EXAMINATION ANSWER KEY

2007 NRC Reactor Operator Exam

1	ID: Q10291	Points: 1.00

Given the following conditions:

- SPTAs are being performed
- CET temperature is 537°F
- RCS pressure indicates 1300 psia
- Containment temperature is 140°F
- Containment pressure is 1.7 psig
- Pressurizer level is 34% and rising
- Reactor Vessel Plenum level indicates 73%
- AFN-P01 is feeding both SGs
- Steam Generator #1 is 50% WR and increasing
- Steam Generator #2 is 45% WR and increasing
- HPSI Injection flow is adequate

Which one of the following conditions is correct concerning Safety Injection (SI) flow?

A. Throttle SI flow, RCS subcooling is adequate

B. DO NOT throttle SI flow until either SG level is within 45 - 60% NR

C. DO NOT throttle SI flow, conditions indicate inadequate RCS inventory control

D. Throttle SI flow, allowing the pressurizer to continue filling could result in a pressurized thermal shock condition

Answer: C

EXAMINATION ANSWER KEY

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Question 1 Details

Question Type:	Multiple Choice
Topic:	Q10291 analyze whether it is permissible to throttle HPSI flow.
System ID:	10291
User ID:	Q10291
Status:	Active
Always select on test:	No
Authorized for practice:	No
Difficulty:	3.00
Time to Complete:	3
Point Value:	1.00
Cross Reference:	
User Text:	42008AK3.05
User Number 1:	4.00
User Number 2:	4.50
Comment:	**Proposed reference to be provided to applicant during examination:** NONE

Technical Reference: SA-2 technical guideline, 40DP-9AP17

K&A: Knowledge of the reasons for the following responses as they apply to the Pressurizer Vapor Space Accident: ECCS termination or throttling criteria

JUSTIFICATION:

A is wrong even though subcooling is met,

B is wrong SG levels do meet throttle criteria

C is correct - Throttling is not permitted due to less than 16% in the upper head.

D is wrong - this is a PZR leak and a void is being drawn in the head. There is no PTS concern with a small LOCA

2	ID: Q8658	Points: 1.00

The Unit has transitioned to two phase Natural Circulation flow (Reflux boiling) due to a small break LOCA with inadequate HPSI flow.

The Crew can enhance Reflux boiling by increasing ...

A. RCS T-cold to >550°F.

B. PZR level from 15 to 55%.

C. SG level from 10% to 50% N/R.

D. PZR pressure from 1500 to 1600 psia.

Answer: C

Question 2 Details

Question Type:	Multiple Choice
Topic:	Q8658 EOP Raising SG level to enhance reflux boiling
System ID:	3227
User ID:	Q8658
Status:	Active
Always select on test:	No
Authorized for practice:	No
Difficulty:	3.00
Time to Complete:	3
Point Value:	1.00
Cross Reference:	
User Text:	41009EK101
User Number 1:	4.20
User Number 2:	4.70
Comment:	**Proposed reference to be provided to applicant during examination:** NONE

Technical Reference: 40EP-9EO03, LOCA

K&A: Knowledge of the operational implications of the following concepts as they apply to the small break LOCA: Natural circulation and cooling, including reflux boiling

JUSTIFICATION:

Reflux boiling is the process of steam going up the SG tubes, condensing an falling back into the RCS. The greater the tube coverage the greater the cooling. Changing RCS parameters will have negligible effect on reflux boiling

3 **ID: Q10365** **Points: 1.00**

Given the following conditions:

- Unit 1 was manually tripped from rated power due to a 10 gpm tube rupture on SG #1
- PBB-S04 tripped due to an 86 lockout on the bus
- Forced Circulation has been lost due to a failure of fast bus transfer
- The CRS is performing steps in 40EP-9EO04, SGTR
- SG #1 has been isolated
- Preparations are being made to cool down the RCS to Mode 5 in Natural Circulation

Based on these conditions, Cooldown rate is limited to ...

A. 30°F/hr due to RCS makeup capability

B. 30°F/hr to prevent asymmetrical steaming condition

C. 100°F/hr Tech Spec limit

D. 100°F/hr due to natural circulation flowrate limitations

Answer: B

Question 3 Details

Question Type:	Multiple Choice
Topic:	Q10365 reason for 30 degree CD limit in SGTR
System ID:	10365
User ID:	Q10365
Status:	Active
Always select on test:	No
Authorized for practice:	No
Difficulty:	4.00
Time to Complete:	3
Point Value:	1.00
Cross Reference:	
User Text:	42015AK101
User Number 1:	4.40
User Number 2:	4.60
Comment:	**Proposed reference to be provided to applicant during examination:** NONE

Technical Reference: 40EP-9EO04 (SGTR), 40DP-9AP09 (Tech Guideline)

K&A: Knowledge of the operational implications of the following concepts as they apply to the Reactor Coolant Pump Malfunctions (Loss of RC Flow): Natural circulation in a nuclear reactor power plant

JUSTIFICATION:

A is wrong one train of SI and provides adequate makeup flow

B is correct based on the tech guideline in order to keep both SG coupled during the cooldown

C & D are wrong since the limit is 30°F/hr in natural circulation

4 **ID: Q10375** **Points: 1.00**

In order to prevent Seal Damage 40AO-9ZZ04 (RCP Emergencies) lists several conditions that require that the Controlled Bleedoff valve be closed. Which of the following conditions would allow the "Bleedoff" valve to remain open?

A. Loss of Nuclear Cooling Water to an RCP in "Standby"

B. Loss of Seal Injection for greater than 10 minutes to a running RCP

C. Loss of Nuclear Cooling Water for greater than 10 minutes to a running RCP

D. Loss of Seal Injection to an RCP in "Standby" with Seal 2 outlet temperature at 250°F

Answer: B

Question 4 Details

Question Type:	Multiple Choice
Topic:	Q10375 RCP seal BO may be left open
System ID:	10375
User ID:	Q10375
Status:	Active
Always select on test:	No
Authorized for practice:	No
Difficulty:	3.00
Time to Complete:	2
Point Value:	1.00
Cross Reference:	
User Text:	42022AK302
User Number 1:	3.50
User Number 2:	3.80
Comment:	**Proposed reference to be provided to applicant during examination:** NONE

Technical Reference: 40AO-9ZZ04 (RCP emergences)

K&A: Knowledge of the reasons for the following responses as they apply to the Loss of Reactor Coolant Pump Makeup: Actions contained in SOPs and EOPs for RCPs, loss of makeup, loss of charging, and abnormal charging

JUSTIFICATION:

A is wrong, 40ao-9ZZ04 directs that a bleed-off valve should be closed as soon as possible

B is correct, an RCP can run indefinitely without seal injection flow

C is wrong the RCP must be tripped and bleed-off valve closed within 10 minutes to a running RCP

D is wrong Loss of seal Injection and Seal 2 outlet temp exceeding 250°F requires the Bleed-off valve be closed

5 **ID: Q10357** **Points: 1.00**

Given the following conditions:

- Unit 1 is in Mode 4
- LPSI pump "B" is providing SDC flow
- RCS temperature 325°F
- Auxiliary Spray valve "B" fails open

NOW

- LPSI pump "B" amps are oscillating
- SIB-FI-307 (SD Cooling B HDR flow to Loops) is fluctuating
- Window 2B06A, SDC TRAIN A/B FLOW LO is alarming

Which one of the following events/conditions is taking place?

A. CHB-HV-530 has closed

B. LPSI pump B is "cavitating"

C. LPSI pump B is in a "runout" condition

D. Inadvertant B train Recirculation Actuation Signal (RAS)

Answer: B

EXAMINATION ANSWER KEY

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Question 5 Details

Question Type:	Multiple Choice
Topic:	Q10357 indications of SDC cavitation
System ID:	10357
User ID:	Q10357
Status:	Active
Always select on test:	No
Authorized for practice:	No
Difficulty:	2.00
Time to Complete:	3
Point Value:	1.00
Cross Reference:	
User Text:	42025AA207
User Number 1:	3.40
User Number 2:	3.70
Comment:	**Proposed reference to be provided to applicant during examination:** NONE

Technical Reference: 40AL-9RK2B

K&A: Ability to determine and interpret the following as they apply to the Loss of Residual Heat Removal System: Pump cavitation

JUSTIFICATION:

A is wrong, SDC suction is thru SI-HV-655 and LPSI suction valve SI-HV-692 is closed isolating SDC flow from RWT

B is correct, these are classic cavitation indications with lowering PZR pressure and stable temperature

C is wrong, run out would be high amps and high flow

D is wrong, RAS would trip the LPSI pump

6 **ID: Q10362** **Points: 1.00**

Given the following conditions:

- Unit 1 is at rated power
- Nuclear Cooling Water was lost
- Essential Cooling Water has cross tied to the Priority Loads
- Shutdown Cooling Heat Exchanger A room is posted as a "HIGH RADIATION AREA"
- The Reactor Operator is briefing an Auxiliary Operator (AO) to throttle EWA-HCV-53

To enter this area, the AO must......

A. obtain a key from RP

B. have continuous RP coverage

C. be on a specific REP authorizing entry.

D. be authorized by a RP Department Leader

Answer: C

Question 6 Details

Question Type:	Multiple Choice
Topic:	Q10362 ALARA guidance
System ID:	10362
User ID:	Q10362
Status:	Active
Always select on test:	No
Authorized for practice:	No
Difficulty:	3.00
Time to Complete:	2
Point Value:	1.00
Cross Reference:	
User Text:	2.3.2
User Number 1:	2.50
User Number 2:	2.90
Comment:	**Proposed reference to be provided to applicant during examination:** NONE

Technical Reference: 75RP-9OP02, Control of Rad Areas

K&A: Radiation Control Knowledge of facility ALARA program

JUSTIFICATION:

A is wrong, keys are for locked high > 1000mrem/hr

B is wrong, continuou RP coverage not required if AO has dose rate meter or alarming EPD

C is wrong, RP department leader authorizes Very High Rad Area Access

D is correct per 75DP-9RP01 (Access Control procedure) 3.9.1 a specific REP is required and a Dose Rate Meter or Alarming EPD or RP coverage

7 **ID: Q10315** **Points: 1.00**

Given the following conditions:

- Unit 1 is operating at rated power
- Pzr level control selector (RCN-HS-110) is positioned to "Y"
- Pzr pressure control selector (RCN-HS-100) is positioned to "Y"
- Pzr heater control selector (RCN-HS-100-3) is positioned to "BOTH"
- Letdown control valve selector (CHN-HS-110-1) is positioned to CH-110-P
- Pressurizer is in "Boron Equalization"
- NNN-D12 de-energizes, causing a loss of power to:

➢ RCN-LC-110X, PZR Level Control Channel "X"
➢ RCN-PIC-100, PZR Pressure Master Controller
➢ RCN-PIK-100, PZR Spray Valve Controller

Which of the following conditions is correct?

A. Letdown control valve closes

B. Proportional heaters will de-energize

C. Normally running charging pump will stop

D. Main spray valves can only be operated with manual output

Answer: B

Question 7 Details

Question Type:	Multiple Choice
Topic:	Q10315 PPCS response to a loss of D-12
System ID:	10315
User ID:	Q10315
Status:	Active
Always select on test:	No
Authorized for practice:	No
Difficulty:	3.00
Time to Complete:	2
Point Value:	1.00
Cross Reference:	
User Text:	42027AK203
User Number 1:	2.60
User Number 2:	2.80
Comment:	**Proposed reference to be provided to applicant during examination:** NONE

Technical Reference: 40AO-9ZZ14, **Loss of Non-Class instrument or Control Power**

K&A: Knowledge of the interrelations between the Pressurizer Pressure Control Malfunctions and the following: Controllers and positioners

JUSTIFICATION:

A is wrong level control is selected to Y letdown valves will be unaffected

B is correct 100-3 selected to both either level going below 25% will trip heaters

C is wrong level control is selected to Y charging pumps will be unaffected

D is wrong Main Spray valves will not operate in manual a loss of power to PIK-100

8	ID: Q10364	Points: 1.00

Given the following conditions:

- Unit 1 had been operating at rated power
- Main turbine tripped
- Reactor did not trip from Control Room
- Steam Bypass "Quick Open" failed to actuate
- An Auxiliary Operator successfully opened the RTSG breakers
- Pressurizer safeties lifted, RCE-PSV-200 did not reseat
- Containment pressure is 16 psig and increasing
- Containment temperature is 195°F and increasing

Which CR instruments are rated for use under these conditions?

A. ERFDADS only

B. Channel "B" instruments only

C. White placard instruments only

D. Channel "A" instruments located on Board 2 only

Answer: C

Question 8 Details

Question Type:	Multiple Choice
Topic:	Q10364 identify post accident instrumentation
System ID:	10364
User ID:	Q10364
Status:	Active
Always select on test:	No
Authorized for practice:	No
Difficulty:	3.00
Time to Complete:	3
Point Value:	1.00
Cross Reference:	
User Text:	2.4.3
User Number 1:	3.50
User Number 2:	3.80
Comment:	**Proposed reference to be provided to applicant during examination:** NONE

Technical Reference: 01-J-RMP-0002

K&A: Ability to identify post-accident instrumentation.

JUSTIFICATION:

A is wrong ERFDADS is not rated for LOCA

B is wrong, some B instruments are post accident qualified but not exclusive, examine may confuse fire rated with post LOCA

C is correct per 01-J-RMP-0002

D is wrong, these are PAM instrument found in Tech Specs but not all the LOCA rated instruments in the CR

9	ID: Q10317	Points: 1.00

Given the following conditions:

- Unit 1 has tripped from rated power
- CRS has entered 40EP-9EO04, Steam Generator Tube Rupture
- Containment pressure is .3 psig and stable
- PZR pressure is 1800 psia and stable
- All required ESFAS actuation have properly initiated

The Reactor Operator begins his alarm management responsibilities, which one of the following alarms should be addressed first due to a potential transition to the Functional Recovery Procedure?

A. LO PZR PRESS CH TRIP

B. LO RC FLOW SG2 CH TRIP

C. MN STM SAFETY RELIEF VLV TRBL

D. 525KV SWYD VOLT TRBL/WRF TRIP PERM

Answer: C

EXAMINATION ANSWER KEY

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Question 9 Details

Question Type:	Multiple Choice
Topic:	Q10317 which alarm should be addresssed first
System ID:	10317
User ID:	Q10317
Status:	Active
Always select on test:	No
Authorized for practice:	No
Difficulty:	4.00
Time to Complete:	3
Point Value:	1.00
Cross Reference:	
User Text:	2.4.45
User Number 1:	3.30
User Number 2:	3.60
Comment:	**Proposed reference to be provided to applicant during examination:** NONE

Technical Reference: 74RM-9EF41, Radmonitor System Alarm Response SGTR 40EP-9EO04

K&A: Emergency Procedures / Plan Ability to prioritize and interpret the significance of each annunciator or alarm.

JUSTIFICATION:

A is wrong, Lo PZR trip came in at 1837 psia

B is wrong, SGTR EOP includes actions natural circ conditions

C is correct, this alarm can be triggered by Main steam Safeties actuated, this would change to a dual event and FRP

D is wrong, this alarm indicates LOOP concurrent with SIAS actuation, SGTR includes steps to deal within LOOP no transition to FRP required

10 **ID: Q10318** **Points: 1.00**

Given the following conditions:

- Reactor has been manually tripped
- SPTAs are in progress
- No Operator actions have taken place
- PZR press is 1900 psia and DECREASING
- Containment pressure is 2.1 PSIG and INCREASING
- S/G pressures are 980 psia and DECREASING
- S/G #1 level is 30% WR and DECREASING
- S/G #2 level is 23% WR and DECREASING
- SG #1 feedrate is 0 gpm
- SG #2 feedrate is 2000 gpm

Which one of the following signals will cause SG #2 feedwater flow to stop?

A. LO PZR PRESS CH TRIP

B. LO SG 2 PRESS CH TRIP

C. HI CNTMT PRESS CH TRIP

D. SG 1 > SG 2 PRESS CH TRIP

Answer: D

Question 10 Details

Question Type:	Multiple Choice
Topic:	Q10318 ESD, what stops AFW
System ID:	10318
User ID:	Q10318
Status:	Active
Always select on test:	No
Authorized for practice:	No
Difficulty:	3.00
Time to Complete:	2
Point Value:	1.00
Cross Reference:	
User Text:	42040AK106
User Number 1:	3.70
User Number 2:	3.80
Comment:	**Proposed reference to be provided to applicant during examination:** NONE

Technical Reference: B05 Alarm Response

K&A: Knowledge of the operational implications of the following concepts as they apply to Steam Line Rupture: High-energy steam line break considerations

JUSTIFICATION:

A is wrong, if feeding with AFN-P01 this would be correct

B is wrong, this would be true if feeding with AFn or Main Feed pumps closing downcommer isolations

C is wrong, SIAS/CIAS will not stop AFAS flow

D is correct, this alarm stops and prevents AFW flow to the lower press SG if DP exceeds 185 psid

11 **ID: Q10407** **Points: 1.00**

Given the following conditions:

- Unit 1 Reactor has tripped
- The CRS has entered 40EP-9EO09, Blackout
- "A" train sequencer has failed
- Auxiliary Operator reports the following alarms at DG "A" local alarm panel

➢ OVERSPEED ENGINE
➢ LUBE OIL LOW PRESSURE TURBO
➢ FAILURE TURBO THRUST BEARING

Which of the following actions if taken alone will allow a start of the "A" DG?

A. Take Control Room handswitch DGA-HS-1 to start

B. Press Reset on DGA-HS-29, Emergency Stop pushbutton

C. Press DGN-HS-301, "FIRST OUT AND SYSTEM RESET" pushbutton

D. Reset the Overspeed Fuel Trip Solenoid and Intake Air Butterfly valves

Answer: D

EXAMINATION ANSWER KEY

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Question 11 Details

Question Type:	Multiple Choice
Topic:	Q10407 Manual DG start in Blackout
System ID:	10407
User ID:	Q10407
Status:	Active
Always select on test:	No
Authorized for practice:	No
Difficulty:	3.00
Time to Complete:	3
Point Value:	1.00
Cross Reference:	
User Text:	41055EA102
User Number 1:	4.30
User Number 2:	4.40
Comment:	**Proposed reference to be provided to applicant during examination:** NONE

Technical Reference: 40ep-9eo10, standard appendix 55

K&A: Ability to operate and monitor the following as they apply to a Station Blackout: Manual ED/G start

JUSTIFICATION:

A is wrong, emergency run trip is in. Examine may believe that sequencer failure is cause

B is wrong, this would work if trip is reset

C is wrong, this action is required for lube oil emergency run trip

D is correct overspeed is a emergency run trip and if reset the LOP signal will start the DG

12	ID: Q10322	Points: 1.00

Given the following conditions:

- Unit 1 has tripped due to a Loss Of Offsite Power
- The CRS has entered 40EP-9EO07, LOOP/LOFC
- Class buses are energized by their respective DGs

In accordance with the LOOP procedure, which buses need to be energized to ensure continued switchyard breaker operation?

A. NAN-S05 and NKN-D41

B. NAN-S05 and NKN-M45

C. NAN-S06 and NKN-D41

D. NAN-S06 and NKN-M45

Answer: B

Question 12 Details

Question Type:	Multiple Choice
Topic:	Q10322 SWYD breaker operations during a LOOP
System ID:	10322
User ID:	Q10322
Status:	Active
Always select on test:	No
Authorized for practice:	No
Difficulty:	4.00
Time to Complete:	2
Point Value:	1.00
Cross Reference:	
User Text:	42056AA126
User Number 1:	2.50
User Number 2:	2.60
Comment:	**Proposed reference to be provided to applicant during examination:** NONE

Technical Reference: 40ep-9eo10, standard appendix 54, 40DP-9AP17

K&A: Ability to operate and / or monitor the following as they apply to the Loss of Offsite Power: Circuit breakers

JUSTIFICATION:

LOOP procedure directs the performance of SA 54 which will align power to NAN-S05 and close NAN-S05F to supply swyd loads. It also aligns battery charger to NKN-M45 to ensure control power is available to swyd loads

D-41 is a turbine building DC distribution panel that supplies LC breaker control power

13	ID: Q10327	Points: 1.00

Given the following conditions:

- Unit 1 is operating at rated power
- Class inverter PNA-N11 AC output breaker has tripped open

Which of the following correctly identifies the effects on the "A" channel SG level and pressure indications/transmitters.

A. SG level and pressure indications fail low

B. SG level and pressure indications fail high

C. SG level indications fail low, SG pressure indications fail high

D. SG level indications fail high, SG pressure indications fail low

Answer: A

Question 13 Details

Question Type:	Multiple Choice
Topic:	Q10327 describe how the loss PNA-D25 effect SG indications
System ID:	10327
User ID:	Q10327
Status:	Active
Always select on test:	No
Authorized for practice:	No
Difficulty:	3.00
Time to Complete:	3
Point Value:	1.00
Cross Reference:	
User Text:	42057AA205
User Number 1:	3.50
User Number 2:	3.80
Comment:	**Proposed reference to be provided to applicant during examination:** NONE

Technical Reference: 40A-9ZZ13 (Loss of Class Instrument Power), 40OP-9PN01 (120Vac AC class Instrument power)

K&A: Ability to determine and interpret the following as they apply to the Loss of Vital AC Instrument Bus: S/G pressure and level meters

JUSTIFICATION:

In unit 1 there is no auto transfer to the class Voltage Regulator so the associated Instrument bus will lose power

A is correct SG level and Pressure instruments will all fail low

14 **ID: Q67322** **Points: 1.00**

Given the following conditions:

- Unit 1 is in Mode 5
- Battery Charger "A" (PKA-H11) has tripped
- Battery Charger "AC" (PKA-H15) is connected to the "C" Battery bus (PKC-M43)

Can the "AC" Battery Charger be aligned to both PKA-M41 and PKC-M43 at this time?

A. YES, provided the Unit remains in Mode 5

B. NO, a mechanical interlock prevents this alignment

C. YES, provided that the "A" battery is disconnected from PKA-M41

D. NO, this action may only occur while restoring the MVDC safety functions as implemented by the Lower Mode Functional Recovery Procedure

Answer: B

Question 14 Details

Question Type:	Multiple Choice
Topic:	Q67322 PK Swing charger features
System ID:	9464
User ID:	Q67322
Status:	Active
Always select on test:	No
Authorized for practice:	No
Difficulty:	2.00
Time to Complete:	2
Point Value:	1.00
Cross Reference:	
User Text:	42058AA1.01
User Number 1:	2.80
User Number 2:	3.10
Comment:	**Proposed reference to be provided to applicant during examination:** NONE **Technical Reference:** 40OP-9PK01, 125 Vdc electrical Distribution **K&A:** Ability to operate and / or monitor the following as they apply to the Loss of DC Power: Cross-tie of the affected dc bus with the alternate supply **JUSTIFICATION:** **B is correct, PVNGS has a mechanical interlock that prevents the Swing chargers from connecting to multiple DC buses simultaneously**

15	ID: Q10328	Points: 1.00

Given the following conditions:

- All 8 RCP LO NCW FLOW alarms have annunciated

Which of the following conditions could have caused this event?

A. Containment pressure of 8.5 psig

B. Pressurizer pressure of 1837 psia

C. Instrument Air header is isolated to Containment

D. Loss of power to NCB-HV-401, Containment Isolation valve

Answer: A

Question 15 Details

Question Type:	Multiple Choice
Topic:	Q10328 possible cause of loss on NCW
System ID:	10328
User ID:	Q10328
Status:	Active
Always select on test:	No
Authorized for practice:	No
Difficulty:	2.00
Time to Complete:	3
Point Value:	1.00
Cross Reference:	
User Text:	42062AA202
User Number 1:	2.90
User Number 2:	3.60
Comment:	**Proposed reference to be provided to applicant during examination:** NONE

Technical Reference: 40AO-9ZZ17, INADVERTANT PPS ACTUATIONS

K&A: Ability to determine and interpret the following as they apply to the Loss of Nuclear Service Water: The cause of possible SWS loss

JUSTIFICATION:

A is correct, NC valves close on CSAS signal 8.5 psig

B is wrong, Sias does not close valves

C is wrong, NC valves are motor operated

D is wrong, motor operated valve fails as is

16 **ID: Q10359** **Points: 1.00**

Which of the following is true regarding an Instrument Air pipe rupture in the Main Steam Support Structure (MSSS)?

A. Service Air will supply all loads

B. Accumulator will provide ADV operation

C. Low Pressure Nitrogen will supply all loads

D. Economizer Feedwater Isolation valves fast closure and slow mode of operation are available via the accumulator

Answer: B

Question 16 Details

Question Type:	Multiple Choice
Topic:	Q10359 IA break in MSSS
System ID:	10359
User ID:	Q10359
Status:	Active
Always select on test:	No
Authorized for practice:	No
Difficulty:	3.00
Time to Complete:	3
Point Value:	1.00
Cross Reference:	
User Text:	42065AK304
User Number 1:	3.00
User Number 2:	3.20
Comment:	**Proposed reference to be provided to applicant during examination:** NONE

Technical Reference: 1M-SGP-001, 40AO-9ZZ06 (Loss of Instrument Air)

K&A: Knowledge of the reasons for the following responses as they apply to the Loss of Instrument Air: Cross-over to backup air supplies

JUSTIFICATION:

A is wrong, the break will prevent backup sources supplying loads, Service Air no longer is a backup

B is correct, accumulator will allow ADV operation for up to 8 hours

C is wrong, Nitrogen backup may open on low pressure but the pipe break makes this useless

D is wrong, accumulator provides fast closure but not slowmode of operation

17 **ID: Q4760** **Points: 1.00**

Given the following conditions:

- Unit 1 is at rated power
- RRS is selected to LOOP 1 Tavg.
- The Tcold instrument which supplies this indication fails LOW.
- Before the Operating Crew can address this failure, a Reactor Trip occurs.

Which of the following identifies the response of the Steam Bypass Control Valves (SBCVs) to this transient?

A. No SBCVs quick open.

B. All eight SBCVs quick open.

C. Only the group X SBCVs (1001 ,1003, 1004 and 1006) quick open.

D. Only the group Y SBCVs (1002 ,1005, 1007 and 1008) quick open.

Answer: A

Question 17 Details

Question Type:	Multiple Choice
Topic:	Q4760 SBCS Post Trip response with low Tavg
System ID:	4760
User ID:	Q4760
Status:	Active
Always select on test:	No
Authorized for practice:	No
Difficulty:	3.00
Time to Complete:	2
Point Value:	1.00
Cross Reference:	
User Text:	44E02EK21
User Number 1:	3.30
User Number 2:	3.70
Comment:	**Proposed reference to be provided to applicant during examination:** NONE

Technical Reference: 40AO-9ZZ16, RRS Malfunctions

K&A: Knowledge of the interrelations between the (Reactor Trip Recovery) and the following: Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

JUSTIFICATION:

A is correct, low Tavg blocks quick open on Reactor Trip

The distractors are wrong for this condition but do reflect SBCS response to various conditions

18 **ID: Q10329** **Points: 1.00**

Given the following conditions:

- Unit 1 reactor has tripped
- AFA-P01 has tripped on overspeed
- AFB-P01 has tripped on an 86 lockout
- AFN-P01 is OOS for scheduled maintenance
- Feedwater flow to each SG is 0 gpm

Which of the following conditions is preventing Main Feedwater from feeding in RTO (Reactor Trip Override)?

A. T-cold instrument fails low

B. Steam flow instrument fails low

C. Downcomer flow instrument fails high

D. Feedwater temperature instrument fails high

Answer: A

Question 18 Details

Question Type:	Multiple Choice
Topic:	Q10329 what's preventing RTO MFW flow
System ID:	10329
User ID:	Q10329
Status:	Active
Always select on test:	No
Authorized for practice:	No
Difficulty:	4.00
Time to Complete:	2
Point Value:	1.00
Cross Reference:	
User Text:	44E02EK21
User Number 1:	3.30
User Number 2:	3.70
Comment:	**Proposed reference to be provided to applicant during examination:** NONE

Technical Reference: 40AO-9zz18. RRS malfunctions

K&A: Knowledge of the interrelations between the (Reactor Trip Recovery) and the following: Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

JUSTIFICATION:

A is correct, DFWCS uses Tavg as compared to 564°F to control flow, low tavg = no flow

B is wrong, this is only used in 3 element control

C is wrong, this is only used in 3 element control

D is wrong, this is only used in 3 element control

19 **ID: Q10373** **Points: 1.00**

Given the following conditions:

- Unit 1 had been operating at rated power
- The Main Turbine tripped one hour ago
- Reactor power being held stable at 50%
- Subgroups 4, 5 and 22 are fully inserted
- CRS is taking actions per 40AO-9ZZ08, Load Rejection

Now

- Rx power is INCREASING
- Tcold is stable

Which of the following events could be in Progress?

A. Continuous CEA withdrawl

B. Expected Xenon reactivity effects

C. Steam Bypass Control Valve, SGN-HV-1001 has failed open

D. SGN-PT-1024, Main Steam Header Pressure, has failed low

Answer: A

EXAMINATION ANSWER KEY

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Question 19 Details

Question Type:	Multiple Choice
Topic:	Q10373 CEA withdrawl post load Reject
System ID:	10373
User ID:	Q10373
Status:	Active
Always select on test:	No
Authorized for practice:	No
Difficulty:	4.00
Time to Complete:	3
Point Value:	1.00
Cross Reference:	
User Text:	42001AA204
User Number 1:	4.20
User Number 2:	4.30
Comment:	**Proposed reference to be provided to applicant during examination:** NONE

Technical Reference: simplified drawings

K&A: Ability to determine and interpret the following as they apply to the Continuous Rod Withdrawal: Reactor power and its trend

JUSTIFICATION:

A is correct, CEA wd would increase power and SBCS would maintain temperature

B is wrong, one hour after load reject, xenon would be building adding neg reactivity

C is wrong, SBCV opening would lower temperature

D is wrong, PT-1024 failing low requires turbine runback, lower power

20 **ID: Q10402** **Points: 1.00**

Given the following conditions:

- Rx has tripped from rated power
- SPTAs are in progress
- T-cold is 555°F and dropping
- SG levels are 20% WR and increasing
- SG pressures are 1100 psia and dropping
- SBCVs are closed
- AFAS 1 and 2 have initiated

Which one of the following requires SRO approval prior to performance?

A. Actuating MSIS

B. Isolation of SG blowdown

C. Tripping the main feed pumps

D. Overriding and throttling auxiliary feedwater valves

Answer: A

Question 20 Details

Question Type:	Multiple Choice
Topic:	Q10402 contingency actions for RCS overcooling
System ID:	10402
User ID:	Q10402
Status:	Active
Always select on test:	No
Authorized for practice:	No
Difficulty:	3.00
Time to Complete:	3
Point Value:	1.00
Cross Reference:	
User Text:	44A11AK12
User Number 1:	3.00
User Number 2:	3.30
Comment:	**Proposed reference to be provided to applicant during examination:** NONE

Technical Reference: 40EP-9EO01 (SPTAS), 40DP-9AP06 (SPTA Tech guideline)

K&A: Knowledge of the operational implications of the following concepts as they apply to the (RCS Overcooling) Normal, abnormal and emergency operating procedures associated with (RCS Overcooling).

JUSTIFICATION:

A is correct, RO can only take actions for setpoints that have been exceeded. 1100 is out of the normal band but well above setpoint of 960#

B, C & D are incorrect. These are all permitted per SPTA contingency actions for Tcold < 560°F

21 **ID: Q10370** **Points: 1.00**

Given the following conditions:

- Unit tripped from rated power
- SGTR exists in SG 1
- Pressurizer level is 35%
- RCS pressure is 1200 psia
- RCPs 1A & 2A in service
- HPSI has been throttled
- SG 1 is ISOLATED, pressure is 1100 psia and level is 10% NR
- SG 2 level is 60% WR and increasing
- Thot is 500°F and stable
- Tcold is 497°F and stable
- 2 Full strength CEAs are stuck out, 44 gpm boration in progress

The CRS has reached a step in 40EP-9EO04 (SGTR) to lower RCS pressure. Assuming a constant temperature, what would be the impact of reducing RCS pressure to 1000 pisa?

A. RCPs must be secured

B. Boron dilution of the RCS

C. Upper Head voiding could occur

D. Full HPSI flow would need to be established

Answer: B

Question 21 Details

Question Type:	Multiple Choice
Topic:	Q10370 SGTR and possible dilution
System ID:	10370
User ID:	Q10370
Status:	Active
Always select on test:	No
Authorized for practice:	No
Difficulty:	4.00
Time to Complete:	3
Point Value:	1.00
Cross Reference:	
User Text:	42024AA206
User Number 1:	3.60
User Number 2:	3.70
Comment:	**Proposed reference to be provided to applicant during examination:** Steam Tables, Standard Appendix 2 (RCP curves only)

Technical Reference: 40EP-9EO04 (SGTR), 40DP-9AP09 (SGTR Tech Guide)

K&A: Ability to determine and interpret the following as they apply to the Emergency Boration: When boron dilution is taking place

JUSTIFICATION:

A is wrong this pressure is ~ 100 psia above NPSH curve

B is correct, some dilution of the RCS is expected

C is wrong, this pressure is greater than 24°F subcooled, sat press for 500°F is 680 psia

D is wrong, all throttle criteria are met

22 **ID: Q10027** **Points: 1.00**

Given the following plant conditions:

- The Reactor was tripped due to a degrading condenser vacuum.
- Immediately after the trip, the Secondary Operator became involved with the B01 report.
- When this operator returned to B06, condenser backpressure is 6.0" HgA (highest shell).
- Steam Generator levels are both 65% WR.

Assuming no other Operator actions on B06, which of the following correctly describes the condition of the secondary plant?

A. No feed with SBCS valves 1001 & 1004 maintaining SG pressure until Condenser pressure reaches 7.5 inches HgA.

B. No feed, SBCVs 1001 thru 1006 locked out to prevent Condenser over pressurization and SBCVs 1007 & 1008 maintaining SG pressure.

C. Main Feed Pumps feeding in RTO with SBCS valves 1001 & 1004 maintaining SG pressure until Condenser pressure reaches 7.5 inches HgA.

D. Main Feed Pumps feeding in RTO, SBCVs 1001 thru 1006 locked out to prevent Condenser over pressurization and SBCVs 1007 & 1008 maintaining SG pressure.

Answer: D

Question 22 Details

Question Type:	Multiple Choice
Topic:	Q10027 AOP 40AO-9ZZ07 Impact of rising backpressure
System ID:	7819
User ID:	Q10027
Status:	Active
Always select on test:	No
Authorized for practice:	No
Difficulty:	3.00
Time to Complete:	3
Point Value:	1.00
Cross Reference:	
User Text:	42051AK301
User Number 1:	2.80
User Number 2:	3.10
Comment:	**Proposed reference to be provided to applicant during examination:** NONE

Technical Reference: 40AO-9ZZ07, Loss of Vacuum

K&A: Knowledge of the reasons for the following responses as they apply to the Loss of Condenser Vacuum: Loss of steam dump capability upon loss of condenser vacuum

JUSTIFICATION:

A is wrong, Main feed pumps don't trip till 13.5 inches Hga, SBCS locks out at 5.5 inches

B is wrong, Main feed is wrong

C is wrong, Feeding but 1001 -1006 locked out at 5.5 inches Hga

D is correct, Feeding with 1007 & 1008 maintaining to atmosphere

23 **ID: Q10330** **Points: 1.00**

Given the following conditions:

- You are making a tour of the Turbine Building
- You discover an Oil leak at Main Feed Pump B
- There is a small amount of smoke coming off the lagging where the oil is dripping
- You have made the required notifications

In accordance with PVNGS plant policies and procedures which type of fire extinguisher is recommended for use on this class of fire?

A. CO_2 extinguisher

B. Pressurized water extinguisher

C. Any type of fire extinguisher is acceptable

D. ABC Multipurpose Dry Chemical extinguisher

Answer: D

Question 23 Details

Question Type:	Multiple Choice
Topic:	Q10330 fire extingusiers and their uses
System ID:	10330
User ID:	Q10330
Status:	Active
Always select on test:	No
Authorized for practice:	No
Difficulty:	2.00
Time to Complete:	2
Point Value:	1.00
Cross Reference:	
User Text:	42067AA108
User Number 1:	3.40
User Number 2:	3.70
Comment:	**Proposed reference to be provided to applicant during examination:** NONE **Technical Reference:** PVNGS Safety Manual, Site Access Training Handbook **K&A:** Ability to operate and / or monitor the following as they apply to the Plant Fire on Site: Fire fighting equipment used on each class of fire **JUSTIFICATION:** **PVNGS material recommends the ABC multipurpose extinguisher is to be used on flammable liquids**

24 ID: Q10371 Points: 1.00

Given the following conditions:

- Control Room has been evacuated due to a fire
- CRS is performing actions per 40AO-9ZZ19, Control Room Fire
- You have been asked to verify SG levels

Per guidance found in 40AO-9ZZ19, how will SG levels be monitored?

A. "A" train "isolated" transmitters only

B. "B" train "isolated" transmitters only

C. Both trains of transmitters are "fire" qualified

D. I&C must be contacted to take "local" readings at the QSPDS panels

Answer: B

Question 24 Details

Question Type:	Multiple Choice
Topic:	Q10371 SG level indications available at the RSP
System ID:	10371
User ID:	Q10371
Status:	Active
Always select on test:	No
Authorized for practice:	No
Difficulty:	2.00
Time to Complete:	2
Point Value:	1.00
Cross Reference:	
User Text:	42068AA103
User Number 1:	4.10
User Number 2:	4.30
Comment:	**Proposed reference to be provided to applicant during examination:** NONE **Technical Reference:** 40AO-9ZZ19, Control Room Fire **K&A:** Ability to operate and / or monitor the following as they apply to the Control Room Evacuation: S/G level **JUSTIFICATION:** **per appendix A of 40AO-9ZZ19, there are 8 "B" train instruments that which have isolators in their circuits which prevent any effect from a CR fire**

25 ID: Q10332 Points: 1.00

The Post Accident Radiation Monitors (RU-150/151) are installed for the purpose of detecting (1)__ as an indication of __(2)__.

A. (1) RCS Activity (2) Fuel Cladding Boundary Failure

B. (1) RCS Activity (2) RCS Pressure Boundary Failure

C. (1) Containment Activity (2) Fuel Cladding Boundary Failure

D. (1) Containment Activity (2) RCS Pressure Boundary Failure

Answer: A

Question 25 Details

Question Type:	Multiple Choice
Topic:	Q10332 RU-150/151 in alarm indicates clad failure
System ID:	10332
User ID:	Q10332
Status:	Active
Always select on test:	No
Authorized for practice:	No
Difficulty:	3.00
Time to Complete:	3
Point Value:	1.00
Cross Reference:	
User Text:	42076AK201
User Number 1:	2.60
User Number 2:	3.00
Comment:	**Proposed reference to be provided to applicant during examination:** NONE

Technical Reference: 74EM-9EF41, Tech Spec Bases

K&A: Knowledge of the interrelations between the High Reactor Coolant Activity and the following: Process radiation monitors

JUSTIFICATION:

A is correct - RU-150/151 are used to provide indication of Fuel Clad failure as detected by activity in the RCS

RU-1 and RU-16, 148 and 149 are used to detect leakage from the RCS to containment

26	ID: Q9209	Points: 1.00

Given the following conditions:

- A loss of coolant accident (LOCA) has occurred.
- Several seconds after the trip, a lockout of PBA-S03 occurs.

As RCS pressure lowers from 500 to 200 psia the Reactor Operator should observe increasing HPSI ...

A. and LPSI flow to all RCS cold legs.

B. and LPSI flow to ONLY the 2A and 2B cold legs.

C. flow to all RCS cold legs and increasing LPSI flow to ONLY 1A and 1B cold legs.

D. flow to all RCS cold legs and increasing LPSI flow to ONLY 2A and 2B cold legs.

Answer: D

Question 26 Details

Question Type:	Multiple Choice
Topic:	Q9209 Describe the design characteristics of the HPSI/LPSI pumps.
System ID:	9209
User ID:	Q9209
Status:	Active
Always select on test:	No
Authorized for practice:	No
Difficulty:	4.00
Time to Complete:	3
Point Value:	1.00
Cross Reference:	
User Text:	44A16AK11
User Number 1:	3.20
User Number 2:	3.50
Comment:	**Proposed reference to be provided to applicant during examination:** NONE **Technical Reference:** station prints and simplified drawings **K&A:** Knowledge of the operational implications of the following concepts as they apply to the (Excess RCS Leakage) Components, capacity, and function of emergency systems. **JUSTIFICATION:** **Each HPSI supplies all 4 cold legs. LPSI pumps are loop dedicated. Given these conditions only LPSI B is available and it will supply increasing flow to Loop 2 cold legs only. LPSI A if running would supply Loop 1 flow.**

27	ID: Q10333	Points: 1.00

Given the following conditions:

- The CRS has entered the Functional Recovery procedure
- RWT level is 7.0%
- You have been directed to verify proper Recirculation Actuation Signal (RAS)

Which of the following actions must be manually preformed given a proper "A" train RAS actuation?

A. Stop SIA-P01, LPSI pump A

B. Close SIA-UV-666, HPSI A pump Recirc valve

C. Open SIA-UV-674, Cntmt Sump to Safety Injection Valve

D. Close CHA-HV-531, RWT to Train A Safety Injection Valve

Answer: D

EXAMINATION ANSWER KEY

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Question 27 Details

Question Type:	Multiple Choice
Topic:	Q10333 describe proper RAS actuation
System ID:	10333
User ID:	Q10333
Status:	Active
Always select on test:	No
Authorized for practice:	No
Difficulty:	2.00
Time to Complete:	2
Point Value:	1.00
Cross Reference:	
User Text:	44E09EK21
User Number 1:	3.60
User Number 2:	3.90
Comment:	**Proposed reference to be provided to applicant during examination:** NONE

Technical Reference: 40ep-9eo09, pages 98-99 - 40AO-9ZZ17, Inadvertant PPS actuations

K&A: Knowledge of the interrelations between the (Functional Recovery) and the following: Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

JUSTIFICATION:

A is wrong, LPSI pump are tripped on a RAS actuation

B is wrong, All SI miniflow valves close on RAS actuation

C is wrong, RAS sump isolation valves open on RAS actuation

D is correct, RWT isolation valves must be manually operated on RAS actuation

28 **ID: Q10334** **Points: 1.00**

Given the following conditions:

- Unit 1 has been tripped from rated power
- All 4 RCPs are secured due to an inter-system LOCA that could not be isolated
- SBCS is controlling T-cold at 562°F

Which one of the following represents the operational implications of this condition?

A. Low Tave may require manual control of SBCS due to Quick Open block being generated

B. High Tave may require manual control of the SBCS due to overcooling if left in automatic control

C. Low Tave may require manual Feedwater control due to the low Refill demand while in Reactor Trip Override

D. High Tave may require manual Feedwater control due to the high Refill demand while in Reactor Trip Override

Answer: D

EXAMINATION ANSWER KEY

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Question 28 Details

Question Type:	Multiple Choice
Topic:	Q10334 Effects of a single RCP shutdown on T-ave
System ID:	10334
User ID:	Q10334
Status:	Active
Always select on test:	No
Authorized for practice:	No
Difficulty:	4.00
Time to Complete:	3
Point Value:	1.00
Cross Reference:	
User Text:	34003K503
User Number 1:	3.10
User Number 2:	3.50
Comment:	**Proposed reference to be provided to applicant during examination:** NONE

Technical Reference: 40A0-9ZZ16, RRS malfunctions

K&A: Knowledge of the operational implications of the following concepts as they apply to the RCPs: Effects of RCP shutdown on T-ave., including the reason for the unreliability of T-ave. in the shutdown loop

JUSTIFICATION:

A is wrong, Tave goes high

B is wrong, Tave may go high but SBCS operates on Tcold

C is wrong Tave goes high

D is correct, With a constant Tcold, Thot will elevate when Natl Circ is being established. A higher than normal Tave will cause RTO to feed excessively requiring Operators to take manual control of Downcomers.

29	ID: Q10405	Points: 1.00

Due to a malfunction Letdown temperature is increasing, if Letdown temperature exceeds 140°F which one of the following is true?

A. CHN-UV-520 will shift to bypass to protect purification IX resin

B. CHN-UV-521 will shift to bypass to prevent Boronometer damage

C. CHN-UV-520 will shift to bypass to prevent positive reactivity addition

D. CHN-UV-521 will shift to bypass to protect the Mylar window in the Letdown Radiation monitor

Answer: A

Question 29 Details

Question Type:	Multiple Choice
Topic:	Q10405 effect of high temp on IX resin
System ID:	10405
User ID:	Q10405
Status:	Active
Always select on test:	No
Authorized for practice:	No
Difficulty:	2.00
Time to Complete:	2
Point Value:	1.00
Cross Reference:	
User Text:	31004A221
User Number 1:	2.70
User Number 2:	2.70
Comment:	**Proposed reference to be provided to applicant during examination:** NONE

Technical Reference: 40AL-9RK3A (Bd 3 ARP), 40OP-9CH01

K&A: Ability to (a) predict the impacts of the following malfunctions or operations on the CVCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Excessive letdown flow,

JUSTIFICATION:

A is correct, CHN-520 will shift to bypass on high letdown temp to protect resin

B is wrong, CHN-521 shift if Nuclear Cooling water from Letdown heat exchanger exceeds 140

C is wrong, high resin temperature means that IX will release boron causing neg reactivity

D is wrong, CHN-521 shift if Nuclear Cooling water from Letdown heat exchanger exceeds 140

30 **ID: Q8273** **Points: 1.00**

Given the following plant conditions:

- Unit 3 is operating at rated power.
- Pressurizer is in Boron Equalization.
- Charging Pump Mode selector switch is in 1-2-3
- Pressurizer Level Setpoint Control (RCN-LIC-110) is in Remote-Auto.
- The Level Control Selector (CHANNEL X/Y) switch is in CH-Y.
- The Heater Control Selector level Trip (CHANNEL X/Y) switch is in CH-Y
- A leak develops on the reference leg of Level Transmitter 110Y. This leak exceeds the capacity of the condensing chamber's ability to keep the reference leg full.

Because of this, you should expect Level Transmitter 110Y indicated level to**...**

A. decrease causing a trip of all Pzr heaters

B. increase causing a trip of charging pump 1

C. increase causing an increase in letdown flow

D. decrease causing an auto-start of charging pump 3

Answer: C

EXAMINATION ANSWER KEY

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Question 30 Details

Question Type:	Multiple Choice
Topic:	Q8273 PLCS LT-110Y Reference Leg leak
System ID:	4977
User ID:	Q8273
Status:	Active
Always select on test:	No
Authorized for practice:	No
Difficulty:	3.00
Time to Complete:	2
Point Value:	1.00
Cross Reference:	
User Text:	32004A202
User Number 1:	3.90
User Number 2:	4.20
Comment:	**Proposed reference to be provided to applicant during examination:** NONE

Technical Reference: Simplified Drawings

K&A: Ability to (a) predict the impacts of the following malfunctions or operations on the CVCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Loss of PZR level (failure)

JUSTIFICATION:

a leak in the reference leg causes indicated level to increase which will cause an increase in letdown flow. Charging pump 1 is the always running pump and will not trip

31 **ID: Q10376** **Points: 1.00**

Given the following conditions:

- Unit 1 is in Mode 5
- SDC in service using LPSI pump "A"
- SIA-HV-635, LPSI HDR A to RC Loop 1A, is closed
- SIA-HV-645, LPSI HDR A to RC Loop 1B, is full open
- You have been directed to raise RCS flow by 500 gpm while maintaining RCS temperature constant

Per 40OP-9SI01, Shutdown Cooling Initiation, which set of valves would be used to make this adjustment?

A. SIA-HV-691, (SDC A Warmup Bypass) and SIA-HV-657 (SDCHX Outlet to RC Loops)

B. SIA-HV-635 (LPSI HDR A to RC Loop 1A) and SIA-HV-691, (SDC A Warmup Bypass)

C. SIA-HV-635, (LPSI HDR A to RC Loop 1A) and SIA-HV-306 (LPSI SDCHX Bypass)

D. SIA-HV-306 (LPSI SDCHX Bypass) and SIA-HV-657 (SDCHX Outlet to RC Loops)

Answer: D

Question 31 Details

Question Type:	Multiple Choice
Topic:	Q10376 increasing SDC flow without changing temperature
System ID:	10376
User ID:	Q10376
Status:	Active
Always select on test:	No
Authorized for practice:	No
Difficulty:	3.00
Time to Complete:	2
Point Value:	1.00
Cross Reference:	
User Text:	34005K410
User Number 1:	3.10
User Number 2:	3.10
Comment:	**Proposed reference to be provided to applicant during examination:** NONE

Technical Reference: SDC Initiation, 40OP-9SI01

K&A: Knowledge of RHRS design feature(s) and/or interlock(s) which provide or the following: Control of RHR heat exchanger outlet flow

JUSTIFICATION:

A is wrong, SIA-691 is kept closed

B is wrong, Loop injection valves are maintained full open or closed not used to throttle, 691 is kept closed

C is wrong, SI-635 Loop injection valves are maintained full open or closed not used to throttle

D is correct, Shutdown Cooling procedure directs the use of 657 and 306 to control flow rate and temperature

32 **ID: Q10386** **Points: 1.00**

Given the following conditions:

- Unit 1 is in Mode 5
- RCS pressure is 360 psia
- RCS temperature is 190°F

What automatic action would you expect to happen if RCS pressure were allowed to reach 410 psia?

A. Low Temperature Over Pressure (LTOP) relief lifts

B. Safety Injection Tank outlet valves receive an auto open signal

C. Bypass for Pressurizer pressure low signal (SIAS) is automatically removed

D. SIC-UV-653, RC Loop 1 to SDC - LPSI pump A suction receives an auto close signal

Answer: B

Question 32 Details

Question Type:	Multiple Choice
Topic:	Q10386 RCS exceeds 410 psia interlocks
System ID:	10386
User ID:	Q10386
Status:	Active
Always select on test:	No
Authorized for practice:	No
Difficulty:	3.00
Time to Complete:	3
Point Value:	1.00
Cross Reference:	
User Text:	32006K4.17
User Number 1:	3.80
User Number 2:	4.10
Comment:	**Proposed reference to be provided to applicant during examination:** NONE

Technical Reference: SDC Initiation, 40OP-9SI01, Tech Specs. 01-E-SIB-014, Outage GOP

K&A: Knowledge of ECCS design features(s) and/or interlock(s) which provide for the following Safety Injection Valve Interlocks

JUSTIFICATION:

A is wrong, the LTOP lifts at 467 psia

B is correct, Valve receive an auto open signal at 410 psia

C is wrong, this occurs at 500 psia

D is wrong, this auto close was mod out to prevent loss of SDC events

33 **ID: Q10367** **Points: 1.00**

The following conditions exist in Unit 1:

- Unit is tripped concurrent with a Loss of Offsite power
- CRS is taking actions in accordance with 40EP-9EO04, SGTR
- An RO is venting the Reactor Head to the Reactor Drain Tank per Standard Appendix 15
- **NO** ESFAS signals are present
- RDT High Pressure alarm has annunciated
- RDT High Temperature alarm has annunciated

Which of the following effects will occur if RDT pressure and temperature continue to increase?

A. RDT vent valve to Containment opens on high RDT pressure

B. Reactor head vent valves to the RDT auto close on high RDT pressure

C. RDT vent valve to Waste Gas System will isolate on high RDT temperature

D. RDT pressurizes until the rupture disk fails, venting energy to Containment

Answer: D

Question 33 Details

Question Type:	Multiple Choice
Topic:	Q10367 loss of RDT
System ID:	10367
User ID:	Q10367
Status:	Active
Always select on test:	No
Authorized for practice:	No
Difficulty:	3.00
Time to Complete:	3
Point Value:	1.00
Cross Reference:	
User Text:	35007K301
User Number 1:	3.30
User Number 2:	3.60
Comment:	**Proposed reference to be provided to applicant during examination:** NONE

Technical Reference: 40AL-9RK3A, ARP

K&A: Knowledge of the effect that a loss or malfunction of the PRTS will have on the following: Containment

JUSTIFICATION:

A is wrong, this valve does not open on high RDT pressure

B is wrong, Rx head vent valves due not auto close on high RDT pressure

C is wrong, RDT isolates to the Waste Gas system on 10 lbs not temperature

D is correct, rupture disc fails at 120 psid

34 **ID: Q10412** **Points: 1.00**

Given the following conditions:

- Unit is a rated power.
- A small SGTR occurs in SG #2.
- RU-142, Main Steam Line radiation monitor is in alarm
- The crew trips the reactor and performs SPTAs.
- SG levels are 50% WR

Which of the following is true in regards to RU-142 response following the trip?

A. Remains in alarm until SG 2 is isolated.

B. Clears due to the drop in N-16 production.

C. Clears due to the reduced primary to secondary D/P.

D. Remains in alarm until SG levels are raised to 45% NR.

Answer: B

Question 34 Details

Question Type:	Multiple Choice
Topic:	Q10412 RU-142 response to a SGTR
System ID:	10412
User ID:	Q10412
Status:	Active
Always select on test:	No
Authorized for practice:	No
Difficulty:	3.00
Time to Complete:	3
Point Value:	1.00
Cross Reference:	
User Text:	37073K501
User Number 1:	2.50
User Number 2:	3.00
Comment:	**Proposed reference to be provided to applicant during examination:** NONE

Technical Reference: 74RM-9EF41 (RMS System alarm response)

K&A: Knowledge of the operational implications as they apply to concepts as they apply to the PRM system: Radiation theory, including sources, types, units, and effects

JUSTIFICATION:

A is wrong, N-16 is not dependent on SG isolation

RU-142 is used to detect N-16. N-16 is dependent on power level and goes away shortly after Rx trip making B the correct answer.

C is wrong, N-16 detectors are very sensitive and will detect any leak, the reduction in DP when SG pressure increases by 100 psia is insignificant

D is wrong, Raising level is performed for Iodine scrubbing

35 **ID: Q10368** **Points: 1.00**

Given that Unit 1 is operating at rated power, with all systems aligned normally. Which one of the following conditions would cause Spent Fuel temperature to rise?

A. Spray Pond temperature rising

B. Loss of 480Vac MCC, NHN-M04

C. Loss of a Cooling Tower load center, NGN-L26

D. Closing down 2 turns on the Essential Cooling Water heat exchanger outlet valve

Answer: C

Question 35 Details

Question Type:	Multiple Choice
Topic:	Q10368 how does PCW affect Spent Fuel pool
System ID:	10368
User ID:	Q10368
Status:	Active
Always select on test:	No
Authorized for practice:	No
Difficulty:	4.00
Time to Complete:	4
Point Value:	1.00
Cross Reference:	
User Text:	38008K101
User Number 1:	3.10
User Number 2:	3.10
Comment:	**Proposed reference to be provided to applicant during examination:** NONE

Technical Reference: 1M-NCP-001

K&A: Knowledge of the physical connections and/or cause-effect relationships between the CCWS and the following systems: SWS

JUSTIFICATION:

A is wrong, Spray pond does not cool Spent fuel Pool other than T-mod in an Outage

B is wrong, M04 would affect cleanup pumps not cooling pumps

C is correct, fans tripping heat up Circ water which heats up Nuclear Cooling water which is used in the SFP Heat Exchanger

D is wrong, this alignment is used in a loss of NCW, not a normal alignment

36	ID: Q10388	Points: 1.00

Which of the following conditions maintains Pressurizer spray line temperature above the alarm setpoint at NOP/NOT?

A. A small orifice in the spray valve disc

B. A mechanical stop on the closed seat

C. A bypass line around the main spray valves

D. The spray valve controller maintains the valves slightly open

Answer: C

Question 36 Details

Question Type:	Multiple Choice
Topic:	Q10388 Spray valve warmup
System ID:	10388
User ID:	Q10388
Status:	Active
Always select on test:	No
Authorized for practice:	No
Difficulty:	3.00
Time to Complete:	3
Point Value:	1.00
Cross Reference:	
User Text:	33010K4.01
User Number 1:	2.70
User Number 2:	2.90
Comment:	**Proposed reference to be provided to applicant during examination:** NONE **Technical Reference:** 40AL-9RK4A, B04A (PZR Trbl) **K&A:** Knowledge of PZR PCS design feature(s) and/or interlock(s) which provide for the following: Spray valve warm-up **JUSTIFICATION:** **A is wrong, An SI valve has this feature not Spray valves** **B is wrong, no mechanical stop** **C is correct, bypass lines are throttled open to keep spray line temperature > 505°F** **D is wrong, controller maintains valves fully closed**

37 **ID: Q10374** **Points: 1.00**

Given the following conditions:

- Unit 1 is rated power
- Pressurizer Master Controller, RCN-PIC-100, is in manual with a 33% output

If manual output were now changed to 55%, Proportional Heaters will be at ______ and Main Spray valves will be _____.

A. 0% output, Full open

B. 100% output, Full open

C. 0% output, Partially open

D. 100% output, Partially open

Answer: A

Question 37 Details

Question Type:	Multiple Choice
Topic:	Q10374 spray valve response to PPCS master controller changes
System ID:	10374
User ID:	Q10374
Status:	Active
Always select on test:	No
Authorized for practice:	No
Difficulty:	3.00
Time to Complete:	3
Point Value:	1.00
Cross Reference:	
User Text:	33010A401
User Number 1:	3.70
User Number 2:	3.50
Comment:	**Proposed reference to be provided to applicant during examination:** NONE

Technical Reference: LOIT lesson Plan

K&A: Ability to manually operate and/or monitor in the control room: PZR spray valve

JUSTIFICATION:

RCN-PIC-100 controlling range is 0-50%, the null point being 16.5 % with proportional heaters at 50% output. Spray control is valves closed to valves open in the range of 33 to 50% controller output. at 50% heaters are off spray full open.

Modified from question 14698

38 **ID: Q10336** **Points: 1.00**

Given the following conditions:

- Unit 1 is operating at rated power
- Channel "A" DNBR and LPD (parameters 3 and 4) are tripped and in bypass during performance of Core Protection Calculator (CPC) calibration

NOW

- CPC "C" trips due to an internal processor fault
- Channel "C" parameters 3 and 4 (DNBR, LPD) trip

From the list below select the condition that describes the Reactor Protection System response to this failure?

A. All Reactor Trip Switchgear breakers open

B. No Reactor Trip Switchgear breakers open

C. Only Reactor Trip Switchgear breaker C opens

D. Only Reactor Trip Switchgear breakers A and C open

Answer: B

Question 38 Details

Question Type:	Multiple Choice
Topic:	Q10336 failed CPCs effect on RPS
System ID:	10336
User ID:	Q10336
Status:	Active
Always select on test:	No
Authorized for practice:	No
Difficulty:	4.00
Time to Complete:	3
Point Value:	1.00
Cross Reference:	
User Text:	37012K611
User Number 1:	2.90
User Number 2:	2.90
Comment:	**Proposed reference to be provided to applicant during examination:** NONE

Technical Reference: Alarm response for B05 - 5B04D, 5A13B, 5A13D

K&A: Knowledge of the effect of a loss or malfunction of the following will have on the RPS: Trip setpoint calculators

JUSTIFICATION:

A is wrong, Channel A CPCs in bypass and tripped will not open any legs in the trip matrix. This leaves PPS in a 2 of 3 trip logic condition on the remaining CPCs. A single channel trip will not trip any RTSG breakers

B is correct, a single channel trip does not trip the associated RTSG breaker

C is wrong, same as A

D is wrong, same as A

39 **ID: Q63943** **Points: 1.00**

Given the following conditions:

- Unit 1 is operating at rated power
- Wide range Pressurizer pressure input (RCD-PT-102D) to the Plant Protection System (PPS) is behaving erratically

If RCD-PT-102D fails __(1)__ then a channel "D" __(2)__ will occur.

A. (1) Low (2) SIAS, CIAS and Low Pressure RPS Trip

B. (1) Low (2) CPC Auxiliary Trip and Low Pressure RPS Trip

C. (1) High (2) CPC Auxiliary Trip and High Pressure RPS Trip

D. (1) High (2) Supplemental Protection System Trip and High Pressure RPS Trip

Answer: A

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Question 39 Details

Question Type:	Multiple Choice
Topic:	Q63943 Failed PZR wide rage instrument
System ID:	9193
User ID:	Q63943
Status:	Active
Always select on test:	No
Authorized for practice:	No
Difficulty:	4.00
Time to Complete:	3
Point Value:	1.00
Cross Reference:	
User Text:	32013K601
User Number 1:	2.70
User Number 2:	3.10
Comment:	**Proposed reference to be provided to applicant during examination:** NONE

Technical Reference: Panel B05 alarm responses 5A05C, 5A07A, 5A13C AND 5A05A

K&A: Knowledge of the effect of a loss or malfunction on the following will have on the ESFAS: Sensors and detectors

JUSTIFICATION:

A is correct, 102D is wide range which feeds SIAS, CIAS, and Low pressure trips

B is wrong, CPC Auxiliary trip comes from narrow range transmitter 101D

C is wrong, same as B as does high press trip

D is wrong, Supp. trip comes from pt-199

40 **ID: Q10389** **Points: 1.00**

Given the following conditions:

- Unit 1 is operating at rated power
- The CRS directs an RO to initiate a SIAS from the Aux Relay Cabinets
- The RO performs the following actions:
- Depresses the 1-3 and 2-4 SIAS trip pushbuttons simultaneously on the "A" train
- Depresses the 1-3 and 2-4 SIAS trip pushbuttons sequentially (push then release) on the "B" train

Assuming that RCS pressure remains above the SIAS setpoint, you would expect an "A" train SIAS full initiation with ...

A. no initiation of the "B" train, "A" SIAS can be reset by depressing either reset pushbutton

B. a half leg initiation of the "B" train, "A" SIAS can be reset by depressing either reset pushbutton

C. no initiation of the "B" train, "A" SIAS can only be reset by depressing both reset pushbuttons simultaneously

D. a half leg initiation of the "B" train, "A" SIAS can only be reset by depressing both reset pushbuttons simultaneously

Answer: A

Question 40 Details

Question Type:	Multiple Choice
Topic:	Q10389 manual initiation and reset from Aus Relay Cabinets
System ID:	10389
User ID:	Q10389
Status:	Active
Always select on test:	No
Authorized for practice:	No
Difficulty:	4.00
Time to Complete:	3
Point Value:	1.00
Cross Reference:	
User Text:	32013A403
User Number 1:	4.50
User Number 2:	4.70
Comment:	**Proposed reference to be provided to applicant during examination:** NONE **Technical Reference:** 73ST-9DG01, ISG testing **K&A:** Ability to manually operate and/or monitor in the control room: ESFAS initiation **JUSTIFICATION:** **To initiate an ESFAS actuation both buttons must be pushed sim. pushing and releasing gives no initiation half leg or otherwise, power is still available to all relays. Resetting requires that either reset button on the train be depressed.** **This makes A the correct answer**

41 **ID: Q5254** **Points: 1.00**

With respect to the Containment HVAC system:

The Containment Normal ACUs are cooled by __(1)__ and the Control Element Drive Mechanism ACUs are cooled by __(2)__.

A. (1) Normal Chilled Water (2) Normal Chilled Water

B. (1) Normal Chilled Water (2) Nuclear Cooling Water

C. (1) Nuclear Cooling Water (2) Normal Chilled Water

D. (1) Nuclear Cooling Water (2) Nuclear Cooling Water

Answer: B

Question 41 Details

Question Type:	Multiple Choice
Topic:	Q5254 HC sys - cnmt HVACs Normal Cooling System's
System ID:	4601
User ID:	Q5254
Status:	Active
Always select on test:	No
Authorized for practice:	No
Difficulty:	2.00
Time to Complete:	3
Point Value:	1.00
Cross Reference:	
User Text:	35022K104
User Number 1:	2.90
User Number 2:	2.90
Comment:	**Proposed reference to be provided to applicant during examination:** NONE **Technical Reference:** 40OP-9NC01 & 40OP-9WC01 **K&A:** Knowledge of the physical connections and/or cause-effect relationships between the CCS and the following systems: Chilled water **JUSTIFICATION:** **Normal Chilled water supplies the Containment normal ACUs and Nuclear Cooling water cools CEDM ACUs in containment**

42 **ID: Q10399** **Points: 1.00**

Given the following conditions:

- Unit 1 has tripped due a LOCA inside Containment
- SIAS/CIAS/MSIS/CSAS have initiated
- Both Containment Spray trains have failed to actuate
- The CRS has entered the Functional Recovery procedure
- CTPC-2 is being implemented to supply CS flow using LPSI pump A

Which one of the below listed sets of parameters will be monitored to satisfy CPTC-2?

A. containment press and CS flow

B. containment humidity and CS flow

C. containment press and LPSI pump amps

D. containment humidity and LPSI pump amps

Answer: C

Question 42 Details

Question Type:	Multiple Choice
Topic:	Q10399 monitor CS parameters with LPSI flow
System ID:	10399
User ID:	Q10399
Status:	Active
Always select on test:	No
Authorized for practice:	No
Difficulty:	3.00
Time to Complete:	2
Point Value:	1.00
Cross Reference:	
User Text:	35026A101
User Number 1:	3.90
User Number 2:	4.20
Comment:	**Proposed reference to be provided to applicant during examination:** NONE

Technical Reference: 40EP-9EO09, CTPC-2

K&A: Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the CSS controls including: Containment pressure

Justification:

A and B are incorrect. When LPSI is cross tied to CS, CS header flow is not available. (40EP-9EO09, CTPC-2, note by step 3).

C is the correct answer. 40EP-9EO09, CTPC-2 step 3.1.f limits amps to ensure continued operation of the LPSI pump. Containment pressure will drop if the section is performed correctly.

D is incorrect. Humidity will be high initially from the LOCA, so a change would not be seen.

43 **ID: Q10340** **Points: 1.00**

Given the following conditions:

- Unit 1 is operating at 80% power
- Both Main Feedpumps are in service

There has been a malfunction of the steam admission poppet valve assembly to the A Main Feedpump Turbine. Assuming a loss of Hot Reheat Steam the "A" Main Feedpump Turbine will ...

A. trip, causing a RPCB

B. shift to Main Steam for it's steam source

C. shift to Cold Reheat Steam for it's steam source.

D. have no change, Hot Reheat Steam is the alternate steam source under the given conditions

Answer: B

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Question 43 Details

Question Type:	Multiple Choice
Topic:	Q10340 Loss of Hot Reheat steam to MFPs
System ID:	10340
User ID:	Q10340
Status:	Active
Always select on test:	No
Authorized for practice:	No
Difficulty:	3.00
Time to Complete:	3
Point Value:	1.00
Cross Reference:	
User Text:	34039K304
User Number 1:	2.50
User Number 2:	2.60
Comment:	**Proposed reference to be provided to applicant during examination:** NONE

Technical Reference: LOIT lesson plan

K&A: Knowledge of the effect that a loss or malfunction of the MRSS will have on the following: MFW pumps

JUSTIFICATION:

HOT reheat steam, Main Steam and Aux steam are the 3 sources to the MFP turbines

Main feed is used during startup and high load conditions
Hot Reheat normal and low load conditions
Aux steam for testing

At 80% power and two MFP available HOt reheat steam will be the source steam, given this loss the turbine will use Main Steam to operate for these reasons B is the correct answer

A is wrong, no MFP trip

C is wrong, Cold reheat is not a source

D is wrong, Hot Reheat is the normal source

44	ID: Q10369	Points: 1.00

The Main Steam Safety Valves lift set points are established to ...

A. prevent the SGs from exceeding design pressure

B. protect the Main Steam piping from overpressurization

C. prevent the RCS Pressure Safety Limit from being exceeded

D. augment the Steam Bypass system during a Large Load Reject

Answer: C

Question 44 Details

Question Type:	Multiple Choice
Topic:	Q10369 MSSV design limits
System ID:	10369
User ID:	Q10369
Status:	Active
Always select on test:	No
Authorized for practice:	No
Difficulty:	4.00
Time to Complete:	2
Point Value:	1.00
Cross Reference:	
User Text:	2.2.22
User Number 1:	3.40
User Number 2:	4.10
Comment:	

Proposed reference to be provided to applicant during examination: NONE

Technical Reference: Tech Specs

K&A: Knowledge of limiting conditions for operations and safety limits.

Justification:

C is the correct answer. Tech Spec Bases, page B 2.1.2-1 states that the Main Steam Safety Valves have settings established to ensure that the RCS pressure SL will not be exceeded.

Memory question. The three distractors are incorrect.

45 **ID: Q15884** **Points: 1.00**

Assume that all Digital Feedwater Control System (DFWCS) input transmitters are in service and selected to AVERAGE.

- The plant is at 15.5% power.
- Power is being increased to 20%.
- Steam Generator #1 downcomer valve position is 80% and is opening slowly.
- Steam Generator #2 downcomer valve position is 70% and is opening slowly.

Concerning the DFWCS, which (if any) of the following automatic actions will occur?

A. Only Steam Generator #1 will go through swapover.

B. No DFWCS automatic action will occur until 16.5% power is reached.

C. Both Steam Generator #1 and Steam Generator #2 will go through swapover.

D. No DFWCS automatic action will occur until both Steam Generator downcomer valves are 80% open.

Answer: C

Question 45 Details

Question Type:	Multiple Choice
Topic:	Q15884 Determine if swapover will occur
System ID:	4831
User ID:	Q15884
Status:	Active
Always select on test:	No
Authorized for practice:	No
Difficulty:	3.00
Time to Complete:	3
Point Value:	1.00
Cross Reference:	
User Text:	34059A103
User Number 1:	2.70
User Number 2:	2.90
Comment:	**Proposed reference to be provided to applicant during examination:** NONE **Technical Reference:** Simplified drawings, 40OP-9ZZ04(Plant Startup Mode 2 to 1) **K&A:** Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the MFW controls including: Power level restrictions for operation of MFW pumps and valves. **Justification:** **C is the correct answer. 40OP-9ZZ04(Plant Startup Mode 2 to 1), page 43 states that swapover will occur if power is greater than 16.5% OR between 15 and 16.5% AND one downcomer valve reaches 80%. The simplified drawings show that if one DFWCS meets this criteria, the other will swapover as well. This explanation renders distractors A, B, and D as incorrect.**

46	ID: Q10342	Points: 1.00

Which of the below listed buses provides control power to AFB-P01, Auxiliary Feedwater Pump "B"?

A. PKB-D22

B. PKD-D24

C. PNB-D26

D. PND-D28

Answer: A

Question 46 Details

Question Type:	Multiple Choice
Topic:	Q10342 Power supplies to AFB-P01
System ID:	10342
User ID:	Q10342
Status:	Active
Always select on test:	No
Authorized for practice:	No
Difficulty:	2.00
Time to Complete:	2
Point Value:	1.00
Cross Reference:	
User Text:	34061K202
User Number 1:	3.70
User Number 2:	3.70
Comment:	**Proposed reference to be provided to applicant during examination:** NONE **Technical Reference:** 40AO-9ZZ13, Loss of Class/Instrument Control Power **K&A:** Knowledge of bus power supplies to the following: AFW electric drive pumps **Justification:** **Memory question. 40AO-9ZZ13, Loss of Class/Instrument Control Power, page 77, shows that PKB-D22 supplies control power to AFB-P01.**

47 **ID: Q10396** **Points: 1.00**

Given the following conditions:

- Unit 1 tripped due to a FWCS malfunction
- AFA-P01 is OOS
- SPTAs are in progress
- SGs are being fed at 500 gpm with the AFB-P01
- AFAS-1 initiates
- The RO positions the "B" Aux Feed isolation valves AFB-UV-34/35 to open then closed

Which one of the following conditions is correct?

A. AFB-UV-34 is in override, 0 feed to SG #1, 500 gpm feedrate to SG #2

B. Both Aux Feed valves are in override, full feed to SG #1, 0 gpm to SG #2

C. No Aux Feed valves are in override, full feed to SG #1, 0 gpm feedrate to SG #2

D. Both Aux Feed valves are in override, 0 gpm feedrate to SG #1, 0 gpm feedrate to SG #2

Answer: C

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Question 47 Details

Question Type:	Multiple Choice
Topic:	Q10396 describe the availability of Auxiliary Feedwater
System ID:	10396
User ID:	Q10396
Status:	Active
Always select on test:	No
Authorized for practice:	No
Difficulty:	4.00
Time to Complete:	3
Point Value:	1.00
Cross Reference:	
User Text:	34061A204
User Number 1:	3.40
User Number 2:	3.80
Comment:	**Proposed reference to be provided to applicant during examination:** NONE

Technical Reference: Drawing 01-E-AFB-005

K&A: Ability to (a) predict the impacts of the following malfunctions or operations on the AFW; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: pump failure or improper

Justification:

C is the correct answer. Referring to drawing 01-E-AFB-005, to place these valves in override, AFB-HS-34C (35C) must be operated, not the "open/close" handswitches. This makes distractors A, B, and D incorrect.

48 **ID: Q66163** **Points: 1.00**

Given the following conditions:

- Unit 2 is operating at rated power.
- All Startup Transformers are initially in a normal lineup.
- Startup Transformer #1, NAN-X01, experiences a fault causing it to lockout.

30 seconds later, which of the following describes the condition of Unit 2?

A. PBA-S03 is energized by its respective DG.

B. PBB-S04 is energized by its respective DG.

C. PBA-S03 and PBB-S04 are both energized by offsite power.

D. Both PBA-S03 and PBB-S04 are both energized by their respective DGs.

Answer: A

Question 48 Details

Question Type:	Multiple Choice
Topic:	Q66163 Startup Transformers under normal operating conditions.
System ID:	9407
User ID:	Q66163
Status:	Active
Always select on test:	No
Authorized for practice:	No
Difficulty:	3.00
Time to Complete:	2
Point Value:	1.00
Cross Reference:	
User Text:	36062K104
User Number 1:	3.70
User Number 2:	4.20
Comment:	**Proposed reference to be provided to applicant during examination:** NONE

Technical Reference: Drawing 1-E-MAA-001

K&A: Knowledge of the physical connections and/or cause-effect relationships between the ac distribution system and the following systems: Off-site power sources

Justification:

A is the correct answer. Referring to drawing 1-E-MAA-001, Startup Transformer 1 is the normal offsite supply to Unit 3 SO6 and Unit 2 SO5, as well as Alternate supply to Unit 1's SO5 and SO6. Therefore, if this transformer is lost, only PBA-S03 will lose power in Unit 2 and have its Diesel Generator start and energize the bus. PBB-SO4 will be unaffected, making distractors B, C, and D incorrect.

49 **ID: Q10343** **Points: 1.00**

Given the following conditions:

- A 4160 V breaker was in the open position when a loss of breaker control power occurred.
- An Operator has been directed to operate this 4160 V breaker locally.

Which of the following is true of local manual operation of this 4160 V breaker if no breaker control power becomes available?

A. Both the closing and tripping springs must be manually charged prior to any local breaker manipulations being performed.

B. The breaker can be locally closed once without manually charging the closing springs, the tripping springs will charge as the breaker closes.

C. The breaker can be locally closed only after manually charging the closing springs, the tripping springs must be manually charged after the breaker closes.

D. The breaker can be locally closed once without manually charging the closing springs, the tripping springs must be manually charged after the breaker closes.

Answer: B

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Question 49 Details

Question Type:	Multiple Choice
Topic:	Q10343 local breaker ops without control power
System ID:	10343
User ID:	Q10343
Status:	Active
Always select on test:	No
Authorized for practice:	No
Difficulty:	3.00
Time to Complete:	2
Point Value:	1.00
Cross Reference:	
User Text:	36062A404
User Number 1:	2.60
User Number 2:	2.70
Comment:	**Proposed reference to be provided to applicant during examination:** NONE

Technical Reference: PVNGS Breaker Lesson Plan

K&A: Ability to manually operate and/or monitor in the control room: Local operation of breakers

Justification:

Bank question. When breakers are open, closing springs are charged. Tripping springs charge when the breaker closes.

Modified from 19147

50 **ID: Q10400** **Points: 1.00**

Given the following conditions:

- Unit 1 is in Mode 6
- Refueling operations are in progress
- SDC train A is in Standby
- SDC train B is in Service
- Refueling LSRO reports lowering level in the Refueling Pool
- Auxiliary Operator reports that the A train LTOP has developed a leak
- SI-HV-653 is de-energized in the open position
- SI-HV-651 WILL NOT stroke closed

In order to isolate the LTOP from the Control Room, the RO must have the Auxiliary Operator energize SI-HV-653 from ...

A. PHA-M31

B. PGA-L33

C. PNC-D27

D. PKC-M43

Answer: D

Question 50 Details

Question Type:	Multiple Choice
Topic:	Q10400 Restoring SDC flow with DC issues
System ID:	10400
User ID:	Q10400
Status:	Active
Always select on test:	No
Authorized for practice:	No
Difficulty:	3.00
Time to Complete:	3
Point Value:	1.00
Cross Reference:	
User Text:	2.2.30
User Number 1:	3.50
User Number 2:	3.30
Comment:	**Proposed reference to be provided to applicant during examination:** NONE **Technical Reference:** 40OP-9PK01 (125 Vdc dist OP), SI system layout **K&A:** Equipment Control: Knowledge of RO duties in the control room during fuel handling such as alarms from fuel handling area, communication with fuel storage facility, systems operated from the control room in support of fueling operations, and supporting instrumentation **Justification:** **D is the correct answer. SI-HV-653 is powered from the C DC bus through an inverter.**

51 ID: Q10344 Points: 1.00

40OP-9DG01, section 7 (Unloading DG "A") contains a note and caution stating that the DG output breaker should be opened immediately once DG load is reduced below .5 MW.

What is the possible impact of continuing to lower load?

A. A Diesel Generator Differential trip may be activated

B. A Diesel Generator Undervoltage trip may be activated

C. A Reverse Power trip of the DG output breaker may be activated

D. A Negative Sequence trip of the DG output breaker may be activated

Answer: C

Question 51 Details

Question Type:	Multiple Choice
Topic:	Q10344 Describe the minimum load required for unloading the DG
System ID:	10344
User ID:	Q10344
Status:	Active
Always select on test:	No
Authorized for practice:	No
Difficulty:	3.00
Time to Complete:	2
Point Value:	1.00
Cross Reference:	
User Text:	36064A211
User Number 1:	2.60
User Number 2:	2.90
Comment:	**Proposed reference to be provided to applicant during examination:** NONE

Technical Reference: 40OP-9DG01, 40AL-9DG01

K&A: Ability to (a) predict the impacts of the following malfunctions or operations on the ED/G system; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Conditions (minimum)

Justification:

A- This is not correct. A Generator Differential trip senses a difference in current on the three phases of the neutral side of the generator and the three phases on the bus side of the output breaker.

B- This is not correct. This alarm senses a voltage regulator failure. The stem refers to lowering load, not voltage.

C- Correct. 40OP-9DG01 (and DG02) state that a reverse power trip can occur in the 0.3 to 0.5 MW indicated range.

D- This is not correct. This trip is caused by current differential between phases.

52	ID: Q10345	Points: 1.00

Given the following plant conditions:

- Unit 2 is in mode 6.
- Containment Refueling Purge is in progress.
- All Containment Refueling Mode Isolation Valves have just closed

A failure of which of the following Radiation Monitors could have caused this condition?

A. RU-37, Power Access Purge

B. RU-33, Refueling Machine Area

C. RU-148, High Range in Containment Area

D. RU-34, Containment Building Refueling Purge

Answer: A

Question 52 Details

Question Type:	Multiple Choice
Topic:	Q10345 RU-37 failure stops cntmt vent
System ID:	10345
User ID:	Q10345
Status:	Active
Always select on test:	No
Authorized for practice:	No
Difficulty:	3.00
Time to Complete:	3
Point Value:	1.00
Cross Reference:	
User Text:	37073K301
User Number 1:	3.60
User Number 2:	4.20
Comment:	**Proposed reference to be provided to applicant during examination:** NONE

Technical Reference: 74RM-9EF41 (Rad Monitor AR), 42AL-2RK5A (B05A alarm response), 40OP-9CP01

K&A: Knowledge of the effect that a loss or malfunction of the PRM system will have on the following: Radioactive effluent releases

Justification:

A is the correct answer as described in 74RM-9EF41, page 6.

Memory question, the other monitors do not feed into the CPIAS circuit.

53 **ID: Q22406** **Points: 1.00**

Given the following conditions:

- Unit 1 is operating at rated power.
- NCN-P01A is in operation with NCN-P01B in standby.
- The Train A Emergency Diesel Generator is tagged out for maintenance.
- ESF Service Transformer NBN-X03 fails.
- This loss does NOT result in a Reactor Trip.

Based on these conditions, the Nuclear Cooling Water system will...

A. have no pumps running.

B. be unaffected (no change in pump operation).

C. remain in operation, however NCN-P01B is now running.

D. remain in operation, with both NCN-P01A and NCN-P01B in operation.

Answer: B

Question 53 Details

Question Type:	Multiple Choice
Topic:	Q22406 NC Power Supply to NC pumps
System ID:	5794
User ID:	Q22406
Status:	Active
Always select on test:	No
Authorized for practice:	No
Difficulty:	3.00
Time to Complete:	3
Point Value:	1.00
Cross Reference:	
User Text:	34076K204
User Number 1:	2.50
User Number 2:	2.60
Comment:	**Proposed reference to be provided to applicant during examination:** NONE **Technical Reference:** station prints and simplified drawings **K&A:** Knowledge of bus power supplies to the following: Reactor building closed cooling water **Justification:** **B is the correct answer. NCW pumps are powered from non-class 4160v busses NBN-S01 and NBN-S02. Losing transformer NBN-X03 with the A Diesel Generator tagged out will result in a loss of Class 4160v power on the A train, but will not affect power to the NCW pumps. The other distractors are therefore incorrect.**

54 ID: Q20772 Points: 1.00

Which of the following is the correct order of plant responses to lowering IA header pressure?

A. Standby compressor starts, Nitrogen backup, IA Header low pressure alarm.

B. IA Header low pressure alarm, Standby compressor starts, Nitrogen backup.

C. Standby compressor starts, IA Header low pressure alarm, Nitrogen backup.

D. IA Header low pressure alarm, Nitrogen backup, Standby compressor starts.

Answer: C

Question 54 Details

Question Type:	Multiple Choice
Topic:	Q20772 Automatic functions IA
System ID:	8375
User ID:	Q20772
Status:	Active
Always select on test:	No
Authorized for practice:	No
Difficulty:	3.00
Time to Complete:	3
Point Value:	1.00
Cross Reference:	
User Text:	38078A301
User Number 1:	3.10
User Number 2:	3.20
Comment:	**Proposed reference to be provided to applicant during examination:** NONE

Technical Reference: 40OP-9ia01(IA normal ops), 40AL-9RK7B (alarm response)

K&A: Ability to monitor automatic operation of the IAS, including: Air pressure

Justification:

B is the correct answer. Normally one compressor is running. The first standby compressor will start at 109 psig and the second standby compressor starts at 105 psig (40OP-9IA01). The instrument air low pressure alarm is at 95 psig (40AL-9RK7B, page 72) and the N2 backup opens at 85 psig 40AL-9RK7B, page 73).

This correct sequence makes the other distractors incorrect.

55 **ID: Q10347** **Points: 1.00**

Given the following conditions:

- Unit 1 has tripped from rated power
- SIAS/CIAS/MSIS have initiated
- WCA-UV-62 (CHW RETURN HDR OUTSIDE CNTMT ISOL VLV) thermals trip while the valve is 50% open and going closed

Which one of the following combination of conditions is correct, WCA-UV-62 is ...

A. closed, Blue SEAS light illuminated

B. closed, Blue SEAS light extinguished

C. 50% open, Blue SEAS light illuminated

D. 50% open, Blue SEAS light extinguished

Answer: B

Question 55 Details

Question Type:	Multiple Choice
Topic:	Q10347 SESS status due to stuck CI valve (WC-62)
System ID:	10347
User ID:	Q10347
Status:	Active
Always select on test:	No
Authorized for practice:	No
Difficulty:	3.00
Time to Complete:	3
Point Value:	1.00
Cross Reference:	
User Text:	35103A301
User Number 1:	3.90
User Number 2:	4.20
Comment:	**Proposed reference to be provided to applicant during examination:** NONE

Technical Reference: 41AL-ES2A, SEIS/SEAS alarm response

K&A: Ability to monitor automatic operation of the containment system, including: Containment isolation

Justification:

B is the correct answer. The valve control circuit has a bypass contact (drawing X-E-WCB-0010) that will continue to close the valve even if the thermal overload contact opens (49 contact) when a CIAS signal is present. Based on information given in the stem, the valve will close, making distractors C and D incorrect.

The SEAS system will show a blue light if a component is called upon to be in a specific position for a given ESFAS actuation and the component is not in that position. In this case, the valve will continue to travel to its intended position and the blue light will not be on. This makes distractor A incorrect.

EXAMINATION ANSWER KEY

2007 NRC Reactor Operator Exam

56	ID: Q10348	Points: 1.00

The #1 CEDM motor generator receives power directly from ...

A. NHN-M03

B. NHN-M10

C. NGN-L03

D. NGN-L10

Answer: C

Question 56 Details

Question Type:	Multiple Choice
Topic:	Q10348 power supplies to CEDM MG sets
System ID:	10348
User ID:	Q10348
Status:	Active
Always select on test:	No
Authorized for practice:	No
Difficulty:	2.00
Time to Complete:	2
Point Value:	1.00
Cross Reference:	
User Text:	31001K201
User Number 1:	3.50
User Number 2:	3.60
Comment:	**Proposed reference to be provided to applicant during examination:** NONE

Technical Reference: electrical prints

K&A: Knowledge of bus power supplies to the following: One-line diagram of power supply to M/G sets.

Justification:

A is the correct answer. 40OP-9SF03 shows the power supply to SFN-C02A (CEDM MG set 1) to be L03, breaker C4.

Memory question, the other distractors have incorrect power supplies.

Modified from Q10221

57	ID: Q10377	Points: 1.00

Given the following plant conditions:

- Unit 1 is operating at rated power.
- Tcold instrument (RCN-TT-111Y) fails low
- All RRS parameters are selected to average.

Which of the following is the correct response to this condition?

A. CEA withdrawl demand, CEDMCS must be taken out of Auto Sequential

B. Maximum refill demand sent to Reactor Trip Override, requires manual feed control if Reactor trips

C. Prevents a Turbine Runback demand, would require manual Main Turbine Load control following a Reactor Power Cutback

D. Minimum level setpoint signal sent to the Pressurizer Level Control System, requires manual or local automatic control of Pressurizer level

Answer: D

Question 57 Details

Question Type:	Multiple Choice
Topic:	Q10377 manual control of PZR level
System ID:	10377
User ID:	Q10377
Status:	Active
Always select on test:	No
Authorized for practice:	No
Difficulty:	3.00
Time to Complete:	2
Point Value:	1.00
Cross Reference:	
User Text:	32011K509
User Number 1:	2.60
User Number 2:	2.70
Comment:	**Proposed reference to be provided to applicant during examination:** NONE

Technical Reference: 40AO-9ZZ16, RRS malfunctions

K&A: Knowledge of the operational implications of the following concepts as they apply to the PZR LCS Reason for manually controlling PZR level

Justification:

D is the correct answer. 40AO-9ZZ17, page 17 has Control System responses to instrument failures. This shows that PLCS will receive a minimum level setpoint.

A is incorrect. The AMI will prevent a withdrawal demand.

B is incorrect. RTO will receive minimum signal since temperature failed low.

C is incorrect. This would send a constant runback signal instead of preventing one.

EXAMINATION ANSWER KEY

2007 NRC Reactor Operator Exam

58 | **ID: Q10404** | **Points: 1.00**

Which one of the following sets of parameters would be indicative of normal RCS flow and temperature at rated power in Unit 1?

A. Core DP = 50 psid, RCP DP = 70 psid, T-hot = 616°F

B. Core DP = 50 psid, RCP DP = 70 psid, T-hot = 621°F

C. Core DP = 70 psid, RCP DP = 110 psid, T-hot = 616°F

D. Core DP = 70 psid, RCP DP = 110 psid, T-hot = 621°F

Answer: C

Question 58 Details

Question Type:	Multiple Choice
Topic:	Q10404 indications associated with normal RCS flow
System ID:	10404
User ID:	Q10404
Status:	Active
Always select on test:	No
Authorized for practice:	No
Difficulty:	3.00
Time to Complete:	3
Point Value:	1.00
Cross Reference:	
User Text:	34002A303
User Number 1:	4.40
User Number 2:	4.60
Comment:	**Proposed reference to be provided to applicant during examination:** NONE

Technical Reference:

K&A: Ability to monitor automatic operation of the RCS, including: Pressure, temperatures, and flows

Justification:

C is the correct answer. The temperature control program shows that a delta T of around 56 degrees exists at 100% power. This would put Thot just over 612degrees F.

Empirical data from the unit control rooms show that normal d/p for the core is ~48 psid and ~110 psid for RCPs.

59 **ID: Q10408** **Points: 1.00**

Given the following conditions:

- SG 1 LT-1111 indicates 50% NR level
- SG 1 LT-1112 indicates 51% NR level
- SG 2 LT-1121 indicates 51% NR level
- SG 2 LT-1122 indicates 52% NR level

If SG 1 LT-1112 were to fail to HIGH, SG 1 level control will shift to ...

A. LT-1111 due to the SG 1 level deviation exceeding 15%

B. LT-1122 due to the SG 1 level deviation exceeding 15%

C. LT-1111 due to the SG 1 to SG 2 level deviation exceeding 15%

D. LT-1122 due to the SG 1 to SG 2 level deviation exceeding 15%

Answer: D

Question 59 Details

Question Type:	Multiple Choice
Topic:	Q10408 monitoring DFWCS with divergent levels
System ID:	10408
User ID:	Q10408
Status:	Active
Always select on test:	No
Authorized for practice:	No
Difficulty:	3.00
Time to Complete:	2
Point Value:	1.00
Cross Reference:	
User Text:	37016A401
User Number 1:	2.90
User Number 2:	2.80
Comment:	**Proposed reference to be provided to applicant during examination:** NONE

Technical Reference: 41AL-1RK6A-6A, FWCS PROCESS TRBL

K&A: Ability to manually operate and/or monitor in the control room: NNI channel select controls

modified Q10087

Justification:

D is the correct answer. 41AL-9RK6A, page 48, under Auto Action 1, states that if the controlling signal for one DFWCS becomes 15% greater than the control signal for the other Steam Generator DFWCS, then the DFWCS with the highest Steam Generator level signal will shift control to maintain level using the lower level signal.

A is incorrect because LT-1111 is on the same SG as LT-1112. This also makes C incorrect.

B is incorrect because a level deviation within the same SG by itself will not cause control to shift to the other DFWCS.

Modified from Q10087

EXAMINATION ANSWER KEY

2007 NRC Reactor Operator Exam

60 **ID: Q10352** **Points: 1.00**

What is the effect on the A train Reactor Vessel Level Monitoring System (RVLMS) if the level 1 heated thermocouple loses power?

A. Levels 1, 3, 5 and 7 will not function. A train RVLMS is Inoperable

B. The loss of the # 1 heated thermocouple disables the entire RVLMS channel. A train RVLMS is Inoperable

C. Voids can only be detected at level 1 if the unheated thermocouple reaches 700°F. A train RVLMS remains Operable

D. All levels will function normally, the heated thermocouple is only used to verify functionality during testing. A train RVLMS remains Operable

Answer: C

Question 60 Details

Question Type:	Multiple Choice
Topic:	Q10352 level 1 heated thermocouple loses power
System ID:	10352
User ID:	Q10352
Status:	Active
Always select on test:	No
Authorized for practice:	No
Difficulty:	4.00
Time to Complete:	3
Point Value:	1.00
Cross Reference:	
User Text:	37017K601
User Number 1:	2.70
User Number 2:	3.00
Comment:	**Proposed reference to be provided to applicant during examination:** NONE

Technical Reference: Lesson plans,

K&A: Knowledge of the effect of a loss or malfunction of the following ITM system components: Sensors and detectors

Justification:

Technical Specifications page 3.3.10-4 outline the conditions for RVLMS to be operable, requiring 4 sensors operable, two upper and two lower. The stem makes the channel operable, therefore distractors A and B are incorrect.

D is incorrect, the HJTC is used for operability, not testing. The System Description manual describes the delta-Ts when covered and uncovered. It also points out that if the unheated thermocouple is >700 degrees F, it will show uncovered. This makes C the correct answer.

61 **ID: Q10353** **Points: 1.00**

Given the following conditions:

- Unit 1 has tripped from rated power
- CRS has entered 40EP-9EO03, Loss of Coolant Accident EOP
- Containment pressure is 15 psig and stable
- Containment Hydrogen levels are 3% and stable

The Crew should ...

A. place Hydrogen Recombiners in service

B. place Hydrogen Recombiners in service only when directed by the TSC.

C. reduce containment pressure, place Hydrogen Recombiners in service at 8.5 psig

D. place Hydrogen Recombiners in service when Containment hydrogen exceeds 4%.

Answer: C

Question 61 Details

Question Type:	Multiple Choice
Topic:	Q10353 H2 control with purge unit
System ID:	10353
User ID:	Q10353
Status:	Active
Always select on test:	No
Authorized for practice:	No
Difficulty:	4.00
Time to Complete:	3
Point Value:	1.00
Cross Reference:	
User Text:	35028A202
User Number 1:	3.50
User Number 2:	3.90
Comment:	**Proposed reference to be provided to applicant during examination:** NONE

Technical Reference: 40EP-9EO03 (LOCA),

K&A: Ability to (a) predict the impacts of the following malfunctions or operations on the HRPS; and (b) based on those predictions, use Procedures to correct, control, or mitigate the consequences of those malfunctions or operations: LOCA condition and relate

Justification:

A is incorrect. Hydrogen Recombiners are not allowed to be put into service with Containment pressure > than 8.5 psig by the LOCA procedure.

B is incorrect. Hydrogen Recombiners do not require TSC approval to put into service.

C is correct. Hydrogen Recombiners can be put into service with hydrogen >0.7% and Containment pressure less than or equal to 8.5%.

D is incorrect. Hydrogen concentration is only required to be at 0.7%.

62	ID: Q10126	Points: 1.00

Given the following conditions:

- Unit 1 is operating at rated power.
- PCA-P01 (Pool Cooling pump A) is operating.
- A LOP occurs on PBA-S03.
- All equipment operates as expected.

Assuming NO Operations actions, Spent Fuel Pool temperature will be ....

A. stable, with PCB-P01 running.

B. stable, with PCA-P01 running.

C. decreasing, with both PCA-P01 and PCB-P01 running.

D. increasing, with neither PCA-P01 or PCB-P01 running.

Answer: D

Question 62 Details

Question Type:	Multiple Choice
Topic:	Q10126 PC Response to a LOP
System ID:	1237
User ID:	Q10126
Status:	Active
Always select on test:	No
Authorized for practice:	No
Difficulty:	3.00
Time to Complete:	3
Point Value:	1.00
Cross Reference:	
User Text:	38033K303
User Number 1:	3.00
User Number 2:	3.30
Comment:	**Proposed reference to be provided to applicant during examination:** NONE **Technical Reference:** 01-E-PCB-001 **K&A:** Knowledge of the effect that a loss or malfunction of the Spent Fuel Pool Cooling System will have on the following: Spent fuel temperature **Justification:** **Bank question. Pool Cooling pumps do not restart automatically on loss of power. Start contact is only closed when CS-1 is in the start position. This is a spring return to normal HS with the 4 - 4C open in after start position.**

63 **ID: Q10354** **Points: 1.00**

Given the following conditions:

- Unit 1 is operating at rated power
- A small tube leak (SGTL) has been verified in SG #2

A "HIGH" alarm on which of the following monitors will cause the Post Filter Blower to shift to the "Thru Filter Mode"?

A. RU-140, Main Steam Line SG #2

B. RU-141 (channel 1), Condenser Vacuum/Gland Seal Exhaust

C. RU-142 (channel 3/4), Main Steam Line N-16

D. RU-143, Particulate & Iodine Channels

Answer: B

EXAMINATION ANSWER KEY

2007 NRC Reactor Operator Exam

Question 63 Details

Question Type:	Multiple Choice
Topic:	Q10354 shift the AR system to the thru filter mode
System ID:	10354
User ID:	Q10354
Status:	Active
Always select on test:	No
Authorized for practice:	No
Difficulty:	2.00
Time to Complete:	2
Point Value:	1.00
Cross Reference:	
User Text:	34055K106
User Number 1:	2.60
User Number 2:	2.60
Comment:	**Proposed reference to be provided to applicant during examination:** NONE **Technical Reference:** 74RM-9EF41 (RMS Alarm response), Prints **K&A:** Knowledge of the physical connections and/or cause effect relationships between the CARS and the following systems: PRM system **Justification:** **B is the correct answer. 74RM-9EF41, page 31, Auto Actions show that RU-141 is the process monitor that actuates the condenser evacuation/gland seal exhaust filtration system.** **Though the other three distractors are indications of a Secondary tube leak, they are not tied to the Post Filter Blower.**

64	**ID: Q10410**	**Points: 1.00**

Given the following conditions:

- Fuel Building Normal supply and exhaust fans have stopped
- Fuel Building Essential AFUs have started
- Control Room Essential AHU fans F04 A & B have started
- Essential Cooling Water Pumps A & B have started
- Essential Chillers A & B have started
- Essential Spray Pond Pumps A & B have started
- This is not an all inclusive list

Which one of the following conditions or actions could have caused these actuations?

A. Spent Fuel Pool area monitor RU-31 has tripped

B. Control Room Ventilation monitor RU-29 has tripped

C. Fuel Building Essential Ventilation System A (FBEVAS) has been actuated from B05

D. Control Room Essential Ventilation Actuation System A (CREFAS) has been actuated from B05

Answer: A

Question 64 Details

Question Type:	Multiple Choice
Topic:	Q10410 interlocks associated with the Radiation Monitors
System ID:	10410
User ID:	Q10410
Status:	Active
Always select on test:	No
Authorized for practice:	No
Difficulty:	3.00
Time to Complete:	2
Point Value:	1.00
Cross Reference:	
User Text:	37072K403
User Number 1:	3.20
User Number 2:	3.60
Comment:	**Proposed reference to be provided to applicant during examination:** NONE

Technical Reference: 74RM-9EF41 (RMS Alarm response), 40OP-9SA01 (BOP ESFAS Modules) Operation

K&A: Knowledge of ARM system design feature(s) and/or interlock(s) which provide for the following: Plant ventilation systems

Justification:

A is the correct answer. 40OP-9SA01, page 5, part 3.3 states that FBEVAS will send trip signals to CREFAS from an automatic or test trip. Since FBEVAS and CREFAS equipment are running (from question stem), then RU-31 must have tripped. Distractors C and D will only actuate the associated system, i.e. no cross trip is sent.

B is incorrect because RU-29 only sends a signal to CREFAS, which does not cross trip FBEVAS.

65	ID: Q6820	Points: 1.00

Given the following conditions:

- Unit 1 is operating a rated power
- I&C is performing a calibration on Circ Water Pump A " Motor Cooling Water flow transmitter"
- Window 7A03A "CIRC WTR SYS TRBL" has alarmed several times due to this calibration

In accordance with the Conduct of Shift procedure which of the following statements correctly identifies Alarm Response Expectations to this alarm? This alarm may be placed in Fast Flash ...

A. with CRS concurrence

B. with CRS concurrence and periodic monitoring

C. by the Reactor Operator with a "Peer" check and periodic monitoring

D. by the Reactor Operator due to this transmitter being considered "Out of Service"

Answer: B

Question 65 Details

Question Type:	Multiple Choice
Topic:	Q6820 ADMIN - Conduct of Shift - Fast Flash
System ID:	2592
User ID:	Q6820
Status:	Active
Always select on test:	No
Authorized for practice:	No
Difficulty:	3.00
Time to Complete:	3
Point Value:	1.00
Cross Reference:	
User Text:	2.1.1
User Number 1:	3.70
User Number 2:	3.80
Comment:	**Proposed reference to be provided to applicant during examination:** NONE **Technical Reference:** Conduct of Shift Operations, 40DP-9OP02 **K&A:** Knowledge of conduct of operations requirements. **Justification:** **Bank question. Conduct of Shift Operations procedure (40DP-9OP02), page 41, part 10.1.5. CRS can direct alarms to be left in fast flash and monitored periodically.**

66 **ID: Q10409** **Points: 1.00**

Which one of the below listed groups of events each require the notification of Plant Personnel?

A. Reactor is at the Point of Adding Heat, Nitrogen is supplying the IA system, Main Condenser vacuum is being broken

B. Venting SITs to containment while in Mode 4, Reactor is at the Point of Adding Heat, Nitrogen is supplying the IA system

C. Nitrogen is supplying the IA system, Main Condenser vacuum is being broken, Venting SITs to containment while in Mode 4

D. Main Condenser vacuum is being broken, Venting SITs to containment while in Mode 4, Reactor is at the Point of Adding Heat

Answer: C

Question 66 Details

Question Type:	Multiple Choice
Topic:	Q10409 system status criteria which require notification of plant personnel
System ID:	10409
User ID:	Q10409
Status:	Active
Always select on test:	No
Authorized for practice:	No
Difficulty:	2.00
Time to Complete:	2
Point Value:	1.00
Cross Reference:	
User Text:	2.1.14
User Number 1:	2.50
User Number 2:	3.30
Comment:	**Proposed reference to be provided to applicant during examination:** NONE

Technical Reference: 40AO-9ZZ06 (Loss of IA), 40OP-9ZZ23 (Outage GOP), 40OP-9AR01 (Cond. Air Removal), 40OP-9SI03 (SIT Ops)

K&A: Knowledge of system status criteria which require the notification of plant personnel.

Justification:

The following procedures outline requirements for notification of plant personnel:

40OP-9AR01, page 33, for opening vacuum breakers

40OP-9ZZ23, page 36, for venting SITs

40AO-9ZZ06, page 10, when nitrogen is supplying the IA system.

Additionally, there is no requirement for notifying plant personnel when the reactor is at the point of adding heat. This makes C the only correct answer.

67	ID: Q10411	Points: 1.00

Given the following conditions:

- You are performing a surveillance test on HPSI pump A
- An obvious typographical error exists in the procedure
- You stop the the activity, and contact your supervisor

Per 01DP-0AP09, Procedure Use and Adherence, you ...

A. must complete an ACT before you continue

B. must complete an TAPA before you continue

C. may continue on with the procedure and must generate an ACT after ST completion

D. may continue on with the procedure and must generate a TAPA after ST completion

Answer: C

Question 67 Details

Question Type:	Multiple Choice
Topic:	Q10411 describe procedure use requirements
System ID:	10411
User ID:	Q10411
Status:	Active
Always select on test:	No
Authorized for practice:	No
Difficulty:	2.00
Time to Complete:	2
Point Value:	1.00
Cross Reference:	
User Text:	2.1.23
User Number 1:	3.90
User Number 2:	4.00
Comment:	**Proposed reference to be provided to applicant during examination:** NONE

Technical Reference: 01DP-0AP09 (Procedure Use and Adherence)

K&A: Ability to perform specific system and integrated plant procedures during all modes of plant operation.

Justification:

C is the correct answer. 01DP-0AP09 (Procedure Use and Adherence), page 15, section 3.14.3 allows the activity to continue if the procedure problem is a typographical error and requires that an ACT be written after completion of the activity. This makes A incorrect.

Band C are incorrect, a TAPA is not required for typographical errors.

Modified from Q8719

68	ID: Q10270	Points: 1.00

Given the following conditions:

- Unit 2 is in Mode 5
- Electrical Maintenance has requested that a procedurally controlled T-Mod be installed

Operations shall place a caution tag on all of the following EXCEPT the:

A. T-mod identifying the controlling document

B. Temporary power source identifying the load it is supplying

C. Normal power source indicating that it is not supplying the affected load

D. Affected component's handswitch indenturing the source of temporary power

Answer: A

Question 68 Details

Question Type:	Multiple Choice
Topic:	Q10270 conditions requiring a Temporary Modifcation
System ID:	10270
User ID:	Q10270
Status:	Active
Always select on test:	No
Authorized for practice:	No
Difficulty:	4.00
Time to Complete:	3
Point Value:	1.00
Cross Reference:	81DP-0DC17
User Text:	2211
User Number 1:	2.50
User Number 2:	3.40
Comment:	**Proposed reference to be provided to applicant during examination:** NONE **Technical Reference:** 40DP-9OP29 (Power Block Permit and Tagging) **K&A:** Knowledge of the process for controlling temporary changes. **Justification:** **C is correct. 40DP-9OP29 (Power Block Permit and Tagging), page 14, section 3.3.5.2 outlines the required tags for installation of temporary power. Hanging a tag on the T-mod itself is not required by this procedure, making the other distractors incorrect.**

69	ID: Q10392	Points: 1.00

Which one of the actions/conditions is correct per 73DP-9ZZ14, Surveillance Testing procedure?

A. No acceptance review is required for an "aborted" ST

B. Cycling a motor operated valve prior to ST performance is a good operational practice

C. Failed steps in an "partially completed ST" shall not be used in the determination of Operability

D. Reperforming steps of an ST is permitted provided this action is documented using replacement pages or ST log entries.

Answer: D

Question 69 Details

Question Type:	Multiple Choice
Topic:	Q10392 ST performance
System ID:	10392
User ID:	Q10392
Status:	Active
Always select on test:	No
Authorized for practice:	No
Difficulty:	3.00
Time to Complete:	3
Point Value:	1.00
Cross Reference:	
User Text:	2.2.12
User Number 1:	3.00
User Number 2:	3.40
Comment:	**Proposed reference to be provided to applicant during examination:** NONE

Technical Reference: 73DP-9ZZ14, Surveillance Testing

K&A: Knowledge of surveillance procedures.

Justification:

D is the correct answer. 73DP-9ZZ14, Surveillance Testing, section 3.7.1 validates this.

A is incorrect. Section 3.6.1.2 requires an aborted ST to be acceptance reviewed.

B is incorrect. This is called "preconditioning" and is addressed in the note under section 3.7.

C is incorrect. The first bullet under section 3.6.1 does not allow failed steps to be invalidated.

70 **ID: Q10356** **Points: 1.00**

The process of determining the Critical Rod position considers numerous conditions. Which one of the following conditions if changed would cause the critical rod position to be lower than calculated?

A. RCS pressure is lowered by 25 psia.

B. The boron concentration is raised by 15 ppm

C. The startup is delayed from 30 to 34 hours post trip.

D. The steam bypass pressure control setpoint is raised by 100 psig.

Answer: C

Question 70 Details

Question Type:	Multiple Choice
Topic:	Q10356 ECC process
System ID:	10356
User ID:	Q10356
Status:	Active
Always select on test:	No
Authorized for practice:	No
Difficulty:	4.00
Time to Complete:	4
Point Value:	1.00
Cross Reference:	
User Text:	2.2.34
User Number 1:	2.00
User Number 2:	3.20
Comment:	**Proposed reference to be provided to applicant during examination:** NONE

Technical Reference: Rx fundamentals

K&A: Knowledge of the process for determining the internal and external effects on core reactivity.

Justification:

For Critical Rod position to be lower than calculated, positive reactivity must be added to the core. C is the correct answer because at the 30 hour point post trip, xenon is decaying off, adding less negative (positive) reactivity.

A is incorrect because the void fraction goes up with a decrease in pressure, allowing more neutrons to leak out of the core, equating to adding negative reactivity.

B is incorrect. Raising boron concentration is adding negative reactivity.

D is incorrect. Raising SBCS setpoint will increase RCS temperature, allowing more neutron leakage.

Modified from Q16222

71 **ID: Q10403** **Points: 1.00**

Which one of the following conditions **IS NOT** required prior to placing the Containment Power Access Purge system in service?

A. Current release permit with start/stop times

B. Containment air grab sample has been obtained

C. Containment pressure must be less than .03 psig

D. Containment Building Refueling Purge monitor RU-34 must be in service

Answer: D

Question 71 Details

Question Type:	Multiple Choice
Topic:	Q10403 procedure use requirements for power access purge
System ID:	10403
User ID:	Q10403
Status:	Active
Always select on test:	No
Authorized for practice:	No
Difficulty:	3.00
Time to Complete:	3
Point Value:	1.00
Cross Reference:	
User Text:	2.1.23
User Number 1:	3.90
User Number 2:	4.00
Comment:	**Proposed reference to be provided to applicant during examination:** NONE

Technical Reference: 40OP-9CP01, Containment Purge System

K&A: Ability to perform specific system and integrated plant procedures during all modes of plant operation.

Justification:

D is correct because RU-34 is NOT required to be in service per 40OP-9CP01, Containment Purge System.

The three distractors are incorrect because they are required by the following sections of this procedure:

A- 6.1.2

B- 6.1.2

C- 6.1.8/6.2.4

72 **ID: Q10358** **Points: 1.00**

Given the following conditions:

- The Unit has tripped from rated power
- The CRS has entered 40EP-9EO04, SGTR procedure

In order to minimize the potential release to atmosphere, which one of the following actions should not be done?

A. Selecting OFF on SGN-HS-1007

B. Feeding the faulted SG using AFA-P01

C. Reducing RCS pressure to within 50 psia of the faulted SG

D. Commencing an RCS Cooldown to a T-hot of less than 540°F

Answer: B

Question 72 Details

Question Type:	Multiple Choice
Topic:	Q10358 describe the SGTR EOP mitigation strategy
System ID:	10358
User ID:	Q10358
Status:	Active
Always select on test:	No
Authorized for practice:	No
Difficulty:	3.00
Time to Complete:	3
Point Value:	1.00
Cross Reference:	
User Text:	2.3.11
User Number 1:	2.70
User Number 2:	3.20
Comment:	**Proposed reference to be provided to applicant during examination:** NONE

Technical Reference: 40EP-9EO04 (SGTR), EOP OPS Expectations

K&A: Radiation Control Ability to control radiation releases.

Justification:

B is the correct answer since it does NOT minimize release to the environment. Per the EOP OPERATIONS EXPECTATIONS, the steam driven aux feedpump should only be used as a last resort.

A is incorrect because it is performed in 40EP-9EO04 (SGTR) in step 9.

C is incorrect, it acts to minimize the leakrate into the SG from the RCS.

D is incorrect, cooling down is the first step in isolating the affected SG.

73 **ID: Q10398** **Points: 1.00**

Given the following conditions:

- Unit 1 is at rated power
- RCP 1A has indications of Seal Failure
- CRS has implemented 40AO-9ZZ04, RCP Emergencies
- The CRS determines that RCP 1A has exceeded Trip Setpoints
- The CRS holds a brief, discussing tripping the 1A RCP

Which one of the following is the correct process to be followed?

A. Trip the 1A RCP, concurrently perform the SPTAs and RCP Emergencies AOP

B. Trip the 1A RCP, address reactivity safety function, concurrently perform the remaining SPTAs and RCP Emergencies AOP

C. Trip the Reactor, trip 1A RCP, address reactivity safety function, concurrently perform the remaining SPTAs and RCP Emergencies AOP

D. Trip the Reactor, address reactivity safety function, trip the 1A RCP, concurrently perform the remaining SPTAs and RCP Emergencies AOP

Answer: D

EXAMINATION ANSWER KEY

2007 NRC Reactor Operator Exam

Question 73 Details

Question Type:	Multiple Choice
Topic:	Q10398 performing AOPs with EOPs
System ID:	10398
User ID:	Q10398
Status:	Active
Always select on test:	No
Authorized for practice:	No
Difficulty:	2.00
Time to Complete:	2
Point Value:	1.00
Cross Reference:	
User Text:	2.4.5
User Number 1:	2.90
User Number 2:	3.60
Comment:	**Proposed reference to be provided to applicant during examination:** NONE

Technical Reference: EOP Users Guide, 40DP-9AP16; AOP Users Guide, 40DP-9AP18; 40AO-9ZZ04, RCP Emergencies.

K&A: Knowledge of the organization of the operating procedures network for normal, abnormal, and emergency evolutions.

Justification:

D is the correct answer. 40AO-9ZZ04, RCP Emergencies, step 7 requires the reactor to be tripped prior to securing the RCP. This makes distractors A and B incorrect. AOP Users Guide, 40DP-9AP18, section 17 states that the Reactivity Control Safety Function SHALL be addressed immediately after a reactor trip. This makes distractor C incorrect.

74 **ID: Q9586** **Points: 1.00**

Given the following conditions:

- Unit 1 has tripped from rated power
- Pressurizer level is 20% and recovering
- RCS pressure is 1800 psia and dropping slowly
- RCS temperature is 563°F and stable
- HPSI flow is adequate

The Crew should stop ...

A. NO RCPs, NPSH and subcooling requirements are being met

B. 1B & 2B RCPs minimizing the chances of a "double sequencing" event

C. 1A & 2A RCPs to reduce the potential for RCS inventory loss should the LOCA event degrade

D. 2A & 2B RCPs leaving the loop 1 RCPs available in the event main spray is needed to support HPSI flow

Answer: C

Question 74 Details

Question Type:	Multiple Choice
Topic:	Q9586 EOP Bases for RCP T2L2 direction
System ID:	6317
User ID:	Q9586
Status:	Active
Always select on test:	No
Authorized for practice:	No
Difficulty:	3.00
Time to Complete:	3
Point Value:	1.00
Cross Reference:	
User Text:	2.4.18
User Number 1:	2.70
User Number 2:	3.60
Comment:	**Proposed reference to be provided to applicant during examination:** NONE

Technical Reference: 40DP-9AP06, SPTA Technical Guidelines.

K&A: Knowledge of the specific bases for EOPs.

Justification:

C is the correct answer. 40DP-9AP06, SPTA Technical Guidelines, page 15, section 5.3 specifies that two RCP's in opposite loops are tripped if RCS pressure drops below the SIAS setpoint (1837 psia) and remains there. This makes distractors A and D incorrect.

B is incorrect. Although the pumps in this distractor are in opposite loops, the reason for securing two pumps is not the double sequencing of ESFAS equipment due to a degraded voltage condition, it is to minimize the loss of RCS inventory due to RCP operation.

75 **ID: Q60605** **Points: 1.00**

Given the following plant conditions:

- Unit 1 has experienced a LOCA
- Pressurizer level is 30% and stable
- Pressurizer pressure is 1100 psia
- Containment temperature is 220°F and increasing slowly
- Containment pressure is 9 psig and increasing slowly
- PBB-S04 is locked out and on fire.
- HPSI throttle criteria are met and HPSI 'A' flow is throttled to 200 gpm per cold leg.
- Containment Spray 'A' flow is 4190 gpm

Which of the following safety functions, if any, are jeopardized?

A. Inventory control

B. All Safety Functions are met

C. Maintenance of Vital Auxiliaries

D. Containment temperature and pressure control.

Answer: D

Question 75 Details

Question Type:	Multiple Choice
Topic:	Q60605 EOP CTPC acceptance critria
System ID:	8714
User ID:	Q60605
Status:	Active
Always select on test:	No
Authorized for practice:	No
Difficulty:	4.00
Time to Complete:	3
Point Value:	1.00
Cross Reference:	
User Text:	2.4.21
User Number 1:	3.70
User Number 2:	4.30
Comment:	**Proposed reference to be provided to applicant during examination:** NONE **Technical Reference:** 40EP-9EO01 (SPTAs), 40DP-9AP06 (Tech Guide) **K&A:** Knowledge of the parameters and logic used to assess the status of safety functions including:1 Reactivity control 2. Core cooling and heat removal 3. Reactor coolant system integrity 4. Containment conditions 5. Radioactivity **Justification:** **Bank Question.** **D is the correct answer. 40EP-9EO01 (SPTAs) step 9.b.2 requires greater than 4350 gpm Containment Spray header flow.**