONSE	SAT	UNSAT	NA
------------------------------------	-----	-------	----

- | | | | |
|---|-------|-------|-------|
| 7) Adjust Turbine load as required | _____ | _____ | _____ |
| 8) Contact I&C to perform attachment 1 to maintain operability of ECCS auto swapover of charging pump suctions. | _____ | _____ | _____ |
| 9) After relay defeated by I&C restore charging and leiddown to normal. | _____ | _____ | _____ |

COMMENTS:

EVENT: C	POSITION: OS	EXAM #	ILED3
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BRIEF DESCRIPTION: FEED FLOW CHANNEL FAILURE

EXPECTED OPERATOR / PLANT RESPONSE	SAT	UNSAT	NA
------------------------------------	-----	-------	----

ANNUNCIATORS: SG C FLOW MISMATCH 110D
 SG C LEV DEV 110C

1) Ensure implementation of OTO-AE-00002, "Feedwater Flow Channel Failure"

- | | | | |
|--|-------|-------|-------|
| • Identify the failure of AE-FT-530 | _____ | _____ | _____ |
| • Select alternate feedwater flow channel or take manual control of S/G Level to prevent a Turbine Trip (and subsequent Rx Trip) on HiHI S/G Level | _____ | _____ | _____ |
| • Stabilize SG level at program 50% | _____ | _____ | _____ |
| • Return Feedwater control to auto, if manual control was selected | _____ | _____ | _____ |
| • Initiate actions to repair the failed channel | _____ | _____ | _____ |

COMMENTS:

EVENT:	D	POSITION:	OS	EXAM #	ILED3
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BRIEF DESCRIPTION: 'D' S/G PORV FAILS OPEN

EXPECTED OPERATOR / PLANT RESPONSE	SAT	UNSAT	NA
------------------------------------	-----	-------	----

ANNUNCIATORS:

- | | | | |
|--|-------|-------|-------|
| 1) Identify AB-PV-4 failure | _____ | _____ | _____ |
| 2) Ensure implementation actions of OTO-AB-00001, "Steam Dump Malfunction" | _____ | _____ | _____ |
| • AB-PV-4 is closed or isolated | | | |
| • Reduce turbine load as necessary | | | |
| 3) Ensure/notify I&C to have the failure investigated/repared | _____ | _____ | _____ |
| 4) Determine that Technical Specification 3.7.1.7.a for Atmospheric Steam Dumps Limiting Condition for Operation is met. | _____ | _____ | _____ |

COMMENTS:

EVENT: E

POSITION: OS

EXAM #

ILED3

BRIEF DESCRIPTION: MFP OIL LEAK/DOWNP

EXPECTED OPERATOR / PLANT RESPONSE

SAT

UNSAT

NA

1) Direct Secondary Equipment Operator/Field Supervisor to
investigate report of 'A' MFP oil leak

2) Ensure the RO/BOP coordinate a load reduction in
preparation to remove the 'A' MFP from service

COMMENTS:

EVENT:	F	POSITION:	OS	EXAM #	ILED3
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BRIEF DESCRIPTION: MFP TRIP WITH AUTO REACTOR TRIP FAILURE

EXPECTED OPERATOR / PLANT RESPONSE	SAT	UNSAT	NA
------------------------------------	-----	-------	----

ANNUNCIATORS: - MFP TRIP 120A

- | | | | |
|--|-------|-------|-------|
| 1) Identify trip of 'A' MFP | _____ | _____ | _____ |
| 2) May implement actions of OTO-AE-00001, "Feedwater System Malfunction" | _____ | _____ | _____ |
| <ul style="list-style-type: none">• Direct operators to start Aux Feed pumps• Direct operators to reduce Turbine Load• Manually Trip Reactor when Red First Out Annunciator Alarms | | | |

COMMENTS:

EVENT:	G	POSITION:	OS	EXAM #	ILED3
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BRIEF DESCRIPTION: OVERSPEED TRIP OF TDAFP LOSS OF HEATSINK

EXPECTED OPERATOR / PLANT RESPONSE	SAT	UNSAT	NA
------------------------------------	-----	-------	----

1) Ensure implementation of E-0, "Reactor Trip or Safety Injection"

- Manual trip required by RO
- Ensure the reactor is tripped
- Ensure the turbine is tripped
- Verify power to NB01 or NB02
- Check if SI is actuated

_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

2) Ensure STA commences CSI monitoring when E-0 is exited

_____	_____	_____
-------	-------	-------

3) Recognize loss of TD AFP and ensure implementation of FR-H.1, "Loss of Secondary Heat sink", after transition to ES-0.1, "Reactor Trip Response"

_____	_____	_____
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COMMENTS:

EVENT:	G	POSITION:	OS	EXAM #	ILED3
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BRIEF DESCRIPTION: OVERSPEED TRIP OF TDAFP LOSS OF HEATSINK

EXPECTED OPERATOR / PLANT RESPONSE	SAT	UNSAT	NA
---	------------	--------------	-----------

- | | | | |
|---|-------|-------|-------|
| 4) Ensure the actions of FR-H.1 are performed | | | |
| • Check if secondary heat sink is required | _____ | _____ | _____ |
| • Try to establish AFW flow to at least 1 S/G | _____ | _____ | _____ |
| • Verify flow to A&D | _____ | _____ | _____ |
| • STOP all RCPs | _____ | _____ | _____ |
| • Shift Steam Dumps to Steam Pressure mode | _____ | _____ | _____ |
| • Check CCP status | _____ | _____ | _____ |
| 5) Establish Main FW Flow to at least One S/G | _____ | _____ | _____ |
| • Check Condensate system in service | | | |
| • Reopen one Main Feedwater Isolation Valve using OOA | | | |
| • Establish Main Feedwater Flow Using Attachment 2 | | | |
| • Block MFP FWIS trip on RP068 | | | |
| • Start the 'B' Main Feedwater Pump | | | |
| • Dispatch SEO to FRV for selected S/G | | | |
| • Establish Communications with SEO | | | |
| • Establish Feedwater flow > 300klb/hr | | | |

COMMENTS:

EVENT:	A/B	POSITION:	RO	EXAM #	ILED3
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BRIEF DESCRIPTION: VCT LEVEL CHANNEL FAILURE PLACE EXCESS
LETDOWN INTO SERVICE

EXPECTED OPERATOR / PLANT RESPONSE	SAT	UNSAT	NA
------------------------------------	-----	-------	----

ANNUNCIATORS: SA066X and SA066Y Alarms

- | | | | |
|--|-------|-------|-------|
| 1) Identify the failure of BGLT112 | _____ | _____ | _____ |
| 2) Implement OTO-BG-00004, VCT Level Channel Failure | _____ | _____ | _____ |
| 3) Dispatch PEO to perform attachment 3 <ul style="list-style-type: none">• Invoke Tech Spec action 3.5.2• Deenergize 112B and 112D valves• Manually reposition valves | _____ | _____ | _____ |
| 4) Align Charging to the RCP seals with flow as low as possible. | _____ | _____ | _____ |
| 5) Place excess letdown into service per OTN-BG-00001 | _____ | _____ | _____ |
| 6) Remove normal letdown from service IAW OTN-BG-00001 | _____ | _____ | _____ |

COMMENTS:

EVENT:	A/B	POSITION:	RO	EXAM #	ILED3
BRIEF DESCRIPTION: VCT LEVEL CHANNEL FAILURE PLACE EXCESS LETDOWN INTO SERVICE					

EXPECTED OPERATOR / PLANT RESPONSE	SAT	UNSAT	NA
7) Adjust Turbine load as required	_____	_____	_____
8) Contact I&C to perform attachment 1 to maintain operability of ECCS auto swapover of charging pump suction.	_____	_____	_____
9) After relay defeated by I&C restore charging and letdown to normal.	_____	_____	_____

COMMENTS:

EVENT: C	POSITION: RO	EXAM #	ILED3
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BRIEF DESCRIPTION: FEED FLOW CHANNEL FAILURE

EXPECTED OPERATOR / PLANT RESPONSE	SAT	UNSAT	NA
------------------------------------	-----	-------	----

ANNUNCIATORS: SG C FLOW MISMATCH 110D
 SG C LEV DEV 110C

1) Ensure implementation of OTO-AE-00002, "Feedwater Flow Channel Failure"

- | | | | |
|--|-------|-------|-------|
| • Identify the failure of AE-FT-530 | _____ | _____ | _____ |
| • Select alternate feedwater flow channel or take manual control of S/G Level to prevent a Turbine Trip (and subsequent Rx Trip) on HIHI S/G Level | _____ | _____ | _____ |
| • Stabilize SG level at program 50% | _____ | _____ | _____ |
| • Return Feedwater control to auto, if manual control was selected | _____ | _____ | _____ |
| • Initiate actions to repair the failed channel | _____ | _____ | _____ |

COMMENTS:

EVENT:	D	POSITION:	RO	EXAM #	ILED3
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BRIEF DESCRIPTION: 'D' S/G PORV FAILS OPEN

EXPECTED OPERATOR / PLANT RESPONSE	SAT	UNSAT	NA
------------------------------------	-----	-------	----

ANNUNCIATORS:

- | | | | |
|--|-------|-------|-------|
| 1) Identify AB-PV-4 failure | _____ | _____ | _____ |
| 2) Ensure implementation actions of OTO-AB-00001, "Steam Dump Malfunction" | _____ | _____ | _____ |
| • AB-PV-4 is closed or isolated | | | |
| • Reduce turbine load as necessary | | | |
| 3) Ensure/notify I&C to have the failure investigated/repared | _____ | _____ | _____ |
| 4) Determine that Technical Specification 3.7.1.7.a for Atmospheric Steam Dumps Limiting Condition for Operation is met. | _____ | _____ | _____ |

COMMENTS:

EVENT:	E	POSITION:	RO	EXAM #	ILED3
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BRIEF DESCRIPTION: MFP OIL LEAK/DOWNPAPER

EXPECTED OPERATOR / PLANT RESPONSE	SAT	UNSAT	NA
------------------------------------	-----	-------	----

- | | | | |
|--|-------|-------|-------|
| 1) Direct Secondary Equipment Operator/Field Supervisor to investigate report of 'A' MFP oil leak | _____ | _____ | _____ |
| 2) Ensure the RO/BOP coordinate a load reduction in preparation to remove the 'A' MFP from service | _____ | _____ | _____ |

COMMENTS:

EVENT:	F	POSITION:	RO	EXAM #	ILED3
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BRIEF DESCRIPTION: MFP TRIP WITH AUTO REACTOR TRIP FAILURE

EXPECTED OPERATOR / PLANT RESPONSE	SAT	UNSAT	NA
------------------------------------	-----	-------	----

ANNUNCIATORS: - MFP TRIP 120A

1) Identify trip of 'A' MFP

2) May implement actions of OTO-AE-00001, "Feedwater System Malfunction"

- Direct operators to start Aux Feed pumps
- Direct operators to reduce Turbine Load
- Manually Trip Reactor when Red First Out Annunciator Alarms

COMMENTS:

EVENT:	G	POSITION:	RO	EXAM #	ILED3
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BRIEF DESCRIPTION: **OVERSPEED TRIP OF TDAFP LOSS OF HEATSINK**

EXPECTED OPERATOR / PLANT RESPONSE	SAT	UNSAT	NA
------------------------------------	-----	-------	----

1) Ensure implementation of E-0, "Reactor Trip or Safety Injection"

- Manual trip required by RC
- Ensure the reactor is tripped
- Ensure the turbine is tripped
- Verify power to NB01 or NB02
- Check if SI is actuated

2) Ensure STA commences CSF monitoring when E-0 is exited

3) Recognize loss of TD AFP and ensure implementation of FR-H.1, "Loss of Secondary Heat sink", after transition to ES-0.1, "Reactor Trip Response"

COMMENTS:

EVENT:	G	POSITION:	RO	EXAM #	ILED3
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BRIEF DESCRIPTION: OVERSPEED TRIP OF TDAFP LOSS OF HEATSINK

EXPECTED OPERATOR / PLANT RESPONSE	SAT	UNSAT	NA
------------------------------------	-----	-------	----

4) Ensure the actions of FR-H.1 are performed

- Check if secondary heat sink is required
- Try to establish AFW flow to at least 1 S/G
- Verify flow to A&D
- STOP all RCPs
- Shift Steam Dumps to Steam Pressure mode
- Check CCP status

_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

5) Establish Main FW Flow to at least One S/G

- Check Condensate system in service
- Reopen one Main Feedwater Isolation Valve using OOA
- Establish Main Feedwater Flow Using Attachment 2
- Block MFP FWIS trip on RP068
- Start the 'B' Main Feedwater Pump
- Dispatch SEO to FRV for selected S/G
- Establish Communications with SEO
- Establish Feedwater flow > 300klb/hr

COMMENTS:

EVENT:	A/B	POSITION:	BOP	EXAM #	ILED3
--------	-----	-----------	-----	--------	-------

BRIEF DESCRIPTION: VCT LEVEL CHANNEL FAILURE PLACE EXCESS
LETDOWN INTO SERVICE

EXPECTED OPERATOR / PLANT RESPONSE	SAT	UNSAT	NA
------------------------------------	-----	-------	----

ANNUNCIATORS: SA066X and SA066Y Alarms

- | | | | |
|--|-------|-------|-------|
| 1) Identify the failure of BGLT112 | _____ | _____ | _____ |
| 2) Implement OTO-BG-00004, VCT Level Channel Failure | _____ | _____ | _____ |
| 3) Dispatch PEO to perform attachment 3 <ul style="list-style-type: none">• Invoke Tech Spec action 3.5.2• Deenergize 112B and 112D valves• Manually reposition valves | _____ | _____ | _____ |
| 4) Align Charging to the RCP seals with flow as low as possible. | _____ | _____ | _____ |
| 5) Place excess letdown into service per OTN-BG-00001 | _____ | _____ | _____ |
| 6) Remove normal letdown from service IAW
OTN-BG-00001 | _____ | _____ | _____ |

COMMENTS:

EVENT:	A/B	POSITION:	BOP	EXAM #	ILED3
--------	-----	-----------	-----	--------	-------

BRIEF DESCRIPTION: VCT LEVEL CHANNEL FAILURE PLACE EXCESS
LETDOWN INTO SERVICE

EXPECTED OPERATOR / PLANT RESPONSE	SAT	UNSAT	NA
------------------------------------	-----	-------	----

- | | | | |
|---|-------|-------|-------|
| 7) Adjust Turbine load as required | _____ | _____ | _____ |
| 8) Contact I&C to perform attachment 1 to maintain operability of ECCS auto swapover of charging pump suctions. | _____ | _____ | _____ |
| 9) After relay defeated by I&C restore charging and letdown to normal. | _____ | _____ | _____ |

COMMENTS:

EVENT: C	POSITION: BOP	EXAM #	ILED3
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BRIEF DESCRIPTION: FEED FLOW CHANNEL FAILURE

EXPECTED OPERATOR / PLANT RESPONSE	SAT	UNSAT	NA
------------------------------------	-----	-------	----

ANNUNCIATORS: SG C FLOW MISMATCH 110D
 SG C LEV DEV 110C

1) Ensure implementation of OTO-AE-00002, "Feedwater Flow Channel Failure"

- | | | | |
|--|-------|-------|-------|
| • Identify the failure of AE-FT-530 | _____ | _____ | _____ |
| • Select alternate feedwater flow channel or take manual control of S/G Level to prevent a Turbine Trip (and subsequent Rx Trip) on HIHI S/G Level | _____ | _____ | _____ |
| • Stabilize SG level at program 50% | _____ | _____ | _____ |
| • Return Feedwater control to auto, if manual control was selected | _____ | _____ | _____ |
| • Initiate actions to repair the failed channel | _____ | _____ | _____ |

COMMENTS:

EVENT:	D	POSITION:	BOP	EXAM #	ILED53
--------	---	-----------	-----	--------	--------

BRIEF DESCRIPTION: 'D' S/G PORV FAILS OPEN

EXPECTED OPERATOR / PLANT RESPONSE	SAT	UNSAT	NA
------------------------------------	-----	-------	----

ANNUNCIATORS:

- | | | | |
|--|-------|-------|-------|
| 1) Identify AB-PV-4 failure | _____ | _____ | _____ |
| 2) Ensure implementation actions of OTO-AB-00001, "Steam Dump Malfunction" | _____ | _____ | _____ |
| • AB-PV-4 is closed or isolated | | | |
| • Reduce turbine load as necessary | | | |
| 3) Ensure/notify I&C to have the failure investigated/repai:red | _____ | _____ | _____ |
| 4) Determine that Technical Specification 3.7.1.7.a for Atmospheric Steam Dumps Limiting Condition for Operation is met. | _____ | _____ | _____ |

COMMENTS:

EVENT:	E	POSITION:	BOP	EXAM #	ILED3
--------	---	-----------	-----	--------	-------

BRIEF DESCRIPTION: MFP OIL LEAK/DOWNPAPER

EXPECTED OPERATOR / PLANT RESPONSE	SAT	UNSAT	NA
------------------------------------	-----	-------	----

- | | | | |
|--|-------|-------|-------|
| 1) Direct Secondary Equipment Operator/Field Supervisor to investigate report of 'A' MFP oil leak | _____ | _____ | _____ |
| 2) Ensure the RO/BOP coordinate a load reduction in preparation to remove the 'A' MFP from service | _____ | _____ | _____ |

COMMENTS:

EVENT:	F	POSITION:	BOP	EXAM #	ILED3
--------	---	-----------	-----	--------	-------

BRIEF DESCRIPTION: MFP TRIP WITH AUTO REACTOR TRIP FAILURE

EXPECTED OPERATOR / PLANT RESPONSE	SAT	UNSAT	NA
------------------------------------	-----	-------	----

ANNUNCIATORS: - MFP TRIP 120A

- | | | | |
|--|-------|-------|-------|
| 1) Identify trip of 'A' MFP | _____ | _____ | _____ |
| 2) May implement actions of OTO-AE-00001, "Feedwater System Malfunction" | _____ | _____ | _____ |
| <ul style="list-style-type: none">• Direct operators to start Aux Feed pumps• Direct operators to reduce Turbine Load• Manually Trip Reactor when Red First Out Annunciator Alarms | | | |

COMMENTS:

EVENT:	G	POSITION:	BOP	EXAM #	ILED3
--------	---	-----------	-----	--------	-------

BRIEF DESCRIPTION: **OVERSPEED TRIP OF TDAFP LOSS OF HEATSINK**

EXPECTED OPERATOR / PLANT RESPONSE	SAT	UNSAT	NA
------------------------------------	-----	-------	----

1) Ensure implementation of E-0, "Reactor Trip or Safety Injection"

- Manual trip required by RO
- Ensure the reactor is tripped
- Ensure the turbine is tripped
- Verify power to NB01 or NB02
- Check if SI is actuated

_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

2) Ensure STA commences CSF monitoring when E-0 is exited

_____	_____	_____
-------	-------	-------

3) Recognize loss of TD AFP and ensure implementation of FR-H.1, "Loss of Secondary Heat sink", after transition to ES-0.1, "Reactor Trip Response"

_____	_____	_____
-------	-------	-------

COMMENTS:

EVENT: G

POSITION: BOP

EXAM #

ILED3

BRIEF DESCRIPTION: OVERSPEED TRIP OF TDAFP LOSS OF HEATSINK

EXPECTED OPERATOR / PLANT RESPONSE

SAT

UNSAT

NA

4) Ensure the actions of FR-H.1 are performed

- Check if secondary heat sink is required
- Try to establish AFW flow to at least 1 S/G
- Verify flow to A&D
- STOP all RCPs
- Shift Steam Dumps to Steam Pressure mode
- Check CIP status

_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

5) Establish Main FW Flow to at least One S/G

- Check Condensate system in service
- Reopen one Main Feedwater Isolation Valve using OOA
- Establish Main Feedwater Flow Using Attachment 2
- Block MFP FWIS trip on RP068
- Start the 'B' Main Feedwater Pump
- Dispatch SEO to FRV for selected S/G
- Establish Communications with SEO
- Establish Feedwater flow > 300klb/hr

_____	_____	_____
-------	-------	-------

COMMENTS:

TO: HOWARD BUNNY (NRC)

FROM: FX BIERMANN
U.E. CALLAWAY PLANT
~~(817) 86~~ (573) 676-8404
FAX (573) 676-4481

CALLAWAY PLANT

APPLICANT	SCENARIO	
	#1	#2
RO	BOP	RO
SRO(I)	RO	CRS
SRO(U)	CRS	BOP

SCENARIO EVENTS

Callaway Plant Initial License Exam - February 1997	
EXAMINERS:	SCENARIO # B/U
	APPLICANTS:
INITIAL CONDITIONS	100% Steady State / BOL/ Equilibrium Xenon
TURNOVER	MD AFW Out of Service

EVENT No.	Event Type *	Event Description	KA Number
A	I	VCT Level Channel Failure (112)	004020A305 (3.2/3.0)
B	N	Place Excess Letdown Into Service	004010A402 (3.6/3.1)
C	I	Feed Flow Channel Failure	035010A204 (3.6/3.8)
D	R C	SG PORV Failure Open in Automatic	041020A405 (3.1/3.3)
E	C R	MFP Oil Leak / Downpower to Remove MFP From Service	059000K416 (3.1/3.2)
F	C/M	MFP Trip with AUTO Reactor Trip Failure / RO Handswitch Works	059000A207 (3.0/3.3)
G	C/M	Overspeed Trip of Turbine Driven AFP / Loss of Heatsink	010000A403 (4.0/3.8)

* (N) Normal (R) Reactivity (I) Instrument (C) Component (M) Major

CAUAWAY PLANT

ES-301

Transient and Event Checklist

Form ES-301-5

SCENARIO SET NO.:

Applicant Type	Evolution Type	Number Reqr'd	Scenario Number			
			1	2	3	4
RO	Reactivity	1	B	E		
	Normal	1	A	A		
	Instrument	2	C	B		
	Component	2	EGH	D,H		
	Major	1	F	F		

B/H

RO POSITION

E
B
A
F
G

As RO	Reactivity	1	B			
	Normal		A			
	Instrument	1	D			
	Component	1	GH			
	Major	1	F			

RO POSITION

E
—
C
D,G
G

SRO-I

As SRO	Reactivity			E		
	Normal	1		A		
	Instrument	1		B,C		
	Component	1		D,G,H		
	Major	1		F		

SRO-U	Reactivity		B	E		
	Normal	1	A	-		
	Instrument	1	C/D	C		
	Component	1	EGH	DGH		
	Major	1	F	F		

RO POSITION

E
B
A,C
D,F
G

NOTE: Enter the scenario set number and Form ES-30 -3 event numbers for each evolution type.

Examiner: _____
Chief Examiner: _____

Callaway Plant

ES-301

Competencies Checklist

Form ES-301-6

Competencies	Applicant #1 RO/SRO-I/SRO-U				Applicant #2 RO/SRO-I/SRO-U				Applicant #3 RO/SRO-I/SRO-U			
	SCENARIO RO				SCENARIO SRO				SCENARIO CRS			
	1	2	3	4	1	2	3	4	1	2	3	4
	RO	SRO	I	U	RO	SRO	I	U	RO	SRO	I	U
Understand & Interpret Annunciators & Alarms	B, C E, H	B, D E, F		A, F	B, D G, H	B, C D, F G		C, D F, G	B, C, D E, G, H	C, D F, G		A, C D, E G
Diagnose Events & Conditions	C, E G, H	B, D E, F H		A, F	D G, H	B, C D, E F, G H		C, D G	C, D E, F G, H	C, D F, G H		A, C D, E, G
Understand Plant & System Response	C, E G, H	A, B D, E F, H		A, B E, F	D G, H	A, B C, D E, F, H		C, D E, G	C, D, E G, H	C, D F, G, H		ALL
Comply With & Use Procedures (1)	A, B C, E, F G, H	A, B D, E F, H		A, B E, F G	A, B D F, G, H	ALL		C, D E, G	ALL EVENTS	C, D F, G, H		ALL
Operate Control Boards (2)	A, B C, E F, G, H	A, B D, E F, H		A, B E, F, G	A, B D F, G, H	—		C, D E, G	—	C, D F, G, H		—
Communicate & Interact With the Crew	ALL	ALL		ALL	ALL	ALL		ALL	ALL	ALL		ALL
Supervisory Ability (3)	—	—		—	—	ALL		—	ALL	—		ALL
Comply With & Use Tech. Specs. (3)	—	—		—	—	B, C D		—	B, C, D	—		A, C D

NOTES:

- (1) Includes technical specification compliance for an RO.
- (2) Optional for an SRO-U.
- (3) Only applicable to SROs.

INSTRUCTIONS:

Circle the applicant's license type and check the competencies covered by each scenario in the set.

Examiner: _____

Chief Examiner: _____

Examiner Standards

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Rev. 7, January 1993

Page 5 of 5

CHIEF EXAMINER SCENARIO COMMENTS - CALLAWAY 2/24/97 EXAM

Legend: D - Difficulty on 1 to 5 scale, 5 being the most difficult

Form ES-301-5

- RO applicant must be in the primary position to take credit for a reactivity manipulation. Therefore, he cannot receive credit for a reactivity manipulation in Scenario 1, Event B. Resolution: Incorporated on form.
- The SRO(U) cannot take credit for a reactivity manipulation in Scenario 2 because he is the BOP operator. A reactivity manipulation is not required for upgrade applicants. Resolution: Incorporated on form.
- Although the SRO(I) applicant is given credit for a normal evolution in Scenario 1, Event A, as the primary operator, it appears the BOP operator would perform the associated actions. Resolution: SRO(I) does not require a normal evolution at panel.
- It appears the SRO(I) applicant should respond to a component failure as the primary operator in Scenario 1, Event E. Resolution: Incorporated on form.
- The BOP operator cannot receive credit for a reactivity manipulation in Scenario B/U. Resolution: Incorporated on form.

Scenario 1

D - 3.5

- It is unlikely that there will be time to run the scenario to a RWST to containment sump s/vapover. Therefore, the component failure in Event H will probably not occur. Resolution: The validation proved that this is likely to occur.
- Event B and Overview - We may want to start this scenario at less than 100% RTP to minimize the time required to reduce power to $\leq 48\%$ to secure "C" RCP. Although the vibration is related to "C" RCP, reference is made to securing "B" RCP in both places. Resolution: References to RCP B corrected.
- Why are we tripping "C" RCP on high vibration and tripping the reactor if we stopped it in Event B at $\leq 48\%$ power? Resolution: Rewrote to make sequence clear.
- Expected Operator/Plant Response actions show very little, if any, discrimination for which operator is actually expected to respond. For instance, in Event A expected RO and BOP actions are identical. Resolution: Revised form to indicate expected responders.

Scenario 2

D - 3.0

- The validation time of 90 minutes is too long. We need to look at making scenario shorter without deleting required examination characteristics. Resolution: Will omit tripping bistables and shorten power reduction.

- Event FGH, Expected Operator/Plant Response - List criteria OS/RO should evaluate in arriving at decision to trip the reactor. Resolution: Incorporated.
- Same comment as Scenario 1 - There appears to be no distinction between the expected operator actions for RO and BOP operators. Resolution: Form changed.

Scenario B/U

D - 2.5

- Expected operator actions listed are the same for all three applicants. Resolution: Form changed.

Attachment 5

JPM and Questions

WALKTHROUGH TEST - OUTLINE

Callaway Plant Initial License Exam - February 1997				
EXAM LEVEL -SRO(I)				
System / JPM	Area	Safety Function	Questions - K/A // Importance // Description	
1. Emergency Boration / FR-S.1 URO-CRK07PCO24J	Plant (RCA)	I	000024K302 (4.2/4.4) Actions in EOP FR-S.1	R
			000024G05 (3.4/3.6) Knowledge of Annunciators /Use of Procedures	M
2. Shift Inst. Bus from B/U to Norm EOS-SNN03PAO10J	Plant	VII	000057K301 (4.1/4.4) Reasons for actions on loss of NN bus	R
			000057A102 (3.8/3.7) PZR Level control on loss of NN bus	M
3. Emer. Feedwater from Firewater EOE-SAE03PAO38J	Plant (RCA)	V	000054K102 (3.6/4.2) Feed Hot Dry Steam Generator	M
			059000K419 (3.2/3.4) Temp Correct FWIV Accum Pressure	R
4. Place H2 Recombiner in Serv. URO-SGS01PFC28J	Plant (C/R)	VI	028000A401 (4.0/4.0) Manually operate HRPS Controls	R
			028000G11 (2.9/3.5) Tech Spec associated with H2 Control	R
5. Cooldown from Aux S/D Panel URO-CTSPA031JC101J	Sim	VIII	000068A112 (4.4/4.4) ASP Controls Indications	R
			000068K312 (4.1/4.5) Sequence of Actions for Evacuation	R
6. Swap CCW Service Loop URO-SEG02PBC21J	Sim	X	008000K401 (3.1/3.3) Auto Start of CCW pumps	R
			008030A304 (3.6/3.7) Auto Actions of System on SI	M
7. Boration of RHR System URO-SEJ02PCC23J	Sim	IV	005000K407 (3.2/3.5) System Interlocks	R
			005000K408 (3.1/3.5) Line up RHR for Recirc	R
8. Makeup to RWST URO-SBG04PDC199J	Sim	II	006000K204 (3.6/3.8) Power Supply to ESFAS valves	R
			000022A108 (3.4/3.3) Monitor VCT level	R
9. Respond to Process Rad Monitor. URO-SSP04PBC87J(F)	Sim (A/P)	XI	073000A402 (3.7/3.7) Monitor System with RM11 Inoperable	R
			073000K401 (4.0/4.3) Release termination due to High Rad	M
10. Source Range Inst. Failure URO-SSE03PAC85J	Sim	IX	015000K501 (2.9/3.2) SR Detector Operation - Use 4 inst. readings determine faulty instrument	R
			015000K506 (3.4/3.7) Use 1/M plot to predict criticality.	R
11. Parallel Emer D/G to Bus URO-SNE01PCC09J	Sim Alternate	VII	064050G01 (3.6/3.8) SNE02C06C Diesel Gen Surveillance	R
			064000K410 (3.5/4.0) Monthly Surv. on DG - Effect of loss of Normal Feeder to NB Bus	R

JPM Checklist

- 1 10 SRO(I)/RO JOMs w/ 7 CR and 3 in-plant
- 2 7 Different Safety Functions for SRO(I) and RO
- 3 CR JPM must be and ESF
- 4 1 JPM low power or Shutdown
- 5 1 in plant JPM EOP or Abnormal Actions
- 6 "Diversify" questions among Ks, As, and Gs
- 7 1 New or Significantly Altered JPMs
- 8 Admin Topics Evaluated in JPMs when possible

- 9 5 SRO(U) JPMs w/2-3 CR and 2-3 in-plant
- 10 5 Different Safety Functions for SRO(U)
- 11 Each System Selected - 1 JPM developed or selected
- 12 1-2 JPMs require alternate path
- 13 In-plant JPM requires escort into RCA
- 14 Less than 30% overlap from last NRC exam
- 15 1 new or significantly altered JPM for SRO(U)

WALKTHROUGH TEST - OUTLINE

Callaway Plant Initial License Exam - February 1997				
EXAM LEVEL - RO				
System / JPM		Area	Safety Function	Questions - K/A // Importance // Description
1.	Emergency Boration / FR-S.I	Plant	I	000024K302 (4.2/4.4) Actions in EOP FR-S.I. R
	URO-CRK07PCO24J	(RCA)		000024G05 (3.4/3.6) Knowledge of Annunciators /Use of Procedures M
2.	Shift Inst. Bus from B/U to Norm	Plant	VII	000057K301 (4.1/4.4) Reasons for actions on loss of NN bus R
	EOS-SNN03PAO10J			000057A102 (3.8/3.7) PZR Level control on loss of NN bus M
3.	Emer. Feedwater from Firewater	Plant	V	000054K102 (3.6/4.2) Feed Hot Dry Steam Generator M
	EOE-SAE03PAO38J	(RCA)		059000K419 (3.2/3.4) Temp Correct FWIV Accum Pressure R
4.	Place H2 Recombiner in Serv.	Plant	VI	028000A401 (4.0/4.0) Manually operate HRPS Controls R
	URO-SGS01PFC28J	(C/R)		028000G11 (2.9/3.5) Tech Spec associated with H2 Control R
5.	Cooldown from Aux S/D Panel	Sim	VIII	000068A112 (4.4/4.4) ASP Controls Indications R
	URO-CTSPA031JC101J			000068K312 (4.1/4.5) Sequence of Actions for Evacuation R
6.	Swap CCW Service Loop	Sim	X	008000K401 (3.1/3.3) Auto Start of CCW pumps R
	URO-SEG02PBC21J			008030A304 (3.6/3.7) Auto Actions of System on SI M
7.	Boration of RHR System	Sim	IV	005000K407 (3.2/3.5) System Interlocks R
	URO-SEJ02PCC23J			005000K408 (3.1/3.5) Line up RHR for Recirc R
8.	Makeup to RWST	Sim	II	006000K204 (3.6/3.8) Power Supply to ESFAS valves R
	URO-SBG04PDC199J			000022A108 (3.4/3.3) Monitor VCT level R
9.	Respond to Process Rad Monitor.	Sim	XI	073000A402 (3.7/3.7) Monitor System with RM11 Inoperable R
	URO-SSP04PBC67J(F)	(A/P)		073000K401 (4.0/4.3) Release termination due to High Rad M
10.	Source Range Inst. Failure	Sim	IX	015000K501 (2.9/3.2) SR Detector Operation - R
	URO-SSE03PAC85J			Use 4 inst. readings determine faulty instrument 015000K506 (3.4/3.7) R Use 1/M plot to predict criticality.
11.	Parallel Emer D/G to Bus	Sim	VII	064050G01 (3.6/3.8) SNE02C06C Diesel Gen Surveillance R
	URO-SNE01PCC09J	Alternate		064000K410 (3.5/4.0) R Monthly Surv. on DG - Effect of loss of Normal Feeder to NB Bus

JPM Checklist

- 10 SRO(I)/RO JPMs w/ 7 CR and 3 in-plant
- 7 Different Safety Functions for SRO(I) and RO
- CR JPM must be and ESF
- 1 JPM low power or Shutdown
- 1 in-plant JPM EOP or Abnormal Actions
- "Diversify" questions among Ks, As, and Gs
- 1 New or Significantly Altered JPMs
- Admin Topics Evaluated in JPMs when possible

- 5 SRO(U) JPMs w/2-3 CR and 2-3 in-plant
- 5 Different Safety Functions for SRO(U)
- Each System Selected - 1 JPM developed or selected
- 1-2 JPMs require alternate path
- 1 in-plant JPM requires escort into RCA
- Less than 30% overlap from last NRC exam
- 1 new or significantly altered JPM for SRO(U)

WALKTHROUGH TEST - OUTLINE

Callaway Plant Initial License Exam - February 1997				
EXAM LEVEL - SRO(U)				
System / JPM		Area	Safety Function	Questions - K/A // Importance // Description
1.	Emergency Boration / FR-S.1	Plant	I	000024K302 (4.2/4.4) Actions in EOP FR-S.1. R
	URO-CTK07PCO24J	(RCA)		000024G05 (3.4/3.6) Knowledge of Annunciators /Use of Procedures M
3.	Emer. Feedwater from Firewater	Plant	V	000054K102 (3.6/4.2) Feed Hot Dry Steam Generator M
	EOE-SAE03PAO38J	(RCA)		059000K419 (3.2/3.4) Temp Correct FWIV Accum Pressure R
4.	Place H2 Recombiner in Serv.	Plant	VI	028000A401 (4.0/4.0) Manually operate HRPS Controls R
	URO-SGS01PFC28J	(C/R)		028000G11 (2.9/3.5) Tech Spec associated with H2 Control R
5.	Cooldown from Aux S/D Panel	Sim	VIII	000068A112 (4.4/4.4) ASP Controls Indications R
	URO-CTSPA031JC101J			000068K312 (4.1/4.5) Sequence of Actions for Evacuation R
9.	Respond to Process Rad Monitor.	Sim	XI	073000A402 (3.7/3.7) Monitor System with RM11 Inoperable R
	URO-SSP04PBC87J(F)	(A/P)		073000K401 (4.0/4.3) Release termination due to High Rad M
11	Parallel Emer D/G to Bus	Sim	VII	064050G01 (3.6/3.8) SNE02C06C Diesel Gen Surveillance R
	URO-SNE01PCC09J	Alternate		064000K410 (3.5/4.0) Monthly Surv. on DG - Effect of loss of Normal Feeder to NB Bus R

JPM Checklist

- | | | | |
|---|--|----|--|
| 1 | 10 SRO(I)/RO JOMs w/ 7 CR and 3 in-plant | 9 | 5 SRO(U) JPMs w/2-3 CR and 2-3 in-plant |
| 2 | 7 Different Safety Functions for SRO(I) and RO | 10 | 5 Different Safety Functions for SRO(U) |
| 3 | CR JPM must be and ESF | 11 | Each System Selected - 1 JPM developed or selected |
| 4 | 1 JPM low power or Shutdown | 12 | 1-2 JPMs require alternate path |
| 5 | 1 in plant JPM EOP or Abnormal Actions | 13 | In-plant JPM requires escort into RCA |
| 6 | "Diversify" questions among Ks, As, and Gs | 14 | Less than 30% overlap from last NRC exam |
| 7 | 1 New or Significantly Altered JPMs | 15 | 1 new or significantly altered JPM for SRO(U) |
| 8 | Admin Topics Evaluated in JPMs when possible | | |

CALLAWAY PLANT

JOB PERFORMANCE MEASURE

JPM NO: URO-CRK07PC024J KSA NO: 000024EA120
U.E. RATING: REQ KSA RATING: 3.2/3.2
JOB TITLE: URO/SRO REVISION: 950621
DUTY: EMERGENCY ACTIONS
TASK TITLE: EMERGENCY BORATION PER FR-S.1
COMPLETION TIME: 8 MINUTES

The performance of this task was evaluated against the standards contained in this JPM and determined to be:

☐ SATISFACTORY ☐ UNSATISFACTORY

Reason, if UNSATISFACTORY:

EVALUATORS SIGNATURE: _____ DATE: _____

TASK PERFORMER: _____

LOCATION OF PERFORMANCE:

CONTROL ROOM _____ SIMULATOR/LAB _____ PLANT X CLASSROOM _____

METHOD OF PERFORMANCE: SIMULATED X PERFORMED _____

REFERENCES: FR-S.1, RESPONSE TO NUCLEAR POWER GENERATION, REVISION 1B1

TOOLS/EQUIPMENT: NONE

PREPARED BY: _____ DATE: _____

REVIEWED BY: _____ DATE: _____

STS/SS

APPROVED BY: _____ DATE: _____

DEPARTMENT HEAD

Read to Performer: I will explain the initial conditions, which steps to simulate or discuss, and provide initiating and subsequent cues. You may use any approved reference materials normally available to you. Make all written reports, oral reports, and log entries as if the evolution was actually being performed. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions: THE 'A' S/G LEVEL HAS DECREASED BELOW THE LOW-LOW LEVEL TRIP SETPOINT AND THE REACTOR HAS FAILED TO TRIP. THE CREW HAS ATTEMPTED TO MANUALLY TRIP THE REACTOR. THE ATTEMPT WAS UNSUCCESSFUL.

Initiating Cues: YOU, AS THE REACTOR OPERATOR, HAVE BEEN DIRECTED TO INITIATE IMMEDIATE BORATION OF THE RCS AT STEP 4 OF FR-S.1, RESPONSE TO NUCLEAR POWER GENERATION.

ASK IF THE OPERATOR UNDERSTANDS THE INITIATING CUES.

Notes: ALL OPERATOR ACTIONS ARE TO BE SIMULATED.

Task Standard: UPON COMPLETION OF THIS JPM, THE OPERATOR WILL BE BORATING THE RCS THROUGH BG-V177.

START TIME: _____

STOP TIME: _____

TASK
NUMBER - ELEMENT

CUE**STANDARD****SCORE**

1. LOCATE A COPY OF FR-S.1, RESPONSE TO NUCLEAR POWER GENERATION		OPERATOR SHOULD OBTAIN PROCEDURE COPY	S U Comments:
2. ENSURE AT LEAST ONE (1) CCP - RUNNING STEP 4.a	BG-HIS-1A, CCP 'A' RED LIGHT IS LIT AND THE GREEN LIGHT IS OUT	OPERATOR SHOULD LOOK FOR A RED LIGHT LIT ON CCP 'A' OR 'B', HANDSWITCH BG-HIS-1A OR BG-HIS-2A ON RL001	S U Comments:
3. ENSURE A CCP OR THE NCP IS RUNNING STEP 4.b.(1)	THE 'A' CCP HANDSWITCH BG-HIS-1A RED LIGHT IS LIT	OPERATOR SHOULD VERIFY RED LIGHT LIT ON BG-HIS-1A	S U Comments:

* CRITICAL STEP

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE
4. OPEN EMERGENCY BORATE TO CHARGING PUMPS SUCTION VALVE BG-HV-8104 STEP 4.b.2	BG-HIS-8104 GREEN LIGHT IS LIT AND THE RED LIGHT DOES <u>NOT</u> ILLUMINATE WHEN THE OPEN PUSHBUTTON IS DEPRESSED	ATTEMPTED TO OPEN BG-HV-8104, EMERGENCY BORATE TO CHARGING PUMPS SUCTION VALVE, BY DEPRESSING BG-HIS-8104 OPEN PUSHBUTTON ON RL002	S U Comments:
5. INITIATE IMMEDIATE BORATION OF RCS BY PERFORMING ATTACHMENT #1, IMMEDIATE RCS BORATION STEP 4.b RNO		OPERATOR SHOULD REALIZE THAT BGHV8104 DID NOT OPEN AND GO TO ATTACHMENT 1	S U Comments:
6. ENSURE A CCP OR THE NCP IS RUNNING STEP 1.a.1	THE 'A' CCP HANDSWITCH BG-HIS-1A RED LIGHT IS LIT	OPERATOR SHOULD VERIFY RED LIGHT LIT ON BG-HIS-1A	S U Comments:

* CRITICAL STEP

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE
7. OPEN CCP SUCTIONS FROM RWST BN-HIS-112D STEP 1.a.2 STEPS 7 AND 8 MAY BE PERFORMED IN ANY ORDER	BG-HIS-112D GREEN LIGHT REMAINS LIT AND RED LIGHT DOES <u>NOT</u> COME ON	OPERATOR SHOULD DEPRESS OPEN ON BN-HIS-112D	S U Comments:
8. OPEN CCP SUCTIONS FROM RWST BN-HIS-112E	BG-HIS-112E GREEN LIGHT REMAINS LIT AND RED LIGHT DOES <u>NOT</u> COME ON	OPERATOR SHOULD DEPRESS OPEN ON BN-HIS-112E	S U Comments:
9. ALTERNATE IMMEDIATE BORATION THROUGH BG-V177 - DIRECT AN EQUIPMENT OPERATOR TO OPEN BG-V177 STEP 1.b.1	CUE: YOU ARE NOW THE EQUIPMENT OPERATOR - YOU HAVE JUST BEEN DIRECTED TO LOCALLY OPEN BG-V177	OPERATOR SHOULD SIMULATE CALLING THE PRIMARY EO AND REQUEST BG-V177, ALTERNATE IMMEDIATE BORATE VALVE, BE OPENED	S U Comments:

* CRITICAL STEP

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE
10. PROCEED TO SAFETY INJECTION PUMP ROOM 'A' STEP 1.b.1		OPERATOR SHOULD GO TO HP ACCESS, THEN AUX BLDG 1974' LEVEL, SI PUMP ROOM 'A'	S U Comments:
11. LOCATE BG-V177		OPERATOR SHOULD FIND VALVE BG-V177, ALTERNATE IMMEDIATE BORATE VALVE, ON THE NORTH SIDE BY SI PUMP ROOM 'A'	S U Comments:
12* OPEN BG-V177 STEP 1.b.1	AFTER LOCATING BG-V177 AND SIMULATE OPENING: CUE: BG-V177 IS OPEN	HANDWHEEL FOR BG-V177, ALTERNATE IMMEDIATE BORATE VALVE, TURNED IN THE COUNTER- CLOCKWISE DIRECTION UNTIL OPEN	S U Comments:

* CRITICAL STEP

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE
13. NOTIFY CONTROL ROOM THAT BG-V177 IS OPEN	CONTROL ROOM ACKNOWLEDGES	OPERATOR SHOULD SIMULATE CALLING THE URO AND REPORTING BG-V177 IS OPEN	S U Comments:
11.	THE JPM IS COMPLETE <u>RECORD STOP TIME</u> <u>ON PAGE 1</u>		S U Comments:
			S U Comments:

* CRITICAL STEP

#1

NAME: _____

JPM NO: URO-CRK07PC024J

QUESTION:

REFERENCE

The plant is at EOL conditions responding to an ATWS condition per FR-S.1. Emergency boration has been initiated. When the reactor trip breakers are opened all rods insert fully with the following exceptions:

ROD H-8 at 150 steps
ROD M12 at 200 steps

FR-S.1 Directs that boration should continue to obtain adequate shutdown margin.

How much reactivity (pcm) is added to OSP-SF-00001, Shutdown Margin Calculation, to account for the 2 rods that failed to insert?

ANSWER:

$$\begin{array}{rcl}
 \text{Most Reactive ROD Reactivity} & & 1249 \\
 \times \text{ \# of Inoperable Rods} & & \times 2 \\
 \hline
 \text{REACTIVITY ADDED} & = & 2498 \text{ pcm } (\pm 50)
 \end{array}$$

KA RATING: 000024K302 (4.2/4.4)

REFERENCE: OSP-SF-00001
STEP 7.6.4.5
Curve Book Table 2-2

COMMENTS / ANSWER GIVEN :

SCORE: SAT UNSAT

JPM NO: URO-CRK07PC024J

QUESTION:

MEMORY

The plant is at 100% power with the Rod Insertion Limit Alarm Inoperable.

- A) What is the insertion limit for Control Bank D?
- B) How often must it be determined to be above its insertion limit with the alarm inoperable?

ANSWER:

- A) Bank D at 161 steps
- B) Every 4 hours

KA RATING: 000024G005 (3.4/3.6)

REFERENCE: Curve Book Figure 13-1
OSP-ZZ-00001 Attachment 3

COMMENTS / ANSWER GIVEN :

SCORE: SAT UNSAT

#1

NAME: _____

JPM NO: URO-CRK07PC024J

QUESTION:

REFERENCE

The plant is at EOL conditions responding to an ATWS condition per FR-S.1. Emergency boration has been initiated. When the reactor trip breakers are opened all rods insert fully with the following exceptions:

ROD H-8 at 150 steps
ROD M12 at 200 steps

FR-S.1 Directs that boration should continue to obtain adequate shutdown margin.

How much reactivity (pcm) is added to OSP-SF-00001, Shutdown Margin Calculation, to account for the 2 rods that failed to insert?

JPM NO: URO-CRK07PC024J

QUESTION:

MEMORY

The plant is at 100% power with the Rod Insertion Limit Alarm Inoperable.

- A) What is the insertion limit for Control Bank D?
- B) How often must it be determined to be above its insertion limit with the alarm inoperable?

Read to Performer: I will explain the initial conditions, which steps to simulate or discuss, and provide initiating and subsequent cues. You may use any approved reference materials normally available to you. Make all written reports, oral reports, and log entries as if the evolution was actually being performed. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions: THE 'A' S/G LEVEL HAS DECREASED BELOW THE LOW-LOW LEVEL TRIP SETPOINT AND THE REACTOR HAS FAILED TO TRIP. THE CREW HAS ATTEMPTED TO MANUALLY TRIP THE REACTOR. THE ATTEMPT WAS UNSUCCESSFUL.

Initiating Cues: YOU, AS THE REACTOR OPERATOR, HAVE BEEN DIRECTED TO INITIATE IMMEDIATE BORATION OF THE RCS AT STEP 4 OF FR-S.1, RESPONSE TO NUCLEAR POWER GENERATION.

Notes: ALL OPERATOR ACTIONS ARE TO BE SIMULATED.

CALLAWAY PLANT

JOB PERFORMANCE MEASURE

JPM NO: EOS SNN03PA010J KSA NO: 000057EA101
U.E. RATING: 2.0/2.0/5.0 KSA RATING: 3.7/3.7
JOB TITLE: URO/SRO REVISION: 950801
DUTY: 120 V VITAL AC INSTRUMENT POWER - CLASS 1E
TASK TITLE: SHIFT AN INSTRUMENT BUS FROM BACKUP TO NORMAL POWER
COMPLETION TIME: 10 MINUTES

The performance of this task was evaluated against the standards contained in this JPM and determined to be:

☐ SATISFACTORY ☐ UNSATISFACTORY

Reason, if UNSATISFACTORY:

EVALUATORS SIGNATURE: _____ DATE: _____

TASK PERFORMER: _____

LOCATION OF PERFORMANCE:

CONTROL ROOM _____ SIMULATOR/LAB _____ PLANT X CLASSROOM _____

METHOD OF PERFORMANCE: SIMULATED X PERFORMED _____

REFERENCES: OTN-NN-00001, 120V VITAL AC INST. POWER - CLASS 1E (NN), REVISION 8

TOOLS/EQUIPMENT: SAFETY EQUIPMENT TO INCLUDE AT LEAST HARD HAT, SAFETY GLASSES WITH SIDE SHIELDS, AND STEEL TOED SHOES

PREPARED BY: _____ DATE: _____

REVIEWED BY: _____ DATE: _____
STS/SS

APPROVED BY: _____ DATE: _____
DEPARTMENT HEAD

Read to Performer: I will explain the initial conditions, which steps to simulate or discuss, and provide initiating and subsequent cues. You may use any approved reference materials normally available to you. Make all written reports, oral reports, and log entries as if the evolution was actually being performed. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions: INSTRUMENT BUS NN01 HAD BEEN PLACED ON THE CONSTANT VOLTAGE TRANSFORMER (CVT THRU NG01A) FOR MAINTENANCE TO PERFORM AN INSPECTION ON INVERTER NN11. NN12, 13 AND 14 ARE ENERGIZED FROM THEIR RESPECTIVE DC BUSES AND BATTERY CHARGERS. THE PLANT IS IN MODE 6. INVERTER NN11 HAS HAD POST MAINTENANCE CHECKS PERFORMED. ALL REQUIRED BREAKER LINEUPS ARE COMPLETE. THE STATIC TRANSFER SWITCH IS IN THE BYPASS SOURCE SUPPLYING LOAD POSITION. THE P202 RED LIGHT IS ILLUMINATED.

Initiating Cues: YOU HAVE BEEN DIRECTED TO TRANSFER NN01 BACK TO THE NORMAL SOURCE (INVERTER AND NK01) FROM THE CONSTANT VOLTAGE TRANSFORMER, PER OTN-NN-00001, SECTION 4.6.2, AND INFORM THE CONTROL ROOM SUPERVISOR WHEN DONE. A CREW BRIEFING HAS BEEN CONDUCTED.

Notes: ALL OPERATOR ACTIONS ARE TO BE SIMULATED.

Task Standard: UPON COMPLETION OF THIS JPM, THE OPERATOR WILL TRANSFER POWER FOR NN01 TO THE NORMAL POWER SUPPLY (INVERTER AND NK01)

START TIME: _____

STOP TIME: _____

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE
1. OBTAIN A CONTROLLED COPY OF OTN-NN-00001, 120V VITAL AC INSTRUMENT POWER - CLASS 1E (NN)		OPERATOR SHOULD OBTAIN PROCEDURE COPY	S U Comments:
2. OPERATOR SHOULD HAVE ON HARD HAT, SAFETY GLASSES WITH SIDE SHIELDS, AND STEEL TOED SAFETY SHOES.		VERIFY OPERATOR HAS REQUIRED SAFETY EQUIPMENT	S U Comments:
3. REVIEW THE PRECAUTIONS AND LIMITATIONS OF OTN-NN-00001 STEP 2.0	ALL PRECAUTIONS AND LIMITATIONS ARE SATISFIED	OPERATOR SHOULD REVIEW THE PRECAUTIONS AND LIMITATIONS	S U Comments:

* CRITICAL STEP

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE S U
4. REVIEW THE INITIAL CONDITIONS STEP 3.0	ALL INITIAL CONDITIONS ARE SATISFIED ASK IF THE OPERATOR UNDERSTANDS THE INITIAL CONDITIONS AND INITIATING CUES	OPERATOR SHOULD REVIEW THE INITIAL CONDITIONS	Comments:
5. CHECK THAT THE MANUAL BYPASS SWITCH (S1) IS IN THE NORMAL SOURCE POSITION (A). STEP 4 6.2.1	SWITCH S1 IS IN THE BYPASS SOURCE POSITION	OPERATOR SHOULD VERIFY NN11 MANUAL BYPASS POSITION SWITCH	Comments:
6. PERFORM SECTION 4.6.1 DUE TO NN11 MANUAL BYPASS SWITCH BEING IN THE BYPASS SOURCE POSITION STEP 4.6.2.1.1		OPERATOR SHOULD GO TO SECTION 4.6.1 DUE TO POSITION OF NN11 MANUAL BYPASS POSITION	Comments:

* CRITICAL STEP

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE S U
7. VERIFY THE MANUAL BYPASS SWITCH (S1) IS IN THE BYPASS SOURCE POSITION (B) STEP 4.6.1.1.	THE MANUAL BYPASS SWITCH (S1) IS IN THE BYPASS SOURCE POSITION	OPERATOR SHOULD VERIFY NN11 MANUAL BYPASS SWITCH (S1) IS IN THE BYPASS SOURCE POSITION(B)	S U Comments:
8. VERIFY BREAKER B1-DC INPUT IS CLOSED STEP 4.6.1.2	BREAKER B1 IS CLOSED	OPERATOR SHOULD VERIFY NN11'S B1 (DC INPUT) IS IN THE CLOSED POSITION	S U Comments:
9. ENSURE BREAKER B2-INVERTER OUTPUT IS IN THE CLOSED POSITION STEP 4.6.1.2	BREAKER B2 IS IN THE CLOSED POSITION	OPERATOR SHOULD VERIFY NN11'S INVERTER OUTPUT (B2) IS IN THE CLOSED POSITION	S U Comments:

* CRITICAL STEP

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE S U
10. ENSURE BREAKER B3-BYPASS SOURCE INPUT TO STATIC SWITCH, IS IN THE CLOSED POSITION STEP 4.6.1.2	BREAKER B3 IS IN THE CLOSED POSITION	OPERATOR SHOULD ENSURE BYPASS SOURCE INPUT TO STATIC SWITCH (B3) IS IN THE CLOSED POSITION FOR NN11	Comments:
11. ENSURE BREAKER B4-BYPASS SOURCE INPUT TO MBS IS IN THE CLOSED POSITION STEP 4.6.1.2	BREAKER B4 IS IN THE CLOSED POSITION	OPERATOR SHOULD VERIFY THE BYPASS SOURCE INPUT TO MBS (B4) IS IN THE CLOSED POSITION	Comments:
12. ENSURE B800- BYPASS CVT INPUT IS IN THE CLOSED POSITION STEP 4.6.1.2	BREAKER B800 IS IN THE CLOSED POSITION	OPERATORS SHOULD VERIFY NN11'S BYPASS CVT INPUT BREAKER IS IN THE CLOSED POSITION	Comments:

* CRITICAL STEP

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE S U
13. VERIFY THAT THE IN SYNC LIGHT (P11) IS LIT STEP 4.6.1.3	P11 IS ILLUMINATED	OPERATOR SHOULD VERIFY THE NN11 IN SYNC (P11) LIGHT IS LIT	Comments:
14. CHECK THAT THE BYPASS SOURCE LOAD RED LIGHT (P202) IS LIT STEP 4.6.1.4	P202 RED LIGHT IS ILLUMINATED	OPERATORS SHOULD VERIFY NN11'S BYPASS SOURCE LOAD RED LIGHT P202 IS LIT	Comments:
15.*TURN THE MANUAL TRANSFER SWITCH (S1) TO THE NORMAL SOURCE POSITION (A) STEP 4.6.1.5	SWITCH S1 IS NOW IN THE NORMAL POSITION	OPERATOR SHOULD TURN NN11'S MANUAL TRANSFER SWITCH (S1) TO THE NORMAL SOURCE POSITION (A)	Comments:

* CRITICAL STEP

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE S U
16. INFORM THE CONTROL ROOM THAT NN11 IS SUPPLIED BY THE ALTERNATE POWER SOURCE NG01ABR1 VIA THE STATIC TRANSFER SWITCH BYPASSING THE INVERTER STEP 4.6.1.6	CONTROL ROOM ACKNOWLEDGES	OPERATOR SHOULD INFORM THE CONTROL ROOM THAT NN11 IS BEING SUPPLIED BY THE ALTERNATE POWER SOURCE NG01ABR1 VIA THE STATIC TRANSFER SWITCH	S U Comments:
17. PERFORM SECTION 4.6.2 TO PLACE NN11 TO NORMAL ALIGNMENT STEP 4.6.1.7		OPERATOR SHOULD RETURN TO SECTION 4.6.2	S U Comments:
18. VERIFY BREAKER B1-DC INPUT IS CLOSED NOTE: STEPS 18 AND 19 MAY BE PERFORMED IN ANY ORDER STEP 4.6.2.2.	BREAKER B1 IS CLOSED	OPERATOR SHOULD VERIFY NN11'S DC INPUT (B1) IS IN THE CLOSED POSITION.	S U Comments:

* CRITICAL STEP

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE
19. VERIFY BREAKER B2-INVERTER OUTPUT IS IN THE CLOSED POSITION NOTE: STEPS 18 AND 19 MAY BE PERFORMED IN ANY ORDER STEP 4.6.2.2	BREAKER B2 IS IN THE CLOSED POSITION	OPERATOR SHOULD VERIFY THAT NN11'S INVERTER OUTPUT BREAKER (B2) IS IN THE CLOSED POSITION	S U Comments:
20. VERIFY THE BYPASS SOURCE SUPPLYING LOAD RED LIGHT (P202) IS LIT STEP 4.6.2.3	P202 RED LIGHT IS ILLUMINATED	OPERATOR SHOULD VERIFY NN11'S BYPASS SOURCE SUPPLYING LOAD RED LIGHT IS LIT	S U Comments:
21. VERIFY THE INVERTER SUPPLYING LOAD AMBER LIGHT (P201) IS NOT LIT STEP 4.6.2.4	P201 AMBER LIGHT IS NOT LIT	OPERATOR SHOULD VERIFY NN11'S INVERTER SUPPLYING LOAD AMBER LIGHT IS NOT LIT	S U Comments:

* CRITICAL STEP

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE S U
22. VERIFY THE IN SYNC LIGHT (P11) IS LIT STEP 4.6.2.5	IN SYNC LIGHT P11 IS ILLUMINATED	OPERATOR SHOULD VERIFY NN11'S IN SYNC LIGHT IS LIT	Comments:
23.* PUSH THE INVERTER TO LOAD PUSHBUTTON (S201) STEP 4.6.2.6	BUTTON S201 HAS BEEN DEPRESSED	OPERATOR SHOULD DEPRESS INVERTER TO LOAD PUSHBUTTON FOR NN11	Comments:
24. VERIFY THE INVERTER SUPPLYING LOAD AMBER LIGHT (P201) IS LIT STEP 4.6.2.6.1	THE INVERTER SUPPLYING LOAD AMBER LIGHT (P201) IS ILLUMINATED	OPERATOR SHOULD VERIFY NN11'S INVERTER SUPPLYING LOAD AMBER LIGHT IS LIT	Comments:

* CRITICAL STEP

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE S U
25. VERIFY THE BYPASS SOURCE SUPPLYING LOAD RED LIGHT (P202) IS <u>NOT</u> LIT STEP 4.6.2.6.2	THE BYPASS SOURCE SUPPLYING LOAD RED LIGHT P202 IS NOT ILLUMINATED	OPERATOR SHOULD VERIFY NN11'S BYPASS SOURCE SUPPLYING LOAD RED LIGHT (P202) IS NOT LIT	S U Comments:
26. PUSH THE ALARM RESET PUSHBUTTON (S2) STEP 4.6.2.7	PUSHBUTTON S2 HAS BEEN RESET	OPERATOR SHOULD RESET NN11'S ALARMS WITH PUSHBUTTON S2	S U Comments:
27. VERIFY THE ANNUNCIATOR ALARM WINDOW 25B IS NOT LIT STEP 4.6.2.8	ALARM WINDOW 25B IS NOT LIT	OPERATOR SHOULD VERIFY ANNUNCIATOR ALARM WINDOW 25B IS NOT LIT	S U Comments:

* CRITICAL STEP

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE
28. INFORM THE CONTROL ROOM THAT NN11 IS SUPPLIED BY THE NORMAL POWER SOURCE NK0111. STEP 4.6.2.9	CONTROL ROOM ACKNOWLEDGES	OPERATOR SHOULD INFORM THE CONTROL ROOM NN11 IS BEING SUPPLIED BY THE NORMAL POWER SOURCE NK0111.	S U Comments:
29.	THE JPM IS COMPLETE <u>RECORD STOP TIME</u> <u>ON PAGE 1</u>		S U Comments:

* CRITICAL STEP

#1

NAME: _____

JPM NO: EOS-SNN03PA010J

QUESTION:

REFERENCE

Vital AC instrumentation bus NN02 is deenergized in MODE 1.

After power is restored to NN02, FCHIK0313A, AFP TURB SPEED GOV VLV CTRL STA A, demand signal is required to be adjusted. WHY?

ANSWER:

On a loss of NN02, the demand speed signal goes to minimum which needs to be reset to required demand signal to restore the pump to OPERABLE.

KA RATING: 000057K301

REFERENCE: OTO-NN-00001, Att. 2a, Step 1.3
Att. 2, Step 18
RFR 15291A

COMMENTS / ANSWER GIVEN :

SCORE: SAT UNSAT

#2

NAME: _____

JPM NO: EOS-SNN03PA010J

QUESTION:

MEMORY

During the response to a loss of vital AC instrument bus NN01, charging flow is minimized.

Why is charging flow minimized?

ANSWER:

Reduce RCS boration.

KA RATING: 000057A102

REFERENCE: OTO-NN-00001, Att. 1, Step 4

COMMENTS / ANSWER GIVEN :

SCORE: SAT UNSAT

#1

NAME: _____

JPM NO: EOS-SNN03PA010J

QUESTION:

REFERENCE

Vital AC instrumentation bus NN02 is deenergized in MODE 1.

After power is restored to NN02, FCHIK0313A, AFP TURB SPEED GOV VLV CTRL STA A, demand signal is required to be adjusted. WHY?

#2

NAME: _____

JPM NO: EOS-SNN03PA010J

QUESTION:

MEMORY

During the response to a loss of vital AC instrument bus NN01, charging flow is minimized.

Why is charging flow minimized?

Read to Performer: I will explain the initial conditions, which steps to simulate or discuss, and provide initiating and subsequent cues. You may use any approved reference materials normally available to you. Make all written reports, oral reports, and log entries as if the evolution was actually being performed. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions: INSTRUMENT BUS NN01 HAD BEEN PLACED ON THE CONSTANT VOLTAGE TRANSFORMER (CVT THRU NG01A) FOR MAINTENANCE TO PERFORM AN INSPECTION ON INVERTER NN11. NN12, 13 AND 14 ARE ENERGIZED FROM THEIR RESPECTIVE DC BUSES AND BATTERY CHARGERS. THE PLANT IS IN MODE 6. INVERTER NN11 HAS HAD POST MAINTENANCE CHECKS PERFORMED. ALL REQUIRED BREAKER LINEUPS ARE COMPLETE. THE STATIC TRANSFER SWITCH IS IN THE BYPASS SOURCE SUPPLYING LOAD POSITION. THE P202 RED LIGHT IS ILLUMINATED.

Initiating Cues: YOU HAVE BEEN DIRECTED TO TRANSFER NN01 BACK TO THE NORMAL SOURCE (INVERTER AND NK01) FROM THE CONSTANT VOLTAGE TRANSFORMER, PER OTN-NN-00001, SECTION 4.6.2, AND INFORM THE CONTROL ROOM SUPERVISOR WHEN DONE. A CREW BRIEFING HAS BEEN CONDUCTED.

Notes: ALL OPERATOR ACTIONS ARE TO BE SIMULATED.

CALLAWAY PLANT

JOB PERFORMANCE MEASURE

JPM NO: EOE-SAE03PA038J KSA NO: 038054AA1.01
U.E. RATING: REQ KSA RATING: 4.5/4.4
JOB TITLE: URO/SRO REVISION: 960425
DUTY: EMERGENCY ACTIONS
TASK TITLE: EMERGENCY FEEDWATER ADDITION FROM FIREWATER
COMPLETION TIME: 8 MINUTES

The performance of this task was evaluated against the standards contained in this JPM and determined to be:

☐ SATISFACTORY ☐ UNSATISFACTORY

Reason, if UNSATISFACTORY:

EVALUATORS SIGNATURE: _____ DATE: _____

TASK PERFORMER: _____

LOCATION OF PERFORMANCE:

CONTROL ROOM _____ SIMULATOR/LAB _____ PLANT X CLASSROOM _____

METHOD OF PERFORMANCE: SIMULATED X PERFORMED _____

REFERENCES: OOA-AE-00002, EMERGENCY FEEDWATER ADDITION FROM FIREWATER,
REVISION 0

TOOLS/EQUIPMENT: OOA-AE-00002, SECURITY KEY 131

PREPARED BY: _____ DATE: _____

REVIEWED BY: _____ DATE: _____
STS/SS

APPROVED BY: _____ DATE: _____
DEPARTMENT HEAD

Read to Performer: I will explain the initial conditions, which steps to simulate or discuss, and provide initiating and subsequent cues. You may use any approved reference materials normally available to you. Make all written reports, oral reports, and log entries as if the evolution was actually being performed. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions: CALLAWAY PLANT HAS TRIPPED FROM 100% POWER. CONTROL ROOM OPERATORS ARE CURRENTLY IN FR-H.1, LOSS OF SECONDARY HEAT SINK DUE TO LOSS OF ALL MAIN AND AUX FEED. 'D' STEAM GENERATOR HAS BEEN DEPRESSURIZED TO 0 PSIG.

Initiating Cues: THE OPERATING SUPERVISOR HAS DIRECTED YOU TO LINEUP FIRE WATER TO 'D' STEAM GENERATOR USING OOA-AE-00002, EMERGENCY FEEDWATER ADDITION FROM FIREWATER, AND NOTIFY HIM WHEN DONE.

ASK IF THE OPERATOR UNDERSTANDS THE INITIATING CUES.

Notes: ALL OPERATOR ACTIONS ARE TO BE SIMULATED.

Task Standard: UPON COMPLETION OF THIS JPM, THE OPERATOR WILL HAVE ALIGNED THE FIREWATER SYSTEM TO 'D' STEAM GENERATOR.

START TIME: _____

STOP TIME: _____

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE
1. OBTAIN A COPY OF OOA-AE-00002, EMERGENCY FEEDWATER ADDITION FROM FIREWATER		OPERATOR SHOULD BE GIVEN PROCEDURE COPY	S U Comments:
2. REVIEW OOA-AE-00002, EMERGENCY FEEDWATER ADDITION FROM FIREWATER		OPERATOR MAY REVIEW OPERATOR AID	S U Comments:
3. WHEN DIRECTED BY THE OS/SS, THIS PROCEDURE SHOULD BE USED TO FEED THE SELECTED DEPRESSURIZED STEAM GENERATOR STEP 1	'D' STEAM GENERATOR HAS BEEN DEPRESSURIZED TO 0 PSIG AND IS READY TO BE FED FROM FIREWATER	OPERATOR SHOULD SELECT 'D' STEAM GENERATOR TO FEED NOTE: GIVEN IN INITIATING CUES	S U Comments:

* CRITICAL STEP

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE S U
4. OBTAIN 3 50 FT SECTIONS OF 2 1/2" FIRE HOSE, 1 75 FT ROPE, 1 12 FT ROPE, 1 FLEX GASKET AND 2 ADJUSTABLE WRENCHES STEP 2.0	OPERATOR HAS OBTAINED 3 50 FT SECTIONS OF 2 1/2" FIRE HOSE, 1 75 FT ROPE, 1 12 FT ROPE, 1 FLEX GASKET AND 2 ADJUSTABLE WRENCHES	OPERATOR SHOULD SHOW LOCATION AND INVENTORY FIREWATER EQUIPMENT BOX NOTE: BOX IS LOCATED IN THE 2047' LEVEL OF THE AUX BLDG NEAR THE NORTHEAST STAIRWELL DOOR	Comments:
5. TIE OPEN THE AREA 5 DOOR TO THE STAIRWELL HANDRAIL USING THE 12' ROPE STEP 3.0	AREA 5 DOOR HAS BEEN TIED OPEN	OPERATOR SHOULD SHOW WHERE TO TIE AREA 5 DOOR OPEN	Comments:
6* HOOK UP ONE END OF FIRE HOSE TO KC-V-0206, AUX BLDG FIRE PROT HOSE CONN NORTH STAIRWELL AREA STEP 4.0	FIRE HOSE HAS BEEN HOOKED UP TO KC-V-0206	OPERATOR SHOULD HOOK UP FIRE HOSE TO KC-V-0206, AUX BLDG FIRE PROT HOSE CONN NORTH STAIRWELL AREA NOTE: LOCATED IN SOUTHEAST CORNER OF THE STAIRWELL OUTSIDE AREA 5	Comments:

* CRITICAL STEP

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE
7. HOOK UP OTHER SECTIONS OF THE 2 1/2" FIRE HOSE TO REACH 'D' STEAM GENERATOR WET LAYUP CONNECTION STEP 5.0	2 1/2" FIRE HOSE SECTIONS ARE HOOKED UP	OPERATOR SHOULD HOOK UP AT LEAST ONE MORE SECTION OF 2 1/2" FIRE HOSE TO REACH 'D' STEAM GENERATOR WET LAYUP CONNECTION	S U Comments:
8. LOWER THE FIREWATER COUPLING TO 'D' STEAM GENERATOR WET LAYUP CONNECTION USING 75 FT ROPE STEP 6.0	FIRE WATER COUPLING IS BY 'D' STEAM GENERATOR WET LAYUP CONNECTION	OPERATOR SHOULD GET FIREWATER COUPLING TO 'D' STEAM GENERATOR WET LAYUP CONNECTION NOTE: FIREWATER COUPLING IS LOCATED IN THE MSIV-FW ADDITION BOX IN AREA 5	S U Comments:
9. REMOVE BLANK FLANGE FROM AEV-328, 'D' STEAM GENERATOR WET LAYUP ISOLATION VALVE STEP 7.0	BLANK FLANGE HAS BEEN REMOVED FROM AEV-328	OPERATOR SHOULD REMOVE BLANK FLANGE FROM AEV-328, STEAM GENERATOR WET LAYUP ISOLATION VALVE	S U Comments:

* CRITICAL STEP

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE
10* INSTALL FIREWATER COUPLING AND NEW GASKET TO 'D' STEAM GENERATOR WET LAYUP CONNECTION STEP 8.0	FIREWATER COUPLING AND GASKET HAVE BEEN INSTALLED TO 'D' STEAM GENERATOR WET LAYUP CONNECTION	OPERATOR SHOULD INSTALL FIREWATER COUPLING AND NEW GASKET TO 'D' STEAM GENERATOR WET LAYUP CONNECTION	S U Comments:
11* HOOK UP THE 2 1/2" FIRE HOSE TO THE FIREWATER COUPLING STEP 9.0	2 1/2" FIRE HOSE IS HOOKED UP TO THE FIRE WATER COUPLING	OPERATOR SHOULD HOOK UP 2 1/2" FIRE HOSE TO THE FIRE WATER COUPLING	S U Comments:
12. NOTIFY CONTROL ROOM TO START A FIRE PUMP STEP 10.0	THE ELECTRIC FIRE PUMP IS NOW RUNNING	OPERATOR SHOULD NOTIFY CONTROL ROOM THAT HE IS READY FOR A FIRE PUMP TO BE STARTED	S U Comments:

* CRITICAL STEP

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE S U
13* SLOWLY FULLY OPEN KC-V-0206, AUX BLDG FIRE PROT HOSE CONNECTION NORTH STAIRWELL STEP 11.0	KC-V-0206 IS FULL OPEN	OPERATOR SHOULD OPEN KC-V-0206, AUX BLDG FIRE PROT HOSE CONNECTION NORTH STAIRWELL	Comments:
14. F SURE FIRE HOSE IS NOT KINKED AS IT IS PRESSURIZED STEP 12.0	FIRE HOSE HAS FULLY PRESSURIZED AND NO KINKS EXIST	OPERATOR SHOULD CHECK FIRE HOSE FOR KINKS	Comments:
15. CONTACT CONTROL ROOM TO ENSURE 'D' SG PRESSURE < 150 PSIG PRIOR TO OPENING AEV-328 CAUTION PRIOR TO STEP 13	'D' STEAM GENERATOR INDICATES 0 PSIG	OPERATOR SHOULD CONTACT CONTROL ROOM TO ENSURE 'D' STEAM GENERATOR < 150 PSIG	Comments:

* CRITICAL STEP

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE
16* SLOWLY FULLY OPEN AEV-328, 'D' S/G WET LAYUP ISOLATION VALVE STEP 13.0	AEV-328 IS OPEN	OPERATOR SHOULD OPEN AEV-328, 'D' S/G SET LAYUP ISOLATION VALVE	S U Comments:
17.	THE JPM IS COMPLETE <u>RECORD STOP TIME</u> <u>ON PAGE 1</u>		S U Comments:

* CRITICAL STEP

#1

NAME: _____

JPM NO: EOE-SAE03PA038J

QUESTION:

MEMORY

The Callaway Plant operators have established an RCS Bleed and Feed in accordance with FR-H.1, Response to Loss of Secondary Heat Sink. The following conditions exist. (Normal Containment Conditions exist)

S/G WR Level

A	23%
B	20%
C	21%
D	25%

RCS WR Leg Temperature

LP1	552°F
LP2	546°F
LP3	553°F
LP4	555°F

The Turbine Driven Auxiliary Feedwater Pump has just become available.

Which are the preferred Steam Generator(s) to be fed and why?

ANSWER:

S/Gs B and/or D should be fed because they are NOT HOT DRY. (25% credit for each S/G identified)
(50% for reason)

KA RATING: 000054K102 (3.6/4.2)

REFERENCE: FR-H.1

COMMENTS / ANSWER GIVEN :

SCORE: SAT UNSAT

#3

NAME: _____

JPM NO: EOE-SAE03PA038J

QUESTION:

REFERENCE USE

While performing Feedwater Isolation Valve (FWIV) Accumulator Precharge Checks per OTN-AE-00001, a Reactor Operator inadvertently rotated the Test Selector Switch (ABHS0069) through all the FWIV positions when the Test Switch (ABHS0068) was in the TEST position.

This action caused the Yellow Train accumulator for All Four Feedwater Isolation Valves to depressurize.

Describe the operability of the FWIV's and/or Feedwater Isolation Actuation System and any required action.

ANSWER:

The Yellow Train of ESFAS actuation for the FWIV is inoperable. (50%)
TS 3.3.2-5a Action 27 should be applied → 12 hrs to HOT STANDBY (50%)

KA RATING: 05900K419 (3.2/3.4)

REFERENCE: OTN-AE-00001

TS 3.7.1.6

TSI 33

TS 3.3.2-5a

COMMENTS / ANSWER GIVEN :

SCORE: SAT UNSAT

#1

NAME: _____

QUESTION:

MEMORY

The Callaway Plant operators have established an RCS Bleed and Feed in accordance with FR-H.1, Response to Loss of Secondary Heat Sink. The following conditions exist. (Normal Containment Conditions exist)

S/G WR Level

A	23%
B	20%
C	21%
D	25%

RCS WR Leg Temperature

LP1	552°F
LP2	546°F
LP3	553°F
LP4	555°F

The Turbine Driven Auxiliary Feedwater Pump has just become available.

Which are the preferred Steam Generator(s) to be fed and why?

#2

NAME: _____

QUESTION:

REFERENCE USE

While performing Feedwater Isolation Valve (FWIV) Accumulator Precharge Checks per OTN-AE-00001, a Reactor Operator inadvertently rotated the Test Selector Switch (ABHS0069) through all the FWIV positions when the Test Switch (ABHS0068) was in the TEST position.

This action caused the Yellow Train accumulator for All Four Feedwater Isolation Valves to depressurize.

Describe the operability of the FWIV's and/or Feedwater Isolation Actuation System and any required action.

Read to Performer: I will explain the initial conditions, which steps to simulate or discuss, and provide initiating and subsequent cues. You may use any approved reference materials normally available to you. Make all written reports, oral reports, and log entries as if the evolution was actually being performed. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions: CALLAWAY PLANT HAS TRIPPED FROM 100% POWER. CONTROL ROOM OPERATORS ARE CURRENTLY IN FR-H.1, LOSS OF SECONDARY HEAT SINK DUE TO LOSS OF ALL MAIN AND AUX FEED. 'D' STEAM GENERATOR HAS BEEN DEPRESSURIZED TO 0 PSIG.

Initiating Cues: THE OPERATING SUPERVISOR HAS DIRECTED YOU TO LINEUP FIRE WATER TO 'D' STEAM GENERATOR USING OOA-AE-00002, EMERGENCY FEEDWATER ADDITION FROM FIREWATER, AND NOTIFY HIM WHEN DONE.

CALLAWAY PLANT

JOB PERFORMANCE MEASURE

JPM NO: URO-SGS01PFC28J KSA NO: 028000A403
U.E. RATING: REQ KSA RATING: 3.1/3.3
JOB TITLE: URO/SRO REVISION: 970121
DUTY: CONTAINMENT HYDROGEN CONTROL
TASK TITLE: PLACE THE HYDROGEN RECOMBINER IN SERVICE
COMPLETION TIME: 15 MINUTES

The performance of this task was evaluated against the standards contained in this JPM and determined to be:

☐ SATISFACTORY ☐ UNSATISFACTORY

Reason, if UNSATISFACTORY:

EVALUATORS SIGNATURE: _____ DATE: _____

TASK PERFORMER: _____

LOCATION OF PERFORMANCE:

CONTROL ROOM ☒ SIMULATOR/LAB _____ PLANT _____ CLASSROOM _____

METHOD OF PERFORMANCE: SIMULATED ☒ PERFORMED _____

REFERENCES: OTN-GS-00001, CONTAINMENT HYDROGEN CONTROL SYSTEM, REVISION 5

TOOLS/EQUIPMENT: COPY OF OTN-GS-00001

PREPARED BY: _____ DATE: _____

REVIEWED BY: _____ DATE: _____

STS/SS

APPROVED BY: _____ DATE: _____

DEPARTMENT HEAD

Read to Performer: I will explain the initial conditions, which steps to simulate or discuss, and provide initiating and subsequent cues. You may use any approved reference materials normally available to you. Make all written reports, oral reports, and log entries as if the evolution was actually being performed. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions: CALLAWAY PLANT HAS EXPERIENCED A LARGE LOSS OF COOLANT DUE TO A MAJOR PIPE RUPTURE ON RCS LOOP 2. A SAFETY INJECTION OCCURRED AND AUTOMATIC CONTAINMENT SPRAY OCCURRED WHEN CONTAINMENT PRESSURE WENT ABOVE 27 PSIG. PLANT OPERATORS ARE CURRENTLY IN FR-Z.1, RESPONSE TO HIGH CONTAINMENT PRESSURE, AS A RESULT OF THE RCS PIPE RUPTURE.

Initiating Cues: THE OPERATING SUPERVISOR HAS DIRECTED YOU TO PLACE THE 'A' HYDROGEN RECOMBINER IN SERVICE PER OTN-GS-00001, SECTION 4.4. CONTAINMENT HYDROGEN CONCENTRATION IS CURRENTLY AT 3% IN DRY AIR.

ASK IF THE OPERATOR UNDERSTANDS THE INITIATING CUES.

Notes: ALL OPERATOR ACTIONS ARE TO BE SIMULATED.

Task Standard: AT THE COMPLETION OF THIS JPM, THE 'A' HYDROGEN RECOMBINER WILL HAVE BEEN PLACED IN SERVICE.

START TIME: _____

STOP TIME: _____

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE
1. OBTAIN A CONTROLLED COPY OF OTN-GS-00001, CONTAINMENT HYDROGEN CONTROL SYSTEM		OPERATOR SHOULD OBTAIN PROCEDURE COPY	S U Comments:
2. REVIEW PRECAUTIONS AND LIMITATIONS STEP 2.0	ALL PRECAUTIONS AND LIMITATIONS ARE SATISFIED	OPERATOR SHOULD REVIEW PRECAUTIONS AND LIMITATIONS	S U Comments:
3. ENSURE CHECKOFF LIST #7, ELECTRIC THERMAL HYDROGEN RECOMBINER HANDSWITCH ALIGNMENT, IS COMPLETE STEP 4.4.1	CHECKOFF LIST #7 HAS BEEN COMPLETED	OPERATOR SHOULD ENSURE CHECKOFF LIST #7, ELECTRIC THERMAL HYDROGEN RECOMBINER HANDSWITCH HAS BEEN COMPLETED	S U Comments:

* CRITICAL STEP

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE
4. ENSURE CHECKOFF LIST #2A, ELECTRIC THERMAL HYDROGEN RECOMBINER HANDSWITCH ALIGNMENT IS COMPLETE STEP 4.4.2	CHECKOFF LIST #2A HAS BEEN DONE	OPERATOR SHOULD VERIFY CHECKOFF LIST #2A, ELECTRIC THERMAL HYDROGEN RECOMBINER HANDSWITCH ALIGNMENT, HAS BEEN COMPLETED	S U Comments:
5. ENSURE 'A' OR 'B' HYDROGEN ANALYZER IS IN SERVICE PER SECTION 4.2 STEP 4.4.3	'A' HYDROGEN ANALYZER IS IN SERVICE PER SECTION 4.2	OPERATOR SHOULD VERIFY 'A' HYDROGEN ANALYZER IS IN SERVICE	S U Comments:
6. ENSURE CTMT COOLERS AND H2 MIXING FANS ARE IN SERVICE STEP 4.4.4	CTMT COOLERS AND H2 MIXING FANS ARE IN SERVICE	OPERATOR SHOULD VERIFY CTMT COOLERS AND H2 MIXING FANS ARE IN SERVICE	S U Comments:

* CRITICAL STEP

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE
7. VERIFY CONTAINMENT HYDROGEN IS LESS THAN 6% AT GS-AI-10 AND GS-AI-19 STEP 4.4.5	GS-AI-10 AND GS-AI-19 SHOW CONTAINMENT HYDROGEN CONCENTRATION TO BE 3%	OPERATOR SHOULD CHECK CONTAINMENT HYDROGEN CONCENTRATION ON GS-AI-10 AND 9 LOCATED ON RL020	S U Comments:
8. COMPARE 3% H2 READING WITH INDICATION ON GS-AR-10 STEP 4.4.5.1	GS-AR-10 SHOWS CONTAINMENT H2 CONCENTRATION TO BE AT 3%	OPERATOR SHOULD COMPARE HYDROGEN CONCENTRATION FROM GS-AI-9 AND 10 TO GS-AR-10	S U Comments:
9. CHECK COMPUTER POINTS GS-A-19 AND GS-A-10 FOR HYDROGEN CONCENTRATION STEP 4.4.5.2	GS-A-19 AND GS-A-10 SHOW A H2 CONCENTRATION OF 3%	OPERATOR SHOULD CHECK COMPUTER POINTS GS-A-19 AND GS-A-10 FOR HYDROGEN CONCENTRATION	S U Comments:

* CRITICAL STEP

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE
10* TURN ON GS01A, ELECTRICAL THERMAL HYDROGEN RECOMBINER BY USING GS-HS-1A STEP 4.4.6	SWITCH GS-HS-1A IS IN THE 'ON' POSITION	OPERATOR SHOULD TURN ON GS01A, ELECTRIC THERMAL HYDROGEN RECOMBINER BY TURNING GS-HS-1A TO 'ON' LOCATED ON RL020	S U Comments:
11. VERIFY H2 RECOMBINER 'A' PWR IND LIGHT GS-JL-1B IS LIT STEP 4.4.7.1	GS-JL-1B IS LIT	OPERATOR SHOULD ENSURE GS-JL-1B IS LIT LOCATED ON GS065A	S U Comments:
12. TURN THE PWR OUT SW, GS-HIS-1B, TO THE 'ON' POSITION STEP 4.4.7.2	SWITCH GS-HIS-1B IS IN THE 'ON' POSITION	OPERATOR SHOULD TURN SWITCH GS-HIS-1B, PWR OUT SW, TO 'ON' LOCATED ON GS065A	S U Comments:

* CRITICAL STEP

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE S U
13. VERIFY RED LIGHT ON SWITCH GS-HIS-1B PWR OUT SW, IS LIT STEP 4.4.7.2	RED LIGHT IS LIT ON GS-HIS-1B	OPERATOR SHOULD VERIFY THE RED LIGHT ON SWITCH GS-HIS-1B, PWR OUT SW, IS LIT	Comments:
14. RECORD EXISTING CONTAINMENT PRESSURE AND COMPUTE AVERAGE ABSOLUTE PRESSURE STEP 4.4.8.1	ALL CONTAINMENT PRESSURE INDICATIONS SHOW CONTAINMENT PRESSURE TO BE AT 10 PSIG $14.7 + \frac{40}{4} = 24.7 \text{ PSIA}$	OPERATOR SHOULD RECORD CONTAINMENT PRESSURE AND COMPUTE AVERAGE ABSOLUTE CTMT PRESSURE	Comments:
15. DETERMINE FROM GN-TR-63, CTMT TEMP RECORDER, THE PRE-LOCA CTMT PRESSURE STEP 4.4.8.2	THE PRE-LOCA CTMT TEMPERATURE WAS 90 DEGREES FAHRENHEIT AT GN-TR-63	OPERATOR SHOULD CHECK GN-TR-63 TO DETERMINE PRE-LOCA CTMT PRESSURE	Comments:

* CRITICAL STEP

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE S U
16. DETERMINE THE CONTAINMENT PRESSURE CORRECTION FACTOR (CP) STEP 4.4.8.3	NOTE: CP SHOULD BE FIGURED BETWEEN 1.4 TO 1.5	OPERATOR SHOULD DETERMINE THE CONTAINMENT PRESSURE CORRECTION FACTOR	Comments:
17. OBTAIN THE MOST RECENT REFERENCE POWER FOR 'A' RECOMBINER STEP 4.4.8.4	REFERENCE POWER FOR 'A' RECOMBINER IS 46.94 (ENSURE THIS VALUE IS USED FOR CALC)	OPERATOR SHOULD OBTAIN MOST RECENT REFERENCE POWER FROM OOA-GS-00001 FOR 'A' RECOMBINER	Comments:
18. MULTIPLY THE CTMT PRESSURE CORRECTION FACTOR BY 46.94 KW FOR 'A' RECOMBINER TO DETERMINE REQUIRED POWER STEP 4.4.8.5	1.45 X 46.94 = 65.7 1.5 X 46.94 = 70.4 REQUIRED POWER (P _R) SHOULD BE $64 \leq P_R \leq 72$ KW	OPERATOR SHOULD MULTIPLY THE CTMT PRESSURE CORRECTION FACTOR BY 46.92 KW FOR 'A' TRAIN	Comments:

* CRITICAL STEP

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE S U
19* ADJUST POTENTIOMETER, GS-HK-1, FOR TRAIN 'A' RECOMBINER TO A POWER OF BETWEEN 64 AND 72 KW STEP 4.4.9.1	THE KW METER SHOWS A SLOW INCREASE UNTIL THE FINAL VALVE IS REACHED	OPERATOR SHOULD ADJUST POTENTIOMETER GS-HK-1 FOR TRAIN 'A' RECOMBINER TO BETWEEN 64 AND 72 KW LOCATED AT SG065A	Comments:
20. CHECK 'A' TRAIN RECOMBINER TEMPERATURE TO BE INCREASING BY SELECTING INDIVIDUAL THERMOCOUPLES AT GS-HIS-1 STEP 4.4.9.2	TEMPERATURE INDICATION ON GS-TI-1 ON SB065A SHOW A TEMPERATURE OF 220 DEGREES FAHRENHEIT AND A SLOW INCREASE	OPERATOR SHOULD CHECK 'A' TRAIN RECOMBINER TEMPERATURE TO BE INCREASING BY SELECTING INDIVIDUAL THERMOCOUPLES AT GS-HIS-1 LOCATED AT SB065A	Comments:
21.	THE JPM IS COMPLETE <u>RECORD STOP TIME ON PAGE 1</u>		Comments:

* CRITICAL STEP

#1

NAME: _____

JPM NO: URO-SGS01PFC28J

QUESTION:

REFERENCE USE

Containment Hydrogen is increasing >6% during post-LOCA conditions with a hydrogen recombiner in service. It is desired to purge hydrogen from containment.

Describe the flowpath for this purge.

ANSWER:

Containment Atmosphere To,
Auxiliary Building Ventilation To,
Emergency Exhaust Trains To,
Unit Vent

KA RATING: 028000A401

REFERENCE: M22GS01/M22GL03
OTN-GS-00001

COMMENTS / ANSWER GIVEN :

SCORE: SAT UNSAT

#2

NAME: _____

JPM NO: URO-SGS01PFC28J

QUESTION:

REFERENCE USE

GSHV3 and GSHV12 Hydrogen Analyzer containment isolation valves are closed and cannot be reopened in MODE 1.

What actions are required?

ANSWER:

Restore 1 channel to operable within 72 hours.

(OR)

Be in Hot Standby within the next 6 hours.

(and)

In Hot Shutdown within the following 6 hours.

KA RATING: 028000G11

REFERENCE: Tech Spec 3.3.3.6 Action d

COMMENTS / ANSWER GIVEN :

SCORE: SAT UNSAT

#1

NAME: _____

QUESTION:

REFERENCE USE

Containment Hydrogen is increasing $>6\%$ during post-LOCA conditions with a hydrogen recombiner in service. It is desired to purge hydrogen from containment.

Describe the flowpath for this purge.

#2

NAME: _____

QUESTION:

REFERENCE USE

GSHV3 and GSHV12 Hydrogen Analyzer containment isolation valves are closed and cannot be reopened in MODE 1.

What actions are required?

Read to Performer: I will explain the initial conditions, which steps to simulate or discuss, and provide initiating and subsequent cues. You may use any approved reference materials normally available to you. Make all written reports, oral reports, and log entries as if the evolution was actually being performed. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions: CALLAWAY PLANT HAS EXPERIENCED A LARGE LOSS OF COOLANT DUE TO A MAJOR PIPE RUPTURE ON RCS LOOP 2. A SAFETY INJECTION OCCURRED AND AUTOMATIC CONTAINMENT SPRAY OCCURRED WHEN CONTAINMENT PRESSURE WENT ABOVE 27 PSIG. PLANT OPERATORS ARE CURRENTLY IN FR-Z.1, RESPONSE TO HIGH CONTAINMENT PRESSURE, AS A RESULT OF THE RCS PIPE RUPTURE.

Initiating Cues: THE OPERATING SUPERVISOR HAS DIRECTED YOU TO PLACE THE 'A' HYDROGEN RECOMBINER IN SERVICE PER OTN-GS-00001, SECTION 4.4. CONTAINMENT HYDROGEN CONCENTRATION IS CURRENTLY AT 3% IN DRY AIR.

CALLAWAY PLANT

JOB PERFORMANCE MEASURE

JPM NO: URO-CTSPA031JC101J KSA NO: 000068A132
U.E. RATING: KSA RATING: (3.9/4.1)
JOB TITLE: URO/SRO REVISION: 970121
DUTY: CONTROL ROOM INACCESSIBILITY
TASK TITLE: PLANT CONTROL / COOLDOWN FROM THE ASP
COMPLETION TIME: 12 MINUTES

The performance of this task was evaluated against the standards contained in this JPM and determined to be:

☐ SATISFACTORY ☐ UNSATISFACTORY

Reason, if UNSATISFACTORY:

EVALUATORS SIGNATURE: _____ DATE: _____

TASK PERFORMER: _____

LOCATION OF PERFORMANCE:

CONTROL ROOM ☒ SIMULATOR/LAB _____ PLANT _____ CLASSROOM _____

METHOD OF PERFORMANCE: SIMULATED _____ PERFORMED ☒ _____

REFERENCES: OTO-ZZ-00001, CONTROL ROOM INACCESSIBILITY, REVISION 14,
ATTACHMENT 5

TOOLS/EQUIPMENT: SIMULATOR / ASP, STEAM TABLES

PREPARED BY: _____ DATE: _____

REVIEWED BY: _____ DATE: _____
STS/SS

APPROVED BY: _____ DATE: _____
DEPARTMENT HEAD

Read to Performer: I will explain the initial conditions, which steps to simulate or discuss, and provide initiating and subsequent cues. You may use any approved reference materials normally available to you. Make all written reports, oral reports, and log entries as if the evolution was actually being performed. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions: CALLAWAY PLANT IS IN MODE 3, 'B' CCP IS RUNNING, CVCS LETDOWN is Isolated. The plant tripped and Control Room Evacuation has been completed due to Fire in the Control Room.

Initiating Cues: You have been DIRECTED TO completed transfer of Control to the ASP per Attachment 5, OTO-ZZ-00001 and verify natural circulation has been established at the ASP per the procedure.

Notes: USE IC20
 Ensure CCP B running
 Override Auto Start of All Auxiliary Feedwater Pumps
 Manually trip the Reactor
 Isolate CVCS normal letdown

Task Standard: UPON COMPLETION OF THIS JPM THE OPERATOR WILL HAVE transferred plant control to the Auxiliary Shutdown Panel and verified natural circulation conditions have been established.

START TIME: _____

STOP TIME: _____

**TASK
NUMBER - ELEMENT**

CUE

STANDARD

SCORE

1. OBTAIN A CONTROLLED COPY OF OTO-ZZ-00001, CONTROL ROOM INACCESSIBILITY, ATTACHMENT 5		OPERATOR SHOULD OBTAIN PROCEDURE COPY	<p>S U</p> <p>Comments:</p>
2. REVIEW NOTES & CAUTIONS PRIOR TO STEP 1 OF ATTACHMENT 5		OPERATOR SHOULD REVIEW NOTES & CAUTIONS PRIOR TO STEP 1 OF ATTACHMENT 5	<p>S U</p> <p>Comments:</p>
<p>3* PLACE SWITCH RP HIS-1 TO THE "ISO CTRL ROOM" POSITION</p> <p>STEP 1.0</p> <p>NOTE: STEP 3, 4 AND 5 MAY BE PERFORMED IN ANY ORDER</p>	RP HIS-1 IS IN "ISO CTRL ROOM"	OPERATOR SHOULD PLACE SWITCH RP HIS-1 TO THE "ISO CTRL ROOM" POSITION	<p>S U</p> <p>Comments:</p>

* CRITICAL STEP

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE
<p>4* PLACE RP HIS-2, ASP XFR SIG PROT B HIS, TO THE "ISO CTRL ROOM" POSITION</p> <p>STEP 1.0</p> <p>NOTE: STEPS 3, 4 AND 5 MAY BE PERFORMED IN ANY ORDER</p>	RP HIS-2 IS IN "ISO CTRL ROOM"	OPERATOR SHOULD PLACE RP HIS-2 TO THE "ISO CTRL ROOM" POSITION	<p>S U</p> <p>Comments:</p>
<p>5* PLACE RP HIS-3, CTRL RM INS XFR SW TO THE "ISO CTRL ROOM" POSITION</p> <p>STEP 1.0</p> <p>NOTE: STEPS 3, 4 AND 5 MAY BE PERFORMED IN ANY ORDER</p>	RP HIS-3 IS IN "ISO CTRL ROOM"	OPERATOR SHOULD PLACE RP HIS-3 TO THE "ISO CTRL ROOM" POSITION	<p>S U</p> <p>Comments:</p>
<p>6. PLACE SWITCHES AL-HS-10, S/G 'B' TDAFP HAND SW. IN "LOCAL"</p> <p>STEP 2.0</p> <p>NOTE: STEPS 6 THROUGH 14 MAY BE PERFORMED IN ANY ORDER</p>	AL-HS-10 IS IN "LOCAL"	OPERATOR SHOULD PLACE AL-HS-10 TO THE "LOCAL" POSITION	<p>S U</p> <p>Comments:</p>

* CRITICAL STEP

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE
<p>7. PLACE SWITCH AL-HS-5, S/G D MDAFP HAND SW, IN THE "LOCAL" POSITION</p> <p>STEP 2.0</p> <p>NOTE: STEPS 6 THROUGH 14 MAY BE PERFORMED IN ANY ORDER</p>	<p>AL-HS-5 IS IN "LOCAL"</p>	<p>OPERATOR SHOULD PLACE AL-HS-5 IN THE "LOCAL" POSITION</p>	<p>S U</p> <p>Comments:</p>
<p>8. PLACE SWITCH AL-HS-7, S/G 'A' MDAFP HAND SW, IN THE "LOCAL" POSITION</p> <p>STEP 2.0</p> <p>NOTE: STEPS 6 THROUGH 14 MAY BE PERFORMED IN ANY ORDER</p>	<p>AL-HS-7 IS IN "LOCAL"</p>	<p>OPERATOR SHOULD PLACE SWITCH AL-HS-7 TO THE "LOCAL" POSITION</p>	<p>S U</p> <p>Comments:</p>
<p>9. PLACE SWITCH AL-HS-12, S/G 'C' TDAFP HAND SW, IN THE "LOCAL" POSITION</p> <p>STEP 2.0</p> <p>NOTE: STEPS 6 THROUGH 14 MAY BE PERFORMED IN ANY ORDER</p>	<p>AL-HS-12 IS IN "LOCAL"</p>	<p>OPERATOR SHOULD PLACE SWITCH AL-HS-12 TO THE "LOCAL" POSITION</p>	<p>S U</p> <p>Comments:</p>

* CRITICAL STEP

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE
<p>10. PLACE SWITCH FC-HS-313, AFP TURB SPEED GOV VLV HAND SW, IN THE "LOCAL" POSITION</p> <p>STEP 2.0</p> <p>NOTE: STEPS 6 THROUGH 14 MAY BE PERFORMED IN ANY ORDER</p>	<p>FC-HS-313 IS IN "LOCAL"</p>	<p>OPERATOR SHOULD PLACE SWITCH FC-HS-313 TO THE "LOCAL" POSITION</p>	<p>S U</p> <p>Comments:</p>
<p>11. PLACE SWITCH AB-HS-2, S/G 'B' STEAM DUMP HAND SW, IN THE "LOCAL" POSITION</p> <p>STEP 2.0</p> <p>NOTE: STEPS 6 THROUGH 14 MAY BE PERFORMED IN ANY ORDER</p>	<p>AB-HS-2 IS IN "LOCAL"</p>	<p>OPERATOR SHOULD PLACE SWITCH AB HS-2 IN THE "LOCAL" POSITION</p>	<p>S U</p> <p>Comments:</p>
<p>12. PLACE SWITCH AB-HS-4, S/G 'D' STEAM DUMP HAND SW, IN THE "LOCAL" POSITION</p> <p>STEP 2.0</p> <p>NOTE: STEPS 6 THROUGH 14 MAY BE PERFORMED IN ANY ORDER</p>	<p>AB-HS-4 IS IN "LOCAL"</p>	<p>OPERATOR SHOULD PLACE SWITCH AB-HS-4 IN THE "LOCAL" POSITION</p>	<p>S U</p> <p>Comments:</p>

* CRITICAL STEP

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE S U
<p>13. PLACE SWITCH AB-HS-1, S/G 'A' STEAM DUMP HAND SW, IN THE "LOCAL" POSITION</p> <p>STEP 2.0</p> <p>NOTE: STEPS 6 THROUGH 14 MAY BE PERFORMED IN ANY ORDER</p>	<p>AB-HS-1 IS IN "LOCAL"</p>	<p>OPERATOR SHOULD PLACE SWITCH AB-HS-1 IN THE "LOCAL" POSITION</p>	<p>Comments:</p>
<p>14. PLACE SWITCH AB-HS-3, S/G 'C' STEAM DUMP HAND SW, IN THE "LOCAL" POSITION</p> <p>STEP 2.0</p> <p>NOTE: STEPS 6 THROUGH 14 MAY BE PERFORMED IN ANY ORDER</p>	<p>AB-HS-3 IS IN "LOCAL"</p>	<p>OPERATOR SHOULD PLACE SWITCH AB-HS-3 IN THE "LOCAL" POSITION</p>	<p>Comments:</p>
<p>15. CLOSE AB-PV-1, S/G 'A' PORV, USING AB-PIC-1B</p> <p>STEP 3.0</p>	<p>AB-PV-1 GREEN LIGHT IS LIT AND RED LIGHT IS OUT</p>	<p>OPERATOR SHOULD CLOSE AB-PV-1, USING AB-PIC-1B</p>	<p>Comments:</p>

* CRITICAL STEP

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE
16. CLOSE AB-PV-3, S/G 'C' PORV, USING AB-PIC-3B STEP 4.0	AB-PV-3 GREEN LIGHT IS LIT AND RED LIGHT IS OUT	OPERATOR SHOULD CLOSE AB-PV-3, USING AB-PIC-3B	S U Comments:
17. OPEN AL-HV-34, CST TO MDAFP 'B' HAND CTRL VLV, BY USING AL-HIS-34B STEP 5.0	AL-HV-34 RED LIGHT IS LIT AND GREEN LIGHT IS OUT	OPERATOR SHOULD OPEN AL-HV-34 USING AL-HIS-34B	S U Comments:
18*. START MDAFP 'B' USING AL-HIS-22B STEP 6.0	'B' MDAFP DISCHARGE PRESSURE INDICATES 1220 PSIG AL-HIS-22B RED LIGHT IS LIT AND GREEN LIGHT IS OUT	OPERATOR SHOULD START 'B' MDAFP USING AL-HIS-22B	S U Comments:

* CRITICAL STEP

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE S U
19. CONTROL S/G 'D' LEVEL AT APPROX 50% USING AL-HK-5B S/G 'D' MDAFP AFW CTRL STEP 7.0	S/G 'D' LEVEL IS 50%	OPERATOR SHOULD CONTROL 'D' S/G LEVEL AT APPROXIMATELY 50% USING AL-HK-5B	S U Comments:
*20. DUMP STEAM AS NECESSARY TO BEGIN C/D TO 557 DEGREES FAHRENHEIT USING S/G 'D' PORV CONTROL AB-PIC-4B STEP 8.0	AB-PIC-4B HAS BOTH GREEN LIGHT AND RED LIGHT ILLUMINATED	OPERATOR SHOULD BEGIN A COOLDOWN TO 557°F BY OPENING AB-PIC-4B	S U Comments:
21. VERIFY NATURAL CIRCULATION AND COOLDOWN BY OBSERVING S/G STEAM PRESSURES - STABLE OR DECREASING STEP 9.1	'A', 'B', 'C' S/G STEAM PRESSURES ARE STABLE, 'D' S/G PRESSURE IS DECREASING SLOWLY	OPERATOR SHOULD VERIFY NATURAL CIRCULATION AND COOLDOWN BY OBSERVING S/G STEAM PRESSURES - STABLE OR DECREASING	S U Comments:

* CRITICAL STEP

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE
22. RCS COLD LEG TEMPERATURES NEAR SATURATION FOR S/G STEAM PRESSURE	'A', 'B', 'C' S/G ARE AT 1100 PSIG 'D' S/G IS 1050 PSIG ALL RCS COLD LEGS ARE AT 559°F	OPERATOR SHOULD VERIFY RCS COLD LEG TEMPERATURES ARE NEAR SATURATION FOR STEAM PRESSURE	S U Comments:
STEP 9.2			
23. RCS HOT LEG TEMPERATURES - STABLE OR DECREASING	ALL RCS HOT LEG TEMPERATURES ARE AT 562°F AND DECREASING SLOWLY	OPERATOR SHOULD VERIFY RCS HOT LEG TEMPERATURES STABLE OR DECREASING	S U Comments:
STEP 9.3			
24.	BOP RO CALLS AND INFORMS THE OPERATOR AL-HV-36, CST TO TDAFP HAND CTRL VLV, IS OPEN		S U Comments:

* CRITICAL STEP

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE S U
25. PRESS THE OPEN PUSHBUTTON ON AB-HIS-5B, MS LOOP 2 SPLY TO TDAFP STEP 10.1	AB-HIS-5B RED LIGHT ILLUMINATES AND GREEN LIGHT GOES OUT	OPERATOR SHOULD DEPRESS THE OPEN PUSHBUTTON ON AB-HIS-5B	Comments:
26. PRESS THE OPEN PUSHBUTTON ON FC-HIS-312B, TDAFP MECH TRIP / THROT VLV STEP 10.2	FC-HIS-312B RED LIGHT IS LIT AND GREEN LIGHT IS OUT	OPERATOR SHOULD DEPRESS THE OPEN PUSHBUTTON ON FC-HIS-312B	Comments:
27. MONITOR SUCTION PRESSURE AT AL-PI-26B, TDAFP SUCTION IND STEP 10.3	AL-PI-26B INDICATES 31 PSIA	OPERATOR SHOULD MONITOR TD AUX FEED PUMP SUCTION PRESSURE USING AL-PI-26B	Comments:

* CRITICAL STEP

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE S U
31. CONTROL TAVG AT 557 DEGREES FAHRENHEIT WITH THE FOLLOWING STEAM DUMPS: S/G 'B' AB-PIC-2B S/G 'D' AB-PIC-4B STEP 12.0	TAVG IS 557°F AND STABLE	OPERATOR SHOULD USE AB-PIC-4B TO MAINTAIN RCS TAVE AT 557°F	S U Comments:
32.	OPERATOR SHOULD REALIZE THAT STEP 13.0 IS N/A		S U Comments:
33. STOP LETDOWN FLOW WITH BG-HIS-8152A, CVCS LTDN OUTER CTMT ISO VLV STEP 14.0	BG-HIS-8152A GREEN LIGHT IS LIT AND RED LIGHT IS OUT	OPERATOR SHOULD STOP RCS LETDOWN FLOW WITH BG-HIS-8152A	S U Comments:

* CRITICAL STEP

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE
34. ENSURE ATTACHMENTS 1, 2, 3 AND 9 FROM PLANT PERSONNEL HAVE BEEN COMPLETED FOR CCW AND CCP STARTS STEP 14.1	ATTACHMENTS 1, 2, 3 AND 9 HAVE BEEN COMPLETED TO ALLOW STARTING OF THE CCW PUMP	OPERATOR SHOULD OBTAIN STATUS OF ATTACHMENT 1, 2, 3 AND 9 PRIOR TO PROCEEDING	S U Comments:
35. REQUEST THE RO TO START EITHER COMPONENT COOLING WATER PUMP PEG01 'B' OR 'D' AT NB02 BUS STEP 15.0	RO HAS BEEN CONTACTED TO START 'B/D' CCW PUMP AND WILL INFORM THE SS WHEN THE CCW PUMP IS RUNNING	OPERATOR SHOULD CONTACT THE RO TO START 'B' OR 'D' CCW PUMP	S U Comments:
36.	THE JPM IS COMPLETE <u>RECORD STOP TIME</u> <u>ON PAGE 1</u>		S U Comments:

* CRITICAL STEP

#1

NAME: _____

JPM NO: URO-CTSPA031JC101J

QUESTION:

REFERENCE USE

Control Room evacuation has been completed per OTO-ZZ-00001. The MCB handswitches for both MD Aux Feed Pumps were inadvertently left in Pull-to-Lock in the Control Room.

What is the effect on operation from the ASP?

ANSWER:

'A' MD AFP will not operate (50%)

'B' MD AFP will operate (50%)

KA RATING: 000068A112

REFERENCE: E23AL01

COMMENTS / ANSWER GIVEN :

SCORE: SAT UNSAT

#2

NAME: _____

JPM NO: URO-CTSPA031JC101J

QUESTION:

REFERENCE USE

Diesel NE02 is manually started during Control Room evacuation. LOCAL MASTER TRANSFER SWITCH, KJ HS-109 is placed in Local/Manual, the diesel is started using KJ-HS-101C, and then KJ HS-109 is returned to AUTO.

Why is KJ HS-109 placed in Local/Manual and then returned to AUTO?

ANSWER:

KJ HS-109 placed in Local/Manual to enable local start pushbutton. (50%)

Returned to Auto so that output breaker closes automatically. (50%)

KA RATING: 000068K312

REFERENCE: OTO-ZZ-00001, Att. 10
E23KJ01A

COMMENTS / ANSWER GIVEN :

SCORE: SAT UNSAT

#1

NAME: _____

QUESTION:

REFERENCE USE

Control Room evacuation has been completed per OTC ZZ-00001. The MCB handswitches for both MD Aux Feed Pumps were inadvertently left in Pull-to-Lock in the Control Room.

What is the effect on operation from the ASP?

#2

NAME: _____

QUESTION:

REFERENCE USE

Diesel NE02 is manually started during Control Room evacuation. LOCAL MASTER TRANSFER SWITCH, KJ HS-109 is placed in Local/Manual, the diesel is started using KJ-HS-101C, and then KJ HS-109 is returned to AUTO.

Why is KJ HS-109 placed in Local/Manual and then returned to AUTO?

Read to Performer: I will explain the initial conditions, which steps to simulate or discuss, and provide initiating and subsequent cues. You may use any approved reference materials normally available to you. Make all written reports, oral reports, and log entries as if the evolution was actually being performed. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions: CALLAWAY PLANT IS IN MODE 3, 'B' CCP IS RUNNING, CVCS LETDOWN is Isolated. The plant tripped and Control Room Evacuation has been completed due to Fire in the Control Room.

Initiating Cues: You have been DIRECTED TO completed transfer of Control to the ASP per Attachment 5, OTO-ZZ-00001 and verify natural circulation has been established at the ASP per the procedure.

CALLAWAY PLANT

JOB PERFORMANCE MEASURE

JPM NO: URO-SEG02PBC21J KSA NO: 008000A401
U.E. RATING: REQ KSA RATING: 3.3/3.1
JOB TITLE: URO/SRO REVISION: 970121
DUTY: COMPONENT COOLING WATER
TASK TITLE: SHIFT NON-ESSENTIAL CCW SUPPLY LOOPS
COMPLETION TIME: 12 MINUTES

The performance of this task was evaluated against the standards contained in this JPM and determined to be:

☐ SATISFACTORY ☐ UNSATISFACTORY

Reason, if UNSATISFACTORY:

EVALUATORS SIGNATURE: _____ DATE: _____

TASK PERFORMER: _____

LOCATION OF PERFORMANCE:

CONTROL ROOM _____ SIMULATOR/LAB X PLANT _____ CLASSROOM _____

METHOD OF PERFORMANCE: SIMULATED _____ PERFORMED X _____

REFERENCES: OTN-EG-00001, COMPONENT COOLING WATER SYSTEM, REVISION 16

TOOLS/EQUIPMENT: NONE

PREPARED BY: _____ DATE: _____

REVIEWED BY: _____ DATE: _____

STS/SS

APPROVED BY: _____ DATE: _____

DEPARTMENT HEAD

Read to Performer: I will explain the initial conditions, which steps to simulate or discuss, and provide initiating and subsequent cues. You may use any approved reference materials normally available to you. Make all written reports, oral reports, and log entries as if the evolution was actually being performed. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions: CALLAWAY PLANT IS IN MODE 1. 'B' TRAIN CCW IS IN SERVICE. 'B' CCW PUMP IS RUNNING WITH A, C, AND D CCW PUMPS SECURED.

Initiating Cues: THE OPERATING SUPERVISOR HAS DIRECTED YOU TO START 'A' CCW PUMP AND SHIFT THE SERVICE LOOP TO 'A' CCW TRAIN PER OTN-EG-00001, SECTION 4.5.

Notes: USE ANY MODE 1 IC. ENSURE COOLING WATER IS ALIGNED TO THE 'A' CCW HEAT EXCHANGER AND 'B' CCP IS IN SERVICE.

Task Standard: UPON COMPLETION OF THIS JPM, THE OPERATOR WILL HAVE STARTED 'A' CCW PUMP AND SHIFTED THE NON-ESSENTIAL SERVICE LOOP TO THE 'A' TRAIN.

START TIME: _____

STOP TIME: _____

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE
1. LOCATE A CURRENT REVISION OF OTN-EG-00001 COMPONENT COOLING WATER SYSTEM		OPERATOR SHOULD OBTAIN PROCEDURE COPY	S U Comments:
2. REVIEW PRECAUTIONS AND LIMITATIONS STEP 2.0	ALL PRECAUTIONS AND LIMITATIONS ARE SATISFIED	OPERATOR SHOULD REVIEW PRECAUTIONS AND LIMITATIONS	S U Comments:
3. REVIEW INITIAL CONDITIONS STEP 3.0	ALL INITIAL CONDITIONS ARE SATISFIED ASK IF THE OPERATOR UNDERSTANDS THE INITIAL CONDITIONS AND INITIATING CUES	OPERATOR SHOULD REVIEW INITIAL CONDITIONS	S U Comments:

* CRITICAL STEP

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE
4. OBTAIN CHECKOFF LIST #7 AND PROVIDE THIS TO THE PEO. STEP 4.5.1	PRIMARY EQUIPMENT OPERATOR (PEO) HAS CHECKOFF LIST #7	CONTACT CRS OR CLERK FOR CHECKOFF LIST #7 AND PROVIDE TO PEO	S U Comments:
5. ENSURE COOLING WATER IS ALIGNED TO 'A' CCW HEAT EXCHANGER STEP 4.5.2	SERVICE WATER IS LINED UP TO 'A' CCW HEAT EXCHANGER	VERIFY COOLING WATER IS ALIGNED TO 'A' CCW HEAT EXCHANGER	S U Comments:
6. VERIFY SUCTION PRESSURE TO 'A' CCW PUMP IS 9-12 PSIG STEP 4.5.3.1	THE PRIMARY EO REPORTS EGPI0017, 'A' CCW PUMP SUCTION PRESSURE, INDICATES 10 PSIG	CALL PRIMARY EO HAVE VERIFY SUCTION PRESSURE IS 9-12 PSIG FOR 'A' CCW PUMP	S U Comments:

* CRITICAL STEP

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE
7* START 'A' CCW PUMP WITH HANDSWITCH EG HIS-21 STEP 4.5.3.2	EG-HIS-21 RED LIGHT ILLUMINATES AND GREEN LIGHT GOES OUT	START 'A' CCW PUMP WITH HANDSWITCH EG HIS-21	S U Comments:
8. DIRECT THE PRIMARY EQUIPMENT OPERATOR TO TURN OFF THE MOTOR SPACE HEATER FOR 'A' CCW PUMP. BREAKER PG19NJF1, CKT. 18 STEP 4.5.3.3	BREAKER PG19NJF1 CKT. 18 IS OFF	CONTACT PEO AND DIRECT HIM TO OPEN BREAKER PG19NJF1, CKT. 18 FOR 'A' CCW PUMP SPACE HEATER	S U Comments:
9. CLOSE 'A' TRAIN SURGE TANK VENT VALVE WITH EG HIS-9 STEP 4.5.4 NOTE: STEPS 9 AND 10 MAY BE PERFORMED IN ANY ORDER	EG-HIS-9 GREEN LIGHT ILLUMINATES AND RED LIGHT GOES OUT	CLOSE EG HIS-9, 'A' CCW SURGE TANK VENT VALVE	S U Comments:

* CRITICAL STEP

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE S U
10. CLOSE 'B' TRAIN VENT VALVE WITH EG HIS-10 STEP 4.5.4 NOTE: STEPS 9 AND 10 MAY BE PERFORMED IN ANY ORDER	EG-HIS-10 GREEN LIGHT ILLUMINATES AND RED LIGHT GOES OUT	CLOSE EG HIS-10, 'B' CCW SURGE TANK VENT VALVE	Comments:
11* OPEN EG HV0015 AND 53, 'A' CCW TRAIN SUPPLY AND RETURN ISOLATION VALVES, WITH SWITCH EG HS-15 STEP 4.5.5	EG-ZL-15 AND 53, CCW TRN 'A' SUPPLY AND RETURN VLV RED LIGHTS ILLUMINATE AND GREEN LIGHTS GO OUT	OPEN EG HV0015 AND EG HV-53, 'A' CCW TRAIN SUPPLY AND RETURN ISOLATION VALVES, WITH SWITCH EG-HS-15 NOTE: BGHV0062 CCW FROM INNER CTMT ISO VLV OR BB HV-13, 14, 15, 16 CCW FROM RCP, MAY CLOSE DUE TO HIGH CCW FLOW	Comments:
12* CLOSE EGHV0016 AND 54, 'B' CCW TRAIN SUPPLY AND RETURN ISOLATION VALVES, WITH SWITCH EG HS-16 STEP 4.5.6	EG-ZL-16 AND 54, GREEN LIGHTS ILLUMINATE AND RED LIGHTS GO OUT	CLOSE EGHV0016 AND 54, 'B' CCW TRAIN SUPPLY AND RETURN ISOLATION VALVES, WITH SWITCH EG HS-16	Comments:

* CRITICAL STEP

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE S U
13. OPEN 'A' CCW TRAIN VENT VALVE WITH EG HIS-9 STEP 4.5.7 NOTE: STEPS 13 AND 14 MAY BE PERFORMED IN ANY ORDER	EG-HIS-9 RED LIGHT ILLUMINATES AND GREEN LIGHT GOES OUT	OPEN 'A' CCW TRAIN VENT VALVE WITH EG HIS-9	S U Comments:
14. OPEN 'B' CCW TRAIN VENT VALVE WITH EG HIS-10 STEP 4.5.7 NOTE: STEPS 13 AND 14 MAY BE PERFORMED IN ANY ORDER	EG-HIS-10 RED LIGHT ILLUMINATES AND GREEN LIGHT GOES OUT	OPEN 'B' CCW TRAIN VENT VALVE WITH EG HIS-10	S U Comments:
14.	THE JPM IS COMPLETE <u>RECORD STOP TIME</u> <u>ON PAGE 1</u>		S U Comments:

* CRITICAL STEP

#1

NAME: _____

JPM NO: URO-SEG02PBC21J

QUESTION:

REFERENCE USE

Component Cooling Water Pump 'C' is running to supply the 'A' Safety Loads and the Non Safety Loads (Service Loop) with it's MCB handswitch, EGHIS0023, in the Normal After Run position.

Describe the operation of Component Cooling Water Pump 'A' for the following situations.
(Assume that it's MCB handswitch, EGHIS0021, is in the Normal After Stop position.)

- A. MCB handswitch for Component Cooling Water Pump 'C' EGHIS0023 is placed in the STOP position.
- B. 4160V Breaker for Component Cooling Water Pump 'C' NB0108 is locally opened.

ANSWER:

- A. Component Cooling Water Pump 'A' does not start. (50%)
- B. Component Cooling Water Pump 'A' starts (25%)
on low discharge pressure (25%)

KA RATING: 008000K401 (3.1/3.3)

REFERENCE: E-23EG01A&B

COMMENTS / ANSWER GIVEN :

SCORE: SAT UNSAT

#2

NAME: _____

JPM NO: URO-SEG02PBC21J

QUESTION:

MEMORY

The Control Room Supervisor has requested the Hot Lab Chemistry Technician to sample the Steam Generators for secondary activity in accordance with step 24 of E-0, Reactor Trip or Safety Injection.

Shortly after the request, the Chemistry Technician reports steam coming from the Steam Generator sample points at the Nuclear Sampling Station.

What is the cause of this situation?

ANSWER:

Loss of Component Cooling Water flow to the sample coolers (50%)
due to the Safety Injection Signal (50%)

KA RATING: 008030A304 (3.6/3.7)

REFERENCE: E-0
M-22EG03

COMMENTS / ANSWER GIVEN :

SCORE: SAT UNSAT

#1

NAME: _____

QUESTION:

REFERENCE USE

Component Cooling Water Pump 'C' is running to supply the 'A' Safety Loads and the Non Safety Loads (Service Loop) with it's MCB handswitch, EGHIS0023, in the Normal After Run position.

Describe the operation of Component Cooling Water Pump 'A' for the following situations.
(Assume that it's MCB handswitch, EGHIS0021, is in the Normal After Stop position.)

- A. MCB handswitch for Component Cooling Water Pump 'C' EGHIS0023 is placed in the STOP position.
- B. 4160V Breaker for Component Cooling Water Pump 'C' NB0108 is locally opened.

#2

NAME: _____

QUESTION:

MEMORY

The Control Room Supervisor has requested the Hot Lab Chemistry Technician to sample the Steam Generators for secondary activity in accordance with step 24 of E-0, Reactor Trip or Safety Injection.

Shortly after the request, the Chemistry Technician reports steam coming from the Steam Generator sample points at the Nuclear Sampling Station.

What is the cause of this situation?

Read to Performer: I will explain the initial conditions, which steps to simulate or discuss, and provide initiating and subsequent cues. You may use any approved reference materials normally available to you. Make all written reports, oral reports, and log entries as if the evolution was actually being performed. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions: CALLAWAY PLANT IS IN MODE 1. 'B' TRAIN CCW IS IN SERVICE. 'B' CCW PUMP IS RUNNING WITH A, C, AND D CCW PUMPS SECURED.

Initiating Cues: THE OPERATING SUPERVISOR HAS DIRECTED YOU TO START 'A' CCW PUMP AND SHIFT THE SERVICE LOOP TO 'A' CCW TRAIN PER OTN-EG-00001, SECTION 4.5.

CALLAWAY PLANT JOB PERFORMANCE MEASURE

JPM NO: URO-SEJ02PCC23J KSA NO: 045005A4.01
U.E. RATING: REQ KSA RATING: 3.6/3.4
JOB TITLE: URO/SRO REVISION: 960424
DUTY: RESIDUAL HEAT REMOVAL
TASK TITLE: BORATION OF RHR SYSTEM
COMPLETION TIME: 20 MINUTES

The performance of this task was evaluated against the standards contained in this JPM and determined to be:

☐ SATISFACTORY ☐ UNSATISFACTORY

Reason, if UNSATISFACTORY:

EVALUATORS SIGNATURE: _____ DATE: _____

TASK PERFORMER: _____

LOCATION OF PERFORMANCE:

CONTROL ROOM _____ SIMULATOR/LAB X PLANT _____ CLASSROOM _____

METHOD OF PERFORMANCE: SIMULATED _____ PERFORMED X _____

REFERENCES: OTN-EJ-00001, RESIDUAL HEAT REMOVAL SYSTEM, REVISION 12

TOOLS/EQUIPMENT: NONE

PREPARED BY: _____ DATE: _____

REVIEWED BY: _____ DATE: _____

STS/SS

APPROVED BY: _____ DATE: _____

DEPARTMENT HEAD

Read to Performer: I will explain the initial conditions, which steps to simulate or discuss, and provide initiating and subsequent cues. You may use any approved reference materials normally available to you. Make all written reports, oral reports, and log entries as if the evolution was actually being performed. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions: CALLAWAY PLANT IS IN MODE 4 WITH THE RCS TEMPERATURE AT 340 DEGREES FAHRENHEIT AND RCS PRESSURE AT 350 PSIG. THE RWST BORON CONCENTRATION IS AT 2400 PPM AND 'A' RHR TRAIN IS AT 700 PPM. THE RCS BORON CONCENTRATION IS 1469 PPM. 'A', 'B', AND 'D' REACTOR COOLANT PUMPS ARE RUNNING WITH THE COLD OVERPRESSURE PROTECTION PROVIDED BY ARMING THE PRESSURIZER PORV'S. 'B' TRAIN CCW IS SUPPLYING THE CCW SERVICE LOOP AND THE 'A' CCW PUMP IS RUNNING.

Initiating Cues: CALLAWAY PLANT IS COOLING DOWN TO PREPARE FOR AN OUTAGE. THE OPERATING SUPERVISOR HAS DIRECTED YOU TO BORATE 'A' TRAIN OF RHR SO IT CAN BE PLACED IN SERVICE FOR THE NORMAL COOLDOWN PER OTN-EJ-00001, SECTION 4.2.

ASK IF THE OPERATOR UNDERSTANDS THE INITIATING CUES.
--

Notes: USE IC-5; 'A' RHR PUMP SHOULD BE OFF WITH THE SUCTION ALIGNED TO THE RWST.

ENSURE BN-HV-8812A IS OPEN

Task Standard: UPON COMPLETION OF THIS JPM, THE 'A' TRAIN OF RHR WILL HAVE BEEN BORATED INTO PREPARATION FOR BEING PLACED IN SERVICE.

START TIME: _____

STOP TIME: _____

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE
1. OBTAIN A CURRENT REVISION OF OTN-EJ-00001, RESIDUAL HEAT REMOVAL SYSTEM		OPERATOR SHOULD OBTAIN PROCEDURE COPY	S U Comments:
2. REVIEW THE PRECAUTIONS AND LIMITATIONS STEP 2.0	ALL THE PRECAUTIONS AND LIMITATIONS ARE SATISFIED	OPERATOR SHOULD REVIEW THE PRECAUTIONS AND LIMITATIONS	S U Comments:
3. ENSURE RWST IS SAMPLED TO PREVENT DILUTION BELOW TECH SPEC VALUES	HOT LAB TECH ACKNOWLEDGES	OPERATOR MAY CALL HOT LAB TECH TO INFORM HIM OF REQUIRED RWST SAMPLES	S U Comments:

* CRITICAL STEP

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE
4. INFORM HOT LAB TECH THAT BORON CONCENTRATION SAMPLES WILL BE NEEDED STEP 4.2.1.2	HOT LAB TECH ACKNOWLEDGES	OPERATOR MAY CALL THE HOT LAB TECH TO INFORM HIM OF REQUIRED BORON SAMPLE OF 'A' RHR TRAIN	S U Comments:
5. ENSURE/CLOSE RHR PUMP SUCTION VALVES FROM THE CONTAINMENT RECIRC SUMP EJHV8811A WITH VALVE EJ HIS-8811A STEP 4.2.1.3	EJ HIS-8811A GREEN LIGHT IS ILLUMINATED AND RED LIGHT IS OUT	OPERATOR SHOULD ENSURE EJHV8811A, 'A' RHR PUMP SUCTION VALVE, IS CLOSED LOCATED ON RL017	S U Comments:
6. ENSURE/CLOSE RHR SUCTION ISOLATION FROM RCS, BBPV8702A, WITH PUSHBUTTON BB HIS-8702A STEP 4.2.1.3 NOTE STEPS 6 & 7 MAY BE PERFORMED IN ANY ORDER	EJ HIS-8702A GREEN LIGHT IS LIT AND RED LIGHT IS OUT	OPERATOR SHOULD ENSURE BBPV8702A RHR SUCTION ISOLATION IS CLOSED WITH EJ HIS-8702A	S U Comments:

* CRITICAL STEP

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE
<p>7. ENSURE/CLOSE RHR SUCTION ISOLATION FROM RCS, EJ HV8701A WITH PUSHBUTTON EJ HIS-8701A</p> <p>STEP 4.2.1.3</p> <p>NOTE STEPS 6 & 7 MAY BE PERFORMED IN ANY ORDER</p>	<p>EJ HIS-8701A GREEN LIGHT IS LIT AND RED LIGHT IS OUT</p>	<p>OPERATOR SHOULD ENSURE EJ HIS-8701A, RHR SUCTION ISOLATION IS CLOSED WITH EJ HIS-8701A</p>	<p>S U</p> <p>Comments:</p>
<p>8. ENSURE RHR HX DISCHARGE TO THE CHARGING PUMP AND SI PUMP, EJ HV-8804A, IS CLOSED WITH EJ-HIS-8804A</p> <p>STEP 4.2.1.3</p>	<p>EJ HIS-8804A GREEN LIGHT IS ILLUMINATED AND RED LIGHT IS OUT</p>	<p>OPERATOR SHOULD ENSURE EJ HIS-8804A, RHR HX DISCHARGE TO THE CHARGING PUMP AND SI PUMP, IS CLOSED</p> <p>LOCATED ON RL017</p>	<p>S U</p> <p>Comments:</p>
<p>9. ENSURE 'A' RHR TRAIN TO CVCS LETDOWN ISO EJ V001 IS CLOSED</p> <p>STEP 4.2.1.3</p>	<p>PRIMARY EO REPORTS EJ V001 IS CLOSED</p>	<p>OPERATOR SHOULD ENSURE THAT EJ V0001 IS CLOSED</p>	<p>S U</p> <p>Comments:</p>

* CRITICAL STEP

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE S U
10. ENSURE RCS HOT LEG RECIRC LINE SUPPLY VALVE, EJ HV-8840, IS CLOSED WITH EJ HIS-8840 STEP 4.2.1.3	EJ HIS-8840 GREEN LIGHT IS ILLUMINATED AND RED LIGHT IS OUT	OPERATOR SHOULD ENSURE EJ HV-8840, RCS HOT LEG RECIRC LINE SUPPLY VALVE, IS CLOSED LOCATED ON RL012	Comments:
11. VERIFY OPEN 'A' RHR PUMP SUCTION FROM THE RWST, BGHV8812A, USING BG HIS-8812A, IS OPEN STEP 4.2.1.4	BN HIS-8812A RED LIGHT IS ILLUMINATED AND GREEN LIGHT IS OUT	OPERATOR SHOULD VERIFY OPEN BNHV8812A, 'A' RHR PUMP SUCTION FROM RWST USING BG HIS-8812A LOCATED ON RL017	Comments:
12. CLOSE 'A' RHR HX BYPASS CONTROL VALVE, EJFCV618 WITH HANDSWITCH EJ FK-618 STEP 4.2.1.5	EJFK-618 HAS 0 DEMAND INDICATED	OPERATOR SHOULD CLOSE EJFCV618, 'A' RHR HX BYPASS CONTROL VALVE WITH HANDSWITCH EJ FK-618 LOCATED ON RL017	Comments:

* CRITICAL STEP

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE S U
13. ENSURE EJHV8716A, RHR SYSTEM HOT LEG RECIRC ISOLATION, EJHV8716A, IS OPEN WITH HANDSWITCH EJ HIS-8716A STEP 4.2.1.6	EJ HIS-8716A RED LIGHT IS LIT AND GREEN LIGHT IS OUT	OPERATOR SHOULD ENSURE EJHV8716A RHR SYSTEM HOT LEG RECIRC ISOLATION IS OPEN	S U Comments:
14. ENSURE/CLOSE EJHV8716B, RHR SYSTEM HOT LEG RECIRC ISOLATION, WITH HANDSWITCH EJ HIS-8716B STEP 4.2.1.6	EJ HIS-8716B GREEN LIGHT ILLUMINATES AND RED LIGHT GOES OUT	OPERATOR SHOULD CLOSE EJHV8716B WITH HANDSWITCH EJ HIS-8716B	S U Comments:
15. ENSURE 'A' CCW TRAIN IS IN OPERATION STEP 4.2.1.7.1	'A' CCW PUMP IS RUNNING	OPERATOR SHOULD ENSURE 'A' CCW TRAIN IS IN OPERATION NOTE: GIVEN IN INITIAL CONDITION	S U Comments:

* CRITICAL STEP

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE
16. OPEN EGHV101, CCW TO 'A' RHR HX ISO WITH HANDSWITCH EG HIS-101 STEP 4.2.1.7.2	EG HIS-101 RED LIGHT ILLUMINATES AND GREEN LIGHT GOES OUT	OPERATOR SHOULD OPEN EGHV101, CCW TO 'A' RHR HX ISO, WITH HANDSWITCH EG HIS-101	S U Comments:
17. CLOSE 'A' RHR HX FLOW CONTROL VALVE, EJHCV606 WITH HANDSWITCH EJ HIC-606 STEP 4.2.1.8	EJ HIC-606, RED NEEDLE POSITION INDICATES '0'	OPERATOR SHOULD CLOSE EF HV-606, 'A' RHR HX FLOW CONTROL VALVE WITH HANDSWITCH EJ HIC-606, LOCATED ON RL017	S U Comments:
18. ENSURE 'A' TRAIN MINIFLOW VALVE, EJFCV610, IS OPEN WITH HANDSWITCH EJ HIS-610 STEP 4.2.1.9	EJ HIS-610 RED LIGHT IS ILLUMINATED AND GREEN LIGHT IS OUT	OPERATOR SHOULD ENSURE 'A' TRAIN MINIFLOW VALVE EJHV610 IS OPEN USING EJ HIS-610	S U Comments:

* CRITICAL STEP

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE S U
19* START PEJ01A, 'A' RHR PUMP, WITH SWITCH EJ HIS-1 STEP 4.2.1.10	EJ HIS-1, 'A' RHR PUMP HANDSWITCH HAS A RED LIGHT LIT AND GREEN LIGHT OUT PUMP DISCHARGE IS 235 PSIG AND FLOW IS 1000 GPM	OPERATOR SHOULD START 'A' RHR PUMP WITH SWITCH EJ HIS-1	S U Comments:
20* HAVE AN EQUIPMENT OPERATOR SLOWLY OPEN BN8717, RHR SYS RECIRC TO RWST STEP 4.2.1.11	THE OPERATOR ACKNOWLEDGES	OPERATOR SHOULD CALL AND HAVE AN EQUIPMENT OPERATOR OPEN BN8717 NOTE: LOA BNV2 OR RAMP MODE MAY BE USED TO OPEN BNV8717	S U Comments:
21. STEP 4.2.1.11	THE EO CALLS BACK AND SAYS EJ-FIS-610 HAS ABOUT 1,750 GPM FLOW AND THAT BN-8717 IS OPEN		S U Comments:

* CRITICAL STEP

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE
22. AS RECIRCULATION FLOW IS BEING INCREASED, MONITOR RHR DISCHARGE PRESSURE FOR ABNORMAL TRANSIENTS STEP 4.2.1.11.1	EJ-PI-614, 'A' RHR PUMP DISCHARGE PRESSURE INDICATES 215 PSIG AND CONSTANT	OPERATOR SHOULD MONITOR 'A' RHR PUMP DISCHARGE PRESSURE FOR ABNORMAL TRANSIENTS WHILE INCREASING RHR RECIRCULATION FLOW	S U Comments:
23. CRACK OPEN EJHCV606, 'A' RHR HX FLOW CONTROL VALVE, ABOUT 10% FOR FIVE (5) MINUTES WITH HANDSWITCH EJ HIC-606 STEP 4.2.1.11.2	EJ-HIC-606 INDICATES 10% OPEN IT IS NOW FIVE (5) MINUTES LATER	OPERATOR SHOULD OPEN EJHCV606, 'A' RHR HX FLOW CONTROL VALVE, ABOUT 10% WITH HANDSWITCH EJ HIC-606	S U Comments:
24. CLOSE EJHCV606, 'A' RHR HX FLOW CONTROL VALVE WITH HANDSWITCH EJ HIC-606 STEP 4.2.1.11.3	EJ HIC-606 SHOWS RED POSITION INDICATOR AT 0%	OPERATOR SHOULD CLOSE EJHCV606, 'A' RHR HX FLOW CONTROL VALVE WITH HANDSWITCH EJ HIC-606	S U Comments:

* CRITICAL STEP

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE
25. CRACK OPEN EJFCV618, RHR HX 'A' BYPASS CTRL, APPROXIMATELY 10% FOR FIVE (5) MINUTES WITH HANDSWITCH EJ FK-618 STEP 4.2.1.11.4	EJ FK-618 POSITION INDICATOR SHOWS 10% OPEN ASSUME IT IS NOW FIVE (5) MINUTES LATER	OPERATOR SHOULD OPEN EJFCV618, RHR HX 'A' BYPASS CTRL, ABOUT 10% WITH HANDSWITCH EF FK-618	S U Comments:
26. CLOSE EJFCV618, RHR HX 'A' BYPASS CTRL, WITH HANDSWITCH EJ FK-618 STEP 4.2.1.11.5	EJ FK618 POSITION INDICATOR SHOWS 0%	OPERATOR SHOULD CLOSE RHR HX 'A' BYPASS CTRL, EJFCV618 WITH HANDSWITCH EJ FK618	S U Comments:
27. OPEN EMHV8964, SI SYSTEM TEST LINE OUTER CTMT ISOLATION VALVE USING EM HIS-8964 STEP 4.2.1.12.1	EM HIS-8964 RED LIGHT ILLUMINATES AND GREEN LIGHT GOES OUT	OPERATOR SHOULD OPEN THE SI SYSTEM TEST LINE OUTER CTMT ISOLATION VALVE, EMHV8964, USING EM HIS-8964	S U Comments:

* CRITICAL STEP

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE
28. OPEN EMHV8871, SI SYSTEM TEST LINE INNER CTMT ISO VALVE USING EM HIS-8871 STEP 4.2.1.12.2	EM HIS-8871 RED LIGHT ILLUMINATES AND GREEN LIGHT GOES OUT	OPERATOR SHOULD OPEN THE SI SYSTEM TEST LINE INNER CTMT ISO VALVE, EMHV8871 USING EM HIS-8871	S U Comments:
29. OPEN EMHCV8890A, RHR 'A' TO ACC INS TEST LINE VLV WITH HANDSWITCH EM HIS-8890A STEP 4.2.1.12.3	EM HIS-8890A RED LIGHT ILLUMINATES AND GREEN LIGHT GOES OUT	OPERATOR SHOULD OPEN THE RHR 'A' TO ACC INJ TEST LINE VLV, EJHCV8890A, WITH HANDSWITCH EJ HIS-8890A	S U Comments:
30.	NOTE: 15 MINUTES HAS NOW ELAPSED		S U Comments:

* CRITICAL STEP

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE S U
31. CLOSE EJHCV8890A, RHR 'A' TO ACC INS TEST LINE VLV STEP 4.2.1.12.4	EM HIS-8890A GREEN LIGHT ILLUMINATES AND RED LIGHT GOES OUT	OPERATOR SHOULD CLOSE THE RHR 'A' TO ACC INJ TEST LINE VALVE, EJHCV8890A WITH HANDSWITCH EJ HIS-8890A	Comments:
32. CLOSE EMHV8871, SI SYSTEM TEST LINE INNER CTMT ISO VLV, USING EM HIS-8871 STEP 4.2.1.12.5	EM HIS-8871 GREEN LIGHT ILLUMINATES AND RED LIGHT GOES OUT	OPERATOR SHOULD CLOSE THE SI SYSTEM TEST LINE INNER CTMT ISO VALVE, EMHV8871 USING EM HIS-8871	Comments:
33. CLOSE EMHV8964, SI SYSTEM TEST LINE OUTER CTMT ISO VLV, USING EM HIS-8964 STEP 4.2.1.12.6	EM HIS-8964 GREEN LIGHT ILLUMINATES AND RED LIGHT GOES OUT	OPERATOR SHOULD CLOSE THE SI SYSTEM TEST LINE OUTER CTMT ISO VALVE, EMHV8964 USING EM HIS-8964	Comments:

* CRITICAL STEP

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE	
			S	U
34.	THE JPM IS COMPLETE <u>RECORD STOP TIME</u> <u>ON PAGE 1</u>		Comments:	

* CRITICAL STEP

#1

NAME: _____

JPM NO: URO-SEJ02PCC23J

QUESTION:

REFERENCE USE

The Callaway Plant is in MODE 4 when BBPT0405, RCS Wide Range Pressure Transmitter Fails HIGH. How will this affect your ability to place the Residual Heat Removal System in service for Normal Cooldown? (Assume both Trains are in the Safety Injection Standby Lineup.)

ANSWER:

Cannot place 'A' Train in a Cooldown Lineup because BBPT0405 feeds EJHV8701A. (50% credit)

Cannot place 'B' Train in a Cooldown Lineup because BBPT0405 feeds EJHV8701B. (50% credit)

KA RATING: 005000K407 (3.2/3.5)

REFERENCE: M-22BB04
OTN-EJ-00001

COMMENTS / ANSWER GIVEN :

SCORE: SAT UNSAT

#2

NAME: _____

JPM NO: URO-SEJ02PCC23J

QUESTION:

REFERENCE USE

The Callaway Plant is in MODE 3.

Explain how inadvertently mispositioning EMHV8923A, RWST TO SI PUMP A SUCTION ISOLATION, could result in entry into Tech Spec 3.0.3.

ANSWER:

Closing this valve would make both trains of ECCS inoperable.

(A SI Pump can't take suction from RWST during injection phase AND B RHR can't supply B CCP during recirc phase.)

KA RATING: 005000K408 (3.1/3.5)

REFERENCE: TSI 2
M-22EM01

COMMENTS / ANSWER GIVEN :

SCORE: SAT UNSAT

#1

NAME: _____

QUESTION:

REFERENCE USE

The Callaway Plant is in MODE 4 when BBPT0405, RCS Wide Range Pressure Transmitter Fails HIGH. How will this affect your ability to place the Residual Heat Removal System in service for Normal Ccoldown? (Assume both Trains are in the Safety Injection Standby Lineup.)

#2

NAME: _____

QUESTION:

REFERENCE USE

The Callaway Plant is in MODE 3.

Explain how inadvertently mispositioning EMHV8923A, RWST TO SI PUMP A SUCTION ISOLATION, could result in entry into Tech Spec 3.0.3.

Read to Performer: I will explain the initial conditions, which steps to simulate or discuss, and provide initiating and subsequent cues. You may use any approved reference materials normally available to you. Make all written reports, oral reports, and log entries as if the evolution was actually being performed. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions: CALLAWAY PLANT IS IN MODE 4 WITH THE RCS TEMPERATURE AT 340 DEGREES FAHRENHEIT AND RCS PRESSURE AT 350 PSIG. THE RWST BORON CONCENTRATION IS AT 2400 PPM AND 'A' RHR TRAIN IS AT 700 PPM. THE RCS BORON CONCENTRATION IS 1469 PPM. 'A', 'B', AND 'D' REACTOR COOLANT PUMPS ARE RUNNING WITH THE COLD OVERPRESSURE PROTECTION PROVIDED BY ARMING THE PRESSURIZER PORV'S. 'B' TRAIN CCW IS SUPPLYING THE CCW SERVICE LOOP AND THE 'A' CCW PUMP IS RUNNING.

Initiating Cues: CALLAWAY PLANT IS COOLING DOWN TO PREPARE FOR AN OUTAGE. THE OPERATING SUPERVISOR HAS DIRECTED YOU TO BORATE 'A' TRAIN OF RHR SO IT CAN BE PLACED IN SERVICE FOR THE NORMAL COOLDOWN PER OTN-EJ-00001, SECTION 4.2.

CALLAWAY PLANT

JOB PERFORMANCE MEASURE

JPM NO: URO-SBG04PDC199J KSA NO: 004000A206
U.E. RATING: 3.8/2.8/4.0 KSA RATING: 3.6/3.9
JOB TITLE: URO REVISION: 970120
DUTY: CHEMICAL AND VOLUME CONTROL SYSTEM
TASK TITLE: MAKEUP TO THE RWST
COMPLETION TIME: 15 MIN

The performance of this task was evaluated against the standards contained in this JPM and determined to be:

☐ SATISFACTORY ☐ UNSATISFACTORY

Reason, if UNSATISFACTORY:

EVALUATORS SIGNATURE: _____ DATE: _____

TASK PERFORMER: _____

LOCATION OF PERFORMANCE:

CONTROL ROOM _____ SIMULATOR/LAB X PLANT _____ CLASSROOM _____

METHOD OF PERFORMANCE: SIMULATED _____ PERFORMED X

REFERENCES: PLANT CURVE BOOK FIGURES 7-2 (REV. 4),
OTN-BG-00002, REACTOR MAKEUP CONTROL AND BORON THERMAL
REGENERATION SYSTEM, (REV. 13)

TOOLS/EQUIPMENT:

PREPARED BY: _____ DATE: _____

REVIEWED BY: _____ DATE: _____

STS/SS

APPROVED BY: _____ DATE: _____

DEPARTMENT HEAD

Read to Performer: I will explain the initial conditions, which steps to simulate or discuss, and provide initiating and subsequent cues. You may use any approved reference materials normally available to you. Make all written reports, oral reports, and log entries as if the evolution was actually being performed. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions: THE PLANT IS MODE 1. THE RWST HI/LO LEVEL ALARM IS IN DUE TO A LOW LEVEL. THE RWST IS NOT IN RECIRCULATION. CHEMISTRY SAMPLED THE RWST AND DETERMINED THAT 2400 PPM MAKEUP SHOULD BE USED.

Initiating Cues: YOU AS THE REACTOR OPERATOR HAVE BEEN DIRECTED BY THE CONTROL ROOM SUPERVISOR TO PERFORM AN ADDITION OF 500 GALLONS OF 2400 PPM WATER TO THE RWST PER OTN-BG-00002.

Notes: INIT 20
Lower RWST Level to the Hi/Lo Alarm
SET ASISRW=_____

Task Standard: UPON COMPLETION OF THIS JPM, MAKEUP TO THE RWST AT 2400 PPM WILL BE INITIATED.

START TIME: _____

STOP TIME: _____

TASK
NUMBER - ELEMENT

CUE**STANDARD****SCORE**

1. OPERATOR SHOULD
OBTAIN A COPY OF
OTN-BG-00002

OPERATOR SHOULD
OBTAIN A COPY OF
OTN-BG-00002

S U
Comments:

2. REVIEW
PRECAUTIONS AND
LIMITATIONS

STEP 2.0

ALL PRECAUTIONS
AND LIMITATIONS
ARE SATISFIED

OPERATOR SHOULD
REVIEW
PRECAUTIONS AND
LIMITATIONS

S U
Comments:

3. REVIEW INITIAL
CONDITIONS

STEP 3.0

ALL INITIAL
CONDITIONS ARE
SATISFIED

ASK IF THE
OPERATOR
UNDERSTANDS THE
INITIAL CONDITIONS
AND INITIATING
CUES

OPERATOR MAY
REVIEW INITIAL
CONDITIONS

S U
Comments:

* CRITICAL STEP

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE
4. TURN THE REACTOR MAKEUP WATER CONTROL SWITCH, BG HS-26, TO STOP (STEP 4.5.1)	BG HS-26 HAS BEEN TURNED TO THE STOP POSITION	OPERATOR SHOULD TURN THE REACTOR MAKEUP WATER CONTROL SWITCH, BG HS-26, TO STOP	S U Comments:
*5. TURN THE MAKEUP MODE SELECTOR SWITCH, BG HS-25, TO MANUAL (STEP 4.5.2)	BG HS-25 IS IN THE MANUAL POSITION	OPERATOR SHOULD TURN THE MAKEUP MODE SELECTOR SWITCH, BG HS-25, TO MANUAL	S U Comments:
6. DETERMINE THE DESIRED BORON VOLUME AND FLOW RATE USING FIGURE 7-2 FROM THE PLANT CURVE BOOK (STEP 4.5.3) NOTE: STEPS 6 THROUGH 13 MAY BE PERFORMED IN ANY ORDER.	CRS DIRECTS THAT 90 GPM IS THE DESIRED FLOWRATE	OPERATOR SHOULD DETERMINE THE DESIRED BORON VOLUME (500 GALLONS TOTAL) AND FLOW RATE.	S U Comments:

* CRITICAL STEP

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE
<p>*7. SET THE BORIC ACID FLOW CONTROLLER BG FK-110, AT THE DESIRED FLOW RATE AND PLACE THE CONTROLLER IN AUTO</p> <p>(STEP 4.5.4)</p> <p>NOTE: STEPS 6 THROUGH 13 MAY BE PERFORMED IN ANY ORDER</p>	<p>BG FK-110 IS SET TO 7.71</p> <p>AUTO P/B IS LIT RED ON BG FK-110</p>	<p>LOCATE BG FK-110 ON RL002. TURN THE POTENTIOMETER UNTIL IT IS SET TO 7.71 (± 0.8)</p> <p>THEN VERIFY THE AUTO P/B IS LIT.</p>	<p>S U</p> <p>Comments:</p>
<p>*8. SET THE REACTOR MAKEUP WATER FLOW CONTROLLER, BG FK-111 AT THE DESIRED FLOW RATE. AND PLACE THE CONTROLLER IN AUTO</p> <p>(STEP 4.5.5)</p> <p>NOTE: STEPS 6 THROUGH 13 MAY BE PERFORMED IN ANY ORDER</p>	<p>BG FK-111 IS SET TO 5.63</p> <p>AUTO P/B IS LIT RED ON BG FK-111</p>	<p>LOCATE BG FK-111 ON RL002. TURN THE POTENTIOMETER UNTIL IT IS SET TO 5.63 (± 0.6)</p> <p>THEN VERIFY THE AUTO P/B IS LIT.</p>	<p>S U</p> <p>Comments:</p>

* CRITICAL STEP

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE
<p>*9. SET THE TOTAL FLOW COUNTER, BG FY-111B, FOR THE NUMBER OF GALLONS REQUIRED</p> <p>(STEP 4.5.6)</p> <p>NOTE: STEPS 6 THROUGH 13 MAY BE PERFORMED IN ANY ORDER</p>	<p>BG FY-111B IS SET TO 500.</p>	<p>LOCATE BG FY-111B ON RL002. OPEN THE WINDOW BY PRESSING THE BLACK BUTTON AND SLIDING THE WINDOW DOWN WHILE THE BUTTON IS PRESSED. SET THE THUMBWHEELS FOR 500±50 GAL. THE REGISTER SHOULD READ 000450 TO 000550.</p>	
<p>10. SET THE BORIC ACID FLOW COUNTER BG FY-110B, SUFFICIENTLY HIGH TO ENSURE BORIC ACID FLOW CONTINUES THROUGHOUT THE MANUAL MAKEUP</p> <p>(STEP 4.5.6.1)</p> <p>NOTE: STEPS 6 THROUGH 13 MAY BE PERFORMED IN ANY ORDER</p>	<p>BG FY-110B IS SET SUFFICIENTLY HIGH</p>	<p>LOCATE BG FY-110B ON RL002. OPEN THE WINDOW BY PRESSING THE BLACK BUTTON AND SLIDING THE WINDOW DOWN WHILE THE BUTTON IS PRESSED. SET THE THUMBWHEELS FOR ANY NUMBER >175G. REGISTER SHOULD READ>001750 THE LAST DIGIT IS TENTHS OF A GALLON.</p>	

* CRITICAL STEP

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE
11. SELECT HARD CLOSE ON BG-HIS-110B VCT OUTLET HDR BGHCV110B HANDSWITCH (STEP 4.5.7) NOTE: STEPS 6 THROUGH 13 MAY BE PERFORMED IN ANY ORDER	BG-HIS-110B GREEN LIGHT IS ILLUMINATED AND RED LIGHTS IS OUT	DEPRESS CLOSE PUSH-BUTTON ON BG-HIS-110B ON RL002.	S U Comments:
12. SELECT HARD CLOSE ON BG-HIS-111B VCT INLET HDR BGHCV111B HANDSWITCH (STEP 4.5.7) NOTE: STEPS 6 THROUGH 13 MAY BE PERFORMED IN ANY ORDER	BG-HIS-111B GREEN LIGHT IS ILLUMINATED AND RED LIGHTS IS OUT	DEPRESS CLOSE PUSH-BUTTON ON BG-HIS-111B ON RL002.	S U Comments:

* CRITICAL STEP

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE
<p>13. PRIOR TO ADDING WATER CONTACT CHEMISTRY TO DETERMINE IF SAMPLING IS REQUIRED.</p> <p>(NOTE PRIOR TO ADDITION TO RWST)</p> <p>NOTE: STEPS 6 THROUGH 13 MAY BE PERFORMED IN ANY ORDER</p>	<p>CHEMISTRY SAYS SAMPLING HAS BEEN COMPLETED.</p>	<p>CALL CHEMISTRY TO DETERMINE IF SAMPLING IS REQUIRED.</p> <p>GIVEN IN INITIAL CONDITIONS</p>	
<p>*14 OPEN BGV0192 AND BGV195.</p> <p>(STEP 4.5.8)</p>	<p>PEO REPORTS THAT BGV0192 AND BGV195 ARE OPEN.</p>	<p>CALL PEO TO LOCALLY OPEN BGV0192 AND BGV195</p>	

* CRITICAL STEP

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE
*15. TURN THE REACTOR COOLANT MAKEUP WATER CONTROL SWITCH, BGHS-26, TO RUN (STEP 4.5.9)	BG HS-26 HAS BEEN PLACED TO RUN. RED LIGHTS ARE LIT ON BG HIS-5A AND BG HIS-6A	OPERATOR SHOULD TURN BG HS-26 TO RUN. VERIFY AT LEAST ONE BA TRANSFER PUMP STARTS BY VERIFYING BG HIS-5A AND/OR BG HIS-6A (LOCATED ON RL001) HAVE A RED LIGHT LIT.	S U Comments:
16.	THE JPM IS COMPLETE <u>RECORD STOP TIME</u> <u>ON PAGE 1</u>		

* CRITICAL STEP

#1

NAME: _____

JPM NO: URO-SBG04PDC199J

QUESTION:

REFERENCE USE

Power is normally isolated to EJHV8809A, RHR to Cold Legs L1 and L2, by isolation handswitch EJHIS8809AA.

What indications, if any, would Control Room receive if breaker NG01BCR1, Feeder to EJHV8809A, was opened.

ANSWER:

ESFAS System Monitor Alarm, SA066X.

(Since ESFAS monitoring is upstream of isolation handswitch contacts.)

KA RATING: 006000K204

REFERENCE: E23EJ09A
OOA-SA-066X

COMMENTS / ANSWER GIVEN :

SCORE: SAT UNSAT

#2

NAME: _____

JPM NO: URO-SBG04PDC199J

QUESTION:

REFERENCE USE

The plant has been operating at steady state 100% power for the past 2 weeks with all systems in automatic. A small charging line leak is suspected inside containment. An operator notes that exactly 3 hours have elapsed between the last 2 initiations of automatic reactor makeup (one makeup occurred).

Assuming pressurizer level has remained constant and no other leakage exists, what is the approximate charging line leak rate?

ANSWER:

 2.3 ± 0.3 gpm

$$\left(\frac{2.73 \text{ ft}^3}{\%} \right) (50\% - 30\%) \left(\frac{7.48 \text{ gal}}{\text{ft}^3} \right) = (408 \text{ gal})$$

$$\left(\frac{408 \text{ gal}}{3 \text{ hr}} \right) \left(\frac{\text{hr}}{60 \text{ min}} \right) = (2.27 \text{ gpm})$$

KA RATING: 000022A108

REFERENCE: OSP-BB-00009

COMMENTS / ANSWER GIVEN :

SCORE: SAT UNSAT

#1

NAME: _____

QUESTION:

REFERENCE USE

Power is normally isolated to EJHV8809A, RHR to Cold Legs L1 and L2, by isolation handswitch EJHIS8809AA.

What indications, if any, would Control Room receive if breaker NG01BCR1, Feeder to EJHV8809A, was opened.

#2

NAME: _____

QUESTION:

REFERENCE USE

The plant has been operating at steady state 100% power for the past 2 weeks with all systems in automatic. A small charging line leak is suspected inside containment. An operator notes that exactly 3 hours have elapsed between the last 2 initiations of automatic reactor makeup (one makeup occurred).

Assuming pressurizer level has remained constant and no other leakage exists, what is the approximate charging line leak rate?

Read to Performer: I will explain the initial conditions, which steps to simulate or discuss, and provide initiating and subsequent cues. You may use any approved reference materials normally available to you. Make all written reports, oral reports, and log entries as if the evolution was actually being performed. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions: THE PLANT IS MODE 1. THE RWST HI/LO LEVEL ALARM IS IN DUE TO A LOW LEVEL. THE RWST IS NOT IN RECIRCULATION. CHEMISTRY SAMPLED THE RWST AND DETERMINED THAT 2400 PPM MAKEUP SHOULD BE USED.

Initiating Cues: YOU AS THE REACTOR OPERATOR HAVE BEEN DIRECTED BY THE CONTROL ROOM SUPERVISOR TO PERFORM AN ADDITION OF 500 GALLONS OF 2400 PPM WATER TO THE RWST PER OTN-BG-00002.

CALLAWAY PLANT

JOB PERFORMANCE MEASURE

JPM NO: URO-SSP04PBC87J(F) KSA NO: 045073A4.02
U.E. RATING: REQ KSA RATING: 3.7/3.7
JOB TITLE: URO/SRO REVISION: 970121
DUTY: PROCESS RAD MONITORING
TASK TITLE: RESPOND TO PROCESS RAD MONITOR ALARM
COMPLETION TIME: 11 MINUTES

The performance of this task was evaluated against the standards contained in this JPM and determined to be:

☐ SATISFACTORY ☐ UNSATISFACTORY

Reason, if UNSATISFACTORY:

EVALUATORS SIGNATURE: _____ DATE: _____

TASK PERFORMER: _____

LOCATION OF PERFORMANCE:

CONTROL ROOM _____ SIMULATOR/LAB X PLANT _____ CLASSROOM _____

METHOD OF PERFORMANCE: SIMULATED _____ PERFORMED X _____

REFERENCES: OTA-SP-RM011, RADIATION MONITOR CONTROL PANEL RM-11, REV 13

TOOLS/EQUIPMENT: NONE

PREPARED BY: _____ DATE: _____

REVIEWED BY: _____ DATE: _____

STS/SS

APPROVED BY: _____ DATE: _____

DEPARTMENT HEAD

Read to Performer: I will explain the initial conditions, which steps to simulate or discuss, and provide initiating and subsequent cues. You may use any approved reference materials normally available to you. Make all written reports, oral reports, and log entries as if the evolution was actually being performed. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions: CALLAWAY PLANT IS MODE 1. CONDENSER AIR DISCHARGE MONITOR CHANNEL GE-RE-92 (925) HAS ALARMED RED.

Initiating Cues: THE OPERATING SUPERVISOR DIRECTS YOU TO RESPOND TO RADIATION MONITOR ALARM 925 USING OTA-SP-RM011, TAKE ALL IMMEDIATE AND SUBSEQUENT ACTIONS, AND INFORM HIM WHEN DONE.

ASK IF THE OPERATOR UNDERSTANDS THE INITIATING CUES.

Notes: USE ANY MODE 1 IC
PREVENT BM-HIS-4 FROM CLOSING BY
SET ZMLAUX11=VALVNC41(4)
MALF AUX11=0
ACTIVATE

INCREASE 'C' S/G ACTIVITY
SET ZMLAUX12=RRMSSGN(3)
MALF AUX12=3.9E-3
RAMP=30
ACTIVATE

CREATE UPWARD TREND ON 256 BY,
MALF RMS3=256
SET = 1E-5
RAMP = 600
ACTIVATE

ALLOW BMHIS4 TO CLOSE WHEN PUSHBUTTON IS DEPRESSED BY
SET ZMLAUX13=JMLAUX11
MALF AUX13=0
COND=X24I122C
ACTIVATE

Task Standard: UPON COMPLETION OF THIS JPM, THE OPERATOR WILL HAVE CLOSED OR VERIFIED CLOSED ALL BLOWDOWN VALVES AND DETERMINED THE CAUSE OF THE RAD MONITOR ALARM TO BE A S/G TUBE LEAK. NON-LICENSED STA WILL IDENTIFY VALVE OUT OF POSITION.

START TIME: _____
STOP TIME: _____

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE
1. OBTAIN A CONTROLLED COPY OF OTA-SP-RM011, RADIATION MONITOR CONTROL PANEL, RM-11		OPERATOR SHOULD OBTAIN PROCEDURE COPY	S U Comments:
2. LOCATE CORRECT SECTION OF OTA-SP-RM011		OPERATOR SHOULD DETERMINE PROPER SECTION TO BE PAGE 18 OF 39, OF ATTACHMENT 1	S U Comments:
3. VERIFY CLOSED BM-HV-1, SG A B/D CTMT ISO VLV NOTE STEPS 3 THRU 7 MAY BE PERFORMED IN ANY ORDER STEP 1.1	BM-HIS-1A GREEN LIGHT IS ILLUMINATED AND RED LIGHT IS OUT	OPERATOR SHOULD VERIFY BM-HV-1, SG A B/D CTMT ISO VLV, IS CLOSED	S U Comments:

* CRITICAL STEP

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE S U
4. VERIFY CLOSED BM-HV-2, SG B B/D CTMT ISO VLV NOTE STEPS 3 THRU 7 MAY BE PERFORMED IN ANY ORDER STEP 1.1	BM-HIS-2A GREEN LIGHT IS ILLUMINATED AND RED LIGHT IS OUT	OPERATOR SHOULD VERIFY BM-HV-2, SG B B/D CTMT ISO VLV IS CLOSED	Comments:
5. VERIFY CLOSED BM-HV-3, SG C B/D CTMT ISO VLV NOTE : STEPS 3 THRU 7 MAY BE PERFORMED IN ANY ORDER STEP 1.1	BM-HIS-3A GREEN LIGHT IS ILLUMINATED AND RED LIGHT IS OUT	OPERATOR SHOULD VERIFY BM-HV-3, SG C B/D CTMT ISO VLV IS CLOSED	Comments:
6. VERIFY CLOSED BM-HV-4 SG D B/D CTMT ISO VLV, NOTE : STEPS 3 THRU 7 MAY BE PERFORMED IN ANY ORDER STEP 1.1	BM-HIS-4A RED LIGHT IS ILLUMINATED AND GREEN LIGHT IS OUT (VLV IS STILL OPEN)	OPERATOR SHOULD VERIFY BM-HV-4 POSITION	Comments:

* CRITICAL STEP

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE
<p>7* CLOSE BM-HV-4, SG D B/D CTMT ISO VLV, WITH HANDSWITCH BM-HIS-4A</p> <p>NOTE : STEPS 3 THRU 7 MAY BE PERFORMED IN ANY ORDER</p> <p>STEP 1.1</p>	<p>BM-HIS-4A GREEN LIGHT ILLUMINATES AND RED LIGHT GOES OUT</p>	<p>OPERATOR SHOULD CLOSE BM-HV-4, SG D B/D CTMT ISO VLV</p>	<p>S U</p> <p>Comments:</p>
<p>8. VERIFY CLOSED BM-HV-5, SG A OUTER CTMT SAMPLE ISO VLV</p> <p>NOTE STEPS 8 THRU 11 MAY BE PERFORMED IN ANY ORDER</p> <p>STEP 1.1</p>	<p>HOT LAB VERIFY BM-HV-5 IS CLOSED</p>	<p>OPERATOR SHOULD VERIFY BM-HV-5, SG A OUTER CTMT SAMPLE ISO VLV IS CLOSE</p> <p>CONTACT HOT LAB</p>	<p>S U</p> <p>Comments:</p>
<p>9. VERIFY CLOSED BM-HV-6, SG B OUTER CTMT SAMPLE ISO VLV</p> <p>NOTE : STEPS 8 THRU 11 MAY BE PERFORMED IN ANY ORDER.</p> <p>STEP 1.1</p>	<p>HOT LAB VERIFIES BM-HV-6 IS CLOSED</p>	<p>OPERATOR SHOULD VERIFY BM-HV-6, SG B OUTER CTMT SAMPLE ISO VLV IS CLOSED</p> <p>CONTACT HOT LAB</p>	<p>S U</p> <p>Comments:</p>

* CRITICAL STEP

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE
10. VERIFY CLOSED BM-HV-7, SG C OUTER CTMT SAMPLE ISO VLV NOTE : STEPS 8 THRU 11 MAY BE PERFORMED IN ANY ORDER STEP 1.1	HOT LAB VERIFIES BM-HV-7 IS CLOSED	OPERATOR SHOULD VERIFY BM-HV-7, SG C OUTER CTMT SAMPLE ISO VLV IS CLOSED CONTACT HOT LAB	S U Comments:
11. VERIFY CLOSED BM-HV-8, SG D OUTER CTMT SAMPLE ISO VLV STEP 1.1	HOT LAB VERIFIES BM-HV-8 IS CLOSED	OPERATOR SHOULD VERIFY BM-HV-8, SG D OUTER CTMT SAMPLE ISO VLV IS CLOSED CONTACT HOT LAB	S U Comments:
12. REQUEST CHEMISTRY SAMPLE S/G's TO VALIDATE ALARM STEP 2.1	CHEMISTRY ACKNOWLEDGES AND WILL SAMPLE ALL S/G's	OPERATOR SHOULD CONTACT HOT LAB	S U Comments:

* CRITICAL STEP

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE S U
16. COMPARE RADIATION LEVEL WITH SJ-RE-02 (SG SAMPLE RAD MON) TO CHECK FOR INCREASES ALSO STEP 2.2	CHANNEL 026 IS TRENDING UPWARDS	OPERATOR SHOULD VERIFY MONITOR SJ-RE-02 (SG SAMPLE RAD MON) FOR RADIATION LEVEL CHANGES	Comments:
17. COMPARE RADIATION LEVEL WITH N-16 MONITORS STEP 2.2	N-16 MONITOR FOR 'C' S/G ,ABRE0016C, IS TRENDING UPWARDS ALL OTHER N-16 MONITORS DISPLAY GREEN AND INDICATE 0 GPM LEAKRATE.	OPERATOR SHOULD MONITOR N-16 MONITORS FOR RADIATION LEVEL CHANGES	Comments:
18. SET UP A TIME TREND ON PLANT COMPUTER FOR THE ALARMING N16 MONITORS STEP 2.2.1	N-16 MONITORS, 16C HAS BEEN TREND ON THE PLANT COMPUTER	OPERATOR SHOULD SETUP A TIME TREND ON PLANT COMPUTER FOR N-16 MONITOR ABRE0016C ENTER TA ENTER ABR0016C	Comments:

* CRITICAL STEP

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE S U
19. MONITOR LEAKAGE RATES USING PLANT COMPUTER AND/OR RM11 FOR POINTS GER0092, SJR002, AND ABR0016C. STEP 2.2.1	CHANNEL 925 IS RED AND INDICATES 1E0 μ ci/ml AND IS TRENDING UPWARDS CHANNEL 026 IS RED AND INDICATES 1E-1 μ ci/ml AND IS TRENDING UPWARDS N-16 MONITOR FOR 'C' S/G ,ABRE0016C, IS TRENDING UPWARDS	OPERATOR SHOULD MONITOR TRENDS ON THE PLANT COMPUTER AND OR RM11 FOR POINTS GER0092 , SJR002 AND ABR0016C.	Comments:
20* ADVISE THE CONTROL ROOM SUPERVISOR TO REFER TO PROCEDURE OTO-BB-00001 STEP 2.3	CONTROL ROOM SUPERVISOR ACKNOWLEDGES	OPERATOR SHOULD INFORM THE CONTROL ROOM SUPERVISOR TO REFER TO OTO-BB-00001, S/G TUBE LEAK PROCEDURE	Comments:
21.	THE JPM IS COMPLETE <u>RECORD STOP TIME</u> <u>ON PAGE 1</u>		Comments:

* CRITICAL STEP

#1

NAME: _____

JPM NO: URO-SSP04PBC87J(F)

QUESTION:

REFERENCE USE

Breaker PG17LBF312 is reported OPEN and will not CLOSE.

- A) What indications would be available in the Control Room of this breaker being open?
- B) How does it effect plant operation?

ANSWER:

A) HBRE0018, DISCH RAD MONITOR INOPERABLE
(Annunciator 61C - Process Mon Failure)
(RM11 Indications)

B) Must comply with FSAR Chapter 16 to discharge DMT's.

KA RATING: 073000A402

REFERENCE: E22SP02

COMMENTS / ANSWER GIVEN :

SCORE: SAT UNSAT

#2

NAME: _____

JPM NO: URO-SSP04PBC87J(F)

QUESTION:

MEMORY

At 100% power, with all systems lined up for normal operations, what process radiation monitors could indicate activity increases on a 10 gpm tube leak on the 'A' steam generator?

ANSWER:

(Any 4 of the 5 for full credit)

GTRE92 - Condenser Air Discharge
BMRE25 - SG Blowdown
BMRE52 - SG Blowdown Discharge
SJRE02 - SG Blowdown Sample
ABR0016A - SG 'A' N-16 Monitor

KA RATING: 073000K401

REFERENCE: OTO-BB-00001

COMMENTS / ANSWER GIVEN :

SCORE: SAT UNSAT

#1

NAME: _____

QUESTION:

REFERENCE USE

Breaker PG17LBF312 is reported OPEN and will not CLOSE.

- A) What indications would be available in the Control Room of this breaker being open?
- B) How does it effect plant operation?

#2

NAME: _____

QUESTION:

MEMORY

At 100% power, with all systems lined up for normal operations, what process radiation monitors could indicate activity increases on a 10 gpm tube leak on the 'A' steam generator?

Read to Performer: I will explain the initial conditions, which steps to simulate or discuss, and provide initiating and subsequent cues. You may use any approved reference materials normally available to you. Make all written reports, oral reports, and log entries as if the evolution was actually being performed. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions: CALLAWAY PLANT IS MODE 1. CONDENSER AIR DISCHARGE MONITOR CHANNEL GE-RE-92 (CHANNEL 925) HAS ALARMED RED.

Initiating Cues: THE OPERATING SUPERVISOR DIRECTS YOU TO RESPOND TO RADIATION MONITOR ALARM 925 USING OTA-SP-RM011, TAKE ALL IMMEDIATE AND SUBSEQUENT ACTIONS, AND INFORM HIM WHEN DONE.

CALLAWAY PLANT

JOB PERFORMANCE MEASURE

JPM NO: URO-SSE03PAC85J KSA NO: 038015A2.01
U.E. RATING: REQ KSA RATING: 3.5/3.9
JOB TITLE: URO/SRO REVISION: 970121
DUTY: NUCLEAR INSTRUMENTATION
TASK TITLE: RESPOND TO A SOURCE RANGE INSTRUMENT FAILURE
COMPLETION TIME: 7 MINUTES

The performance of this task was evaluated against the standards contained in this JPM and determined to be:

☐ SATISFACTORY ☐ UNSATISFACTORY

Reason, if UNSATISFACTORY:

EVALUATORS SIGNATURE: _____ DATE: _____

TASK PERFORMER: _____

LOCATION OF PERFORMANCE:

CONTROL ROOM _____ SIMULATOR/LAB X PLANT _____ CLASSROOM _____

METHOD OF PERFORMANCE: SIMULATED _____ PERFORMED X _____

REFERENCES: OTO-SE-00001, SOURCE RANGE NUCLEAR CHANNEL FAILURE, REV 6.
SOSs 86-107 AND 92-0105.

TOOLS/EQUIPMENT: NONE

PREPARED BY: _____ DATE: _____

REVIEWED BY: _____ DATE: _____
STS/SS

APPROVED BY: _____ DATE: _____
DEPARTMENT HEAD

Read to Performer: I will explain the initial conditions, which steps to simulate or discuss, and provide initiating and subsequent cues. You may use any approved reference materials normally available to you. Make all written reports, oral reports, and log entries as if the evolution was actually being performed. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions: CALLAWAY PLANT IS MODE 4, PREPARING FOR A COOLDOWN TO MODE 5. SOURCE RANGE CHANNEL N31 FAILED HIGH. CONTROL ROOM PERSONNEL HAVE ENTERED OFF NORMAL PROCEDURE OTO-SE-00001, SOURCE RANGE NUCLEAR CHANNEL FAILURE. ALL IMMEDIATE OPERATOR ACTIONS HAVE BEEN TAKEN. THERE IS NO ONE CURRENTLY IN CONTAINMENT.

Initiating Cues: THE CONTROL ROOM SUPERVISOR HAS DIRECTED YOU TO PERFORM STEPS 6.2 THRU 6.7 OF OTO-SE-00001, AND INFORM HIM WHEN DONE. THE SHIFT SUPERVISOR AND ISEG ENG ARE CURRENTLY REVIEWING TECHNICAL SPECIFICATIONS TABLE 3.3-1 AND 3.9.2 AND WILL BRIEF THE CREW. I & C TECHS ARE READY TO PLACE THE FLUX DOUBLING NORMAL/TEST SWITCH IN THE 'TEST' POSITION WHEN REQUIRED.

ASK IF THE OPERATOR UNDERSTANDS THE INITIATING CUES.

Notes: USE IC-5. USE MALF NIS1 SELECT CHANNEL 31, FAIL TO 1E4 CPS, RAMP 5 SECONDS, 0 TIME DELAY.

Task Standard: UPON COMPLETION OF THIS JPM, THE OPERATOR WILL HAVE SWAPPED CHARGING PUMP SUCTION TO NORMAL SOURCE, TRIPPED SOURCE RANGE CHANNEL N31 AS REQUIRED BY OTO-SE-00001.

START TIME: _____

STOP TIME: _____

TASK
NUMBER - ELEMENT

CUE**STANDARD****SCORE**

1. OBTAIN A CONTROLLED COPY OF OTO-SE-00001, SOURCE RANGE NUCLEAR CHANNEL FAILURE		OPERATOR SHOULD OBTAIN PROCEDURE COPY	S U Comments:
2. IF A SOURCE RANGE HIGH FLUX LEVEL AT SHUTDOWN ALARM SOUNDS WHILE THE REACTOR IS SHUTDOWN EVACUATE CONTAINMENT STEP 6.2	THERE IS NO ONE CURRENTLY IN CONTAINMENT	THE OPERATOR MAY ENSURE THAT NO ONE IS CURRENTLY IN CONTAINMENT NOTE :ALSO GIVEN IN INITIAL CONDITIONS	S U Comments:
3. IF THE ALARM IS CONFIRMED TO BE ERRONEOUS, ACCESS TO CONTAINMENT MAY BE REESTABLISHED STEP 6.2.1	THE ARE NO PLANS CURRENTLY TO SEND ANYONE INTO CONTAINMENT	OPERATOR MAY ALLOW PERSONNEL TO ENTER CONTAINMENT	S U Comments:

* CRITICAL STEP

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE
4. IF THE SOURCE RANGE FAILS AFTER INTERMEDIATE RANGE CHANNEL RELIABILITY HAS BEEN CONFIRMED AND THE SOURCE RANGE BLOCK, CONTINUED NORMAL OPERATION IS PERMITTED STEP 6.3	THE REACTOR IS SUBCRITICAL BELOW THE INTERMEDIATE RANGE INSTRUMENT INDICATION	OPERATOR MAY ENSURE THE REACTOR IS SUBCRITICAL BELOW THE INTERMEDIATE RANGE INSTRUMENT INDICATION RANGE	S U Comments:
5. BYPASS THE HIGH FLUX REACTOR TRIP BY PLACING THE "LEVEL TRIP" SWITCH IN THE BYPASS POSITION STEP 6.4	THE HIGH FLUX REACTOR TRIP "LEVEL TRIP" SWITCH HAS BEEN PLACED IN THE BYPASS POSITION	OPERATOR SHOULD PLACE THE HIGH FLUX REACTOR TRIP "LEVEL TRIP" IN THE BYPASS POSITION	S U Comments:
6. BYPASS THE "HIGH FLUX AT SHUTDOWN" ALARM BY PLACING THE HIGH FLUX AT SHUTDOWN SWITCH IN THE BLOCK POSITION STEP 6.5	THE HIGH FLUX AT SHUTDOWN ALARM SWITCH HAS BEEN PLACED IN THE BLOCK POSITION	THE OPERATOR SHOULD BYPASS THE HIGH FLUX AT SHUTDOWN ALARM BY PLACING THE HIGH FLUX AT SHUTDOWN SWITCH IN THE BLOCK POSITION	S U Comments:

* CRITICAL STEP

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE
<p>7.* AT DRAWER N31 HAVE I & C PLACE THE FLUX DOUBLING NORMAL/TEST SWITCH TO THE TEST POSITION</p> <p>STEP 6.6.1</p>	<p>I & C HAS PLACED THE FLUX DOUBLING NORMAL/TEST SWITCH IN THE TEST POSITION</p>	<p>THE OPERATOR SHOULD HAVE I & C PLACE THE FLUX DOUBLING NORMAL/TEST SWITCH IN THE TEST POSITION</p> <p>NOTE : USE LOA SES7=TRUE</p>	<p>S U</p> <p>Comments:</p>
<p>8.* PRESS THE BLOCK PUSHBUTTON ON SE-HS-11</p> <p>NOTE : STEPS 8 AND 9 MAY BE PERFORMED IN ANY ORDER</p> <p>STEP 6.6.2</p>	<p>THE SE-HS-11 BLOCK PUSHBUTTON HAS BEEN DEPRESSED</p>	<p>THE OPERATOR SHOULD DEPRESS THE BLOCK PUSHBUTTON ON SE-HS-11</p>	<p>S U</p> <p>Comments:</p>
<p>9.* PRESS THE BLOCK PUSHBUTTON ON SE-HS-12</p> <p>NOTE : STEPS 8 AND 9 MAY BE PERFORMED IN ANY ORDER</p> <p>STEP 6.6.2</p>	<p>THE SE-HS-12 BLOCK PUSHBUTTON HAS BEEN DEPRESSED</p>	<p>THE OPERATOR SHOULD DEPRESS THE BLOCK PUSHBUTTON ON SE-HS-12</p>	<p>S U</p> <p>Comments:</p>

* CRITICAL STEP

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE
<p>10.* PRESS THE RESET PUSHBUTTON ON SE-HS-11</p> <p>STEP 6.6.3</p> <p>NOTE: STEPS 10 AND 11 MAY BE PERFORMED IN ANY ORDER.</p>	<p>THE SE-HS-11 RESET PUSHBUTTON HAS BEEN DEPRESSED</p>	<p>THE OPERATOR SHOULD DEPRESS THE RESET PUSHBUTTON ON SE-HS-11</p>	<p>S U</p> <p>Comments:</p>
<p>11.* PRESS THE RESET PUSHBUTTON ON SE-HS-12</p> <p>STEP 6.6.3</p> <p>NOTE: STEPS 10 AND 11 MAY BE PERFORMED IN ANY ORDER</p>	<p>THE SE-HS-12 RESET PUSHBUTTON HAS BEEN DEPRESSED</p>	<p>THE OPERATOR SHOULD DEPRESS THE RESET PUSHBUTTON ON SE-HS-12</p>	<p>S U</p> <p>Comments:</p>
<p>12. VERIFY THE SR FLUX DBL BLOC BISTABLE LIGHT ON SB069 IS OUT</p> <p>STEP 6.6.4</p>	<p>THE SR FLUX DBL BLOC BISTABLE LIGHT ON SB069 IS NOT LIT</p>	<p>THE OPERATOR SHOULD VERIFY THAT THE SR FLUX DBL BLOC BISTABLE LIGHT ON SB069 IS NOT LIT</p>	<p>S U</p> <p>Comments:</p>

* CRITICAL STEP

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE
13.* PRESS THE OPEN PUSHBUTTON ON BN-HIS-112C, VCT OUTLET VLV NOTE : STEPS 13 AND 14 MAY BE PERFORMED IN ANY ORDER STEP 6.6.5	THE RED LIGHT FOR BN-HIS-112C ILLUMINATES AND THE GREEN LIGHT GOES OUT	OPERATOR SHOULD OPEN THE VCT TO CCP SUCTION VALVE BN-HV-112C NOTE : IT IS CRITICAL THAT IF SUCTIONS ARE SWAPPED THE VCT OUTLETS ARE OPENED PRIOR TO CLOSING THE RWST VLVS TO CCP	S U Comments:
14.* PRESS THE OPEN PUSHBUTTON ON BN-HIS-112B, VCT OUTLET VLV NOTE STEPS 13 AND 14 MAY BE PERFORMED IN ANY ORDER STEP 6.6.5	THE RED LIGHT FOR BN-HIS-112B ILLUMINATES AND THE GREEN LIGHT GOES OUT	OPERATOR SHOULD OPEN THE VCT TO CCP SUCTION VALVE BN-HV-112C NOTE : IT IS CRITICAL THAT IF SUCTIONS ARE SWAPPED THE VCT OUTLETS ARE OPENED PRIOR TO CLOSING THE RWST VLV TO CCP	S U Comments:
15.* PRESS THE CLOSE PUSHBUTTON ON BN-HIS-112E, CCP A SUCTION FROM RWST NOTE : STEPS 15 AND 16 MAY BE PERFORMED IN ANY ORDER STEP 6.6.6	THE GREEN LIGHT FOR BN-HIS-112E ILLUMINATES AND RED LIGHT GOES OUT	OPERATOR SHOULD CLOSE THE CCP A SUCTION FROM RWST, BN-HV-112E	S U Comments:

* CRITICAL STEP

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE
16.* PRESS THE CLOSE PUSHBUTTON ON BN-HIS-112B, CCP B SUCT FROM RWST NOTE : STEPS 15 AND 16 MAY BE PERFORMED IN ANY ORDER STEP 6.6.6	THE GREEN LIGHT FOR BN-HIS-112B ILLUMINATES AND RED LIGHT GOES OUT	OPERATOR SHOULD CLOSE BN-HV-11B, CCP B SUCT FROM RWST	S U Comments:
17. IF NECESSARY, SELECT THE OPPOSITE SOURCE RANGE CHANNEL FOR AUDIBLE INDICATION AT THE NIS CABINET STEP 6.7	WHEN SELECTED AT THE NIS CABINET THE AUDIBLE COUNTS START	OPERATOR SHOULD SELECT N32 AT THE NIS CABINET FOR AUDIBLE INDICATION	S U Comments:
18.	THE JPM IS COMPLETE <u>RECORD STOP TIME</u> <u>ON PAGE 1</u>		S U Comments:

* CRITICAL STEP

#1

NAME: _____

JPM NO: URO-SSE03PAC85J

QUESTION:

REFERENCE USE

A Reactor Startup is in progress. What Source Range Nuclear Instrument Level (CPS) would you expect when the Intermediate Range Instruments start indicating an increasing power level (greater than 10^{-11} AMPS)?

ANSWER:

10^3 to 10^4 CPS

KA RATING: 015000K501 (2.9/3.2)

REFERENCE: OTG-ZZ-00002
STEP 4.1.17.1

COMMENTS / ANSWER GIVEN :

SCORE: SAT UNSAT

#2

NAME: _____

JPM NO: URO-SSE03PAC85J

QUESTION:

REFERENCE USE

Callaway Plant is at End of Life. Both Source Range Nuclear Instruments indicated 20 CPS prior to withdrawing Control Banks for a Reactor Startup. Source Range Nuclear Instruments indicate 40 CPS when Control Bank 'B' is at 180 steps.

Estimate the critical rod height.

ANSWER:

75 Steps on Control Bank 'D' (± 10 Steps)

KA RATING: 015000K506 (3.4/3.7)

REFERENCE: OTG-ZZ-00002
STEP 4.1.13
CURVE BOOK FIGURE 1-9, REV. 11

COMMENTS / ANSWER GIVEN :

SCORE: SAT UNSAT

#1

NAME: _____

QUESTION:

REFERENCE USE

A Reactor Startup is in progress. What Source Range Nuclear Instrument Level (CPS) would you expect when the Intermediate Range Instruments start indicating an increasing power level (greater than 10^{-11} AMPS)?

#2

NAME: _____

QUESTION:

REFERENCE USE

Callaway Plant is at End of Life. Both Source Range Nuclear Instruments indicated 20 CPS prior to withdrawing Control Banks for a Reactor Startup. Source Range Nuclear Instruments indicate 40 CPS when Control Bank 'B' is at 180 steps.

Estimate the critical rod height.

Read to Performer: I will explain the initial conditions, which steps to simulate or discuss, and provide initiating and subsequent cues. You may use any approved reference materials normally available to you. Make all written reports, oral reports, and log entries as if the evolution was actually being performed. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions: CALLAWAY PLANT IS MODE 4, PREPARING FOR A COOLDOWN TO MODE 5. SOURCE RANGE CHANNEL N31 FAILED HIGH. CONTROL ROOM PERSONNEL HAVE ENTERED OFF NORMAL PROCEDURE OTO-SE-00001, SOURCE RANGE NUCLEAR CHANNEL FAILURE. ALL IMMEDIATE OPERATOR ACTIONS HAVE BEEN TAKEN. THERE IS NO ONE CURRENTLY IN CONTAINMENT.

Initiating Cues: THE CONTROL ROOM SUPERVISOR HAS DIRECTED YOU TO PERFORM STEPS 6.2 THRU 6.7 OF OTO-SE-00001, AND INFORM HIM WHEN DONE. THE SHIFT SUPERVISOR AND ISEG ENG ARE CURRENTLY REVIEWING TECHNICAL SPECIFICATIONS TABLE 3.3-1 AND 3.9.2 AND WILL BRIEF THE CREW. I & C TECHS ARE READY TO PLACE THE FLUX DOUBLING NORMAL/TEST SWITCH IN THE 'TEST' POSITION WHEN REQUIRED.

CALLAWAY PLANT

JOB PERFORMANCE MEASURE

JPM NO: URO-SNE01PCC09J KSA NO: 045064A4.01
U.E. RATING: REQ KSA RATING: 4.0/4.3
JOB TITLE: URO/SRO REVISION: 960418
DUTY: SAFETY RELATED ELECTRICAL GENERATION
TASK TITLE: PARALLEL A DIESEL GENERATOR TO AN ENERGIZED BUS
COMPLETION TIME: 15 MINUTES

The performance of this task was evaluated against the standards contained in this JPM and determined to be:

☐ SATISFACTORY ☐ UNSATISFACTORY

Reason, if UNSATISFACTORY:

EVALUATORS SIGNATURE: _____ DATE: _____

TASK PERFORMER: _____

LOCATION OF PERFORMANCE:

CONTROL ROOM _____ SIMULATOR/LAB ☒ PLANT _____ CLASSROOM _____

METHOD OF PERFORMANCE: SIMULATED _____ PERFORMED ☒

REFERENCES: OTN-NE-0001A, STANDBY DIESEL GENERATION SYSTEM - TRAIN 'A',
REVISION 1

TOOLS/EQUIPMENT: NONE

PREPARED BY: _____ DATE: _____

REVIEWED BY: _____ DATE: _____
STS/SS

APPROVED BY: _____ DATE: _____
DEPARTMENT HEAD

Read to Performer: I will explain the initial conditions, which steps to simulate or discuss, and provide initiating and subsequent cues. You may use any approved reference materials normally available to you. Make all written reports, oral reports, and log entries as if the evolution was actually being performed. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions: THE PLANT IS OPERATING IN MODE 1. THE 'A' EMERGENCY DIESEL GENERATOR HAS BEEN STARTED PER OTN-NE-0001A, SECTION 4.3. NB01 IS ENERGIZED FROM ITS NORMAL OFF-SITE POWER SOURCE.

Initiating Cues: YOU HAVE BEEN DIRECTED TO PARALLEL THE 'A' DIESEL GENERATOR TO NB01 AND LOAD TO AT LEAST 2 MW PER OTN-NE-0001A, SECTION 4.4.

Notes: ENSURE 'A' EMERGENCY DIESEL GENERATOR IS RUNNING UNLOADED IF PERFORMING ON THE SIMULATOR.

Task Standard: UPON COMPLETION OF THIS JPM, NE01 IS SYNC TO NB01 WITH ≥ 2 MWE LOAD.

START TIME: _____

STOP TIME: _____

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE
1. OBTAIN A COPY OF OTN-NE-0001A, STANDBY DIESEL GENERATION SYSTEM - TRAIN A		OPERATOR SHOULD OBTAIN PROCEDURE COPY	S U Comments:
2. REVIEW THE PRECAUTIONS AND LIMITATIONS OF OTN-NE-0001A	ALL PRECAUTIONS AND LIMITATIONS ARE SATISFIED	OPERATOR SHOULD READ THE PRECAUTIONS AND LIMITATIONS	S U Comments:
3. REVIEW THE INITIAL CONDITIONS OF OTN-NE-0001A	ALL INITIAL CONDITIONS ARE SATISFIED ASK IF THE OPERATOR UNDERSTANDS THE INITIAL CONDITIONS AND INITIATING CUES	OPERATOR SHOULD READ THE INITIAL CONDITIONS	S U Comments:

* CRITICAL STEP

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE S U
4. VERIFY THE MASTER TRANSFER SWITCH, KJ-HS-9, IS IN "AUTO" STEP 4.4.1	THE MASTER TRANSFER SWITCH IS IN "AUTO"	OPERATOR SHOULD SIMULATE CALLING THE DIESEL OPERATOR AND REQUEST THE POSITION OF KJ-HS-9, MASTER TRANSFER SWITCH, ON KJ107 / VERIFY LACK OF ANNUNCIATOR 20E, NE01 OOS	S U Comments:
5. ENSURE THE DIESEL GENERATOR HAS BEEN STARTED IN ACCORDANCE WITH SECTION 4.3 OR 5.3 OF THIS PROCEDURE STEP 4.4.2	THE DIESEL GENERATOR HAS BEEN STARTED PER SECTION 4.3 OF THIS PROCEDURE	OPERATOR SHOULD ENSURE THAT THE DIESEL GENERATOR IS RUNNING	S U Comments:
6* PLACE NE-HS-5, UNIT PARALLEL SWITCH, TO THE PARALLEL POSITION STEP 4.4.3	SWITCH NE-HS-5 HAS BEEN PLACED IN PARALLEL POSITION	OPERATOR SELECTS PARALLEL WITH NE-HS-5 ON RL015, THEN SPRING RETURN TO "OFF" POSITION	S U Comments:

* CRITICAL STEP

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE S U
7. VERIFY THE WHITE PARALLEL OPERATION LIGHT ON NE107 IS LIT STEP 4.4.3	THE WHITE PARALLEL LIGHT ON NE107 IS LIT	OPERATOR SHOULD CONTACT EO TO VERIFY THE WHITE PARALLEL LIGHT IS LIT ON NE107	Comments:
8* PLACE NE-HS-27, EMERG SPLY SYNC TRANSFER SWITCH, IN THE "ON" POSITION STEP 4.4.4	NE-HS-27 IS IN THE "ON" POSITION	OPERATOR SELECTS "ON" WITH NE-HS-27, NB01 EMERG SPLY SYNC TRANSFER, ON RL015	Comments:
9* PLACE NB-HS-10, 4.16 KV BUS NB01 SYNC SCOPE SEL SWITCH, IN THE DG FEED BREAKER POSITION STEP 4.4.5	NB-HS-10 IS SELECTED TO DG FEEDER BKR POSITION THE SYNC SCOPE IS ROTATING IN FAST DIRECTION; SYNC LIGHTS NB-ZL-9 ARE FLASHING	OPERATOR SELECTS D-G FDR BKR WITH NB-HS-10, 4.16 KV BUS NB01 SYNC SCOPE SEL, ON RL015	Comments:

* CRITICAL STEP

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE S U
10. ADJUST THE DIESEL GENERATOR SPEED USING GOVERNOR CONTROL KJ-HS-7A UNTIL SYNCHROSCOPE NB-EI-3 IS ROTATING IN THE FAST DIRECTION STEP 4.4.6	SYNCHROSCOPE IS ROTATING IN THE FAST DIRECTION AS INDICATED ON NB-EI-3	OPERATOR TURNS KJ-HS-7A, DG NE01 GOV, TO RAISE IF SPEED IS SLOW AND TO LOWER IF SPEED FAST AS INDICATED BY 4.16 KV BUS NB01 SYNC SCOPE, NB-EI-3 ON RLC15 TO SATISFY SYNCH CHECK RELAY	S U Comments:
11. ADJUST NE01 VOLTAGE USING NE-HS-13A TO MATCH NB01 BUS VOLTAGE +50, -0 VOLTS STEP 4.4.7	NE01 VOLTAGE ON NB-EI-28 IS 25V HIGHER THAN NB01 BUS VOLTAGE ON NB-EI-1	OPERATOR SHOULD ADJUST NE01 VOLTAGE TO MATCH NB01 VOLTAGE +50, -0 VOLTS	S U Comments:
12. VERIFY PROPER OPERATION OF SYNC LIGHT NB-ZL-9 STEP 4.4.8	DIMMEST AT 12 O'CLOCK AND BRIGHTEST AT 6 O'CLOCK ON SYNCH SCOPE NB-EI-3	OPERATOR SHOULD VERIFY PROPER OPERATION OF NB-ZL-9	S U Comments:

* CRITICAL STEP

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE
13. VERIFY NB-ZL-27A ILLUMINATES WHEN THE SYNCHROSCOPE IS BETWEEN THE 11 O'CLOCK AND THE 12 O'CLOCK POSITION STEP 4.4.9	NE-ZL-27A IS COMING ON AT FIVE (5) DEGREES BEFORE THE 12 O'CLOCK POSITION AND OFF AT FIVE (5) DEGREES AFTER 12 O'CLOCK	OPERATOR SHOULD WATCH NE-AL-27A, EMERG SPLY TO BUS NB01 SYNC, AND DETERMINE WHEN THE LIGHTS ILLUMINATE	S U Comments:
14. ALLOW SYNCHROSCOPE NB-EI-3 TO COMPLETE ONE REVOLUTION TO VERIFY PROPER SPEED FOR SYNCHRONIZATION STEP 4.4.10	SYNCHROSCOPE IS ROTATING IN THE FAST DIRECTION AT ABOUT THE SPEED OF THE SECOND HAND OF A CLOCK	OPERATOR SHOULD OBSERVE THE SYNC SCOPE FOR ONE COMPLETE REVOLUTION AND ADJUST THE SPEED UNLESS IT IS ROTATING AT ABOUT THE SPEED OF A CLOCK SECOND HAND	S U Comments:
15* WHEN THE SYNCHROSCOPE REACHES THE 11 O'CLOCK POSITION TURN NB-HIS-25 TO CLOSE AND HOLD UNTIL THE BREAKER INDICATES CLOSED, THEN RELEASE THE CONTROL SWITCH STEP 4.4.11	NB-HIS-25 RED LIGHT IS ILLUMINATED AND THE GREEN LIGHT IS OUT	WHEN SYNC SCOPE REACHES THE 11 O'CLOCK POSITION, AND SYNCH CHECK PERMISSIVE LIGHT ON, CLOSE IN NB01 EMERG SPLY BKR NB0111 WITH SWITCH NB-HIS-25 AND HOLD UNTIL THE RED LIGHT IS ILLUMINATED AND THE GREEN LIGHT IS OUT, THEN THE OPERATOR SHOULD RELEASE THE SWITCH	S U Comments:

* CRITICAL STEP

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE S U
16* UPON CLOSURE OF THE D/G BREAKER PICKUP LOAD TO AT LEAST 200 KW BY OPERATING THE D/G GOVERNOR CONTROL KJ-HS-7A IN THE RAISE DIRECTION IF NECESSARY STEP 4.4.12	D/G LOAD IS 220 KW	OPERATOR SHOULD GO TO RAISE ON KJ-HS-7A ON RL015 UNTIL DG NE01 AC MEGAWATT METER READS ≥ 0.2	S U Comments:
17. RETURN NB-HS-10, 4.16KV BUS NB01 SYNC SCOPE SEL SWITCH, TO THE 'OFF' POSITION STEP 4.4.13	NB-HS-10 IS IN 'OFF'	OPERATOR SHOULD RETURN NB-HS-10, SYNCHROSCOPE SELECTOR SWITCH, ON RL015 TO THE 'OFF' POSITION	S U Comments:
18. RETURN NE-HS-27, SYNC TRANSFER SWITCH, TO THE 'OFF' POSITION STEP 4.4.13	NE-HS-27 IS IN 'OFF'	OPERATOR SHOULD RETURN NE-HS-27, SYNCHROSCOPE TRANSFER SWITCH, ON RL015 TO THE 'OFF' POSITION	S U Comments:

* CRITICAL STEP

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE S U
19. ADJUST DIESEL GENERATOR VOLTAGE WITH THE NE-HS-13A, AUTO DIESEL VOLTAGE REGULATOR STEP 4.4.14	POWER FACTOR IS 0.9	OPERATOR SHOULD ADJUST D/G VAR LOADING USING NE-HS-13A, AUTO VOLTAGE REGULATOR	Comments:
20. INCREASE DIESEL GENERATOR LOAD AS DIRECTED BY THE SHIFT SUPERVISOR STEP 4.4.15	THE SHIFT SUPERVISOR DIRECTS YOU TO INCREASE D/G LOAD TO TWO (2) MW	THE OPERATOR SHOULD INCREASE DIESEL GENERATOR LOAD AS DIRECTED BY THE SHIFT SUPERVISOR	Comments:
21* INCREASE DIESEL GENERATOR LOAD, BY PLACING NE-HS-7A IN THE RAISE POSITION, TO TWO (2) MW STEP 4.4.15	D/G LOAD IS TWO (2) MW	OPERATOR SHOULD GO TO RAISE ON NE-HS-7A ON RL015 TO RAISE D/G LOAD TO TWO (2) MW \pm 400 KW	Comments:

* CRITICAL STEP

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE
22.	THE JPM IS COMPLETE <u>RECORD STOP TIME</u> <u>ON PAGE 1</u>		S U Comments:

* CRITICAL STEP

#1

NAME: _____

JPM NO: URO-SNE01PCC09J

QUESTION:

REFERENCE USE

The Callaway Plant is in MODE 1. The following data was recorded during the monthly surveillance for Diesel Generator NE01.

Fuel Oil Storage Tank Level	75%
Fuel Oil Day Tank Level	4 ft.
Time to reach 4000 ± 320 volts	10.8 sec.
Time to reach 60 ± 1.2 Hz	11.3
Time 5580 to 6201 KW is attained	0943
Time at which Diesel is unloaded	1045

Describe the surveillance results/operability of Diesel Generator NE01.

ANSWER:

Does not meet acceptance criteria/inoperable due to low Fuel Oil Storage Tank Level.

KA RATING: 064050G01 (3.6/3.8)

REFERENCE: OSP-NE-0001A
TS 3.8.1.1

COMMENTS / ANSWER GIVEN :

SCORE: SAT UNSAT

#2

NAME: _____

JPM NO: URO-SNE01PCC09J

QUESTION:

REFERENCE USE

The Callaway Plant is in MODE 1. Standby Diesel Generator NE02 is carrying 6100 KW during the performance OSP-NE-0001B, "Standby Diesel Generator 'B' Periodic Tests". A Fault Pressure condition causes a Lockout on Transformer XNB02. Describe the effect on 4160V Bus NB02 and it's loads.

ANSWER:

(50% credit each)

- NB0209, Main Feeder Breaker from XNB02 OPENS
- Shutdown Sequencer actuates

KA RATING: 06400K410 (3.5/4.0)

REFERENCE: OTA-RL-RK022
E-22NF01

COMMENTS / ANSWER GIVEN :

SCORE: SAT UNSAT

#1

NAME: _____

QUESTION:

REFERENCE USE

The Callaway Plant is in MODE 1. The following data was recorded during the monthly surveillance for Diesel Generator NE01.

Fuel Oil Storage Tank Level	75%
Fuel Oil Day Tank Level	4 ft.
Time to reach 4000 ± 320 volts	10.8 sec.
Time to reach 60 ± 1.2 Hz	11.3
Time 5580 to 6201 KW is attained	0943
Time at which Diesel is unloaded	1045

Describe the surveillance results/operability of Diesel Generator NE01.

#2

NAME: _____

QUESTION:

REFERENCE USE

The Callaway Plant is in MODE 1. Standby Diesel Generator NE02 is carrying 6100 KW during the performance OSP-NE-0001B, "Standby Diesel Generator 'B' Periodic Tests". A Fault Pressure condition causes a Lockout on Transformer XNB02. Describe the effect on 4160V Bus NB02 and it's loads.

Read to Performer: I will explain the initial conditions, which steps to simulate or discuss, and provide initiating and subsequent cues. You may use any approved reference materials normally available to you. Make all written reports, oral reports, and log entries as if the evolution was actually being performed. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions: THE PLANT IS OPERATING IN MODE 1. THE 'A' EMERGENCY DIESEL GENERATOR HAS BEEN STARTED PER OTN-NE-0001A, SECTION 4.3. NB01 IS ENERGIZED FROM ITS NORMAL OFF-SITE POWER SOURCE.

Initiating Cues: YOU HAVE BEEN DIRECTED TO PARALLEL THE 'A' DIESEL GENERATOR TO NB01 AND LOAD TO AT LEAST 2 MW PER OTN-NE-0001A, SECTION 4.4.

CHIEF EXAMINER JPM COMMENTS - CALLAWAY 2/24/97 EXAM

GENERAL

- The checklist at the bottom of the outline states "1 New or Significantly Altered JPMs." The requirements are that two JPMs be new or significantly altered for SRO(I) and RO applicants. Which JPMs are new or significantly altered?
Resolution: Nos. 5 and 8. Noted on outline.
- It appears several of the KSA numbers are actually a combination of two KSAs, e.g., JPMs 3, 7, 9, 10, and 11 and JPM 6, Question 2 and JPM 11, Question 1.
Resolution: Some KSA numbers were from new catalog. Replaced these with numbers from old catalog.

Legend: CS - Critical Steps D - Level of difficulty on a scale of 1 to 5.
Q - Question R - Reference allowed M - No reference allowed
K - Knowledge level question A - Comprehension/analysis level question

JPM 1 CS - 1 D - 2 This appears to be an alternate path JPM and is not noted as such on the outline. Resolution: Identified as such on outline.

Q1 - R/A Q2 - M/K: Asks for an operating limit.

JPM 2 CS - 2 D - 2.5

Q1 - R/A This is too easy with reference which was just used in JPM. Consider making it a memory question and asking what must be done to ensure operability of AFP turbine on loss of NN02 bus. This would better demonstrate the ability of applicant to operate the turbine. Resolution: The OTO referenced was not used in the JPM. Reworded question.

Q2 - M/K This question could be improved to better solicit the applicant's system operating knowledge. For instance, one could ask what, if any, adjustment should be made to charging flow following loss of bus NN01 or what effect, if any, loss of Bus NN01 will have CVCS system configuration. Resolution: Reworded.

JPM 3 CS - 5 D - 3.5

It appears that Steps 4, 8, and 9 should also be critical. Resolution: Incorporated.

Q1 - M/A Credit 20% for identifying each steam generator and 60% for identifying reason. Can steam generator levels be read to this accuracy from available instruments? If not, there should be a wider spread in level readings. Resolution: Changed credit assignment. Instruments can be read to indicated accuracy.

Q2 - R/A

JPM 4 CS - 2 D - 3.0

Q1 - R/K Why is this question not a direct lookup. The procedure describes the flow path. Resolution: Changed to memory question.

Q2 - R/A

JPM 5 CS - 5 D - 3.5

Why are not Steps 6-14 critical? Consider terminating JPM at Step 31. Also, why is Step 31 not critical? Resolution: Incorporated comments.

Q1 - R/A Use of logic drawing.

Q2 - R/A Use of logic drawing.

JPM 6 CS - 3 D - 2.0

Q1 - R/A Use of logic drawing.

Q2 - M/A Why is applicant expected to know this from memory? Resolution: Rewrote and changed to reference allowed question.

JPM 7 CS - 2 D - 2.5

Why are not several other steps which involve valve manipulations critical? Resolution: Made several additional steps critical.

Q1 - R/A Q2 - R/A

JPM 8 CS - 5 D - 2.5

Q1 - R/A Q2 - R/A

JPM 9 CS - 2 D - 2.5

Q1 - R/A Q2 - M/K: Operating characteristic

JPM 10 CS - 9 D - 2.5

Q1 - R/K: Why is a reference allowed on this question? It appears that the answer is not in the reference and if it were, the question would be too easy. Resolution: Applicant only allowed to look at control board.

Q2 - R/A

JPM 11 CS - 2 D - 2.7

Q1 - R/A Q2 - R/A

Attachment 6

Admin Topics

ADMIN TOPICS - OUTLINE

Callaway Plant Initial License Exam - February 1997			
EXAM LEVEL -		SRO(I)	
Administrative Topic/Discussion Description		<u>Method of Evaluation:</u> 1. ONE Admin JPM, or 2. TWO Admin Questions	
A1	Shift Manning	194001A.1.03 (3.4)	Q- Shift manning requirements
	Activity Coordination	194001A.1.11 (4.1)	Q- Shift activity coordination.
	Plant Parameter Verification	194001A1.02 (3.9)	JPM - Calculate QPTR
A2	Surveillance Procedures	194001A1.08 (3.1)	Q. Heat Balance Surveillance acceptance criteria review.
	Locked Components	194001A1.06 (3.4)	Q- Requirements for altering position of locked components.
A3	Knowledge of Significant Radiation Hazards	194001K1.03 (3.4)	Q- High Rad Key control - Access to incore detectors.
		194001K1.03 (3.4)	Q-Dose limits and authorization to exceed.
A4	Emergency Action Levels	194001A1.16 (4.4)	JPM -Classify EVENT - (IN CONTROL ROOM)

JPM Checklist

- | | |
|--|---|
| 1 10 SRO(I)/RO JPMs w/ 7 CR and 3 in-plant | 9 5 SRO(U) JPMs w/2-3 CR and 2-3 in-plant |
| 2 7 Different Safety Functions for SRO(I) and RO | 10 5 Different Safety Functions for SRO(U) |
| 3 CR JPM must be and ESF | 11 Each System Selected - 1 JPM developed or selected |
| 4 1 JPM low power or Shutdown | 12 1-2 JPMs require alternate path |
| 5 1 in plant JPM EOP or Abnormal Actions | 13 1in-plant JPM requires escort into RCA |
| 6 "Diversify" questions among Ks, As, and Gs | 14 Less than 30% overlap from last NRC exam |
| 7 1 New or Significantly Altered JPMs | 15 1 new or significantly altered JPM for SRO(U) |
| 8 Admin Topics Evaluated in JPMs when possible | |

ADMIN TOPICS - OUTLINE

Callaway Plan Initial License Exam - February 1997			
EXAM LEVEL -		SRO(U)	
Administrative Topic/Discussion Description		<u>Method of Evaluation:</u> 1. ONE Admin JPM, or 2. TWO Admin Questions	
A1	Shift Manning	194001A.1.03 (3.4)	Q- Shift manning requirements
	Activity Coordination	194001A.1.11 (4.1)	Q- Shift activity coordination.
	Plant Parameter Verification	194001A1.02 (3.9)	JPM - Calculate QPTR
A2	Surveillance Procedures	194001A1.08 (3.1)	Q. Heat Balance Surveillance acceptance criteria review.
	Locked Components	194001A1.06 (3.4)	Q- Requirements for altering position of locked components.
A3	Knowledge of Significant Radiation Hazards	194001K1.03 (3.4)	Q- High Rad Key control - Access to incore detectors.
		194001K1.03 (3.4)	Q-Dose limits and authorization to exceed.
A4	Emergency Action Levels	194001A1.16 (4.4)	JPM -Classify EVENT - (IN CONTROL ROOM)

JPM Checklist

- | | |
|--|---|
| 1 10 SRO(I)/RO JPMs w/ 7 CR and 3 in-plant | 9 5 SRO(U) JPMs w/2-3 CR and 2-3 in-plant |
| 2 7 Different Safety Functions for SRO(I) and RO | 10 5 Different Safety Functions for SRO(U) |
| 3 CR JPM must be and ESF | 11 Each System Selected - 1 JPM developed or selected |
| 4 1 JPM low power or Shutdown | 12 1-2 JPMs require alternate path |
| 5 1 in plant JPM EOP or Abnormal Actions | 13 In-plant JPM requires escort into RCA |
| 6 "Diversify" questions among Ks, As, and Gs | 14 Less than 30% overlap from last NRC exam |
| 7 1 New or Significantly Altered JPMs | 15 1 new or significantly altered JPM for SRO(U) |
| 8 Admin Topics Evaluated in JPMs when possible | |

ADMIN TOPICS - OUTLINE

Callaway Plan Initial License Exam - February 1997			
EXAM LEVEL -		RO	
Administrative Topic/Discussion Description		<u>Method of Evaluation:</u> 1. ONE Admin JPM, or 2. TWO Admin Questions	
A1	Shift Turnover	194001A1.03 (2.5)	Q-Requirements for watch relief/turnover.
	Procedure Use	194001A..01 (3.3)	Q-Use of Continuous Use Procedures.
	Plant Parameter Verification	194001A1.02 (4.1)	JPM - Calculate QPTR
A2	Equipment Control	194001A1.13 (4.3)	Q- Determine Proper ECCS valve alignment.
	Tagging & Clearances	194001K1.02 (3.7)	Q-Use of Valving/Switching Orders
A3	Knowledge of Significant Radiation Hazards	194001K1.04 (3.3)	Q-Operation of Electronic Dosimeter.
		194001K1.03 (2.8)	Q-Dose limits and authorization to exceed.
A4	Emergency Action Levels	194001A1.16 (3.1)	Q-E-Plan Notification requirements
		194001A1.16 (3.1)	Q-Lines of authority during RERP activation.

JPM Checklist

- | | | | |
|---|--|----|--|
| 1 | 10 SRO(I)/RO JPMs w/ 7 CR and 3 in-plant | 9 | 5 SRO(U) JPMs w/2-3 CR and 2-3 in-plant |
| 2 | 7 Different Safety Functions for SRO(I) and RO | 10 | 5 Different Safety Functions for SRO(U) |
| 3 | CR JPM must be and ESF | 11 | Each System Selected - 1 JPM developed or selected |
| 4 | 1 JPM low power or Shutdown | 12 | 1-2 JPMs require alternate path |
| 5 | 1 in plant JPM EOP or Abnormal Actions | 13 | 1in-plant JPM requires escort into RCA |
| 6 | "Diversify" questions among Ks, As, and Gs | 14 | Less than 30% overlap from last NRC exam |
| 7 | 1 New or Significantly Altered JPMs | 15 | 1 new or significantly altered JPM for SRO(U) |
| 8 | Admin Topics Evaluated in JPMs when possible | | |

A1 Question #1 Shift Turnover

KA #194001A103

OBJ: 003A02A2

REFERENCE: ODP-ZZ-00003, "Shift Relief and Turnover"

MEMORY

You are the oncoming Unit Reactor Operator for the p.m. shift (1500-2300) on 8/13/96. Your last watch was the a.m. shift (0700-1500) on 8/11/96.

How far back (date and time) are you required to review the RO logs prior to relieving the watch?

ANSWER:

8/12/96 1500

A1 Question #2 Procedure Use

KA #194001A101

OBJ: 003A29C3

REFERENCE: APA-ZZ-00100, "Procedure Adherence" Page 2

REFERENCE USE

You are the Balance of Plant Operator and have been directed to perform OSP-AL-P001B, "Section XI Motor Driven Aux Feedwater Pump 'B' Operability" surveillance. At step 6.1.9, the Equipment Operator at the pump reports that flow on ALFI0051 is 0 gpm and valve ALV0028, "Motor Driven Aux Feedwater Pump 'B' Discharge to Condensate Storage Tank Isolation Valve", position cannot be adjusted (valve is stuck).

What are your required actions?

ANSWER:

- Stop the 'B' Motor Driven Aux Feedwater Pump (This discontinues the surveillance) (50% credit)
- Notify the Control Room Supervisor and/or Shift Supervisor (50% credit)

A1 - JPM Plant Parameter Verification

KA #194001A102

OBJ: 003AA3B4

REFERENCE: OSP-SE-00003, Quadrant Power Tilt Ratio Calculation

REFERENCE USE

Perform JPM URO-SSE04PCC99J for QPTR.

CALLAWAY PLANT

JOB PERFORMANCE MEASURE

JPM NO: URO-SSE04PCC99J KSA NO: 194001A102
U.E. RATING: REQ KSA RATING: 4.1/3.9
JOB TITLE: URO/SRO REVISION: 970113
DUTY: NUCLEAR INSTRUMENTATION
TASK TITLE: PERFORM A QPTR
COMPLETION TIME: 15 MINUTES

The performance of this task was evaluated against the standards contained in this JPM and determined to be:

☐ SATISFACTORY ☐ UNSATISFACTORY

Reason, if UNSATISFACTORY:

EVALUATORS SIGNATURE: _____ DATE: _____

TASK PERFORMER: _____

LOCATION OF PERFORMANCE:

CONTROL-ROOM _____ SIMULATOR/LAB X PLANT _____ CLASSROOM _____

METHOD OF PERFORMANCE: SIMULATED _____ PERFORMED X _____

REFERENCES: OSP-SE-00003, QUADRANT POWER TILT RATIO CALCULATION, REVISION 7

TOOLS/EQUIPMENT: CALCULATOR, SIMULATOR CURVE BOOK, EXTRA ATTACHMENT #2 OF
OSP-SE-00003 COMPLETED FOR GRADING

PREPARED BY: _____ DATE: _____

REVIEWED BY: _____ DATE: _____

STS/SS

APPROVED BY: _____ DATE: _____

DEPARTMENT HEAD

Read to Performer: I will explain the initial conditions, which steps to simulate or discuss, and provide initiating and subsequent cues. You may use any approved reference materials normally available to you. Make all written reports, oral reports, and log entries as if the evolution was actually being performed. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions: CALLAWAY PLANT WAS AT BOL, 80% POWER WITH THE AXIAL FLUX DIFFERENCE EQUAL TO -5%, WHEN SHUTDOWN BANK CONTROL ROD P4 DROPPED DUE TO A FAILURE OF THE STATIONARY GRIPPER COIL FUSE. CONTROL ROOM ANNUNCIATORS 79C, 78B, AND 78C ARE IN ALARM. ALL POWER RANGE NUCLEAR INSTRUMENTS ARE OPERABLE. THE NSSS COMPUTER IS BEING WORKED ON AT THIS TIME. THE CONTROL ROOM PC IS NOT AVAILABLE.

Initiating Cues: THE OPERATING SUPERVISOR HAS DIRECTED YOU TO PERFORM A QPTR CALCULATION USING NI DETECTOR CURRENTS PER OSP-SE-00003, SECTION 6.3.

Notes: IC-19 SHOULD BE USED.
MALF CRF4, SG, P4 ACT

CHECK DETECTOR CURRENTS TO BE CLOSE TO THE FOLLOWING:

	N41	N42	N43	N44
Upper	114.8	130.8	131.6	129.9
Lower	137.8	162.0	153.6	148.5

SIMULATOR 100% BOL DETECTOR CURRENTS ON LAN
I:\SIM\MMI\STATION\OSPSE3.DOC

Task Standard: UPON COMPLETION OF THIS JPM, THE OPERATOR WILL HAVE PERFORMED A MANUAL QPTR CALCULATION WITH A TOLERANCE OF $\pm .1$.

START TIME: _____

STOP TIME: _____

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE
1. OBTAIN A COPY OSP-SE-00003, QPTR CALCULATION		OPERATOR SHOULD OBTAIN PROCEDURE COPY	S U Comments:
2. REVIEW PRECAUTIONS AND LIMITATIONS STEP 3.0	ALL PRECAUTIONS AND LIMITATIONS ARE SATISFIED	OPERATOR SHOULD REVIEW PRECAUTIONS AND LIMITATIONS	S U Comments:
3. REVIEW INITIAL CONDITIONS STEP 4.0	ANNUNCIATORS 79C, 78B AND 78C ARE NOT OPERABLE ASK IF THE OPERATOR UNDERSTANDS THE INITIAL CONDITIONS AND INITIATING CUES	OPERATOR SHOULD REVIEW INITIAL CONDITIONS	S U Comments:

* CRITICAL STEP

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE
4. LOCATE NUCLEAR INSTRUMENT PANEL SE054 STEP 6.3.1		OPERATOR SHOULD LOCATE PANEL SE054	S U Comments:
5* RECORD EACH POWER RANGE UPPER CURRENT OUTPUT ON ATTACHMENT #2 STEP 6.3.1	IF PERFORMED IN THE PLANT, HAVE THE OPERATOR USE THE FOLLOWING DETECTOR CURRENTS N41 = 114.8 N42 = 130.8 N43 = 131.6 N44 = 129.9	OPERATOR SHOULD READ EACH UPPER CURRENT VALUE FOR THE POWER RANGE DETECTORS OR RECORD VALUE GIVEN BY THE CUE	S U Comments:
6* RECORD EACH POWER RANGE LOWER CURRENT OUTPUT ON ATTACHMENT #2 STEP 6.3.1	IF PERFORMED IN THE PLANT, HAVE THE OPERATOR USE THE FOLLOWING DETECTOR CURRENTS N41 = 137.8 N42 = 162.0 N43 = 153.6 N44 = 148.5	OPERATOR SHOULD READ EACH LOWER CURRENT VALUE FOR THE POWER RANGE DETECTORS OR RECORD VALUE GIVEN BY THE CUE	S U Comments:

* CRITICAL STEP

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE S U
7* USE TABLE 11.1 FROM THE CURVE BOOK TO OBTAIN THE CURRENT VALUES FOR THE UPPER DETECTORS, AFD = 0 VALUES SHOULD BE USED STEP 6.3.2	THE UPPER CURRENT VALUES THAT SHOULD BE USED ARE N41 = 174.65 N42 = 168.83 N43 = 171.38 N44 = 168.73 PROVIDE SIMULATOR DATA SHEET	OPERATOR SHOULD USE TABLE 11-1, AFD CALIBRATION VALUE TABLE AFD = 0 TO RECORD POWER RANGE UPPER CURRENT VALUES	S U Comments:
8* USE TABLE 11.1 FROM THE CURVE BOOK TO OBTAIN THE CURRENT VALUES FOR THE LOWER DETECTORS, AFD = 0 VALUES SHOULD BE USED STEP 6.3.2	THE LOWER CURRENT VALUES THAT SHOULD BE USED ARE N41 = 208.68 N42 = 207.89 N43 = 198.39 N44 = 191.81 PROVIDE SIMULATOR DATA SHEET	OPERATOR SHOULD USE TABLE 11-1, AFD CALIBRATION VALUE TABLE AFD = 0 TO RECORD POWER RANGE LOWER CURRENT VALUES	S U Comments:
9* DIVIDE EACH UPPER DETECTOR CURRENT BY ITS 100% POWER DETECTOR CURRENT VALUE AND ENTER IT IN THE NORMALIZED DETECTOR CURRENT FOR EACH VALUE STEP 6.3.3	THE UPPER CALCULATED VALUES SHOULD BE N41 = 0.657 N42 = 0.775 N43 = 0.768 N44 = 0.770 NOTE: TOLERANCE OF ± 0.1 ON EACH CALCULATION	OPERATOR SHOULD DIVIDE EACH UPPER DETECTOR CURRENT BY ITS 100% POWER DETECTOR CURRENT VALUE AND ENTER IT IN THE NORMALIZED DETECTOR CURRENT FOR EACH VALUE	S U Comments:

* CRITICAL STEP

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE
<p>10* DIVIDE EACH LOWER DETECTOR CURRENT BY ITS 100% POWER DETECTOR CURRENT VALVE AND ENTER IT IN THE NORMALIZED DETECTOR CURRENT FOR EACH VALVE</p> <p>STEP 6.3.3</p>	<p>THE LOWER CALCULATED VALUES SHOULD BE</p> <p>N41 = 0.660 N42 = 0.779 N43 = 0.774 N44 = 0.774</p> <p>NOTE: TOLERANCE OF ± 0.1 ON EACH CALCULATION</p>	<p>OPERATOR SHOULD DIVIDE EACH LOWER DETECTOR CURRENT BY ITS 100% POWER DETECTOR CURRENT VALUE AND ENTER IT IN THE NORMALIZED DETECTOR CURRENT FOR EACH VALVE</p>	<p>S U</p> <p>Comments:</p>
<p>11* ADD UP THE NORMALIZED UPPER DETECTOR CURRENTS AND DIVIDE BY FOUR (4) TO DERIVE THE UPPER DETECTOR NORMALIZED CURRENT AVERAGES AND RECORD IT IN ATTACHMENT #2</p> <p>STEP 6.3.4</p>	<p>OPERATOR SHOULD ADD UP THE NORMALIZED UPPER DETECTOR CURRENTS AND DIVIDE BY 4 TO DERIVE THE UPPER DETECTOR NORMALIZED CURRENT AVERAGES AND RECORD IT IN ATTACHMENT 2.</p> <p>NOTE: UPPER NORMALIZED CURRENT AVERAGE SHOULD = 0.743 (± 0.1)</p>	<p>OPERATOR SHOULD ADD UP THE NORMALIZED UPPER DETECTOR CURRENTS AND DIVIDE BY 4 TO DERIVE THE UPPER DETECTOR NORMALIZED CURRENT AVERAGES AND RECORD IT IN ATTACHMENT 2.</p>	<p>S U</p> <p>Comments:</p>

* CRITICAL STEP

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE
12* ADD UP THE NORMALIZED LOWER DETECTOR CURRENTS AND DIVIDE BY FOUR (4) TO DERIVE THE LOWER DETECTOR NORMALIZED CURRENT AVERAGES AND RECORD IT IN ATTACHMENT #2 STEP 6.3.5		OPERATOR SHOULD ADD UP THE NORMALIZED LOWER DETECTOR CURRENTS AND DIVIDE BY 4 TO DERIVE THE LOWER DETECTOR NORMALIZED CURRENT AVERAGES AND RECORD IT IN ATTACHMENT 2. NOTE: LOWER NORMALIZED CURRENT AVERAGE SHOULD = 0.747 (\pm 0.1)	S U Comments:
13* DIVIDE THE UPPER NORMALIZED DETECTOR CURRENT BY THE UPPER NORMALIZED DETECTOR CURRENT AVERAGE TO OBTAIN THE POWER TILT RATIO FOR EACH UPPER CHANNEL STEP 6.3.6		OPERATOR SHOULD DIVIDE THE UPPER NORMALIZED DETECTOR CURRENT BY THE UPPER NORMALIZED DETECTOR CURRENT AVERAGE TO OBTAIN THE POWER TILT RATIO FOR EACH UPPER CHANNEL	S U Comments:

* CRITICAL STEP

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE S U
14* THE QPTR SHOULD BE CALCULATED NOTE AFTER STEP 6.3.6		THE OPERATOR SHOULD CALCULATE THE QPTR, AS A MINIMUM, TO TWO (2) SIGNIFICANT DIGITS TO THE RIGHT OF THE DECIMAL POINT	Comments:
15* RECORD THE POWER TILT RATIO FOR EACH UPPER CHANNEL STEP 6.3.6	THE QPTR SHOULD CALCULATE OUT TO THE FOLLOWING VALUES: N41 = 0.88 N42 = 1.04 N43 = 1.03 N44 = 1.04 NOTE: TOLERANCE OF ± 0.01 ON EACH CALCULATION	OPERATOR SHOULD RECORD THE POWER TILT RATIO FOR EACH UPPER CHANNEL IN ATTACHMENT 2 UNDER STEP 6.3.6	S U Comments:
16* DIVIDE THE LOWER NORMALIZED DETECTOR CURRENT BY THE LOWER NORMALIZED DETECTOR CURRENT AVERAGE TO OBTAIN THE POWER TILT RATIO FOR EACH LOWER CHANNEL STEP 6.3.7		OPERATOR SHOULD DIVIDE THE LOWER NORMALIZED DETECTOR CURRENT BY THE LOWER NORMALIZED DETECTOR CURRENT AVERAGE TO OBTAIN THE POWER TILT RATIO FOR EACH LOWER CHANNEL	S U Comments:

* CRITICAL STEP

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE S U
17* THE QPTR SHOULD BE CALCULATED NOTE AFTER STEP 6.3.7		OPERATOR SHOULD CALCULATE THE QPTR, AS A MINIMUM, TO TWO (2) SIGNIFICANT DIGITS TO THE RIGHT OF THE DECIMAL POINT	Comments:
18* RECORD THE POWER TILT RATIO FOR EACH LOWER POWER RANGE CHANNEL STEP 6.3.7	THE QPTR SHOULD CALCULATE OUT TO THE FOLLOWING VALUES: N41 = 0.88 N42 = 1.04 N43 = 1.04 N44 = 1.04 NOTE: TOLERANCE OF ± 0.01 ON EACH CALCULATION	OPERATOR SHOULD RECORD THE POWER TILT RATIO FOR EACH LOWER CHANNEL IN ATTACHMENT 2 UNDER STEP 6.3.7	Comments:
19.	THE JPM IS COMPLETE <u>RECORD STOP TIME ON PAGE 1</u>		Comments:

* CRITICAL STEP

Read to Performer: I will explain the initial conditions, which steps to simulate or discuss, and provide initiating and subsequent cues. You may use any approved reference materials normally available to you. Make all written reports, oral reports, and log entries as if the evolution was actually being performed. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions: CALLAWAY PLANT WAS AT BOL, 80% POWER WITH THE AXIAL FLUX DIFFERENCE EQUAL TO -5%, WHEN SHUTDOWN BANK CONTROL ROD P4 DROPPED DUE TO A FAILURE OF THE STATIONARY GRIPPER COIL FUSE. CONTROL ROOM ANNUNCIATORS 79C, 78B, AND 78C ARE IN ALARM. ALL POWER RANGE NUCLEAR INSTRUMENTS ARE OPERABLE. THE NSSS COMPUTER IS BEING WORKED ON AT THIS TIME. THE CONTROL ROOM PC IS NOT AVAILABLE.

Initiating Cues: THE OPERATING SUPERVISOR HAS DIRECTED YOU TO PERFORM A QPTR CALCULATION USING NI DETECTOR CURRENTS PER OSP-SE-00003, SECTION 6.3.

STEP 6.3.1

SE054 DETECTOR
CURRENT READINGS

	N41	N42	N43	N44
Upper	114.8	130.8	131.6	129.9
Lower	137.8	162.0	153.6	148.5

STEP 6.3.2

100% POWER LEVEL
DETECTOR CURRENTS
(BOL, 0% AFD)

	N41	N42	N43	N44
Upper	174.65	168.83	171.38	168.73
Lower	208.68	207.89	198.39	191.81

PERSON COMPLETING

INITIALS

1st Check _____

DATE STARTED _____

2nd Check _____

DATE COMPLETED _____

QUADRANT POWER TILT RATIO CALCULATION						
	STEP	CHANNEL	N41	N42	N43	N44
U	6.3.1	DETECTOR CURRENT	114.8	130.8	131.6	129.9
P	6.3.2	100% DETECTOR CURRENT	174.65	168.83	171.38	168.73
E	6.3.3	NORMALIZED DETECTOR CURRENT	0.657	0.775	0.768	0.770
R	6.3.4	NORMALIZED CURRENT AVERAGE	0.743	0.743	0.743	0.743
	6.3.6	POWER TILT RATIO	0.88	1.04	1.03	1.04

	STEP	CHANNEL	N41	N42	N43	N44
L	6.3.1	DETECTOR CURRENT	137.8	162.0	153.6	148.5
O	6.3.2	100% DETECTOR CURRENT	208.68	207.89	198.39	191.81
W	6.3.3	NORMALIZED DETECTOR CURRENT	0.660	0.779	0.774	0.774
E	6.3.5	NORMALIZED CURRENT AVERAGE	0.747	0.747	0.747	0.747
R	6.3.7	POWER TILT RATIO	0.88	1.04	1.04	1.04

NOTE: Read detector current to the nearest microamp.

STEP 6.3.1

SE054 DETECTOR
CURRENT READINGS

	N41	N42	N43	N44
Upper	114.8	130.8	131.6	129.9
Lower	137.8	162.0	153.6	148.5

STEP 6.3.2

100% POWER LEVEL
DETECTOR CURRENTS
(BOL, 0% AFD)

	N41	N42	N43	N44
Upper	174.65	168.83	171.38	168.73
Lower	208.68	207.89	198.39	191.81

A2 Question #1 Equipment Control

KA #194001A113

OBJ: 0110560J

REFERENCE: SOS 96-0442
OSP-EM-P001A

REFERENCE USE

The Callaway Plant is in MODE 1. You are performing OSP-EM-P001A for a routine surveillance run on Safety Injection Pump 'A'. While the Equipment Operator is adjusting flow in step 6.1.7.2, you receive an alarm on the 'B' Train ESFAS status panel for EM-HV-8814B, "SI PMP B RECIRC TO RWST ISO" and notice closed indication on the valve handswitch. When you question the Equipment Operator, you discover that he has operated the wrong valve (EM-HV-8814B instead of EM-HV-8814A).

What Technical Specification Action applied while in this lineup and why?

ANSWER:

(1/3 credit each)

- TS 3.0.3
- 'A' SI Pump inoperable due to step 6.1.3, which closes EM-HV-8821A.
- 'B' SI Pump inoperable due to not having a recirc flowpath.

A2 Question #2 Tagging and Clearances

KA #194001K102

OBJ: 003A330H

REFERENCE: APA-ZZ-00310, Step 3.4.3
 APA-ZZ-00310, Att. 1!
 M22EB01

REFERENCE USE

Closed Cooling Water Heat Exchanger 'A' is out of service and ready for WPA to be placed.
The following tags exist for this activity.

	Position
1. EBV006 - Inlet	Closed
2. EBV048 - Drain	Open / Cap Removed
3. EBV047 - Vent	Open / Cap Removed
4. EBV008 - Outlet	Closed

1. Determine valving order.
2. Where should this system be drained?

ANSWER:

1. Close inlet/outlet (either order)
 Open vent/drain (either order)
2. Drain to LE system
 (or)
 Portable Container or Surge Tank

A3 Question #1 Knowledge of Significant Radiation Hazards

KA #194001K104

OBJ: 0410010B

REFERENCE: SOS 96-1713

LP T68.0410.7, Obj. B

Radiation Worker Category II

Site Specific Information, Pg. 7

MEMORY

You and an Equipment Operator are working in the 'B' RHR Room during a Refueling Outage. The 'B' RHR Train is operating in a normal cooldown alignment. Your electronic dosimeter alarms and when you check it, you find that it indicates a dose rate of 420 mr/hr. The maximum anticipated dose rate on the RWP was 50 mr/hr.

What are your required actions?

ANSWER:

(1/3 credit each)

- Notify your co-worker
- Leave the area immediately
- Notify Health Physics

A3 Question #2 Knowledge of Significant Radiation Hazards

KA #194001K103

OBJ: 003A31E9

REFERENCE: APA-ZZ-01000

MEMORY

During a plant emergency, entry into the North piping penetration room is required to stop an offsite release. The general area radiation levels are 15 REM/hr, and a 30 minutes stay time is anticipated.

With no prior dose, which Federal dose limit may be exceeded? Whose authorization is needed to exceed this dose?

ANSWER:

1. Annual Federal Limit of 5 REM/yr. (50%)
2. Senior Vice President Nuclear (any one 50%)
 - Vice President Nuclear
 - Emergency Coordinator
 - Recovery Manager
 - Emergency Duty Officer (EDO)

A4 Question #1 Emergency Action Levels

KA #194001A116

OBJ: 1020010Q

REFERENCE: EIP-ZZ-00201, Page 4, Att. 3

MEMORY

The plant has declared an Unusual Event due to excessive RCS leakage.

- 1) What are the time limits for initial notifications?
- 2) What off-site agencies must be initially notified?

ANSWER:

1. 15 minutes (from time of declaration)
2. State of Missouri (SEMA)
Surrounding Counties (Callaway, Cole, Montgomery, and Gasconade)

A4 Question #2 Emergency Action Levels

KA #194001A116

OBJ: 1020010J

REFERENCE: EIP-ZZ-00100, "Classification of Emergencies" Page 3

MEMORY

A 400 gpm Steam Generator Tube Rupture occurs at 0400 on a Sunday. Who is responsible for the initial implementation of the Emergency Plant Implementing Procedures?

ANSWER:

Shift Supervisor/Emergency Coordinator

A1 Question #1 Shift Manning

KA #194001A103

OBJ: 003A270A

REFERENCE: Tech Spec 6.2.2

MEMORY

A plant heatup is in progress with the RCS at 300°F and 1800 psi, with a pressurizer bubble.

Per Technical Specifications, what is the minimum shift crew composition including fire brigade requirements?

ANSWER:

			Fire Brigade
SS	-	1	0
SRO/CRS	-	1	1
RO	-	2	0
EO	-	2	4
STA	-	1	<hr/>
			5
(50%)			(50%)

A1 Question #2 Activity Coordination

KA #194001A111

OBJ: 003AA1A2

REFERENCE: ODP-ZZ-00001, "Operations Department - Code of Conduct"

MEMORY

The Callaway Plant is operating at 100% Reactor Power, steady on 7/4/96 at 0200. The S1A qualified Operating Supervisor is filling the Field Supervisor position. An explosion occurs on the 'C' Main Transformer which results in a fire and a Reactor Trip.

Describe the expected response of the Control Room Supervisor and the Field Supervisor.

ANSWER:

The Control Room Supervisor will respond to the fire as the Fire Brigade Leader/Incident Commander. (50%)

The Field Supervisor will report to the Control Room to assume the duties of Control Room Supervisor. (50%)

A1 - JPM Plant Parameter Verification

KA #194001A102

OBJ: 003AA3B4

REFERENCE: OSP-SE-00003, Quadrant Power Tilt Ratio Calculation

REFERENCE USE

Perform JPM URO-SSE04PCC99J for QPTR.

CALLAWAY PLANT

JOB PERFORMANCE MEASURE

JPM NO: URO-SSE04PCC99J KSA NO: 194001A102
U.E. RATING: REQ KSA RATING: 4.1/3.9
JOB TITLE: URO/SRO REVISION: 970113
DUTY: NUCLEAR INSTRUMENTATION
TASK TITLE: PERFORM A QPTR
COMPLETION TIME: 15 MINUTES

The performance of this task was evaluated against the standards contained in this JPM and determined to be:

☐ SATISFACTORY ☐ UNSATISFACTORY

Reason, if UNSATISFACTORY:

EVALUATORS SIGNATURE: _____ DATE: _____

TASK PERFORMER: _____

LOCATION OF PERFORMANCE:

CONTROL ROOM _____ SIMULATOR/LAB X PLANT _____ CLASSROOM _____

METHOD OF PERFORMANCE: SIMULATED _____ PERFORMED X

REFERENCES: OSP-SE-00003, QUADRANT POWER TILT RATIO CALCULATION, REVISION 7

TOOLS/EQUIPMENT: CALCULATOR, SIMULATOR CURVE BOOK, EXTRA ATTACHMENT #2 OF
OSP-SE-00003 COMPLETED FOR GRADING

PREPARED BY: _____ DATE: _____

REVIEWED BY: _____ DATE: _____
STS/SS

APPROVED BY: _____ DATE: _____
DEPARTMENT HEAD

Read to Performer: I will explain the initial conditions, which steps to simulate or discuss, and provide initiating and subsequent cues. You may use any approved reference materials normally available to you. Make all written reports, oral reports, and log entries as if the evolution was actually being performed. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions: CALLAWAY PLANT WAS AT BOL, 80% POWER WITH THE AXIAL FLUX DIFFERENCE EQUAL TO -5%, WHEN SHUTDOWN BANK CONTROL ROD P4 DROPPED DUE TO A FAILURE OF THE STATIONARY GRIPPER COIL FUSE. CONTROL ROOM ANNUNCIATORS 79C, 78B, AND 78C ARE IN ALARM. ALL POWER RANGE NUCLEAR INSTRUMENTS ARE OPERABLE. THE NSSS COMPUTER IS BEING WORKED ON AT THIS TIME. THE CONTROL ROOM PC IS NOT AVAILABLE.

Initiating Cues: THE OPERATING SUPERVISOR HAS DIRECTED YOU TO PERFORM A QPTR CALCULATION USING NI DETECTOR CURRENTS PER OSP-SE-00003, SECTION 6.3.

Notes: IC-19 SHOULD BE USED.
MALF CRF4, SG, P4 ACT

CHECK DETECTOR CURRENTS TO BE CLOSE TO THE FOLLOWING:

	N41	N42	N43	N44
Upper	114.8	130.8	131.6	129.9
Lower	137.8	162.0	153.6	148.5

SIMULATOR 100% BOL DETECTOR CURRENTS ON LAN
I:\SIM\MMI\STATION\OSPSE3.DOC

Task Standard: UPON COMPLETION OF THIS JPM, THE OPERATOR WILL HAVE PERFORMED A MANUAL QPTR CALCULATION WITH A TOLERANCE OF $\pm .1$.

START TIME: _____

STOP TIME: _____

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE
1. OBTAIN A COPY OSP-SE-00003, QPTR CALCULATION		OPERATOR SHOULD OBTAIN PROCEDURE COPY	S U Comments:
2. REVIEW PRECAUTIONS AND LIMITATIONS STEP 3.0	ALL PRECAUTIONS AND LIMITATIONS ARE SATISFIED	OPERATOR SHOULD REVIEW PRECAUTIONS AND LIMITATIONS	S U Comments:
3. REVIEW INITIAL CONDITIONS STEP 4.0	ANNUNCIATORS 79C, 78B AND 78C ARE NOT OPERABLE ASK IF THE OPERATOR UNDERSTANDS THE INITIAL CONDITIONS AND INITIATING CUES	OPERATOR SHOULD REVIEW INITIAL CONDITIONS	S U Comments:

* CRITICAL STEP

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE
4. LOCATE NUCLEAR INSTRUMENT PANEL SE054 STEP 6.3.1		OPERATOR SHOULD LOCATE PANEL SE054	S U Comments:
5* RECORD EACH POWER RANGE UPPER CURRENT OUTPUT ON ATTACHMENT #2 STEP 6.3.1	IF PERFORMED IN THE PLANT, HAVE THE OPERATOR USE THE FOLLOWING DETECTOR CURRENTS N41 = 114.8 N42 = 130.8 N43 = 131.6 N44 = 129.9	OPERATOR SHOULD READ EACH UPPER CURRENT VALUE FOR THE POWER RANGE DETECTORS OR RECORD VALUE GIVEN BY THE CUE	S U Comments:
6* RECORD EACH POWER RANGE LOWER CURRENT OUTPUT ON ATTACHMENT #2 STEP 6.3.1	IF PERFORMED IN THE PLANT, HAVE THE OPERATOR USE THE FOLLOWING DETECTOR CURRENTS N41 = 137.8 N42 = 162.0 N43 = 153.6 N44 = 148.5	OPERATOR SHOULD READ EACH LOWER CURRENT VALUE FOR THE POWER RANGE DETECTORS OR RECORD VALUE GIVEN BY THE CUE	S U Comments:

* CRITICAL STEP

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE
7* USE TABLE 11.1 FROM THE CURVE BOOK TO OBTAIN THE CURRENT VALUES FOR THE UPPER DETECTORS, AFD = 0 VALUES SHOULD BE USED STEP 6.3.2	THE UPPER CURRENT VALUES THAT SHOULD BE USED ARE N41 = 174.65 N42 = 168.83 N43 = 171.38 N44 = 168.73 PROVIDE SIMULATOR DATA SHEET	OPERATOR SHOULD USE TABLE 11-1, AFD CALIBRATION VALUE TABLE AFD = 0 TO RECORD POWER RANGE UPPER CURRENT VALUES	S U Comments:
8* USE TABLE 11.1 FROM THE CURVE BOOK TO OBTAIN THE CURRENT VALUES FOR THE LOWER DETECTORS, AFD = 0 VALUES SHOULD BE USED STEP 6.3.2	THE LOWER CURRENT VALUES THAT SHOULD BE USED ARE N41 = 208.68 N42 = 207.89 N43 = 198.39 N44 = 191.81 PROVIDE SIMULATOR DATA SHEET	OPERATOR SHOULD USE TABLE 11-1, AFD CALIBRATION VALUE TABLE AFD = 0 TO RECORD POWER RANGE LOWER CURRENT VALUES	S U Comments:
9* DIVIDE EACH UPPER DETECTOR CURRENT BY ITS 100% POWER DETECTOR CURRENT VALUE AND ENTER IT IN THE NORMALIZED DETECTOR CURRENT FOR EACH VALUE STEP 6.3.3	THE UPPER CALCULATED VALUES SHOULD BE N41 = 0.657 N42 = 0.775 N43 = 0.768 N44 = 0.770 NOTE: TOLERANCE OF ± 0.1 ON EACH CALCULATION	OPERATOR SHOULD DIVIDE EACH UPPER DETECTOR CURRENT BY ITS 100% POWER DETECTOR CURRENT VALUE AND ENTER IT IN THE NORMALIZED DETECTOR CURRENT FOR EACH VALUE	S U Comments:

* CRITICAL STEP

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE
<p>10* DIVIDE EACH LOWER DETECTOR CURRENT BY ITS 100% POWER DETECTOR CURRENT VALVE AND ENTER IT IN THE NORMALIZED DETECTOR CURRENT FOR EACH VALVE</p> <p>STEP 6.3.3</p>	<p>THE LOWER CALCULATED VALUES SHOULD BE</p> <p>N41 = 0.660 N42 = 0.779 N43 = 0.774 N44 = 0.774</p> <p>NOTE: TOLERANCE OF ± 0.1 ON EACH CALCULATION</p>	<p>OPERATOR SHOULD DIVIDE EACH LOWER DETECTOR CURRENT BY ITS 100% POWER DETECTOR CURRENT VALUE AND ENTER IT IN THE NORMALIZED DETECTOR CURRENT FOR EACH VALVE</p>	<p>S U</p> <p>Comments:</p>
<p>11* ADD UP THE NORMALIZED UPPER DETECTOR CURRENTS AND DIVIDE BY FOUR (4) TO DERIVE THE UPPER DETECTOR NORMALIZED CURRENT AVERAGES AND RECORD IT IN ATTACHMENT #2</p> <p>STEP 6.3.4</p>		<p>OPERATOR SHOULD ADD UP THE NORMALIZED UPPER DETECTOR CURRENTS AND DIVIDE BY 4 TO DERIVE THE UPPER DETECTOR NORMALIZED CURRENT AVERAGES AND RECORD IT IN ATTACHMENT 2.</p> <p>NOTE: UPPER NORMALIZED CURRENT AVERAGE SHOULD = 0.743 (± 0.1)</p>	<p>S U</p> <p>Comments:</p>

* CRITICAL STEP

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE
<p>12* ADD UP THE NORMALIZED LOWER DETECTOR CURRENTS AND DIVIDE BY FOUR (4) TO DERIVE THE LOWER DETECTOR NORMALIZED CURRENT AVERAGES AND RECORD IT IN ATTACHMENT #2</p> <p>STEP 6.3.5</p>		<p>OPERATOR SHOULD ADD UP THE NORMALIZED LOWER DETECTOR CURRENTS AND DIVIDE BY 4 TO DERIVE THE LOWER DETECTOR NORMALIZED CURRENT AVERAGES AND RECORD IT IN ATTACHMENT 2.</p> <p>NOTE: LOWER NORMALIZED CURRENT AVERAGE SHOULD = 0.747 (\pm 0.1)</p>	<p>S U</p> <p>Comments:</p>
<p>13* DIVIDE THE UPPER NORMALIZED DETECTOR CURRENT BY THE UPPER NORMALIZED DETECTOR CURRENT AVERAGE TO OBTAIN THE POWER TILT RATIO FOR EACH UPPER CHANNEL</p> <p>STEP 6.3.6</p>		<p>OPERATOR SHOULD DIVIDE THE UPPER NORMALIZED DETECTOR CURRENT BY THE UPPER NORMALIZED DETECTOR CURRENT AVERAGE TO OBTAIN THE POWER TILT RATIO FOR EACH UPPER CHANNEL</p>	<p>S U</p> <p>Comments:</p>

* CRITICAL STEP

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE
14* THE QPTR SHOULD BE CALCULATED NOTE AFTER STEP 6.3.6		THE OPERATOR SHOULD CALCULATE THE QPTR, AS A MINIMUM, TO TWO (2) SIGNIFICANT DIGITS TO THE RIGHT OF THE DECIMAL POINT	S U Comments:
15* RECORD THE POWER TILT RATIO FOR EACH UPPER CHANNEL STEP 6.3.6	THE QPTR SHOULD CALCULATE OUT TO THE FOLLOWING VALUES: N41 = 0.88 N42 = 1.04 N43 = 1.03 N44 = 1.04 NOTE: TOLERANCE OF ± 0.01 ON EACH CALCULATION	OPERATOR SHOULD RECORD THE POWER TILT RATIO FOR EACH UPPER CHANNEL IN ATTACHMENT 2 UNDER STEP 6.3.6	S U Comments:
16* DIVIDE THE LOWER NORMALIZED DETECTOR CURRENT BY THE LOWER NORMALIZED DETECTOR CURRENT AVERAGE TO OBTAIN THE POWER TILT RATIO FOR EACH LOWER CHANNEL STEP 6.3.7		OPERATOR SHOULD DIVIDE THE LOWER NORMALIZED DETECTOR CURRENT BY THE LOWER NORMALIZED DETECTOR CURRENT AVERAGE TO OBTAIN THE POWER TILT RATIO FOR EACH LOWER CHANNEL	S U Comments:

* CRITICAL STEP

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE
17* THE QPTR SHOULD BE CALCULATED NOTE AFTER STEP 6.3.7		OPERATOR SHOULD CALCULATE THE QPTR, AS A MINIMUM, TO TWO (2) SIGNIFICANT DIGITS TO THE RIGHT OF THE DECIMAL POINT	S U Comments:
18* RECORD THE POWER TILT RATIO FOR EACH LOWER POWER RANGE CHANNEL STEP 6.3.7	THE QPTR SHOULD CALCULATE OUT TO THE FOLLOWING VALUES: N41 = 0.88 N42 = 1.04 N43 = 1.04 N44 = 1.04 NOTE: TOLERANCE OF ± 0.01 ON EACH CALCULATION	OPERATOR SHOULD RECORD THE POWER TILT RATIO FOR EACH LOWER CHANNEL IN ATTACHMENT 2 UNDER STEP 6.3.7	S U Comments:
19.	THE JPM IS COMPLETE <u>RECORD STOP TIME</u> <u>ON PAGE 1</u>		S U Comments:

* CRITICAL STEP

Read to Performer: I will explain the initial conditions, which steps to simulate or discuss, and provide initiating and subsequent cues. You may use any approved reference materials normally available to you. Make all written reports, oral reports, and log entries as if the evolution was actually being performed. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions: CALLAWAY PLANT WAS AT BOL, 80% POWER WITH THE AXIAL FLUX DIFFERENCE EQUAL TO -5%, WHEN SHUTDOWN BANK CONTROL ROD P4 DROPPED DUE TO A FAILURE OF THE STATIONARY GRIPPER COIL FUSE. CONTROL ROOM ANNUNCIATORS 79C, 78B, AND 78C ARE IN ALARM. ALL POWER RANGE NUCLEAR INSTRUMENTS ARE OPERABLE. THE NSSS COMPUTER IS BEING WORKED ON AT THIS TIME. THE CONTROL ROOM PC IS NOT AVAILABLE.

Initiating Cues: THE OPERATING SUPERVISOR HAS DIRECTED YOU TO PERFORM A QPTR CALCULATION USING NI DETECTOR CURRENTS PER OSP-SE-00003, SECTION 6.3.

STEP 6.3.1

SE054 DETECTOR
CURRENT READINGS

	N41	N42	N43	N44
Upper	114.8	130.8	131.6	129.9
Lower	137.8	162.0	153.6	148.5

STEP 6.3.2

100% POWER LEVEL
DETECTOR CURRENTS
(BOL, 0% AFD)

	N41	N42	N43	N44
Upper	174.65	168.83	171.38	168.73
Lower	208.68	207.89	198.39	191.81

PERSON COMPLETINGINITIALS

1st Check _____

DATE STARTED _____

2nd Check _____

DATE COMPLETED _____

QUADRANT POWER TILT RATIO CALCULATION						
	STEP	CHANNEL	N41	N42	N43	N44
U	6.3.1	DETECTOR CURRENT	114.8	130.8	131.6	129.9
P	6.3.2	100% DETECTOR CURRENT	174.65	168.83	171.38	168.73
E	6.3.3	NORMALIZED DETECTOR CURRENT	0.657	0.775	0.768	0.770
R	6.3.4	NORMALIZED CURRENT AVERAGE	0.743	0.743	0.743	0.743
	6.3.6	POWER TILT RATIO	0.88	1.04	1.03	1.04

	STEP	CHANNEL	N41	N42	N43	N44
L	6.3.1	DETECTOR CURRENT	137.8	162.0	153.6	148.5
O	6.3.2	100% DETECTOR CURRENT	208.68	207.89	198.39	191.81
W	6.3.3	NORMALIZED DETECTOR CURRENT	0.660	0.779	0.774	0.774
E	6.3.5	NORMALIZED CURRENT AVERAGE	0.747	0.747	0.747	0.747
R	6.3.7	POWER TILT RATIO	0.88	1.04	1.04	1.04

NOTE: Read detector current to the nearest microamp.

STEP 6.3.1

SE054 DETECTOR
CURRENT READINGS

	N41	N42	N43	N44
Upper	114.8	130.8	131.6	129.9
Lower	137.8	162.0	153.6	148.5

STEP 6.3.2

100% POWER LEVEL
DETECTOR CURRENTS
(BOL, 0% AFD)

	N41	N42	N43	N44
Upper	174.65	168.83	171.38	168.73
Lower	208.68	207.89	198.39	191.81

A2 Question #1 Surveillance Procedures

KA #194001A108

OBJ: 003AA3F2

REFERENCE: OSP-SE-00004, NIS Power Range Heat Balance

REFERENCE USE

Use the provided Calorimetric computer printout and procedure OSP-SE-00004, NIS Power Range Heat Balance, to answer the following.

Do the Excore Power Range Nuclear Instruments require gain adjustments? If so, which one(s) and for what reason(s)?

ANSWER:

(1/4 credit each)

- Yes
- N41
- N43
- indicated power is less than calculated power

CALLAWAY NUCLEAR POWER RANGE CHANNEL
CALORIMETRIC CALCULATION SUMMARY
REAL TIME

PAGE 1 OF 21
CAL TIME 12:22
CAL DATE 1/11/97

TOTAL CORE THERMAL POWER	VALUE	ENG. U.
STEAM GENERATOR THERMAL POWER - LOOP 1	2444.421	MBTU/HR
- LOOP 2	2444.440	MBTU/HR
- LOOP 3	2445.147	MBTU/HR
- LOOP 4	2447.558	MBTU/HR
- TOTAL	9781.567	MBTU/HR
TOTAL CORE THERMAL POWER (C/P)	2852.10	MW
CALCULATED CORE THERMAL POWER	80.00	% POWER
AVERAGE OF NIS READINGS	79.94	% POWER

SUMMARY OF POWER INDICATIONS	VALUE	CAL - DT
AVE OF RCS LOOP DELTA T POWER	81.02	-1.00
	VALUE	CAL - NIS
NUCLEAR POWER RANGE CHANNEL N41 Q	79.42	0.58
NUCLEAR POWER RANGE CHANNEL N42 Q	80.28	-0.26
NUCLEAR POWER RANGE CHANNEL N43 Q	79.63	0.38
NUCLEAR POWER RANGE CHANNEL N44 Q	80.35	-0.34

USER SELECTED CALCULATION OPTIONS	LOOP 1	LOOP 2	LOOP 3	LOOP 4
FEEDWATER FLOW OPTION	1	1	1	1
STEAM FLOW OPTION	1	1	1	1
BLOWDOWN FLOW OPTION	1	1	1	1
STEAM GEN. PRESSURE OPTION	1	1	1	1
FEEDWATER TEMP. OPTION	1	1	1	1

FEED/STEAM OPTION - 1

A2 Question #2 Locked Components

KA #194001A106

OBJ: 003A06A2

REFERENCE: M22KD01

ODP-ZZ-00004, Section 5

REFERENCE USE

With the plant in MODE 1, plant helpers call Control Room and request valve KDV0037 Potable Water to DG Room be opened for use of potable water for cleaning.

What is your responsibility as a Control Room Supervisor to allow valve operation?

ANSWER:

- 1) Direct EO to open valve. (50%)
- 2) Place KDV0037 in locked valve deviation list. (50%)

A3 Question #1 Knowledge of Significant Radiation Hazards

KA #194001K103

OBJ: 003A31FC

REFERENCE: HTP-ZZ-06001, "High Radiation/V-ry High Radiation Access"

REFERENCE USE

The Callaway Plant is in a Refueling Outage with core offload in progress (Thimble Tubes Retracted). Two I&C Technicians come to the Control Room and request you (the Control Room Supervisor) to authorize them to enter the In-Core Instrument Tunnel to calibrate the sump level transmitter.

Using plant procedures, explain the requirements for entry or the reason that entry should be denied.

ANSWER:

Deny access because the area is a VHRA with the In-Core Thimbles retracted (pg. 1). No entry to VHRA (pg. 7) (and Att. 2).

A3 Question #2 Knowledge of Significant Radiation Hazards

KA #194001K103

OBJ: 003A31E9

REFERENCE: APA-ZZ-01000

MEMORY

During a plant emergency, entry into the North piping penetration room is required to stop an offsite release. The general area radiation levels are 15 REM/hr, and a 30 minutes stay time is anticipated.

With no prior dose, which Federal dose limit may be exceeded and whose authorization is needed?

ANSWER:

1. Annual Federal Limit of 5 REM/yr. (50%)
2. Senior Vice President Nuclear
Vice President Nuclear (Any one 50%)
Emergency Coordinator
Recovery Manager
EDO - Emergency Duty Officer

A4 - JPM Emergency Action Levels

KA #194001A116

OBJ: 003D010C

REFERENCE: EIP-ZZ-00101, Classification of Emergencies

REFERENCE USE

Perform JPM SRO-ERI02PAC50J(TC) for Emergency Event Classification.

CALLAWAY PLANT

JOB PERFORMANCE MEASURE

JPM NO: SRO-ER102PAC50J(TC) KSA NO: 194001A116
U.E. RATING: REQ KSA RATING: 3.1/4.4
JOB TITLE: SRO REVISION: 960718
DUTY: RERP IMPLEMENTATION
TASK TITLE: EMERGENCY EVENT CLASSIFICATION
COMPLETION TIME: 15 MINUTES

The performance of this task was evaluated against the standards contained in this JPM and determined to be:

☐ SATISFACTORY ☐ UNSATISFACTORY

Reason, if UNSATISFACTORY:

EVALUATORS SIGNATURE: _____ DATE: _____

TASK PERFORMER: _____

LOCATION OF PERFORMANCE:

CONTROL ROOM X SIMULATOR/LAB X PLANT X CLASSROOM X

METHOD OF PERFORMANCE: SIMULATED _____ PERFORMED X

REFERENCES: EIP-ZZ-00101, CLASSIFICATION OF EMERGENCIES, REVISION 19

TOOLS/EQUIPMENT:

PREPARED BY: _____ DATE: _____

REVIEWED BY: _____ DATE: _____
STS/SS

APPROVED BY: _____ DATE: _____
DEPARTMENT HEAD

Read to Performer: I will explain the initial conditions, which steps to simulate or discuss, and provide initiating and subsequent cues. You may use any approved reference materials normally available to you. Make all written reports, oral reports, and log entries as if the evolution was actually being performed. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions: WHILE AT 100% POWER, THE MAIN TURBINE TRIPPED DUE TO HIGH MSR LEVEL, BUT THE REACTOR DID NOT TRIP. A MANUAL TRIP FROM RL003 OR RL006 WAS NOT SUCCESSFUL. THE REACTOR OPERATOR WAS ABLE TO INSERT THE CONTROL RODS AND BRING THE REACTOR SUBCRITICAL PER FR-S.1, RESPONSE TO NUCLEAR POWER GENERATION. NO OTHER EMERGENCY EVENTS ARE IN PROGRESS.

Initiating Cues: YOU ARE THE SHIFT SUPERVISOR AND NEED TO DETERMINE THE EMERGENCY EVENT CLASSIFICATION REQUIRED PER EIP-ZZ-00101.

ASK IF THE OPERATOR UNDERSTANDS THE INITIATING CUES.

Notes: THIS JPM IS TIME CRITICAL WITHIN 15 MINUTES.

Task Standard: UPON COMPLETION OF THIS JPM, THE OPERATOR WILL HAVE DECLARED A SITE EMERGENCY DUE TO FAILURE OF THE REACTOR PROTECTION SYSTEM GROUP 4 REACTOR PROTECTION SYSTEM.

START TIME: _____

STOP TIME: _____

TASK NUMBER - ELEMENT	CUE	STANDARD	SCORE
1. OBTAIN A COPY OF EIP-ZZ-00101, CLASSIFICATION OF EMERGENCIES		OPERATOR SHOULD OBTAIN PROCEDURE COPY	S U Comments:
2* DECLARE A SITE EMERGENCY		OPERATOR SHOULD DECLARE A SITE EMERGENCY DUE TO FAILURE OF REACTOR PROTECTION SYSTEM GROUP 4.S.	S U Comments:
3.	THE JPM IS COMPLETE <u>RECORD STOP TIME</u> <u>ON PAGE 1</u>		S U Comments:

* CRITICAL STEP

Read to Performer: I will explain the initial conditions, which steps to simulate or discuss, and provide initiating and subsequent cues. You may use any approved reference materials normally available to you. Make all written reports, oral reports, and log entries as if the evolution was actually being performed. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions: WHILE AT 100% POWER, THE MAIN TURBINE TRIPPED DUE TO HIGH MSR LEVEL, BUT THE REACTOR DID NOT TRIP. A MANUAL TRIP FROM RL003 OR RL006 WAS NOT SUCCESSFUL. THE REACTOR OPERATOR WAS ABLE TO INSERT THE CONTROL RODS AND BRING THE REACTOR SUBCRITICAL PER FR-S.1, RESPONSE TO NUCLEAR POWER GENERATION. NO OTHER EMERGENCY EVENTS ARE IN PROGRESS.

Initiating Cues: YOU ARE THE SHIFT SUPERVISOR AND NEED TO DETERMINE THE EMERGENCY EVENT CLASSIFICATION REQUIRED PER EIP-ZZ-00101.

CHIEF EXAMINER ADMIN SECTION COMMENTS - CALLAWAY 2/24/97 EXAM

Legend: Q - Question, M - no reference allowed, R - reference allowed, K - knowledge level question, A - comprehension/analysis level question, CS - critical steps, D - difficulty level on a scale of 1-5.

RO TEST

A1.Q1 M/K: Easy, but required knowledge.

A1.Q2 R/A

A1.JPM D - 2.5 CS - 13

Place note on outline to perform with plant JPMs on Thursday. Need to justify accuracy of answer to 0.1. It may be possible to perform the calculation incorrectly and still meet accuracy requirement. Resolution: Changed accuracy requirement to 0.01.

A2.Q1 R/A A2.Q2 R/A

A3.Q1 M/K: Replace. Too easy. Resolution: Replaced. A3.Q2 M/K: Immediate action.

A4.Q1 M/K: Immediate action. Can this knowledge be justified for RO? Resolution: Rewrote.

A4.Q2 M/K: Same comments as A4.Q1. I suggest that more appropriate questions be developed for the RO test. Resolution: Rewrote.

SRO TEST

A1.Q1 M/K: Need to justify why this is memory knowledge. Resolution: Required to know from memory.

A1.Q2 M/K: Can CRS leave control room before turnover to FS? Yes. Shift supervisor may assume duties.

A1.JPM: CS - 13 D - 2.5 Place note on outline to perform with plant JPMs on Thursday. Resolution: Done.

A2.Q1 R/A A2.Q2 R/K

A3.Q1 R/A Thimble tubes retracted is a cue. Should they not be retracted during offload. Give cue only if asked. Resolution: Incorporated.

A3.Q2 M/K

A4.JPM CS - 1 D - 2.0

Above comments were resolved by Callaway on 2/10/97.

Attachment 7

KA Cross-Reference

WRITTEN EXAM QUESTIONS BY KA NUMBER

000001K103	RO #87	
000001K302		SRO #75
000003G07		SRO #76
000005K301	RO #65	SRO #58
000007K203	RO #93	
000007A103		SRO #92
000008A106	RO #81	SRO #82
000009K324	RO #82	SRO #83
000011G11	RO #83	
000011A114		SRO #77
000011G007		SRO #78
000015A210	RO #75	
000015A210		SRO #74
000022A101	RO #90	SRO #84
000022A201		SRO #97
000024A204		SRO #79
000024G10	RO #80	SRO #59
000025G10	RO #91	SRO #85
000026K302	RO #77	SRO #60
000027A101	RO #74	SRO #86
000028A201	RO #98	SRO #98
000029K312	RO #86	SRO #61
000029G11		SRO #80
000032G11	RO #96	SRO #88
000033A202	RO #95	SRO #87
000036K101		SRO #100
000037A212	RO #89	
000037G05		SRO #93
000038K306	RO #85	SRO #90
000038A132	RO #84	SRO #89
000040K101	RO #70	SRO #63
000040E103	RO #66	SRO #52
000051A202	RO #73	SRO #64
000054G09	RO #88	
000054K102		SRO #94
000055K101	RO #67	SRO #65
000055K302	RO #68	SRO #66
000056K302	RO #99	SRO #99
000057A101		SRO #81
000057A219	RO #79	SRO #67
000058A103	RO #92	
000058A201		SRO #95
000059A201	RO #97	SRO #68
000061G09	RO #94	SRO #91
000065G10	RO #100	
000065A206		SRO #96
000067K304	RO #71	SRO #69
000068K201	RO #72	SRO #70
000069A202	RO #78	SRO #71
000074A101	RO #69	SRO #72
000076G008	RO #76	SRO #73
001000K402	RO #16	
001000GK04	RO #22	SRO #30
001000K202	RO #15	SRO #18

WRITTEN EXAM QUESTIONS BY KA NUMBER

001010K521	RO #14	SRO #19
002000K509	RO #39	SRO #37
003000A107	RO #17	
003000G10	RO #18	SRO #20
004000K601	RO #19	SRO #21
004000K202	RO #20	SRO #22
005000A202	RO #62	
006000K603	RO #43	SRO #38
007000A201	RO #58	SRO #54
008010A301	RO #61	
008010A303		SRO #57
010000K102	RO #51	
010000K403		SRO #51
011000A203	RO #40	SRO #39
012000K603	RO #53	SRO #41
012000A403	RO #54	SRO #40
013000K502	RO #23	SRO #24
013000K403	RO #21	SRO #25
013000A201	RO #24	SRO #23
014000A203	RO #55	
015000K402	RO #26	
015000A303	RO #25	SRO #26
017020A402	RO #27	SRO #27
022000A101	RO #28	SRO #29
022000A301	RO #29	SRO #28
026000K401	RO #44	
026000A301		SRO #35
028000K501	RO #63	SRO #42
029000K103	RO #45	SRO #43
033000G11	RO #41	SRO #44
035010K301	RO #37	
035010K601		SRO #52
039000A404	RO #38	SRO #45
041020K418	RO #57	SRO #55
045000A401	RO #59	
056020G10	RO #30	
059000K104	RO #31	
059000K302	RO #32	
061000K501	RO #33	SRO #33
061000A104	RO #34	SRO #31
061000A303	RO #35	SRO #32
062000K201	RO #48	
062000G008		SRO #53
063000K302	RO #52	
063000K402		SRO #36
064000A307	RO #50	SRO #46
064050G07	RO #49	
072000K302	RO #36	SRO #34
073000K101	RO #56	SRO #47
075000A401	RO #42	SRO #48
076000K119	RO #60	
078000K302	RO #64	SRO #56
079000K101	RO #46	SRO #49
086000A402	RO #47	SRO #50

WRITTEN EXAM QUESTIONS BY KA NUMBER

194001A116	RO #13	
194001A103	RO #7	
194001A115	RO #12	SRO #11
194001K107	RO #4	SRO #4
194001K101	RO #1	SRO #1
194001A105	RO #8	SRO #7
194001K113		SRO #15
194001K102	RO #2	SRO #2
194001A116		SRO #13
194001K103	RO #3	SRO #3
194001A106	RO #9	SRO #8
194001K105		SRO #14
194001K116	RO #5	SRO #5
194001A108	RO #10	SRO #9
194001A116		SRO #17
194001A102	RO #6	SRO #6
194001A103		SRO #12
194001A101		SRO #16
194001A113	RO #11	SRO #10

SRO SORT BY SRO QUESTION NUMBER

SRO #1	Question #007	SRO #51	Question #008
SRO #2	Question #027	SRO #52	Question #032
SRO #3	Question #036	SRO #53	Question #045
SRO #4	Question #004	SRO #54	Question #052
SRO #5	Question #060	SRO #55	Question #022
SRO #6	Question #071	SRO #56	Question #057
SRO #7	Question #021	SRO #57	Question #082
SRO #8	Question #044	SRO #58	Question #093
SRO #9	Question #066	SRO #59	Question #087
SRO #10	Question #094	SRO #60	Question #076
SRO #11	Question #003	SRO #61	Question #019
SRO #12	Question #086	SRO #62	Question #084
SRO #13	Question #033	SRO #63	Question #042
SRO #14	Question #049	SRO #64	Question #085
SRO #15	Question #025	SRO #65	Question #039
SRO #16	Question #088	SRO #66	Question #063
SRO #17	Question #070	SRO #67	Question #092
SRO #18	Question #091	SRO #68	Question #055
SRO #19	Question #080	SRO #69	Question #009
SRO #20	Question #048	SRO #70	Question #068
SRO #21	Question #001	SRO #71	Question #098
SRO #22	Question #026	SRO #72	Question #090
SRO #23	Question #047	SRO #73	Question #029
SRO #24	Question #011	SRO #74	Question #014
SRO #25	Question #034	SRO #75	Question #097
SRO #26	Question #079	SRO #76	Question #037
SRO #27	Question #017	SRO #77	Question #013
SRO #28	Question #074	SRO #78	Question #067
SRO #29	Question #065	SRO #79	Question #035
SRO #30	Question #054	SRO #80	Question #046
SRO #31	Question #043	SRO #81	Question #075
SRO #32	Question #053	SRO #82	Question #073
SRO #33	Question #006	SRO #83	Question #056
SRO #34	Question #015	SRO #84	Question #051
SRO #35	Question #059	SRO #85	Question #077
SRO #36	Question #016	SRO #86	Question #062
SRO #37	Question #024	SRO #87	Question #023
SRO #38	Question #020	SRO #88	Question #005
SRO #39	Question #028	SRO #89	Question #095
SRO #40	Question #069	SRO #90	Question #031
SRO #41	Question #064	SRO #91	Question #018
SRO #42	Question #012	SRO #92	Question #010
SRO #43	Question #081	SRO #93	Question #038
SRO #44	Question #002	SRO #94	Question #050
SRO #45	Question #061	SRO #95	Question #089
SRO #46	Question #041	SRO #96	Question #099
SRO #47	Question #083	SRO #97	Question #096
SRO #48	Question #072	SRO #98	Question #030
SRO #49	Question #100	SRO #99	Question #040
SRO #50	Question #058	SRO #100	Question #078

SRO SORT BY TEST QUESTION NUMBER

Question #001	SRO #21	Question #051	SRO #84
Question #002	SRO #44	Question #052	SRO #54
Question #003	SRO #11	Question #053	SRO #32
Question #004	SRO #4	Question #054	SRO #30
Question #005	SRO #88	Question #055	SRO #68
Question #006	SRO #33	Question #056	SRO #83
Question #007	SRO #1	Question #057	SRO #56
Question #008	SRO #51	Question #058	SRO #50
Question #009	SRO #69	Question #059	SRO #35
Question #010	SRO #92	Question #060	SRO #5
Question #011	SRO #24	Question #061	SRO #45
Question #012	SRO #42	Question #062	SRO #86
Question #013	SRO #77	Question #063	SRO #66
Question #014	SRO #74	Question #064	SRO #41
Question #015	SRO #34	Question #065	SRO #29
Question #016	SRO #36	Question #066	SRO #9
Question #017	SRO #27	Question #067	SRO #78
Question #018	SRO #91	Question #068	SRO #70
Question #019	SRO #61	Question #069	SRO #40
Question #020	SRO #38	Question #070	SRO #17
Question #021	SRO #7	Question #071	SRO #6
Question #022	SRO #55	Question #072	SRO #48
Question #023	SRO #87	Question #073	SRO #82
Question #024	SRO #37	Question #074	SRO #28
Question #025	SRO #15	Question #075	SRO #81
Question #026	SRO #22	Question #076	SRO #60
Question #027	SRO #2	Question #077	SRO #85
Question #028	SRO #39	Question #078	SRO #100
Question #029	SRO #73	Question #079	SRO #26
Question #030	SRO #98	Question #080	SRO #19
Question #031	SRO #90	Question #081	SRO #43
Question #032	SRO #52	Question #082	SRO #57
Question #033	SRO #13	Question #083	SRO #47
Question #034	SRO #25	Question #084	SRO #62
Question #035	SRO #79	Question #085	SRO #64
Question #036	SRO #3	Question #086	SRO #12
Question #037	SRO #76	Question #087	SRO #59
Question #038	SRO #93	Question #088	SRO #16
Question #039	SRO #65	Question #089	SRO #95
Question #040	SRO #99	Question #090	SRO #72
Question #041	SRO #46	Question #091	SRO #18
Question #042	SRO #63	Question #092	SRO #67
Question #043	SRO #31	Question #093	SRO #58
Question #044	SRO #8	Question #094	SRO #10
Question #045	SRO #53	Question #095	SRO #89
Question #046	SRO #80	Question #096	SRO #97
Question #047	SRO #23	Question #097	SRO #75
Question #048	SRO #20	Question #098	SRO #71
Question #049	SRO #14	Question #099	SRO #96
Question #050	SRO #94	Question #100	SRO #49

RO SORT BY RO QUESTION NUMBER

RO #1	Question #007	RO #51	Question #078
RO #2	Question #027	RO #52	Question #037
RO #3	Question #036	RO #53	Question #064
RO #4	Question #004	RO #54	Question #069
RO #5	Question #060	RO #55	Question #032
RO #6	Question #071	RO #56	Question #083
RO #7	Question #049	RO #57	Question #022
RO #8	Question #021	RO #58	Question #052
RO #9	Question #044	RO #59	Question #086
RO #10	Question #066	RO #60	Question #025
RO #11	Question #094	RO #61	Question #045
RO #12	Question #003	RO #62	Question #075
RO #13	Question #014	RO #63	Question #012
RO #14	Question #080	RO #64	Question #057
RO #15	Question #091	RO #65	Question #093
RO #16	Question #082	RO #66	Question #084
RO #17	Question #099	RO #67	Question #039
RO #18	Question #048	RO #68	Question #063
RO #19	Question #001	RO #69	Question #090
RO #20	Question #026	RO #70	Question #042
RO #21	Question #034	RO #71	Question #009
RO #22	Question #054	RO #72	Question #068
RO #23	Question #011	RO #73	Question #085
RO #24	Question #047	RO #74	Question #062
RO #25	Question #079	RO #75	Question #008
RO #26	Question #070	RO #76	Question #029
RO #27	Question #017	RO #77	Question #076
RO #28	Question #065	RO #78	Question #098
RO #29	Question #074	RO #79	Question #092
RO #30	Question #038	RO #80	Question #087
RO #31	Question #046	RO #81	Question #073
RO #32	Question #059	RO #82	Question #056
RO #33	Question #006	RO #83	Question #088
RO #34	Question #043	RO #84	Question #095
RO #35	Question #053	RO #85	Question #031
RO #36	Question #015	RO #86	Question #019
RO #37	Question #033	RO #87	Question #013
RO #38	Question #061	RO #88	Question #096
RO #39	Question #024	RO #89	Question #089
RO #40	Question #028	RO #90	Question #051
RO #41	Question #002	RO #91	Question #077
RO #42	Question #072	RO #92	Question #097
RO #43	Question #020	RO #93	Question #067
RO #44	Question #010	RO #94	Question #018
RO #45	Question #081	RO #95	Question #023
RO #46	Question #100	RO #96	Question #005
RO #47	Question #058	RO #97	Question #055
RO #48	Question #016	RO #98	Question #030
RO #49	Question #050	RO #99	Question #040
RO #50	Question #041	RO #100	Question #035

RO SORT BY TEST QUESTION NUMBER

Question #001	RO #19	Question #051	RO #90
Question #002	RO #41	Question #052	RO #58
Question #003	RO #12	Question #053	RO #35
Question #004	RO #4	Question #054	RO #22
Question #005	RO #96	Question #055	RO #97
Question #006	RO #33	Question #056	RO #82
Question #007	RO #1	Question #057	RO #64
Question #008	RO #75	Question #058	RO #17
Question #009	RO #71	Question #059	RO #32
Question #010	RO #44	Question #060	RO #5
Question #011	RO #23	Question #061	RO #38
Question #012	RO #63	Question #062	RO #74
Question #013	RO #87	Question #063	RO #68
Question #014	RO #13	Question #064	RO #53
Question #015	RO #36	Question #065	RO #28
Question #016	RO #48	Question #066	RO #10
Question #017	RO #27	Question #067	RO #93
Question #018	RO #94	Question #068	RO #72
Question #019	RO #86	Question #069	RO #54
Question #020	RO #43	Question #070	RO #26
Question #021	RO #8	Question #071	RO #6
Question #022	RO #57	Question #072	RO #42
Question #023	RO #95	Question #073	RO #81
Question #024	RO #39	Question #074	RO #29
Question #025	RO #60	Question #075	RO #62
Question #026	RO #20	Question #076	RO #77
Question #027	RO #2	Question #077	RO #91
Question #028	RO #40	Question #078	RO #51
Question #029	RO #76	Question #079	RO #25
Question #030	RO #98	Question #080	RO #14
Question #031	RO #85	Question #081	RO #45
Question #032	RO #55	Question #082	RO #16
Question #033	RO #37	Question #083	RO #56
Question #034	RO #21	Question #084	RO #66
Question #035	RO #100	Question #085	RO #73
Question #036	RO #3	Question #086	RO #59
Question #037	RO #52	Question #087	RO #80
Question #038	RO #30	Question #088	RO #83
Question #039	RO #67	Question #089	RO #89
Question #040	RO #99	Question #090	RO #69
Question #041	RO #50	Question #091	RO #15
Question #042	RO #70	Question #092	RO #79
Question #043	RO #34	Question #093	RO #65
Question #044	RO #9	Question #094	RO #11
Question #045	RO #61	Question #095	RO #84
Question #046	RO #31	Question #096	RO #88
Question #047	RO #24	Question #097	RO #92
Question #048	RO #18	Question #098	RO #78
Question #049	RO #7	Question #099	RO #17
Question #050	RO #49	Question #100	RO #46

Callaway Plant Exam Bank

<u>Questions Used</u>	<u>RO #</u>	<u>SRO #</u>	<u>NRC Exam Question #</u>
#0110140D	100		35
#0110270C	54	40	69
#0110350C	47	50	58
#0110360G	36	34	15

Attachment 8

Operating Test KA Overlap Check

Scenario Events

1G	000011A113 (4.1/4.2)
1F	000011K312 (4.4/4.6)
1B	000015A123 (3.1/3.2)
2B	000028A101 (3.8/3.9)
2E	001050A201 (3.7/3.9)
B/U B	004010A402 (3.6/3.1)
2A	004010A404 (3.8/3.4)
B/U A	004020A305 (3.2/3.0)
1H	006020A402 (3.9/3.8)
1D	010000A203 (4.1/4.2)
B/U G	010000A403 (4.0/3.0)
2C	035010A203 (3.4/3.6)
B/U C	035010A204 (3.6/3.8)
1C	035010K401 (3.6/3.8)
2D	038027A101 (4.0/3.9)
2F	038038A101 (4.5/4.4)
B/U D	041020A405 (3.1/3.3)
2H	045006A306 (3.9/4.2)
1E	045010A301 (3.5/3.6)
2G	045061A204 (3.4/3.8)
B/U F	059000A207 (3.0/3.3)
B/U E	059000K416 (3.1/3.2)
1A	076000A404 (3.5/3.5)

JPM'S

000022A108 (3.4/3.3)	JPM 8Q2
000024EA120	JPM 1
000024G05 (3.4/3.6)	JPM 1Q2
000024K302 (4.2/4.4)	JPM 1Q1
000054K102 (3.6/4.2)	JPM 3Q1
000057A102 (3.8/3.7)	JPM 2Q2
000057EA101	JPM 2
000057K301 (4.1/4.4)	JPM 2Q1
000068A112 (4.4/4.4)	JPM 5Q1
000068A132	JPM 5
000068K312 (4.1/4.5)	JPM 5Q2
004000A206	JPM 8
005000K407 (3.2/3.5)	JPM 7Q1
005000K408 (3.1/3.5)	JPM 7Q2
006000K204 (3.6/3.8)	JPM 8Q1
008000A401	JPM 6
008000K401 (3.1/3.3)	JPM 6Q1
008030A304 (3.6/3.7)	JPM 6Q2
015000K501 (2.9/3.2)	JPM 10Q1
015000K506 (3.4/3.7)	JPM 10Q2
028000A401 (4.0/4.0)	JPM 4Q1
028000A403	JPM 4
028000G11 (2.9/3.5)	JPM 4Q2
038015A201	JPM 10
038054AA101	JPM 3
045005A401	JPM 7
045064A401	JPM 11
045073A402	JPM 9
059000K419 (3.2/3.4)	JPM 3Q2
064000K410 (3.5/4.0)	JPM 11Q2
064050G01 (3.6/3.8)	JPM 11Q1
073000A402 (3.7/3.7)	JPM 9Q1
073060K401 (4.0/4.3)	JPM 9Q2

Admin

194001A101	RO A1 Question #2
194001A102	RO A1 - JPM
194001A102	SRO A1 - JPM
194001A103	RO A1 Question #1
194001A103	SRO A1 Question #1
194001A106	SRO A2 Question #2
194001A108	SRO A2 Question #1
194001A111	SRO A1 Question #2
194001A113	RO A2 Question #1
194001A116	RO A4 Question #1
194001A116	RO A4 Question #2
194001A116	SRO A4 - JPM
194001K102	RO A2 Question #2
194001K103	RO A3 Question #2
194001K103	SRO A3 Question #1
194001K103	SRO A3 Question #2
194001K104	RO A3 Question #1