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Revised copy of Written Exam

After NRC validation

01. Given the following conditions:

- A LOCA has occurred
- Two Main Core Spray Pumps (NZ01A & NZO1B) are injecting
- Two Containment Spray Pumps (51A & 51B) are operating
- Total Containment Spray flow is 5,000 GPM
- Torus water temperature is 160° F
- Torus Pressure is 10 PSIG
- Torus Water level is 75"

Based on these conditions, which of the following is the Maximum Core Spray flow available?

a. 8,000 gpm.

b. 9,000 gpm.

c. 10,000 gpm.

d. 11,000 gpm.

Answer Key		
# 1		
Choice		Basis or Justification
Correct:	C	**Requires Support Procedure 4 to answer.** Using Figure A, Core Spray vortex Limit, at 75", max flow is 15,000 gpm; since the Cont Spray Pumps are drawing 5,000, Core Spray can only have 10,000
Distractors:	A	Plausible distractor
	B	Plausible distractor
	D	Plausible distractor

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
H	3.5	3	

Source Documentation			
Source:	New Exam Item Modified Bank Item OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank	1999 exam #80
Reference(s):	Support Procedure 4 Figure A; 6231-PGD-2621 845.0003		
Learning Objective:	(01)03055, (01)00306		
Terminal Objective:	20005(01)405		
Knowledge/Ability:	295030 EA1.01	Importance: 3.6 / 3.8	
Ability to operate and/or monitor the following as they apply to Low Suppression Pool Water level: ECCS systems(NPSH considerations)			

Prepared by: Michael Spenser

02. Given the following:

- Hydrogen concentration is 2% in the Containment
- Torus water level is 150 Inches
- The off-site release rate is projected to stay below the release rate for an Unusual Event

Based on the above conditions, which of the following describes the required vent path to be used to maintain the Torus pressure below the Primary Containment Pressure Limit curve

a. The Drywell hardened pipe vent.

b. The Torus hardened pipe vent.

c. The Drywell Purge valves.

d. The Torus vent valves.

Answer Key		
# 2		
Choice		Basis or Justification
Correct:	D	Correct, as indicated in Support Procedure 32
Distractors:	A	Plausible distractor, but the hardened vent is NOT to be used if Hydrogen is present in Containment
	B	Plausible distractor, but the hardened vent is NOT to be used if Hydrogen is present in Containment
	C	Plausible distractor, viable vent path on higher water level in Containment

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
H	3	2	

Source Documentation			
Source:	New Exam Item Modified Bank Item OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank	1999 exam #89
Reference(s):	Primary Containment EMG 3200.02; 6231-PGD-2621 845.0008;.0010		
Learning Objective:	(02)03000; (02)01300		
Terminal Objective:	20005 (01)424 34501(02)412		
Knowledge/Ability:	500000 EK1.01	Importance: 3.3/3.9	
Knowledge of the operational implications of the following concepts as they apply to High Containment H2 concentrations; containment Integrity			

Prepared by: Joseph M. Milligan

03. Given the following conditions:

- An Instrument Air header line break occurs on the discharge of the Air Receivers
- The break can NOT be isolated
- Instrument Air pressure as read on Panel 7F is dropping
- CONTROL AIR PRESSURE LO annunciator has just alarmed
- The direction is now given to manually scram the reactor.

Based on the above conditions, which of the following systems are available for level / pressure control? (Assume Instrument Air header pressure continues to lower).

a. Bypass Valves, LFRV "A" and/or "C", and CRD.

b. EMRV's, CRD, and RWCU letdown.

c. Bypass Valves, Feedwater on "A" or "C" block valve, and RWCU letdown.

d. EMRV's, Isolation Condensers, and Feedwater using heater string outlet valve(s).

Answer Key		
# 3		
Choice		Basis or Justification
Correct:	D	These systems do not require Instrument air to operate; though at some time, makeup to the Isol cond will be required using firewater or manual operation of makeup valves
Distractors:	A	The bypass valves are not available after the outboard MSIV's fail closed
	B	Cleanup letdown will not be available; the valve fails closed on a loss of air
	C	The bypass valves are not available after the outboard MSIV's fail closed Cleanup letdown will not be available; the valve fails closed on a loss of air

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
H	2.5	3	

Source Documentation			
Source:	New Exam Item Modified Bank Item OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank	1999 exam #47
Reference(s):	ABN-2000-3200.35; 6231-PGd-2621 828.0043		
Learning Objective:	(01)(02) 00916,08331,08346,08348,08686		
Terminal Objective:	27904(01)403		
Knowledge/Ability:	295019 AA1.02	Importance: 3.3 / 3.1	
Ability to operate and/or monitor the following as they apply to loss of IA: IA system Valves			

Prepared by: Joseph M.Milligan

04. A continuous fire watch is required for which of the following conditions?

a. Battery Room A & B Halon 1301 System tank at 96% full charge weight and 91% full charge pressure.

b. One Thermal Fire Detection instrument for Emergency Diesel Generator #1 is inoperable; all other detectors are operable.

c. Emergency Lighting Unit (ELU) #40 has been declared inoperable.

d. The 4160 Volt Switchgear CO_2 roll down fire door has been accidentally damaged and may not be able to perform its designed function.

Answer Key		
# 4		
Choice		Basis or Justification
Correct:	D	**For this question, a copy of 101.2 TRM will be provided.** It will require the examinee to know how to use the information provided in the Technical Requirements
Distractors:	A	Plausible; Selected if examinee misinterprets the requirements. As written, this distracter is desired conditions of the Halon system
	B	Plausible; Selected if examinee misinterprets the requirements. The Technical Requirements allow 1 detector to be OOS.
	C	Plausible; Selected if examinee misinterprets the requirements. The Technical Requirements allow a 72 hour period to establish emergency lighting requirements.

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
H	2.5	5	

Source Documentation			
Source:	New Exam Item Modified Bank Item OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank	1999 exam #99
Reference(s):	Technical Requirements (Att 101.2-3); 6231-PGD-2621 [2621.830.05]		
Learning Objective:	(01) 00960		
Terminal Objective:	34101(02)411		
Knowledge/Ability:	G2.4. 25	Importance: 2.9 / 3.4	
Knowledge of Fire Protection Procedures			

Prepared by: Joseph M. Milligan

05. Given the following conditions:

- Reactor startup has been in progress for 6 hours
- Reactor power 5%
- Main turbine warm-up is in progress
- Chemistry just reported the following reactor coolant sample results:
  - Conductivity: 8 μS/cm @ 25°C
  - Chlorides: 0.3 ppm

Based on the above conditions, which one of the following describes the required actions, if any?

A. No action is required because a Technical Specification LCO has not been entered.

B. A shutdown must be initiated immediately because the low steaming rate (< 100,000 lbm/hr) limitations have been exceeded.

C. A shutdown must be initiated immediately because the high steaming rate (> 100,000 lbm/hr) limitations have been exceeded.

D. No action is required as long as the reactor coolant quality does not remain at these values for greater than 72 hours.

Answer Key		
# 5		
Choice		Basis or Justification
Correct:	D	**Tech Spec is required to answer this question.** IAW TS 3.3.E.3, Limits are 10 μS/cm and 0.5 ppm Chloride (5% power is 363,000 lbm/hr, based on 100% steaming rate is 7.26 Mlbm/hr) Limits given are below TS for >100,000 lbm/hr, but are > than limits established in TS 3.3.E.5, hence TS 3.3.E.5 is applicable
Distractors:	A	Plausible, 72 hour limits are below given and steaming rate > 100, 000 lbm/hr
	B	Misinterpretation of TS or miscalculation of steaming rate based on 5% power
	C	Misinterpretation of TS or miscalculation of steaming rate based on 5% power

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
H	3	3	X – 43.1

Source Documentation			
Source:	New Exam Item Modified Bank Item OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank	1999 NRC EXAM
Reference(s):	TS 3.3.E; 6213-PGD-2621 850.0 .0090		
Learning Objective:	(02) 01658, (02) 01920, (02)01921		
Terminal Objective:	34403(02)001		
Knowledge/Ability:	Generic: Conduct of Ops 2.1.34	Importance: 2.3 / 2.9	
Ability to maintain primary and Secondary plant chemistry within allowable limits			

Prepared by: Joseph M. Milligan, distractor a. modified at licensee request and stem clarified to ensure only one correct answer.

6. Given the following:

- The plant is operating at full power.
- The Equipment Operator (EO) reports that the diesel fuel oil storage tank appears to have a slow leak.
- The level gage indicates 13,800 gallons of fuel oil.

Based on the above conditions, which one of the following is correct?

a. The plant may continue operating for up to 7 days, provided the other diesel generator is tested at greater than 80 percent load for at least one hour every 24 hours.

b. The plant must be placed in cold shutdown because there is NOT sufficient fuel oil supply to maintain both diesel generators operating for 3 days in the event of a LOCA and a loss of off site power.

c. The plant may continue operating. The fuel oil required to maintain both diesel generators operating for 36 hours is only 9790 gallons.

d. The plant must be placed In cold shutdown because there is NOT sufficient fuel oil supply to maintain both diesel generators operating for 4 days in the event of a LOCA and a loss of off site power with a loss of one 4160V bus.

Answer Key		
# 6		
Choice		Basis or Justification
Correct:	B	Correct answer. TS 3.7.C.3 and 4. 14,000 gal. required to consider EDGs operable.
Distractors:	A	Plausible distracter, continued operation allowed with one EDG OOS.
	C	Plausible distracter, fuel oil required for 3 days with LOOP, LOCA and loss of one bus.
	D	Plausible distracter, plant conditions stated require 9790 gallons for 3 days operation. Four days Is not used for this bases in TS.

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
H	3.5	2	X – 43.2

Source Documentation		
Source:	New Exam Item X Modified Bank Item OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank
Reference(s):	TS 3.7.C and bases; CFR 55.43.2 [2621.828.13]	
Learning Objective:	00803, 00804	
Terminal Objective:	20003(01)04, 26401(01)001, 004	
Knowledge/Ability:	295003 G2.2.25	Importance: 2.5/3.7
Knowledge of bases In TS for LCOs and Safety Limits. Partial or complete loss of AC power.		

Prepared by: Larry Briggs

7. The plant is operating at 100% power when a loss of off-site power occurs.

   Under these conditions, a reactor scram is caused by a:

   a. Turbine Trip to reduce the expected RPV pressure rise and flux spike.

   b. High reactor pressure condition to protect the RPV from overpressure.

   c. Low reactor water level condition to ensure an adequate RPV water inventory.

   d. MSIV closure to maintain an adequate RPV water inventory.

Answer Key		
# 7		
Choice		Basis or Justification
Correct:	A	Correct per the UFSAR Transient Analysis.
Distractors:	B	Plausible distracter; will get high pressure but trip comes from turbine trip which initiates the high pressure.
	C	Plausible distracter; Feed pumps are lost but level will not be first scram signal.
	D	Plausible distracter; Closure of MSIVs will lower level but the turbine trip will occur first.

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
F	2.5	2	

Source Documentation		
Source:	New Exam Item X Modified Bank Item OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank
Reference(s):	2000 ABN 3200-36, Loss of Off-Site Power, Para. 2.3 [2621.828.25/38]	
Learning Objective:	01187, 01212, 01148, 01157, 01723, 08658	
Terminal Objective:	2480401405, 2120501403	
Knowledge/Ability:	295003 AK3.05	Importance: 3.7/3.7
Knowledge of the reasons for the following responses as they apply to partial or complete loss of AC power; reactor scram.		

Prepared by: Larry Briggs

8. A reactor scram occurred from 75 percent power and two control rods remained at Notch 48. EMG 3200.01B, "RPV Control - With ATWS" has been entered. Several automatic initiations and isolations are required to be bypassed.

   In accordance with the EOP Users Guide, which of the following bypasses is required under these conditions and what is the reason for the bypass?

   a. The ADS timer is bypassed so reactor pressure control can be accomplished by the preferred method, manual operation of the EMRV's.

   b. The MSIV automatic isolation is bypassed to prevent the insertion of positive reactivity and possible restart of the reactor.

   c. The ADS timer is bypassed to prevent uncontrolled depressurization, preventing insertion of positive reactivity and a possible restart of the reactor.

   d. The RBCCW isolation is bypassed to ensure cooling is available for heat removal via the shutdown cooling heat exchangers.

Answer Key		
# 8		
Choice		Basis or Justification
Correct:	C	Correct per EOP users guide.
Distractors:	A	Plausible, EMRV could be used but would add heat to Torus and is not the preferred method.
	B	Plausible, MSIV closure if being used for heat removal would result in a pressure spike and some positive reactivity but would not result in restart.
	D	Plausible, RBCCW is maintained for heat removal of Drywell, not shutdown cooling.

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
F	3	2	

Source Documentation		
Source:	New Exam Item Modified Bank Item X (RQ #2948) OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank
Reference(s):	EMG 3200.01B, Level/Power Control. EOP users guide, RPV Control with ATWS, Pgs. 1B-15 and 16. [2621.845.19]	
Learning Objective:	02257, 0378, 0379, 01022	
Terminal Objective:	21805(01)401, 20005(02)405	
Knowledge/Ability:	295006 AA2.01	Importance: 4.5/4.6
Ability to determine and/or interpret the following as they apply to scram, Reactor Power.		

Prepared by: Larry Briggs

09. Given the following:

- The reactor is at 42% power
- RPV level and temperature are normal for this power
- The main turbine trips on low condenser vacuum

Which one of the following describes the expected reactor response under these conditions and the reason for the response?

The reactor will:

a. Scram, due to main generator trip logic.

b. Scram, due to main turbine stop valve closure.

c. NOT trip, since this is within bypass capacity.

d. NOT trip, since the scram is bypassed at this power level.

Answer Key		
# 9		
Choice		Basis or Justification
Correct:	B	Correct, the reactor will scram when above 30 percent.
Distractors:	A	Plausible, although reactor trips, it is not due to any generator trip logic.
	C	Plausible, 40% is bypass capacity.
	D	Plausible, trip is bypassed below 40% power.

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
F	2	2	

Source Documentation		
Source:	New Exam Item X Modified Bank Item OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank
Reference(s):	ABN 3200.10 Turbine Trip, and ABN 3200.01, Reactor Scram [2621.828.25/38]	
Learning Objective:	01187, 01212, 01157, 08658	
Terminal Objective:	2480401405, 2120501403	
Knowledge/Ability:	295006 AK2.04	Importance: 3.6/3.7
Knowledge of the interrelations between SCRAM and the following. Turbine trip logic: Plant specific.		

Prepared by: Larry Briggs

10. Given the following:

- Reactor Power is 100%
- Turbine Control Valve position is 98%

The reactor operator, while making preparations to backwash the main condenser, inadvertently increased reactor recirculation pump speed on the master controller and increased reactor power to 106%.

Based on the above conditions, which one of the following correctly describes the plant response for these conditions with no further operator action?

a. Turbine generator load will increase and the bypass valves will open to maintain turbine inlet pressure at the pre-transient value.

b. Turbine generator load will increase to maintain the turbine inlet pressure at the pre-transient value.

c. Turbine generator load will remain the same and the bypass valves will open to control reactor pressure at the pre-transient value.

d. Turbine generator load will increase and bypass valves remain closed due to normal deadband in the turbine control system.

Answer Key		
# 10		
Choice		Basis or Justification
Correct:	A	Turbine load will increase and bypass valves will open to maintain Turb. inlet pressure at setpoint.
Distractors:	B	Plausible, applicant may assume small load increase possible but load limit is set to 105%
	C	Plausible, applicant may assume bypass valves will maintain pressure and load at pre event values.
	D	Plausible, applicant may assume there is a normal deadband in the turb. cont. sys.

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
F	2.5	2	

Source Documentation		
Source:	New Exam Item X Modified Bank Item OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank
Reference(s):	2611-PGD-2621 System 51, Sect. B, Gen. Description	
Learning Objective:	(01) 02312	
Terminal Objective:	24901(01)003	
Knowledge/Ability:	295007 AK1.04	Importance: 2.7/2.8
Knowledge of the operational implications of the following concepts as they apply to High Rx Pressure, Turbine load.		

Prepared by: Larry Briggs

11. The plant was operating at 75% power when the turbine control EPR failed high.

    Based on the above conditions, which one of the following describes the initial plant response?

    a. Reactor pressure lowering, reactor water level lowering, reactor power lowering.

    b. Reactor pressure lowering, reactor water level raising, generator output raising.

    c. Reactor pressure raising, reactor water level lowering, steam flow lowering.

    d. Reactor pressure raising, reactor power raising, generator output raising.

Answer Key		
# 11		
Choice		Basis or Justification
Correct:	C.	Correct per ABN-3200.09, Electric Pressure Regulator Malfunction failure high. High failure gives Hi Press, low level, low steam flow, lower generator output.
Distractors:	A.	Plausible, Conditions are a mix of EPR failure low and high
	B.	Plausible, Conditions are a mix of EPR failure low and high
	D.	Plausible, Conditions are a mix of EPR failure low and high

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
H	3	2	

Source Documentation			
Source:	New Exam Item X Modified Bank Item OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank	
Reference(s):	2611-PGD-2621 System 51, Sect B. and ABN-3200.09		
Learning Objective:	9521,2316		
Terminal Objective:	2490401002, 2490101003		
Knowledge/Ability:	295007 AK3.06	Importance: 3.7/3.8	
Knowledge of the reasons for the following responses as they apply to High Reactor Pressure. Reactor/turbine pressure regulating system operation.			

Prepared by: Larry Briggs

12. Given the following conditions:

- The reactor has been manually scrammed
- Reactor Power is 4%
- EMG-3200.01b, RPV CONTROL - WITH ATWS, has been entered
- Level is being lowered as directed by the EMG
- Reactor Recirculation Pumps have been tripped

Based on the above conditions, LEVEL is lowered to:

a. Reduce natural circulation.

b. Reduce boron dilution.

c. Increase core inlet subcooling.

d. Increase natural circulation.

Answer Key		
# 12		
Choice		Basis or Justification
Correct:	A	Per EOP Users Guide,
Distractors:	B	Plausible, Reducing water level would raise boron concentration (although it would not mix well), but this is not the intent of the level reduction.
	C	Plausible, would be accomplished by increased injection
	D	Plausible, would be accomplished by increased water level.

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
F	2.5	2	

Source Documentation		
Source:	New Exam Item X Modified Bank Item OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank
Reference(s):	EOP Users Guide, pg. 1B-8 [2621.845.19]	
Learning Objective:	845, 2257, 378, 379, 1022	
Terminal Objective:	2000502405,	
Knowledge/Ability:	295009 AK1.05	Importance: 3.3/3.4
Knowledge of the operational implications of the following concepts as they apply to LOW REACTOR WATER LEVEL, Natural circulation.		

Prepared by: Larry Briggs

13. Given the following:

- The reactor scrammed from 75% power due to a main turbine generator load rejection.
- All plant systems functioned normally on the trip.

Based on the above conditions, which one of the following correctly describes the Feedwater Control System response to this transient?

a. A RPV level change of minus 10 inches from program will change the master controller setpoint to 152 inches to ensure level is returned to normal following the scram.

b. A scram signal and a RPV level change of minus 10 inches will change the master controller setpoint to 142 inches TAF to reduce flow demand and prevent a high water level transient following the scram.

c. A scram signal will change the master controller setpoint to 140 inches TAF to reduce flow demand and prevent a high water level transient following the scram.

d. Level control remains in automatic, the high demand for feedwater results in runout protection of the feedpumps until level returns to 130 inches TAF at which time the runout protection is released.

Answer Key		
# 13		
Choice		Basis or Justification
Correct:	B	Correct per Feedwater Control System (FCS), Pgs 17-19.
Distractors:	A	Plausible, a level change of -10 inches and a scram signal programs level at 142 inches, not 152 inches.
	C	Plausible, a scram signal and a level change is required to change level set to 142 inches, not 140 inches.
	D	Plausible, runout protection can be invoked but it will be released at 110 inches for scrams from > 50%.

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
F	3	2	

Source Documentation		
Source:	New Exam Item X Modified Bank Item OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank
Reference(s):	Procedure [2621.828.18]	
Learning Objective:	715, 2383	
Terminal Objective:	2590501401	
Knowledge/Ability:	295009 AA1.02	Importance: 4.0/4.0
Ability to operate and/or monitor the following as they apply to LOW REACTOR WATER LEVEL. Reactor water level control.		

Prepared by: Larry Briggs

14. Following a two-week outage, the plant was returned to full power two days ago. Since then, the Drywell pressure and temperature has increased, requiring the Drywell to be vented several times.

Based on the above, which one of the following is the cause of this condition?

a. An increased cycling rate of the containment nitrogen compressors.

b. An increased service water flow rate.

c. A 0.5 GPM increase in the unidentified leakage rate.

d. A 0.5 GPM increase in the identified leakage rate

Answer Key		
#14		
Choice		Basis or Justification
Correct:	C	Correct, RCS leak increases the temperature and pressure.
Distractors:	A	Plausible, Increased Nitrogen use will increase pressure but not temperature
	B	Plausible, Increased service water flow will reduce RBCCW temp and reduce Drywell temperature and pressure.
	D	Plausible, increased identified leakage goes to equipment drain tank not the drywell like unidentified leakage. Should have no affect on either parameter.

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
H	2	2	

Source Documentation		
Source:	New Exam Item X Modified Bank Item OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank
Reference(s):	RAP C-3-f and C-8-h [2621.828.32]	
Learning Objective:	00432	
Terminal Objective:	2230101006	
Knowledge/Ability:	295010 AA2.06	Importance: 3.6/3.6
Ability to determine and/or interpret the following as they apply to HIGH DRYWELL PRESSURE, Drywell temperature.		

Prepared by: Larry Briggs

15. The plant is operating at full power when C-3-f, "DW PRESS HI/LOW" annunciates. The Control Room Operator reports the following plant conditions.

- Time between Drywell sump pump-downs has shortened
- Containment pressure has increased 0.2 psi
- Containment airborne radiation levels have remained constant
- Drywell Bulk temperature has increased 5°F

Which one of the following is the reason for the conditions stated?

a. An operating drywell cooler has developed a 25 gpm RBCCW leak on the INLET to the cooler.

b. An operating drywell cooler has developed a 25 gpm RBCCW leak on the OUTLET to the cooler.

c. One of the reactor recirculation pump's seal leak-off rate has increased by 0.25 gpm.

d. One of the EMRVs is leaking by and tailpiece temperature is 230 degrees F.

Answer Key		
# 15		
Choice		Basis or Justification
Correct:	A	Only leak that will satisfy all conditions
Distractors:	B	Plausible, but would not result in temperature increase in containment
	C	Plausible, would meet conditions except radiation levels
	D	Plausible, but EMRV valve would leak into Torus water volume.

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
H	3	2	

Source Documentation		
Source:	New Exam Item X Modified Bank Item OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank
Reference(s):	RAP C-3-f, DW PRESS HI/LO [2621.828.32]	
Learning Objective:	00416, 00418	
Terminal Objective:	2230101006	
Knowledge/Ability:	295010 AK3.04	Importance: 3.5/3.8
Knowledge of the reasons for the following responses as they apply to HIGH DRYWELL PRESSURE, Leak investigation.		

Prepared by: Larry Briggs

16. The plant is at 60% power with 4 Recirculating pumps operating at 7E4 gpm.

    One of the four Recirculating pumps trips and the plant enters the Exclusion Area of the Power to Flow Map.

    Based on the above conditions, which of the following actions must be taken to exit the Exclusion Area?

    a. Recirculation flow must be reduced to minimum

    b. Cram rods must be inserted

    c. Recirculation flow must be increased

    d. The reactor must be manually scrammed

Answer Key		
# 16		
Choice		Basis or Justification
Correct:	B	**This question will require use of Power Operation Map** The conditions given plot a point just on the exclusion area; loss of feed heating will result in a power increase, placing the plant into the Exclusion area. Inserting CRAM rods to exit the area is required.
Distractors:	A	Plausible, this would normally reduce power but flow is at minimum allowed
	C	Plausible, this would exit region but a power increase is not allowed to exit the Exclusion area
	D	Plausible, required if power oscillations occur.

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
H	2	3	

Source Documentation		
Source:	New Exam Item Old NRC Exam X Modified 1999 NRC exam #66 (Revised distractors for op implications.) Modified Bank Item Other Exam Bank OC Exam Bank NRC Exam Bank	
	2000-ABN-3200.16; 202.1 Att 202.1-2; 6231-PGD-2621 832.0004	
Learning Objective:	(01)(02)02022	
Terminal Objective:	20001(01)501	
Knowledge/Ability:	295014 AK1.06	Importance: 3.8/3.9
Knowledge of the operational implications of the following concepts as they apply to INADVERTENT REACTIVITY ADDITION. Abnormal reactivity additions		

Prepared by: Joseph M. Milligan

17. Given the following:

- The reactor scrammed from 100% power
- Seven control rods failed to insert further than notch 04 on the scram
- Control rods could not be inserted using Control Rod Drive pressure
- Reactor Engineering determined that the reactor would remain shutdown under all conditions without Boron
- The plant is currently at 400 psig

Based on the above conditions, which one of the following is correct?

a. Per TS, the 7 control rods can be valved out of service and plant operations can be resumed once it is determined that the failures are not due to a failed CRD collet housing.

b. Per TS, the 7 control rods must be fully inserted, then valved out of service before plant operations can be resumed.

c. TS require the plant to be placed in the cold shutdown condition and plant restart is not allowed until all 7 control rods are repaired.

d. TS require the plant to be placed in the Shutdown condition and plant restart is not allowed until at least 1 of the 7 control rods is repaired.

Answer Key		
#17		
Choice		Basis or Justification
Correct:	D	TS allow power operation with up to 6 control rods valved out of service, as long as SDM requirements can be met.
Distractors:	A	Plausible, up to 6 control rods as long as no collet failures.
	B	Plausible, only 6 allowed
	C	Plausible, does not require cold shutdown, would not have to repair all 7 control rods

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
F	3	3	

Source Documentation		
Source:	New Exam Item X Modified Bank Item OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank
Reference(s):	TS Section 3.2.A & B [2621.828.11]	
Learning Objective:	00005	
Terminal Objective:	2100401413	
Knowledge/Ability:	295015 G2.1.33	Importance: 3.4/4.0
Incomplete scram: Ability to recognize indications for system operating parameters which are entry-level conditions for Technical Specifications.		

Prepared by: Larry Briggs

18. Given the following:

- The plant has experienced a LOCA and severe fuel damage.
- Wind direction is from 90° (E) at 10 MPH
- There was an electrical problem in the 4160 volt switchgear which has disabled Containment Spray.
- Electrical maintenance personnel are certain that the Containment Spray System can be repaired in less than 2.5 hours.
- Containment venting will be required per EMG-3200.02
- The RAC has informed you that the projected dose at the site boundary will be 1.2 REM (TEDE)
- A General Emergency has been declared.

Based on the above conditions, select the required Protective Action Recommendation (PAR)?

a. Evacuate 2 mile radius and WSW, W, and WNW for 5 miles, shelter the rest of the 10 mile EPZ.

b. Evacuate 2 mile radius and E, ENE, and ESE for 5 miles, shelter the rest of the 10 mile EPZ.

c. Shelter 2 mile radius and E, ENE, and ESE for remainder of 10 mile EPZ.

d. Shelter 2 mile radius and WSW, W, and WMW for the remainder of the 10 mile EPZ.

Answer Key		
# 18		
Choice		Basis or Justification
Correct:	A	Per EPIP-OC-.02, Exhibit 1b. Section 2.0.
Distractors:	B	Plausible, inverse of actual correct answer
	C	Plausible, Allowed by EPIP if release is less than 2 hours but inverse of wind direction
	D	Plausible, Allowed by EPIP if release is less than 2 hours

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
H	2	4	43.4/5

Source Documentation		
Source:	New Exam Item Modified Bank Item X RQ#3375* OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank
Reference(s):	EPIP-OC-.02, Exhibit 1b. [E-Plan]	
Learning Objective:	2685.780.07, A, AA, EE	
Terminal Objective:	2000502401	
Knowledge/Ability:	295017 AA2.05	Importance: 2.5/3.8
Ability to determine and/or interpret the following as they apply to HIGH OFF-SITE RELEASE RATE. Meteorological data.		

*Modified stem to reduce release rate and used same distractors and correct ans.
Prepared by: Larry Briggs

19. An Equipment Operator reported that there was an Off-Gas explosion at the AOG Recombiner and a loss of power to the AOG building. All AOG system automatic actuations occurred. The operator also reported that when he evacuated the AOG building the exit door would not stay closed and latched.

    Based on the above conditions, which one of the following is correct per ABN-3200.22, AOG Building Loss of Power?

    This event will:

    a. NOT result in an increase in the stack release rate since all off-gas will now pass through the 30 minute delay line.

    b. NOT result in an increased release rate because the AOG system isolates all off-gas release paths.

    c. Result in an increase in the stack release rate and an unmonitored release.

    d. Result in an increase in the stack release rate with NO unmonitored release.

Answer Key		
#19		
Choice		Basis or Justification
Correct:	C	Per ABN the AOG system can release into the AOG building. This can allow radioactive material to be released at ground level since the door would not stay closed. Stack activity will go up because AOG system is bypassed and uses the 30 min. delay line only
Distractors:	A	Plausible, applicant may not be aware that off-gas normally passes through 30 minute line and AOG.
	B	Plausible, AOG system does isolate, it also bypasses itself.
	D	Plausible, Applicant may not be aware that system can release H2 and radioactive gas into AOG build.

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
F	4	3	

Source Documentation			
Source:	New Exam Item X Modified Bank Item OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank	
Reference(s):	ABN 3200.22 [2621.828.02 & .04]		
Learning Objective:	02801, 00682		
Terminal Objective:	2710401001, 3040101002, 3040101001		
Knowledge/Ability:	295017 AK2.03	Importance: 3.3/3.5	
Knowledge of the interrelations between HIGH OFF-SITE RELEASE RATE and the following. Off-gas system.			

Prepared by: Larry Briggs

20. The plant is in a refueling outage. Source Range Monitor (SRM) indications at the beginning of the shift are:

- SRM 21 4 CPS
- SRM 22 7 CPS
- SRM 23 8 CPS
- SRM 24 6 CPS

During the withdrawal of a control rod during refueling operations, the CRO reports the following count rates:

- SRM 21 34 CPS
- SRM 22 40 CPS
- SRM 23 30 CPS
- SRM 24 35 CPS

Based on the above conditions, which one of the following correctly describes the required action per ABN-3200.07, Unexplained Reactivity Change?

a. Initiate a manual reactor scram.

b. Insert the control rod using normal insertion procedures to "00".

c. Make an announcement to evacuate the 95 foot elevation and the refueling floor immediately.

d. Allow count rate to stabilize and notify reactor engineering before proceeding with any other action.

Answer Key		
# 20		
Choice		Basis or Justification
Correct:	B	Correct per ABN-3200.07, Para 3.1, limit for doublings is 3.
Distractors:	A	Plausible, applicant could assume runaway reactor.
	C	Plausible, action for reactivity if moving a fuel assembly. Evacuation is if needed per procedure.
	D	Plausible, applicant could assume high count rate due to rate of reactivity insertion.

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
H	3.5	2	X – 43.7

Source Documentation		
Source:	New Exam Item Modified Bank Item X (1999 audit #71)* OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank
Reference(s):	ABN-3200.07, Para 3.1 [2621.812.03]	
Learning Objective:	00326, 01734	
Terminal Objective:	2340401401	
Knowledge/Ability:	295023 G2.1.32	Importance: 3.4/3.8
Ability to explain and apply system limits and precautions, REFUELING ACCIDENTS.		

*Modified starting and final counts in stem and all distractors, two significantly.
Prepared by: Larry Briggs

21. Given the following plant conditions:

- A LOCA has occurred
- All control rods are at "00"
- Torus pressure is 14 psig and increasing
- Torus water level is 130 inches and decreasing
- Drywell temperature is 248°F
- CHRMS is reading 2,500 R/hr

All systems responded normally to the event and no operator actions have been taken.

Based on the above conditions, which one of the following operator actions is correct?

a. Emergency depressurize the reactor.

b. Manually initiate Drywell spray.

c. Vent the Torus through Torus vent valves V-28-18 and V-28-47.

d. Vent the Drywell through Drywell vent valves V-23-21 and V-23-22.

Answer Key		
# 21		
Choice		Basis or Justification
Correct:	B	Per EMG 3200.02, start drywell sprays when above 12 psig
Distractors:	A	Plausible, ED is required if Drywell temp cannot be maintained below 281F, but would not correct to state that it cannot be maintained when temp is at 248F and DW Sprays have not been placed in service.
	C	Plausible, Several EMG procedure legs call for this vent path
	D	Plausible, With the containment water level provided the applicant could select this vent path.

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
H	3	2	

Source Documentation			
Source:	New Exam Item X	Old NRC Exam	
	Modified Bank Item	Other Exam Bank	
	OC Exam Bank	NRC Exam Bank	
Reference(s):	EMG-3200.02, Procedure 310, Containment Spray System Operation [2621.845.08]		
Learning Objective:	03036		
Terminal Objective:	2260101002		
Knowledge/Ability:	295024 EK2.11	Importance: 4.2/4.2	
Knowledge of the interrelations between HIGH DRYWELL PRESSURE and the following. Drywell spray (RHR) logic, Mark I & II [PRA related: Initiation of Containment Cooling]			

Prepared by: Larry Briggs

22. The reactor was manually scrammed from 30 percent power due to a small unisolable leak on a reactor water level instrument line in the Drywell.

- Containment pressure is 2.5 psig and slowly increasing.
- All systems performed normally on the scram.
- Torus level is normal.

Based on the above, which one of the following is the correct method of containment pressure control?

a. The Drywell should be vented through the 2 inch Drywell vent line to the Reactor Building Ventilation System, as this will provide Torus scrubbing of the airborne radionuclides.

b. The Drywell should NOT be vented as this pressure ensures the Reactor Building to Torus vacuum breakers will remain seated to prevent de-inerting the containment.

c. The Drywell should be vented via the 12 inch Torus vent line to the SBGTS to ensure that containment pressure can be maintained below 3 psig and will provide Torus scrubbing of airborne radionuclides.

d. The Drywell should be vented through the 2 inch Torus vent line to the Reactor Building Ventilation System, as this will provide Torus scrubbing of the airborne radionuclides.

Answer Key		
# 22		
Choice		Basis or Justification
Correct:	D	EOP user's guide, Primary cont. press control, Pg 2-27 - 2-55; EMG-3200.02
Distractors:	A	Plausible, 2 inch vent line available but does not provide Torus scrubbing.
	B	Plausible, EOP requires venting but basis discusses the delta press, >1psig to hold vacuum breakers closed.
	C	Plausible, 12 inch vent does provide scrubbing but is not recommended by EOP

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
H	3.5	3	

Source Documentation		
Source:	New Exam Item X Modified Bank Item OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank
Reference(s):	EOP users guide, pgs 2-27 thru 2-55, and EMG-3200.02 [2621.845.08]	
Learning Objective:	03000, 09546	
Terminal Objective:	2000501435, 2000502410	
Knowledge/Ability:	295024 EK3.07	Importance: 3.5/4.0
Knowledge of the reasons for the following responses as they apply to HIGH DRYWELL PRESSURE. Drywell Venting. [PRA related: Containment venting]		

Prepared by: Larry Briggs

23. Given the following:

- The plant is operating at full power.
- Torus pressure is 0.8 psig
- Drywell pressure is 1.2 psig.
- Containment valve line up has been verified in accordance with OPS-2024.06, Containment Ventilation System - Diagnostic and Restoration.

Based on the above conditions, which one of the following is correct?

a. There is a small steam leak in the Drywell, enter EMG 3200.02, Primary Containment Control and implement Support Procedure 31 to maintain Drywell pressure below 3.0 psig.

b. There is a nitrogen leak in the Drywell, enter EMG-3200.02, Primary Containment Control and implement Support Procedure 31 to maintain Drywell pressure below 3.0 psig.

c. Torus water level has decreased by about 10 inches, enter Procedure 310, Containment Spray System and restore level to normal.

d. Torus water level has increased by about 10 inches, enter Procedure 310, Containment Spray System and restore level to normal.

Answer Key		
# 23		
Choice		Basis or Justification
Correct:	C	Correct, a 10 inch level decrease will lower pressure about 0.5 psig. Restore level per Section 2.5 of Procedure 310.
Distractors:	A	Plausible, EMG 3200.02 would be entered at 143 inches in Torus or 3 psig
	B	Plausible, Nitrogen leak could increase Drywell pressure but would not explain lower Torus pressure.
	D	Plausible, Applicant may have direction of pressure change reversed.

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
H	3.5	3	X – 43.5

Source Documentation		
Source:	New Exam Item X Modified Bank Item OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank
Reference(s):	RAP C-5-e, and Procedure 310 [2621.828.32]	
Learning Objective:	00418, 00446	
Terminal Objective:	2220101503, 2230101006	
Knowledge/Ability:	295030 EA2.04	Importance: 3.5/3.7
Ability to determine and/or interpret the following as they apply to LOW SUPPRESSION POOL WATER LEVEL. Drywell/suppression chamber differential pressure: Mark I & II		

Prepared by: Larry Briggs

24. The reactor was operating at full power when the plant experienced a scram due to a failure in the turbine control oil system.

Plant conditions are:

- Reactor level is at 90 inches TAF
- Reactor power is less than 2% and decreasing
- Alarm H-3-c, RX LVL LO-LO, channel 1 has annunciated

Based on the above conditions, which one of the following is correct?

a. Diesel Generators and Core Spray Systems are running.

b. Recirculation pumps have tripped and MSIV's are closed.

c. Recirculation pumps have tripped and Diesel Generators are running.

d. MSIVs are closed and Isolation Condensers have initiated.

Answer Key		
# 24		
Choice		Basis or Justification
Correct:	A	Per RQP-3024.01, H-3-e, EDGs and Core Spray only require 1 channel to actuate.
Distractors:	B	Plausible, both actions occur at 90 inches but require both channels to actuate
	C	Plausible, same as "B"
	D	Plausible, same as "B"

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
H	2.5	2	

Source Documentation			
Source:	New Exam Item X Modified Bank Item OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank	
Reference(s):	2000-RAP-3024.01, H-3-e AND H-4-e [2621.828.37]		
Learning Objective:	01157, 01164		
Terminal Objective:	2120501403		
Knowledge/Ability:	295031 EK2.09	Importance: 3.3/3.4	
Knowledge of the interrelations between REACTOR LOW WATER LEVEL and the following. Recirculation system: Plant specific			

Prepared by: Larry Briggs

25. Given the following:

- The plant has experienced a LOCA and a scram.
- Containment pressure is 8 psig and slowly increasing.
- RPV water level is 55 inches TAF and lowering.
- Electrical faults have resulted in the lockout of 1C and 1D 4160V buses.
- Reactor pressure is 250 psig and lowering slowly.
- Radiation levels in the Reactor Building are 50 mrem/hour

Based on the above conditions, which of the following is correct?

a. Line up for injection from the Condensate Storage Tank via Core Spray by opening the Core Spray Inlet Header Valves V-20-1 and V-20-2 in the Reactor Building SW corner room, -19 foot elevation.

b. Line up the Fire Water system for injection to Core Spray Loop 1 by opening V-20-83, fire water supply outside the reactor building, 23 foot, North side.

c. Line up the Standby Liquid Control System to inject demineralized water from the test tank on the 75 foot elevation of the Reactor Building.

d. Line up the Condensate Transfer System to inject via Core Spray System 1 by opening regulator bypass valves on the 23 foot elevation of the Reactor Building.

Answer Key		
# 25		
Choice		Basis or Justification
Correct:	B	Correct, quickest to line up, does not require RB entry, and the correct valve location is given.
Distractors:	A	Plausible, Is a valve lineup, however location is incorrect and no power to CS pumps.
	C	Plausible, Is a valve lineup but elevation is incorrect. SBLC sys. is on 95 foot elev.
	D	Plausible, Is a valve lineup but elevation is incorrect and system pressure is to high for cond. transfer system.

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
H	2.5	4	

Source Documentation		
Source:	New Exam Item X Modified Bank Item OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank
Reference(s):	Support Procedures 5, 6, 7, and 56 [2621.845.19]	
Learning Objective:	03055, 03058	
Terminal Objective:	2000501402	
Knowledge/Ability:	295031 G2.1.30	Importance: 3.9/3.4
Reactor Low Water Level. Ability to locate and operate components/including local controls. [PRA related: Core Spray (manual initiation or injection with fire water]		

Prepared by: Larry Briggs

26. The reactor experienced a scram due to a load rejection from 100% power. The CRO reports the following plant conditions:

- Reactor pressure is 1060 psig
- All recirculation pumps have tripped
- Reactor water level is at 100 inches TAF and being lowered
- Eight control rods are at notch 48
- Reactor power is 3%

To manually insert the control rods, place the Mode Selector Switch in __1.__ Bypass the Rod Worth Minimizer, and __2.__ the CRD Drive Water Pressure Control Valve (NC-18)

a. (1) Startup (2) Close

b. (1) Startup (2) Open

c. (1) Refuel (2) Close

d. (1) Refuel (2) Open

Answer Key		
# 26		
Choice		Basis or Justification
Correct:	C	Correct for manual insertion Per Support Procedure 21.
Distractors:	A	Plausible, but the startup mode is incorrect
	B	Plausible, but the startup mode is incorrect
	D	Plausible, but the valve must be closed

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
F	2.5	2	

Source Documentation			
Source:	New Exam Item X Modified Bank Item OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank	
Reference(s):	EMG-3200.01b (Power Leg) and Support Procedure 21 [2621.845.19]		
Learning Objective:	02257		
Terminal Objective:	2000501411		
Knowledge/Ability:	295037 EA1.07	Importance: 3.9/4.0	
Ability to operate and/or monitor the following as they apply to SCRAM CONDITION PRESENT AND REACTOR POWER ABOVE APRM DOWNSCALE OR UNKNOWN. RMCS: Plant-Specific.			

Prepared by: Larry Briggs

27. Technical Specifications provide an Off-Gas system isolation setpoint 15 minutes after a high radiation signal.

    The bases for the high radiation setpoint is to prevent an individual exposed to a plume cloud from exceeding:

    a. 10 mRem a year Gamma dose.

    b. 10 mRem a year Gamma and Beta dose.

    c. 100 mRem a year Gamma dose.

    d. 100 mRem a year Gamma and Beta dose.

Answer Key		
# 27		
Choice		Basis or Justification
Correct:	C	Per TS Bases, Section 3.6.E
Distractors:	A	Plausible, Not correct value per 10CFR100 limits.
	B	Plausible, Not correct value per 10CFR100 limits and a Beta dose is not anticipated from shine of a cloud passing over.
	D	Plausible, Beta dose is not anticipated from shine of a cloud passing over.

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
F	4	5	43.2

Source Documentation			
Source:	New Exam Item X Modified Bank Item OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank	
Reference(s):	TS Bases, Section 3.6.E [2621.850.90]		
Learning Objective:	01661		
Terminal Objective:	3410302017, 3410302018		
Knowledge/Ability:	295038 EK3.02	Importance: 3.9/4.2	
Knowledge of the reasons for the following responses as they apply to HIGH OFF-SITE RELEASE RATE. System isolations.			

Prepared by: Larry Briggs

28. Given the following:

- The plant scrammed from 100% power due to a LOCA with fuel damage.
- There was leakage of contaminated water into the turbine building
- An alert has been declared due to an off site release

Based on the above conditions, which one of the following is correct?

The turbine building ventilation system should be:

a. Operated normally to maintain Turbine Building temperatures for habitability.

b. Secured to prevent a ground level release out the Turbine Building Stack.

c. Operated normally to ensure adequate dilution of the gasses discharged through the Main Stack.

d. Operated normally to prevent having an unmonitored ground level release.

Answer Key		
# 28		
Choice		Basis or Justification
Correct:	D	Per EOP Users Guide, Reactivity Release Control EOP.
Distractors:	A	Plausible, run to maintain radiological habitability.
	B	Plausible, securing ventilation will cause radioactivity buildup in building and inhibit personnel access.
	C	Plausible, normal ventilation concern during routine plant operations.

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
H	3	3	

Source Documentation			
Source:	New Exam Item Modified Bank Item OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank	Mod 1999 Exm. #87
Reference(s):	EOP Users Guide, Reactivity Release Control EOP. [2621.845.12]		
Learning Objective:	01667, 02483		
Terminal Objective:	2000502414		
Knowledge/Ability:	295038 EA1.06	Importance: 3.5/3.6	
Ability to operate and/or monitor the following as they apply to HIGH OFF-SITE RELEASE RATE. Plant ventilation.			

Stem and distractors modified extensively.
Prepared by: Larry Briggs

29. The plant is at 100% power when annunciator C-8-f,"DW H2/O2 SYS A TROUBLE," alarms. The instrumentation technician reports that the "A" H2 analyzer cell has failed. The "B" H2 analyzer is functioning normally. A replacement cell is on order and will be received within 2 weeks.

    Based on the above conditions, which one of the following Technical Specification statements, if any, is correct?

    a. There is no restriction on plant operations since the "B" H2/O2 analyzer was placed into service and is functioning normally.

    b. System "A" must be returned to service within 30 days or the plant must be placed into Cold Shutdown within the next 24 hours.

    c. System "A" must be returned to service within 7 days or the plant must be placed into Cold Shutdown within the next 24 hours.

    d. Manual H2/O2 samples must be taken using the Post Accident Sampling System.

Answer Key		
# 29		
Choice		Basis or Justification
Correct:	B	Correct per TS 3.13.F
Distractors:	A	Plausible, Applicant may think no restrictions since repairs will be complete in 2 weeks.
	C	Plausible, this is condition for both monitors being out of service.
	D	Plausible, this is specified action in diagnostic procedure if both monitors are OOS

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
H	2	4	X – 43.1

Source Documentation			
Source:	New Exam Item X Modified Bank Item OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank	
Reference(s):	TS 3.13.F [2621.828.65]		
Learning Objective:	00930, 00931		
Terminal Objective:	2250104501		
Knowledge/Ability:	500000 G2.1.12	Importance: 2.9/4.0	
HIGH CONTAINMENT HYDROGEN CONCENTRATION. Ability to apply Technical Specifications for a system.			

Prepared by: Larry Briggs

30. Given the following:

- Reactor power 70%
- Core flow 9.0 x 10E4 GPM
- Three Reactor Recirculation loops are operating
- Two Reactor Recirculation loops are idle

Which one of the following is correct if another Reactor Recirculation Pump Trips?

a. IAW ABN-3200.01, Reactor Scram, immediately scram the reactor and trip all recirc pumps to prevent entering the Exclusion Region.

b. IAW ABN-3200.01, Reactor Scram, monitor core flow, if the Exclusion Region is entered then scram the reactor to prevent core power oscillations.

c. IAW ABN-3200.02, Recirculation Pump Trip, monitor core flow, if the Buffer Region is entered then insert Cram Rods to prevent entering the Exclusion Region.

d. IAW ABN-3200.02, Recirculation Pump Trip, verify the tripped recirc pump's discharge isolation valve is open, then close the discharge valve to prevent backflow through the loop.

Answer Key		
# 30		
Choice		Basis or Justification
Correct:	A	Correct per ABN-3200.02, Recirculation Pump Trip
Distractors:	B	Plausible, Partially correct, insert Cram Rod to exit Exclusion Region. This is for a trip when 4 or 5 RRPs are operating
	C	Plausible, partially correct for a trip if 4 or 5 RRPs running, insert Cram Rods if Exclusion Region is entered.
	D	Plausible, correct action if a RRP trip when 4 or 5 are running.

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
H	4	4	43.5

Source Documentation			
Source:	New Exam Item X Modified Bank Item OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank	
Reference(s):	ABN-3200.02, Recirculation Pump Trip [2621.828.38]		
Learning Objective:	00226		
Terminal Objective:	2020402001		
Knowledge/Ability:	295001 AK3.04	Importance: 3.4/3.6	
Knowledge of the reasons for the following responses as they apply to PARTIAL OR COMPLETE LOSS OF FORCED CORE FLOW CIRCULATION. Reactor SCRAM			

Prepared by: Larry Briggs

31. Given the following:

- The plant is at 100% power
- Alarm 9XF-1-d, BUS A/B UV has alarmed
- The MG charger for "B" battery has tripped due to a breaker problem
- The maximum voltage that the static inverter will supply is 124.0 VDC

Based on the above conditions, which one of the following is correct?

a. TS require that the "B" 125 VDC Battery must be declared inoperable and that the reactor must be placed in cold shutdown within 30 hours.

b. TS allow the reactor to remain in operation for a period not to exceed 7 days out of a 30 day period with one 125 VDC bus inoperable, provided the requirements of TS 3.8 are met.

c. Restore operability of the "B" 125 VDC bus by connecting it to the Static Inverter in accordance with OPS-3024.10c, Electrical Distribution - 125 VDC Diagnostic and Restoration Actions.

d. Restore operability of the "B" 125 VDC bus by cross connecting the "A" and "B" buses in accordance with System Operating Procedure 340.1, 125 VDC Distribution Systems "A" and "B."

Answer Key		
# 31		
Choice		Basis or Justification
Correct:	A	Per TS 3.7.B and 125 VDC diagram, sheet No. 275
Distractors:	B	Plausible, allowed by TS if it is the "A" 125 VDC bus that is inoperable.
	C	Plausible, the candidate may select this answer because it is a possible action, but the voltage on the Static Inverter is too low to consider the bus operable.
	D	Plausible, has a cross-tie arrangement but Kirk key interlock prevents both breakers for closing. The breakers are for tying the static charger to either bus.

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
H	2.5	3	X – 43.1

Source Documentation			
Source:	New Exam Item X Modified Bank Item OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank	
Reference(s):	RAP-3024.02, WINDOW 9xf-1-d - TS 3.7 and OPS-3024.10c, 125 VDC Diagnostic & 125 VDC diagram, sheet No. 275. [2621.828.12]		
Learning Objective:	01117, 01118		
Terminal Objective:	2630101004		
Knowledge/Ability:	295004 AA2.03	Importance: 2.9/2.9	
Ability to determine and/or interpret the following as they apply to PARTIAL OR COMPLETE LOSS OF D.C. POWER. Battery voltage.			

Prepared by: Larry Briggs

32. On a turbine trip, the reheater & intercept valves and the extraction steam check valves isolate.

Which one of the following is the correct reason for these isolations?

a. To prevent moisture carryover from the High Pressure Turbine to the Low Pressure Turbine via the Moisture Separator Reheaters.

b. To minimize cycling of the Auxiliary Flash Tank Drain Pumps due to reheater drain flow control problem on a turbine trip.

c. To prevent the 2nd Stage Reheaters from excessive shell to tube differential temperatures.

d. To prevent turbine overspeed due to backflow from extraction steam and continued steam flow from reheaters.

Answer Key		
# 32		
Choice		Basis or Justification
Correct:	D	Per lesson plan PGD-2621 course 828, lesson 050, Pgs. 22 & 23. Station Procedure 318, Main Steam System and Reheat Steam, Para. 6.2.5, 6.2.8, and Attachment 2.
Distractors:	A	Plausible, Applicant may assume moisture from the reheater will carryover without continued steam reheat flow.
	B	Plausible, This is a concern per para. 6.2.8 of Procedure 318.
	C	Plausible, This is a concern on Startup and low power operation per Procedure 318, Para. 6.2.5

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
F	2	2	

Source Documentation			
Source:	New Exam Item X Modified Bank Item OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank	
Reference(s):	lesson plan PGD-2621 course 828, lesson 050, Pgs. 22 & 23. Station Procedure 318, Main Steam System and Reheat Steam, Para. 6.2.5, 6.2.8, and Attachment 2. [2621.828.50 & 51]		
Learning Objective:	01188, 01201, 01723		
Terminal Objective:	2450101408		
Knowledge/Ability:	295005 AK3.05	Importance: 2.5/2.6	
Knowledge of the reasons for the following responses as they apply to MAIN TURBINE GENERATOR TRIP. Extraction steam/moisture separator isolations.			

Prepared by: Larry Briggs

33. The plant was in the process of reducing power to conduct MSIV surveillance testing. The CRO reports the following:

- RPV level has increased to 165 inches TAF
- Feed water flow is greater than steam flow
- Alarm J-5-d, MFRV LOCK UP (A) has annunciated
- The auxiliary plant operator reported that an airline in the Feed Pump area has broken and is leaking air.

Based on the above conditions, which one of the following is the correct initial response?

a. Implement ABN-3200.35, Instrument Air System Failure Abnormal Operations and repair the broken instrument air line.

b. Reduce reactor power as directed by RAP H-7-e, RX LEVEL HI/LO.

c. Implement OPS-3024.14, Feedwater System - Diagnostic and Restoration Actions, and place MFRV "A" in local manual operation.

d. Initiate a manual scram IAW ABN-3200.01, Reactor Scram, before a turbine trip occurs at 175 inches TAF.

Answer Key		
# 33		
Choice		Basis or Justification
Correct:	C	Procedure requires taking manual control first then fix air leak
Distractors:	A	Plausible, Applicant may want to fix air leak first but control of feed is most important and IAW RAP J-5-d.
	B	Plausible, This will aggravate condition
	D	Plausible, Applicant could take preemptive action but not correct at this point.

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
H	3	2	X – 43.5

Source Documentation		
Source:	New Exam Item X Modified Bank Item OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank
Reference(s):	RAP-J-5-d, MFRV LOCK UP" [2621.828.18]	
Learning Objective:	02194	
Terminal Objective:	2590401006	
Knowledge/Ability:	295008 AA2.02	Importance: 3.4/3.4
Ability to determine and/or interpret the following as they apply to HIGH REACTOR WATER LEVEL. Steam flow/feed flow mismatch.		

Prepared by: Larry Briggs

34. Given the following:

- The plant is at 75% power and increasing
- Alarm C-3-a, PUMP 1-1 TRIP (RBCCW) annunciates
- RBCCW Pump 1-2 was successfully started
- RBCCW temperatures are increasing slowly on Panel 13R

Based on the above conditions, which one of the following is correct?

a. If the condition lasts for more than one minute, scram the reactor and trip all recirculation pumps to prevent damage to the recirculation pumps.

b. Increase Service Water flow to reduce the RBCCW outlet temperature and/or reduce Reactor Water Cleanup System flow rate to reduce heat loads.

c. If one Recirculation Pump CCW FLOW LO alarms, scram the plant immediately, IAW ABN 3200.01, Reactor Scram, to protect the recirculation pump.

d. Monitor Drywell temperature and pressure, vent the Drywell if pressure exceeds 1.6 psig by venting through Drywell Vent Valves V-23-21 and V-23-22 (Panel 12XR) to maintain normal Drywell pressure.

Answer Key		
# 34		
Choice		Basis or Justification
Correct:	B	Per ABN-3200.19, RBCCW Failure Response, Section 3.5
Distractors:	A	Plausible, true if all flow is lost or alarms on more than one recirculation pump.
	C	Plausible, requires alarm on more than one recirculation pump.
	D	Plausible, This action is taken to maintain pressure between 1.1 and 1.3 psig

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
H	2.5	2	

Source Documentation		
Source:	New Exam Item X Modified Bank Item OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank
Reference(s):	ABN-3200.19, RBCCW Failure Response, RAP C-3-c, PUMP 1-1 TRIP. [2621.828.35]	
Learning Objective:	00057, 00065, 07270	
Terminal Objective:	2080101403	
Knowledge/Ability:	295018 AK3.06	Importance: 3.3/3.3
Knowledge of the reasons for the following responses as they apply to PARTIAL OR COMPLETE LOSS OF COMPONENT COOLING WATER. Increasing cooling water flow to heat exchangers.		

Prepared by: Larry Briggs

35. The plant is at full power when a loss of instrument air transient occurs.

In accordance with ABN.3200.35, Instrument Air System Failure, what is the purpose for requiring a reactor scram when Instrument Air pressure reaches 55 psig?

a. To minimize the reactor pressure transient when the MSIVs fail shut.

b. To prevent a hydraulic lock when the Scram Discharge Volume valves fail shut.

c. To prevent uncontrolled rod insertions when the Scram Valves randomly fail open.

d. To ensure sufficient pressure is available to assist the scram before the CRD Flow Control Valve fails shut.

Answer Key		
# 35		
Choice		Basis or Justification
Correct:	C	Per ABN-3200.35, a manual scram is required at 55 psig to prevent uncontrolled rod insertion and avoid fuel damage
Distractors:	A	Plausible, the MSIVs will fail shut, but not until after the reactor would have scrammed due to low air pressure.
	B	Plausible, the SDV vent and drain valves will fail shut but this is not the concern. The actual concern is the Scram Inlet and Outlet valves failing open allowing the rods to scram in a random sequence.
	D	Plausible, the CRD Flow Control Valve does fail shut, but not until after the rods would have already started inserting. Reactor Pressure is adequate at power to insert the rods.

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
F	2	3	

Source Documentation		
Source:	New Exam Item X Modified Bank Item OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank
Reference(s):	ABN-3200.35; [2621.828.43]	
Learning Objective:	00917, 00920	
Terminal Objective:	2780401401, 2790401403	
Knowledge/Ability:	295019 G2.4.48	Importance: 3.5/3.8
Partial or complete loss of Instrument Air. Ability to interpret control room indications to verify the status and operation of system, and understand how operator actions and directives affect plant and system conditions.		

Prepared by: Phil Nielsen

36. The plant has recently shutdown for refueling with the following conditions:

- Shutdown cooling is in operation with the "C" Shutdown Cooling Pump running
- "E" Recirculation Loop is in service; all other loops are idle
- Coolant temperature is 180°F
- RPV level is 185 inches TAF
- Torus level 80 inches for Torus coating inspection and maintenance
- Steam Separator and Dryer have not been removed

The following events occur:

- 4160 VAC bus 1A trips due to a fault on the bus
- EDG 1 starts and supplies 4160 VAC bus 1C
- The CRO reports that reactor coolant temperature is slowly rising.

Based on the above conditions, which one of the following is (are) the correct action(s)?

a. Per OPS-3024.27, Shutdown Cooling System - Diagnostic and Restoration Actions, close the "E" recirculation loop discharge isolation valve.

b. Per OPS-3024.27, Shutdown Cooling System - Diagnostic and Restoration Actions, initiate Alternate cooling using one Core Spray pump raise RPV level and open one EMRV to establish core cooling.

c. Per OPS-3024.22, Reactor Recirculation System Diagnostic and Restoration Actions, start the "A" recirculation pump and open its discharge valve to establish cooling flow.

d. Per OPS-3024.10a, Electrical Distribution - 4160 VAC Diagnostic and Restoration Actions, restore power to Bus 1A IAW Procedure 337, Section 3.2, "Energizing 4160V, Bus 1A From the Startup Transformer."

Answer Key		
# 36		
Choice		Basis or Justification
Correct:	A	Correct per procedure if level is at least 185 inches TAF
Distractors:	B	Plausible, an alternative cooling method in SDC procedure diagnostic.
	C	Plausible, viable option but power for recirculation pump is bus 1A
	D	Plausible, viable option except bus 1A tripped due to a fault on the bus.

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
H	4	5	X – 43.5

Source Documentation		
Source:	New Exam Item X Modified Bank Item OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank
Reference(s):	OPS-3024.10a, 27, and 22 [2621.828.45]	
Learning Objective:	00036, 02602	
Terminal Objective:	2050101008, 2050401402	
Knowledge/Ability:	295021 AA2.07	Importance: 2.9/3.1
Ability to determine and /or interpret the following as they apply to LOSS OF SHUTDOWN COOLING. Reactor Recirculation flow.		

Prepared by: Larry Briggs

37. Given the following conditions:

- Plant is shutdown
- Reactor temperature is 180°F and slowly increasing
- RPV level is 170 inches TAF
- Shutdown cooling has been lost and is not expected to be recovered for 4 hours
- The steam separator and dryer have not been removed
- All recirculation pumps are secured
- The "A" recirculation loop suction and discharge valves are open, all other loops are idle
- Torus level 80 inches for Torus work in progress

Based on the above conditions, which one of the following is the correct action(s)?

Direct the control room operators to:

a. Refer to OPS-3024.27, Shutdown Cooling System – Diagnostic and Restoration Actions, and increase RPV level to greater than 185 inches TAF to establish natural circulation.

b. Refer to OPS-3024.27, Shutdown Cooling System – Diagnostic and Restoration Actions, and establish cooling using the EMRVs.

c. Refer to Procedure 305, Shutdown Cooling System Operation, and close the "A" recirculation loop discharge valve and establish SDC system operation.

d. Refer to Procedure 307, Isolation Condenser System, and reduce RPV level to less than 160 inches TAF and initiate Isolation Condensers.

Answer Key		
# 37		
Choice		Basis or Justification
Correct:	A	Correct per diagnostic procedure OPS-3024.27. Raising level will allow natural circulation to cool the reactor system.
Distractors:	B	Plausible, Plausible, a recommended action if above 212°F and Torus level above 90 inches.
	C	Plausible, a recommended action if "E" loop suction and discharge valves are open and SDC is operable
	D	Plausible, a recommended action if greater than 212°F and to augment answer a.

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
H	4	3	43.5

Source Documentation			
Source:	New Exam Item X Modified Bank Item OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank	
Reference(s):	OPS-3024.27, Shutdown Cooling System - Diagnostic and Restoration Actions [2621.828.45]		
Learning Objective:	00036, 02602		
Terminal Objective:	2050101008, 2050401402		
Knowledge/Ability:	295021 AK1.04	Importance: 3.6/3.7	
Knowledge of the operational implications of the following concepts as they apply to LOSS OF SHUTDOWN COOLING. Natural circulation			

Prepared by: Larry Briggs

38. Initially the following conditions exist:

- The reactor is at 100% power
- All control rods are operable
- CRD hydraulic pump "A" is secured for routine maintenance

Then the "B" CRD Pump trips and the following alarms annunciate:

- Alarm H-2-c, PUMP B OL
- Alarm H-7-c, CHARG WTR PRESS LO
- A short time later, Alarm H-8-c, ACCUMULATOR PRESS LO/LEVEL HI annunciates
- Then an ACCUMULATOR LEVEL/PRESS window energizes on the Rod Block Alarm Display

Which one of the following correctly describes the operational implications of this condition?

a. IAW TS, the two control rods with Accumulator trouble alarms are considered inoperable and must be valved out of service.

b. IAW TS, the plant can continue to operate for a period not to exceed 7 days with the CRD hydraulic pumps inoperable.

c. IAW OPS-3024.08, CRD Hydraulic System - Diagnostic and Restoration, one restart of the "B" CRD pump may be attempted.

d. IAW 2000-ABN-3200.01, Reactor Scram, the reactor must be manually scrammed immediately.

Answer Key		
# 38		
Choice		Basis or Justification
Correct:	D	An immediate scram is required when the second accumulator trouble alarm is received.
Distractors:	A	Plausible, rods are considered inoperable if they cannot be moved with normal drive pressure
	B	Plausible, This is a true statement, but only if one CRD pump OOS.
	C	Plausible, the diagnostic procedures tell the operator to start the stand-by pump. RAP specifically says not to restart on overload trip of pump.

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
H	2	2	X - 43.5

Source Documentation		
Source:	New Exam Item X Modified Bank Item OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank
Reference(s):	RAP-H-7-c, TS 3.4.D, OPS-3024.08, Sect. 3.1 [2621.828.11]	
Learning Objective:	00020	
Terminal Objective:	2010401408	
Knowledge/Ability:	295022 AK1.02	Importance: 3.6/3.7
Knowledge of the operational implications of the following concepts as they apply to LOSS OF CRD PUMPS. Reactivity control.		

Prepared by: Larry Briggs

39. The plant has been taken critical and a heatup is in progress.

- Plant pressure is 500 psig.
- Alarm H-7-c, CHARG WTR PRESS LO, has annunciated.
- The "A" CRD Pump is running.
- A significant leak in the common CRD header just before the CRD filters was reported.
- No Scram Accumulator trouble alarms have annunciated.

Based on the above conditions, which one of the following is correct?

a. The reactor must be scrammed IAW ABN 3200.01, Reactor Scram, because the CRD seals could be damaged due to loss of cooling flow.

b. The reactor must be scrammed IAW ABN 3200.01, Reactor Scram, while accumulator pressure is sufficient to ensure scram capability.

c. Technical Specifications require the plant temperature to be reduced to less than 212°F under these conditions.

d. Technical Specifications allow continued operation for up to 6 hours to determine if shutdown margin can be met with multiple control rods inoperable.

Answer Key		
# 39		
Choice		Basis or Justification
Correct:	B	The reactor is required to be scrammed with Reactor Pressure <850 psig and low CRD Charging Water Pressure.
Distractors:	A	Plausible, should be scrammed but not due to a concern for seal damage.
	C	Plausible, if the condition was caused by inoperable CRD pumps. This condition was caused by a leak in the system.
	D	Plausible, Multiple Control Rods are not inoperable.

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
H	2.5	2	

Source Documentation		
Source:	New Exam Item X Modified Bank Item OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank
Reference(s):	RAP H-7-c [2621.828.11]	
Learning Objective:	00020	
Terminal Objective:	2010401410	
Knowledge/Ability:	295022 AK2.07	Importance: 3.4/3.6
Knowledge of the interrelations between LOSS OF CRD PUMPS and the following. Reactor Pressure (SCRAM assist) Plant Specific.		

Prepared by: Larry Briggs

40. Given the following:

- The reactor is operating at 100% power
- SBGT System 1 is selected as preferential system
- Turbine Building Exhaust Fan EF-1-7 is running
- Radwaste Building Exhaust Fan EF-1-16 is running

The following occurs:

- Alarm 10F-1-f, VENT HI (RADIATION MONITORS PROCESS RX BLDG) annunciates
- Both SBGT systems started on the Vent Hi alarm
- Several minutes later the SBGT System 2 shutdown

Which of the following correctly states the operational implications of the above?

a. Shutdown of the SBGT System 2 will result in a significant increase of the radioactive release from the Reactor Building and will require notification of off-site authorities.

b. Verification of the VENT HI alarm will require entry into EMG-3200.11, Secondary Containment Control and entry into EPIP-OC-.01, Classification of Emergency Events.

c. This alarm indicates that a significant release has taken place and will require a Reactor Scram IAW ABN-3200.01, Reactor Scram, and a Reactor Building evacuation.

d. SBGT System 2 must be manually restarted in accordance with Procedure 330, Standby Gas Treatment System, to minimize the Reactor Building release.

Answer Key		
# 40		
Choice		Basis or Justification
Correct:	B	Per RAP-3024.01, 10F-1-k
Distractors:	A	Plausible, This was normal system response but applicant may not be aware that 2nd system secures once proper operation of preferential system is verified
	C	Plausible, Will require RB evacuation but not a scram based on provided information in stem
	D	Plausible, This not necessary, system is performing properly.

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
H	2.5	3	

Source Documentation			
Source:	New Exam Item X Modified Bank Item OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank	
Reference(s):	RAP-3024.01, 10F-1-k, Procedure 330, Standby Gas Treatment System, Section 4 and 5 [2621.845.11] [2621.828.42]		
Learning Objective:	01667, 00982		
Terminal Objective:	2000501428, 2610501404		
Knowledge/Ability:	295034 EK1.02	Importance: 4.1/4.4	
Knowledge of the operational implications of the following concepts as they apply to SECONDARY CONTAINMENT VENTILATION HIGH RADIATION. Radiation releases.			

Prepared by: Larry Briggs

41. The Reactor Building ventilation is aligned and operating normally when RB Exhaust Fan EF-1-5 trips.

    Based on the above conditions, which one of the following is correct?

a. Reactor Building supply fans trip and SBGT system automatically initiates at +1.5 inches water pressure.

b. Reactor Building supply fans will trip and the supply and discharge dampers will close at +1.0 inch of water and the SBGT system must be manually started.

c. The Reactor Building positive pressure spike will cause the 119 foot elevation blowout panels to fail resulting in a loss of Secondary Containment integrity.

d. The Reactor Building pressure spike will cause an automatic start of the standby Reactor Building Exhaust Fan EF-1-6 at +1.5 inches of water.

Answer Key		
# 41		
Choice		Basis or Justification
Correct:	B	Correct, per lesson plan PGD-2621, Lesson .0042, actions take place at 1.0 inch water.
Distractors:	A	Plausible, supply fans trip but SBGT system must be manually started
	C	Plausible, will get positive pressure spike, but the supply fans will trip limiting the positive pressure.
	D	Plausible, EF-1-6 does not auto start

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
F	3	2	

Source Documentation		
Source:	New Exam Item X Modified Bank Item OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank
Reference(s):	lesson plan PGD-2621, Lesson .0042	
Learning Objective:	00979, 00762	
Terminal Objective:	2610501401	
Knowledge/Ability:	295035 EK2.02	Importance: 3.6/3.8
Knowledge of the interrelations between SECONDARY CONTAINMENT HIGH DIFFERENTIAL PRESSURE and the following. SBGT/FRVS		

Prepared by: Larry Briggs

42. Given the following conditions:

- The plant is at full power
- A rupture of a Core Spray suction line has occurred in the NW Corner room.
- The EO reports that the water level in the NW Corner Room is at least 16 inches deep.
- Water levels are normal in all other areas.

Based on the above conditions, which one of the following is correct?

a. One Core Spray loop is inoperable, immediately shutdown the reactor IAW Procedure 203, Plant Shutdown.

b. Two Core Spray loops are inoperable, Scram the reactor and enter EMG-3200.01a, RPV Control – No ATWS.

c. One Core Spray loop is inoperable; when level is above Max Safe in Two Areas, IAW EMG 3200-11, Secondary Containment Control, then shutdown the reactor.

d. Two Core Spray Subsystems are inoperable, Emergency Depressurization IAW EMG-3200.11, Secondary Containment Control, is required.

Answer Key		
# 42		
Choice		Basis or Justification
Correct:	C	In the No loop for two Max Safes/no primary system discharging. 16" is base of equipment pedestals and the point after which equipment starts to be submerged
Distractors:	A	Plausible, Only one area above max safe.
	B	Plausible, No primary system discharging into secondary containment.
	D	Plausible, No primary system discharging into secondary containment.

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
H	3	2	X – 43.5

Source Documentation		
Source:	New Exam Item Modified Bank X #100, 99 audit* OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank
Reference(s):	EMG–3200.11 Secondary Containment and Radioactivity Release EOP[2621.845.11]	
Learning Objective:	03082	
Terminal Objective:	2000501431	
Knowledge/Ability:	295036 EA2.01	Importance: 3.0/3.2
Ability to determine and/or interpret the following as they apply to SECONDARY CONTAINMENT HIGH SUMP/AREA WATER LEVEL. Operability of components within the affected area.		

Modified all distractors to include procedure reference and bulleted and revised the stem.
Prepared by: S. Sowell, Modified by Larry Briggs

43. Given the following:

- The plant is at full power
- Monthly full flow surveillance testing is in progress on Containment Spray System One

During testing:

- A large ESW leak developed on the inlet piping to the 1-2 Containment Spray heat exchanger
- The NE corner room was flooded to a level of 20 inches prior to securing the Containment Spray System (CSS) and the ESW system

For the above circumstances, which one of the following is correct?

The TS bases states that to meet the heat removal requirements, flow from one operable CSS pump in:

a. EACH system is required; the LCO allows the reactor to continue to operate for up to 15 days to make repairs.

b. EACH system is required; the LCO allows the reactor to continue to operate for up to 7 days to make repairs.

c. System 2 is sufficient; the LCO allows reactor operation to continue as long as System 2 is fully functional.

d. System 2 is sufficient; the LCO allows the reactor to continue to operate for up to 7 days to make repairs.

Answer Key		
# 43		
Choice		Basis or Justification
Correct:	D	Only one pump required, however LCO does not allow entire system to be OOS
Distractors:	A	Plausible, only one pump in either system OOS operation can continue for 15 days
	B	Plausible, only one pump in either system is necessary for heat removal, 15 days is correct in this case if the two pumps are not in the same loop, which they are in this case.
	C	Plausible, True, only one pump is required, but LCO of 15 days would apply, not unlimited operation.

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
H	2	4	X – 43.2

Source Documentation		
Source:	New Exam Item X Modified Bank Item OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank
Reference(s):	TS Bases, Section 3.4 and LCO 3.4.C. [2621.828.09]	
Learning Objective:	00468, 00469	
Terminal Objective:	2260104002	
Knowledge/Ability:	295036 G2.2.25	Importance: 2.5/3.7
Secondary Containment High Sump/Area Water Level. Knowledge of bases in Technical Specifications for limiting conditions for operations and safety limits.		

Prepared by: Larry Briggs

44. Given the following:

- There is a fire in the Control Room ventilation system
- There is heavy smoke in the control room.
- The Halon system has actuated

If time permits ABN-3200.30, Control Room Evacuation directs the operator to manually scram the reactor and perform the following:

a. Trip all Reactor Recirculation Pumps and close the MSIVs

b. Close the MSIVs and manually start both EDGs

c. Manually start both EDGs and initiate the "A" Isolation Condenser

d. Initiate the "B" Isolation Condenser and trip all BUT one Reactor Feedwater Pump

Answer Key		
# 44		
Choice		Basis or Justification
Correct:	A	Correct per ABN-3200.30, Section 3
Distractors:	B	Plausible, in part correct, EDGs will be verified to be supplying their loads only if there is a loss of power.
	C	Plausible, in part correct, the operator is directed to initiate an Iso Condenser but not start the EDGs.
	D	Plausible, in part correct, should trip ALL feedwater pumps.

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
F	2	2	

Source Documentation			
Source:	New Exam Item X Modified Bank Item OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank	
Reference(s):	ABN-3200.30, Control Room Evacuation, Section 3. [2621.801.01]		
Learning Objective:	01408		
Terminal Objective:	0180102001		
Knowledge/Ability:	600000 AK2.04	Importance: 2.5/2.6	
Knowledge of the interrelations between PLANT FIRE ON SITE and the following. Breakers/relays/and disconnects.			

Prepared by: Larry Briggs

45. Which one of the following, concerning class of fire and the extinguishing agent, is correct.

	Class A	Class C	Class D
a.	Water Stream	CO2	Dry Chemical
b.	Water Fog	Water Stream	Dry Chemical
c.	CO2	Water Fog	Water Stream
d.	Dry chemical	CO2	Water Fog

Answer Key		
# 45		
Choice		Basis or Justification
Correct:	A	Correct, only answer where each of the indicated extinguishing agents is acceptable.
Distractors:	B	Plausible, but would not use a stream of water on an electrical fire (Class C)
	C	Plausible, but would not use a water stream on a burning metal fire (Class D)
	D	Plausible, but would not use a water fog on a burning metal fire (Class D)

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
F	2	1	

Source Documentation		
Source:	New Exam Item X Modified Bank Item OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank
Reference(s):	Corporate Safety Book	
Learning Objective:		
Terminal Objective:		
Knowledge/Ability:	600000 AA1.08	Importance: 2.6/2.9
Ability to operate and/or monitor the following as they apply to PLANT FIRE ON SITE. Fire fighting equipment used on each class of fire.		

Prepared by: Larry Briggs

46. Given the following:

- Reactor power 80%
- Four recirculation loops in service

The "A" main feedwater pump trips and cannot be restarted.

Based on the above conditions, which one of the following is correct?

Reduce power by:

a. Inserting CRAM rods to avoid exceeding the Minimum Critical Power Ratio.

b. Inserting CRAM rods to avoid entering the Exclusion Region.

c. Reducing Recirculation pump speed as necessary to ensure power is within feedwater pump capacity.

d. Reducing Recirculation pump speed to minimum flow (6.4E4 gpm) to ensure power is within feedwater pump capacity.

Answer Key		
# 46		
Choice		Basis or Justification
Correct:	C	RAP-3024-01, H-7-e
Distractors:	A	Plausible, could use rods but not fast enough to maintain level.
	B	Plausible, same as "A"
	D	Plausible, reduction to minimum is not recommended and it could cause entry into the Exclusion Region.

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
F	3	2	

Source Documentation		
Source:	New Exam Item X Modified Bank Item OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank
Reference(s):	RAP-3024-01, H-7-e and ABN-3200-17, Feedwater System Flow Control Failure [2621.828.18]	
Learning Objective:	00734	
Terminal Objective:	2590401006	
Knowledge/Ability:	202002 A1.04	Importance: 2.9/2.9
Ability to predict and/or monitor changes in parameters associated with operating the RECIRCULATION FLOW CONTROL SYSTEM controls including. Reactor Water Level.		

Prepared by: Larry Briggs

47. Given the following:

- Reactor power is 90%.
- "SPEED CNTRL LOST" annunciates for the "A" Recirculation Pump
- The red "AIRFAIL" light for the "A" Recirculation Pump illuminates.

Which one of the following is correct for the "A" Recirculation Pump?

a. The I/P converter has failed.

b. The master flow controller has failed.

c. The scoop tube has locked on a loss of control air.

d. The scoop tube has locked on a loss of speed control signal.

Answer Key		
# 47		
Choice		Basis or Justification
Correct:	D	Correct, receipt of both alarms indicates a loss of speed control signal per OP 301.2, section 11.0
Distractors:	A	Plausible, I/P failure will not generate all of the indicated alarms
	B	Plausible, but Master flow controller failure would affect all of the Recirc Pumps.
	C	Plausible, but you would not receive the "SPEED CONTROL LOST" on a loss of air.

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
H	3	2	

Source Documentation		
Source:	New Exam Item Mod. Bank Item #1, NRC audit, 99 OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank
Reference(s):	Op. 301.2, Section 11 [2621.828.40]	
Learning Objective:	00228	
Terminal Objective:	2020101006	
Knowledge/Ability:	202002 A3.02	Importance: 3.4/3.4
Ability to monitor automatic operations of the RECIRCULATION FLOW CONTROL SYSTEM including. Lights and alarms.		

Modified distractors to eliminate take Local and/or remote control
Prepared by: S. Sowell, modified by Larry Briggs

48. The following conditions existed at 0800:

- The plant was operating at 100% power
- V-14-37, "A" Isolation Condenser (IC) AC Condensate Return valve, was declared inoperable due to a breaker problem.
- V-14-37 is in its normal position

The following conditions occurred at 1000:

- Alarm C-7-b, SHELL TEMP HI, has annunciated due to a high "A" IC Shell Temperature.
- Alarm C-6-b, SHELL B LVL HI/LO, annunciated due to a "B" IC level of 7.8 feet

Based on the above conditions, which of the following is required by TS?

a. The "B" IC level must be lowered to normal by 1400 or declare the "B" IC inoperable.

b. The "B" IC isolation valves must be verified operable by 1200 or declare the "B" IC inoperable.

c. V-14-37 must be repaired by 1200 or declare the "A" IC inoperable and close all steam inlet and condensate outlet valves.

d. Make-up must be added to the "A" IC to clear the high temperature alarm by 1400 or declare the "A" IC inoperable.

Answer Key		
# 48		
Choice		Basis or Justification
Correct:	C	High temp and a level alarm indicate condensate return valve leakage. TS require the IC to be declared inop within 4 hours of V-14-37 failure.
Distractors:	A	Plausible, TS has limitations for level but they are related to a low-level condition.
	B	Plausible, "B" IC valves must be verified operable, but the "B" IC would not be declared inop.
	D	Plausible, system diagnostic procedures require action to clear the high temperature alarm but TS do not.

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
H	3	2	X – 43.1

Source Documentation		
Source:	New Exam Item X Modified Bank Item OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank
Reference(s):	TS 3.8 [2621.828.23]	
Learning Objective:	02551	
Terminal Objective:	2070302401	
Knowledge/Ability:	207000 G2.1.33	Importance: 3.4/4.0
Isolation (Emergency) Condenser. Ability to recognize indications for system operating parameters that are entry-level conditions for Technical Specifications.		

Prepared by: Larry Briggs

49. Given the following:

- The reactor was manually scrammed
- Several control rods did not insert
- Reactor power remained above 2%
- Standby Liquid Control System (SLCS) "A" was manually initiated
- G-2-b, "SQUIB VALVE OPEN" has annunciated
- No other SLCS alarms have annunciated

Based on the above conditions, which one of the following is correct?

a. SLCS flow is below normal, the required concentration of B-10 will not be injected within the 20 minute design time, reseat the relief valve for the "A" SLCS pump IAW SP-22, Initiating the Liquid Poison System.

b. SLCS flow is below normal, the required concentration of B-10 will not be injected in the 120 minute design time, start the "B" SLCS pump IAW SP-22, Initiating the Liquid Poison System.

c. SLCS flow is normal, the required concentration of B-10 will be injected in the 120 minute design time, no action is necessary.

d. SLCS flow is normal, the required concentration of B-10 will be injected within the 20 minute design time, no action is necessary.

Answer Key		
# 49		
Choice		Basis or Justification
Correct:	B	Per TS Bases and Support Procedure No. 22.
Distractors:	A	Plausible, Minimum required injection time is 26 minutes not 20 minutes, relief lifting would cause problem as described; however, the procedure requires starting other pump.
	C	Plausible, Flow is not normal with alarm clear, 120 minute is within the allowable band of times.
	D	Plausible, Flow is not normal with alarm clear, minimum required injection time is 26 minutes not 20 minutes.

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
H	3	3	

Source Documentation			
Source:	New Exam Item X Modified Bank Item OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank	
Reference(s):	Support Procedure 22 and TS Bases 3.2 [2621.828.45]		
Learning Objective:	00334, 00335, 00336, 00338		
Terminal Objective:	2110101004, 2110501401, 2110502401		
Knowledge/Ability:	211000 A2.04	Importance: 3.1/3.4	
Ability to (a) predict the impacts of the following on the STANDBY LIQUID CONTRO SYSTEM; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations. Inadequate system flow. [PRA related: Initiation of Boron following ATWS]			

Prepared by: Larry Briggs

50. Given the following:

- Reactor is at 5 percent power on the Bypass Valves
- Individual control rod scram time testing is being conducted

Procedure 302.2, Control Rod Drive Manual Control System, instructs the operator to immediately remove the scram signal when movement stops or the control rod is fully inserted.

Based on the above conditions, which one of the following is correct?

The individual scram signal is removed:

a. To prevent receiving a scram discharge volume high level scram.

b. To prevent filling the RBEDT through the scram discharge volume vent valves.

c. To allow the scram signal to be reset to drain the scram discharge volume.

d. To allow the brush recorder in the cable spreading room to be secured.

Answer Key		
# 50		
Choice		Basis or Justification
Correct:	A	Correct per Procedure 302.2, Control Rod Drive Manual Control System, Section 9.
Distractors:	B	Plausible, vent and drain valves remain open, RBEDT would be filling through the drain valves.
	C	Plausible, SDV drain valves remain open , no scram signal applied.
	D	Plausible, a normal scram will energize the recorder, but recorder is manually controlled on individual CRD scram time tests.

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
F	3	3	

Source Documentation		
Source:	New Exam Item X Modified Bank Item OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank
Reference(s):	Procedure 302.2, Control Rod Drive Manual Control System, Section 9. [2621.828.11]	
Learning Objective:	00017, 00019	
Terminal Objective:	2010101009	
Knowledge/Ability:	212000 K4.10	Importance: 3.3/3.6
Knowledge of REACTOR PROTECTION SYSTEM design feature(s) and/or interlocks which provide for the following. Individual rod SCRAM testing.		

Prepared by: Larry Briggs

51. Reactor Protection System (RPS) power supplies are aligned normally when RPS "B" trips due to a fault in the "B" RPS MG Set. Power is restored by taking the POWER SELECT switch to the TRANS position powering RPS "B" from VMCC 1A2.

    Operation with this RPS power supply alignment is:

    A. Permitted, with no limitations.

    B. Permitted, but limited to 30 hours.

    C. Permitted, but limited to 96 hours.

    D. NOT permitted, RPS "B" must be realigned to VMCC 1B2 immediately.

Answer Key		
# 51		
Choice		Basis or Justification
Correct:	C	Correct as indicated in GL 91-11 and OPS-3024.10e and Para. 5.2.3 of 408.12
Distractors:	A	Plausible, lineup is permitted but there are time limitations.
	B	Plausible, lineup is permitted but there are time limitations. 96 hours is a standard time used in TS and other procedures.
	D	Plausible, since there are limitations but the lineup is permitted.

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
F	2.5	3	

Source Documentation			
Source:	New Exam Item X Modified Bank Item OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank	
Reference(s):	OPS-3024.10e, Elect. Dist.: RPS Diagnostic and Restoration Actions and Station Procedure 408.12, Oper. of RPS Panel 1-1 and Transformer PS-1, Section 5 [2621.828.37 & .56]		
Learning Objective:	01167, 02320		
Terminal Objective:	2120101001, 2120101301, 2620102001, 2620302401		
Knowledge/Ability:	212000 K1.04	Importance: 3.4/3.6	
Knowledge of the physical connections and/or cause-effect relationships between REACTOR PROTECTION SYSTEM and the following. A.C. electrical distribution.			

Prepared by: Larry Briggs

52. Given the following:

- A reactor startup is in progress
- Power is in range 7 of the IRMs and steady
- Source range instruments are being withdrawn as power is increased

During the Source Range Monitor (SRM) instrument withdrawal:

- A fault in SRM "A" drive circuit results in it withdrawing fully from the core
- SRM "A" indicates 50 CPS

Based on the above conditions, which one of the following is correct?

a. No action is required; control rods can continue to be withdrawn because only two SRM instruments are required during a startup.

b. No action is required; the SRM rod block is bypassed when IRMs are in range 7 or greater because overlap has been verified.

c. A SRM rod block is received due to premature withdrawal of the SRM and the SRM will have to be bypassed so the startup can proceed.

d. A SRM rod block is received to prevent exceeding a local linear heat generation rate in an unmonitored portion of the core; the SRM must be repaired before proceeding.

Answer Key		
# 52		
Choice		Basis or Justification
Correct:	C	Per TS bases, the premature full withdrawal gives a low count rate (<100 CPS) and initiates a rod withdrawal block.
Distractors:	A	Plausible, Only two SRMs required but will have to take action due to rod block.
	B	Plausible, bypassed in range 8
	D	Plausible, rod block is received but not for stated reason.

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
H	2.5	3	X – 43.2

Source Documentation			
Source:	New Exam Item X Modified Bank Item OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank	
Reference(s):	TS Bases, Pg. 3.1.6, and Station Procedure 401.4, NI Instrumentation - SRM Channel Bypass Operation. [2621.828.29]		
Learning Objective:	00023, 00347, 00350, 00356		
Terminal Objective:	2150101005		
Knowledge/Ability:	215004 G2.1.32	Importance: 3.4/3.8	
Source Range Monitor (SRM) System. Ability to explain and apply system limits and precautions.			

Prepared by: Larry Briggs

53. Given the following:

- A reactor startup is in progress
- Reactor power is 5.5×10^4 CPS on all SRMs and slowly increasing

Which one of the following correctly describes the operational implications if one of the SRMs cannot be withdrawn?

a. An automatic reactor scram on SRM HI-HI (G-3-d) if the non-coincidence jumpers are installed.

b. A rod withdrawal block will occur at 1×10^5 CPS and remain in effect until one of the IRMs reaches Range 7 AND the affected SRM drawer is placed in INOP.

c. A rod withdrawal block will occur at 1×10^5 CPS and remain in effect until all IRMs are in Range 8 OR the affected SRM is bypassed.

d. The startup must be stopped and held at the current power level until the affected SRM can be repaired by the I&C Technician.

Answer Key		
# 53		
Choice		Basis or Justification
Correct:	C	Per Station Procedure 401.4, Nuclear Instrumentation - SRM Channels Bypass Operation.
Distractors:	A	Plausible, SRMs are approaching the 5E5 trip setpoint, but the jumpers are normally installed and must be removed for the non-coincident SRM scram
	B	Plausible, all SRMs must reach range 8 before the SRM rod block is bypassed OR the SRM must be bypassed not placed in INOP.
	D	Plausible, but startup not required to be stopped

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
F	3	2	

Source Documentation		
Source:	New Exam Item Modified Bank Item OC Exam Bank	Old NRC Exam X #18 on 1999 exam Other Exam Bank NRC Exam Bank
Reference(s):	Station Procedure 401.4, Nuclear Instrumentation - SRM Channels Bypass Operation. [2621.828.29]	
Learning Objective:	00347, 00356, 00358	
Terminal Objective:	2150101024, 2150101403	
Knowledge/Ability:	215004 K5.03	Importance: 2.8/2.8
Knowledge of the operational implications of the following concepts as they apply to SOURCE RANGE MONITOR (SRM) SYSTEM. Changing detector position.		

Used original conditions, stem and all distractor modified.
Prepared by: Joseph M. Milligan, Modified by Larry Briggs

54. Given the following:

- Reactor is operating at 100% power
- APRMs 1, 2, 3, and 4 indicating lights are extinguished AND indicate downscale on Panels 4F, 3R, and 5R
- APRM DNSCL OR INOP alarm on Panel 4F Rod Block Display

Based on the above conditions, which one of the following is correct?

a. Power to PSP-1 has been lost; restore 120 VAC IAW OPS-3024.10e, Reactor Protection System - Diagnostic and Restoration Actions.

b. Power to the APRMs has been lost; restore 120 VAC IAW OPS-3024.10f, Electrical Distribution - Instrument Power Restoration Actions.

c. Power to the APRMs has been lost; restore the 125 VDC supply IAW OPS-3024.10c, Electrical Distribution - 125 VDC System Diagnostic and Restoration Actions.

d. Power to one channel of Nuclear Instrumentation has been lost; restore 120 VAC power IAW Operating Procedure 403.1, Placing the LPRM-APRM System in Operation.

Answer Key		
# 54		
Choice		Basis or Justification
Correct:	A	Power to APRMs is from the RPS
Distractors:	B	Plausible, restoration direction is in RPS diagnostic procedure
	C	Plausible, power is 120 Volt but AC, not DC. DC is supplied to SRM and IRM instruments not APRMs.
	D	Plausible, Power lost to one channel of APRMs, not the whole NI System.

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
F	4	4	43.5

Source Documentation			
Source:	New Exam Item X Modified Bank Item OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank	
Reference(s):	OPS-3024.20, NI Diagnostic and OPS-3024.10e, Elect. Dist. RPS Diagnostic and Restoration. [2621.828.29]		
Learning Objective:	00356, 00360		
Terminal Objective:	2150101001, 2150101023		
Knowledge/Ability:	215005 K2.02	Importance: 2.6/2.8	
Knowledge of the electrical power supplies to the following. APRM channels.			

Prepared by: Larry Briggs

55. The plant was operating at 100% power when the flow transmitter supplying "A" loop flow to the RPS 1 flow summer fails high.

    Which of the following is the cause of the high flow signal and what is the appropriate procedure reference?

    a. An APRM half-scram. Refer to OPS-3024.20, Nuclear instrumentation - Diagnostic and Restoration to return the flow instrument to service.

    b. A Flow Inop half scram. Return to service IAW Plant Operating Procedure 301.2, Reactor Recirculation System.

    c. An APRM Downscale Rod Block. Refer to Response Alarm Procedure 3024.01, (G-4-f) APRM DNSCL.

    d. A Flow Comparator Mismatch Rod Block. Refer to Response Alarm Procedure 3024.01, (G-5-f) APRM FLO BIAS OFF NORMAL.

Answer Key		
# 55		
Choice		Basis or Justification
Correct:	D	RAP G-5-f
Distractors:	A	Plausible, would receive half scram if failure was downscale
	B	Plausible, would receive half scram if failure was downscale
	C	Plausible, flow failing upscale would appear that power was lower.

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
F	3	3	

Source Documentation		
Source:	New Exam Item X Modified Bank Item OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank
Reference(s):	Response Alarm Procedure 3024.01, (G-5-f) APRM Flow Bias Off Normal [2621.828.37]	
Learning Objective:	01157, 01165, 08658	
Terminal Objective:	2120101001/005/310, 2120501403	
Knowledge/Ability:	215005 A2.06	Importance: 3.4/3.5
Ability to (a) predict the impacts of the following in the AVERAGE POWER RANGE MONITOR/LOCAL POWER RANGE MONITOR SYSTEM; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations. Recirculation flow channels upscale.		

Prepared by: Larry Briggs

56. Given the following:

- Reactor is operating at 100% power
- Drywell pressure is 2 psig and slowly increasing
- RX LVL HI/LO (H-7-e) is in alarm
- RX LVL LO (Channel II, H-6-e) is in alarm
- RE21 B Yarway indicates 130 inches TAF and lowering

Based on the above conditions, which one of the following is correct?

a. There is an instrument variable leg leak in the Drywell, immediately scram the reactor IAW ABN-3200.01, Reactor Scram and enter EMG-3200.01A, RPV CONTROL - NO ATWS.

b. There is an instrument variable leg leak in the Drywell, enter OPS-3024.24, Reactor Pressure Vessel Level Instruments Diagnostic and Restoration Actions and make preparations to shutdown the reactor.

c. There is an instrument reference leg leak in the Drywell, scram the reactor IAW ABN-3200.01, Reactor Scram and enter EMG-3200.02, Primary Containment Control.

d. There is an instrument reference leg leak in the Drywell, enter OPS-3024.24, Reactor Pressure Vessel Level Instruments Diagnostic and Restoration Actions and control RPV level in the normal band.

Answer Key		
# 56		
Choice		Basis or Justification
Correct:	B	Variable leg leak will give low indication and unisolable leakage will require SD of plant.
Distractors:	A	Plausible, Scram point is RX LO level of 138.9 inches TAF, however it takes both channels. An immediate scram is not required.
	C	Plausible, reference leg leak would give high level reading, primary containment control would be entered at 3.0 psig
	D	Plausible, reference leg leak would give high level reading, there is no actual level decrease.

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
H	3	3	X – 43.5

Source Documentation			
Source:	New Exam Item X Modified Bank Item OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank	
Reference(s):	OPS-3024.24, Reactor Pressure Vessel Level Instruments Diagnostic and Restoration Actions and TS Section 3.3.D [2621.828.55]		
Learning Objective:	02042		
Terminal Objective:	2160101402		
Knowledge/Ability:	216000 G2.4.4	Importance: 4.0/4.3	
Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures. Nuclear Boiler Instrumentation.			

Prepared by: Larry Briggs

57. Given the following:

- The plant is operating at 100% power
- I&C reports that High Drywell Pressure Switch PS-RV46A has failed low and a new switch will not be available for at least 2 days

Based on the above conditions, which one of the following is correct?

a. TS requires that ADS capability be restored in one channel within 1 hour or reduce reactor pressure to less than 110 psig within the next 24 hours.

b. TS requires that the failed channel initiation signal be placed in the trip condition within 4 days or be less than 110 psig within the next 24 hours.

c. TS permits the affected EMRV to be placed in the "off" position for up to 8 hours to make repairs to the affected EMRV, not to exceed 8 hours in a 30 day period.

d. TS permits the affected pressure switch to be bypassed per System Operating Procedure 308, Emergency Core Cooling System Operation, for a period not to exceed 7 days in a 30 day period.

Answer Key		
# 57		
Choice		Basis or Justification
Correct:	B	TS Table 3.1.1, statement h., and TS 3.4.B.3
Distractors:	A	Plausible, action if one instr. in each channel is inop
	C	Plausible, correct statement for EMRV, not inop pressure switch
	D	Plausible, correct procedure for normal lineup of ADS, also MS has lineup for normal operation.

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
H	4	4	43.1

Source Documentation		
Source:	New Exam Item X Modified Bank Item OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank
Reference(s):	TS Table 3.1.1, statement h., and TS 3.4.B.3 [2621.828.05]	
Learning Objective:	00370. 00372	
Terminal Objective:	2180101001	
Knowledge/Ability:	218000 K6.07	Importance: 3.4/3.5
Knowledge of the effect that a malfunction of the following will have on the AUTOMATIC DEPRESSURIZATION SYSTEM. Primary containment instrumentation.		

Prepared by: Larry Briggs

58. Given the following:

- The "A" EMRV lifted due to a spurious signal
- The operator cycled the EMRV and it appears that the valve has reseated based on tail pipe temperature of 140°F and decreasing

Subsequent indications are:

- Reactor pressure is steady
- Torus temperature is steady
- The Alarm SV/EMRV NOT CLOSED has not cleared
- The "A" EMRV acoustic monitor on panel 15R still indicates that the valve is partially open

Based on the above, which one of the following is correct?

a. This is the normal indication for the acoustic monitor following an EMRV actuation.

b. The acoustic monitor has failed and must be repaired within the next 7 days or the reactor must be shutdown within the next 24 hours.

c. The acoustic monitor has failed and must be repaired within the next 24 hours or the reactor must be shutdown within the next 30 hours.

d. The acoustic monitor may be taken out of service without further TS action if the backup EMRV "Valve Position Indication" is operable.

Answer Key		
# 58		
Choice		Basis or Justification
Correct:	D	Per TS 3.13
Distractors:	A	Plausible, this is not normal but sensitivity set too low could cause this.
	B	Plausible, action if both position systems are inop
	C	Plausible, generic action for failure (TS 3.0.A)

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
H	4	2	43.1

Source Documentation			
Source:	New Exam Item X Modified Bank Item OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank	
Reference(s):	TS 3.13 and ABN-3200.40, Stuck Open EMRV [2621.828.05]		
Learning Objective:	00370, 00372		
Terminal Objective:	2180101001		
Knowledge/Ability:	218000 A1.02	Importance: 3.7/4.0	
Ability to predict and/or monitor changes in parameters associated with operation the AUTOMATIC DEPRESSURIZATION SYSTEM controls including. ADS valve acoustical monitor noise: Plant-Specific.			

Prepared by: Larry Briggs

59. Given the following:
    - Intake temperature is 87°F
    - The plant is at 90% power to meet NJ discharge permit temperature limits
    - The "B" EMRV has been leaking by for the last three days
    - Torus water level is 152 inches
    - Torus temperature is 95°F

    Based on the above conditions, which one of the following is correct?

    a. Place one Containment Spray System in Torus Cooling per Support Procedure 25.

    b. Lower the Torus water level using one Core Spray System IAW Support Procedure 37.

    c. IAW TS lower reactor pressure to less than 110 psig within 24 hours.

    d. IAW TS lower Torus water volume to less than 92,000 ft^3 within 24 hours or place the reactor in Cold Shutdown within the following 24 hours.

Answer Key		
# 59		
Choice		Basis or Justification
Correct:	A	Per EMG-3200.02, Primary Containment Control
Distractors:	B	Plausible, this is step to lower level in the Torus
	C	Plausible, would be required if EMRV were inop due to leakage.
	D	Plausible, true statement if temperature is caused by testing that raises temperature.

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
H	2	3	X – 43.5

Source Documentation		
Source:	New Exam Item X Modified Bank Item OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank
Reference(s):	EMG-3200.02, Primary Containment Control [2621.845.06]	
Learning Objective:	03000	
Terminal Objective:	2000501417, 2000502409	
Knowledge/Ability:	223002 G2.4.4	Importance: 4.0/4.3
Primary Containment Isolation System/Nuclear Steam Supply Shut-off. Ability to recognize abnormal indications for system operating parameters that are entry-level conditions for emergency and abnormal operating procedures.		

Prepared by: Larry Briggs

60. Given the following:

- The reactor was scrammed due to an elevated Drywell pressure
- Reactor level dropped to 105 inches TAF and is recovering
- Drywell pressure is 4 psig
- The high drywell pressure signals to RPS channel II did not actuate.

Which one of the following, concerning the Sump 1-8 isolation valves, is correct under these conditions?

a. Neither Sump 1-8 isolation valve will close, but the sump pumps trip, preventing the transfer of radioactive liquid outside of the Primary Containment.

b. Both Sump 1-8 isolation valves will close preventing the transfer of radioactive liquid outside of the Primary Containment.

c. Neither Sump 1-8 isolation valve will close, allowing the transfer of radioactive liquid outside of the Primary Containment.

d. One Sump 1-8 isolation valve will close, preventing the transfer of radioactive liquid outside of the Primary Containment.

Answer Key		
# 60		
Choice		Basis or Justification
Correct:	C	Neither valve will close due to the RPS logic.
Distractors:	A	Plausible, Applicant may think that one valve is controlled by each RPS channel.
	B	Plausible, Applicant may think the either RPS channel can close both valves.
	D	Plausible, Applicant may think one valve will close and they are in series..

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
F	3.5	2	

Source Documentation			
Source:	New Exam Item X Modified Bank Item OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank	
Reference(s):	Drawing 147434 (No. 156) and Dwg. GE 237E566, Sheets 1 thru 6 and Sheets 15 & 16 [2621.828.37]		
Learning Objective:	02456		
Terminal Objective:	2120501401		
Knowledge/Ability:	223002 K3.22	Importance: 2.5/2.6	
Knowledge of the effect that a loss or malfunction of the PRIMARY CONTAINMENT ISOLATION SYSTEM/NUCLEAR STEAM SUPPLY SHUT-OFF will have on the following. Containment drainage system.			

Prepared by: Larry Briggs

61. Given the following:

- The plant experienced a Turbine trip and an ATWS.
- 1 EMRV and 1 Safety valve are open and have failed to reseat
- Reactor pressure is 950 psig and rising
- Reactor level is 158 inches TAF and steady
- Two Main Core Spray Pumps and 2 Core Spray Booster Pumps have automatically started
- Containment Spray Pump 51A and ESW Pump 52A were started IAW Support Procedure 29, Initiation of Containment Spray System for DRYWELL SPRAY
- Containment Spray Pump 51C and ESW Pump 52C were started IAW Support Procedure 25, Initiation of Containment Spray System for TORUS COOLING
- Torus water level is 130 inches
- Torus water temperature is 100 °F and rising.

Based on the above conditions, which one of the following is correct?

a. Secure Core Spray pumps and start additional Containment Spray pumps as required.

b. Start additional Containment Spray pumps as required in addition to all of the pumps already operating.

c. Secure Containment Spray pumps to allow the continued operation of the Core Spray pumps.

d. Start additional Core Spray pumps as required in addition to all of the pumps already operating.

Answer Key		
# 61		
Choice		Basis or Justification
Correct:	A	Only 4 Core Spray/Containment Spray pumps are permitted to operate at one time. Core Spray pumps are not required for ACC and additional Containment Spray pumps are needed.
Distractors:	B	Plausible, additional Containment Spray pumps are needed, but only 4 total pumps are permitted
	C	Plausible, conditions require additional Containment Spray pumps, not Core Spray pumps.
	D	Plausible, but Core Spray pumps are not controlling level with pressure of 950 psig.

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
H	3.5	3	

Source Documentation		
Source:	New Exam Item X Modified Bank Item OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank
Reference(s):	Support Procedure 29, Initiation of Containment Spray System for Drywell Sprays [2621.845.08 & .19]	
Learning Objective:	03000, 02257	
Terminal Objective:	3450102207, 2090501402	
Knowledge/Ability:	226001 K1.01	Importance: 3.4/3.6
Knowledge of the physical connections and/or cause-effect relationships between RHR/LPCI: CONTAINMENT SPRAY SYSTEM MODE and the following. Suppression pool.		

Prepared by: Larry Briggs

62. Given the following conditions:

- The plant has experienced a LOCA inside containment concurrent with a loss of off-site power
- Only one EDG has started and is supplying its 4160 VAC bus

Which one of the following combinations of operating equipment is correct for the given conditions?

a. Containment Spray Pump 51A
ESW Pump 52A
Core Spray Main Pump 1A
Core Spray Booster Pump 3C

b. Containment Spray Pump 51B
ESW Pump 52D
Core Spray Main Pump 1D
Core Spray Booster Pump 3D

c. Containment Spray Pump 51B
ESW Pump 52A
Core Spray Main Pump 1A
Core Spray Booster Pump 3D

d. Containment Spray Pump 51C
ESW Pump 52D
Core Spray Main Pump 1B
Core Spray Booster Pump 3D

Answer Key		
# 62		
Choice		Basis or Justification
Correct:	C	All powered from EDG #1 via Bus 1C and 480 VAC bus 1A2
Distractors:	A	Plausible, CS Booster Pump 3C powered from EDG2,; all others EDG 1
	B	Plausible, ESW Pump 52D powered from EDG 2; all others powered from EDG 1
	D	Plausible, CS Booster Pump 3D powered from EDG 1; all others powered from EDG 2

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
F	2	2	

Source Documentation		
Source:	New Exam Item Modified Bank Item OC Exam Bank	Old NRC Exam X 1999 EX. #61 Other Exam Bank NRC Exam Bank
Reference(s):	Procedure 341 Section 4.5.3; 6231-PGD-2621 828.0016; 845.0001[2621.828.13]	
Learning Objective:	03114, 00814	
Terminal Objective:	2620101008, 2640101004, 2640101406	
Knowledge/Ability:	226001 K2.02	Importance: 2.9/2.9
RHR/LPCI Containment Spray System. Knowledge of electrical power supplies to the following. Pumps		

Prepared by: Joseph M. Milligan

63. Given the following:

- The plant experienced a trip that resulted in a high pressure transient
- EMRV(s) lifted and appear to have reseated
- Position 7 on EMRV/Isolation Condenser (IC) Temperature recorder indicates tailpipe temperature reached 250°F and in the last 20 minutes has dropped to 200°F
- Position 8 temperatures on the EMRV/IC Temperature recorder have remained at 120°F
- Alarm B-3-g, EMRV OPEN, has cleared
- Alarm B-4-g, SV/EMRV NOT CLOSED, has cleared

You have been directed to determine which EMRVs lifted. Which one of the following is correct under these conditions?

The EMRV(s) that lifted can be determined by:

a. Reading the downcomer temperatures recorded on position 7 and 8 of the EMRV/Isolation Condenser recorder on 1F/2F.

b. Reading the tailpipe temperatures on Panel TE 210 located on the 23 foot elevation in the Reactor Building.

c. Observing the seal-in alarms and listening to the acoustic monitors at panel 15R.

d. Reading Suppression Pool Bulk Temperature Monitoring System temperature indications at Panel 18R

Answer Key		
# 63		
Choice		Basis or Justification
Correct:	B	Panel TE 210 is the only place individual tailpipe temperatures can be monitored.
Distractors:	A	Plausible, Position 7 reads a common tailpipe temperature for EMRVs A, B & E Position 8 reads C & D
	C	Plausible, lights and acoustics only good while there is steam flow. EMRV not closed alarm comes from acoustics.
	D	Plausible, EMRV(s) not open long enough to give much increase in pool bulk temperature since tailpipe only went to 250 degrees.

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
H	2.5	5	

Source Documentation		
Source:	New Exam Item X Modified Bank Item OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank
Reference(s):	RAPS B-3-g & B-4-g. Surveillance proc. 602.4.003, 602.4.011, and 604.3.026 [2621.828.05]	
Learning Objective:	07318	
Terminal Objective:	2180404001, 2180201402	
Knowledge/Ability:	239002 A4.02	Importance: 3.6/3.7
Ability to manually operate and/or monitor in the control room. Tail pipe temperatures		

Prepared by: Larry Briggs

64. Given the following:

- The plant is operating at 50% power
- The turbine inlet pressure is 995 psig
- The reactor pressure is 1010 psig

Reactor power is being raised to 100 percent with control rods and recirculation flow.

Which one of the following is correct if NO operator action is taken concerning the turbine controls?

a. The Turbine will trip on "25% Load Trip Not Reset" before reaching 100% power.

b. The Turbine Bypass Valves will open before reaching 100% power.

c. An APRM upscale rod block will occur before reaching 100% power.

d. A high pressure reactor scram will occur before reaching 100% power.

Answer Key		
# 64		
Choice		Basis or Justification
Correct:	D	The reactor will trip on high pressure prior to reaching 100% power
Distractors:	A	Plausible, This will cause a turbine trip on 25% load decrease without resetting, not increasing as stated in this question.
	B	Plausible, Load Limit is set to greater than 100% when the turbine is started.
	C	Plausible, APRM rod blocks normally occur when approaching 100% but plant will scram on high pressure before reaching 100%

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
H	3.5	3	

Source Documentation		
Source:	New Exam Item X Modified Bank Item OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank
Reference(s):	[2621.828.51]	
Learning Objective:	02312, 02313, 02314	
Terminal Objective:	2490101003	
Knowledge/Ability:	241000 K5.05	Importance: 2.8/2.9
Knowledge of the operational implications of the following concepts as they apply to REACTOR/TURBINE PRESSURE REGULATING SYSTEM. Turbine inlet pressure vs. turbine load		

Prepared by: Larry Briggs

65. Given the following:

- The reactor is at 5%, increasing power following a startup
- RPV level is being controlled on the "A" and "C" Low Flow Regulating Valves (LFRVs)
- The Master Level Controller (MLC) is in Auto

Based on the above conditions, which one of the following is correct? When the LFRV Manual/Auto (M/A) station is in:

a. MANUAL, the operator sets the LFRV valve position and the MLC maintains the RPV level.

b. AUTO, the operator sets the desired level and the MLC controls level using 3-element control.

c. MANUAL, the operator sets the desired level and the LFRV controller maintains the RPV level.

d. AUTO, the operator sets the desired level and the LFRV controller maintains the RPV level.

Answer Key		
# 65		
Choice		Basis or Justification
Correct:	D	LFRV in AUTO controls level at low power
Distractors:	A	Plausible, Operator does set valve position
	B	Plausible, correct except FWCS does not use 3 element at this power
	C	Plausible, in manual the valve position is set, not the level desired.

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
F	3.5	3	

Source Documentation			
Source:	New Exam Item X Modified Bank Item OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank	
Reference(s):	PGD-2621, 828.0, 0018, pgs 14 & 15 [2621.828.18]		
Learning Objective:	02389, 02390		
Terminal Objective:	2590101008		
Knowledge/Ability:	259002 K1.03	Importance: 3.8/3.9	
Knowledge of the physical connections and/or cause-effect relationships between REACTOR WATER LEVEL CONTROL SYSTEM and the following. Reactor water level.			

Prepared by: Larry Briggs

66. Given the following:

- Alarm 9XF-4-c, "CIP-3 PWR XFER" is in alarm
- No other alarms are in

The electricians have identified and repaired the problem with the motor generator (MG) output breaker and are ready to close it and return the MG set to service.

The IT-3 ABT:

a. Is power seeking and will remain on the alternate source when the MG is returned to service.

b. Is power seeking and will transfer to its normal (MG) source when the MG is returned to service and the ABT is reset.

c. Is normal seeking and will transfer to its normal (MG) source when the MG is returned to service.

d. Is normal seeking and will transfer to its normal (MG) source after the MG is returned to service and the ABT is reset.

Answer Key		
# 66		
Choice		Basis or Justification
Correct:	C	Correct per lesson PGD-2621-828.0-.0056, Pg. 13 of 21, ABT IT-3 is normal seeking
Distractors:	A	Plausible, Correct for a power seeking ABT
	B	Plausible, correct if a normal seeking ABT
	D	Plausible, Normal seeking does not require reset, power seeking does.

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
F	2	2	

Source Documentation		
Source:	New Exam Item X Modified Bank Item OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank
Reference(s):	lesson PGD-2621-828.0-.0056, Pg. 13 of 21 [2621.828.56]	
Learning Objective:	01066, 01087, 08452	
Terminal Objective:	2620101001, 2620101004	
Knowledge/Ability:	262001 A3.02	Importance: 3.2/3.3
Ability to monitor automatic operations of the A.C. ELECTRICAL DISTRIBUTION including. Automatic bus transfer.		

Prepared by: Larry Briggs

67. The plant was operating with no equipment OOS when:

- A LOCA occurred causing drywell pressure to rise
- When the plant was manually scrammed, a loss of off-site power occurred
- The EDGs started and supplied power to their emergency busses
- Drywell pressure was 5 psig and rising slowly when the EDG 1 ENG TEMP HI annunciator was received.

Based on the above conditions, which one of the following is correct?

EDG 1 will:

a. Continue to supply the electrical loads on bus 1C.

b. Immediately trip and deenergize the loads on bus 1C.

c. Supply the loads on bus 1C for 60 seconds and then deenergize the loads on bus 1C.

d. Immediately trip and the loads on bus 1C will be automatically reenergized from EDG 2.

Answer Key		
# 67		
Choice		Basis or Justification
Correct:	A	High Temperature shutdown is bypassed on a fast start so the loads will continue to have power.
Distractors:	B	Plausible, there is a high temperature trip, but it is bypassed with a fast start
	C	Plausible, there is a high temperature trip, but it is bypassed with a fast start, 60 second time delay exists between the annunciator in the question and an EDG shutdown
	D	Plausible, there is a high temperature trip, but the high temperature shutdown is bypassed on a fast start and bus 1C is not auto transferred to EDG 2

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
H	3	3	

Source Documentation			
Source:	New Exam Item X Modified Bank Item OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank	
Reference(s):	PGD-2612, 828.0, No. 13, Emergency Diesel Generators		
Learning Objective:	00792		
Terminal Objective:	2640601001		
Knowledge/Ability:	264000 K3.03	Importance: 4.1/4.2	
Knowledge of the effect that a loss or malfunction of the EMERGENCY GENERATORS (DIESEL/JET) will have on the following. Major loads powered from electrical buses fed by the emergency generator(s).			

Prepared by: Larry Briggs

68. Given the following:

- The plant experienced a LOCA
- Drywell pressure is 5 psig
- EDG 1 and 2 are running when the EDG 1 DISABLED annunciator alarms due to low lube oil pressure

Based on the above conditions, which one of the following is correct?

The No. 1 EDG will:

a. Shutdown immediately and lockout.

b. Continue to run until the motor is damaged.

c. Idle at 400 RPM for 90 seconds then shutdown.

d. Immediately reduce RPM to idle speed then shutdown.

Answer Key		
# 68		
Choice		Basis or Justification
Correct:	A	Correct, the EDG will shutdown because a High Drywell Pressure provides an "Idle Start" signal, not a fast start. Low Lube Oil Pressure provides a trip under these conditions.
Distractors:	B	Plausible, low lube oil press is NOT bypassed with an "Idle Start" signal.
	C	Plausible, EDG will be at 400 RPM on hi Drywell pressure start
	D	Plausible, this is correct answer if EDG were supplying the 4160 VAC bus.

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
H	3	2	

Source Documentation		
Source:	New Exam Item X Modified Bank Item OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank
Reference(s):	lesson plan PGD-2621-828-.0013, Pgs. 26-29. [2621.828.13]	
Learning Objective:	00406, 00792, 00801	
Terminal Objective:	2640101004, 2640101406	
Knowledge/Ability:	264000 K6.03	Importance: 3.5/3.7
Knowledge of the effect that a loss or malfunction of the following will have on the EMERGENCY GENERATORS (DIESEL/JET). Lube oil pumps.		

Prepared by: Larry Briggs

69. Given the following:

- Plant is cold shutdown
- Preparations for reactor startup are in progress

The reactor operator adjusts the CRD cooling water pressure for 15 psig above cold shutdown reactor pressure.

As reactor pressure is increased during the startup, how is the cooling water pressure differential maintained?

a. The cooling water flow control valve must be manually adjusted to maintain the 10 to 25 psig delta pressure.

b. The cooling water flow control valve will automatically adjust to maintain the 15 psig delta pressure.

c. The drive header pressure is manually maintained 250 psig above reactor pressure, which maintains cooling water delta pressure.

d. The drive header pressure automatically maintains 250 psig above reactor pressure, which maintains cooling water delta pressure.

Answer Key		
# 69		
Choice		Basis or Justification
Correct:	C	Once adjusted the cooling water valve acts like a fixed orifice, maintaining the required pressure as long as the drive water delta pressure is maintained.
Distractors:	A	Plausible, the cooling water flow control valve is a manual valve but it does not require adjustment to maintain pressure.
	B	Plausible, the cooling water flow control valve does not automatically adjust the pressure.
	D	Plausible, pressure is maintained by maintaining drive water delta pressure, but the drive water header pressure control valve must be manually adjusted to maintain pressure.

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
F	2.5	2	

Source Documentation		
Source:	New Exam Item X Modified Bank Item OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank
Reference(s):	Procedure 302.1, Control Rod Drive Hydraulic System, section 6 and 3. [2621.828.11]	
Learning Objective:	00018	
Terminal Objective:	2010101002	
Knowledge/Ability:	201001 A4.05	Importance: 2.7/2.8
Ability to manually operate and/or monitor in the control room. Cooling water header pressure control valve.		

Prepared by: Larry Briggs

70. Given the following:

- The first plant startup of the year is in progress
- Reactor power is 7%
- Rod withdrawals are in progress to increase power
- All systems are aligned and operating normally for this power level

When the reactor operator selects the next control rod within the group, the Rod Worth Minimizer (RWM) failed.

Based on the above conditions, which one of the following is correct?

a. The RWM may NOT be bypassed and the plant startup may NOT continue until the RWM is returned to service IAW Procedure 409, Operation of the RWM.

b. The RWM may be bypassed and the startup may continue IAW Procedure 201, Plant Startup. A second licensed operator and additional Reactor Engineering assistance are NOT required.

c. The RWM may be bypassed and the startup may continue IAW Procedure 201, Plant Startup after a second licensed operator is stationed. No additional Reactor Engineering assistance is required.

d. The RWM may be bypassed and the plant startup may continue IAW Procedure 201, Plant Startup after a second licensed operator and a Reactor Engineer are stationed.

Answer Key		
# 70		
Choice		Basis or Justification
Correct:	C	correct per Procedure 201 and TS 3.2.
Distractors:	A	Plausible, correct action if less than 12 rods out and 2nd startup of year.
	B	Plausible, SU may continue but 2nd operator is required.
	D	Plausible, Same as "B" but RE is not required.

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
H	2.5	5	43.5

Source Documentation		
Source:	New Exam Item X Modified Bank Item OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank
Reference(s):	Procedure 201, Plant Startup and TS 3.2 [2621.828.41]	
Learning Objective:	01309	
Terminal Objective:	2140101003	
Knowledge/Ability:	201006 A2.07	Importance: 2.5/2.8
Ability to (a) predict the impacts of the following on the ROD WORTH MINIMIZER SYSTEM (RWH) (PLANT SPECIFIC); and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations. RWM hardware/software failure: Plant specific.		

Prepared by: Larry Briggs

71. Given the following:

- The reactor is operating on three loops
- Two loops are Idle
- All other equipment is operating normally

You have directed the CRO to increase recirculation flow to the maximum possible to obtain the maximum reactor power.

While increasing flow the MG OL A (E-3-c) alarm annunciates.

Based on the above conditions, which one of the following is correct?

The "A" Recirculation Pump MG set:

a. Speed must be lowered to reduce the over current condition and clear the OL alarm.

b. Is about to trip, scram the reactor and trip the remaining Recirculation Pumps.

c. Has tripped, scram the reactor and trip the remaining Recirculation Pumps.

d. Has tripped, verify loop isolation valve position and close the "A" loop discharge valve and verify bypass valve is open.

Answer Key		
# 71		
Choice		Basis or Justification
Correct:	A	Per RAP E-3-c, MG OL A
Distractors:	B	Plausible, same as "C" but anticipating trip with manual action
	C	Plausible, This is action required if pump MG trips when on 3 loops
	D	Plausible, this is action if a recirculation pump trips when more that 3 loops are operating

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
F	3	2	

Source Documentation		
Source:	New Exam Item X Modified Bank Item OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank
Reference(s):	RAP E-3-c, MG OL A [2621.828.38]	
Learning Objective:	00220, 00226	
Terminal Objective:	2020101006	
Knowledge/Ability:	202001 A3.09	Importance: 3.3/3.3
Ability to monitor automatic operations of the RECIRCULATION SYSTEM including. MG set trip: Plant-Specific.		

Prepared by: Larry Briggs

72. Given the following:

- Plant is at 100% power
- All systems functioning normally

A 50 GPM tube leak develops in one of the Regenerative Heat Exchangers.

How will the above conditions affect the Reactor Water Cleanup System (RWCU) operation?

a. Water being returned to the reactor coolant system will re-enter the RWCU system and result in lower Demineralizer inlet temperatures.

b. Water entering the RWCU system from the reactor coolant system will bypass the RWCU system resulting in lower Demineralizer inlet temperatures.

c. Water entering the RWCU system from the reactor coolant system will bypass the RWCU system resulting in a 50 GPM flow rate reduction through the cleanup system.

d. Water being returned to the reactor coolant system will re-enter the RWCU system resulting in a 50 GPM flow rate increase through the cleanup system.

Answer Key		
# 72		
Choice		Basis or Justification
Correct:	A	Higher pressure on return side of Regen Heat exchanger will put colder water into RWCU lowering temperature through Non Regen and into the demins.
Distractors:	B	Plausible, Leakage cannot go from inlet to coolant system due to delta pressure.
	C	Plausible, Leakage cannot go from inlet to coolant system due to delta pressure.
	D	Plausible, but flow rate will not increase due to control valve ND-11

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
H	3.5	6	

Source Documentation		
Source:	New Exam Item X Modified Bank Item OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank
Reference(s):	GE 148F144, Clean-up Demineralizer System (Print No. 108) [2621.828.39]	
Learning Objective:	00277, 08216	
Terminal Objective:	2040101011	
Knowledge/Ability:	204000 K5.04	Importance: 2.7/2.7
Knowledge of the operational implications of the following concepts as they apply to REACTOR WATER CLEANUP SYSTEM. Heat exchanger operation.		

Prepared by: Larry Briggs

73. Given the following:

- The reactor has recently been shutdown
- Cooldown is in progress
- Reactor temperature is 340°F
- Shutdown cooling has just been placed in service
- "A" recirculation pump is running
- All other loops are idle

The "A" recirculation pump tripped.

Which one of the following is correct as a result of the 'A' recirc pump trip?

a. Reactor temperature will increase and loop temperatures will decrease due to flow bypassing the core.

b. Backflow through the idle loops will cause the SDC System to isolate at 350°F loop temperature.

c. SDC system will isolate and the pumps will trip due to high pressure as the pressure increases with the reactor heat up.

d. SDC pumps will trip due to pump low suction pressure when the recirculation pump tripped.

Answer Key		
# 73		
Choice		Basis or Justification
Correct:	A	Core flow is bypassed when the "A" recirc pump trips, allowing temp. in the reactor to increase and SDC system temps. to decrease.
Distractors:	B	Plausible, Backflow will happen in idle loops but it will be cold SDC system water not the hot water in the reactor.
	C	Plausible, May get a pressure transient from the trip but SDC does not isolate on high pressure.
	D	Plausible, There is a low suction pressure trip, but well below current plant conditions.

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
H	3	3	

Source Documentation			
Source:	New Exam Item X	Old NRC Exam	
	Modified Bank Item	Other Exam Bank	
	OC Exam Bank	NRC Exam Bank	
Reference(s):	Station Procedure 305, Shutdown Cooling System Operation, Section 4[2621.828.45]		
Learning Objective:	00039, 07234		
Terminal Objective:	2050101008		
Knowledge/Ability:	205000 K1.03	Importance: 3.4/3.5	
Knowledge of the physical connections and/or cause-effect relationships between SHUTDOWN COOLING SYSTEM (RHR SHUTDOWN COOLING MODE) AND THE FOLLOWING. Recirculation loop temperature.			

Prepared by: Larry Briggs

74. Given the following:

- The reactor scrammed due to a spurious MSIV closure
- Pressure is being controlled by use of EMRVs
- Containment Spray (CS) System 1 (one CS pump and one ESW pump) has been placed in service (Torus cooling mode)

The plant subsequently experienced a loss of off-site power; both EDGs start and energize the 1C and 1D bus.

Which of the following is correct? Containment Spray System 1 and it's associated ESW pump:

a. Will automatically restart immediately after power is restored to their bus.

b. Will automatically restart after a 3 minute (approximate) time delay after power is restored to their bus.

c. May be manually restarted after a 3 minute (approximate) time delay after power is restored to their bus.

d. May be manually restarted immediately after power is restored to their bus.

Answer Key		
# 74		
Choice		Basis or Justification
Correct:	C	Correct per Procedure 341, Emergency Diesel Generator Operation, Section 4.
Distractors:	A	Plausible, applicant may assume auto restart since pumps were running when power was lost. This restart used to be automatic.
	B	Plausible , applicant may assume auto restart after time delay since pumps were running when power was lost. This restart used to be automatic.
	D	Plausible, may assume manual restart OK immediately following restoration of power to the bus.

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
F	3	2	

Source Documentation			
Source:	New Exam Item X Modified Bank Item OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank	
Reference(s):	Procedure 341, Emergency Diesel Generator Operation, Section 4. [2621.828.13 & .09]		
Learning Objective:	00814, 00471, 02221		
Terminal Objective:	2640104002, 2260104002		
Knowledge/Ability:	219000 K6.01	Importance: 3.2/3.3	
Knowledge of the effect that a loss or malfunction of the following will have on the RHR/LPCI: TORUS/SUPPRESSION POOL COOLING MODE. A.C. electrical power.			

Prepared by: Larry Briggs

75. Which one of the following does **NOT** provide protection for the Main Generator?

  a. Stator Cooling Water Failure runback

  b. Anti-Motoring trip

  c. Overexcitation trip

  d. Stator Ground trip

Answer Key		
# 75		
Choice		Basis or Justification
Correct:	B	Anti-Motoring trip is to protect the prime mover
Distractors:	A	Plausible, protects generator
	C	Plausible, protects generator
	D	Plausible, protects generator

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
F	3.5	2	

Source Documentation		
Source:	New Exam Item X Modified Bank Item OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank
Reference(s):	ABN-3200.10, Attachments 1 and 2 and Lesson PGD-2621, .0025 [2621.828.25]	
Learning Objective:	01196, 01201, 01212	
Terminal Objective:	2480101406	
Knowledge/Ability:	245000 K4.06	Importance: 2.7/2.8
Knowledge of MAIN TURBINE GENERATOR AND AUXILIARY SYSTEMS design feature(s) and/or interlocks that provide for the following. Generator protection.		

Prepared by: Larry Briggs

76. Reactor power is 70% when the "B" feedwater heater string must be removed from service to repair a leaking feedwater heater drain valve.

After the removal of the heater string from service, which of the following describes the response of the:

- feedwater temperature to the reactor and
- the 1B3 feedwater heater shell pressure

a. Feedwater temperature to the reactor rises
Feedwater heater shell pressure rises

b. Feedwater temperature to the reactor lowers
Feedwater heater shell pressure rises

c. Feedwater temperature to the reactor rises
Feedwater heater shell pressure lowers

d. Feedwater temperature to the reactor lowers
Feedwater heater shell pressure lowers

Answer Key		
# 76		
Choice		Basis or Justification
Correct:	D	Per Procedure 317.1, Feedwater Heaters
Distractors:	A	Plausible, Feed temp and shell pressure will lower.
	B	Plausible, Feed temp lowers
	C	Plausible, Shell pressure lowers

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
H	3	2	

Source Documentation		
Source:	New Exam Item X Modified Bank Item OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank
Reference(s):	Procedure 317.1, Feedwater Heaters, Section 4 [2621.828.17]	
Learning Objective:	00727, 00734	
Terminal Objective:	2600202005, 2600202402	
Knowledge/Ability:	259001 A1.02	Importance: 3.2/3.3
Ability to predict and/or monitor changes in parameters associated with operating the REACTOR FEEDWATER SYSTEM controls including. Feedwater inlet temperature.		

Prepared by: Larry Briggs

77. Given the following:

The plant was operating at 100% power, when alarm B-5-g, EMRV POWER LOST/DISABLED annunciated. The Equipment Operator reported that breakers 1 and 3 (ADS system feeder breaker to ER-18A and B) in Panel DC-F have tripped and cannot be closed.

Based on the above conditions, which one of the following is correct?

a. TS require the plant to be placed in the cold shutdown condition due to the loss of DC-F control power.

b. TS Limiting Condition for Operation does not apply since all EMRVs are operable.

c. TS allow continued operation for up to 3 days provided the Isolation Condensers are verified operable.

d. TS require reactor pressure to be reduced to 110 psig or less, within 24 hours.

Answer Key		
# 77		
Choice		Basis or Justification
Correct:	B	Per RAP B-5-g, the alternate DC supply maintains ADS operability.
Distractors:	A	Plausible, correct action if panel DC-F is lost.
	C	Plausible, correct action if only 4 ADS valves are operable.
	D	Plausible, correct action if less than 4 ADS valves are operable.

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
H	4	3	X – 43.1

Source Documentation		
Source:	New Exam Item X Modified Bank Item OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank
Reference(s):	TS 3.4 and 3.7 and RAP B-5-g [2621.828.05]	
Learning Objective:	00370, 00372	
Terminal Objective:	2180101001	
Knowledge/Ability:	262002 G2.1.33	Importance: 3.4/4.0
Uninterruptible Power Supply (AC/DC). Ability to recognize indications for system operating parameters which are entry-level conditions for technical specifications.		

Prepared by: Larry Briggs

78. Given the following:

- Plant is at 100% power
- Normal power to CIP-3 has been lost due to a fault in the generator
- Auto transfer switch IT-3 failed to automatically transfer

Based on the above conditions, which one of the following is correct?

a. A partial Drywell isolation will occur resulting in a loss of RBCCW to the Recirculation Pump seals.

b. A Reactor Water Level transient should be expected due to loss of control by the Digital Feedwater/Recirculation Control System computer.

c. The reactor will scram due to a loss of main condenser vacuum when the off-gas and condenser off-gas air extraction valves isolate.

d. The reactor will scram due to MSIV closure when solenoid power is lost.

Answer Key		
# 78		
Choice		Basis or Justification
Correct:	C	Off gas and air extraction valves isolate and will result in a loss of vacuum if power is lost for several minutes.
Distractors:	A	Plausible, Partial isolation does occur but RBCCW is not isolated.
	B	Plausible, a level transient is expected when CIP-3 is re-energized, not on a loss of CIP-3.
	D	Plausible, MSIV position indication is lost, requires DC solenoids to de-energize also to close MSIVs

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
H	3.5	4	

Source Documentation		
Source:	New Exam Item X Modified Bank Item OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank
Reference(s):	OPS-3024.10f, Electrical Distribution - Instrument Power Restoration Actions. [2621.828.56]	
Learning Objective:	01085, 01101	
Terminal Objective:	2620302401	
Knowledge/Ability:	262002 K3.14	Importance: 2.8/3.1
Knowledge of the effect that a loss or malfunction of the UNINTERRUPTABLE POWER SUPPLY (AC/DC) will have on the following. Reactor Power (Plant Specific)		

Prepared by: Larry Briggs

79. Given the following:

- The plant is at full power
- 125 VDC Power panel DC-2 was lost

Based on the above conditions, which one of the following is correct?

a. CRD's DC logic will cause 'A' CRD pump to trip, if running.

b. RWCU's DC logic will cause a system isolation.

c. Main Turbine DC Emergency Bearing Oil pump loses power.

d. "B" Isolation Condenser DC Steam Inlet Valve loses power.

Answer Key		
# 79		
Choice		Basis or Justification
Correct:	D	Correct per OPS-3024.10c, page 55.
Distractors:	A	Plausible, This would occur if 125 VDC panel "F" is lost (pg 40 of 3024.10c).
	B	Plausible, This would occur if 125 VDC panel "F" is lost (pg 40 of 3024.10c)
	C	Plausible, This is required if 125 VDC panel "A" is lost (pg 9 of 3024.10c)

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
F	2	3	

Source Documentation			
Source:	New Exam Item X Modified Bank Item OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank	
Reference(s):	OPS-3024.10c, Electrical Distribution - 125VDC Diagnostic and Restoration Actions. [2621.828.12]		
Learning Objective:	01109, 01121		
Terminal Objective:	2620401401		
Knowledge/Ability:	263000 K2.01	Importance: 3.1/3.4	
Knowledge of electrical power supplies to the following. Major D.C. loads.			

Prepared by: Larry Briggs

80. The Augmented Off Gas (AOG) System alarm BLOWER A H2 HI (10XF-6-e) has annunciated.

Which one of the following is correct concerning the TS Bases for the above alarm limit?

a. The limit is set to ensure that a potentially explosive mixture of Hydrogen is maintained below the flammability limit of H2 in air.

b. The limit is set to ensure that any H2 leakage from the AOG system will not result in an explosive concentration in the AOG building.

c. The H2 limit ensures that a Hydrogen explosion will not occur in the AOG system, which is not designed to withstand a Hydrogen explosion.

d. The H2 limit ensures that Hydrogen concentration will not adversely affect the removal of radioactive effluents by the AOG system.

Answer Key		
# 80		
Choice		Basis or Justification
Correct:	A	Per TS 3.6 Bases, Page 3.6.6
Distractors:	B	Plausible, leakage could result in explosive mixture but not in TS basis
	C	Plausible, AOG system is designed to withstand internal explosion
	D	Plausible, but H2 does not affect the removal of radioactive effluents.

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
F	3	3	X – 43.2

Source Documentation		
Source:	New Exam Item X Modified Bank Item OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank
Reference(s):	TS 3.6 Bases, Page 3.6.6 [2621.828.04]	
Learning Objective:	01661	
Terminal Objective:	3040102001	
Knowledge/Ability:	271000 G2.2.25	Importance: 2.5/3.7
Offgas System. Knowledge of bases in Technical Specifications for limiting conditions for operations and safety limits.		

Prepared by: Larry Briggs

81. Given the following:

- The reactor is operating at 80% power
- Spent Fuel Pool Cooling is in service on the "A" SFP Cooling heat exchanger
- RBCCW surge tank level is increasing slowly
- Chemistry reports that RBCCW activity has increased
- F^{18} was present in the sample

Based on the above conditions, which one of the following is correct?

The leak is from:

a. The "A" SFP Cooling Heat Exchanger

b. The Cleanup System Regenerative Heat Exchanger

c. One of the Recirculation Pump Seal Coolers

d. One of the Shutdown Cooling Heat Exchangers

Answer Key		
# 81		
Choice		Basis or Justification
Correct:	C	Per OPS-3024.21, Reactor Building Closed Cooling Water System - Diagnostic and Restoration Actions, the presence of F18 indicates it is primary coolant.
Distractors:	A	Plausible, would not have F18
	B	Plausible, no RBCCW going to Regenerative Heat exchanger
	D	Plausible, source of leakage but SDC is not in service

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
H	3	3	

Source Documentation			
Source:	New Exam Item X Modified Bank Item OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank	
Reference(s):	OPS-3024.21, Reactor Building Closed Cooling Water System - Diagnostic and Restoration Actions, Section 4.1 [2621.828.35]		
Learning Objective:	00058, 00062		
Terminal Objective:	2080101009, 2080401007		
Knowledge/Ability:	400000 K1.04	Importance: 2.9/3.1	
Knowledge of the physical connections and/or cause-effect relationships between CCWS and the following. Reactor coolant system, in order to determine source(s) of RCS leakage into CCWS (RBCCW or TBCCW at Oyster Creek).			

Prepared by: Larry Briggs

82. The Control Rod Drive Mechanism design provides for Rod Position Indication by:

    a. Providing an internal wet tube that houses a movable position indication probe that moves reed switches past a fixed magnet.

    b. Providing an internal wet tube that houses a fixed position indication probe with a movable magnet attached to the drive piston.

    c. Providing an internal dry tube that houses a fixed position indication probe with a movable magnet attached to the drive piston.

    d. Providing an internal dry tube that houses a movable position indication probe that moves reed switches past a fixed magnet.

Answer Key		
# 82		
Choice		Basis or Justification
Correct:	C	Correct per PGD-2621-828.0-0036, Reactor Manual Control System, page 2 of 9.
Distractors:	A	Plausible, probe is fixed not movable and is in a dry tube.
	B	Plausible, Same as "A"
	D	Plausible, probe is fixed.

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
F	2.5	2	

Source Documentation		
Source:	New Exam Item X Modified Bank Item OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank
Reference(s):	PGD-2621-828.0-0036, Reactor Manual Control System, page 2 of 9. [2621.828.36]	
Learning Objective:	00078	
Terminal Objective:	2140101003	
Knowledge/Ability:	201003 K4.05	Importance: 3.2/3.3
Knowledge of CONTROL ROD AND DRIVE MECHANISM design feature(s) and/or interlocks that provide for the following: Rod position indication.		

Prepared by: Larry Briggs

83. Given the following:

- The plant is at 100% power
- A TIP trace on channel 2 is in progress

The following transient occurs:

- A LOCA and a plant scram
- Two minutes later Drywell pressure is 10 psig and rising
- The TIP Channel 2 "IN SHIELD" lamp is out
- The TIP Channel 2 "REVERSE" lamp is out
- The TIP Channel 2 "BALL VALVE CLOSED" lamp is out
- The TIP Channel 2 "PURGE LAMP" is lit

Based on the above conditions, which one of the following, per Procedure 405.2, Operation of the TIP System, is correct?

a. The Control Room Operator (CRO) must place the Channel 2 shear valve keylock switch to "FIRE"

b. The CRO must place the BALL VALVE Manual Control Switch to "CLOSE"

c. No action is required, as long as the PURGE VALVE indicates "CLOSED"

d. The Equipment Operator must manually withdraw the TIP probe

Answer Key		
# 83		
Choice		Basis or Justification
Correct:	A	Per Station Procedure 405.2, Operation of the TIP System, Section 5.14.
Distractors:	B	Plausible, but Ball valve cannot be closed if TIP is not withdrawn.
	C	Plausible, part of containment isolation took place.
	D	Plausible, hand crank would be too slow to ensure containment integrity.

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
H	4	2	

Source Documentation		
Source:	New Exam Item Modified Bank Item X #38 on 1999 audit OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank
Reference(s):	Station Procedure 405.2, Operation of the TIP System, Section 5.14[2621.828.29]	
Learning Objective:	09563, 09565, 09566	
Terminal Objective:	2150101005	
Knowledge/Ability:	215001 K6.04	Importance: 3.1/3.4
Knowledge of the effect that a loss or malfunction of the following will have on the TRAVERSING IN-CORE PROBE. Primary containment isolation system: Mark I&II (Not BWR1)		

Modified Stem and changed two of the distractors.
Prepared by: Larry Briggs

84. Given the following:

- The Main Turbine shell is being warmed using the No. 2 Stop Valve Internal Bypass
- The MPR setpoint is being maintained at 100 psig above reactor pressure

The operator opens the No. 2 Stop Valve Internal Bypass, which results in the 1st stage reheater extraction steam pressure reaching 200 psig.

Based on the above conditions, which one of the following is correct?

a. The Control Valves will automatically close and must be reopened by the operator to continue the main turbine heatup.

b. The main turbine will trip and reactor pressure will be controlled on the Bypass Valves.

c. The operator must throttle the No. 2 Stop Valve Internal Bypass to prevent exceeding the temperature limits of the 1st stage reheater.

d. The reactor will scram and the operator must close the No.2 Stop Valve Internal Bypass to prevent depressurizing the reactor.

Answer Key		
# 84		
Choice		Basis or Justification
Correct:	D	A reactor scram will occur when the Turbine Stop Valve Closure Scram Bypass is un-bypassed because the system senses pressure equivalent to 30% power.
Distractors:	A	Plausible, although this would limit the transient, control valves will not automatically close
	B	Plausible, because power is <30% in given conditions, however 200 psig on the reheater indicates >30% power and causes a reactor scram.
	C	Plausible, too late once 200 psig exceeded. In a recent plant event, the operator did close down on the valve before 100 psig was reached and caused a significant level perturbation, but no reactor scram.

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
H	3	3	

Source Documentation			
Source:	New Exam Item X Modified Bank Item OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank	
Reference(s):	Station Procedure 315.1, Turbine Generator Startup, Section 3.3.12 [2621.828.51]		
Learning Objective:	01202, 01724, 09521		
Terminal Objective:	2450101002, 2450101401		
Knowledge/Ability:	239001 A1.08	Importance: 3.8/3.9	
Ability to predict and/or monitor changes in parameters associated with operating the MAIN AND REHEAT STEAM SYSTEM controls including. Reactor Pressure.			

Prepared by: Larry Briggs

85. Given the following:

- The plant was operating at 100% power when a turbine trip occurred
- The reactor FAILED to scram on closure of the stop valves
- The reactor did scram on high neutron flux

Based on the above conditions, which one of the following concerning Technical Specifications and their Bases is correct?

a. The Reactor Coolant Pressure Safety Limit may have been exceeded and the plant must be placed in Cold Shutdown until an analysis can be performed to determine if the pressure Safety Limit was exceeded.

b. A Limiting Safety System Setting was exceeded and the plant must be placed in Cold Shutdown until an analysis can be performed to determine if the fuel cladding integrity Safety Limit was exceeded.

c. The Reactor High Pressure Safety Valve initiation Limiting Safety System setting was exceeded and the plant must be placed in Cold Shutdown until the fuel can be inspected for damage.

d. A fuel integrity safety limit was exceeded and the plant must be placed in Cold Shutdown until the fuel can be inspected and permission to restart has been granted by the NRC.

Answer Key		
# 85		
Choice		Basis or Justification
Correct:	B	Per TS 2.1 Bases and TS 2.1.C
Distractors:	A	Plausible, Expect a large pressure spike but will not get to Safety Limit
	C	Plausible, Same as "A" but will not get to Safety setpoint.
	D	Plausible, Safety Limit analysis if required to see if it was exceeded. Not supposed to by TS Bases.

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
F	2	4	X – 43.2

Source Documentation		
Source:	New Exam Item X Modified Bank Item OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank
Reference(s):	TS 2.1 Bases and TS 2.1.C [2621.850.90]	
Learning Objective:	01658, 01919	
Terminal Objective:	3410302017, 3410302018	
Knowledge/Ability:	290002 G2.2.25	Importance: 2.5/3.7
Reactor vessel internals. Knowledge of bases in technical specifications for limiting conditions for operations and safety limits.		

Prepared by: Larry Briggs

86. Given the following:

- The plant has been shutdown and the head removed
- One control rod is at notch 02 to check refueling bridge interlocks, all others are at "00"
- SDC is in service
- A full core offload has been in progress for several hours
- Workers are in the Drywell.

The following just occurred:

- One of two operational SRMs failed
- One of the Criticality Monitors in the Drywell failed
- The Fuel Pool temperature is reported to be 110°F

IAW Procedure 205, Reactor Refueling, which one of the following is correct under these conditions?

a. Defueling may continue if the control rod is inserted to "00".

b. Defueling may continue with criticality monitors out of service.

c. Defueling must be secured until the failed SRM is returned to service.

d. Defueling must be secured until spent fuel pool temperature is reduced.

Answer Key		
# 86		
Choice		Basis or Justification
Correct:	C	Per Station Procedure 205, Reactor Refueling, Section 7, two SRMs are required for core alterations
Distractors:	A	Plausible, one rod may be withdrawn up to two notches, but do not meet SRM requirements.
	B	Plausible, if the Drywell evacuated, refueling could continue, but do not meet SRM requirements.
	D	Plausible, there are limitations for fuel pool temperature, but the temperature is in spec.

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
H	3	4	X – 43.7

Source Documentation		
Source:	New Exam Item X Modified Bank Item OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank
Reference(s):	Station Procedure 205, Reactor Refueling, Section 7, Prerequisites and Precautions and Limitations [2621.812.03]	
Learning Objective:	01132	
Terminal Objective:	3410302029	
Knowledge/Ability:	G2.1.32	Importance: 3.4/2.8
Conduct of Operations. Ability to explain and apply system limits and precautions.		

Prepared by: Larry Briggs

87. Given the following:

The plant was operating at 100% when a control room fire occurred requiring an evacuation. All of the expected operator actions were completed. An Isolation Condenser was NOT placed in service prior to leaving the control room.

You are the Shift Manager. In accordance with ABN-3200.30, Control Room Evacuation, you would report to the:

a. TSC and coordinate activities to place the Remote Shutdown Panel (RSP) in service and initiate a cooldown using the "A" IC.

b. TSC and coordinate activities to place the RSP in service and initiate a cooldown using the "B" IC.

c. 480 Volt room and direct efforts to place the RSP in service and initiate a cooldown using the "A" IC.

d. 480 Volt room and direct efforts to place the RSP in service and initiate a cooldown using the "B" IC.

Answer Key		
# 87		
Choice		Basis or Justification
Correct:	B	Per ABN-3200-30, Control Room Evacuation, the SM (& STA) report to the TSC to coordinate activities and place "B" IC in service.
Distractors:	A	Plausible, the SM does report to the TSC, but "B" IC is the one placed in service.
	C	Plausible, Report to TSC not 480 Volt room and the "A" IC cannot be started remotely.
	D	Plausible, Report to TSC not 480 Volt room

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
F	3	2	

Source Documentation			
Source:	New Exam Item X	Old NRC Exam	
	Modified Bank Item	Other Exam Bank	
	OC Exam Bank	NRC Exam Bank	
Reference(s):	ABN-3200-30, Control Room Evacuation [2621.801.01]		
Learning Objective:	01408		
Terminal Objective:	0180102001		
Knowledge/Ability:	G2.1.8	Importance: 3.8/3.6	
Conduct of Operations. Ability to coordinate personnel activities outside the control room.			

Prepared by: Larry Briggs

88. Given the following:

- The reactor is being shutdown IAW Station Procedure 203, Plant Shutdown
- Reactor power is 10%
- IRMs have just been inserted and 1 detector reads above 100% on Range 9
- Reactor pressure is 1010 psig

Based on the above conditions, which one of the following actions is correct IAW Procedure 203, Plant Shutdown?

a. Confirm Recirculation flow is greater than 10.4 X 10^4 GPM and place the IRM in Range 10.

b. Confirm Recirculation flow is less than 10.4 X 10^4 GPM and place the IRM in Range 10.

c. Place the Mode switch to Startup and continue the reactor shutdown.

d. Select the IRM and withdraw it from the core until it reads less than 100% on range 9.

Answer Key		
# 88		
Choice		Basis or Justification
Correct:	A	Per Station Procedure 203, Plant Shutdown, Section 6.47
Distractors:	B	Plausible, value correct number but flow must be above the value.
	C	Plausible, one of the following steps after increasing recirc flow.
	D	Plausible, would have the desired effect, but not recommended in the procedure

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
F	3	2	

Source Documentation		
Source:	New Exam Item X Modified Bank Item OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank
Reference(s):	Station Procedure 203, Plant Shutdown, Section 6.47 [2621.832.06]	
Learning Objective:	00359, 01323	
Terminal Objective:	1030102002	
Knowledge/Ability:	G2.1.23	Importance: 3.9/4.0
Conduct of Operations. Ability to perform specific system and integrated plant procedures during different modes of plant operations.		

Prepared by: Larry Briggs

9

89. Given the following:

- The plant is at 100% power
- Two EMRVs have leakage to the Torus and cannot be reseated
- Torus temperature is 92°F and steady
- One Containment Spray System is in Torus Cooling
- Reactor Coolant unidentified leakage has increased from 1.5 GPM to 3.8 GPM in the last 16 hours

Which one of the following is correct, based on the above plant conditions?

a. Place a second Containment Spray System in Torus Cooling.

b. Scram the reactor and perform a cooldown.

c. Commence a reactor shutdown to reduce reactor pressure to less than 110 psig within 24 hours.

d. Identify the source of RCS leakage within 4 hours or conduct a plant shutdown.

Answer Key		
# 89		
Choice		Basis or Justification
Correct:	D	TS 3.3 requires leakage to be identified within 4 hours or SD within 12 hours.
Distractors:	A	Plausible, but not required until Torus temperature cannot be maintained less than 95 degrees F. Temperature is steady.
	B	Plausible, but not required under given conditions.
	C	Plausible, this would be required if 2 EMRVs were inoperable; they are just leaking by.

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
H	4	5	X – 43.1

Source Documentation		
Source:	New Exam Item X Modified Bank Item OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank
Reference(s):	TS 3.3, TS 3.4.B, TS 3.7, and EMG-3200-02, Primary Containment Control [2621.850.90]	
Learning Objective:	01661	
Terminal Objective:	3410302017	
Knowledge/Ability:	G2.1.6	Importance: 2.1/4.3
Conduct of Operations. Ability to supervise and assume a management role during plant transients and upset conditions.		

Prepared by: Larry Briggs

90. Given the following:

- The plant is operating at 100% power
- The No. 1 EDG is OOS for maintenance on its governor
- Core Spray Booster pumps NZ03-A and D are OOS for routine PMs

Electrical Maintenance has requested permission to remove the "B" CRD pump from service to repair an oil leak and change the oil.

As the Unit Supervisor you would:

a. Allow the maintenance because the LCO allows continued operation for up to 7 days with one CRD pump inoperable.

b. Allow the maintenance because CRD pumps are not considered safety related.

c. Not allow the maintenance because LCO 3.0.B applies with the Core Spray Booster Pumps also being inoperable.

d. Not allow the maintenance because the "A" CRD pump's emergency power is not available at this time.

Answer Key		
# 90		
Choice		Basis or Justification
Correct:	D	TS 3.4.D and TS 3.7.C. With one EDG OOS the other train must have all components operable.
Distractors:	A	Plausible, This is LCO for one pump inoperable, but "A" is inop due to the EDG 1 being inop.
	B	Plausible, CRD pumps are addressed by TS
	C	Plausible, applicant must know Booster pumps are on OOS diesel.

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
H	3	4	X – 43.1

Source Documentation			
Source:	New Exam Item X Modified Bank Item OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank	
Reference(s):	TS 3.4.D and TS 3.7.C [2621.828.11]		
Learning Objective:	00006, 03304		
Terminal Objective:	2010101011		
Knowledge/Ability:	G2.2.24	Importance: 2.6/3.8	
Equipment Control. Ability to analyze the affect of maintenance activities on LCO status.			

Prepared by: Larry Briggs

91. The maintenance department has prepared a Temporary Modification (TM) Package and submitted it to Engineering. The Temporary Modification requires installation of blank flanges to isolate a CRD pump for 4 days for maintenance.

As the Shift Manager conducting a review of the TM, in addition to the Maintenance Risk Assessment and a 50.59 Screening Review, what is the highest additional review required by Station Procedure 108.8, Temporary Modification Control.

a. Second independent 50.59 screening review.

b. Nuclear Safety Review Board (NSRB) review.

c. Plant Operations Review Committee (PORC) review

d. Nuclear Regulatory Commission (NRC) review

Answer Key		
# 91		
Choice		Basis or Justification
Correct:	A	Per Station Procedure 108.8, Temporary Modification Control
Distractors:	B	Plausible, NSRB would normally be involved in a TS change not a 50.59 review.
	C	Plausible, would be required if a 50.59 evaluation was required.
	D	Plausible, if more than marginal decrease in safety is determined during evaluation.

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
F	3.5	4	X – 43.3

Source Documentation		
Source:	New Exam Item X Modified Bank Item OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank
Reference(s):	Administrative procedures	
Learning Objective:		
Terminal Objective:		
Knowledge/Ability:	G2.2.10	Importance: 1.9/3.3
Equipment Control. Knowledge of the process for determining if the margin of safety; as defined in the basis of any Technical Specification is reduced by a proposed change/test or experiment.		

Prepared by: Larry Briggs

92. The core was completely off loaded. Which one of the following is required to establish SRM operability for reloading per Procedure 205.0, Reactor Refueling?

    a. Load the first 4 bundles around the SRM detector.

    b. Place Neutron sources in the core.

    c. Adjust the SRM bias to raise the SRM sensitivity.

    d. Maintain a dipping cell next to the fuel assemblies being moved.

Answer Key		
# 92		
Choice		Basis or Justification
Correct:	B	Placing Neutron sources in the core as fuel is reloaded provides adequate counts to ensure continuing operation of the SRMs by keeping a visible count rate.
Distractors:	A	Plausible, loading fuel cell adjacent to SRMs in the control cell is performed first to help ensure count rate remains above 1 CPS. The four bundles around the SRM would be in four different cells.
	C	Plausible, this would not be effective in increasing the sensitivity of the detector.
	D	Plausible, can be done but not at OC

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
F	3	2	43.6/7

Source Documentation		
Source:	New Exam Item X Modified Bank Item OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank
Reference(s):	Station Procedure 205.0, Reactor Refueling [2621.812.03]	
Learning Objective:	01132	
Terminal Objective:	3410302029	
Knowledge/Ability:	G2.2.34	Importance: 2.8/3.2
Equipment Control. Knowledge of the process for determining the internal and external effects on core reactivity.		

Prepared by: Larry Briggs

93. Given the following:

- A reactor startup is in progress
- Rod withdrawal is in progress
- A control rod has been withdrawn to notch 48

The US has directed you to perform a coupling check of the control rod per Procedure 302.2, Control Rod Drive Manual Control System.

Which one of the following is correct if the control rod is correctly coupled?

Hold ROD CONTROL switch in ROD OUT NOTCH:

a. And place the NOTCH OVERRIDE switch to NOTCH OVERRIDE; position indication will indicate "48" with a red backlight.

b. And place the NOTCH OVERRIDE switch to NOTCH OVERRIDE. Position indication will go dark.

c. And position indication will indicate "48" with a red backlight.

d. And position indication will go dark then settle at position "48," verify the settle light is out.

Answer Key		
# 93		
Choice		Basis or Justification
Correct:	A	Per Station Procedure 302.2, Control Rod Drive Manual Control System
Distractors:	B	Plausible, this would happen if uncoupled
	C	Plausible, must go to NOTCH OVERRIDE to perform coupling check
	D	Plausible, same as "C" above, dark indication indicates uncoupled

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
F	2.5	2	

Source Documentation		
Source:	New Exam Item X Modified Bank Item OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank
Reference(s):	Station Procedure 302.2, Control Rod Drive Manual Control System [2621.828.36]	
Learning Objective:	00076, 00726	
Terminal Objective:	2170101006	
Knowledge/Ability:	G2.2.2	Importance: 4.0/3.5
Equipment Control. Ability to manipulate the console controls as required to operate the facility between shutdown and designated power levels.		

Prepared by: Larry Briggs

94. Which one of the following is an appropriate use of a Special Condition Tag (SCT), per Procedure 108P, Clearance and Tagging?

   a. The SCT is being applied with an information tag to change and correct the stated position on the information tag.

   b. A second SCT is being applied to the same component and is being tagged in the same position.

   c. The SCT is being applied to the same component as a red tag and the component is tagged in the same position.

   d. An SCT is being applied to a breaker to maintain it in the energized condition.

Answer Key		
# 94		
Choice		Basis or Justification
Correct:	D	Per Station Procedure 108P, Clearance and Tagging, Section 5.2 and 5.3
Distractors:	A	Plausible, can be applied with information tag if positions do not conflict.
	B	Plausible, two SCTs cannot be applied to one component.
	C	Plausible, SCT cannot be applied to a red tagged component.

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
F	3	2	

Source Documentation			
Source:	New Exam Item X Modified Bank OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank	Mod. Lim EX. Q #18
Reference(s):	Station Procedure 108P, Clearance and Tagging, Section 5.2 and 5.3		
Learning Objective:	Administrative procedures		
Terminal Objective:			
Knowledge/Ability:	G2.2.13	Importance: 3.6/3.8	
Equipment Control. Knowledge of tagging and clearance procedures.			

Revised 2 distractors including correct answer.
Prepared by: Larry Briggs

95. Given the following:

A male, fully qualified radiation worker at Oyster Creek has just returned from 2 weeks of outage support at Peach Bottom.

- Total Effective Dose Equivalent (TEDE) received at Peach Bottom was 200 mrem
- After a fall at home the worker received an ankle X-Ray estimated at 20 mrem exposure to the ankle
- The workers TEDE for Oyster Creek for 2002 is 125 mrem

Which one of the following is correct IAW Oyster Creek Procedure, ADM-4000.01, Administrative Dose Limits?

For the year 2002, the individual would need the permission of the:

a. Radiation Protection Manager to exceed 3655 mRem.

b. Radiation Protection Manager and Oyster Creek Vice President to exceed 4655 mRem.

c. Radiation Protection Manager to exceed 4675 mRem.

d. Radiation Protection Manager and the Oyster Creek Vice President to exceed 3675 mRem.

Answer Key		
# 95		
Choice		Basis or Justification
Correct:	D	Oyster Creek Procedure, ADM-4000.01, Administrative Dose Limits. Limit is 4000 mrem. 20 mrem is not counted as occupational exposure..
Distractors:	A	Plausible, if 20 mrem to ankle is considered TEDE
	B	Plausible, if applicant uses NRC limits with 20 mrem to ankle considered TEDE
	C	Plausible, if NRC limits are used. Still need VP approval also.

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
H	3	5	X – 43.4

Source Documentation		
Source:	New Exam Item X (MOD 2001 PB NRC*) Modified Bank Item OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank
Reference(s):	Oyster Creek Procedure, ADM-4000.01, Administrative Dose Limit; Fundamentals, Radiation Protection	
Learning Objective:		
Terminal Objective:		
Knowledge/Ability:	G2.3.4	Importance: 2.5/3.1
Radiation Control. Knowledge of radiation exposure limits and/or contamination control, including permissible levels in excess of those authorized.		

*Modified Stem and all distractors to include approval for excess of normal authorized level. Also made limits site specific.

Prepared by: Larry Briggs

96. Given the following:

- Oyster Creek is at 5% power
- A Drywell entry is being made to repair a leak identified during the 1000 psi inspection following the outage.
- The leak is on a pipe flange and the gasket needs to be isolated and replaced.

As the Unit Supervisor (US) use the As Low As Reasonably Achievable (ALARA) guidelines to determine which one of the following methods should be used to complete the repair. Consider only the radiation exposure aspects of the repair.

a. Two individuals:
Install temporary shielding for 30 minutes in a 200 mr/hr area.
Take 60 minutes to complete the repair in a 20 mr/hr area.
Remove the shielding in 20 minutes in a 200 mr/hr area.

b. Two individuals:
Take 60 minutes to complete the repair with no temporary shielding in a 200 mr/hr area.

c. Two individuals:
Install temporary shielding for 20 minutes in a 200 mr/hr area.
Take 60 minutes to complete the repair in a 40 mr/hr area.
Remove the shielding in 15 minutes in a 200 mr/hr area

d. One individual:
Install temporary shielding for 60 minutes in a 200 mr/hr area.
Two individuals:
Take 60 minutes to complete the repair in a 40 mr/hr area.
One individual:
Removes the shielding in 30 minutes in a 200 mr/hr area.

Answer Key		
# 96		
Choice		Basis or Justification
Correct:	C	314 mrem exposure
Distractors:	A	Plausible,374 mrem exposure
	B	Plausible, 400 mrem exposure
	D	Plausible,380 mrem exposure

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
H	2.5	5	X – 43.4

Source Documentation		
Source:	New Exam Item X (2001 PB NRC EX*) Modified Bank Item OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank
Reference(s):	Station Procedure ADM-4110.04, Radiological Work Process, Exhibit 8; ; Fundamentals, Radiation Protection	
Learning Objective:		
Terminal Objective:		
Knowledge/Ability:	G2.3.2	Importance: 2.5/2.9
Radiation Control. Knowledge of ALARA program.		

*Stem only slightly modified
Prepared by: Larry Briggs

97. Given the following:

- The plant is at 75% power and being shutdown in preparation for a refueling outage
- A drywell purge with air is in progress
- Stack activity has increased to 500 CPS.

The control room operator reports that Torus pressure has increased during the purging process and is approaching Drywell pressure.

In accordance with Station Procedure 312.9, Primary Containment Control:

a. Close the Torus and Drywell vent valves to stop the radioactive release.

b. Close the Drywell vent valves to stop the radioactive release.

c. Close Drywell vent valves then open the Torus vent valves to reduce Torus pressure.

d. Open the Torus vent valves then close the Drywell vent valves to reduce the Torus pressure.

Answer Key		
# 97		
Choice		Basis or Justification
Correct:	C	Per Station Procedure 312.9, Primary Containment Control, Section 7.
Distractors:	A	Plausible, not required till counts have reached 1000 CPS
	B	Plausible, not required till counts have reached 1000 CPS
	D	Plausible, This would violate primary containment when the Torus valves were opened.

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
F	3.5	3	

Source Documentation		
Source:	New Exam Item X Modified Bank Item OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank
Reference(s):	Station Procedure 312.9, Primary Containment Control, Section 7 [2621.828.32]	
Learning Objective:	00418, 00424, 00446	
Terminal Objective:	2230101006	
Knowledge/Ability:	G2.3.9	Importance: 2.5/3.4
Radiation Control. Knowledge of the process for performing a containment purge.		

Prepared by: Larry Briggs

98. Given the following:

- The plant experienced a reactor scram due to a loss of condenser vacuum
- Isolation Condensers did not automatically initiate
- RPV level reached 120 inches TAF and is recovering
- Reactor pressure is 1055 psig
- DC control power for Recirculation Pump breakers has been lost

The US has directed the reactor operator to use the "A" Isolation Condenser to help reduce pressure.

Based on the above conditions and IAW Support Procedure 11, Alternate Pressure Control Systems, Isolation Condensers, which one of the following is correct?

Dispatch an operator:

a. To the 1A 4160 VAC bus to manually trip the "E" recirculation pump breaker to clear the high flow trip.

b. To the Recirculation Pump MG set room to manually trip the "E" recirculation pump breaker to prevent the high flow trip.

c. To the 1A 4160 VAC bus to manually trip the "A" recirculation pump breaker to prevent the high flow trip.

d. To the Recirculation Pump MG set room to manually trip the "A" recirculation pump breaker to clear high flow trip.

Answer Key		
# 98		
Choice		Basis or Justification
Correct:	C	Per Support Procedure 11, Alternate Pressure Control Systems, Isolation Condensers.
Distractors:	A	Plausible, however the "E" recirculation pump affects the "B" isolation condenser
	B	Plausible, "E" recirc pump affects the "B" IC and the field breaker in the MG set room is not used to trip the Recirc Pump
	D	Plausible, "A" recirc pump affects the "A" IC however the field breaker in the MG set room is not used to trip the Recirc Pump

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
H	3	3	

Source Documentation			
Source:	New Exam Item X	Old NRC Exam	
	Modified Bank Item	Other Exam Bank	
	OC Exam Bank	NRC Exam Bank	
Reference(s):	Support Procedure 11, Alternate Pressure Control Systems, Isolation Condensers [2621.845.04]		
Learning Objective:	03096, 09521		
Terminal Objective:	2000501412		
Knowledge/Ability:	G2.4.35	Importance: 3.3/3.5	
Emergency Plan. Knowledge of local auxiliary operator tasks during emergency operations including system geography and system implications.			

Prepared by: Larry Briggs

99. Given the following:

- Reactor has scrammed due to a LOCA
- Two (2) control rods are at notch 48
- RPV level is unknown
- Torus level is 180 inches
- Reactor Engineering has not been notified yet

Based on the above conditions, which one of the following accident mitigation strategies is correct?

a. Emergency Depressurization - With ATWS, EMG-3200.04B, to reduce pressure, with a minimum of injection, till placed on shutdown cooling.

b. RPV Flooding -With ATWS, EMG-3200.08B, to reduce pressure and slowly inject water until the Main Steam lines are flooded to ensure adequate core cooling.

c. RPV Flooding - No ATWS, EMG-3200.08A, to reduce pressure and rapidly inject water until the Main Steam lines are flooded to ensure adequate core cooling.

d. RPV Control - No ATWS, EMG-3200.01B, to control water level and pressure control to ensure adequate core cooling and cool down the reactor to cold shutdown conditions.

Answer Key		
# 99		
Choice		Basis or Justification
Correct:	B	Per entry conditions, RPV level is unknown.
Distractors:	A	Plausible, similar, but level would be know in this case.
	C	Plausible, applicant must note that Reactor Engineering has not been notified to determine if core will remain shutdown. It most likely would but has not been determined.
	D	Plausible, but level is unknown and 2 rods are not inserted.

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
H	2.5	4	43.5

Source Documentation			
Source:	New Exam Item X Modified Bank Item OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank	
Reference(s):	RPV Flooding [2621.845.18]		
Learning Objective:	08025		
Terminal Objective:	2000501410, 2005010418		
Knowledge/Ability:	G2.4.7	Importance: 3.1/3.8	
Emergency Procedures/Plan. Knowledge of event based EOP mitigation strategies.			

Prepared by: Larry Briggs

100. Given the following:

- The plant has experienced a 3 gpm reactor coolant leak
- The EOPs are being implemented
- RPV level is 75 inches TAF and has been steady for the last 10 minutes
- RPV pressure is at 700 psig
- Drywell pressure is 5 psig and steady

IAW with EPIPs the Shift Manager must:

a. Declare an Unusual Event, and activate the Initial Response Emergency Organization and the TSC.

b. Declare an Unusual Event and notify the proper NJ authorities within 15 minutes and the NRC within 1 hour.

c. Declare an Alert, and activate the Initial Response Emergency Organization and the TSC.

d. Declare an Alert and notified the proper NJ authorities within 15 minutes and the NRC within 1 hour.

Answer Key		
# 100		
Choice		Basis or Justification
Correct:	B	Per EPIP-OC-.01, Classification of Emergency Events, EPIP-OC-.02, Direction of Emergency Response/Emergency Control Center (ECC), and EPIP-OC-.03, Emergency Notification. **Will need EPIP-OC-.01, attachment 1, Emergency Classification Table to answer.**
Distractors:	A	Plausible, IREO and TSC is not required to be activated on UE
	C	Plausible, but not an Alert
	D	Plausible, but not an Alert

Metrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
H	3	5	

Source Documentation			
Source:	New Exam Item X Modified Bank Item OC Exam Bank	Old NRC Exam Other Exam Bank NRC Exam Bank	
Reference(s):	EPIP-OC-.01, Classification of Emergency Events, EPIP-OC-.02, Direction of Emergency Response/Emergency Control Center (ECC), and EPIP-OC-.03, Emergency Notification.		
Learning Objective:	2685.780.07, A, AA		
Terminal Objective:	2000502401		
Knowledge/Ability:	G2.4.29	Importance: 2.6/4.0	
Emergency Procedures/Plan. Knowledge of the Emergency Plan.			

Prepared by: Larry Briggs