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MCGUIRE . JLY/AUGUST 2002

RETAKE EXAM NO. 50-369/2002-302

Senior Reactor Operator *Written* **Exam**

ELR 7/29/'02

PWR SRO Examination Outline ES-401-4 3

Facility: McGuire **Date of Exam: 7/29/02** **Exam Level: SRO**

Tier	Group	K/A Category Points K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	Point Total	Target
1 Emergency & Abnormal Plant Evolutions	1	4	2	5				3	8			2	24	24
	2	1	1	3				5	6			0	16	16
	3	0	0	1				1	1			0	3	3
	Tier Totals	5	3	9				9	15			2	43	43
2 Plant Systems	1	3	2	2	5	1	0	0	0	1	3	2	19	19
	2	1	0	2	0	1	2	4	3	2	1	1	17	17
	3	0	0	1	1	1	0	0	1	0	0	0	4	4
	Tier Totals	4	2	5	6	3	2	4	4	3	4	3	40	40
3	Generic Knowledge and Abilities				Cat 1: 4		Cat 2: 4		Cat 3: 5		Cat 4: 4		17	17

Totals

Notes: 1. Ensure that at least two topics from every K/A category are sampled within each tier (i.e., the "Tier Totals" in each WA category shall not be less than two).

2 The point total for each group and tier in the proposed outline must match that specified in the table. The final point total for each group and tier may deviate by ±1 from that specified in the table based on NRC revisions. The final exam must total 100 points.

3 Select topics from many systems; avoid selecting more than two or three K/A topics from a given system unless thep relate to plant-specific priorities.

4 Systems/evolutions within each yroup are identified on the associated outline.

5 The shaded areas are not applicable to the category/tier.

6* The generic K/As in Tiers 1 and 2 shall be selected from Section 2 of the K/A Catalog, but the topics must be relevant to the applicable evolution or system.

7 On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings for the SRO license level, and the point tatals for each system and category. K/As below 2.5 should be justified on the basis of plant-specific priorities. Enter the tier totals for each category in the table above.

[illegible] Form ES-401-1

[illegible]

E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	Imp.	Points	Qnum	Bank Question	Lesson Plan	NRC	Bank	Mod	New	Memory	Comp	Analysis
000001 Continuous Rod Withdrawal / I			3.02				Knowledge of the reasons for the following responses ... Tech Spec limits on rod operability	3.2/4.3	1	SRO Only	1004	0				1	1		
[illegible]							[illegible]	[illegible]	[illegible]	SRO Only	[illegible]					[illegible]	[illegible]		
000005 Inoperable/Stuck Control Rod / I					2.03		Ability to determine and interpret...Required actions if more than one rod is stuck or inoperable	2.5*/3.0*	1	SRO Only	995	0				1	1		
[illegible]					[illegible]		[illegible]	[illegible]	[illegible]	SRO Only	[illegible]			[illegible]			[illegible]		
EW/E04 LOCA Outside Containment / III						3.1	Ability to perform procedures to reduce excessive levels of radiation and guard against personnel exposure.	2.9/3.3	1	20 RO&SRO	1012	0			1			1	
W/E02 SI Termination / III	1.2						Knowledge of the operational implications of the following concepts ...Normal, abnormal and emergency operating procedures associated with (SI Termination).	3.4/3.9	1	SRO Only	1011	0			1				1
000015/17 RCP Malfunction / IV			3.01				Knowledge of the reasons for the following responses ...Potential damage from high winding and/or bearing temperatures	2.5/3.1	1	2 RO&SRO	959	0		1			1		
W/E09 Natural Circ. /IV		2.10					Knowledge of the interrelations between Component, and functions of control and safety sytems, including instrumentation, signals, interlocks....	2.8/3.8	1	3 RO&SRO	911.1	0		1			1		
000024 Emergency Boration /I						2.30	Knowledge of RO duties in the control room during fuel handling such as alarms from fuel handling area, communication with fuel storage facility, systems operated from the control room in support of fueling operations, and supporting instrumentation.	3.5/3.3	1	4 RO&SRO	960	0				1		1	
000026 Loss of Component Cooling Water / VIII				1.06			Ability to operate and/or monitor ...Control of flow rates to components cooled by the CCWS	2.9/2.9	1	5 RO&SRO	961	0				1		1	
[illegible]					[illegible]		[illegible]	[illegible]	[illegible]	SRO Only	[illegible]					[illegible]			
000040 Steam Line Rupture - Excessive Heat Transfer / IV			3.06				Knowledge of the reasons for the following responses ... Containment temperature and pressure considerations	3.4/3.9	1	7 RO&SRO	962	0				1			1
W/E08 RCS Overcooling - PTS / IV		2.1					Knowledge of the interrelationships between...Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual	3.2/3.4	1	8 RO&SRO	1020	0				1		1	
000051 Loss of Condenser Vacuum / IV	1.04						Knowledge of the interrelationships between...rod position	2.5*/2.5*	1	9 RO&SRO	963	0			1			1	
000055 Station Blackout / VI	1.01						Knowledge of the operational implications of the following concepts ...Effect of battery discharge rates on capacity	3.3/3.7	1	10 RO&SRO	906.1	0		1			1		
000057 Loss of Vital Ac Elec. Inst. Bus. / VI			3.01				Knowledge of the reasons for the following responses ... Actions contained in EOP for loss of vital ac electrical instrument bus	4.1/4.2	1	11 RO&SRO	964	0				1	1		
000059 Accidental Liquid Radwaste Rel. / IX				1.03			Ability to operate and/or monitor ...Flow rate controller	3.0*/2.9	1	30 RO&SRO	1008	0				1	1		
000062 Loss of Nuclear Service Water / IV				1.06			Knowledge of the operational implications of the following concepts ...Control of flow rates to components cooled by the SWS	2.9/2.9	1	12 RO&SRO	894.1	0		1				1	
000067 Plant Fire On-site / IX			3.02				Knowledge of the reasons for the following responces ...Steps called out in the site fire protection plan, FPS manual, and fire zone manual	2.5/3.3	1	RO &SRO	460.1	0		1			1		

000068 Control Room Evac. / VIII					2.11		Ability to determine and interpret... indications of natural circulation	4.3/4.4	1	SRO ONLY	968	0				1				1
[illegible]					[illegible]		[illegible]	[illegible]	[illegible]	SRO Only	[illegible]			[illegible]	[illegible]	[illegible]			[illegible]	
000074 (W/E06&E07) Inad. Core Cooling / IV	1.01						Knowledge of the operational implications of the following concepts ...Methods of calculating subcooling margin	4.3/4.7	1	SRO Only	93.1	0		1					1	
000076 High Reactor Coolant Activity / IX					2.03		Ability to determine and interpret...RCS radioactivity level meter	2.5/3.0	1	16 RO&SRO	307.1	0		1				1		
[illegible]					[illegible]		[illegible]	[illegible]	[illegible]	SRO Only	[illegible]			[illegible]	[illegible]	[illegible]			[illegible]	
K/A Category Totals:	4	1	5	3	8	3	Group Point Total:	24	24	10 SRO	6		0	11	3	10	11	10		3

24 Sampled
24 Target Sample

ES-401 Plant Wide Generic Topics Form ES-401-1

Emergency and Abnormal Plant Evolutions - Tier 1/Group 2

E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	Imp.	Points	Bank Question	Qnum	Lesson Plan	Source Information NRC	Bank	Mod	New	Memory	Comp	Analysis
000007 Reactor Trip - Stabilization - Recovery / I				1.06			Ability to operate and/or monitor ...Reactor trip (scram): verification that the control and safety rods are in after the trip	4.4/4.5	1	195.4	SRO Only	0		1			1		
000008 Pressurizer Vapor Space Accident / II							deselected					0					0	0	0
000009 Small Break LOCA / III			3.16				Knowledge of the reasons for the following responses ...Containment temperature, pressure, humidity and level limits	3.8/4.1	1	969	RO&SRO	0				1	1		
W/E03 LOCA Cooldown - Depress. / IV					2.1		Ability to determine and interpret...Facility conditions and selection of appropriate procedures during abnormal and emergency operations.	3.4/4.2	1	970.00	SRO Only	0				1			1
W/E11 Loss of Emergency Coolant Recirc / IV							deselected					0					0	0	0
000022 Loss of Reactor Coolant Makeup / II				1.01			Ability to operate and/or monitor ...CVCS letdown and charging	3.4/3.3	1	971	RO&SRO	0				1	1		
000025 Loss of RHR System / IV				1.01			Ability to operate and/or monitor ...RCS/RHRS cooldown rate	3.6/3.7	1	1010	RO&SRO	0				1			1
000027 Pressurizer Pressure Control System Malfunction / III					2.15		Ability to determine and interpret...Actions to be taken if PZR pressure instrument fails high	3.7/4.0	1	972	SRO Only	0		1			1		
000032 Loss of Source Range NI / VII			3.01				Knowledge of the reasons for the following responses ... Startup termination on source-range loss	3.2/3.6	1	512.1	RO&SRO	0		1					1
000033 Loss of Intermediate Range NI / VII							deselected					0							
000037 Steam Generator Tube Leak / III					2.07		Ability to determine and interpret...Flowpath for dilution of ejector exhaust air	3.1/3.6	1	1013	SRO Only	0				1			1
000038 Steam Generator Tube Rupture / III	1.02						Knowledge of the interrelationships between...Leak rate vs. pressure drop	3.2/3.5	1	1014	RO&SRO (???)	0				1			1
000054 Loss of Main Feedwater / IV			3.02				Knowledge of the reasons for the following responses ... Matching of feedwater and steam flows	3.4*/3.7*	1	965	RO&SRO	0				1			1
000055 Inadequate Heat Transfer - Loss of Secondary Heat Sink / IV					2.1		Ability to determine and interpret...Facility conditions and selection of appropriate procedures during abnormal and emergency operations.	3.2/3.9	1	967	SRO Only	0				1			1
000058 Loss of DC Power / VI					2.0		Ability to determine and interpret...125V dc bus voltage, low/critical low, alarm	3.3*/3.6	1	1015	RO&SRO	0				1			1
000060 Accidental Gaseous Radwaste Rel. / IX		2.01					Ability to operate and/or monitor ...ARM system, including the normal radiation-level indications and the operability status	2.6/2.9*	1	479.2	RO&SRO	0		1				1	
000061 ARM System Alarms / VII				1.01			Ability to operate and/or monitor ...	3.6/3.6	1	973	RO&SRO	0				1	1		
W/E16 High Containment Radiation / IX				1.10			Ability to operate and/or monitor ...Desired operating results during abnormal and emergency situations.	2.9/3.3	1	398.1	12 RO&SRO	0		1					1
000067 Plant Fire On Site / VIII					2.2		Ability to determine and interpret...Fire and other or non-emergency conditions on site	2.3/2.3		974.1	SRO Only							1	
K/A Category Totals:	1	1	3	5	5	0	Group Point Total:	16	16	3	8 SRO		0	6	0	10	5	2	9

Tier 1																						
													Bank			Source Information						
E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	Imp.	Points	Question	Qnum	Lesson Plan	NRC	Bank	Mod	New	Memory	Comp	Analysis
000028 Pressurizer Level Malfunction / II			3.04				Knowledge of the reasons for the following responses ... Change in PZR level with power change, even though RCS T-ave. constant, due to loop size difference	2.9*/3.0*	1	902.1	RO&SRO	0		1				1	
000036 Fuel Handling Accident / VIII				1.01			Ability to operate and/or monitor ...Reactor building containment purge ventilation system	3.3/3.6	1	859.2	RO&SRO	0		1				1	
000055 Loss of Off-site Power / VI							deselected					0					0	0	0
W/E 13 Steam Generator Over-pressure / IV							deselected					0					0	0	0
W/E 15 Containment Flooding / V					2.10		Ability to determine and interpret...Facility conditions and selection of appropriate procedures during abnormal and emergency operations.	2.7/3.2	1	891.2	RO&SRO	0		1			1		
K/A Category Totals:	0	0	1	1	1	0	Group Point Total:	5	3	1	0 SRO		0	3	0	0	1	2	0

System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	Imp.	Points	Qnum	Bank Question	Lesson Plan	Source Information NRC	Bank	Mod	New	Memory	Comp	Analysis
001 Control Rod Drive											2.24	Ability to analyze the affect of maintenance activities on LCO status.	2.6/3.8	1	SRO Only	1005	0				1		1	
003 Reactor Coolant Pump										4.05		Ability to manually operate and/or monitor in the control room...RCP seal leakage detection instrumentation	3.1/3.0	1	RO&SRO	977	0				1		1	
004 Chemical Volume Control				4.15								Knowledge of design feature(s) and/or interlock(s) which provide for...Interlocks associated with operation of orifice isolation valves	3.0*/3.4	1	RO&SRO	974	0				1	1		
013 Engineered Safety Features Actuation	1.03											Knowledge of physical connections and/or cause and effect relationships...CCS (coolant charging system)	3.8/4.1	1	RO&SRO	1016	0				1			1
014 Rod Position Indication										4.01		Ability to manually operate and/or monitor in the control room...Rod selection control	3.3/3.1	1	RO&SRO	306.1	0		1			1		
015 Nuclear Instrumentation					5.02							Knowledge of the following operational implications...Discriminator/compensation operation	2.7/2.9	1	RO&SRO	37.20	0		1				1	
017 In-core Temperature Monitor										4.01		Ability to manually operate and/or monitor in the control room...Actual in-core temperatures	3.3/4.1	1	RO&SRO	404.10	0		1			1		
022 Containment Cooling		2.01										Knowledge of the power supplies to the following: Containment Cooling Fans	3.0/3.3	1	RO&SRO	993.00	0				1	1		
025 Ice Condenser				4.02								Knowledge of design feature(s) and/or interlock(s) which provide for...System control	2.8*/3.0*	1	RO&SRO	661.1	0		1			1		
026 Containment Spray				4.07								Knowledge of design feature(s) and/or interlock(s) which provide for...Adequate level in containment sump for suction (interlock)	3.5*/4.1*	1	RO&SRO	975	0		1				1	
056 Condensate	1.03											Knowledge of physical connections and/or cause and effect relationships...MFW	2.6*/2.6	1	RO&SRO	415.2	0		1				1	
059 Main Feedwater									3.04			Ability to monitor automatic operation of the...Turbine driven feed pump	2.5*/2.6*	1	RO&SRO	978	0				1			1
061 Auxiliary/Emergency Feedwater				4.13								Knowledge of design feature(s) and/or interlock(s) which provide for...Initiation of cooling water and lube oil	2.7/2.9	1	RO&SRO	1007	0				1	1		
063 DC Electrical			3.01									Knowledge of the effect that a loss or malfunction ...will have on ...ED/G	3.7*/4.1	1	RO&SRO	987	0				1	1		
068 Liquid Rad Waste											4.31	Knowledge of annunciators alarms and indications, and use of the response ins	3.3/3.4	1	RO&SRO	407.10	0		1					1
071 Waste Gas Disposal	1.06											Knowledge of physical connections and/or cause and effect relationships...ARM and PRM systems	3.1*/3.1	1	RO&SRO	771.2	0		1				1	
072 Area Radiation Monitoring				4.02								Knowledge of design feature(s) and/or interlock(s) which provide for...Fuel building isolation	3.2*/3.4*	1	RO&SRO	976	0				1	1		
059 Main Feedwater			2.03									Knowledge of the effect that a loss or malfunction ...will have on ...S/Gs	3.5/3.7	1	RO&SRO	986	0				1		1	
013 Engineered Safety Features Actuation		2.01										Knowledge of the bus power supplies to the following ...ESFAS/Safeguards equipment control	3.6*/3.8	1	RO&SRO	990	0				1	1		
K/A Category Totals:	3	1	3	5	1	0	0	0	1	3	2	Group Point Total:	19	19	1 SRO	4		0	8	0	11	9	7	3

Facility	Form ES-401-2
Tier 2 Group 1	

System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	Imp.	Points	Qnum	Question	NRC	Bank	Mod	New	Memory	Comp	Analysis
002 Reactor Coolant							1.07					Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the...Reactor differential temperature	3.3/3.5	1	RO&SRO	1008				1			1
006 Emergency Core Cooling	1.13											Knowledge of physical connections and/or cause and effect relationships...CSS	2.9/3.3	1	RO&SRO	1009				1			1
010 Pressurizer Pressure Control					5.01							Knowledge of the following operational implications...Determination of condition of fluid in PZR, using steam tables	3.5/4.0	1	RO&SRO	311.1		1					1
011 Pressurizer Level Control			3.03									Knowledge of the effect that a loss or malfunction ...will have on ...PZR RCS	3.2/3.7	1	RO&SRO	980				1			1
012 Reactor Protection						6.10						Knowledge of the effect that a loss or malfunction will have on ...Permissive Circuits	3.3/3.6	1	RO&SRO	243.1					0	0	0
016 Non-nuclear Instrumentation						6.01						Knowledge of the effect that a loss or malfunction will have on ...Sensors and detectors	2.7/3.0	1	RO&SRO	1021				1			1
027 Containment Iodine Removal												deselected									0	0	0
028 Hydrogen Recombiner and Purge Control								2.03				Ability to predict the impacts of the following malfunction or operation...and based on those predictions, use procedures to correct, control or mitigate the consequences of...The hydrogen air concentration in excess of limit flame propagation or deteration with resulting equipment damage in containment	3.4/4.0	1	SRO Only	966				1	0	1	0
029 Containmoot Purge												Topic Deselected by L.E.M.		1							0	0	0
033 Spent Fuel Pool Cooling								2.02				Ability to predict the impacts of the following malfunctions or operations..Loss of SFPCS	2.8/3.3	1	SRO Only	892.2		1				1	
034 Fuel Handling Equipment							1.02					Ability to predict and/or monitor the impacts of the following malfunctions or operations..Water level in the refueling canal	2.9/3.7		RO&SRO	1017		1				1	
035 Steam Generator									4.06			Ability to manually operate and/or monitor in the control room: S/G isolation on steam leak or tube rutpure/leak	4.5/4.6	1	RO&SRO	1019				1		1	
039 Main and Reheat Steam									3.02			Ability to monitor automatic operation of the...Isolation of the MRSS	3.1/3.5	1	RO&SRO	951				1	1		
055 Condenser Air Removal			3.01									Knowledge of the effect that a loss or malfunction ...will have on ...Main condenser	2.5/2.7	1	RO&SRO	547.2		1			1		
062 AC Electrical Distribution										4.04		Knowledge of the effect that a loss or malfunction will have on ...Local operation of breakers	2.6/2.7	1	RO&SRO	988				1	1		
064 Emergency Diesel Generator								2.04				Ability to predict the impacts of the following malfunction or operation...and based on those predictions, use procedures to correct, control or mitigate the consequences of...Unloading prior to securing an ED/G	2.7/3.0	1	RO&SRO	983				1		1	
073 Process Radiation Monitoring							1.01					Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the...Radiation levels	3.2/3.5	1	RO&SRO	469.1		1					1
075 Circulating Water											1.28	Knowledge of the purpose and function of major system components and controls.	3.2/3.3	1	RO&SRO	1018				1		1	
079 Station Air												deselected											

086 Fire Protection								2.02			Ability to predict the impacts of the following malfunction or operation...and based on those predictions, use procedures to correct, control or mitigate the consequences of...Low FPS header pressure	3.0/3.3	1	RO&SRO	909				1	1		
103 Containment											deselected									0	0	0
K/A Category Totals:	1	0	2	0	1	2	4	3	2	1	1	Group Point Total:	19	17	2 SRO	4	0	5	0	11	4	5	6

21 SRO systems - 17 SRO K/As
20? RO K/As are imported
~~Randomly delete 3? SRO K/As - make RO only~~

17 Sampled
17 Target Sample

ES-301	2002 NRC Examination Outline																								
	Final Systems - Tier 2 Group 3																								
																					Sim	Plant Walkthrough			
System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	Imp.	Points	Qnum	Question	NRC	Bank	Mod	New	Memory	Comp	Analysis
005 Residual Heat Removal												deselected											
007 Pressurizer Relief/Quench Tank					5.02							Knowledge of the operational implication of the following concepts: Methods of forming a steam bubble in the PZR			RO&SRO	1002				1	1		
008 Component Cooling Water				4.02								Knowledge of design feature(s) and/or interlock(s) which provide for... Operation of the surge tank, including the associated valves and controls	2.9/2.7	1	RO&SRO	992				1	1		
041 Steam Dump/Turbine Bypass Control								2.03				Ability to predict the impacts of the following malfunction or operation ... and based on those predictions, use procedures to correct, control or mitigate the consequences of...Loss of IAS	2.8/3.1	1	SRO Only	979				1		1	
045 Main Turbine Generator												deselected											
076 Service Water			3.07									Knowledge of the following operational implications...ESF loads	3.7/3.9	1	RO&SRO	882.1		1			1		
079 Instrument Air												KA deselected by LSRO due to no operational validity		1									
K/A Category Totals:	0	1	1	1	0	0	0	1	0	0	0	Group Point Total:	5	4	1 SRO	1	0	1	0	2	3	1	0

[illegible]

Facility: Beaver Valley	Date of Exam: 8/2002		Exam Level: SRO											
						Bank	Lesson	Source Modification						
Category	K/A #	Topic	Imp.	Points	Qnum	Question	Plan	NRC	Bank	Mod	New	Memory	Comp	Analysis
Conduct of Operations	2.1.3	Knowledge of shift turnover practices.	3.0/3.4	1	RO&SRO	984	0				1	1		
	2.1.8	Ability to coordinate personnel activities outside the control room.	3.8/3.6	1	RO&SRO	994	0				1	1		
	2.1.21	Ability to obtain and verify controlled procedure copy.	3.1/3.2	1	RO&SRO	143.2	0		1			1		
	2.1.30	Knowledge of conditions and limitations in the facility license.	4.1/3.4	1	SRO Only	300					1	1		
	Total		4	4										
Equipment Control	2.2.11	Knowledge of the process for controlling temporary changes.	2.5/3.4*	1	RO&SRO	997	0				1	1		
	2.2.26	Knowledge of refueling administrative requirements.	2.5/3.7	1	SRO Only	447.1	0		1			1		
	2.2.33	Knowledge of control rod programming.	2.5/2.9	1	RO&SRO	996	0				1			1
	2.2.34	Knowledge of the process for making permanent plant changes.	2.5/2.9	1	SRO Only	300					1	1		
	Total		4	4										
Radiation Control	2.3.2	Knowledge of facility ALARA program.	2.5/2.9	1	RO&SRO	985	0				1		1	
	2.3.4	Knowledge of radiation exposure limits and contamination control, including permissible levels in excess of those authorized.	2.5/3.1	1	RO&SRO	353.1	0		1				1	
	2.3.9	Knowledge of the process for performing a containment purge.	2.5/3.4	1	RO&SRO	432.2	0		1			1		
	2.3.10	Ability to perform procedures to reduce excessive levels of radiation and guard against personnel exposure.	2.9/3.3	1	RO&SRO	125.1	0		1			1		
	2.3.6	Knowledge of the requirements for reviewing post accident release reports.	3.1/3.3	1	SRO Only	300					1	1		
	Total		5	5										
Emergency Procedures and Plan	2.4.15	Knowledge of communications procedures associated with EOP implementation.	3.0/3.5	1	RO&SRO	1003	0				1	1		
	2.4.18	Knowledge of the specific bases for EOPs.	2.7/3.6	1	RO&SRO	191.2	0		1				1	
	2.4.20	Knowledge of operational implications of EOP warnings, cautions, and notes.	3.3/4.0	1	RO&SRO	1000	0				1	1		
	2.4.4	Ability to recognize abnormal indications for system operating parameters which are entry conditions for emergency and abnormal operating procedures.	4.3/4.7	1	SRO Only	300					1			1
	Total		4	4										
		Tier 3 Point Total	17	17	5 SRO	1		0	6	0	11	12	3	2

Randomly select K/As that will be SRO only.

17 SRO K/As to be sampled - 13 will be imported from the RO generic section

1 Pt(s) The NCPs are limited to 3 consecutive starts in any 2-hour period. There is an additional requirement of a minimum idle period of 30 minutes between restarts. What is the reason for these limitations?

A. This restriction assures that the oil temperature will decrease to design specifications between restart attempts.

B. This restriction prevents overheating the motor windings due to high starting currents.

C. This restriction allows the NCP seals to fully reseat between NCP oil lift pump cycles.

D. This restriction ensures that natural circulation is reestablished between starts to prevent a cold-water addition accident.

1 Pt(s) Unit 1 is responding to a feed line break inside containment. Given the following events and conditions:

- Completed EP/1/A/5000/E-0 ***(Reactor Trip or** Safety Injection)*
- Entering EP/1/A/5000/E-1 *(Loss of Reactor or **Secondary** Coolant)*
- The STA reported the following valid Critical Safety Functions:
  - Subcriticality - yellow path
  - Containment Pressure - orange path
  - Heat Sink - orange path
  - All other CSFs are green or yellow

Which one of the following statements correctly describes the proper procedure flow path?

A. **Remain in E-B *(Loss of Reactor or Secondary Coolant)***

B. **Transition immediately to FR-S.2 *(Response to Loss of Core Shutdown)***

C. **Transition immediately to FR-Z.1 *(Response to High Containment Pressure)***

D. **Transition immediately to FR-H.1 *(Response to Loss of Secondary Heat Sink)***

1 Pt(s) Following a Small Break LQCA inside containment the following conditions exist:

- Containment Temperature is 145 degrees F.
- Containment Pressure is 3.2 psig
- Reactor Coolant temperature is 500 degrees F.
- Lower Containment humidity is 100%

Adverse Containment Conditions are determined by:

A. Calculating the containment saturation pressure.

B. The operator taking into account the containment temperature.

C. The operator through the use **of containment pressure.**

D. The saturation temperature of the Reactor Coolant System versus containment pressure.

I Pt(s)

Unit 2 has experienced a load rejection from 100% R.T.P. due to the trip of the "2A" FWPT. **As** a result of the transient the following conditions exist:

- Pressurizer level is greater than setpoint
- 2NV-238 ***(Charging Line Flow*** *Control)* is closing
- NC pump seal injection is <5 gpm per pump

Which one of the following statements correctly describes the required operator action to restore adequate and proper NC **pump** seal injection flowrate?

A. Open 2NV-241 *(Seal Inj. Flow Control)*

B. Close 2NV-241

C. Close 2NV-238 while opening 2NV-241.

D. Open 2NV-238 while opening 2NV-241.

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1 Pt(s) Which one of the following pre-planned activities that has been evaluated and approved in advance by Operations can take place during shift turnover?

A. Dilution to ECB

B. ZPPT

C. Drain to Mid-Loop

D. Reactor Startup

---

1 Pt(s) Unit 1 is heating **up** in Mode **4** with NCS temperature at 230°F.

Which one of the following conditions would violate containment integrity if the condition existed for **42** hours in the current mode?

REFERENCES PROVIDED

A. **1KF-122 (*Fuel Transfer Tube)* is known to be leaking by its seat.**

B. **1RN-253A (*RB Non ESS Sup Cont Inside Isol*) failed its stroke-timing test, but can be closed from the control room.**

C. **1KC-429B (*Rx Bldg Drain Hdr Cont Inside Isol*) power supply has failed, and is closed.**

D. **1VQ-1A (*Cont Air Rel Inside Isol)* has its air supply removed and has failed closed.**

1 Pt(s) Unit 1 was conducting a reactor startup following a refueling outage. Given the following conditions during the reactor startup:

N-31 indicates 2.1×10^{4} cps
N-32 indicates 2.0×10^{4} cps
N-35 indicates 5.5×10^{-11} amps
N-36 indicates 1.0×10^{-10} amps
Rods are **in** manual with *no* rod motion
SR and IR NIs arc slowly increasing
T_{ave} is holding steady

Which one of the following best explains the indications'?

A. N-35 compensating voltage is set too high

B. N-35 compensating voltage is set too low

C. N-36 compensating voltage is set too high

D. N-36 compensating voltage is set too low

1 Pt(s) Unit 1 was responding in E-1 *(Loss of Reactor or Secondary Coolant)* to small break LOCA.

Given the following parameters at the indicated times:

Parameter	0200	0205	0210
• NCS pressure (psig)	1500	1550	1600
• Core exit T/C temp (OF)	576	584	586
• T_{ave} (°F)	567	569	572
• T_{hot} (°F)	570	574	578
• T_{cold} (°F)	563	564	566
• Pressurizer level (%)	10%	19%	28%
• Containment pressure (psig)	0.7	0.9	1.1

CA flow to all 4 S/Gs exceeds 450 gpm from 0200 to 0210

What is the earliest time (if any) when adequate subcooling exist such that the operators can transition to **ES-1.1** ***(Safety Injection Termination)?***

REFERENCES PROVIDED

A. Transition to ES-1.1 at 2:00

B. Transition to ES-1.1 at 2:05

C. Transition to ES-1.1 at 2:10

D. Remain in E-1, SI flow may be not terminated

I Pt(s) **A** worker is preparing to enter a 'High Radiation Area' to work on **a** valve in the reactor building. During the pre-job briefing, RP states that the expected whale body radiation levels are **as** follows:

- Dose rate in the center of the room = 100 mrem/hr
- Dose rate 18 inches from valve = 200 mrem/hr
- Contact reading = 1100 mrem/hr

How should the area around the valve be classified?

A. The room is a 'Radiation Area'; the valve is a HOT SPOT

B. The room is a 'High Radiation Area'; valve is <u>NOT</u> a HOT SPOT

C. The room is a 'High Radiation Area'; the valve is a HOT SPOT

D. The room is an 'Extra High Radiation Area'; the valve is <u>NOT</u> a HOT SPOT

---

1 Pt(s) Today, you are directed to complete a valve lineup on Unit 1 in accordance with enclosure 4.10 to OP/1/A/6200/005, *Spent Fuel Cooling System.* The controlled copy of the procedure has a restri ted change noted for valve 1KF-145. This normally open valve has been locked open in accordance with a special order that remains in effect until October 1st.

Which one of the following statements describes the correct action needed to validate your working copy of the procedure'? (Your copy of the procedure is in other respects identical to the controlled copy.)

A. Replace your working copy with an **updated** procedure printed from the NEDL system.

B. Annotate the working copy with a pen and ink change for the valve position for 1KF-145; change to "Locked Open", annotate the restricted change number and initial the change.

C. Annotate the working copy **with** just the restricted change number (as a cross reference) next to the 1KF-145 Bine item, and initial the change.

D. Use the working copy as is since restricted changes of this nature are not required to he written into working copies.

1 Pt(s) Unit 1 was operating at 100% power when a total loss of feedwater occurred. The operators reached **Step 7** of FR-H.1 ***(Response to Loss of Secondary Heat Sink)***, which attempts to establish **CA** flow to at least one S/G. Sub-step **7.k** states:

> ***Main ain feed flow rate less than or equal to 100 GPM until S/G WR level is greater than 12% (17% ACC).***

Given the following conditions:

	Loop A	Loop B	Loop C	Loop D
S/G (WR) [%]	0	15	9	10
NC T_{Hot} [°F]	150	555	530	545

- Containment pressure is 3.4 psig
- The TD **CA pump** is available to feed the S/Gs

Which one of the foliowing statements correctly describes the bases for the restrictions for restoring feedwater flow following feed and bleed in FR-H.1?

A. Restore **flow** to the 'A' **S/G** because loop **'A'** T-hot is the lowest of the loops and this will reduce the chance of thermal **shocking** the S/G. Flow should not be restored to the 'B' and 'C' **S/Gs** because they **will** be reserved for use Later to provide a steam supply for the TD CA pump.

B. Restore flow **to** the 'B' S/G because 'B' **S/G** level is the highest and this **will** reduce the chance of thermal shocking the S/G. Flow should be preferentially restored to the **'B'** or 'C' S/G to maintain the TD CA **pump** steam supply.

C. Restore **flow** to the 'C' S/G because loop 'C' T-hot is less than loop 'B' T-hot and this will reduce the chance of thermal shocking the S/G. Flow should be preferentially restored to the **'B'** or **'C' S/G** to maintain the TD **CA** pump steam supply.

D. Restore flow **to** the 'D' S/G because the 'D' S/G is higher than 'A' S/G level, which will reduce the risk of thermal shock. Plow should not be restored to the 'B' and 'C' S/Gs because they will be reserved for use later to provide a steam supply for the TD **CA** pump.

I Pt(s) Unit I was conducting a plant start up. At 1% power, an instrument malfunction caused an inadvertent reactor trip. Given the following indications:&

Two rod bottom lights are NOT lit
Reactor trip and bypass breakers are open
IR amps = $2x10^{-8}$
IR SUR = -0.3 DPM

Which one of the following response actions is required?

A. **Implement AP/14, *(Control Rod Misalignment)* and respond to the stuck rods.**

B. **Implement E-0, *(Reactor Trip or Safety Injection)*, and immediately transition to FR-S.2, *(Response to Loss of Core Shutdown)*.**

C. **Implement E-0, *(Reactor Trip or Safety Injection)* and immediately transition to FR-S.1, *(Response to Nuclear Power Generation/ATWS)*.**

D. **Implement E-0, *(Reactor Trip or Safety Injection)*, and then transition to ES-0.1, *(Reactor Trip Response)*.**

I Pt(s) **Unit** 1 **is** in Mode 1 conducting a plant startup. The operators have reached 11% R.T.P. when a momentary electrical transient on the **'IA'** Main Bus Line occurs resulting in the foliowing conditions:

Bus	1TA	1TB	1TC	1TD
Frequency (Hz)	55	60	55	60
Voltage (VAC)	6410	6900	6410	6900

Which one of the following sequences would occur?

A. **NCPs 1A and 1C trip because of Under-Frequency while NCPs 1B and 1D continue running and a reactor trip does NOT occur.**

B. **NCPs 1A and 1C trip because of Under-Voltage while NCPs 1B and 1D continue running and a reactor trip occurs.**

C. **AL 4 NCPs trip because of Under-Frequency and a reactor trip does NOT occur.**

D. **AL 4 NCPs trip because of Under-Frequency and a reactor trip occurs.**

1 Pt(s) Unit 1 was operating at 100% power when a crud burst occurred. Given the following events and conditions:

- 1EMF-48 (Reactor Coolant Hi Rad) Trip 2 alarm
- 1EMF-18 (Reactor Coolant Filter 1A) Trip 2 alarm

Which one of the following actions per AP/1/A/5500/18 (Activity in the Reactor Coolant System) is required to reduce coolant activity due to a crud burst in the NC system? (Assume no clad damage has occurred.)

A. Purge the VCT with nitrogen

B. Place/ensure both mixed bed demineralizers are in service

C. Increase letdown flow

D. Add hydrogen to the reactor coolant

1 Pt(s) Unit 1 is operating at 100% power. Given the following conditions:

- Rod control is in 'MANUAL'
- Control Rank D is at 200 steps

If the rods in control hank D start stepping out at 8 steps per minute, which one of the following actions is required at this time'?

A. **Select Control Bank D** on **the rod selector switch and manually insert Control Bank D**

B. ***Select* "AUTO"** on **the Bank *Select* Switch** and **see if** rod **motion stops**

C. Commence emergency boration

D. **Trip the** reactor

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1 Pt(s) Unit 1 *is* operating at 50% power. Given the foilowing conditions:

- Pressurizer pressure is 2235 psig
- Pressurizer Relief Tank (PRT) pressure *is* 20 psig
- PRT temperature *is* 125 "F
- PRT level *is* 8I%
- The PRT *is* being cooled by spraying from the RMWST
- A pressurizer code safety valve is suspected of leaking by it's seat

What temperature would be indicated on the associated safety valve discharge RTD if the code safety were leaking by?

REFERENCES PROVIDED

A. 258-262 °F

B. 227-231 °F

C. 161-165 °F

D. 123 -127°F

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1 Pt(s) **A** male worker needs to repack a valve in an area that has the following radiological characteristics:

- The worker's present exposure is 1800 mrem for the year.
- General area dose rate = 65 mrem/hr
- Airborne contamination concentration = 20 **DAC**

The job will take **4** hours with **a** mechanic wearing **a** full-face respirator. **It** will only take 2 hours if the mechanic does NOT wear the respirator.

Which of the following choices for completing this job would maintain the workers exposure within the Station ALARA requirements?

A. The worker should wear the respirator otherwise he mill exceed ***25% of*** the DAC **limit.**

B. The worker should **NOT** wear the respirator because the dose received **will** exceed neither NRC nor site dose limits.

C. The worker should wear the respirator because the **total** TEDE dose received will be less than if he **does** not wear one.

D. The worker should NOT wear the respirator hecause the total TEDE dose received will be greater ***if*** he wears one.

1 Pt(s) Unit 2 is in the process of starting up the reactor in accordance with all controlling procedures. Given the following conditions and events:

- 2 EMF-3 *(CONTAINMENT REFUELING BRIDGE MONITOR)* Trip 1 setpoint is $7x10^1$ mR/hr and Trip 2 setpoint is $1.5x10^2$ mR/hr.

	0200	0205	0210	0215
2EMF 3 (mR/hr)	5x10'	$1.1x10^2$	$1.6x10^2$	$2.7x10^2$
N-31 (CPS)	$1.2x10^4$	$1.7x10^4$	$2x 10^4$	0
N-32 (CPS)	$9.2x10^3$	$1.1x10^4$	0	0
N-35 (amps)	$9.1x10^{-11}$	$1.0x10^{-10}$	$1.2x10^{-10}$	$1.2x10^{-10}$
N-36 (amps)	$9.3x10^{-11}$	$1.1x10^{-10}$	$1.3x10^{-10}$	$1.3x10^{-10}$

If channel N-32 is deenergized due to a SR detector failure at 0210, what is the earliest time (if any) that the containment evacuation alarm will actuate in Unit 2 during the startup?

A. **0205**

B. **0210**

C. **0215**

D. **The** containment evacuation alarm **will not** actuate

1 Pt(s) Unit 1 was responding to a small break LOCA. 'Containment pressure reached **3.5** psig. The Subcooling Margin Monitor currently indicated +35 &F. Which of the following statements correctly describes the status of subcooling in the core?

A. The core is subcooled by 35 °F

B. The core is superheated by 35 °F

C. The core is superheated by more than 35 °F due to the effects of adverse containment conditions

D. The core is subcooled by more than 35 °F due to the effects of adverse containment conditions

1 Pt(s)

Unit 1 has initiated a liquid radioactive waste release from the Ventilation Unit Condensate Drain Tank (VUCDT) through the RC system. All lineups and authorizations have been properly made in accordance with OP/0/B/6200/35 using the normal path. Two RC pumps are the minimum required under the LWR document.

Given the following initial conditions:

- 3 RC pumps are running
- IEMF-44 *(CONT VENT DRN TANK OUT)* correctly set for trip 1 and trip 2 activity limits
- MRIRR = 75 GPM based on boron concentration
- No other releases are in progress

If the release automatically terminates 40 seconds after initiation, which one of the following conditions could have terminated the release and what is the proper operator response?

A. **1WM-46 *(LIQUID WASTE DISCH VALVE)* closing automatically if 1 RC pump tripped, and the** release **may not** be **restarted until Chemistry resamples the tank.**

B. **1WM-46 closing automatically if 1EMF-44 reached the trip 2 setpoint, the release may be restarted two additional times.**

C. **1WP-35 *(WMT & VUCDT TO RC CNTRL)* closing automatically if 1 RC pump tripped, and the release may not** be **restarted until Chemistry resamples the tank.**

D. **1WP-35 closing automatically if 1EMF-44 reached the trip 2** setpoint, **the** release **may be restarted two additional times.**

I Pt(s) Unit 1 is operating at 80% power when an electrical transient causes several condensate system pumps to trip. Given the following conditions and events:

	Start	10 sec	20 sec	30 sec	40 sec
CF pump 1A Suction Pressure (psig)	451	238	232	229	227
CF pimp 1B Suction Pressure (psig)	448	227	**324**	240	238
# Hotwell Pumps running	2	2	**3**	2	**1**
# Condensate Rooster Pumps running	2	1	0	**2**	**1**

Which one of the following Is the earliest time and the reason that BOTH main feedwater pumps will have tripped?

A. 10 seconds, due to 2/3 Condensate Booster Pumps Tripped

B. 20 seconds, due to 3/3 Condensate Booster Pumps Tripped

C. 30 seconds, due to suction pressure

D. 40 seconds, due to 2/3 Condensate Booster Pumps and 2/3 Hotwell Pumps Tripped

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1 Pt(s) Unit 1 has just entered Mode 5 in preparation for refueling. Given the following conditions and events:

- A lower containnient entry is planned for the next shift.
- The SRO directs the RO tu purge the containment in preparation for the containment entry.
- Currently the VP system is ***secured*** with all fans off and containment purge and exhaust valves closed

Which one **of** the following describes the proper alignment of the containment purge system?

A. **The *NORMAL-REFUEL SELECTOR* switch is placed in the "*NORM*" position and ratio of supply air is 2/1 (Upper/Lower Containment).**

B. **The *NORMAL-REFUEL SELECTOR* switch is placed in the "*NORM*" position and ratio of supply air is 4/1 (Upper/Lower Containment).**

C. **The *NORMAL-REFLEE SELECTOR* switch is placed in the "*REFUEL*" position and ratio of supply air is 2/1 (Upper/Lower Containment).**

D. **The *NORMAL-REFUEL SELECTOR* switch is placed in the "*REFUEL*" position and ratio of supply air is 4/1 (Upper/Lower Containment).**

I Pt(s) IJnit 1 is shutdown, Mode *6,* in a refueling outage. Given the following conditions:

- Containment airlock doors are both open
- **A** full shift of qualified maintenance personnel are available inside containment
- The Refueling SRO is in the control room
- The Fuel Handling Supervisor is inside containment

Refueling has been completed and the Fuel Handling Supervisor (who is not a qualified SRO) requests permission to latch all control rods to prepare for the reactor startup, What additional requirements must he met (if any) to proceed with latching rods?

A. **Latching rods may proceed at the discretion of the Fuel Handling Supervisor.**

B. **Latching rods may not proceed until after containment integrity has been restored.**

C. **Latching control d may t p til ft th Refueling SR arrives inside containment to super**

D. **Latching control rods may t p til after th li SRO arrives inside containment and t t t it has been restored.**

1 Pt(s) Unit 1 is shutdown in a refueling outage. Given the following events and conditions:

- The VI system was in a normal lineup.
- The VS system was in a normal lineup.
- A VI header rupture occurs.
- 'VI Low' and 'Low Low Pressure' Annunicators alarm
- The VI system completely depressurizes.

What effect does a total loss of the VI system have on the VS system?

A. VI-820 will auto-close as VI header pressure decreases below 82 psig and the VS air compressor will start automatically to maintain VS header pressure.

B. VI-820 will auto-close as VI header pressure decreases below 90 psig and the VS air compressor must be manually started to maintain VS header pressure.

C. Check valves in the VI - VS cross-connect line will close to isolate VS system pressure before it drops below 90 psig.

D. VS pressure in the Fire Protection Pressurizer Tank will be Lost until a VS air compressor can be started.

I Pt(s) If a **fire** was reported in the McGuire Office Complex (MOC), which one of the following responses **is** correct by station procedures?

A. **Offsite** fire departments are responsible **for** ail fire suppression activities at the scene. The Fire Brigade must be held in reserve **for** station fires inside the protected area.

B. **Offsite** fire departments are responsible for all fare **suppression** activities **at** the scene. The Fire Brigade may provide limited support if resources **allow.**

C. The Fire Brigade is responsible for the initial response at the scene. They are required to turn over control of the scene **as** soon as an offsite fire department arrives and immediately return to the protected area.

D. The Pike Brigade is responsible for fire suppression activities **at** the scene. **An** offsite fire department may be called to provide support *if* additional resources are required.

1Pt(s) Unit 1 is in the process of making **a** radioactive gaseous waste release from the waste gas decay tank in accordance with OP/0/A/6200/19 (*Waste Gus Decay Tank* ***Release).*** Given the following conditions:

- Most Restrictive Instantaneous Release Rate (MRIRR) – 35 CFM
- EMF-50(L) **trip** 1 setpoint = 1.0E5 CPM
- EMF-50(L) trip 2 setpoint = 2.0E5 CPM
- EMF-36(L) is out of service
- 'The operators reset 1EMF-50(L) whenever procedural direction allows

	0200	0215	0230	0245
Release rate (CFM)	22	37	32	41
EMF-50(L) (CPM)	1.1E5	2.1E5	2.2E.5	2.2E5

What **was** the earliest time that the operators were required to terminate (and not restart) the gaseous release.

A. 0208 - **cannot release with 1EMF-36(L) cut of service**

B. **0215 - must terminate due to exceeding MRIRR**

C. **0230 - must terminate due to 2nd trip of EMF-50(L)**

D. **0245 - must terminate after 3rd trip of EMF-50(L)**

1 Pt(s) Unit 1 is in the process of making a radioactive gaseous waste release from the waste gas decay tank in accordance with OP/0/A/6200/18 ***(Waste Gas Operation).*** Given the following conditions:

- Most Restrictive Instantaneous Release Rate (MRIRR) = 31 CFM
- Maximum Observed System Release Rate (MOSRR) = 40 CFM
- EMF-50 *(WASTE GAS DISCH)* trip 1 setpoint = 2.0E5 CPM
- EMF-50 trip 2 = 3.0E5 CPM
- EMF-36 ***(UNIT VENT GAS)*** is in service

Time	**0200**	**0215**	**0230**	**0245**
Release rate (CFM)	30	32	41	27
EMF-50 (CPM)	2.8E5	3.2E5	3.1E5	4.2E5

If the operators reset EMF-50 whenever allowed by procedure, what is the earliest time that the operators are **required** to terminate (**and** not immediately restart) the gaseous release?

A. **0200**

B. **0215**

C. **0230**

D. **0245**

1 Pt(s) Unit 2 was in the process of starting up the reactor following a refueling outage. Given the following plant conditions and events:

- Reactor trip breakers are closed
- Withdrawal of 'A' control bank has commenced
- Train A of Wide Range Shutdown Monitoring is inoperable

If source range N-32 fails low, which one of the following actions is required?

A. Startup may continue with train B of the Gamma-Metrics Shutdown Monitor System substituting for the failed N-32 source range channel

B. Immediately stop withdrawal of shutdown banks

C. Immediately open the reactor trip breakers

D. Immediately reinsert shutdown banks and open the reactor trip breakers

1 Pt(s) Unit 1 was operating at 100% power when main condenser vacuum dropped suddenly from **25** inches vacuum to **23** inches vacuum. Given the following events and conditions:

- All **3** condenser steam air ejectors (CSAEs) arc in service
- Both primary and secondary jets are operating
- The system lineup is in the normal configuration

Which one of the following statements correctly describes the cause of this problem?

A. Loss of YM supply to the condenser hoot seals

B. CM flow to all CSAE inter-coolers has been obstructed

***C*. Loss of the main steam supply to the CSAEs**

D. A CSAE drain was left open

1 Pt(s) Unit 2 is responding to an ATWS without Safety Injection actuation. Given the following indications:

- Pressurizer level begins to go down
- The 2A NV pump ammeter indicates running amps are low

If all automatic control systems operated normally, which one of the following conditions would cause the 2A NV pump running amps to decrease to the lowest value?

A. 2NV-238 *(CHARGING LINE FLOW CONTROL)* failed open

B. 2NV-238 *(CHARGING LINE FLOW CONTROL)* failed closed

C. 2NV-241 *(SEAL INJ FLOW CONTROL)* failed open

D. 2NV-241 *(SEAL INJ FLOW CONTROL)* failed closed

1 Pt(s) Unit 2 was operating at 90% power after a start-up from a refueling outage. A pressurizer PORV is found to be leaking and the associated PORV block valve was shut. The PRT was cooled down to the following PRT conditions:

- PRT Level - 65%
- PRT Pressure – 9 psig
- PRT Temperature 100°F
- Lower Containment Temperature - 118°F

what actions are required to restore and maintain normal operating conditions to the PRT for the long term'?

A. Vent the PRT to the waste gas system

B. Vent the PRT to containment.

C. Cool the PRT by pressurizing with nitrogen and initiating spray flow from the NCDT.

D. Cool the PRT by initiating spray flow through the sparger Bine from the RWST

1 Pt(s) Unit 2 was operating at 100% when a "FLOOR COOLING GLYCOL HIGH TEMPERATURE" annunciator is received. A review of the RTD panel reveals that several ice condenser floor slabs have high temperature indicated.

Which one of the following statements correctly describes the operational concern raised by this annunciator?

A. High glycol temperatures will cause the inn-service glycol compressor to trip causing a loss of NF coaling and excessive ice sublimation.

B. Low floor cooling glycol temperatures could cause cracks in the ice condenser thermal barrier.

C. Slab freeze and thaw cycles could result in floor buckling that could interfere with lower door operation.

D. Slab freeze and thaw cycles could cause gaps between the floor and the intermediate deck doors resulting in a bypass flow path.

1Pt(s) Unit 1 is operating at full power and Unit 2 is refueling. Unit 1 is releasing a minimally decayed waste gas decay tank when a significant packing leak starts on isolation valve 1WG-160, (*WG Decay* ***Tank*** *Outlet to* ***Unit*** *Vent* ***Control).***

Which one of the following statements correctly describes the automatic actions required to assure that the leak is contained and filtered?

A. **1EMF-50** ***(WASTE GAS DISCH HI RAD)*** **automatically closes 1WG-160, and 1EMF-41** ***(AUX BLDG VENT HI RAD)*** **automatically stops the auxiliary building ventilation unfiltered exhaust fans.**

B. **1EMF-41 automatically stops the auxiliary building ventilation unfiltered exhaust fans, and EMF-36** ***(UNIT VENT HI RAD)*** **automatically closes 1WG-160.**

C. **1EMF-36 automatically closes 1WG-160, and 1EMF-35** ***(UNIT VENT PART HI RAD)*** **automatically aligns the auxiliary building ventilation filter trains.**

D. **1EMF-35 automatically stops the auxiliary building ventilation unfiltered exhaust fans, and 1EMF-41 automatically aligns the auxiliary building ventilation filter trains.**

1Pt(s) Unit 2 is in Mode 6 with refueling activities in progress. Given the following events and conditions:

- A containment purge is in progress
- A fuel element was rammed into the side of the reactor vessel
- 2EMF-3 *(CONTAINMENT REFUELING BRIDGE)* and 2EMF-38 *(CONTAINMENT PARTICULATE)* are in Trip 2 alarm

Which one of the following actions should occur, **assuming** that operators follow the **required** procedure steps'?

A. The containment evacuation alarm **sounds** automatically. The containment purge stops automatically.

B. The containment evacuation alarm can **only** be actuated by the control room. The containment purge stops automatically.

C. The containment evacuation alarm sounds automatically. The containment purge is stopped manually.

D. The containment evacuation alarm can only he actuated by the control room. The containment purged is stopped manually.

1Pt(s) Unit 1 has experienced four CRUD bursts this month. Given the following events and conditions:

- **IA** reactor coolant filter d/p was indicating 40 psid.
- IEMF-18 *(REACTOR COOLANT FILTER 1A)* reads **5** times its normal value.
- 1A reactor coolant filter was taken out of service.
- 1B reactor Coolant filter was placed in service.
- IB reactor coolant filter dip is 10 psid.
- 1A mixed bed demineralizer is in service.
- IEMF-48 *(REACTOR COOLANT)* reads its normal value
- Local radiation readings near reactor coolant filter 1B are **3** times normal.

If the detector for 1EMF-19 *(REACTOR COOLANT FILTER 1B)* fails, what actions (if any) are the operators required to take in response to these conditions?

A. Switch mixed bed demineralizers.

B. Shift back to 1A reactor coolant filter until 1EMF-19 is returned to service.

C. Place both mixed bed demineralizers in service until 1EMF-19 is returned to service.

D. No action is required.

1 Pt(s) Unit 2 is operating at 100% power. Given the following events and conditions:

- Operators started RV pumps 'A' & 'B' due to rising containment temperatures.
- Containment Upper temperature is 90 °F, decreasing.
- Containment Lower temperature is 119 °F, decreasing.
- At 0200, a station blackout occurs on both Units 1 and 2
- Operators implement the appropriate procedures.

Which one of the following **pumps** provides the assured source of cooling water to maintain containment temperature within Tech Spec limits?

A. '2C' RV pump only

B. 'ZA' RN pump only

C. '2B' RN pump only

D. Either '2A' or '2B' RN pumps.

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1 Pt(s) Unit 1 has experienced a rupture of the RN piping inside containment. Emergency procedures prescribe successful response mechanisms if containment water level remains between 3.5 **and** 10.5 feet.

Why is safe plant recovery not assured for a design basis large break LOCA when containment water level exceeds 10.5 feet?

A. Operation of the ND system is compromised by high suction pressure.

B. Operation of the NS pumps is endangered by excess debris fouling the containment suction strainers.

C. Operation of the hydrogen purge system is compromised by loss of direct access to the containment atmosphere.

D. Operation of critical ECCS components needed for safe recovery is endangered by submersion.

1Pt(s) Unit 1 is operating at 100% power when the OAC registers a **low** spent fuel pool level alarm. Given the following events and conditions:

- The operators read - **2.1** ft SFP level and stable on the main control board.
- The operating KF pump has tripped.
- ***An*** NLO reports a large leak in the auxiliary building has stopped.
- Normal SFP makeup is not available.

Which one of the following statements correctly describes the corrective action for this event?

A. Implement AP/1/A/5500/41 *(Loss of Spent Fuel Cooling or Lever),* find and isolate the leak on the KF discharge piping.

B. Implement AP/1/A/5500/41 (*Loss of Spent Fuel Cooling or Level)* Find and isolate the leak on the KF suction piping.

C. Implement AP/1/A/5500/40 (*Loss of Refueling Canal Level*), and initiate assured makeup due a leak on the discharge piping.

D. Implement AP/1/A/5500/40 (*Loss of Refueling Canal Level*), and initiate assured makeup due to a leak on the suction piping.

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1 Pt(s) Unit 2 is operating at 100 % power. Given the following events and conditions:

- "B" Train of essential operating equipment (RN, KC, NV) is in service.
- 2A RN train is in operation for surveillance testing.
- The RN trains are separated with 2RN-41B *(TRAIN B TO NON-ESS HDR ISOL)* **CLOSED**.

Which one of the following statements correctly describes the potential consequence if 2RN-190B *(RN TO R KC HX CONTROL)* failed to perform its automatic function associated with decreasing B train RN flow?

A. Overheating 2B RN pump.

B. 2B RN strainer goes to 'Backwash' mode due to hi d/p.

C. Overheating the running B train KC pumps.

D. 2RN-41B will open to restore Blow to the heat exchanger.

1 Pt(s) Unit 2 has just begun to shutdown (decreasing 2MWe/min) for refueling. Given the following events and conditions:

- Pressurizer level is at program level and in 'automatic'.
- The controlling pressurizer level transmitter fails at its current output.
- No operator action is taken.

Which one of the following statements correctly describes the system response as plant load is reduced?

A. Charging flow decreases
Letdown isolates
Pressurizer heaters torn off

B. Charging flow increases
Pressurizer heaters energize
Pressurizer level increase to the trip setpoint

C. Charging Wow decreases
Letdown will not isolate
Pressurizer Bevel decreases until the pressurizer is empty

D. Charging flow increases
Pressurizer heaters will not energize
Pressurizer Bevel increases to the trip setpoint.

---

1 Pt(s)

A station emergency battery is supplying DC bus loads without a battery charger online. If the load on the DC bus does not change, which one of the following statements correctly describes a vital battery's discharge rate (amps) as the battery is expended?

A. The discharge rate will be fairly constant until the design battery capacity (amp-hours) is exhausted and then will rapidly decrease.

B. The discharge rate will decrease steadily until the design battery capacity is exhausted.

C. The discharge rate will increase steadily until the design battery capacity is exhausted.

D. The discharge rate will initially decrease until approximately 50% design capacity had been expended and then increase until the battery has been exhausted.

1 Pt(s) The crew has verified natural circulation in ES-0.1 ***(Reactor Trip Response)*** based on decreasing core exit thermocouple readings **and** subcooling > 0 "F. Ten minutes later, the operator notes that the thermocouple input to both plasma displays is malfunctioning.

Which one of the following correctly describes a valid indication that natural circulation is continuing?

A. **S/G saturation temperatures are decreasing and *REACTOR VESSEL UR LEVEL* indication is greater than 100 %.**

B. **S/G pressures are decreasing and T_{cold} is at S/G saturation temperature.**

C. **S/G pressures are decreasing and *REACTOR VESSEL D/P* indication *is* greater than 100%.**

D. **S/G pressure is at saturation pressure for T_{cold} and *REACTOR VESSEL D/P* indication is greater than 100 %.**

1 Pt(s) Given the following Unit 1 initial conditions:

- Reactor power is at 40%
- Power range NIS indicate:
  - 40% (N41), 41% (N42), 41% (N43), 41% (N44)
- Tave for each loop indicates:
  - 567°F ('A'), 567° F ('B'), 568 ° F ('C'), 568" F ('D')
- Turbine power is at 481 MWe
- Rod control is in automatic.
- Group demand **counters** and DRPI indicate Control Bank 'D' at 140 steps.

Control Rank 'D' Rod L-12 drops fully into the core **and** the following conditions now exist:

- Power range NIS indicate:
  - 40% (N41), 38% (N42), 42% (N43), **42%** (N44)
- Tave for each loop indicates:
  - 564° F ('A'), 564" F ('B'), 563° F ('C'), 564° F ('D')
- Turbine power is *448* MWe

The effect of the dropped rod on the Rod Control System is that rods will initially:

A. Move out due to the Tave signal providing the largest error signal.

B. Move out due to the Power Range NIS input processed by the Mismatch Rate Comparator creating the largest error signal.

C. Move in due to Power Range NIS input processed by the Mismatch Rate Comparator creating the largest error signal.

D. Move in due to the Tave signal providing the largest error signal.

---

1 Pt(s) Unit 1 is in Mode *6* and fuel reload is complete. Given the following events and conditions:

- Source range counts have increased in the past 45 minutes.
- The Source Range Hi Flux at Shutdown alarm has began to alarm intermittently for the past 30 minutes
- Chemistry has reported boron in the refueling cavity *2650* ppm.
- Only one Charging Pump is available

Which one of the following actions must be implemented under these conditions'?

A. **Start emergency boration of the NCS.**

B. **Block Source Range High Flux Reactor Trip.**

C. **Have IAE adjust Hi Flux at Shutdown setpoints up ½ decade**

D. **Start alternate boration of the NCS**

1 Pt(s) Given the following events and conditions:

The Component Cooling Water System piping has just severed where the Reactor Coolant Pump Component Cooling return combines with **the** Excess Letdown Heat Exchanger.

Which one **of** the following statements correctly describes the control room indication(s) that you would see for this failure?

A. NCP Thermal Barrier Outlet valve(s) CLOSED.

B. Containment Sump 'A' level increasing.

C. Seal Water Return flow increasing.

D. Reactor Coolant Pump motor bearing(s) temperature increasing.

---

1 Pt(s) Unit 1 was operating at 100%. Given the following events and conditions:

- The following **fans** were in operation:
  - Pipe Tunnel Booster Fans
  - Return Air Fans
  - Lower Containment Fans
  - Upper Containment Fans

- A LOCA occurs
- All systems functioned as designed
- Fan switches selected to low speed

Which one of the following describes the alignment of the above containment cooling systems'?

A. Pipe Tunnel Booster Fans start and run in low speed

B. Return Air Fans fans start.

C. Lower Containment Fans start and run in high speed

D. Upper Containment Fans start and go to "MAX" position.

1 Pt(s) Unit 2 was at 75% R.T.P. when a loss of condenser vacuum occurred Given the following conditions:&

Rods are in automatic
The steam dump select switch is selected to 'Tave' mode
Condenser vacuum is slowly decreasing
No component or instrument failures occurred
No operator action *taken*

Which one of the following sequences best describes the actuation of the control rods to this event?

A. Control rods wove in due to decreased condenser back pressure

B. Control rods move out due to decreased condenser back pressure

C. Control rods move in due to increased condenser hack pressure

D. Control rods move out due to increased condenser back pressure

1 Pt(s) Unit I was at 100% R.T.P. when the following transient occurs:

- A Loss of Offsite Power occurs
- A reactor trip occurs due to failure of the turbine to successfully runback to in house loads
- Diesel Generator "A" fails to start
- Diesel Generator "B" successfully loads bus ETB

What is the basis in E-0 *(Reactor Trip or Safety* ***Injection)*** Step 4 RNO for restoration of power to ETA when time allows and continuing with E-07

A. Minimum shift crews are assumed in the EOPs and manpower *is* not available to restore power to ETA.

B. The action to restore power to ETA *is* directed by the TSC only

C*. The actions to restore power to ETA will be addressed after transition to ECA 0.0 *(Loss of All AC Power).

D. Only one train of safeguard equipment is required to deal with the emergency condition.

1Pt(s) Unit 1 was operating at 100% power when the following occurred:

- "1B" FWPT was manually tripped due to an oil *leak*
- AP/1/A/5500/03 *(Load Rejection)* has been implemented and completed through step 10.

Step 10 has the operator perform the following:

- Place CF pump in manual
- Check "CF Header Pressure at least 100 psig above steam header pressure".
- If CF Header pressure is low the RNO states:

  *"**WHEN** S/G levels are greater than or equal to program level (and CF valves begirt closing), **THEN** adjust CF Pump speed to maintain CF HEADER PRESSURE 100-120 psig above "STEAMHEADER PRESSURE".*

What is the basis for this step?

A. **As S/G levels are restored the FWPT suction flow decreases and FWPT speed control is slow to decrease FWPT speed.**

B. **As S/G levels are restored the FWPT suction flow increases and FWPT speed control is slow to decrease FWPT speed..**

C. **As S/G levels are restored the CF control valves start to close down and FWPT speed control is slow to decrease EWPT speed.**

D. **As S/G levels are restored the CF control valves start to open and EWPT speed control is slow to decrease FWPT speed.**

1 Pt(s) Unit 1 is responding to a large-break loss of coolant accident inside containment. Given the following events **and** conditions:

- Operators have implemented E-0 ***(Reactor Trip or Safety Injection),*** and are implementing Step 22 (Check if NC System **INTACT),** RNO.
- The RO has just energized the Hydrogen Igniters
- Containment hydrogen pressure spikes to 5 psig **and** then ***immediately*** returns to 1.5 psig.

Which one of the following statements correctly describes the correct procedural flow path'?

A. ***Go* to EP/1/A/5000/E-1 *(Loss of Reactor or Secondary Coolant)* and then EP/1/A/5000/FR-Z.1 *(Response to High Containment Pressure)***

B. **Go to E-1**

C. **Go to FR-Z.1**

D. **Implement Generic Enclosure 4 (*Start Hydrogen Recombiners)***

1 Pt(s)

A fire has occurred in the auxiliary building affecting Unit 1 equipment. Transfer of plant control to the auxiliary shutdown panel is not possible due to the fire. AP/1/A/5500/24 *(Loss of Plant Control Due to Fire or Sabatoge)* has been implemented. Transfer of plant control for Unit 1 to the SSF is complete. The QSM asks you to determine natural circulation.

As SRO located at the SSF what indications could you use to determine natural circulation?

A. **Steam Generator Pressure and Core Exit Thermocouples**

B. **NC Loop W/R Pressure and Steam Generator Pressure**

C. **Incore Thermocouples and NC Loop W/R Pressure**

D. **NC Loop Tcold and Pressurizer level**

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1 Pt(s)

A reactor trip and safety injection has occurred and E-0 *(Reactor **Trip** or Safety Injection)* is in progress. When Safety Injection termination criteria are met, the crew is directed to stop all but one NV pump in Step 25. After securing one NV Pump , plant conditions are as follows:

- S/G N/R levels are at 30% and decreasing
- Pzr Level is stable at 12%
- Pzr Pressure is going down
- Subcooling based on Gore Exit Thermocouples is 10 degrees
- FWST level is 185 inches

Select the appropriate procedure for these conditions:

A. **ES-1.3** ***(Transfer to Cold Leg Recirc).***

B. **E-2** ***(Faulted S/G Isolation).***

C. **E-1** ***(Loss of Reactor or Secondary Coolant)***

D. **ES-1.2** ***(Post LOCA Cooldown and Despressurization).***

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1 Pt(s)

Unit 1 has experienced a Loss of All AC Power. EP/1/A/5000/ECA-0.0 (Loss of **All AC** Power) is in effect. The attempted start of the Standby Make-up Pump was unsuccessful. The crew is at Step **24** of **ECA** 0.0. This **step** directs the crew to *"Depressurizeintact S/Gs to 210 psig"*. Prior to Step **24** of ECA-0.0 there is **a** NOTE that reads:

"Pzr level may he lost and reactor vessel heud voiding may occur due to depressurization of the S/Gs. Depressurization should not he stopped to prevent these occurrences."

Which one of the following describes the bases for this caution?

A. **S/Gs should be depressurized to allow the establishment of natural circulation.**

B. **Reducing NC pressure and temperature maximizes NCP seal life.**

C. **S/Gs should be depressurized to allow more CA flow to help with cooldown.**

D. **Reducing NC pressure and temperature minimizes NC inventory loss out of the seals.**

1 Pt(s) Unit 2 has just tripped as a result of a loss of offsite power. The following plant conditions exist:

- "2A" D/G failed to start
- "2B" D/G started and Ioaded bus 2ETB
- Four rods fail to fully insert into the core.
- Reactor Trip Breaker " 2 B is closed.
- Intermediate Range SUR is ZERO
- Pressurizer pressure is 2150 psig and slowly decreasing
- Containment pressure is .4 psig and slowly increasing.

EP/2/A/5000/E-0 ***(Reactor Trip or Safety Injection)*** Immediate Actions are being performed.

Based on the above conditions which one of the following would be the correct procedure flow path?

A. ***GO TO*** **AP/2/A/5500/07** ***(Loss of Electrical Power)***

B. **Stay in E-O** ***(Reactor Trip or Safety Injection)***

C. ***GO TO*** **EP/2/A/5000/ES-0.1** ***(Reactor Trip Response)***

D. ***GO TO*** **EP/2/A/5000/FR-S.1** ***(Response to Nuclear Generation)***

1 Pt(s) Unit 1 has just experienced a Safely Injection due to a failed open Pressurizer Power Operated Relief Valve (PORV). During the process of implementing EP/1/A/5000/E-0 ***(Reactor** Trip **Safety** Injection),* the **STA** notices that Train "B" of Phase **'A'** did not actuate automatically. Which one of the following describes the communication process that should take place to ensure Phase **'A'** Train "B" is actuated?

A. The STA should directly tell the BOP to actuate Train "B" of Phase 'A'.

B. The STA should directly tell the Control Room SRO to instruct the BOP to actuate Train "B" of Phase 'A'.

C. The STA should tell the QSM who will instruct the Control Room SRO to tell the BOP to actuate Train "B" of Phase 'A'.

D. The STA should tell the OSM and Control Room SRO that he/she (the STA) is going to actuate Train "B" of Phase 'A'.

1 Pt(s) Unit 1 has experienced a 50% load rejection which resulted in Control **Bank** "D" Group 1 being greater **than 12** steps misaligned from its associated step counter. Tech Spec 3.1.4 Rod Control Group Alignment Limits states:

"All shutdown and control rods shall be OPERABLE; with all individual indicated rod positioners within 12 steps of their group step counter demand position".

Which one of the following is the basis for this Tech Spec?

A. Ensure SDM limits are maintained and QPTR is maintained within limits.

B. Ensure power distribution and SDM Limits are preserved.

C. Ensure QPTR is maintained within Limits and rod alignments are correct.

D. Ensure AFD is maintained and limit power distribution.

1 Pt(s) During RCCA Movement Testing, **a** 'ROD CONTROL URGENT FAILURE' annunciator **a l m s .**

IAE investigates and reports that two control rods are untrippable.

Which one of the following describes the Action Statement per Tech Specs'?

A. **Within one (1) hour verify SDM is within the limits of the COLR AND Be in Mode 3 in six (6) hours**

B. **Initiate boration to restore SDM to within limits AND Be in Mode 3 in four (4) hours.**

C. **Within one (1) hour verify SDM is within the limits of the COLR OR Be in Mode 4 in six (6) hours**

D. **Initiate boration to restore SDM tu within limits OR Be in Mode 4 in four (4) hours**

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1 Pt(s) *An* NLO has been dispatched to recirculate the Ventilation Unit Condensate Drain Tank (WCDT) in preparation for doing *a* release. **As** recirculation **is** being established, the 1EMF-44 flow meter ruptures **and 'IEMF-44** LOSS OF **SAMPLE** FLOW' annunciator alarms.

Which one of the following describes the reason for this incident?

A. Both Unit 1 VUCDT pumps were simultaneously started.

B. 1WL-359 (*VUCDT Pump Recirc Throttle)* was opened too far and too much flow, was initiated.

C. Radwaste Chemistry failed to open 1WM-222 (VUCDT to RC Disch Hdr).

D. 1WL-359 was not throttled prior to VUCDT pump start.

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1 Pt(s) A Unit 1 reactor trip results in an autostart of the #1 Turbine Driven Auxiliary Feedwater (#1 TDCA) Pump.

Which one of the following describes the design feature that provides for initiation of cooling water to the #1 Turbine Driven CA Pump turbine bearing oil cooler?

A. Nuclear Service Water (RN) flow from the RN Essential Header is initiated upon autostart when the RN cooling water supply valve to the #1 TDCA Pump turbine oil cooler automatically opens.

B. As the #1 TDCA Pump starts and rolls up to speed, Auxiliary Feedwater (CA) from the pump's own discharge piping begins to flow through the #1 TDCA Pump turbine oil cooler and is returned to the pump.

C. Component Cooling Water (KC) flow from the KC Essential Header is initiated upon autostart when the KC cooling water supply valve to the #I TDCA Pump turbine oil cooler automatically opens.

D. No cooling water from any source is supplied to either the #1 TDCA Bump's turbine or pump bearings. 'Oilers' with level sightglasses are checked by Non-Licensed Operators on their rounds.

I Pt(s) Given the following **events and** conditions:

- Unit 1 is operating at **37%** power.
- Control **Bank** 'D' Rods are at 180 steps withdrawn
- All control systems are in automatic.
- An electrical fault trips the '1D' Reactor Coolant Pump

Which one of the following describes the prompt effects for '**D' LOOP ONLY** on the primary and secondary sides of the plant'?

	Tave	S/C, Press	DeltaT	S/G Level
A.	**Increase**	**Increase**	**No Effect**	**Decrease**
B.	**Decrease**	**No Effect**	**Decrease**	**Decrease**
C.	**Increase**	**Increase**	**No Effect**	**Increase**
D.	**Decrease**	**No Effect**	**Decrease**	**Increase**

1 Pt(s) Given the following events and conditions:

- Unit 1 has experienced a Large Break LQCA
- Containment Pressure increased to 5 PSIG.
- NS system automatically started and reduced containment pressure to less than 0.35 PSIG.
- NS *is* secured (NS **pumps** stopped and NS discharge valves closed)
- NS has not been **'RESET'.**
- Containment pressure returns to 1.1 PSIG.

Which one of the following describes the response of the NS system **to** the subsequent containment pressure increase?

A. **NS pump discharge valves will open at 0.35 PSIG and the NS pumps will auto start at 8.35 PSIG.**

B. **NS pump discharge valves will open at 0.8 PSIG and the NS pumps will auto start at 1.0 PSIG.**

C. **NS pump discharge valves will open at 0.35 PSIG and the NS pumps will auto start at 0.8 PSIG.**

D. **NS pump discharge valves will open at 0.8 PSIG and the NS pumps will auto start at 3.O PSIG.**

1 Pt(s) Given the following events and conditions:&

Unit 1 is approaching Mode 5 to replace a leaking Pressurizer PORV
NC Cooldown is in progress
'A' Train ND is in the RHR mode.
'A' Train KC is in service at maximum design flow
'A' Train RN is in service
'1A1' KC Pump breaker trips (Overcurrent Relay)

Which one of the following describes the effect on the cooldown rate?

A. The Reactor Coolant System heats up, the KC System is unaffected.

B. No effect on the Reactor Coolant System, the KC System begins to heat up.

C. The Reactor Coolant System cooldown rate decreases as the KC System heats up.

D. The KC System only begins to heat up, but the ND System maintains a stable Reactor Coolant System cooldown rate.

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1 Pt(s) Unit 1 was responding in E-1 *(Loss of Reactor or Secondary Coolant)* to small break LOCA. The crew **has** just completed Step 8.f when the OATC observes the following parameters:

Given the following parmeters at the indicated time:

Parameter	Value
• Stable NCS pressure (psig)	1650
• Core exit T/C temp (°F)	**586**
• T_{ave} (°F)	*572*
• T_{hot} (°F)	578
• T_{cold} (°F)	566
• Pressurizer level (%)	28%
• Containment pressure (psig)	1.1
• CA flow to all 4 S/Gs exceeds 450 **gpm**	

Which one of the following is the crew's next required action?

REFERENCES PROVIDED

A. Remain in E-1, stop NS pumps

B. Transition to ES-1.2 (*Post LOCA Cooldown and Despressurization)*

C. Transition to ES-1.1 (*Safety Injection Termination*)

D. Remain in E-1, return to step 7

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1 Pt(s) Unit 1 is responding to **a** small break **LOCA** using E-1 ***(Loss of Reactor or Secondary Coolant).*** Given the following events **and** conditions:

- FWST Level indicates 340 inches
- Containment pressure indicates 1.5 psig
- Containment Sump Level indicates 1.05 ft
- 1EMF-41 (*AUX BLDG VENTILATION*) is in Trip 2 alarm
- Aux Building area radiation monitors **are** in alarm
- 1EMF-51A and B (*CONTAINMENT TRN A & B)* indicates 25 R/Hr
- Hydrogen Analyzer indicates 0.7% in containment
- NLO's report significant leakage at the seals of the "1A" ND pump

The crew determines that **a** transition to **ECA-1.2** (*LOCA Outside* ***Containment)*** is required. Which one of the following actions of ECA-1.2 reduces excessive levels of radiation and guard against personnel exposure?

A. Monitor 1EMF-41 (*AUX BLDG VENTILATION)*

B. Dispatch NLO to energize Hydrogen Recombiners

C. Secure VA (Aur. Bldg. Ventilation System) to limit airborne contamination.

D. Identify and isolate the break

I Pt(s) Given the following conditions and events:

- Unit I has a very small S/G tube leak on S/G '1C'.
- Chemistry reports the leak is .075 gpm.
- 1EMF-73 (Unit 1 Steam Line '1C' Monitor) is in **Trip** 1 **alarm**
- 1EMF-33 (IJnit 1 Condenser Air Ejector) is in Trip 1 alarm.

Which one of the following correctly describes how the flowpath for dilution of the Stearn Jet Air Ejector (SJAE) exhaust is changed in response to this leak?

A. No effects on SJAE exhaust alignment for dilution flowpath or **EMF(s).**

B. SJAE exhaust dilution is swapped to discharge to the Auxiliary Building Ventilation **(VA)** Filtered Exhaust and diluted with VA to the Unit Vent.

C. All Unit I and Unit 2 VA Filtered Exhaust Fans (VA-FXF) and all Unit 1 and Unit 2 Unfiltered Exhaust Fans **(VA-UXF)** are started to dilute the **SJAE** exhaust to the Unit Vent(s).

D. Unit 2 VA Supply Fans are secured and all Unit 1 and Unit 2 VA is routed to **the** Unit 1 Unit Vent to dilute the SJAE exhaust.

1 Pt(s)

Unit 2 has experienced a Steam Generator Tube Rupture on S/G '2B'. The operators are currently in EP/2/A/5000/E-3 ***(Steam Generator Tube Rupture).*** The NC System has been cooled down such that core exit T/Cs are less than required based upon the ruptured S/G pressure. '2B' S/G Narrow Range level indicates 100%. The operators are performing step 20, "Depressurize the NC System".

Which one of the following operational implications of E-3 has the most effect on primary-to-secondary leak rate and NC System pressure drop while maintaining NC subcooling?

A. Initiate NC Depressurization using maximum available Pzr spray flow.

B. Depressurize the NC System by opening one NC Pzr PORV.

C. Depressurize the NC System by opening all NC Bzr PORVs.

D. Open 1NV-21A (NV Spray To PZR Isol).

1 Pt(s)

A BLACKOUT has occurred on 1ETA. D/G '1A' failed to *start* due to an **86N** relay actuation. On Annunciator Panel 1AD-1 1, 'Battery EVCA Undervoltage' is in alarm.

Per the Annunciator Response Procedure which one of **the** following addresses the Battery EVCA under voltage condi ion?

A. **Cross tie EVDB to EVDA.**

B. **Cross tie EVDC to EVDA.**

C. **Swap Battery Charger Connection box to 2EMXH.**

D. **Swap Battery Charger Connection box to 2EMXA.**

1 Pt(s) Given the following conditions and events:

- Unit 2 has experienced a large **break LOCA** inside containment.
- EP/2/A/5000/E-0 *(Reactor **Trip** or Safety **Injection}*** is complete and the crew has transitioned to EP/2/A/5000/FR-Z.1 ***(Response to High Containment Pressure).***
- While checking Phase 'B' AVAC equipment in service, the RO notices that the '2A' and '2B' Containment Air Return Fans are not running.

Which one of the following describes the reason the fans are NOT running and actions needed to start the fans?

A. **VX SYS CPCS TRAIN A/B INHIBIT status lights are LIT, dispatch operator to local panels to potentiometer to actuate relays.**

B. **VX SYS CPCS TRAIN A/B INHIBIT status Bights are LIT, RO starts fans from control room switch.**

C. **VX SYS CPCS TRAIN A/B INHIBIT status lights are DARK, dispatch operator to local panels to potentiometer to actuate relays.**

D. **VX SYS CPCS TRAIN A/B INHIBIT status lights are DARK, dispatch operator to start fans from local panel on 767' elevation.**

I Pt(s) Unit 2 is in Mode 6 loading fuel. Given the foilowing plant a l m s :

- 2EMF-3 *(Containment Refueling Bridge) Trip* 2 alarm.
- 2EMF-4 *(Spent Fuel Building BRDG) Trip* 2 alarm.
- "INCORE INST ROOM SUMP HI LEVEL" annunciator LIT.

Which one of the foilowing procedures should be implemented?

A. **AP/2/A/5500/25 *(Spent Fuel Damage)***

B. **EP/2/A/5000/FR-Z.3 *(Response to High Containment Radiation Level)***

C. **AP/2/A/5500/40 *(Loss of Refueling Canal Level)***

D. **AP/2/A/5500/18 *(High Activity in Reactor Coolant)***

1 Pt(s) Unit 1 has just experienced a Loss of Offsite Power and the Unit 1 Turbine has tripped.

Which one of the following describes the effect this transient has on the Condenser Circulating Water (RC) and Vacuum Priming (ZP) Systems?

A. RC Waterbox Vacuum breaker valves remain closed if all RC pumps trip, to maintain vacuum in the RC piping.

B. RC Waterbox Vacuum breaker valves open automatically if all RC pumps trip, to prevent structural collapse of the RC piping.

C. RC Waterbox Vacuum breaker valves remain closed if all RC pumps trip, to prevent thermal shocking of the RC piping.

D. RC Waterbox Vacuum breaker valves open automatically if all RC pumps trip, to prevent water hammer of the RC piping.

I Pt(s)

Unit 2 has experienced a Steam Generator Tube Rupture (SGTR) on the '1D' S/G. The crew has completed EP/2/A/5000/E-0 ***(Reactor Trip or Safety** injection)* and has entered EP/2/A/5000/E-3 (*Steam **Generator Tube Rupture).*** The crew is performing Step **4** in E-3, which directs the RO to close the MSIV and **MSIV** bypass valves on the **RUPTURED** S/G. When the CLOSE push button is depressed the valve does not close.

Which one of the following describes the RNO step **and** the subsequent method of cooldown?

A. **Close MSIVs and MSIV bypass valves on remaining INTACT S/Gs and use ALL PORVs to cool down.**

B. **Close MSIVs and MSIV bypass valves: on remaining INTACT S/Gs and use INTACT S/G PORVs to cool down.**

C. **Close MSIVs and MSIV bypass valves ow INTACT 'A' and 'R" S/Gs and coo8 down using PORV on RUPTURED S/G.**

D. **Close MSIVs and MSHV bypass; valves on INTACT 'B' and 'C' S/Gs and cool down using condenser dump valves from RUPTURED S/G.**

I Pt(s) Unit 1 is beginning a cooldown to Mode 6 to enter a refueling outage.

Which one of the following describes the:

- Tech Spec/SLC cooldown limits on the NC system and Pressurizer
- Reason why (if any) for the differences.

A. Tech Spec cooldown limit for the NC System is 100° F hour.
SLC cooldown limit for the Pressurizer is 200° F /hour.
NC System cooldown rate is more limiting doe to the decrease in the nil ductility reference temperature as exposure to neutron fluence in creases.

B. Tech Spec cooldown Limit for the NC System is 100° F hour.
SLC cooldown limit for the Pressurizer is 60° F /hour.
Pressurizer cooldown rate is more limiting due to the effects of insure/outsurge.

C. Tech Spec cooldown limit for the NC System is 100° F /hour
SLC cooldown limit for the Pressurizer is 60° F /hour
Pressurizer cooldown rate is more limiting due to the concern for non ductile failure of the pressurizer metal.

D. Tech Spec cooldown limit for the NC System 100° F /hour.
SLC cooldown limit for the Pressurizer is 200° F /hour.
NC System cooldown rate is more limiting doe to the increase in the nil ductility reference temperature as exposure to neutron fluence increases.

1 Pt(s) Given the following conditions and events:

- **Unit** 1 is at 55% power when a Full ioad rejection occurs due to the loss of '1A' and '1B' Buslines.
- Main Turbine Impulse Pressure Channel **2** fails "AS **IS".**

Which one of the following describes the correct response of the *stem* dumps to this event'?

A. Error signal develops between auctioneered **Tave** and Tref. **Steam** dumps open to reduce Tave until Tave = Tref.

B. Error signal develops between auctioneered Tave and Tref Steam dumps open and Tave reduces to 3 degrees above Tref.

C. No error signal developed between auctioneered Tave and Tref. Steam dumps do not open.

D. Error signal develops between auctioneered **Tave** and Tref Steam dumps do not open.

1 Pt(s) Unit 1 is at 100% power when the controlling Pressurizer Pressure instrument fails HIGH. Per AP/1A/5500/11 *(Pressurizer Pressure Anomalies)* the first action the operator must take is place "PZR PRESS CNTRL SELECT" switch to an operable channel.

What is the basis for this action?

A. This failure causes PORVs 1NC-32B & 368 to open and a fast response is required to prevent a reactor trip on low pressure.

B. This failure causes all the Pressurizer heaters to energize and a fast response is required to prevent a reactor trip on high pressure.

C. This failure causes PORV 1NC-34A and reactor coolant pump spray valves to open and a fast response is required to prevent a reactor trip on low pressure.

D. This failure causes the reactor coolant pump spray valves to fail closed and the backup heaters to energize and a fast response is required to prevent a reactor trip on high pressure.

1 Pt(s) EMF 59 (Equipment Staging Building Ventilation Monitor) is in 'Trip 2'. Which one of the following describes the actions that occur as a result of the Trip 2 alarm?

A. **If VK *(Equipment Staging Building Vent.)* is in "Auto" the supply fans will trip.**

B. **If VK is in "On" the supply fans will trip**

C. **If VK is in "Auto" the exhaust and supply fans will trip.**

D. **If VK *is* in "On" the exhaust and supply fans will trip.**

1 Pt(s)

Unit 2 is operating at 100%, all control system components are in their normal configuration (1-2 position). The controlling pressurizer level channel slowly fails to sixteen percent (16%). Which one of the following describes the effect on the letdown valves?

A. **2NV-1A, 2NV-457A, 2NV-458A NV-35A close, and Pzr heaters energize.**

B. **2NV-1A, 2NV-457A, 2NV-458A, 2NV-35A close, and Pzr heaters de-energize.**

C. **2NV2A, 2NV-457A, 2NV-458A, 2NV-35A close and Pzr heaters energize.**

D. **2NV2A, 2NV-457A, 2NV-458A, 2NV-35A close and Pzr heaters de-energize.**

1 Pt(s)

Unit 1 is responding to a LQCA from a trip at full power. Given the following events and conditions:

- A safety injection occurred at 0200.
- FWST level reaches 33 in. at 0246.
- S/I, Sequencers, and Containment Spray have been reset for both trains.
- The 1A NS pump has been successfully swapped to the containment sump.
- 1NS-1B (B NS Pump Suct From Cont Sump) will not open.

Which one of the following is the reason 1NS-1B will not open?

A. 1NI-184B (RB Sump to Train B ND & NS) is CLOSED

B. "NS SYS CPCS TRAIN B INHIBIT" light LIT

C. 1NS-38B (B ND to NS Containment Outside Isol) is CLOSED

D. 1NS-38B (B ND to NS Containment Outside Isol) is OPEN

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1 Pt(s)

Unit 2 is in an outage. All the fuel is in the spent fuel pool. The spent fuel mol ventilation system is in normal system operation. A fuel shuffle is in progress in the spent fuel pool. During the shuffle a fuel assembly is accidentally damaged and 2EMF-42 (Fuel Building Ventilation Radiation Monitor) goes into Trip 2.

Which one of the following describes the effect on spent fuel pool ventilation system as a result of 2EMF-42 in Trip 2.

A. The VF supply and exhaust fans trip and the filter is placed in the filtration mode.

B. The VF Filter Train Bypass Damper valve closes and the Filter Train inlet and outlet open

C. The VF system is automatically placed in BYPASS MODE and the discharge dampers open and supply dampers close

D. The VF system is automatically placed in the FUEL HANDLING MODE OF OPERATION and the supply fans trip.

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1 Pt(s) Unit 1 is at 100% power when indications are received of a "1B' Reactor Coolant Pump seal malfunction. AP/1/A/5500/08 *(Malfunction of NC Pump)* is implemented.

Which one of the following conditions describes a number two seal failure?

A. **# 1 Seal Leak off flow – GOING DOWN**
NC Pump number 2 Seal Standpipe low level alarm – LIT
NCDT input – STABLE, OW GOING DOWN

B. **# 1 Seal Leak off flow – GOING UP**
NC Pump number 2 Seal Standpipe high level alarm – LIT
NCDT input – STABLE, OR GOING DOWN

C. **# 1 Seal Leak off flow – GQING DOWN**
NC Pump number 2 Seal Standpipe high level alarm – LIT
NCDT input – GOING UP

D. **# 1 Seal Leak off flow – GOING UP**
NC Pump number 2 Seal Standpipe low level alarm – LIT
NCDT input – GOING UP

1 Pt(s) Unit 2 was operating at 75% power when the foilowing indications were observed:

- S/G Level Deviation Alarms for all S/Gs
- Feedflow/Steamflow Mismatch Alarms for all S/Gs
- FWPTs speed going down
- All Feedwater control switches are in normal position

Which one of the following correctly describes the failure affecting the main feedwater pumps'?

A. Steam header pressure transmitter fails HIGH.

B. Steam header pressure transmitter fails LOW.

C. Feedwater header pressure transmitter fails LOW.

D. Feedwater pump d/p program fails HIGH.

1Pt(s) The following conditions exist on Unit 2:

- 100% power at 1180 MWe
- The valve positioner for atmospheric dump valve 2SV-30 fails.
- Control room indication shows the valve OPEN.

Which one of the following actions in AP/1A/5500/01 ***(Steam Leak)*** correctly describes the FIRST direction from the SRO that will CLOSE the open *atmospheric* dump valve?

A. Instruct the RO to select "OFF RESET" on the STEAM DUMP INTL BYPASS switches.

B. Instruct RO to depress the 'CLOSE' pushbutton ow the atmospheric dump valve control room switch.

C. Instruct IAE to energize the P-12 solenoids to close the atmospheric dump valve.

D. Dispatch operator to isolate air to the atmospheric dump valve.

1 Pt(s)

Unit 1 is holding at 60% power. Pressurizer level and pressure control are selected to the "3-2" position. Given the following conditions:

- **A** leak develops on the low pressure (process) side of the transmitter for the controlling pressurizer level channel.

Assuming no operator action, which one of the following statements correctly describes the effect of this failure on the Pressurizer level and pressure control systems?

A. Indicated pressurizer level decreases, NV-238 (*Charging Line Flow Control)* opens, **actual** pressurizer level increases and pressure **goes** up.

B. Indicated pressurizer level increases, NV-238 closes, actual pressurizer level decreases and pressure goes **down.**

C. Indicated pressurizer level decreases, the pressurizer level master output decreases to increase level and pressure goes **up.**

D. Indicated pressurizer level increases, the pressurizer level master output increases to decrease level, and pressure goes **down.**

1 Pt(s) Unit 1 is operating at 100% power when a leak develops in the tubes of the 1B1 feedwater heater.

Which one of the following describes the automatic actions that occur on **an** 'EMERGENCY HIGH **LEVEL'** in the 1B1 feedwater heater'?

A. Close ALL **"B"** feedwater heater inlet steam isolations
Close "B" bleed steam check valve
Close **ALL** 1st stage reheater steam vents
Close ALL "A" heater normal drain valves
Close 1st stage reheater drain control valves
Open ALL "B" heater bleed steam drain valves
Open 1st stage purge valve for 1B1 feedwater heater

B. Close **ALL** "B" feedwater heater inlet steam isolations
Close ALL "B" bleed steam check valves
Close ALL 1st stage reheater steam vents
Close ALL "A" heater normal drain valves
Close 1st stage reheater drain control valves
Close ALL **"B"** heater bleed steam drain valves
Open **2nd** stage purge valve for 1B1 feedwater heater

C. Close "1B1" feedwater heater inlet steam isolation
Close "B" bleed steam check valve
Open ALL **1st** stage reheater steam vents
Open 1A1 heater normal drain valve
Open ALE 1st stage drain control valves
Open All "B" heater bleed steam drain valves
Open All 1st stage **"B"** heater purge valves

D. Close "1B1" feedwater heater inlet steam isolation valve
Close "B" bleed steam check valve
Close 1A1 heater normal drain valve
Close All 1st stage reheater steam vents
Close 1A1 1st stage reheater drain control valve
Open "B" heater bleed steam drain valves
Open ALL 1st stage drain valves

1 Pt(s)

Unit 2 has experienced a Steam Line Break inside containment. The "2C" S/G has depressurized to 100 **psig** and actual W/R level is approximately **10%.**

Which one of the following describes the indicated "2C" S/G W/R level response?

A. **S/G W/R level reference leg density decreases, actual d/p goes down, indicated S/G Bevel goes up.**

B. **S/G W/R level reference lag density increases, actual d/p goes down, indicated S/G level goes down**

C. **S/G W/R level reference leg density decreases, actual d/p goes up, indicated S/G level goes down**

D. **S/G W/R level reference leg density increases, actual d/p goes up, indicated S/G level goes up**

1 Pt(s) "B" Train of essential equipment is in operation on Unit I.

While performing OP/1/A/6350/002 ***(Diesel Generator)*** with the "1A' diesel running in parallel to the grid, the following sequence of events occurs:

- Load is reduced on the diesel to 200KW in anticipation of opening the EMERGENCY breaker.
- The RO accidentally OPENS the normal feeder breaker from 1ATC.

Which one of the following describes the system response and the proper procedural response to deal with this situation?

A. Degraded voltage is sensed on 1ETA and the BLACKOUT sequencer actuates, the crew mill use **AP/1/5500/07(Loss** of Electrical Power).

B. The Diesel Generator Sequencer does not actuate, and the diesel generator assumes the load ofthe bus. The operator uses OP/1/A/6350/002 to return to normal alignment.

C. Undervoltage is sensed on 1ETA and the BLACKOUT sequencer actuates, the crew **will** use **AP/1/5500/07.**

D. The Diesel Generator BLACKOUT sequencer recloses the breaker **from** BATC. Crew reloads the bus using **AP/1/A/5500/07,** Enclosure 1 ***(Manual Loading of Emergency Bus).***

1 Pt(s) **A** work team of Maintenance and R.P. personnel have been dispatched to repack the seals on a pump. The work area around the pump is **a** 800 mrem/hr **High** Radiation **Area.** The R.P. personnel are monitoring the Maintenance crew from a low dose area of 60 mrem/hr.

Which one of the following work teams and estimated repair times would maintain worker exposure ALARA?

A. **6 Maintenance and 3 RP. personnel (9 workers) working for 20 minutes**

B. **5 Maintenance and 2 R.P. personnel (7 workers) working for 30 minutes**

C. **4 Maintenance and 2 R.P. personnel (6 workers) working for 1 hour**

D. **2 Maintenance and 2 R.P. personnel (4 workers) working for 2 hours**

1 Pt(s) Level in the "2C" S/G is slowly increasing due to a failure of the Channel 1 N/R S/G level transmitter.

Which one of the foliowing describes the correct response of the S/G level control system to this failure'?

A. The flow error will initially be greater than the level error. A 1% level error will initially produce a 3% valve position change.

B. The Wow error will initially be greater than the Level error. 4 1% level error will initially produce a 1% valve position change.

C. The Bevel error will initially be greater than the flow error. A 1% Level error will initially produce a 1% valve position change.

D. The Bevel error will initially be greater than the flow error. A 1% level error will initially produce a 3% valve position change.

1 Pt(s)

The Diesel Generator DC Control Power Breaker for the "1A" D/G has failed and must be replaced by IAE.

Which one of the following components is affected by this failure?

A. D/G "1A" Diesel Fuel Oil Booster Pump

B. D/G "1A" Speed Switches

C. D/G "1A" Battery Charger 1EDGA

D. D/G "1A" Sump Pump Control Power

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1 Pt(s) PCB 7 and PCB 8 are part of the **230** KV switchyard. Which one of the following describes the RO's indication he/she has from the control room to monitor breaker position?

A. Both PCB 7 and PCB 8 are on the OAC and Main Control Board

B. PCB 7 and PCB 8 are ONLY available on the OAC

C. Main Control Board indication ONLY for PCB 7 and OAC ONLY for PCB 8

D. Main Control Board and OAC indication for PCB 8 and OAC indication only for PCB 7

1 Pt(s)

There has been a fire in the Unit 2 turbine building basement. The **"A'** Main Fire Pump auto-started due to a low fire header pressure signal. The **fire** brigade has extinguished the fire after forty-five minutes.

- "1A" and "1B" Jockey Pumps are **'OFF'**
- "A" Main Fire **Pump is** running
- "B" and "C" Main Fire Pumps are **'OFF'**

Which one of the following describes the procedural process of recovering from a low fire header pressure and returning the Main Fire and Jockey pumps to normal alignment?

A. Stop the **"A"** Main Fire Pump, place the Jockey pump to be started in "MAN", and place the other Jockey pump in "START".

B. Stop the **"A"** Main Fire Pump, place the Jockey pump to he started in **'START",** and place the other Jockey pump in "MAN".

C. Place the Jockey pump to he started in "START", the other Jockey pump in "MAN, and stop the **"A"** Main Fire Pump.

D. Place the Jockey **Pump** to be started in "MAN", **"START"** the Jockey Pump selected to "MAN", and stop the "A" Main **Fire** Pump.

1 Pt(s) Which one of the following describes the automatic operation of 1KC-122 *(KC Surge Tank Vent Valve)?*

A. **1EMF-46A** (B) in Trip **1** alarm will **cause** the vent **to** close; when the alarm dears the valve will automatically re-open (the "OPEN" position seals in).

B. **1EMF-46A** (B) in Trip 2 alarm mill **cause** the vent **to close;** when **the** alarm clears the valve will automatically re-open (the "OPEN" position seals in).

C. 1EMF-46A (B) **in** Trig 1 alarm **will** cause the vent to close and the "CLOSE" positions seals in; the valve must be locally re-opened.

D. 1EMF-46A (B) in Trip 2 alarm will cause the vent to close and the "CLOSE" positions seals in; the valve must be locally re-opened.

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1 Pt(s) Which one of the following describes the power supply alignment during a BLACKOUT or SAFETY INJECTION for the following containment cooling fans?

A. On a BLACKOUT the VU Fans (on the affected bus) start, on a SAFETY INJECTION the VU Fans (on the affected bus) are shunt tripped OFF.

B. On a BLACKOUT the VL Fans (on the affected bus) are shunt tripped OFF, on a SAFETY INJECTION the VL Fans (on the affected bus) start and run in low speed.

C. On a BLACKOUT the VR Fans (on the affected bus) swap to EMERGENCY power, on a SAFETY INJECTION the VR Fans (on the affected bus) are shunt tripped OFF.

D. On a BLACKOUT the RA Pans (on the affected bus) are shunt tripped OFF, on a SAFETY INJECTION the RA Fans (on the affected bus) start.

1 Pt(s) During the delivery of chlorine gas cylinders on site a cylinder fell from the truck and ruptured. All control room VC intakes closed except 1VC-9A and 1VC-11B which were mechanically bound and failed to close completely. Chlorine gas has entered the control room. AP/1/A/5500/17 *(Loss of Control Room)* has been implemented on both Units.

As SRO, which one of the following describes your instructions (per AP/17)?

A. Direct one RO to the reactor trip breakers and immediately trip the reactor. Direct one operator to the front standard of the main turbine and standby.

B. Direct one RO to the reactor trip breakers and standby. Direct one operator to the front standard of the main turbine and immediately trip the turbine.

C. Direct one RO to the reactor trip breakers and immediately trip the reactor. Direct one operator to the front standard of the main turbine and immediately trip the turbine.

D. Direct one RO to the reactor trip breakers and standby. Direct one operator to the front standard of the main turbine and standby.

1 Pt(s) Unit **2** is operating **at** 100% power with ail rods but. Given the following events and conditions:

- Control Rod 'H-8' drops into the core.
- AP/2/A/5500/14 *(Rod Control Malfunction),* Enclosure 1 ***(Response** to Dropped Rod)* has being implemented.
- Control Rod 'H-8' has been pulled 150 steps off the bottom of the core.
- Rod 'K-13' drops into the core.

Which one of the following statements correctly describes the operator's response to this event?

A. Continue withdrawal of rod 'H-8'.

B. <u>GO TO</u> AP/1/A/5500/38 (Emergency Boration)

C. Return to Step one (1) of AP/1/A/5500/14.

D. Trip the reactor and <u>GO TQ</u> E-0 *(Reactor Trip/Safety Injection)*

1 Pt(s) Unit 1 has experienced a 50% runback due to the loss of Busline 1A. AP/1/A/5500/03 Load Rejection has been implemented and the Immediate Actions have been completed. Based on the indicated Power Mismatch (PMM) and Temperature Mismatch (TMM), which one of the following correctly describes rod movement?

A. **BMM = 0, TMM = +4.**
Rods OUT at 40 steps per minute

B. **PMM = -4, TMM = 0.**
Rods IN at 40 steps per minute

C. **PMM = +3, TMM = +3.**
Rods OUT at 72 steps per minute

D. **PMM = +1.5, TMM = +1.5.**
Rods IN at 8 steps per minute

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1 Pt(s)

During the process of implementing a Temporary Modification (TM) affected drawings are notated to refer the Operators to the appropriate TM package.

Which one of the following describes the process for notating a Temporarily Modified on the drawing in the control room?

A. Flow diagrams and electrical one line drawings MUST always be red-marked tu reflect the temporary modification.

B. Flow diagrams **and** electrical one Bine drawings should NOT be red-marked to reflect the temporary modification.

C. Flow diagrams **MUST** be red-marked to reflect the temporary modification, electrical one line drawings should NOT be red marked to reflect the temporary modification.

D. Flow diagrams should NOT be red-marked tu reflect the temporary modification, electrical owe line drawings MUST be red marked to reflect the temporary modification.

1 Pt(s) Which one of the following would require the use of an R&R for managing configuration control?

A. Troubleshooting activities and needed to meet the intent of a procedure and is within the original system design.

B. Long term system alignments and needed to meet the intent of **a** procedure and *is* within the original system design

C. **An** alternate component or alignment which it **NOT** within the original design and intent of the system is desired.

D. The use of **an** alternate component **or** alignment is needed to meet the intent of **a** procedure and is within the original system design.

1 Pt(s) Which one of the following must the Control Room SRO ensure prior to authorizing a Liquid Waste Release from the Waster Monitor Tank (WMT)?

A. **A source check has been performed** on **EMF-44.**

B. **The required number of RC pumps is in operation.**

C. **The "Recommended Release Kate" is equal to the "Allowable Release Rate".**

D. **The "Expected CPM of EMF 44" and the "EMF 44 Trip 1 Setpoint" are less than the "EMF 44 Trip 2 Setpoint"**

1 Pt(s) Which one of the following is a correct list of SAFTETY LIMITS?

A. Thermal Power, RCS Highest Loop Tave and Pressurizer Pressure.

B. Thermal Power, AFD, Pressurizer Pressure.

C. AFD, QPTR and Reactor Power.

D. Linear Meat Generation Rate, Thermal Power and QPTR.

1Pt(s) Which one of the following is the power supply to the "2B" Safety Injection Pump?

A. **1ETB**

B. **1EMXB**

C. **2ETB**

D. **2EMXB**

1Pt(s) IJnit 1 is heating **up** in Mode 4 with NCS temperature ***at* 230°F.**

Which one of the following conditions would violate containment integrity if the condition existed **for 42** hours **in** the current mode?

REFERENCES PROVIDED

A. **1KF-122 (*Fuel Transfer Tube)* is known to be leaking by its seat.**

B. **1RN-253A (*RB Non ESS Sup Cont Inside Isol*) failed its stroke-timing test, but can be closed from the control room.**

C. **1KC-429B (*Rx Bldg Drain Hdr Cont Inside Isol*) power supply has failed, and is closed.**

D. **1VQ-1A *(ContAir Rel Imide Isol)* has its air supply removed and has failed closed.**

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1 Pt(s)

Unit 1 was conducting a reactor startup following **a** refueling outage. Given the following conditions during the reactor startup:

- N-31 indicates 2.1×10^{4} cps
- N-32 indicates 2.0×10^{4} cps
- N-35 indicates 5.5×10^{-11} amps
- N-36 indicates 1.0×10^{-10} amps
- Rods are in manual with no rod motion
- SR and IR NIs are slowly increasing
- T_{ave} is holding steady

Which one **of** the following best explains the indications'?

A. **N-35 compensating voltage is set *too* high**

B. **N-35 compensating voltage is set too low**

C. **N-36 compensating voltage is set too high**

D. **N-36 compensating voltage is set too low**

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1 Pt(s) Unit 1 was responding in E-1 *(Loss of Reactor or Secondary Coolant)* to small break LOCA.

Given the following parameters at the indicated times:

Parameter	0200	0205	0210
• NCS pressure (psig)	1500	1550	1600
• Core exit T/C temp (°F)	576	584	586
• T_{ave} (°F)	567	569	572
• T_{hot} (°F)	570	574	578
• T_{cold} (°F)	563	564	566
• Pressurizer level (%)	10%	19%	28%
• Containnient pressure (psig)	0.7	0.9	1.1

CA flow to all 4 S/Gs exceeds 450 gpm from 0200 to 0210.

What is the earliest time (if any) does adequate subcooling exist such that the operators can transition ***to*** ES-1.1 *(Safety **Injection Termination)'!***

REFERENCES PROVIDED

A. Transition to ES-1.1 at 2:00

B. Transition to ES-1.1 at 2:05

C. Transition to ES-1.1 at 2:10

D. Remain in E-1, SI flow may be not terminated

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1 Pt(s)

Unit 1 has experienced a Loss of **All AC** Power. EP/1/A/5000/ECA-0.0 (Loss of **All AC** Power) is in effect. The attempted start of the Standby **Make-up** Pump was unsuccessful. The crew is at Step 24 of ECA 0.0. This step directs the crew to "*Depressurize intact S/Gs to 210 psig*". Prior to Step **24** of ECA-0.0 there is **a** NOTE that reads:

"*Pzr level may lie lost and reactor vessel head voiding may occur due to depressurization of the S/Gs. Depressurization should not be stopped to prevent these occurrences.*"

Which one of the following describes the bases for this caution?

A. **S/Gs should be depressurized to allow the establishment of natural circulation.**

B. **Reducing NC pressure and temperature maximizes NCP sed life.**

C. **S/Gs should be depressurized to allow more CA flow to help with cooldown.**

D. **Reducing NC pressure and temperature minimizes NC inventory loss out of the seals.**

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1 Pt(s) Unit 2 **has** just tripped as a result of **a** loss of offsite power. The following plant conditions exist:

- "2A" D/G failed to start
- "2B" D/G started and loaded bus 2ETB
- Four rods fail to fully insert into the core.
- Reactor Trip Breaker "2B" is ciosed.
- Intermediate Range SUR is ZERO
- Pressurizer pressure **is** 2 150 psig and slowly decreasing
- Containment pressure **is** .4 psig and slowly increasing.

EP/2/A/5000/E-0 (*Reactor Trip or Safety* ***Injection)*** has been entered.

Based on the above conditions which one of the following would be the correct procedure flow path?

A. **GO TO AP/2/A/5500/07** ***(Loss of Electrical Power)***

B. **Stay in E-0** ***(Reactor Trip or Safety Injection)***

C. **GO TO EP/2/A/5000/ES-0.1** ***(Reactor Trip Response)***

D. ***GO*** **TO EP/2/A/5000/FR-S.1** ***(Response to Nuclear Generation)***

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1 Pt(s) Unit I is in the process of starting **up** after **a** refueling outage. Which one of the following describes the major actions required to establish **a** bubble in the pressurizer?

Fill the Pressurizer and:

A. Energize all Pressurizer heaters
When Pressurizer temperature reaches saturation increase letdown flow to 120 gpm.
Decrease charging **flow** to minimum

B. Energize all Pressurizer heaters
When Pressurizer temperature reaches saturation increase letdown flow **to** 100 gpm.
Decrease charging flow to minimum.

C. Energize only A,B and D Pressurizer heaters
When Pressurizer temperature reaches saturation increase letdown flow to 120 gpm.
Decrease charging flow to minimum

D. Energize only A,B and D Pressurizer heaters
When Pressurizer temperature reaches saturation increase letdown flow to 100 gpm.
Decrease charging flow to minimum.

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1 Pt(s)

Unit 1 has just experienced a Safety Injection due to **a** failed open Pressurizer Power Operated Relief Valve (PORV). During the process of implementing EP/1/A/5000/E-0 ***(Reactor Trip Safety Injection),*** the STA notices that Train "B" of Phase **'A'** did not actuate automatically. Which one of the following describes the communication process that should take place to ensure Phase **'A'** Train "B" is actuated?

A. The STA should directly tell the BOP to actuate Train "B" of Phase 'A'.

B. The STA should directly tell the Control Room SRO to instruct the BOP to actuate Train "B" of Phase **'A'.**

C. The STA should tell the OSM who will instruct the Control **Room** SRO to tell the BOP to actuate Train "B" of Phase 'A'.

D. The STA should tell the OSM and Control Room SRO that he/she (the STA) is going to actuate Train "B" of Phase 'A'.

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1 Pt(s) Unit 1 has experienced **a** 50% load rejection which resulted in Control Bank "D" **Group** 1 being greater **than 12** steps misaligned from its associated step counter. Tech Spec 3.1.4 **Rod** Control Group Alignment Limits states:

"All shutdown and control rods shall be OPERABLE; with *all individual indicated rod positioners within 12 steps of their group step counter demand position".*

Which one of the following *is* the basis for this Tech Spec?

A. Ensure SDM limits are maintained and QPTR is maintained within limits.

B. Ensure power distribution and SDM limits are preserved.

C. Ensure QPTR is maintained within limits and rod alignments are correct.

D. Ensure AFD is maintained and limit power distribution.

---

1 Pt(s) During RCCA Movement Testing, a 'ROD CONTROL URGENT FAILURE' annunciator alarms.

IAE investigates and reports that two control rods are untrippable.

Which one of the following describes the Action Statement per Tech Specs?

A. Within one (1) hour verify SDM is within the limits of the COLR AND Be in Mode 3 in six (6) hours

B. Initiate boration to restore SDM to within limits AND Be in Mode 3 in four (4) hours.

C. Within one (1) hour verify SDM is within the limits of the COLR OR Be in Mode 4 in six (6) hours

D. Initiate horation to restore SDM to within limits OR Be in Mode 4 in four (4) hours

---

1 Pt(s)

An NLO has been dispatched to recirculate the Ventilation Unit Condensate Drain **Tank** (VUCDT) in preparation for doing a release. As recirculation is being established, the 1EMF-44 flow meter ruptures and '1EMF-44 **LOSS** OF **SAMPLE** FLOW' annunciator alarms.

Which one **of** the following describes the reason for this incident?

A. Both Unit 1 VUCDT pumps were simultaneously started.

R. 1WL-359 (*VUCDT Pump Recirc Throttle)* was opened too far and too much flow was initiated.

C. Radwaste Chemistry failed to open 1WM-222 (VUCDT to RC Disch Hdr).

B. 1WL-359 was not throttled prior to VUCDT pump start.

---

1 Pt(s) **A** Unit 1 reactor trip results in an autostart of the #1 Turbine Driven Auxiliary Feedwater (#1 **TDCA)** Pump.

Which one of the following describes the design feature that provides for initiation of cooling water to the #I Turbine Driven CA Pump turbine bearing oil cooler'?

A. Nuclear Service Water (RN) flow from the RN Essential Header is initiated upon autostart when the RN cooling water supply valve to the #1 TDCA Pump turbine oil cooler automatically opens.

B. As the #1 TDCA Pump **starts** and rolls up to speed, Auxiliary Feedwater (CA) from the pump's own discharge piping begins to flow through the #1 TDCA Pump turbine oil cooler and is returned to the pump's suction.

C. Component Cooling Water (KC) flow from the KC Essential Header is initiated upon autostart when the KC cooling water supply valve to the #1 TDCA Pump turbine oil cooler automatically opens.

D. **No** cooling water from any source is supplied to either the #1 TDCA Pump's turbine or pump bearings. 'Oilers' with level sightglasses are checked by Nom-Licensed Operators on their rounds.

---

1 Pt(s) Given the following events and conditions:

- Unit 1 is operating at 37% power.
- Control Bank 'D' Rods are **at** 180 steps withdrawn
- **All** control systems are in automatic.
- **An** electrical fault trips the 'ID' Reactor Coolant Pump

Which one **of** the following describes the prompt effects for **'D' LOOP ONLY** on the primary and secondary sides of the plant?

	Tave	S/G Press	DeltaT	S/G Level
A.	**Increase**	**Increase**	**No Effect**	**Decrease**
B.	**Decrease**	**No Effect**	**Decrease**	**Decrease**
C.	**Increase**	**Increase**	**No Effect**	**Increase**
D.	**Decrease**	**No Effect**	**Decrease**	**Increase**

1 Pt(s) Given the following events and conditions:

- Unit I has experienced a Large Break **LOCA**
- Containment Pressure increased to 5 PSIG.
- NS system automatically started and reduced containment pressure to less than 0.35 PSIG.
- NS is secured **(NS pumps** stopped and **NS** discharge valves closed).
- NS has not been 'RESET'.
- Containnient pressure returns to 1.1 PSIG.

Which one of the following describes the response of the NS system to the subsequent containnient pressure increase'!

A. NS pump discharge valves will open at 0.35 PSIG and the NS pumps will auto start at 0.35 PSIG.

3. NS pump discharge valves will open at 0.8 PSIG and the NS pumps will auto start at 1.0 PSIG.

C. NS pump discharge valves will open at 0.35 PSIG and the NS pumps will auto start at 0.8 PSIG.

D. NS pump discharge valves will open at 0.8 PSIG and the NS pumps will auto start at 3.0 PSIG.

---

1 Pt(s)

Given the following events and conditions:

- Unit 1 is approaching Mode 5 to replace a leaking Pressurizer PORV
- NC Cooldown is in progress
- **'A'** Train ND is in the RWR mode.
- **'A'** Train KC is in service at maximum design **flow**
- **'A'** Train RN is in service
- '1A1' KC Pump breaker trips (Overcurrent Relay)

Which one of the following describes the effect on the cooldown rate?

A. **No effect on the Reactor Coolant System or Reactor Coolant System heatup rate.**

B. **No effect on the Reactor Coolant System, the KC System begins to heat up.**

C. **The Reactor Coolant System cooldown rate decreases as the KC System heats up.**

D. **The KC System only begins to heat up, but the ND System maintains a stable Reactor Coolant System cooldown rate.**

---

1 Pt(s) Unit 1 was responding in E-1 ***(Loss of Reactor or** Secondary Coolant)* to small break LOCA. The crew has just completed Step 8.f when the OATC observes the following parameters:

Given the following parameters at the indicated times:

Parameter	**Value**
• NCS pressure (psig)	1650
• Core exit T/C temp (°F)	586
• T_{ave} (°F)	*572*
• T_{hot} (°F)	*578*
• T_{cold} (°F)	***566***
• Pressurizer level (%)	28%
• Containment pressure **(psig)**	1.1
• **CA** flow to all 4 S/Gs exceeds 450 gpm	

Which one of the following is the crew's next required action'?

REFERENCES PROVIDED

A. Remain in E-1, stop NS pumps

B. Transition to ES-1.2 *(Post LOCA Cooldown and Despressurization)*

C. Transition to ES-1.1 (*Safety Injection Termination)*

D. Remain in E-1, return to step 7

---

1 Pt(s) Unit 1 is responding to a small break LOCA using E-1 *(Loss of Reactor or **Secondary** Coolant)*. Given the following events and conditions:

- FWST Level indicates 340 inches
- Containment pressure indicates 1.5 psig
- Containment Sump Level indicates 1.05 ft
- 1EMF-41 (*AUX BLDG VENTILATION*) is in Trip *2* alarm
- Aux Building area radiation monitors are in alarm
- 1EMF-51A and B (*CONTAINMENT TRN A & B*) indicates 25 R/Hr
- Hydrogen Analyzer indicates 0.7% in containment
- NLO's report significant leakage at the seals of the "1A" ND pump

The crew determines that **a** transition to ECA-1.2 (*LOCA **Outside** Containment*) ***is*** required. Which one of the following actions of ECA-1.2 reduces excessive levels of radiation and guard against personnel exposure?

A. Monitor 1EMF-41 (*AUX BLDG VENTILATION)*

B. Dispatch NLO to energize Hydrogen Recombiners

C. Secure VA (Aux. Bldg. Ventilation System) to limit airborne contamination.

D. Identify and isolate the break

---

1 Pt(s) Given the following conditions and events:

- Unit 1 has a very small S/G tube leak on S/G 'IC'.
- Chemistry reports the leak is .075 gpm.
- IEMF-73 (Unit 1 Steam Line '1C' Monitor) is in Trip 1 alarm
- IEMF-33 (Unit 1 Condenser Air Ejector) is in Trip 1 alarm.

Which one of the following correctly describes how the flowpath for dilution of the Steam Set **Air** Ejector **(SJAE)** exhaust is changed in response to this leak?

A. No effects on SJAE exhaust alignment for dilution flowpath or **EMF(s).**

B. SJAE exhaust dilution is swapped to discharge to the Auxiliary Building Ventilation (VA) Filtered Exhaust and diluted with VA to the Unit Vent.

C. All Unit 1 and Unit 2 VA Filtered Exhaust Fans (V.4-FXF) and all Unit 1 and Unit 2 Unfiltered Exhaust Fans (VA-UXF) are started to dilute the SJAE exhaust to the IJnit Vent(s).

D. Unit 2 VA Supply Fans are secured and all Unit 1 and Unit 2 VA is routed to the Unit 1 Unit Vent to dilute the SJAE exhaust.

1Pt(s) Unit 2 has experienced a Steam Generator Tube Rupture on S/G '2B'. The operators are currently in EP/2/A/5000/E-3 ***(Steam Generator Tube Rupture).*** The NC System has been cooled down such that core exit T/Cs are less than required based upon the ruptured S/G pressure. '2B' S/G Narrow Range level indicates 100%. The operators are performing step 20, "Depressurize the NC System".

Which one of the following operational implications of **E-3** has the most effect on primary-to-secondary leak rate and NC **System** pressure. drop while maintaining NC subcooling?

A. Initiate NC Depressurization using maximum available Pzr spray flow.

B. Depressurize the NC System by opening one NC Pzr PORV.

C. Depressurize the NC System by opening all NC Pzr PORVs.

D. Open 1NV-21A (NV Spray To PZR Isol).

---

1 Pt(s) A BLACKOUT has occurred on IETA. D/G '1A' failed to start due to an **S6N** relay actuation. On Annunciator Panel 1AD-1 **1,** 'Battery **EVCA** Undervoltage' is in alarm.

Per the Annunciator Response Procedure which one of the following addresses the Battery EVCA under voltage condition?

A. Cross tie EVDB to EVDA.

B. Cross tie EVDC to EVDA.

C. Swap Battery Charger Connection box to 2EMXH.

D. Swap Battery Charger Connection box to 2EMXA.

---

1 Pt(s) Given the following conditions and events:

- Unit 2 has experienced a large break LOCA inside containment.
- EP/2/A/5000/E-0 *(Reactor **Trip** or **Safety Injection**)* is complete and the crew has transitioned to EP/2/A/5000/FR-Z.1 *(Response to **High** Containment **Pressure**)*.
- While checking Phase 'B' HVAC equipment in *service*, the KO notices that the '2A' and '2B' Containment Air Return Fans are not running.

Which one of the following describes the reason the fans are NOT running and actions needed to start the fans?

REFERENCE PROVIDED

A. VX SYS CPCS TRAIN A/B INHIBIT status lights are LIT, dispatch operator to local panels to potentiometer to actuate relays.

B. VX SYS CPCS TRAIN A/B INHIBIT status lights are LIT, KO starts fans from control room switch.

C. VX SYS CPCS TRAIN A/B INHIBIT status lights are DARK, dispatch operator to local panels *to* potentiometer *to* actuate relays.

D. VX SYS CPCS TRAIN A/B INHIBIT status lights are DARK, dispatch operator to start fans from local panel on 767' elevation.

1Pt(s) Unit 2 **is** in Mode **6** loading fuel. Given the following plant alarms:

- 2EMF-3 ***(Containment Refueling Bridge)*** Trip 2 alarm.
- 2EMF-4 ***(Spent Fuel Building BRDG)*** Trip 2 alarm.
- "INCORE INST ROOM SUMP **HI** LEVEL annunciator LIT.

Which one of the following procedures should be implemented?

A. **AP/2/A/5500/25** ***(Spent Fuel Damage)***

B. **EP/2/A/5000/FR-Z.3** ***(Response to High Containment Radiation Level)***

C. **AP/2/A/5500/40** ***(Loss of Refueling Canal Level)***

D. **AP/2/A/5500/18** ***(High Activity in Reactor Coolant)***

---

1 Pt(s) Unit 1 has just experiencsd a **LOSS** of Offsite Power and the Unit **1** Turbine has tripped.

Which one of the following describes ths effect this transient has on the Condenser Circulating Water (RC) and Vacuum Priming (ZP) Systems'?

A. RC Waterbox Vacuum breaker valves remain closed if all RC pumps trip, to maintain vacuum in the RC piping.

B. RC Waterbox Vacuum breaker valves open automatically if all RC pumps trip, to prevent structural collapse of the RC piping.

C. RC Waterbox Vacuum breaker valves remain closed if all RC pumps trip, to prevent thermal shocking of the RC piping.

D. RC Waterbox Vacuum breaker valves open automatically if all RC pumps trip, to prevent water hammer of the RC piping.

1 Pt(s)

Unit 2 has experienced a Steam Generator Tube Rupture (SGTR) on the 'ID' S/G. The crew has completed EP/2/A/5000/E-0 *(Reactor Trip* ***or*** *Safety Injection)* and has entered EP/2/A/5000/E-3 (*Steam Generator Tube* ***Rupture).*** The crew is performing Step 4 in E-3, which directs the RO to close the MSIV and **MSIV** bypass valves on the **RUPTURED** S/G. When the CLOSE push button is depressed the valve does not close.

Which one of the following describes the RNO step and the subsequent method of cooldown?

A. Close MSIVs and MSIV bypass valves on remaining INTACT S/Gs and use ALL PORVs to cool down.

B. Close MSIVs and MSIV bypass valves on remaining INTACT S/Gs and use INTACT S/G PORVs to cool down.

C. Close MSIVs and MSIV bypass valves on INTACT 'A' and 'B" S/Gs and cool down using PORV on RUPTURED S/G.

D. Close MSIVs and MSIV bypass valves on INTACT 'B' and 'C' S/Gs and cool down using condenser dump valves from RUPTURED S/G.

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1 Pt(s) Unit 1 is beginning a cooldown to Mode 6 to enter a refueling outage

Which one of the following describes the:

- Tech Spec/SLC cooldown limits on the NC system and Pressurizer
- Reason why (if any) for the differences.

A. Tech Spec cooldown limit for the NC System is 100° F/hour.
SLC cooldown limit for the Pressurizer is 200° F hour.
NC System cooldown rate is more limiting due to the decrease in the nil ductility reference temperature as exposure to neutron fluence in creases.

B. Tech Spec cooldown limit for the NC System is 100° F hour.
SLC cooldown limit for the Pressurizer is 60° F hour.
Pressurizer cooldown rate is more limiting due to the effects of insure/outsurge.

C. Tech Spec cooldown limit for the NC System is 100° F/hour
SLC cooldown limit for the Pressurizer is 60° F hour
Pressurizer cooldown rate is more limiting due to the concern for non ductile failure of the pressurizer metal.

D. Tech Spec cooldown limit for the NC System 100° F hour.
SLC cooldown limit for the Pressurizer is 200° F /hour.
NC System cooldown rate is more limiting due to the increase in the nil ductility reference temperature as exposure to neutron fluence increases.

---

1 Pt(s) Given the following conditions and events:

- Unit 1 is at 55% power when a Full load rejection occurs due to the loss of '1A' and '1B' Buslines.
- Main Turbine Impulse Pressure Channel 2 fails **"AS IS".**

Which one of the following describes the correct response of the steam dumps to this event'?

A. Error signal develops between auctioneered Tave and Tref. Steam dumps open to reduce Tave until Tave = Tref.

B. Error signal develops between auctioneered Tave and Tref Steam dumps open and Tave reduces to 3 degrees above Tref.

C. No error signal developed between auctioneered Tave and Tref. Steam dumps do not open.

D. Error signal develops between auctioneered Tave and Tref Steam dumps do not open.

---

1 Pt(s)

A worker is preparing to enter a 'High Radiation Area' to **work** on **a** valve in the reactor building. During the pre-job briefing, RP states that the expected whole body radiation levels are as follows:

- Dose rate in the center of the **room** = 100 mrem/hr
- Dose rate 18 inches from **valve** = 200 mrem/hr
- Contact reading = 1100 mrem/hr

How should the area around the valve be classified?

A. The room *is* a 'Radiation Area'; the valve is a HOT SPOT

B. The rwm is a 'High Radiation Area'; valve is <u>NOT</u> a HOT SPOT

C. The room is a 'High Radiation Area'; the valve is a HOT SPOT

D. The room is an 'Extra High Radiation Area'; the valve is <u>NOT</u> a HOT SPOT

---

1 Pt(s) Today, you *are* directed to complete a valve lineup on Unit 1 in accordance with enclosure 4.10 to OP/1/A/6200/005, ***Spent Fuel*** *Cooling* ***System.*** The controlled copy of the procedure has a restricted change noted for valve 1KF-145. This normally open valve has been locked open in accordance. with a special order that remains in effect until October 1st.

Which one of the following statements describes the correct action needed to validate your working copy of the procedure? (Your copy of the procedure is in other respects identical to the controlled copy.)

A. Replace your working copy with an updated procedure printed from the NEDL system.

B. Annotate the working copy with a pen and ink change for the vaive position for 1KF-145; change to "Locked Open", annotate the restricted change number and initial the change.

C. Annotate the working copy with just the restricted change number (as a cross reference) next to the 1KF-145 line item, and initial the change.

D. Use the working ropy as is since restricted changes of this nature are not required to he written into working copies.

---

1 Pt(s) Unit 1 was operating at 100% power when a total loss of feedwater occurred. The operators reached Step 7 of FR-H.1 *(Response to Loss of Secondary Heat Sink),* which attempts to establish **CA** flow to at least one S/G. Sub-step **7.k** states:

> ***Maintain feed flow rate less than or equal to 100 GPM until S/G WR level is greater than 12% (17% ACC).***

Given the following conditions:

	Loop A	Loop B	Loop C	Loop D
S/G (WR) [%]	0	15	9	10
NC T_{Hot} [°F]	150	555	530	545

- Containment pressure is 3.4 psig
- The TD **CA** pump is available to feed the S/Gs

Which one **of** the following statements correctly describes the bases for the restrictions for restoring feedwater flow following feed and bleed in FR-H.1?

A. Restore flow to the 'A' S/G because loop 'A' T-hot **is** the lowest of the loops and this will reduce the chance of thermal shocking the S/G. Flow should not be restored to the 'R' and **'C' S/Gs** because they will be reserved for use later to provide a steam supply for the TD CA pump.

B. Restore flow to the 'B' S/G because 'B' S/G level is the highest and this will reduce the chance of thermal shocking the S/G. **Flow** should be preferentially restored to the **'B'** or **'C'** ***S/C:*** to maintain the TD **CA** pump steam supply.

C. Restore flow to the 'C' **S/G** because loop **'C'** T-hot is **less** than loop 'R' T-hot and this will reduce the chance of thermal shocking the S/G. Flow should be preferentially restored to the 'B' or 'C' S/G to maintain the TD CA pump steam supply.

D. Restore flow to the 'D' S/G because the 'D' S/G is higher than **'A' S/G** level, which will reduce the risk of thermal shock. Flow should not be restored to the 'R' and 'C' S/Gs because they will be reserved for use later to provide a steam supply for the **TD CA** pump.

---

1 Pt(s) Unit 1 was conducting a plant stat up. At 1% power, an instrument malfunction caused an inadvertent reactor trip. Given the following indications:

- Two rod bottom lights are NOT lit
- Reactor trip and bypass breakers are open
- IR amps = 2×10^{8}
- IR SUR = **-0.3** DPM

Which one of the following response actions is required?

A. **Implement AP/14, *(Control Rod Misalignment)* and respond to the stuck rods.**

B. **Implement E-Q.*(Reactor Trip or Safety Injection),* and immediately transition to FR-S.2, *(Response to Loss of Core Shutdown).***

C. **Implement E-Q,*(Reactor Trip or Safety Injection)* and immediately transition to FR-S.1, *(Response to Nuclear Bower Generation/ATWS).***

D. **Implement E-0, (*Reactor Trip or Safety Injection*), and then transition to ES-0.1, (*Reactor Trip Response*).**

---

1 Pt(s) Unit 1 is in Mode 1 conducting a plant startup. The operators have reached 11% R.T.P. when a momentary electrical transient on the '1A' Main **Bus** Line occurs resulting in the following conditions:

Bus	**ITA**	1TB	1TC	1TD
Frequency (Hz)	*55*	*60*	*55*	60
Voltage (VAC)	6410	6900	6410	6900

Which one of the following sequences would occur?

A. **NCPs 1A and 1C trip because of Under-Frequency while NCPs 1B and 1D continue running and a reactor trip does NOT occur.**

B. **NCPs 1A and IC trip because of Under-Voltage while NCPs 1B and 1D continue running and a reactor trip occurs.**

C. **All 4 NCPs trip because of Under-Frequency and a reactor trip does NOT occur.**

D. **All 4 NCPs trip because of Under-Frequency and a reactor trip occurs.**

---

1 Pt(s) Unit 1 was operating *at* 100% power when a crud burst occurred. Given the following events and conditions:

- 1EMF-48 (Reactor Coolant Hi Rad) Trip 2 alarm
- 1EMF-18 (Reactor Coolant Filter 1A) Trip 2 alarm

Which one of the following actions per AP/1/A/5500/18 (Activity in the Reactor Coolant System) is required to reduce coolant activity due to a crud burst in the NC system'?(Assume no clad damage has occurred.)

A. Purge the VCT with nitrogen

B. Place/ensure both mixed bed demineralizers are in service

C. Increase letdown flow

D. Add hydrogen to the reactor coolant

---

1 Pt(s) Unit I is operating at 100% power. Given the following conditions:

- Rod control is in **'MANUAL'**
- Control **Bank** D is at 200 steps

If the rods in control bank D start stepping cut at 8 steps **per** minute, which one of the following actions is required at this time'?

A. Select Control Rank D on the rod selector switch and manually insert Control Bank D

B. Select "AUTO" on the Bank Select Switch and see if rod motion stops

C. Commence emergency boration

D. Trip the reactor

1Pt(s) Unit I **is** operating at 50% power. Given the following conditions:

- Pressurizer pressure is 2235 psig
- Pressurizer Relief Tank (PRT) pressure is 20 psig
- PRT temperature is 125°F
- PRT **level** is 81%
- The PRT is being cooled by spraying from the RMWST
- **A** pressurizer code safety valve is suspected of leaking by it's seat

What teniperature would be indicated on the associated safety valve discharge RTD if the code safety were leaking by?

REFERENCES PROVIDED

A. 258-2629!

B. 227-231 °F

C. 161-165°F

D. 123 -127°F

I Pt(s) A male worker needs to repack a valve in an area that has the following radiological characteristics:

- The worker's present exposure is 1800 mrem for the year.
- General area dose rate = 65 mrem/hr
- Airborne contamination concentration = 20 DAC

The job will take 4 hours with a mechanic wearing a full-face respirator. It will only take 2 hours if the mechanic does NOT wear the respirator.

Which of the following choices for completing this job would maintain the workers exposure within the Station ALARA requirements?

A. The worker should wear the respirator otherwise he will exceed **25%** of the DAC **limit.**

B. The worker should **NOT** wear the respirator because the dose received will exceed neither NRC nor site dose limits.

C. The worker should wear the respirator because the total TEDE dose received will be less than if he does not wear one.

I). The worker should NOT wear the respirator hecause the total TEDE dose received will he greater if he wears one.

---

1 Pt(s) Unit 2 is in the process of starting up the reactor in accordance with all controlling procedures. Given the following conditions and events:

- 2 EMF-3 *(CONTAINMENT REFUELING BRIDGE MONITOR)* Trip 1 setpoint is 7x10' mR/hr and Trip 2 setpoint is $1.5x10^2$ mR/hr.

	0200	0205	0210	021s
2EMF 3 (mR/hr)	5x10'	$1.1x10^2$	$1.6x10^2$	$2.7x10^2$
N-31 (CPS)	$1.2x10^4$	$1.7x10^4$	$2x 10^4$	0
N-32 (CPS)	$9.2x 10^3$	$1.1x10^4$	0	0
N-35 (amps)	$9.1x 10^{-11}$	$1.0x10^{-10}$	$1.2x10^{-10}$	$1.2x10^{-10}$
N-36 (amps)	$9.3x10^{-11}$	$1.1x10^{-10}$	$1.3x10^{-10}$	$1.3x10^{-10}$

If channel N-32. is deenergized due to a SR detector failure at 0210, what is the earliest time (if any) that **the** containment evacuation alarm will actuate in Unit 2 during the startup'?

A. 0205

B. 0210

***C.* 0215**

D. The containment evacuation alarm will not actuate

---

1 Pt(s) Unit 1 has initiated a liquid radioactive waste release from the Ventilation Unit Condensate Drain Tank (VUCDT) through the RC system. All lineups and authorizations have been properly made in accordance with OP/0/B/6200/35 using the normal path. Two **RC** pumps are the minimum required under the LWR document.

Given the following initial conditions:

- **3** RC pumps are running
- 1EMF-44 *(CONT VENT DRN TANK OUT)* correctly set for trip 1 and trip *2* activity limits
- MRIRR = 75 GPM based on boron concentration
- No other releases are in progress

If the release automatically terminates 40 seconds after initiation, which one of the following conditions could have terminated the release and what is the proper operator response?

A. **1WM-46** ***(LIQUID WASTE DISCH VALVE)*** closing automatically if **1**RC pump tripped, and the release may not be restarted until Chemistry resamples the tank.

B. **1WM-46** closing automatically if **1EMF-44** reached the trip 2 setpoint, the release may be restarted two additional times.

C. **1WP-35** ***(WMT & VUCDT TO RC CNTRL)*** closing automatically if **1**RC pump tripped, and the release may not be restarted until Chemistry resamples the tank.

D. 1WP-35 closing automatically if 1EMF-44 reached the trip 2 setpoint, the release may be restarted two additional times.

1 Pt(s) Unit 1 is operating at 80% power when an electrical transient causes several condensate system pumps to trip. Given the following conditions and events:

	Start	10 sec	20 sec	30 sec	40 sec
CF pump 1A Suction Pressure (psig)	451	238	232	229	227
CF pump 1B Suction Pressure (psig)	448	227	223	240	238
# Hotwell Pumps running	2	2	3	2	1
# Condensate Booster Pumps running	2	1	0	2	1

Which one of the following is the earliest time and the reason that BOTH main feedwater pumps will have tripped'!

A. 10 seconds, due to 2/3 Condensate Booster Pumps Tripped

B. 20 seconds, due to 3/3 Condensate Booster Pumps Tripped

C. 30 seconds, due to suction pressure

D. 40 seconds, due to 213 Condensate Booster Pumps and 213 Hotwell Pumps Tripped

1 Pt(s) Unit 1 has just entered Mode 5 in preparation for refueling. Given the following conditions and events:

- A lower containnicnt entry *is* planned for the next shift.
- The **SRO** directs the RO to purge the containnient in preparation for the containment entry.
- Currently the VP system is secured with all fans off and containment purge and exhaust valves closed

Which one of the following describes the proper alignment of the containment purge system?

A. The ***NORMAL REFUEL SELECTOR*** switch is placed in the ***"NORM"*** position and ratio of supply air is 2/1 (Upper/Lower Containment).

B. The ***NORMAL REFUEL SELECTOR*** switch **is** placed in the ***"NORM"*** position and ratio of supply air is **4/1** (Upper/Lower Containment).

C. The ***NORMAL REFUEL SELECTOR*** snitch is placed in the "***REFUEL***" position and ratio of supply air is 211 (Upper/Lower Containment).

D. The ***NORMAL-REFUEL SELECTOR*** **switch** is placed in **the** ***"REFUEL"*** position and ratio ***of*** supply air **is 4/1** (Upper/Lower Containment).

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1 Pt(s) Unit 1 is shutdown, Mode 6, in a refueling outage. Given the following conditions:

- Containment airlock doors are both open
- A full shift of qualified maintenance personnel are available inside containment
- The Refueling SRO is in the control room
- The Fuel Handling Supervisor is inside containnient

Refueling has been completed and the Fuel Handling Supervisor (who is not a qualified SRO) requests permission to latch all control rods to prepare for the reactor startup. What additional requirements must be met (if any) to proceed with iatching rods'?

A. Latching rods may proceed at the discretion of the Fuel Handling Supervisor.

B. Latching rods may not proceed until after containment integrity has been restored.

C. Latching control rods may not proceed until after the Refueling SRO arrives inside containment to supervise.

D. Latching control rods may not proceed until after the Refueling SRO arrives inside containment and containment integrity has been restored.

---

1 Pt(s) Unit 1 is shutdown in a refueling outage. Given the following events and conditions:

- The VI system was in **a** normal lineup.
- The VS system was in **a** normal lineup.
- **A** VI header rupture occurs.
- 'VI Low' and 'Low Low Pressure' Annunicators **alann**
- The VI system completely depressurizes.

What effect docs a total loss of the VI system have on the VS system'?

A. VI-820 will auto-close as VI header pressure decreases below 82 psig and the VS air compressor will start automatically **to** maintain VS header pressure.

B. VI-820 will auto-close **as** VI header pressure decreases below 90 psig and the VS air compressor must be manually started to maintain VS header pressure.

C. Check valves in the VI - VS cross-connect line will close **to** isolate VS system pressure before it drops below 90 psig.

D. VS pressure in the Fire Protection Pressurizer Tank will be lost until a VS air compressor can be started.

---

1 Pt(s) If a fire was reported in the McGuire Office Complex (MOC), which one of the following responses is correct by station procedures?

A. **Offsite fire departments are responsible for all fire suppression activities at the scene. The Fire Brigade must be held in reserve for station fires inside the protected area.**

B. **Offsite fire departments are responsible for all fire suppression activities at the scene. The Fire Brigade may provide limited support if resources allow.**

C. **The Fire Brigade is responsible for the initial response at the scene. They are required to turn over control of the scene as soon as an offsite fire department arrives and immediately return to the protected area.**

D. **The Fire Brigade is responsible for fire suppression activities at the scene. An offsite fire department may be called to provide support if additional resources are required.**

---

1 Pt(s) Unit 1 is in the process of making a radioactive gaseous waste release from the waste gas decay tank in accordance with OP/0/A/6200/19 (*Waste Gas Decay Tank* ***Release).*** Given the following conditions:

- Most Restrictive Instantaneous Release Rate (MRIRR) = 35 CFM
- EMF-50(L) trip 1 setpoint = 1.0E5 CPM
- EMF-50(L) trip 2 setpoint = 2.0E5 CPM
- EMF-36(L) **is** out of service
- The operators reset 1EMF-50(L) whenever procedural direction allows

Time	**0200**	**0215**	**0230**	**0245**
Release rate (CFM)	22	37	32	41
EMF-50(L) (CPM)	1.1E5	2.1E5	2.2E5	2.2E5

What was the earliest time that the operators were required to terminate (and not restart) the gaseous release.

A. 0200 - cannot release with 1EMF-36(L) out of service

B. 0215 - must terminate due to exceeding MRIRR

C. 0230 - must terminate due to 2nd trip of EMF-50(L)

D. 0245 - must terminate after 3rd trip of EMF-50(L)

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1 Pt(s)

IJnit 1 is in the process of making a radioactive gaseous waste release from the waste gas decay tank in accordance with OP/0/A/6200/18 ***(Waste Gas Operation).*** Given the following conditions:

- Most Restrictive Instantaneous Release Rate (MRIRR) = 31 CFM
- Maximum Observed System Release Kate (MOSRR) = 40 CFM
- EMF-50 *(WASTE GAS DISCH)* trip 1 setpoint = 2.0E5 CPM
- EMF-50 trip 2 = 3.0E5 **CPM**
- **EMF-36** *(UNIT VENT GAS)* is in service

Time	**0200**	**0215**	**0230**	**0245**
Release **rate** (CFM)	30	32	41	27
EMF-50 (CPM)	2.8E5	3.2E5	3.1E5	4.2E5

If the operators reset EMF-50 whenever allowed by procedure, what is the earliest time that the operators **are** **required** to terminate (and not immediately restart) the gaseous release'?

A. 0200

B. 0215

C. 0230

D. 0245

I Pt(s)

Unit 2 was in the process of starting **up** the reactor following a refueling outage. Given the following plant conditions and events:

- Reactor trip breakers are closed
- Withdrawal of **'A'** control **bank** has commenced
- Train **A** of Wide Range Shutdown Monitoring ***is*** inoperable

If source range *N-32* fails low, which one of the following actions **is** required?

A. Startup may continue with train B of the Gamma-Metrics Shutdown Monitor System substituting for the failed N-32 source range channel

B. *Immediately* stop withdrawal of shutdown banks

C. Immediately open the reactor trip breakers

D. Immediately reinsert shutdown banks and open the reactor trip breakers

---

I Pt(s) Unit **1** was operating at 100% power when main condenser vacuum dropped suddenly from 25 inches vacuum to 23 inches vacuum. Given the following events and conditions:

- All **3** condenser steam air ejectors **(CSAEs)** are in service
- Both primary and secondary jets are operating
- The system lineup is in the normal configuration

Which one of the following statement? correctly describes the cause of this problem'?

A. Loss of YM supply to the condenser boot seals

B. CM flow to all CSAE inter-coolers has been obstructed

C. Loss of the main steam supply to the CSAEs

D. A CSAE drain was left open

1 Pt(s) Unit 2 is responding to an **ATWS** without Safety Injection actuation. Given the following indications:

- Pressurizer level begins to go down
- The **2A** NV pump ammeter indicates running amps are low

If all automatic control systems operated normally, which one of the following conditions would cause the **2A** NV pump running amps to decrease to the lowest value?

A. **2NV-238** ***(CHARGING LINE FLOW CONTROL)*** **failed open**

B. **2NV-238** ***(CHARGING LINE FLOW CONTROL)*** **failed closed**

C. **2NV-241** ***(SEAL INJ FLOW CONTROL)*** **failed open**

D. **2NV-241** ***(SEAL INJ FLOW CONTROL)*** **failed closed**

---

1 Pt(s) Unit 2 was operating at 100%when a "FLOOR COOLING GLYCOL HIGH TEMPERATURE" annunciator is received. **A** review of the RTD **panel** reveals that several ice condenser floor slabs have high temperature indicated.

Which one of the foliowing statements correctly describes the operational concern raised hy this annunciator'?

A. High glycol temperatures will cause the in-service glycol compressor to trip causing a loss of NF cooling **and** excessive ice sublimation.

B. Low floor cooling glycol temperatures could cause cracks in the ice condenser thermal harrier.

C. Slab freeze and thaw cycles could result in floor buckling that could interfere with lower door operation.

D. Slab freeze and thaw cycles could cause gaps between the floor and the intermediate deck doors resulting in a bypass flow path.

1 Pt(s) Unit 1 is operating at full power and Unit 2 is refueling. Unit **1** is releasing a minimally decayed waste gas decay tank when a significant packing leak ***starts*** on isolation valve 1WG-160, *(WG Decay Tank Outlet to Unit Vent Control).*

Which one of the following statements correctly describes the automatic actions required to assure that the leak is contained and filtered?

A. **1EMF-50** ***(WASTE GAS DISCH HI RAD)*** automatically closes **1WG-160,** and **1EMF-41** ***(AUX BLDG VENT HI RAD)*** automatically stops the auxiliary building ventilation unfiltered exhaust fans.

B. **1EMF-41** automatically stops: the auxiliary building ventilation unfiltered exhaust fans, and **1EMF-36** ***(UNIT VENT HI RAD)*** automatically closes **1WG-160.**

C. **1EMF-36** automatically closes **1WG-160,** and **1EMF-35** ***(UNIT VENT PART HI RAD)*** automatically aligns the auxiliary building ventilation filter trains.

D. **1EMF-35** automatically stops the auxiliary building ventilation unfiltered exhaust fans, and **1EMF-41** automatically aligns the auxiliary building ventilation filter trains.

I Pt(s)

Unit 2 *is* in Mode *6* with refueling activities in progress. Given the following events **and** conditions:

- **A** containment purge is in progress
- **A** fuel element was rammed into the side of the reactor vessel
- EMF-3 *(CONTAINMENT REFUELING BRIDGE)* and EMF-38 *(CONTAINMENT PARTICULATE)* are in Trip 2 alarm

Which one of the following actions should occur, assuming that operators follow the required procedure steps?

A. **The containment evacuation alarm sounds automatically. The containment purge stops automatically.**

B. **The containment evacuation alarm can only be actuated by the control room. The containment purge stops automatically.**

C. **The containment evacuation alarm sounds automatically. The containment purge is stopped manually.**

D. **The containment evacuation alarm can only be actuated by the control room. The containment purged is stopped manually.**

I Pt(s)

Unit I has experienced four CRUD bursts this month. Given the following events and conditions:

- **IA** reactor coolant filter d/p was indicating 40 psid.
- 1EMF-18 *(REACTOR COOLANT FILTER 1A)* reads 5 times its normal value.
- **1A** reactor coolant filter was taken out of service.
- 1B reactor coolant filter was placed in service.
- 1B reactor coolant filter d/p is 10 psid.
- 1A mixed bed demineralizer is in service.
- 1EMF-48 *(REACTOR COOLANT)* reads its normal value.
- Local radiation readings near reactor coolant filter 1B are **3** times normal.

If the detector for 1EMF-19 *(REACTOR COOLANT FILTER 1B)* fails. what actions (if any) **are** the operators required to take in response to these conditions'?

A. Switch mixed bed demineralizers.

B. Shift hack to 1A reactor coolant filter until 1EMF-19 is returned to service.

C. Place both mixed bed demineralizers in service until 1EMF-19 is returned to service.

D. No action is required.

---

1 Pt(s) Unit 2 is operating at 100%power. Given the following events and conditions:

- Operators started RV pumps **'A'** & 'B' due to rising containment temperatures.
- Containment Upper temperature is 90 °F, decreasing.
- Containment Lower temperature is I19 °F, decreasing.
- At 0200, a station blackout occurs on both Units 1 and 2
- Operators implement the appropriate procedures.

Which one of the following pumps provides the assured source of cooling water to maintain containment temperature within Tech Spec limits?

A. '2C' RV pump

B. '2A' RN pump

C. '2B' RN pump

D. '2A' or '2B' RN pumps.

---

1 Pt(s) Unit 1 has experienced a rupture of the RN piping inside containment. Emergency procedures prescribe successful response mechanisms if containment water level remains between 3.5 and 10.5 feet.

Why is safe plant recovery not assured for a design basis large break LOCA when containment water level exceeds 10.5 feet?

A. Operation of the ND system is compromised hy high suction pressure.

B. Operation of the NS pumps is endangered by excess debris fouling the containment suction strainers.

C. Operation of the hydrogen purge system is compromised by loss of direct access to the containment atmosphere.

D. Operation of critical ECCS components needed for safe recovery is endangered by suhmersion.

---

1 Pt(s) Unit 2 is operating at 100 % power. Given the following events and conditions:

- "B" Train of essential operating equipment (RN, KC, NV) is in service.
- 2.4 RN train is in operation for surveillance testing.
- The RN trains are separated with 2RN-41B *(TRAIN B TO NON-ESS HDR ISOL)* **CLOSED.**

Which one of the following statenients correctly describes the potential consequence if 2RN-190B *(RN TO B KC HX CONTROL)* failed to perform its automatic function associated with decreasing B train RN flow'?

A. Overheating 2B RN pump.

B. 2B RN strainer goes *to* 'Backwash' mode due to hi d/p.

C. Overheating the running B train KC pumps.

D. 2RN-41B will open to restore flow to the heat exchanger.

---

1 Pt(s) Unit 2 has just begun **to** shutdown (decreasing 2MWe/min) for refueling. Given the following events and conditions:

- Pressurizer level is at program level and in 'automatic'.
- The controlling pressurizer level transmitter fails at its current output.
- No operator action is taken.

Which one of the following statements correctly describes the system response as plant load is reduced?

A. Charging flow decreases
Letdown isolates
Pressurizer heaters turn off

B. Charging flow increases
Pressurizer heaters energize
Pressurizer level increase to the trip setpoint

C. Charging flow decreases
Letdown will not isolate
Pressurizer level decreases until the Pressurizer is empty

D. Charging flow increases
Pressurizer heaters will not energize
Pressurizer level increases to the trip setpoint.

---

1 Pt(s) **A** station emergency battery is supplying DC bus loads without a battery charger online. If the load on the DC **bus** does not change, which one of the following statements correctly describes **a** vital battery's discharge rate (amps) as the battery is expended?

A. The discharge rate will be fairly constant until the design battery capacity (amp-hours) is exhausted and then **will** rapidly decrease.

B. The discharge rate will decrease steadily until the design battery capacity ***is*** exhausted.

C. The discharge rate will increase steadily until the design battery capacity is exhausted.

D. The discharge rate will initially decrease until approximately ***50%*** design capacity had been expended and then increase until the battery has been exhausted.

---

1 Pt(s) The crew has verified natural circulation in ES-0.1 ***(Reactor Trip Response)*** based on decreasing core exit thermocouple readings and subcooling > 0 °F. Ten minutes later, the operator notes that the thermocouple input to both plasma displays *is* malfunctioning.

Which one of the following correctly describes a valid indication that natural circulation is continuing?

A. **S/G saturation temperatures are decreasing and *REACTOR VESSEL UR LEVEL* indication is greater than 100 %.**

B. **S/G pressures are decreasing and T_{cold} is at S/G saturation temperature.**

C. **S/G pressures are decreasing and *REACTOR VESSEL D/P* indication is greater than 100%.**

D. **S/G pressure is at saturation pressure for T_{cold} and *REACTOR VESSEL D/P* indication is greater than 100 % .**

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1 Pt(s) Given the following Unit 1 initial conditions:

- Reactor power is at 40%
- Power range NIS indicate.:
  - 40% (N41), 41% (N42), 41% (N43), 41% (N44)
- Tave for each Loop indicates:
  - 567° F ('A'), 564" F ('B'), 568°F ('C'), 568° F ('D')
- Turbine pourer is a?481 MWe
- Rod control is in automatic
- Group demand counters and DRPI indicate Control Bank 'D' at 140 steps.

Control Bank 'D' Rod L-12 drops fully into the core and the foilowing conditions now exist:

- Power range NIS indicate:
  - 40% (N41), 38% (N42), 42% (N43), 42% (N44)
- Tave for each loop indicates:
  - 564° F ('A'), 564° F ('B'), 563°F ('C'), 564°F ('IS)
- Turbine power is 478 MWe

The effect of the dropped rod on the Rod Control System is that rods will initially:

A. Move out due to the Tave signal providing the largest error signal.

B. Move out due to the Power Range NIS input processed by the Mismatch Rate Comparator creating the largest error signal.

C. Move in due to Power Range NIS input processed by the Mismatch Kate Comparator creating the largest error signal.

D. Move in due to the Tave signal providing the largest error signal.

---

1 Pt(s) The **NCPs** are limited to *3* consecutive starts in any 2-hour period. There is an additional requirement of **a** minimum idle period of **30** minutes between restarts. What is the reason for these limitations'?

A. **This restriction assures that the oil temperature will decrease to design specifications between restart attempts.**

B. **This restriction prevents overheating the motor windings due to high starting currents.**

C. **This restriction allows the NCP seals to fully reseat between NCP oil lift pump cycles.**

D. **This restriction ensures that natural circulation is reestablished between starts to prevent a cold-water addition accident.**

1Pt(s) Unit 1 is in Mode **6** and fuel reload is complete. Given the following events and conditions:

- Source range counts have increased in the past **45** minutes.
- The Source Range Hi **Flux** at Shutdown alarm has began to alarm intermittently for the past 30 minutes
- Chemistry has reported boron in the refueling cavity 2650 ppm.
- Only one Charging Pump is available

Which one of the following actions must be implemented under these conditions?

A. Start emergency boration of the NCS.

B. Block Source Range High Flux Reactor Trip.

C. Have IAE adjust Hi Flux at Shutdown setpoints up ½ decade

D. Start alternate boration of the NCS

---

1 Pt(s) Given the following events and conditions:

The Component Cooling Water System piping has just severed where the Reactor Coolant Pump Component Cooling return combines with the Excess Letdown Heat Exchanger.

Which one of the following statements correctly describes the control room indication(s) that you would see for this failure?

A. NCP Thermal Barrier Outlet valve(s) CLOSED.

B. Containment Sump 'A' level increasing.

C. Seal Water Return flow increasing.

D. Reactor Coolant Pump motor bearing(s) temperature increasing.

1Pt(s) Unit 1 was operating at 100%. Given the following events and conditions:

- The following fans were in operation:
  - **Pipe** Tunnel Booster Fans
  - Return Air Fans
  - Lower Containment Fans
  - Upper Containment Fans

- A LOCA occurs
- All systems functioned as designed
- Fan switches selected to low speed

Which one **of** the following describes the alignment of the above containment cooling systems'!

A. Pipe Tunnel Booster Fans start and run in low speed

B. Return Air Fans fans start.

C. Lower Containment Fans start and run in high speed

D. Upper Containment Fans start and go to "MAX" position.

1 Pt(s) Unit 2 was at 75% R.T.P. when a loss **of** condenser vacuum occurred. Given the following conditions:

- Rods are in automatic
- The s t e m dump select switch is selected to 'Tave' mode
- Condenser vacuum is slowiy decreasing
- No component or instrument failures occurred
- No operator action taken

Which one of the following sequences best describes the actuation of the control rods to this event?

A. Control rods move in due to decreased condenser back pressure

B. Control rods move out due to decreased condenser back pressure

C. Control rods move in due to increased condenser back pressure

D. Control rods move out due to increased condenser back pressure

---

1 Pt(s)

Unit 1 was at 100% R.T.P. when the following transient occurs:

- **A** Loss of Offsite Power occurs
- **A** reactor trip occurs **due** to failure of the turbine to successfully runback to in house loads
- Diesel Generator " A fails to start
- Diesel Generator "B" successfully loads bus ETB

What is the basis in E-0 ***(Reactor Trip or Safety Injection)*** Step **4** RNO for restoration of power to **ETA** when time allows and continuing with E-O?

A. Minimum shift crews are assumed in the EOPs and manpower is not available to restore power to ETA.

B. The action to restore power to ETA is directed by the TSC only

C. The actions to restore power to ETA will be addressed after transition to ECA 0.0 *(Loss of All AC Power)*.

D. Only one train of safeguard equipment is required to deal with the emergency condition.

---

1 Pt(s) Unit 1 was operating at 100% power when the following occurred:

- "1B" FWPT was manually tripped due to an oil leak
- AP/1/A/5500/03 *(Load **Rejection**)* has been implemented and completed through step 10.

Step 10 has the operator perform the following:

- Place CF **pump** in manual
- Check "CF Header Pressure at least 100 psig above steam header pressure".
- If CF Header pressure is low the RNO states:

> *"**WHEN** S/G levels are greater than or equal* io *program level (and CF valves begin closing), **THEN** adjust CF Pump speed* io *maintain CF HEADER PRESSURE 100-120 psig above "STEAM HEADER PRESSURE".*

What is the basis for this step?

A. As S/G levels are restored the FWPT suction flow decreases and FWPT speed control is slow *to* decrease FWPT speed.

B. As S/G levels are restored the FWPT *suction* flow increases and FWPT speed control is slow to decrease FWPT speed..

C. As S/G levels are restored the CF control valves start to close down and EWPT speed control is slow to decrease PWPT speed.

D. As S/G levels are restored the CF control valves start to open and FWPT speed control is slow to decrease FWPT speed.

---

1 Pt(s) Unit 1 is responding to a large-break loss of coolant accident inside containment. Given the following events and conditions:

- Operators have implemented E-0 ***(Reuctnr Trip or Safety Injection),*** and are implementing Step 22 (Check if NC System **INTACT),** RNO.
- The RO has just energized the Hydrogen Igniters
- Containment hydrogen pressure spikes to 5 psig and then ***immediately*** returns to 1.5 psig.

Which one of the following statements correctly describes the correct procedural flow path?

A. **Go to EP/1/A/5000/E-1** ***(Loss of Reactor or Secondary Coolant)*** **and then EP/1/A/5000/FR-Z.1** ***(Response to High Containment Pressure)***

B. **Go to E-1**

e. **Go to FR-Z.1**

D. **Implement Generic Enclosure 4** ***(Start Hydrogen Recombiners)***

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1 Pt(s) IJnit 1 is responding to a feed line **break** inside containment. Given the following events and conditions:

- Completed EP/1/A/5000/E-0 *(Reactor Trip or Safety Injection)*
- Entering EP/1/A/5000/E-1 *(Loss of Reactor or Secondary Coolant)*
- The STA reported the following valid Critical Safety Functions:
  - Subcriticality - yellow path
  - Containment Pressure - orange path
  - Heat Sink - orange path
  - **All** other CSFs are green or yellow

Which one of the following statements correctly describes the proper procedure flow path?

A. **Remain in E-1** ***(Loss of Reactor or Secondary Coolant)***

B. **Transition immediately to PK-S.2** ***(Response tu Loss of Core Shutdown)***

C. **Transition immediately to FR-Z.1** ***(Response tu High Containment Pressure)***

D. **Transition immediately to FR-H.1** ***(Response to Loss of Secondary Heat Sink)***

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1 Pt(s)

A fire has occurred in the auxiliary building affecting Unit 1 equipment. Transfer of plant control to the auxiliary shutdown panel is not possible due to the fire. AP/1/A/5500/24 *(Loss of Plant Control Due to Fire or Sabatoge)* has been implemented. Transfer of plant control for Unit 1 to the SSF is complete. The QSM asks you to determine natural circulation.

As SRO located at the SSF what indications could you use to determine natural circulation?

A. Steam Generator Pressure and Core Exit Thermocouples

B. NC Loop W/R Pressure and Steam Generator Pressure

C. Incore Thermocouples and NC Loop W/R Pressure

D. NC Loop Tcold and Pressurizer level

I Pt(s) Following a Small Break LOCA inside containment the following conditions **exist:**

- Containment Temperature is 145 degrees F.
- Containnient Pressure is 3.2 psig
- Reactor Coolant temperature is 500 degrees F.
- Lower Containment humidity is 100%

Adverse Containment Conditions are determined by:

A. Calculating the containment saturation pressure.

B. The operator taking into account the containment temperature.

C. The operator through the use of containment pressure.

D. The saturation temperature of the Reactor Coolant System versus containment pressure.

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1 Pt(s)

A reactor trip and safety injection has occurred and E-0 *(Reactor Trip or Safety Injection)* is *in* progress. When Safety Injection termination criteria are met, the crew **is** directed to stop all but one NV pump in Step 25. After .securing one NV Pump , plant conditions are as follows:

- S/G N/R levels are at 30% and decreasing
- Pzr Level is stable at 12%
- Pzr Pressure is going down
- Subcooling based on Core Exit Thermocouples is 10 degrees
- FWST level is 185 inches

Select the appropriate procedure for these conditions:

A. **ES-1.3** ***(Transfer to Cold Leg Recirc).***

B. **E-2** ***(Faulted S/G Isolation).***

C. **E-I** ***(Luss of Reactor or Secondary Coolant)***

D. **ES-1.2** ***(Post LOCA Cooldown and Despressurization).***

---

1 Pt(s)

Unit 2 has experienced a load rejection from 100% R.T.P. due to the trip of the "2A" FWPT. **As a** result of the transient the following conditions exist:

- Pressurizer level is greater than setpoint
- 2NV-238 *(ChargingLine Flow Control)* is closing
- NC pump seal injection is <5 gpm per pump

Which one of the following statements correctly describes the required operator action to restore adequate and proper NC pump seal injection flowrate?

A. Open 2NV-241 *(Seal Znj. Flow Contro)l*

B. Close 2NV-241

C. Close 2NV-238 while opening 2NV-241.

D. Open 2NV-238 while opening 2NV-241.

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1 Pt(s) Unit 1 is at 100% power when the controlling Pressurizer Pressure instrument **fails** HIGH. **Per** AP/1A/5500/11 *(Pressurizer **Pressure Anomalies)*** the first action **the** operator must take is place "PZR PRESS CNTRL SELECT" switch to an operable channel.

What is the basis for this action?

A. This failure causes **PORVs** 1NC-32B & **36R** to open and a fast response is required to prevent a reactor trip on low pressure.

B. This failure causes all the Pressurizer heaters to energize and a fast response is required to prevent a reactor trip on high pressure.

C. This failure causes PQKV 1NC-34A and reactor coolant **pump** spray valves to open and a fast response is required to prevent a reactor trip on low pressure.

D. This failure causes the reactor coolant **pump** spray valves to fail closed and the backup heaters to energize and a fast response is required to prevent a reactor trip on high pressure.

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1 Pt(s) EMF 59 (Equipment Staging Building Ventilation Monitor) is **in** 'Trip 2'. Which **one of** the following describes the **actions that** occur as a result of the Trip 2 *alarm'?*

A. **If VK *(Equipment Staging Building Vent.)* is in "Auto" the supply fans will trip.**

B. **If VK *(Equipment Staging Building Vent.)* is in "On" the supply fans will trip**

C. **If VK *(Equipment Staging Building Vent.)* is in "Auto" the exhaust and supply fans will trip.**

D. **If VK *(Equipment Staging Building Vent.)* is in "On" the exhaust and supply fans will trip.**

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1 Pt(s) Unit 2 is operating at 100%, all control system components are in their normal configuration (1-2 position). The controlling pressurizer level channel slowly fails to sixteen percent (16%). Which one of the following describes the effect on the letdown valves?

A. **2NV-1A, 2NV-457A, 2NV-458A 2NV-35A close, and Pzr heaters energize.**

B. **2NV-1A, 2NV-457A, 2NV-458A, 2NV-35A close, and Pzr heaters de-energize.**

C. **2NV2A, 2NV-457A, 2NV-458A, 2NV-35A close and Pzr heaters energize.**

D. **2NV2A, 2NV-457A, 2NV-458A, 2NV-35A close and Pzr heaters de-energize.**

I Pt(s) Unit 1 is responding to **a** LOCA from **a** trip at full power. Given the following events and conditions:

- **A** safety injection occurred at 0200.
- FWST level reaches *33* in. at 0246.
- S/I, Sequencers, and Containment Spray have been reset for both trains.
- The 1A **NS** pump has been successfully swapped to the containment sump.
- 1NS-1B (B NS Pump Suct From Cont Sump) will not open.

Which one ofthe following is the reason 1NS-1B will not open'?

A. 1NI-184B (RB Sump to Train B ND & NS) is CLOSED

B. "NS SYS CPCS TRAIN B INHIBIT" light LIT

C. 1NS-38B (B ND to NS Containment Outside Isol) is CLOSED

D. 1NS-38B (B ND to NS Containment Outside Isol) is OPEN

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1 Pt(s)

IJnit 2 is in an outage. All the fuel is in the spent fuel pool. The spent fuel pool ventilation system is in normal system operation. A fuel shuffle is in progress in the spent fuel pool. During the shuffle a fuel assembly is accidentally damaged and 2EMF-42 (Fuel Building Ventilation Radiation Monitor) goes into Trip 2.

Which one of the following describes the effect on spent fuel pool ventilation system as a result of 2EMF-42 in Trip 2.

A. The VF supply and exhaust fans trip and the filter is placed in the filtration mode.

B. The VF Filter Train Bypass Damper valve closes and the Filter Train inlet and outlet open

C. The VF system is automatically placed in BYPASS MODE and the discharge dampers open and supply dampers close

D. The VF system is automatically placed in the FUEL HANDLING MODE OF OPERATION and the supply fans trip.

---

1 Pt(s) Unit 1 is at 100% power when indications are received of a "1B' Reactor Coolant Pump seal malfunction. AP/1/A/5500/08 *(Malfunction of NC Pump)* is implemented.

Which one of the following conditions describes a number **two** seal failure?

A. **# 1 Seal Leak off flow – GOING DOWN**
NC Pump number 2 Seal Standpipe low level alarm – LIT
NCDT input – STABLE, OR GOING DOWN

B. **# 1 Seal Leak off flow – GOING UP**
NC Pump numher 2 Seal Standpipe high level alarm – LIT
NCDT input – STABLE, OR GOING DOWN

C. **# 1 Seal Leak off Bow – GOING DOWN**
NC Pump number 2 Seal Standpipe high level alarm – LIT
NCDT input – GOING UP

D. **# 1 Seal Leak off flow – GOING UP**
NC Pump number 2 Seal Standpipe low level alarm – LIT
NCDT input – GOING UP

1 Pt(s)

Unit 2 was operating at 75% power when the following indications were observed

- S/G Level Deviation Alarms for all S/Gs
- Feedflow/Steamflow Mismatch Alarms for all S/Gs
- FWPTs speed going down
- All Feedwater control switches are in normal position

Which one of the following correctly describes the failure affecting the main fecdwater **pumps'?**

A. Steam header pressure transmitter fails HIGH.

B. Steam header pressure transmitter fails LOW.

C. Feedwater header pressure transmitter fails LOW.

D. Feedwater pump d/p program fails HIGH.

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1 Pt(s) The following conditions exist on Unit 2:

- 100% power at 1180 MWe
- The valve positioner for atmospheric dump valve **2SV-30** fails.
- Control room indication shows the valve OPEN

Which one of the following actions in AP/1A/5500/01 *(Steam Leak)* correctly describes the **FIRST** direction from the **SRO** that will CLOSE the open atmospheric dump valve?

A. Instruct the RO to select "OFF RESET" on the STEAM DUMP INTL BYPASS switches.

B. Instruct RO to depress the 'CLOSE' pushbutton on the atmospheric dump valve control room switch.

C. Instruct IAE to energize the P-12 solenoids to close the atmospheric dump valve.

D. Dispatch operator to isolate air to the atmospheric dump valve.

1Pt(s) Unit 1 is holding at **60%** power. Pressurizer level and pressure control are selected to the "3-2" position. Given the following conditions:

- A leak develops on the low pressure (process) side of the transmitter for the controlling pressurizer level channel.

Assuming no operator action, which one of the following statements correctly describes the effect of this failure on the Pressurizer level and pressure control systems?

A. Indicated pressurizer level decreases, NV-238 (Charging ***Line Flow Control)*** opens, actual pressurizer level increases and pressure goes up.

B. Indicated pressurizer level increases, NV-238 closes, actual pressurizer level decreases and pressure **goes** down.

C. Indicated pressurizer level decreases, the pressurizer level master output decreases to increase level and pressure goes up.

D. Indicated pressurizer level increases, the pressurizer level master output increases to decrease level, and pressure goes down.

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1 Pt(s) Unit 1 **is** operating at 100% power when a **leak** develops in the tubes of the 1B1 feedwater heater.

Which one of the following describes the actions that occur on an 'EMERGENCY HIGH LEVEL' in the 1B1 feedwater heater?

A. Close ALL **"B"** feedwater heater inlet steam isolations
Close "B" bleed steam check valve
Close ALL 1st stage reheater steam vents
Close ALL "A" heater normal drain valves
Close **1"** stage reheater drain control valves
Open ALL **"B"** heater bleed steam drain valves
Open **1st** stage purge valve for **1B1** feedwater heater

B. Close ALL **"B"** feedwater heater inlet steam isolations
Close ALL **"B"** bleed steam check valves
Close ALL 1st stage reheater steam vents
Close ALL "A" heater normal drain valves
Close **1st** stage reheater drain control valves
Close ALL "B" heater bleed steam drain valves
Open **2nd** stage purge valve for **1B1** feedwater heater

C. Close **"1B1"** feedwater heater inlet steam isolation
Close **"B"** bleed steam check valve
Open ALL 1st stage reheater steam vents
Open **1A1** heater normal drain valve
Open ALL 1st stage drain control valves
Open All "B" heater bleed steam drain valves
Open All **1"** stage "B" heater purge valves

D. Close **"1B1"** feedwater heater inlet steam isolation valve
Close "B" bleed steam check **valve**
Close **1A1** heater normal drain valve
Close **All 1st** stage reheater steam vents
Close **1A1 1st** stage reheater drain control valve
Open **"B"** heater bleed steam drain valves
Open ALL 1st stage drain valves

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1 Pt(s)

Unit 2 has experienced a **Steam** Line Break inside containment. The "2C" S/G **has** depressurized to 100 psig and actual W/R level is approximately 10%.

Which one of the following describes the indicated "2C" S/G W/R **level** response?

A. **S/G W/R level reference leg density decreases, actual d/p goes down, indicated S/G level goes up.**

B. **S/G W/R level reference leg density increases. actual d/p goes down, indicated S/G level goes down**

C. **S/G W/R level reference leg density decreases, actual d/p goes up, indicated S/G level goes down**

D. **S/G W/R level reference leg density increases, actual d/p goes up, indicated S/G level goes up**

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1 Pt(s) "B" Train of essential equipment is in operation on Unit 1.

While performing OP/1/A/6350/002 ***(Diesel** Generator)* with the "1A" diesel running in parallel to the grid, the following sequence of events occurs:

- Load is reduced on the diesel to 200KW in anticipation of opening the EMERGENCY breaker.
- The RO accidentally OPENS the normal feeder breaker from 1ATC.

Which one of the following describes the system response and the proper procedural response to deal with this situation?

A. Degraded voltage is sensed on 1ETA and the BLACKOUT sequencer actuates, the crew will use **AP/1/5500/07(Loss** of Electrical Power).

B. The Diesel Generator Sequencer does not actuate, and the diesel generator assumes the load of the bus. The operator uses **OP/1/A/6350/002** to return **to** normal alignment.

C. Undervoltage is sensed on 1ETA and the BLACKOUT sequencer actuates, the crew will use **AP/1/5500/07.**

D. The Diesel Generator BLACKOUT sequencer recloses the breaker from 1ATC. Crew reloads the bus using **AP/1/A/5500/07,** Enclosure 1*(Manual Loading **of Emergency** BUS).*

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1 Pt(s) Which one of the following pre-planned activities that has been evaluated and approved in advance by Operations can take place during shift turnover?

A. Dilution to ECB

B. ZPPT

C. Drain to Mid-Loop

D. Reactor Startup

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1 Pt(s)

A work team of Maintenance and R.P. personnel have been dispatched to repack the seals on a pump. The work area around the pump is a 800 mrem/hr High Radiation Area. The R.P. personnel are monitoring the Maintenance crew from a low dose area of 60 mrem/hr.

Which one of the following work teams and estimated repair times would maintain worker **exposure ALARA?**

A. 6 Maintenance and 3 R.P. personnel (9 workers) working for 20 minutes

B. 5 Maintenance and 2 R.P. personnel (7 workers) working for 30 minutes

C. 4 Maintenance and 2 R.P. personnel (6 workers) working for 1 hour

D. 2 Maintenance and 2 R.P. personnel (4 workers) working for 2 hours

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1 Pt(s) Level in the "2C" S/G is slowly increasing due to a failure of the Channel 1 N/R S/G level transmitter.

Which one of the following describes the correct response of the S/G level control system to this failure?

A. The flow error will initially he greater than the level error. A 1% level error will initially produce a 3% valve position change.

B. The flow error will initially he greater than the level error. A 1% level error will initially produce a 1% valve position change.

C. The level error will initially he greater than the flow error. A 1% level error will initially produce a 1% valve position change.

D. The level error will initially he greater than the flow error. A 1% level error will initially produce a 3% valve position change.

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1 Pt(s)

The Diesel Generator DC Control **Power** Breaker for the "1A" D/G has failed and must be replaced by IAE.

Which one of the following components is affected by this failure?

A. **D/G "1A" Diesel Fuel Oil Rooster Pump**

B. **D/G "1A" Speed Switches**

C. **D/G "1A" Battery Charger 1EDGA**

D. **D/G "1A" Sump Pump Control Power**

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1 Pt(s) **PCB 7** and **PCB 8** are part of the 230 **KV** switchyard. Which one of the following describes the RO's indication he/she has from the control room to monitor breaker position?

A. **Both PCB 7 and PCB 8 are on the OAC and Main Control Board**

B. **PCB 7 and PCB 8 are ONLY available on the OAC**

C. **Main Control Board indieation ONLY for PCB 7 and OAC ONLY for YCB 8**

I). **Main Control Board and QAC indication for PCB 8 and OAC indication only for PCB 7**

1Pt(s) There has been a fire in the Unit 2 turbine building basement. The **"A'** Main Fire Pump auto-started due to a low fire header pressure signal. The fire brigade **has** extinguished the fire after forty-five minutes.

- "1A" and "1B" Jockey Pumps are 'OFF'
- "A" Main Fire Pump is running
- "B" and "C" Main Fire Pumps are 'OFF'

Which one of the following describes the procedural process of recovering from **a low** fire header pressure and returning the Main Fire and Jockey pumps to normal alignment?

A. Stop the "A" Main Fire Pump, place the Jockey pump to be started in "MAX", and place the other Jockey pump in "START".

B. Stop the **"A"** Main Fire Pump, place the Jockey pump to be started in "START", and place the other Jockey pump in "MAN".

C. Place the Jockey pump **to** be started in "START", the other Jockey pump in **'MAN,** and stop the "A" Main Fire Pump.

D. Place the Jockey Pump to be started in "MAN", "START' the Jockey Pump selected to "MAN", and stop the "A" Main Fire Pump.

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1 Pt(s) Which one of the following is the power supply to the "2B" Safety Injection Pump?

A. **1ETB**

B. **1EMXB**

C. **2ETB**

D. **2EMXB**

1Pt(s) Which one ofthc following is **a** correct list of SAFTETY LIMITS?

A. Thermal Power, RCS Highest Loop Tave and Pressurizer Pressure.

B. Thermal Power, AFD, Pressurizer Pressure.

C. AFD, QPTR and Reactor Power.

D. Linear Heat Generation Rate, Thermal Power and QPTR.

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1 Pt(s) Which one **of the** following describes the automatic operation 1KC-122 (*KC Surge Tank* Vent Valve)'?

A. **1EMF-46A (B)** in Trip I alarm will cause the vent to close; when the alarm clears the valve will automatically re-open (the "OPEN" position seals in).

B. **1EMF-46A (B)** in Trip 2 alarm will cause the vent to close; when the alarm clears the valve will automatically re-open (the "OPEN" position seals in).

C. **1EMF-46A (B)** in Trip I alarm will cause the vent **to** close and the "CLOSE" positions seals in; the valve must he locally re-opened.

D. **IEMF-46A (B)** in Trip 2 alarm will cause the vent to close and the "CLOSE" positions seals in; the valve **must** be locally re-opened.

I Pt(s) Which one **of** the following describes the power supply alignment during a **BLACKOUT** or SAFETY INJECTION for the following containment cooling fans?

A. On a BLACKOUT the VU Fans (on the affected bus) start, on a SAFETY INJECTION the VU Fans (on the affected bus) are shunt tripped OFF.

B. On a BLACKOUT the VL Fans (on the affected bus) are shunt tripped OFF, on a SAFETY INJECTION the VL Pans (on the affected bus) **start** and run in low speed.

C. On a BLACKOUT the VR Fans (on the affected bus) swap to EMERGENCY power, on a SAFETY INJECTION the VR Fans (on the affected bus) are shunt tripped OFF.

D. On a BLACKOUT the RA Fans (on the affected bus) are shunt tripped **OFF,** on a SAFETY INJECTION the RA Pans (on the affected bus) start.

1Pt(s) During the delivery of chlorine gas cylinders on site a cylinder **fell** from the truck and ruptured. All control room VC intakes closed except 1VC-9A and 1VC-11B which were mechanically bound and failed to close completely. Chlorine **gas** has entered the control room. AP/1/A/5500/17 ***(Loss of Control Room)*** has been implemented on both Units.

As SRO, which one of the following describes your instructions (per **AP**/17)?

A. Direct one RO to the reactor trip breakers and immediately trip the reactor. Direct one operator to the front standard of the main turbine and standby.

B. Direct one RO to the reactor trip breakers and standby. Direct one operator to the front standard of the main turbine and immediately trip the turbine.

C. Direct one RO to the reactor trip breakers and immediately trip the reactor. Direct one operator to the front standard of the main turbine and immediately trip the turbine.

D. Direct one RO to the reactor trip breakers and standby. Direct one operator to the front standard of **the** main tnrbine and standby.

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1 Pt(s)

Unit 2 is operating at 100% power with all rods out. Given the following events and conditions:

- Control Rod 'H-8' drops into the core.
- AP/2/A/5500/14 *(Rod Control Malfunction),* Enclosure 1 ***(Response** to Dropped Rod)* has being implemented.
- Control Rod 'H-8' has been pulled 150 steps off the bottom of the core.
- Rod 'K-14' drops into the core.

Which one of the following statements correctly describes the operator's response to this event?

A. Continue withdrawal of rod 'H-8'.

B. GO TO AP/1/A/5500/38 (Emergency Boration)

C. Return to Step one (I) of AP/1/A/5500/14.

D. Trip the reactor and GO TO E-0 *(Reactor Trip/Safety Injection)*

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1 Pt(s) Unit 1 has experienced a 50% runback due to the loss of Busline 1A. AP/1/A/5500/03 Load Rejection has been implemented and the Immediate Actions have been completed. Rased on the indicated Power Mismatch (PMM) and Temperature Mismatch (TMM), which one of the. following correctly describes rod movement?

A. **PMM = 0, TMM = +4.**
Rods OUT at 40 steps per minute

B. **PMM = -4, TMM = 0.**
Rods IN at 40 steps per minute

C. **PMM = +3, TMM = +3.**
Rods OUT at 72 steps per minute

D. **PMM = +1.5, TMM = +1.5.**
Rods IN at 8 steps per minute

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1 Pt(s)

During the process of implementing **a** Temporary Modification (TM) affected drawings are notated to refer the Operators to the appropriate TM package.

Which one of the following describes the process for notating **a** Temporarily Modified on the drawing in the control room?

A. Flow diagrams and electrical one line drawings **MUST** always he red-marked to reflect the temporary modification.

B. Flow diagrams and electrical one line drawings should NOT he red-marked to reflect the temporary modification.

C. Plow diagrams MUST be red-marked to reflect the temporary modification, electrical one line drawings should NOT be red marked to reflect the temporary modification.

D. **Flow** diagrams should NOT he sed-marked to reflect the temporary modification, electrical one line drawings MUST be red marked to reflect the temporary modification.

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1 Pt(s) Which one of the following would require the use **of an** R&R for managing configuration control?

A. Troubleshooting activities and needed to meet the intent of a procedure and is within the original system design.

B. Long term system alignments and needed to meet the intent of a procedure and is within the original system design

C. An alternate component or alignment which it NOT within the original design and intent of the system is desired.

D. The use of an alternate component or alignment is needed to meet the intent of a procedure and is within the original system design.

I Pt(s) Which one of the following must the Control Room SRO ensure prior to authorizing a Liquid Waste Release from the Waster Monitor Tank (WMT)?

A. A source check has been performed on EMF-44.

B. The required number of RC pumps is in operation.

C. The "Recommended Release Rate" is equal to the "Allowable Release Rate".

D. The "Expected CPM of EMF 44" and the "EMF 44 Trip 1 Setpoint" are less than the "EMF 44 Trip 2 Setpoint"
