

## QUESTION RO 1

Plant startup is in progress.

IAW IOI-3, Power Changes, which of the following simultaneous manipulations are allowed?

- A. Adjusting Pressure Set and isolating 5B FW Heater.
- B. Inserting control rods and raising Recirculation flow.
- C. Withdrawing control rods and adjusting Main Generator voltage.
- D. Lowering Recirculation Flow and Placing 6A FW Heater in service.

LOD = \_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_

## QUESTION RO 1

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #	3			
	Group #				
	K/A#	Generic	G2.1.23		
	Importance Rating	4.3			
K&A: Ability to perform general or normal operating procedures during any plant condition					
Generic					
<p>Explanation: <b>Answer C</b> – IAW IOI-3, simultaneous manipulations that affect reactivity are prohibited. Direct reactivity manipulations are control rod movements and reactor recirc adjustments. Changes in feedwater final temperature or reactor pressure are indirect reactivity manipulation. Generator voltage adjustments have small impacts on reactivity and are not considered reactivity manipulations.</p> <p>A – Incorrect – Plausible since isolating a #5 FW HTR has a small effect on final feedwater temperature very low power. However, it would still affect final FW temp and is prohibited while adjusting Pressure Set.</p> <p>B – Incorrect – Plausible since inserting control rods inserts negative reactivity and raising Recirc flow inserts positive reactivity, leading some to see this as allowable. However, IOI-3 does not differentiate between positive or negative reactivity additions.</p> <p>D – Incorrect – Plausible since lowering Recirc flow and placing a FW heater in service both insert negative reactivity. However, IOI-3 does not differentiate between positive or negative reactivity additions.</p>					
Technical Reference(s): IOI-03 Rev. 83		Reference Attached: IOI-03 pp. 9-10			
Proposed references to be provided to applicants during examination: None					
Learning Objective (As available): OT-3046-03-LP					
Question Source:	Bank #				
	Modified Bank #				
	New	x			
Question History:	Previous 2 NRC Exams?	No			
Question Cognitive Level:	Memory or Fundamental Knowledge	x			
	Comprehension or Analysis				
10 CFR Part 55 Content:	55.41	x			
	55.43				
Comments:					

## QUESTION RO 2

The operator needs to compare P601 indications for Suppression Pool temperature with SPDS.

The SPDS parameter value is red.

SPDS indicates the value for Suppression Pool temperature is in a/an \_\_\_\_\_ condition.

- A. Active Alarm
- B. Caution Alarm
- C. BAD Input Data
- D. Normal/Safe Alarm

LOD = \_\_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_\_

## QUESTION RO 2

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #	3			
	Group #				
	K/A#	Generic	G2.1.45		
	Importance Rating	4.3			
K&A: Ability to identify and interpret diverse indications to validate the response of another indication					
Generic					
<p>Explanation: <b>Answer A</b> – &gt; An alarm condition is indicated in the SPDS Display by displaying the text color in red.</p> <p>B – Incorrect – Plausible, a caution condition is indicated in the SPDS Display by displaying the text color in yellow.</p> <p>C – Incorrect – Plausible, a bad input data condition is indicated in the SPDS Display by displaying the text color in magenta.</p> <p>D – Incorrect – Plausible, a normal/safe condition is indicated in the SPDS Display by displaying the text color in green.</p>					
Technical Reference(s): SPDS Ref Manual Rev. G		Reference Attached: SPDS Ref Manual pp.33-34			
Proposed references to be provided to applicants during examination: None					
Learning Objective (As available): OT-Combined-C91-E & O					
Question Source:	Bank # Modified Bank # New	River Bend 2016 # RO-68			
Question History:	Previous 2 NRC Exams? No				
Question Cognitive Level:	Memory or Fundamental Knowledge    x Comprehension or Analysis				
10 CFR Part 55 Content:	55.41    x 55.43				
Comments:					

### QUESTION RO 3

The reactor is in Cold Shutdown with pre-startup evolutions in progress.

The plant is operating with a negative Moderator Temperature Coefficient.

ICS is available and providing valid data.

IAW IOI-01, Cold Startup, SVI-B21-T1176, RCS Heat up and Cooldown Surveillance, is commencing.

SVI-B21-T1176 requires RPV temperature and pressure to be recorded within   (1)   minutes prior to rod withdrawal to achieve criticality, and every   (2)   minutes during the heat up.

	<u>  (1)  </u>	<u>  (2)  </u>
A.	15	15
B.	15	30
C.	30	15
D.	30	30

LOD = \_\_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_\_

## QUESTION RO 3

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #	3			
	Group #				
	K/A#	Generic	G2.2.1		
	Importance Rating	4.5			
K&A: Ability to perform pre-startup procedures for the facility, including operating those controls associated with plant equipment that could affect reactivity					
Generic					
<p>Explanation: <b>Answer B</b> – &gt; IOI-3 and the SVI direct the temperature to be recorded 15 minutes prior to rod withdrawal to achieve criticality and recorded every 30 minutes until it is not achievable to exceed 100 °F/hr heat up rate.</p> <p>A – Incorrect – Plausible, 1<sup>st</sup> part – correct. 2<sup>nd</sup> Part, if ICS is not available and the moderator temperature coefficient is positive, temperature must be recorded every 15 minutes.</p> <p>C – Incorrect – Plausible, 1<sup>st</sup> part – IOI-3 and the SVI direct the temperature to be recorded 15 minutes prior to rod withdrawal to achieve criticality. 2<sup>nd</sup> Part, if ICS is not available and the moderator temperature coefficient is positive, temperature must be recorded every 15 minutes.</p> <p>D – Incorrect – Plausible, 1<sup>st</sup> part – IOI-3 and the SVI direct the temperature to be recorded 15 minutes prior to rod withdrawal to achieve criticality. 2<sup>nd</sup> part – correct.</p>					
Technical Reference(s): IOI-1 Rev. 57, SVI-B21-T1176 Rev. 15		Reference Attached: IOI-1 pp. 14 & 25, SVI-B21-T1176 pp. 1			
Proposed references to be provided to applicants during examination: None					
Learning Objective (As available): OT-3036-02(LP)-A					
Question Source:	Bank #				
	Modified Bank #				
	New		x		
Question History:	Previous 2 NRC Exams?		No		
Question Cognitive Level:	Memory or Fundamental Knowledge		x		
	Comprehension or Analysis				
10 CFR Part 55 Content:	55.41		x		
	55.43				
Comments:					

## QUESTION RO 4

IAW the applicable procedure, which of the following is used to alert the Operator of Control Room annunciators that have been removed from service?

- A. Information Tag
- B. Not In Service Sticker
- C. Temporary Modification Tag
- D. Minor Deficiency Monitoring (MDM) Tag

LOD = \_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_

## QUESTION RO 4

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #	3			
	Group #				
	K/A#	Generic	G2.2.14		
	Importance Rating	3.9			
K&A: Knowledge of the process for controlling equipment configuration or status					
Generic					
<p>Explanation: <b>Answer A</b> – &gt; IAW PAP-1404, Info tags or Caution tags are to be used to identify Control Room annunciators that are removed from service.</p> <p>B – Incorrect – Plausible since Not In Service Stickers were previously used to identify OOS annunciators. However, now NIS Stickers are only used for instrumentation.</p> <p>C – Incorrect – Although the Temp Mod procedure controls annunciators removed from service, TM tags are not used. Additionally, Not-in-Service stickers are no longer allowed to be used to identify OOS annunciators in the Control Room. Plausible if operator not very familiar with TM procedure.</p> <p>D – Incorrect – The MDM Process is for the management of maintenance deficiencies whose significance is so minor that it would not be prudent to remove the equipment from service to repair. Not tracking of annunciators. Plausible if operator confuses these tags with Repair Tags.</p>					
Technical Reference(s): PAP-1404 Rev. 9, NOP-OP-1014 Rev. 8		Reference Attached: PAP-1404 pp. 4-5, NOP-OP-1014 pp. 20-22			
Proposed references to be provided to applicants during examination: None					
Learning Objective (As available): OT-JFG3039-05-6					
Question Source:	Bank # Modified Bank # New	Perry 2019-01 NRC Exam # RO-04			
Question History:	Previous 2 NRC Exams?	Perry 2019-01 NRC Exam # RO-04			
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis	x			
10 CFR Part 55 Content:	55.41 55.43	x			
Comments:					



## QUESTION RO 5

A discharge of Waste Sample Tank (WST) A is in progress in accordance with SVI-G50-T5266, Liquid Radwaste Release Permit

Then annunciator H13-P906-01-A3, RW DISCH ISOL RADWASTE TO ESW PRCS RAD MON HI, alarms.

Based on this information, \_\_\_\_\_.

- A. an additional ESW pump needs to be started
- B. an additional Service Water pump needs to be started
- C. the RADWASTE HI FLW DISCH HDR FCV, G50-F153 has isolated automatically
- D. the RADWASTE HI FLW DISCH HDR FCV, G50-F153 needs to be manually isolated

LOD = \_\_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_\_

## QUESTION RO 5

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #	3			
	Group #				
	K/A#	Generic	G2.3.5		
	Importance Rating	2.9			
K&A: Ability to use radiation monitoring systems, such as fixed radiation monitors and alarms or personnel monitoring equipment					
Generic					
<p>Explanation: <b>Answer C</b> – &gt; Per ARI-H13-P906-01-A3 the G50-F153 valve will automatically isolate on a high radiation condition on the Radwaste to ESW PRCS Rad Monitor.</p> <p>A – Incorrect – Plausible since the G50 SVI requires running an ESW pump during discharges to ensure no low flow condition exists during times of high cooling tower makeup.</p> <p>B – Incorrect – Plausible – In order to restart the discharge, sufficient flow needs to be established.</p> <p>D – Incorrect – Plausible since ARI-H13-P906-01-A3 Subsequent Operator Actions require the operator to “verify” this valve is closed.</p>					
Technical Reference(s): ARI-H13-P906-001 Rev. 8		Reference Attached: ARI-H13-P906-001 pp. 7-8			
Proposed references to be provided to applicants during examination: None					
Learning Objective (As available): OT-COMBINED-D17A-F					
Question Source:	Bank # Modified Bank # New	Perry 2013 # RO-06			
Question History:	Previous 2 NRC Exams? No				
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis x				
10 CFR Part 55 Content:	55.41 x 55.43				
Comments:					

## QUESTION RO 6

Which of the following are PAM instruments per Tech Spec 3.3.3.1, Post Accident Monitoring (PAM) Instrumentation?

1. Shutdown Range Level Indicator, B21-R605 on P601
2. Upset Range Level Recorder, C34-R608 on P680
3. Fuel Zone Level Indicator, B21-R610D on P601
4. Wide Range Level Recorder, B21-R623A on P601

- A. 1 and 2
- B. 1 and 3
- C. 2 and 4
- D. 3 and 4

LOD = \_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_

## QUESTION RO 6

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #	3			
	Group #				
	K/A#	Generic	G2.4.3		
	Importance Rating	3.7			
K&A: Ability to identify post-accident instrumentation					
Generic					
<p>Explanation: <b>Answer D</b> – &gt; Wide Range Level and Fuel Zone Level Indicators on P601 is designated as a PAM instrument in TS 3.3.3.1 Table 3.3.3.1-1.</p> <p>A – Incorrect – Plausible, actions taken in an accident can lead to levels in the RPV only visible in the Shutdown and Upset ranges. However, these instruments are not PAM instruments.</p> <p>B – Incorrect – Plausible, actions taken in an accident can lead to levels in the RPV visible in the Shutdown range. However, this is not a PAM instrument. Fuel Zone Level on P601 is designated as a PAM instrument.</p> <p>C – Incorrect – Plausible, actions taken in an accident can lead to levels in the RPV visible in the Upset range however, this is not a PAM instrument. Wide Range Level on P601 is designated as a PAM instrument.</p>					
Technical Reference(s): Tech Spec 3.3.3.1 Amend. 131 & Amend. 135		Reference Attached: Tech Spec pp. 3.3-20 & 23			
Proposed references to be provided to applicants during examination: None					
Learning Objective (As available): OT-COMBINED-B21(INST)-1.4					
Question Source:	Bank # Modified Bank # New	Perry Audit 2007-1 # RO-9			
Question History:	Previous 2 NRC Exams?	No			
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis	x			
10 CFR Part 55 Content:	55.41 55.43	x			
Comments:					

## QUESTION RO 7

The shutdown margin for Perry is the amount of reactivity by which a xenon-free reactor at 68 °F would be subcritical if all control rods were fully \_\_\_\_.

- A. withdrawn, except an average worth control rod which remains fully inserted
- B. inserted, except for an average worth control rod which remains fully withdrawn
- C. withdrawn, except for the highest worth control rod which remains fully inserted
- D. inserted, except for the highest worth control rod which remains fully withdrawn

LOD = \_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_

## QUESTION RO 7

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #	4			
	Group #				
	K/A#	292002	K1.10		
	Importance Rating	3.5			
K&A: Neutron Life Cycle: Define shutdown margin					
Rx Theory					
<p>Explanation: <b>Answer D</b> – &gt; Shutdown Margin (SDM) is the amount of reactivity that the core is or can be made subcritical. The Tech Spec definition of SDM also specifies a xenon-free reactor at 68 °F and all control rods fully inserted, except for the highest worth control rod which remains fully withdrawn.</p> <p>A – Incorrect – Plausible, 1<sup>st</sup> Part - SDM is determined with control rods inserted, not withdrawn. 2<sup>nd</sup> Part, the highest worth control rod is assumed to be fully withdrawn.</p> <p>B – Incorrect – Plausible, 1<sup>st</sup> Part - Correct. 2<sup>nd</sup> Part, the highest worth control rod is assumed to be fully withdrawn.</p> <p>C – Incorrect – Plausible, 1<sup>st</sup> Part - SDM is determined with control rods inserted, not withdrawn. 2<sup>nd</sup> Part, the highest worth control rod is assumed to be fully withdrawn, not inserted.</p>					
Technical Reference(s): GFE LP (BWR Rx Theory, Ch. 8) Rev. 5		Reference Attached: GFE LP (BWR Rx Theory, Ch. 8) p. 66			
Proposed references to be provided to applicants during examination: None					
Learning Objective (As available): OT-3301-08-32					
Question Source:	Bank # Modified Bank # New	NRC GFES March 2015 # 24 (B1348)			
Question History:	Previous 2 NRC Exams?	No			
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis	x			
10 CFR Part 55 Content:	55.41 55.43	x			
Comments:					

## QUESTION RO 8

The plant was operating at 90% power.

Over the past 2 hours, power was raised to 100% power.

Based on the power change, Xenon concentration will   (1)  .

In order to maintain 100% power, Recirculation flow will have to be   (2)   until equilibrium xenon is reached.

- |    | <u>  (1)  </u>         | <u>  (2)  </u>      |
|----|------------------------|---------------------|
| A. | increase then decrease | lowered then raised |
| B. | decrease then increase | lowered then raised |
| C. | increase then decrease | raised then lowered |
| D. | decrease then increase | raised then lowered |

LOD = \_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_

## QUESTION RO 8

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #	4			
	Group #				
	K/A#	292006	K1.05		
	Importance Rating	2.9			
K&A: Fission Product Poisons: Describe the following processes and state their effect on reactor operations: Equilibrium xenon					
<b>Rx Theory</b>					
<p>Explanation: <b>Answer B</b> – &gt; Because of the increase in flux, Xe concentration will decrease for approx. 5 hrs. Then Xe concentration will start to increase to the new higher equilibrium level over approx. 30-40 hrs. To counteract the positive reactivity inserted by the burnout of Xe, recirc flow must be lowered to maintain 100% power. Once Xe concentration begins increasing, recirc flow must be raised to maintain 100% power.</p> <p>A – Incorrect – 1<sup>st</sup> part – The Xe transient starts by burning out Xe faster than it is produced from the decay of I<sub>135</sub>. After 5 hours, I<sub>135</sub> decays to Xe<sub>135</sub> and raises Xe concentration until Xe equilibrium is reached. 2<sup>nd</sup> Part - Correct.</p> <p>C – Incorrect – 1<sup>st</sup> part – The Xe transient starts by burning out Xe faster than it is produced from the decay of I<sub>135</sub>. After 5 hours, I<sub>135</sub> decays to Xe<sub>135</sub> and raises Xe concentration until Xe equilibrium is reached. 2<sup>nd</sup> part – Due to the initial burnout of Xe, positive reactivity is added to the core, requiring a reduction in core flow to offset the positive reactivity. Once Xe concentration begins to increase, core flow must be raised to offset the added negative reactivity.</p> <p>D – Incorrect – 1<sup>st</sup> part – Correct. 2<sup>nd</sup> part – Due to the initial burnout of Xe, positive reactivity is added to the core, requiring a reduction in core flow to offset the positive reactivity. Once Xe concentration begins to increase, core flow must be raised to offset the added negative reactivity.</p>					
Technical Reference(s): GFE LP (BWR Rx Theory, Ch. 6) Rev. 4		Reference Attached: GFE LP (BWR Rx Theory, Ch. 6) pp. 14, 15, 23			
Proposed references to be provided to applicants during examination: None					
Learning Objective (As available): OT-3301-06-5.A					
Question Source:	Bank #	Modified Bank #	New x		
Question History:	Previous 2 NRC Exams?	No			
Question Cognitive Level:	Memory or Fundamental Knowledge	Comprehension or Analysis	x		
10 CFR Part 55 Content:	55.41	55.43	x		
Comments:					



## QUESTION RO 9

Which of the following are the functions performed by burnable poisons in the reactor?

1. Provide neutron flux shaping
2. Provide more uniform power density
3. Offset the effects of control rod burnout
4. Allow higher enrichment of new fuel assemblies

A. 1, 2 & 3

B. 1, 3 & 4

C. 1, 2 & 4

D. 2, 3 & 4

LOD = \_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_

## QUESTION RO 9

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #	4			
	Group #				
	K/A#	292007	K1.01		
	Importance Rating	3.1			
K&A: Fuel Depletion And Burnable Poisons: Define burnable poison and state its use in the reactor					
<b>Rx Theory</b>					
<p>Explanation: <b>Answer C</b> – &gt; (1) Burnable poisons provide neutron flux shaping and (2) more uniform power shaping by axially and radially zoning the loading of burnable poisons. (4) Adding burnable poisons also allow for higher enrichment of new fuel assemblies.</p> <p>A – Incorrect – Plausible, 1 &amp; 2 are correct. 3 is incorrect. Burnable poisons do not offset the effects of control rod burnout. Control rods are positioned in the core to control Rx power and are alternated throughout the fuel cycle to limit control rod burnout.</p> <p>B – Incorrect – Plausible, 1 &amp; 4 are correct. 3 is incorrect. See above.</p> <p>D – Incorrect – Plausible, 2 &amp; 4 are correct. 3 is incorrect. See above.</p>					
Technical Reference(s): GFE LP (BWR Rx Theory, Ch. 7) Rev. 4		Reference Attached: GFE LP (BWR Rx Theory, Ch. 7) pp. 6-7			
Proposed references to be provided to applicants during examination: None					
Learning Objective (As available): OT-3301-07-1					
Question Source:	Bank # Modified Bank # New	NRC GFE Exam Sep 2017 Form A #32			
Question History:	Previous 2 NRC Exams?	No			
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis	x			
10 CFR Part 55 Content:	55.41 55.43	x			
Comments:					

## QUESTION RO 10

The steam inlet nozzle used in steam jet air ejectors converts the (1) of the steam into (2) .

- |    | <u>(1)</u>     | <u>(2)</u>     |
|----|----------------|----------------|
| A. | kinetic energy | pressure       |
| B. | kinetic energy | velocity       |
| C. | enthalpy       | pressure       |
| D. | enthalpy       | kinetic energy |

LOD = \_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_

# QUESTION RO 10

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #	4			
	Group #				
	K/A#	293004	K1.04		
	Importance Rating	2.6			
K&A: Thermodynamic Process: (Nozzles) Describe the functions of nozzles in air ejectors					
Thermodynamics					
<p>Explanation: <b>Answer D</b> – &gt; The purpose of a nozzle in a steam jet air ejector is to convert enthalpy of the steam to kinetic energy (k-e) to compress the air and non-condensable gases to maintain a vacuum in the suction chamber.</p> <p>A – Incorrect – Plausible, the diffuser on the outlet of the suction chamber is designed to convert the k-e of the steam and non-condensable gases to pressure to maintain vacuum in the suction chamber.</p> <p>B – Incorrect – Plausible, the k-e imparted into the steam in the nozzle imparts energy into the non-condensable gases in the suction chamber, creating the vacuum. This is a misunderstanding of the meanings of k-e and velocity.</p> <p>C – Incorrect – Plausible, Enthalpy is the total energy of the system plus the product of pressure and velocity. The measurement of saturated steam is directly related to its pressure.</p>					
Technical Reference(s): GFE LP (BWR Thermodynamics, Ch. 4) Rev. 4, GFE LP PPT 3302-04 Rev. 4		Reference Attached: GFE LP (BWR Thermodynamics, Ch. 4) pp.13, 15-17,19-20, 22, GFE LP PPT 3302-04 slide 27			
Proposed references to be provided to applicants during examination: None					
Learning Objective (As available): OT-3032-04-4					
Question Source:	Bank # Modified Bank # New	NRC GFES Sep 2015 Form A # 39			
Question History:	Previous 2 NRC Exams? No				
Question Cognitive Level:	Memory or Fundamental Knowledge    x Comprehension or Analysis				
10 CFR Part 55 Content:	55.41    x 55.43				
Comments:					

## QUESTION RO 11

The plant was operating at 80% power when extraction steam was inadvertently isolated to the #6 feedwater heaters.

Extraction steam remained isolated and power was restored to 80% power.

Compared to the conditions just prior to the transient, the current main generator MW output is \_\_\_\_\_.

- A. higher, because increased steam flow through the main turbine caused the main generator to pick up more load
- B. lower, because decreased steam flow caused Main Turbine Control Valve #4 to close more to maintain Rx pressure
- C. the same as before because Rx Power was returned to 80% power
- D. lower, because the steam cycle thermal efficiency has decreased

LOD = \_\_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_\_

## QUESTION RO 11

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #	4			
	Group #				
	K/A#	293005	K1.06		
	Importance Rating	2.6			
K&A: Thermodynamic Cycles: Describe how changes in system parameters affect thermodynamic efficiency					
Thermodynamics					
<p>Explanation: <b>Answer D</b> – &gt; Feedwater heating is the process in which a fraction of steam from the turbine is removed at some intermediate point and used to preheat feedwater and condensate prior to return to the reactor. The heat rejected to the feed and condensate is not lost to the circulating system, and increases the thermal efficiency of the plant. A loss of feedwater heating will cause reactor power to increase. The new thermal plant efficiency will be less than before due to the thermal energy needed to raise the feedwater temperature to saturation in the reactor.</p> <p>A – Incorrect – Plausible, Isolating steam to a HP FWH will lower efficiency; the FW flow will now enter the reactor at a lower temperature. More sensible heat must be added to raise the FW temperature to saturated conditions.</p> <p>B – Incorrect – Plausible since the lower plant efficiency results in less steam going to the main turbine. Perry uses partial arc admission TCV and TCVs 1, 2, &amp; 3 will close to maintain pressure in the reactor. However, TCV #4 is fully closed at 80% Rx power and does not start to open until 85%</p> <p>C – Incorrect – Plausible since this would be correct if Extraction Steam was not isolated to FW heaters. However, with Extraction steam isolated, plant efficiency is lower and generator output would be lower.</p>					
Technical Reference(s): OT-3302-05 Lesson Plan Rev. 4		Reference Attached: OT-3302-05 LP pp. 26-29			
Proposed references to be provided to applicants during examination: None					
Learning Objective (As available): OT-3302-05-9					
Question Source:	Bank # Modified Bank # New	NRC GFE Mar 2020 Form A # 28			
Question History:	Previous 2 NRC Exams? No				
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis x				
10 CFR Part 55 Content:	55.41 x 55.43				
Comments:					

## QUESTION RO 12

With the plant operating at rated power, lowering Main Lube Oil temperature is accomplished by \_\_\_\_\_ flow through the main lube oil cooler.

- A. lowering Service Water
- B. raising Service Water
- C. lowering Main Lube Oil
- D. raising Main Lube Oil

LOD = \_\_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_\_

## QUESTION RO 12

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #	4			
	Group #				
	K/A#	293007	K1.06		
	Importance Rating	2.8			
K&A: Heat Transfer: (Heat Exchangers) Discuss the factors that affect heat transfer rate in a heat exchanger					
Thermodynamics					
<p>Explanation: <b>Answer B</b> – &gt; Normal operation of the main lube oil (MLO) coolers directs all lube oil through the shell side of the heat exchanger. Service water (SW) is throttled by a controller located on H13-P680. To lower the temperature of the MLO leaving the cooler, SW flow is increased to remove more heat.</p> <p>A – Incorrect – Plausible, Lowering SW flow will lower the heat transfer rate from the cooler causing the MLO temperature to rise.</p> <p>C – Incorrect – Plausible, lowering MLO flow would lower the temperature, but there is no procedurally allowed method to alter the flow rate of oil through the cooler.</p> <p>D – Incorrect – Plausible, raising MLO flow would increase the temperature. In addition, there is no method to alter the flow rate of oil through the cooler.</p>					
Technical Reference(s): 302-0212 Rev. UUU, SDM-N34 Rev. 9		Reference Attached: 302-0212 Partial, SDM-N34 p. 16			
Proposed references to be provided to applicants during examination: None					
Learning Objective (As available): OT-3302-07-10					
Question Source:	Bank # Modified Bank # New	NRC GFE Mar 2019 Form A # 15			
Question History:	Previous 2 NRC Exams?	No			
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis	x			
10 CFR Part 55 Content:	55.41 55.43	x			
Comments:					



## QUESTION RO 13

The plant was operating at rated power with CRD A pump tagged out.

Then the following occurred:

- Reactor Recirculation Pump 'B' tripped
- Bus XH12 feeder breaker tripped on overcurrent

The current conditions are as follows:

- Reactor power is 63%
- Core flow is 41 Mlbm/hr

What action is required?

### Reference Provided:

- A. Insert control rods in reverse order using the pull sheets
- B. Raise core flow using the 'A' Flow control valve
- C. Insert a manual scram
- D. Insert Cram Rods

LOD = \_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_

## QUESTION RO 13

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #	1			
	Group #	1			
	K/A#	295001	AK1.04		
	Importance Rating	4.3			
K&A: Knowledge of the operational implications and/or cause and effect relationships of the following concepts as they apply to Partial Or Complete Loss Of Forced Core Flow Circulation: Thermal-hydraulic instabilities					
<b>Partial or Complete Loss of Forced Core Flow Circulation</b>					
<p>Explanation: <b>Answer C</b> – A trip of one Rx Recirc pump would result in entry into ONI-C51, Unplanned Change in Reactor Power or Reactivity, and operation in the Immediate Exit Region of the OPRMs Operable P/F Map. In this area of the P/F Map likelihood of power oscillations is greatly increased. Using the correct P/F Map would require the use of Cram Rods to exit the Immediate Exit Region. However, with both CRD pumps unavailable, exit from the Immediate Exit Region cannot be done with Control Rods. Per ONI-C51 if the affected region cannot be exited, a scram is required.</p> <p>A – Incorrect – Plausible since control rod insertion is required. However, inserting control rods in reverse order would require stopping at Insert Limit for each step. And with CRD A Pump tagged out and a trip of the bus that feeds CRD B Pump, inserting rods is not possible.</p> <p>B – Incorrect – Plausible since raising core flow is acceptable method to exit the Controlled Entry/Immediate Exit Region only if both Recirc Pumps are operating.</p> <p>D – Incorrect – Plausible since inserting Cram Rods for this combination of flow and power would be correct if it was possible to insert them. However, with CRD A Pump tagged out and a trip of the bus that feeds CRD B Pump, inserting cram rods is not possible.</p>					
Technical Reference(s): PDB-A06 Rev. 15, ONI-C51 Chart Rev. N		Reference Attached: PDB-A06 pp. 3-7 & ONI-C51 Chart (partial)			
Proposed references to be provided to applicants during examination: PDB-A06 pp. 3-7					
Learning Objective (As available): OT-3035-04 (LP)-A.2					
Question Source:	Bank # Modified Bank # New	Perry 2015 NRC RO #11			
Question History:	Previous 2 NRC Exams? No				
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis x				
10 CFR Part 55 Content:	55.41 x 55.43				
Comments:					

## QUESTION RO 14

The plant is operating at rated power.

The Auxiliary Transfer Switch on P870 is in OFF

Then breaker L1003, MAIN STARTUP SUPPLY BRKR (FROM 100-PY-B), spuriously trips open.

Based on this information, Bus \_\_\_\_\_.

- A. L10 is deenergized
- B. L10 is powered from 200-PY-B
- C. L11 and Bus L12 are deenergized
- D. H11 and Bus H12 are powered from their alternate sources

LOD = \_\_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_\_

## QUESTION RO 14

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #	1			
	Group #	1			
	K/A#	295003	AK3.01		
	Importance Rating	3.7			
K&A: Knowledge of the reasons for the following responses or actions as they apply to Partial Or Complete Loss Of AC Power: Manual and automatic bus transfer					
<b>Partial or Complete Loss of AC Power</b>					
<p>Explanation: <b>Answer B</b> – With the plant at rated power, and a trip of L1003, IAW ARI-H13-P870, Bus L10 will automatically transfer to Unit 2 Startup Transformer, 200-PY-B, if there is no Open Phase condition on the U2 SU transformer even with the ATS in OFF. The Auxiliary Transfer Switch when in AUTO prevents energizing an L Bus from the Normal and Alternate sources simultaneously.</p> <p>A – Incorrect – Plausible if an Open Phase condition on U2 SU transformer existed. However, no OPP condition was given in stem.</p> <p>C – Incorrect – Plausible if the Open Phase condition existed during shutdown or lower power operations. Bus L10 is the normal feed for Buses L11 &amp; L12 during startup and low power operations.</p> <p>D – Incorrect – Plausible misconception since Buses H11 and H12 have automatic bus transfers if the Normal sources trip and no Bus lockout exists.</p>					
Technical Reference(s): ARI-H13-P870-01 Rev. 20, IOI-3 Rev. 83, SOI-R10(13KV) Rev. 10, 206-010 Rev. FF		Reference Attached: ARI-H13-P870 pp. 32, 43, IOI-3 pp. 54, 59, SOI-R10(13KV) pp. 12, 76-77, 79-80, 206-010 (Partial)			
Proposed references to be provided to applicants during examination: None					
Learning Objective (As available): OT-COMBINED-R10 #64					
Question Source:	Bank # Modified Bank # New	x			
Question History:	Previous 2 NRC Exams?	No			
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis	x			
10 CFR Part 55 Content:	55.41 55.43	x			
Comments:					

## QUESTION RO 15

The plant was operating at rated power.

Then annunciator ANN PWR SUPPLY FAIL, H13-P680-07-E15 illuminated.

Which distribution panel lost power?

- A. D-1-A-06
- B. D-1-B-06
- C. ED-1-A-06
- D. ED-1-B-06

LOD = \_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_

## QUESTION RO 15

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #	1			
	Group #	1			
	K/A#	295004	G2.4.31		
	Importance Rating	4.2			
K&A: Knowledge of annunciator alarms, indications, or response procedures					
Partial or Total Loss of DC Power					
<p>Explanation: <b>Answer A</b> – &gt; Annunciator ANN PWR SUPPLY FAIL, H13-P680-07-E15, is activated by the loss of power to D-1-A-06. This is the only annunciator window powered from the non-divisional inverter.</p> <p>B – Incorrect – Plausible, D-1-B-06 is a Div 2 Distribution Panel that supplies control power to several components in the control room and would result in alarms in the CR, but not the stated alarm.</p> <p>C – Incorrect – Plausible, ED-1-A-06 is an Essential Div 1 Distribution Panel that supplies control power to several components in the control room and would result in alarms in the CR, but not the stated alarm.</p> <p>D – Incorrect – Plausible, ED-1-B-06 is an Essential Div 2 Distribution Panel that supplies control power to Div 1 ECCS and RPS Aux Relay Panel in the control room and would result in alarms in the CR, but not the stated alarm.</p>					
Technical Reference(s): ELI-R42 Rev. 8, and ARI-H13-P680-07 Rev. 37		Reference Attached: ELI-R42 pp. 3, 7, 13-14, 20, and ARI-H13-P680-07 p 145.			
Proposed references to be provided to applicants during examination: None					
Learning Objective (As available): OT-COMBINED-R42 #4					
Question Source:	Bank #				
	Modified Bank #				
	New		x		
Question History:	Previous 2 NRC Exams?	No			
Question Cognitive Level:	Memory or Fundamental Knowledge		x		
	Comprehension or Analysis				
10 CFR Part 55 Content:	55.41		x		
	55.43				
Comments:					

## QUESTION RO 16

The plant was operating at 30% rated power when a main turbine trip occurred.

Following the main turbine trip:

The Combined Intermediate Valves are (1) .

The Positive Assist Non-return Check Valves are (2) .

	<u>(1)</u>	<u>(2)</u>
A.	open	open
B.	shut	shut
C.	open	shut
D.	shut	open

LOD = \_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_

## QUESTION RO 16

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #	1			
	Group #	1			
	K/A#	295005	AK2.05		
	Importance Rating	2.9			
K&A: Knowledge of the relationship between the Main Turbine Generator Trip and the following systems or components: Main and reheat steam system					
<b>Main Turbine Generator Trip</b>					
<p>Explanation: <b>Answer B</b> – &gt; A main turbine trip would require the Operators to enter ONI-N32, Turbine and/or Generator Trip, and verify Automatic Actions occur. On a main turbine trip, the CIVs close to isolate the reheat steam to the LP turbine to prevent an over speed condition. Also the PACVs close to prevent the steam in the FW heaters from returning through the extraction steam lines causing an over speed condition.</p> <p>A – Incorrect – Plausible, both sets of valves close on a turbine trip, but a misconception that these valves will remain open since no reactor scram would occur.</p> <p>C – Incorrect – Plausible, The CIVs shut on a turbine trip. The misconception that the CIVs would remain open due to the lower pressure in the MSRs at the reduced power level.</p> <p>D – Incorrect – Plausible, the PACVs also close on a turbine trip. The misconception that the PACVs open in in a similar process as the drain valves open on a turbine trip.</p>					
Technical Reference(s): ONI-N32 Rev. 17, SDM-N31/11A/39 Rev. 3, SDM-N36/25/26 Rev. 9		Reference Attached: ONI-N32 pp. 3-4, SDM-N31/11A/39 pp. 15-16, SDM-N36/25/26 pp. 14-15			
Proposed references to be provided to applicants during examination: None					
Learning Objective (As available): OT-COMBINED-N31-F, OT-COMBINED-N36_25_26-F.1, OT-3035-09(LP)-B.1					
Question Source:	Bank # Modified Bank # New	Perry 2017 NRC RO #70			
Question History:	Previous 2 NRC Exams? No				
Question Cognitive Level:	Memory or Fundamental Knowledge x Comprehension or Analysis				
10 CFR Part 55 Content:	55.41 x 55.43				
Comments:					



## QUESTION RO 17

The plant is at rated power with Digital Feedwater Operator Rx Level Setpoint is set at 200 inches.

Which of the following describes the response of the DFWCS if a manual scram is now inserted?

- A. Upon receipt of the scram signal, the level demand signal will be 196 inches for 10 seconds and then lower to 178 inches.
- B. Upon receipt of the scram signal, the level demand signal will be 200 inches for 10 seconds and then lower to 178 inches.
- C. When level reaches 178 inches, the level demand signal will be 196 inches for 10 seconds and then lower to 178 inches.
- D. When level reaches 178 inches, the level demand signal will be 200 inches for 10 seconds and then lower to 178 inches.

LOD = \_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_

## QUESTION RO 17

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #	1			
	Group #	1			
	K/A#	295006	AK3.04		
	Importance Rating	3.7			
K&A: Knowledge of the reasons for the following responses or actions as they apply to SCRAM: Reactor water level setpoint setdown					
<b>Scram</b>					
<p>Explanation: <b>Answer D</b> – &gt; On a Rx scram, if RPV level lowers to 178", Setpoint Setdown will actuate. With the Operator Rx Level Setpoint set at 200", when RPV level drops below L3, Setpoint Setdown logic demands the Operator Rx Level Setpoint setting for 10 seconds then lowers to 178".</p> <p>A &amp; B – Incorrect – 1<sup>st</sup> part – The scram signal does not initiate Setpoint Setdown logic.</p> <p>A &amp; C – Incorrect – 2<sup>nd</sup> part – The Operator Rx Level Setpoint was set at 200". Therefore the Setpoint Setdown logic demands 200" not 196".</p>					
Technical Reference(s): ONI-C71-1 Rev. 23		Reference Attached: ONI-C71-1 pp. 3-4			
Proposed references to be provided to applicants during examination: None					
Learning Objective (As available): OT-COMBINED-C34-1.7					
Question Source:	Bank # Modified Bank # New	Perry 2019-1 NRC RO #15			
Question History:	Previous 2 NRC Exams?	Perry 2019-01 # RO-15			
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis	x			
10 CFR Part 55 Content:	55.41 55.43	x			
Comments:					

## QUESTION RO 18

The plant was operating at rated power when a small steam leak developed in the drywell causing drywell pressure and temperature to rise slowly.

Then the Control Room was evacuated due toxic gas.

Only the Immediate Actions of ONI-C61, Evacuation of the Control Room, have been completed.

Currently, accurate Drywell pressure indication \_\_\_\_\_.

- A. cannot be obtained from either Remote Shutdown Panel
- B. can only be obtained from the Div. 1 Remote Shutdown Panel
- C. can only be obtained from the Div. 2 Remote Shutdown Panel
- D. can be obtained from both the Div. 1 and Div. 2 Remote Shutdown Panels

LOD = \_\_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_\_

## QUESTION RO 18

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #	1			
	Group #	1			
	K/A#	295016	AA2.05		
	Importance Rating	3.9			
K&A: Ability to determine and/or interpret the following as they apply to Control Room Abandonment: Drywell pressure					
<b>Control Room Abandonment</b>					
<p>Explanation: <b>Answer C</b> – The Div.2 Remote Shutdown Panel instruments do not have transfer switches. And, they are normally energized.</p> <p>A – Incorrect – Plausible since control has not been transferred to Div. 1 RSD panel. However, the Div.2 RSD Drywell pressure instrument is providing accurate information.</p> <p>B – Incorrect – Plausible when control has been transferred to Div. 1 RSD panel that the Div. 1 instruments would be indicating properly. However, this action has not been completed yet.</p> <p>D – Incorrect – Plausible when control has been transferred to Div. 1 RSD panel that the Div. 1 instruments would be indicating properly. However, this action has not been completed yet.</p> <p>.</p>					
Technical Reference(s): SDM-C61 Rev. 9		Reference Attached: SDM-C61 pp. 10, 33-34			
Proposed references to be provided to applicants during examination: None					
Learning Objective (As available): OT-3035-13(LP) and OT-COMBINED-C61-E					
Question Source:	Bank #				
	Modified Bank #				
	New	x			
Question History:	Previous 2 NRC Exams?	No			
Question Cognitive Level:	Memory or Fundamental Knowledge	x			
	Comprehension or Analysis				
10 CFR Part 55 Content:	55.41	x			
	55.43				
Comments:					

## QUESTION RO 19

The plant was operating at 50% power with NCC B pump tagged out.

Then NCC C pump tripped on overcurrent.

Annunciator NCC PUMP DISCH HEADER PRESSURE LOW H13-P970-01-B1 alarmed

To improve NCC system pressure, isolate flow to \_\_\_\_\_.

- A. the hydrogen analyzers
- B. the Radwaste evaporators
- C. Control Complex Chillers A & B
- D. Offgas Vault refrigeration machines

LOD = \_\_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_\_

## QUESTION RO 19

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #	1			
	Group #	1			
	K/A#	295018	AA2.05		
	Importance Rating	3.7			
K&A: Ability to determine and/or interpret the following as they apply to Partial Or Complete Loss Of Component Cooling Water: System pressure					
<b>Partial Or Complete Loss Of Component Cooling Water</b>					
<p>Explanation: <b>Answer B</b> – &gt; Normally 2 NCC pumps are in operation. The loss of 1 pump lowers system head. ONI-P43 directs the operator to adjust system flow to support 1-pump operation. The Radwaste evaporators use approx. 1400 gpm of flow. When the evaporators are isolated, pump head increases to compensate for the increase in system headloss. Isolation of the evaporators is sufficient to raise pressure of the system based on the pump curves. ONI-P43 actions are driven by flow rates; the Candidate must determine that the pressure increase in the system resulted from reducing system flow by 1400 gpm.</p> <p>A – Incorrect – Plausible, the hydrogen analyzers are cooled by Emergency Closed Cooling and have no effect on the pressure of the NCC system</p> <p>C – Incorrect – Plausible, the A &amp; B Control Complex Chillers are cooled by Emergency Closed Cooling and have no effect on the pressure of the NCC system, but the C Control Complex Chiller is cooled by NCC.</p> <p>D – Incorrect – Plausible, the Offgas Vault refrigeration machines are cooled by Turbine Building Closed Cooling and have no effect on the pressure of the NCC system.</p>					
Technical Reference(s): ONI-P43 Rev. 15, SOI-P43 Rev. 20, PBD-B2 Rev. 9, ARI-H13-P970-1 Rev. 27, Lesson Plan OT330302 Rev. 4		Reference Attached: ONI-P43 p. 8, SOI-P43 pp. 4, 10, & 54, PBD-B2 p. 4, and ARI-H13-P970-1 p. 13, Lesson Plan OT330302 pp. 91 & 92			
Proposed references to be provided to applicants during examination: None					
Learning Objective (As available): OTCOMBINED-P43 #2, #8, #9, OT-3303-02-13					
Question Source:	Bank #				
	Modified Bank #				
	New	x			
Question History:	Previous 2 NRC Exams?	No			
Question Cognitive Level:	Memory or Fundamental Knowledge				
	Comprehension or Analysis	x			
10 CFR Part 55 Content:	55.41	x			
	55.43				
Comments:					

## QUESTION RO 20

The plant is operating at rated power with the following conditions:

- Unit 1 Service and Unit 1 Instrument Air Compressors are tagged out for replacement
- Unit 2 Instrument Air Compressor 2P52-C001 is running

An air leak develops on an air header piping joint.

ONI-P52, Loss Of Service And/Or Instrument Air, has been entered.

Based on the indications shown on the attached picture, what is the consequence of the air leak?

### **Attachment Provided:**

- A. All non-ADS SRVs will not operate if needed.
- B. SA/IA XCON VALVE 2P52-F0050 will close on lowering air header pressure.
- C. The Outboard MSIVs may not be capable of closing within the required Technical Specification closing times.
- D. The Inboard MSIVs may not be capable of closing within the required Technical Specification closing times.

LOD = \_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_

## QUESTION RO 20

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #	1			
	Group #	1			
	K/A#	295019	G2.4.20		
	Importance Rating	3.8			
K&A: Knowledge of the operational implications of emergency and abnormal operating procedures warnings, cautions, and notes					
<b>Partial or Complete Loss of Instrument Air</b>					
<p>Explanation: <b>Answer C</b> – &gt; Per NOTE in ONI-P52, at &lt; 90 psig, the MSIVs may not be capable of closing with in times specified in PDB-G001 which are based on TS 3.6.1.3 SR #7.</p> <p>A – Incorrect – Plausible, however, non-ADS SRV B21-F051D is supplied from P57, SRIA.</p> <p>B – Incorrect – Plausible, valve closure is based on Instrument Air Receiver tank pressure not air header pressure.</p> <p>D – Incorrect – Plausible, Inboard MSIVs are supplied from the Parallel Header which is shown to be &gt; 90 psig</p>					
Technical Reference(s): ONI-P52 Rev. 18		Reference Attached: ONI-P52 pp. 3-4, 8, & 27			
Proposed references to be provided to applicants during examination: Partial panel 1H13-P870 picture					
Learning Objective (As available): OT-COMBINED-P51_P52 #24					
Question Source:	Bank # Modified Bank # New	Perry 2017 Audit # RO-51			
Question History:	Previous 2 NRC Exams? No				
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis x				
10 CFR Part 55 Content:	55.41 x 55.43				
Comments:					



## QUESTION RO 21

The plant is shutdown for a forced outage with the following equipment status:

- Plant is in MODE 4
- RHR A is operating in the Shutdown Cooling Mode with 1E12-F003A, RHR HX'S OUTLET VALVE open 39% and 1E12-F048A, RHR HX'S BYPASS VALVE open 38%
- RHR B pump is tagged out
- Rx Recirc Pumps A & B are shutdown
- RWCU is in Normal Recirculation Mode

Then, an electrical problem caused 1E12-F003A, RHR HX OUTLET VALVE, to close and it cannot be reopened.

Based on the above conditions, which of the following provides the most accurate indication of Rx water temperature for calculating heat-up rate?

- A. RHR HX Water Discharge on recorder E12-R601
- B. Reactor Vessel Head Flange on recorder B21-R643
- C. Reactor Recirc Loop Suctions on recorder B33-R604
- D. Reactor Vessel Bottom Head Drain on recorder B21-R643

LOD = \_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_

## QUESTION RO 21

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #	1			
	Group #	1			
	K/A#	295021	G2.1.19		
	Importance Rating	3.9			
K&A: Ability to use available indications to evaluate system or component status					
<b>Loss Of Shutdown Cooling</b>					
<p>Explanation: <b>Answer A</b> – &gt; ONI-E12-2, Loss of Decay Heat Removal, requires the operator to calculate H/U rate on a loss of SDC. In order for a temperature element to provide accurate indication, it must have sufficient flow by it. With the conditions given, the RHR pump is still running and the HX B/P valve E12-F048A would be throttled open. Therefore, the RHR heat exchanger outlet temperature point is the only one providing accurate Rx water temperature indication.</p> <p>B – Incorrect – Plausible as this point can be used if the Rx vessel head is removed and the Rx cavity is flooded up.</p> <p>C – Incorrect – Plausible as this is the preferred point if a Rx Recirc pump is running.</p> <p>D – Incorrect – Plausible as this point can be used if RWCU is in service <u>and</u> a Rx Recirc pump is running.</p>					
Technical Reference(s): IOI-12 Rev. <b>19</b> , ONI-E12-2 Rev. <b>43</b>		Reference Attached: IOI-12 pp. 7-9, ONI-E12-2 pp. 8 & 21			
Proposed references to be provided to applicants during examination: None					
Learning Objective (As available): OT-COMBINED-E12-E.1					
Question Source:	Bank #				
	Modified Bank #				
	New	x			
Question History:	Previous 2 NRC Exams?	No			
Question Cognitive Level:	Memory or Fundamental Knowledge				
	Comprehension or Analysis	x			
10 CFR Part 55 Content:	55.41	x			
	55.43				
Comments:					

## QUESTION RO 22

The plant is shutdown with refueling in progress.

The following conditions exist:

- A fuel bundle has just arrived from the Refuel Floor with the IFTS Upender inclined
- A fuel bundle is being rechanneled in the south Fuel Prep Machine
- FHB VENT EXH GAS, D17-K716, is alarming
- Bubbles are seen rising from the bundle in the Fuel Prep Machine

What action is required?

- A. Place the IFTS Upender in the vertical position.
- B. Verify the IFTS Bottom Valve, 1F42-F004, is closed.
- C. Place the Fuel Prep Machine is in the full down position.
- D. Transfer the fuel bundle in the fuel prep machine to the spent fuel storage rack.

LOD = \_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_

## QUESTION RO 22

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #	1			
	Group #	1			
	K/A#	295023	AA1.03		
	Importance Rating	3.1			
K&A: Ability to operate or monitor the following as they apply to Refueling Accidents: Fuel handling equipment					
<b>Refueling Accidents</b>					
<p>Explanation: <b>Answer C</b> – &gt; With the given conditions, the Candidate must determine that entry into ONI-J11-2 is required and apply the Immediate Actions to ensure the Fuel Prep Machine is in the full down position. This is a safe condition as defined in ONI-J11-2.</p> <p>A – Incorrect – Plausible, the safe position for the IFTS is in the inclined position, but placing it in the vertical position would be its normal position to transfer fuel to the spent fuel pool.</p> <p>B – Incorrect – Plausible, this is a required action if the IFTS Carriage was stuck while in transfer.</p> <p>D – Incorrect – An alternate safe storage area is fully seated in its designated spent fuel storage rack location. If the Candidate is unaware that the inspection stand as a safe location, they may move the bundle to ensure it is in a safe location.</p>					
Technical Reference(s): ARI-H13-P680-8 Rev. 21, ONI-J11-2 Rev. 18,		Reference Attached: ARI-H13-P680-8 p. 3, ONI-J11-2 pp. 3-5 & 7			
Proposed references to be provided to applicants during examination: None					
Learning Objective (As available): OT-COMBINED-J11-J.1 & J.2, OT-3602 #13					
Question Source:	Bank #	RQL-343001			
	Modified Bank #				
	New				
Question History:	Previous 2 NRC Exams?	No			
Question Cognitive Level:	Memory or Fundamental Knowledge	x			
	Comprehension or Analysis				
10 CFR Part 55 Content:	55.41	x			
	55.43				
Comments:					

## QUESTION RO 23

The plant was operating at rated power when an earthquake occurred.

Plant damage has resulted in the following:

- Drywell pressure and temperature are rising
- Suppression Pool level is lowering

What is the lowest Suppression Pool level that will adequately condense the steam discharged from the drywell to ensure Primary Containment pressure will not exceed allowable limits?

- A. 7.25 feet.
- B. 12.25 feet.
- C. 14.25 feet.
- D. 16.75 feet.

LOD = \_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_

## QUESTION RO 23

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #	1			
	Group #	1			
	K/A#	295024	EK1.02		
	Importance Rating	4.0			
K&A: Knowledge of the operational implications and/or cause and effect relationships of the following concepts as they apply to High Drywell Pressure: Containment building integrity (Mark III)					
<b>High Drywell Pressure</b>					
<p>Explanation: <b>Answer C</b> – A primary leak in the DW will challenge containment integrity when direct pressurization of containment occurs. Direct pressurization of the containment would occur if SP level lowered enough to preclude steam condensation. IAW EOP-02, Primary Containment Control Bases, two feet of water above the horizontal vents (14.25') is required to adequately condense the steam. This will ensure that primary containment pressure does not exceed allowable limits during a primary system break.</p> <p>A – Incorrect – Plausible as this is the SP level below which equipment damage to the RCIC system would occur. However, if SP level were allowed to reach this level, direct pressurization of containment would occur from discharging steam.</p> <p>B – Incorrect – Plausible as this is the SP level of the first row of drywell horizontal vents. However, if SP level were allowed to reach this level, direct pressurization of containment would occur from discharging steam.</p> <p>D – Incorrect – Plausible as this is the SP level that Suppression Pool Makeup would automatically actuate in the event of a LOCA. However, it is not the lowest SP level that would preclude exceeding primary containment limits.</p>					
Technical Reference(s): EOP-02 Bases Rev. 6, EOP-01 Bases Rev. 9, and ARI-H13-P601-20 Rev. 26		Reference Attached: EOP-02 Bases p. 38, EOP-01 Bases p. 90, and ARI-H13-P601-20 p. 79			
Proposed references to be provided to applicants during examination: None					
Learning Objective (As available): OT-3402-E-EOP-02-5					
Question Source:	Bank #	Modified Bank #	New x		
Question History:	Previous 2 NRC Exams?	No			
Question Cognitive Level:	Memory or Fundamental Knowledge	Comprehension or Analysis	x		
10 CFR Part 55 Content:	55.41	55.43	x		
Comments:					

## QUESTION RO 24

The plant was operating at 50% power following a refuel outage.

A grid disturbance resulted in a Main Turbine trip and reactor scram.

Some Bypass Valves failed to operate after the scram.

RPV pressure peaked at 1120 psig and lowered to a steady value of 940 psig.

Bypass Valve # 1 is currently 20% open.

Which of the following describes how many SRVs should have opened following the scram and currently remain open?

- A. 10 SRVs opened, 1 SRV remains open
- B. 10 SRVs opened, 2 SRVs remain open
- C. 19 SRVs opened, 0 SRVs remain open
- D. 19 SRVs opened, 1 SRV remains open

LOD = \_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_

## QUESTION RO 24

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #	1			
	Group #	1			
	K/A#	295025	EK3.01		
	Importance Rating	4.3			
K&A: Knowledge of the reasons for the following responses or actions as they apply to High Reactor Pressure: Safety/relief valve operation					
<b>High Reactor Pressure</b>					
<p>Explanation: <b>Answer B</b> – When Rx pressure went &gt;1103 psig, B21-F051D opened and armed Lo-Lo-Set. When LLS armed it lowered the opening setpoint of B21-F051C to 1073 psig and it also opened. As RPV pressure continued to rise to 1120 psig, the opening setpoints for 8 additional SRVs were exceeded. With BPV #1 20% open and Rx pressure stable at 940 psig, neither of the LLS SRVs reached the reset setpoints. Thus, both remain open.</p> <p>A – Incorrect – 2<sup>nd</sup> part – Plausible if the LLS function did not properly arm F051C. If so, the Relief Function closure setpoint of B21-F051C would continue to be 1113 psig.</p> <p>C – Incorrect – 1<sup>st</sup> part – Plausible since a turbine trip (load reject) from rated power opens all 19 SRVs. However, initial power is listed at 50% which would account for the reduced peak pressure. 2<sup>nd</sup> part – plausible if LLS function did not properly arm.</p> <p>D – Incorrect – 1<sup>st</sup> part – Plausible since a turbine trip (load reject) from rated power opens all 19 SRVs. However, initial power is listed at 50% which would account for the reduced peak pressure. 2<sup>nd</sup> part – Plausible if the LLS function did not properly arm F051C. If so, the Relief Function closure setpoint of B21-F051C would continue to be 1113 psig.</p>					
Technical Reference(s): ONI-B21-1 Rev. 11, PDB-R01 Rev. 47, and EOP Bases Rev. 9		Reference Attached: ONI-B21-1 p. 12, PDB-R01 p. 119, and EOP Bases pp. 88-89 & 116			
Proposed references to be provided to applicants during examination: None					
Learning Objective (As available): OT-COMBINED-B21-N					
Question Source:	Bank # Modified Bank # New	Perry 2019-02 # RO-22			
Question History:	Previous 2 NRC Exams? No				
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis x				
10 CFR Part 55 Content:	55.41 x 55.43				
Comments:					



## QUESTION RO 25

IAW EOP Bases, which of the following identify why Suppression Pool Make Up is initiated during a high power ATWS?

1. Increase suppression pool heat capacity
2. Ensure sufficient NPSH for ECCS pumps
3. Maintain margins to the Drywell Weir Level Limit
4. Ensure post-accident coverage of the horizontal vents

- A. 1, 2, & 3
- B. 1, 2, & 4
- C. 1, 3, & 4
- D. 2, 3, & 4

LOD = \_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_

## QUESTION RO 25

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #	1			
	Group #	1			
	K/A#	295026	EK1.04		
	Importance Rating	3.5			
K&A: Knowledge of the operational implications and/or cause and effect relationships of the following concepts as they apply to the Suppression Pool High Water Temperature: Suppression pool level					
<b>Suppression Pool High Water Temperature</b>					
<p>Explanation: <b>Answer B</b> – &gt; The EOP Bases state SPMU may be initiated to quickly add a large quantity of water to the SP. The design function of SPMU is to automatically make up for SP drawdown following a LOCA, thereby ensuring adequate post-accident coverage of the drywell horizontal vents, increasing the SP heat capacity, and maintain margin to ECCS pump NPSH limits.</p> <p>1, 2, &amp; 4 – Correct</p> <p>3 – Incorrect – Maximum Pressure Suppression Primary Containment Water Level is defined as the DW water level corresponding to an elevation 3 inches above the top of the weir wall. Since Mark III containments do not have a DW water level indication, DWLL is used to determine the margin to this limit. If no water is added from outside the primary containment, this water level will not be exceeded. Initiation of SPMU has not impact on the margin to DWLL.</p>					
Technical Reference(s): EOP Bases Rev. 9		Reference Attached: EOP Bases pp. 83 & 138-140			
Proposed references to be provided to applicants during examination: None					
Learning Objective (As available): OT-3402-05-C, OT-3402-06-C.3					
Question Source:	Bank #				
	Modified Bank #				
	New	x			
Question History:	Previous 2 NRC Exams?	No			
Question Cognitive Level:	Memory or Fundamental Knowledge	x			
	Comprehension or Analysis				
10 CFR Part 55 Content:	55.41	x			
	55.43				
Comments:					

**QUESTION RO 26**

The plant was operating at rated power when a reactor scram was inserted resulting in a leak from the scram discharge volume.

Which of the following degraded, stable containment conditions require all available containment cooling fans operated?

- A. Temperature 100 °F
- B. Temperature 90 °F
- C. Pressure 2.5 psig
- D. Pressure 1.5 psig

LOD = \_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_

# QUESTION RO 26

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #	1			
	Group #	1			
	K/A#	295027	EA1.02		
	Importance Rating	3.7			
K&A: Ability to operate or monitor the following as they apply to High Containment Temperature (MARK III Containment Only): Containment ventilation/cooling					
<b>High Containment Temperature (Mark III Containment Only)</b>					
<p>Explanation: <b>Answer A</b> – &gt; EOP-02 is entered when containment temperature exceeds 95 °F and directs the operation of all available containment cooling once temperature cannot be maintained &lt; 95°F in the containment temperature leg.</p> <p>B – Incorrect – Plausible, as the containment temperature is higher than normal, but the action to maximize containment cooling is not directed until containment temperature is unable to be maintained below 95 °F.</p> <p>C – Incorrect – Plausible, this pressure is above the EOP-02 entry condition. Although, the action to maximize containment cooling is directed out of the Containment Temperature leg of EOP-02.</p> <p>D – Incorrect – Plausible, since the cause of the increased containment pressure and temperature is hot Rx coolant from the SDV, maximizing containment cooling would also lower containment pressure. However, this is not the bases for the action.</p>					
Technical Reference(s): EOP-02 Rev. 6		Reference Attached: EOP-02 pp. 61-62			
Proposed references to be provided to applicants during examination: None					
Learning Objective (As available): OT-3402-7-C					
Question Source:	Bank # Modified Bank # New	Perry 2007-2 NRC #RO-14			
Question History:	Previous 2 NRC Exams?	No			
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis	x			
10 CFR Part 55 Content:	55.41 55.43	x			
Comments:					

**QUESTION RO 27**

The plant is at rated power.

Suppression Pool level is 17.0 feet and rapidly lowering due to a leak.

Which of the following is the minimum Suppression Pool level that ensures the SRV Tail Pipe Quenchers will remain submerged if Emergency Depressurization is performed?

- A. 12.25 feet
- B. 7.25 feet
- C. 5.25 feet
- D. 3.25 feet

LOD = \_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_

## QUESTION RO 27

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #	1			
	Group #	1			
	K/A#	295030	EK1.05		
	Importance Rating	4.0			
K&A: Knowledge of the operational implications and/or cause and effect relationships of the following concepts as they apply to the Low Suppression Pool Water Level: SRV discharge submergence					
<b>Low Suppression Pool Water Level</b>					
<p>Explanation: <b>Answer C</b> – &gt; Per EOP Bases, the minimum SP level to use SRVs to ED is 5.25 ft. below this level, insufficient level exists to quench the steam leaving the SRVs</p> <p>A – Incorrect – Plausible, at this level the highest horizontal vent start to uncover.</p> <p>B – Incorrect – Plausible, at this level, RCIC loses NPSH due to low level in the suppression pool.</p> <p>D – Incorrect – Plausible, at this level the SRV tail pipe quenchers are completely uncovered.</p> <p>These are SP levels of consequence.</p>					
Technical Reference(s): EOP Bases Rev. 9, 301-0734 Rev. K		Reference Attached: EOP Bases p. 88, 301-0734			
Proposed references to be provided to applicants during examination: None					
Learning Objective (As available): OT-3402-12-C.1					
Question Source:	Bank # Modified Bank # New	Perry 2002 NRC # RO-77			
Question History:	Previous 2 NRC Exams? No				
Question Cognitive Level:	Memory or Fundamental Knowledge x Comprehension or Analysis				
10 CFR Part 55 Content:	55.41 x 55.43				
Comments:					

## QUESTION RO 28

The plant was operating at rated power with equipment tagged out:

- HPCS pump tagged out for motor change out
- CRD B pump for oil replacement

Then a problem required the operators to insert a manual reactor scram.

The following conditions exist:

- Rx power is 5%
- RPV level lowered to 140 inches following the scram and is now 150 inches and recovering with the MFP
- CRD A pump tripped on low suction pressure

Which of the following actions would most expeditiously preclude power oscillations?

- A. Initiate Standby Liquid Control from memory
- B. Terminate feedwater IAW the Feedwater hardcard
- C. Terminate ECCS IAW the ECCS Termination hardcard
- D. Insert control rods IAW EOP-SPI 1.3, Manual Rod Insertion

LOD = \_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_

QUESTION RO 28

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #	1			
	Group #	1			
	K/A#	295031	EK2.17		
	Importance Rating	3.9			
K&A: Knowledge of the relationship between the Reactor Low Water Level and the following systems or components: Feedwater system					
<b>Reactor Low Water Level</b>					
<p>Explanation: <b>Answer B</b> – &gt; EOP-05-1, ATWS, directs T&amp;P injection to establish Rx water level of -25 to 100" to preclude periodic neutron flux oscillations. Since Rx level did not reach L2, HPCS &amp; RCIC did not auto start. The only feed into the RPV is FW. By reducing reactor water level to &lt;100 inches, the feedwater spargers are uncovered allowing for preheating of the incoming feed and minimize core inlet subcooling leading to a lower reactor power and lessen the flux oscillations in the core. With Rx power at 5%, Rx level would lower quickly.</p> <p>A – Incorrect – Plausible, this action is carried out in the immediate actions of EOP-01-5, but the low flow rate of the SLC system slowly lowers neutron flux over the following 35 minutes and is credited with limiting the in-core flux fluctuations once HSBW has been injected, but this is not the most expeditious method of lowering power.</p> <p>C – Incorrect – Plausible, the prevention of injection from ECCS is another priority to preclude cold water from being injected inside the shroud. But given the current conditions, HPCS is not available for injection and the low pressure ECCS would not inject until RPV pressure was lowered.</p> <p>D – Incorrect – Plausible, insertion of control rods with this EOP-SPI requires a running CRD pump. Direction of this will be directed after the completion of the immediate actions and after the stabilization of reactor water level &lt;100 inches.</p>					
Technical Reference(s): EOP-01-5 Rev. 1		Reference Attached: EOP-01-5 pp. 28-29			
Proposed references to be provided to applicants during examination: None					
Learning Objective (As available): OT-3403-11-A					
Question Source:	Bank #	Modified Bank #	New x		
Question History:	Previous 2 NRC Exams? No				
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis x				
10 CFR Part 55 Content:	55.41 x	55.43			
Comments:					



## QUESTION RO 29

Fifteen minutes ago the plant was starting up from a refuel outage when a Loss of Offsite Power occurred.

- Pressure control is on SRVs with one SRV open and a second SRV cycling on setpoint
- Control rod indication was lost due to loss of power to P680

Based on this information, what is the current reactor power?

- A. <4%
- B. 5%
- C. 7%
- D. 10%

LOD = \_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_

## QUESTION RO 29

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #	1			
	Group #	1			
	K/A#	295037	EA2.01		
	Importance Rating	4.3			
K&A: Ability to determine or interpret the following as they apply to Scram Condition Present And Reactor Power Above APRM Downscale Or Unknown: Reactor power					
<b>Scram Condition Present and Reactor Power Above APRM Downscale or Unknown</b>					
<p>Explanation: <b>Answer C</b> – &gt; The LOOP would have caused an MSIV isolation and a load reject which would have opened all SRVs and armed LLS. With pressure control on SRVs Rx power can be determined to be &gt;5% and &lt;10%. Each SRV can pass steam equivalent to 5% Rx power at rated conditions. Since one SRV is open and a second SRV is cycling on setpoint. Rx power must be &gt;5% and &lt;10%. This was run in the simulator on 7/22/22. With 1 LLS SRV open and Rx power ~6-7%, RPV pressure increased until the 2<sup>nd</sup> LLS SRV opened and started lowering pressure. The condition, "S/U from refuel outage" indicates minimal decay heat contributed to SRV cycling.</p> <p>A – Incorrect – Plausible since this is the APRM downscale value and if only one SRV was cycling.</p> <p>B – Incorrect – Plausible since this would be equivalent to one SRV's capability.</p> <p>D – Incorrect – Plausible since this would be equivalent to two SRV's capability.</p>					
Technical Reference(s): EOP-Bases Rev. 9, ONI-B21-1 Rev.11, and PYBP-POS-30 Rev. 6		Reference Attached: EOP-Bases pp. 117-118, ONI-B21-1 p.12, and PYBP-POS-30 p. 9			
Proposed references to be provided to applicants during examination: None					
Learning Objective (As available): OT-3402-02-F, OT-3035-07(LP)-E					
Question Source:	Bank #	Modified Bank #	New		
			x		
Question History:	Previous 2 NRC Exams?	No			
Question Cognitive Level:	Memory or Fundamental Knowledge	Comprehension or Analysis	x		
10 CFR Part 55 Content:	55.41	x	55.43		
Comments:					

## QUESTION RO 30

The plant was operating at rated power when a steam leak developed in the annulus.

ALERT and HIGH alarms are locked in on appropriate PLANT VENT GAS Radiation Monitor

The Shift Manager has declared an Unusual Event (RU1.1) based on radiation release to the environment.

Based on the attached SPDS printout:

Entry into EOP-03, Secondary Containment Control and ONI-D17, High Radiation Levels Within The Plant (1) is required.

Monitor the (2) Plant Vent Radiation Monitor to track release rate.

### Attachment Provided

- |    | <u>(1)</u>  | <u>(2)</u> |
|----|---|------------|
| A. | <u>only</u>                                       | Unit 1     |
| B. | <u>only</u>                                       | Unit 2     |
| C. | <u>and</u> EOP-04, Radioactivity Release Control, | Unit 1     |
| D. | <u>and</u> EOP-04, Radioactivity Release Control, | Unit 2     |

LOD = \_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_

## QUESTION RO 30

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #	1			
	Group #	1			
	K/A#	295038	EA1.04		
	Importance Rating	3.4			
K&A: Ability to operate or monitor the following as they apply to High Offsite Radioactivity Release Rate: Plant process computer/parameter display systems					
<b>High Offsite Radioactivity Release Rate</b>					
<p>Explanation: <b>Answer A</b> – A HIGH alarm on the Plant Vent rad monitors requires entry into ONI-D17 and EOP-03. At the Unusual Event level, there is no entry requirement for EOP-04. The SPDS printout indicates a HIGH alarm on AEGT A Train which discharges to the Unit 1 Plant Vent, which is the correct release point.</p> <p>B &amp; D – Incorrect – 2nd part - AEGT fan B discharges through the Unit 2 Plant Vent.</p> <p>C &amp; D – Incorrect – 1<sup>st</sup> part - No entry conditions for EOP-04 are met.</p>					
Technical Reference(s): ODCM Rev 24, ONI-D17 Rev. 20, ARI-H13-P680-07 Rev. 37, & EOP-03/04 Bases Rev. 0		Reference Attached: ODCM p 33, ONI-D17 p. 3, ARI-H13- P680-07 pp.17, 18, & 21, & EOP-03/04 Bases p 54			
Proposed references to be provided to applicants during examination: SPDS screenshot					
Learning Objective (As available): OT-COMBINED-D17-O					
Question Source:	Bank # Modified Bank # New	Perry 2015 # RO-35			
Question History:	Previous 2 NRC Exams? No				
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis x				
10 CFR Part 55 Content:	55.41 x 55.43				
Comments:					

## QUESTION RO 31

Annunciator, FIRE DETECTION FIRE ALARM, H13-P680-07-A5, alarmed.

A fire was detected in the LH-2-B transformer which initiated the Fire Protection System.

As a result, fire main pressure lowered to 115 psig before recovering to 150 psig.

Which type of fire protection system actuated and which fire pump(s) automatically started:

- A. Wet-pipe Sprinkler system and both the Motor Fire Pump and Diesel Fire Pump started
- B. Deluge system and both the Motor Fire Pump and Diesel Fire Pump started
- C. Wet-pipe Sprinkler system and only the Motor Fire Pump started
- D. Deluge system and only the Motor Fire Pump started

LOD = \_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_

## QUESTION RO 31

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #	1			
	Group #	1			
	K/A#	600000	AK2.06		
	Importance Rating	3.8			
K&A: Knowledge of the relationship between PLANT FIRE ON SITE and the following systems or components: Fire pumps					
<b>Plant Fire On Site</b>					
<p>Explanation: <b>Answer D</b> – The Fire Protection Deluge System is automatically initiated upon detection of a fire in the Interbus transformers. When the Deluge System initiated, the deluge valves opened which lowered fire header pressure. When fire header pressure drops to &lt; 120 psig, the Motor Fire pump auto started.</p> <p>A – Incorrect – Plausible as the Wet-pipe systems protect various parts of the plant such as turbine bearings. Also, the Diesel Fire Pump would auto start if fire main pressure dropped to &lt; 105 psig.</p> <p>B – Incorrect – Plausible as the Diesel Fire Pump would auto start if fire main pressure dropped to &lt; 105 psig.</p> <p>C – Incorrect – Plausible as the Wet-pipe systems protect various parts of the plant such as turbine bearings.</p>					
Technical Reference(s): ARI-H13-P680-07 Rev. 37, ONI-P54 Rev 27, SOI-P54 (WTR) Rev. 30		Reference Attached: ARI-H13-P680-07 pp. 9-10, ONI-P54 p. 3-4, SOI-P54(WTR) pp. 30, 125			
Proposed references to be provided to applicants during examination: None					
Learning Objective (As available): OT-COMBINED-P54_WTR-C & G					
Question Source:	Bank # Modified Bank # New	Susquehanna 2019 # 52			
Question History:	Previous 2 NRC Exams?	No			
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis	x			
10 CFR Part 55 Content:	55.41 55.43	x			
Comments:					

## QUESTION RO 32

Perry is operating at rated power with the following conditions:

- Main Generator Terminal Voltage 21.9 KV
- Main Generator Megawatts 1280 Mwe
- Main Generator VARs 200 MVARs lagging
- Main Generator has a Hydrogen Leak
- Main Generator Hydrogen Pressure 60 psig

A grid disturbance results in the following:

- Steadily lowering grid voltage
- Annunciator H13-P680-09-D4, AUTO VOLT REGULATOR TRIP, alarmed
- The Main Generator voltage regulator shifts to MANUAL

With no operator action, this transient could result in   (1)   .

The operator should   (2)   generator voltage to correct this condition.

### Reference Provided

	<u>  (1)  </u>	<u>  (2)  </u>
A.	overheating the Main Generator stator windings	raise
B.	overheating the Main Generator stator windings	lower
C.	exceeding the Generator Underexcited Reactive Amp Limit	raise
D.	exceeding the Generator Underexcited Reactive Amp Limit	lower

LOD = \_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_

## QUESTION RO 32

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #	1			
	Group #	1			
	K/A#	700000	AA2.10		
	Importance Rating	3.7			
K&A: Ability to determine or interpret the following as they apply to Generator Voltage And Electric Grid Disturbances: Generator overheating and the required actions					
<b>Generator Voltage and Electric Grid Disturbances</b>					
<p>Explanation: <b>Answer B</b> – &gt; ARI-H13-P680-09-D4 directs the operator to continue to operate with the VR in Manual if no turbine trip occurred. However, Operator Action is required to adjust the VR to avoid damaging the Main Generator. With no operator action and a lowering grid voltage, the Main Generator will supply more VARs to the grid. As VAR loading rises, the generator will exceed its limit in the B-C section of the curve limited by Armature Heating. The operator is directed to maintain the generator w/in the limits of the Generator Capability Curve, PDB-C02. This requires the operator to lower the voltage. Lowering voltage reduces the amount of LAGGING vars.</p> <p>A &amp; C Part 2 Incorrect – Plausible, if generator was carrying leading VARs. However, with the generator at the limit, raising field voltage will take the generator further from unity and further exceeding the generator capability curve.</p> <p>C &amp; D Part 1 Incorrect – Plausible, if generator was carrying leading VARs, the lower limit of the generator capability curve at this MWe is the URAL. This would be correct if grid voltage was rising and the generator was LEADING.</p>					
Technical Reference(s): PDB-C002 Rev 6, ONI-S11 Rev. 15, PAP-0102 Rev.20, SOI-N32/39/41/51 Rev. 40, ARI-H13-P680-09 Rev. 19		Reference Attached: PDB-C002 p. 4, ONI-S11 pp.3, 11, PAP-0102 p.9, SOI-N32/39/41/51 p. 7 & 69, ARI-H13-P680-09 pp. 39-40			
Proposed references to be provided to applicants during examination: PDB C02					
Learning Objective (As available): OT-COMBINED-N41_N51-H & -O					
Question Source:	Bank # Modified Bank # New	Perry NRC Exam 2019-2 #RO-30			
Question History:	Previous 2 NRC Exams? No				
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis x				
10 CFR Part 55 Content:	55.41 x 55.43				
Comments:					



### QUESTION RO 33

The plant is operating at rated power.

Which of the following alarms would result in a degradation of Main Condenser vacuum?

- A. OG PRE-TREAT PRCS RAD MON RAD HIGH
- B. MAIN STEAM LINE RADIATION HI HI/INOP
- C. OG ISOL OG POST-TREAT PRCS RAD MON A/B 3XHI
- D. BYPASS VLV SHUT OG POST-TREAT PRCS RAD A/B HI

LOD = \_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_

## QUESTION RO 33

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #	1			
	Group #	2			
	K/A#	295002	AK1.04		
	Importance Rating	3.4			
K&A: Knowledge of the operational implications and/or cause and effect relationships of the following concepts as they apply to Loss Of Main Condenser Vacuum: Offgas flow changes					
<b>Loss Of Main Condenser Vacuum</b>					
<p>Explanation: <b>Answer C</b> – &gt; Flow from the SJAE's is directed to the Offgas system. Receipt of an OG Post-Treat PRCS Rad Mon A/B 3XHI alarm will cause 1N64-F632, OG Discharge Isol. Valve to close which isolates Offgas. When Offgas is isolated, flow from the SJAE's is isolated and air and non-condensable gases will buildup in the main condenser causing a degradation of main condenser vacuum.</p> <p>A – Incorrect – Plausible since this alarm is an early indication of a potential fuel problem. However, no automatic isolations occur.</p> <p>B – Incorrect – Plausible since this alarm is an early indication of a potential fuel problem and a MSL rad high will cause a trip of the hoppers if running. Since the plant was at rated power, the hoppers would not be running.</p> <p>D – Incorrect – Plausible since this alarm is an early indication of a potential fuel problem and causes the Adsorber bypass valve to shut. This would not result in a degradation of condenser vacuum.</p>					
Technical Reference(s): ARI-H13-P604-01 Rev 8, ARI-H13-P601-19 Rev 22, SDM-N64 Rev 0		Reference Attached: ARI-H13-P604-01 pp. 3, 7, & 13, ARI-H13-P601-19 p. 25, SDM-N64 p. 41			
Proposed references to be provided to applicants during examination: None					
Learning Objective (As available): OT-COMBINED-D17A-I.1					
Question Source:	Bank # Modified Bank # New	Perry NRC Exam 2017 # RO-31			
Question History:	Previous 2 NRC Exams?	No			
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis	x			
10 CFR Part 55 Content:	55.41 55.43	x			
Comments:					

## QUESTION RO 34

HPCS initiated on a Loss of Feedwater.

When reactor water level reaches 230 inches, E22-F004, HPCS Injection Valve, is   (1)   and E22-C001, HPCS Pump, is   (2)  .

- |    | <u>  (1)  </u> | <u>  (2)  </u> |
|----|----------------|----------------|
| A. | open           | tripped        |
| B. | open           | running        |
| C. | closed         | tripped        |
| D. | closed         | running        |

LOD = \_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_

# QUESTION RO 34

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #	1			
	Group #	2			
	K/A#	295008	AA1.06		
	Importance Rating	3.8			
K&A: Ability to operate or monitor the following as they apply to High Reactor Water Level: HPCS					
<b>High Reactor Water Level</b>					
<p>Explanation: <b>Answer D</b> – &gt; With a loss of FW, the Plant is in ONI-C71, Rx Scram which directs the operator to maintain Rx water level 178-219 inches. The Operator is using Scram hardcard which instructs them to stabilize Rx water level using FW, HPCS, or RCIC. When RWL reaches L8, HPCS injection valve starts to automatically close to stop injection. The pump remains running with the min flow valve open to maintain pump cooling. With an injection rate of 3600 gpm at rated pressure and a close stroke time of 16 seconds, the HPCS pump would add ~960 gallons after L8 is reached. The volume between L8 and 230" in the Rx is ~2700 gallons. Therefore, E22-F004 would be closed when level swells up to 230".</p> <p>A &amp; B 1<sup>st</sup> part – Incorrect – Plausible since the Low Pressure ECCS pump injection valves remain open following a trip of the associated pump.</p> <p>A &amp; C 2<sup>nd</sup> part – Incorrect – Plausible because the MFP &amp; RFPTs trip on L8</p>					
Technical Reference(s): ARI-H13-P601-16 Rev. 22, ARI-H13-P680-03 Rev. 19		Reference Attached: ARI-H13-P601-16 pp. 13, 71, ARI-H13-P680-03 p. 23			
Proposed references to be provided to applicants during examination: None					
Learning Objective (As available): OT-COMBINED-E22A-#35					
Question Source:	Bank #				
	Modified Bank #				
	New	x			
Question History:	Previous 2 NRC Exams?	No			
Question Cognitive Level:	Memory or Fundamental Knowledge	x			
	Comprehension or Analysis				
10 CFR Part 55 Content:	55.41	x			
	55.43				
Comments:					

## QUESTION RO 35

The plant was shutdown for a forced outage when RPV level began to lower.

Concurrently, the control room was evacuated IAW ONI-C61, Control Room Evacuation.

RHR Loop 'B' is being used in LPCI Level Control in accordance with IOI-11, Shutdown From Outside the Control Room.

Which of the following describes the operator action required to position LPCI B INJECTION VALVE, 1E12-F042B, for this evolution?

1E12-F042B, is manipulated using its control switch located at \_\_\_\_.

- A. MCC disconnect EF1D07-X without requiring the use of a Transfer Switch on the Division 2 Remote Shutdown Panel, 1C61-P002
- B. MCC disconnect EF1D07-X only after a Transfer Switch is placed in EMERG on the Division 2 Remote Shutdown Panel, 1C61-P002
- C. the Division 2 Remote Shutdown Panel without requiring the use of a Transfer and Control Switch on the Division 2 Remote Shutdown Panel, 1C61-P002
- D. the Division 2 Remote Shutdown Panel only after a Transfer and Control Switch is placed in EMERG on the Division 2 Remote Shutdown Panel, 1C61-P002

LOD = \_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_

# QUESTION RO 35

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #	1			
	Group #	2			
	K/A#	295009	G2.1.30		
	Importance Rating	4.4			
K&A: Ability to locate and operate components, including local controls					
<b>Low Reactor Water Level</b>					
<p>Explanation: <b>Answer A</b> – 1E12-F042B is controlled from MCC EF1D07 X. The Transfer Switch is also located at the MCC bucket, not the RSD panel.</p> <p>B – Incorrect – Remote S/D operation of 1E12-F042B does not require manipulation of any switches on the Div. 2 RSD panel. Plausible since operation of Div. 1 Remote Shutdown components require manipulation of transfer switches.</p> <p>C – Incorrect - 1E12 F042B is not controlled from the Div. 2 RSD panel. Plausible since operation of Div. 1 Remote Shutdown components at the actual Div. 1 RSD panel.</p> <p>D – Incorrect - 1E12 F042B is not controlled from the Div. 2 RSD panel and Remote S/D operation of 1E12 F042B does not require manipulation of any switches on the Div. 2 RSD panel. Plausible since operation of Div. 1 Remote Shutdown components require manipulation of transfer switches</p>					
Technical Reference(s): IOI-11 Rev. 41		Reference Attached: IOI-11 pp. 67, 71-72 & 74			
Proposed references to be provided to applicants during examination: None					
Learning Objective (As available): OT-Combined-C61-F.2					
Question Source:	Bank # Modified Bank # New	Perry 2015 # RO-03			
Question History:	Previous 2 NRC Exams? No				
Question Cognitive Level:	Memory or Fundamental Knowledge x Comprehension or Analysis				
10 CFR Part 55 Content:	55.41 x 55.43				
Comments:					

**QUESTION RO 36**

Which of the following describes the bases for maximizing Containment Cooling during the execution of EOP-02, Primary Containment Control?

To preclude exceeding the Containment \_\_\_\_\_.

- A. average air temperature LCO limit
- B. design temperature limit of 330 °F
- C. environmental qualification temperature of 185 °F
- D. environmental qualification temperature of 330 °F

LOD = \_\_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_\_

# QUESTION RO 36

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #	1			
	Group #	2			
	K/A#	295011	AK3.01		
	Importance Rating	3.6			
K&A: Knowledge of the reasons for the following responses or actions as they apply to High Containment Temperature: Increased containment cooling					
<b>High Containment Temperature (Mark III Containment Only)</b>					
<p>Explanation: <b>Answer C</b> – Containment equipment qualification temperature is 185 °F.</p> <p>A. – Incorrect – Entry into EOP-02 is not required until the containment average air temperature is &gt; 95 °F. LCO limit is ≤ to 95 °F</p> <p>B. – Incorrect – The containment design temperature limit is ≤ 185 °F. (330 °F is the Drywell design temperature limit).</p> <p>D. – Incorrect – The environmental qualification temperature for safety-related electrical equipment in Containment is 185 °F. (330 °F is the environmental qualification temperature for safety-related electrical equipment in the Drywell).</p>					
Technical Reference(s): EOP-02 Bases Rev. 6, SDM-T23 Rev. 15, TS 3.6.1.5 Rev Amend. 171 & TS 3.6.5.5 Rev. Amend. 171		Reference Attached: EOP-02 Bases pp. 9 and 24, SDM-T23 p. 36, TS 3.6.1.5 p. 3.6-21, TS 3.6.5.5 p. 3.6-70			
Proposed references to be provided to applicants during examination: None					
Learning Objective (As available): x					
Question Source:	Bank # Modified Bank # New	Perry 2021 # RO-31			
Question History:	Previous 2 NRC Exams?	Perry 2021 # RO-31			
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis	x			
10 CFR Part 55 Content:	55.41 55.43	x			
Comments:					



## QUESTION RO 37

A reactor startup is in progress following a forced outage.

Control rods are being withdrawn for criticality.

The highest SRM reading is  $5 \times 10^4$  CPS.

While withdrawing Control Rod 30-31 it double notched.

Reactor Period is now 100 seconds.

With no operator action, annunciator (1) will alarm in (2) seconds.

	<u>(1)</u>	<u>(2)</u>
A.	RPS NEUTRON MON TRIP H13-P680-05-B7	69
B.	ROD BLOCK SRM UPSC/INOP H13-P680-06-C1	69
C.	RPS NEUTRON MON TRIP H13-P680-05-B7	138
D.	ROD BLOCK SRM UPSC/INOP H13-P680-06-C1	138

LOD = \_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_

## QUESTION RO 37

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #	1			
	Group #	2			
	K/A#	295014	AK2.05		
	Importance Rating	4.2			
K&A: Knowledge of the relationship between Inadvertent Reactivity Addition and the following systems or components: Neutron monitoring system/OPRMs					
<b>Inadvertent Reactivity Addition</b>					
<p>Explanation: <b>Answer B</b> – &gt; The Rod Block SRM UPSC/INOP setpoint is <math>1 \times 10^5</math> cps. This will alarm based on the period in 69 seconds. <math>1 \times 10^5</math> is the Rod Block setpoint. <math>nl (1 \times 10^5 / 5 \times 10^4) * 100 \text{ sec} = t = 69 \text{ sec}</math>.  <math>P = P_0 e^{t/\tau}</math></p> <p>A&amp;C 1<sup>st</sup> part – Incorrect – Plausible if the RPS trip function was not disabled. However, shorting links are installed which removes the non-coincident protection.</p> <p>C&amp;D 2<sup>nd</sup> part – Incorrect – This would be the time to alarm for the RPS NEUTRON MON TRIP if it was enabled. <math>2 \times 10^5</math> is the RPS trip setpoint. <math>nl (2 \times 10^5 / 5 \times 10^4) * 100 \text{ sec} = t = 138 \text{ sec}</math>. <math>P = P_0 e^{t/\tau}</math></p> <p>Alternate calculation is use of the IOI-1 conversion.</p> <p>Doubling time x 1.443 = period</p> <p>Period (<math>\tau</math>)/1.443=doubling time</p> <p><math>100/1.443=69</math> seconds</p> <p><math>(5 \times 10^4 \times 2)= 1 \times 10^5</math> Rod Block is one doubling</p> <p><math>(5 \times 10^4 \times 2 \times 2)= 2 \times 10^5</math> RPS Trip setpoint</p>					
Technical Reference(s): ARI-H13-P680-06 Rev. 9, IOI-01 Rev. 57, and SDM-C51(SRM) Rev. 8		Reference Attached: ARI-H13-P680-06 p. 29, IOI-01 p. 27, and SDM-C51(SRM) p. 21			
Proposed references to be provided to applicants during examination: None					
Learning Objective (As available): OT-COMBINED-C51_SRM-1.6, OT-3301-08-8					
Question Source:	Bank #	Modified Bank #	New x		
Question History:	Previous 2 NRC Exams?	No			
Question Cognitive Level:	Memory or Fundamental Knowledge	Comprehension or Analysis	x		
10 CFR Part 55 Content:	55.41	x	55.43		
Comments:					

**QUESTION RO 38**

The plant was operating at rated power when an unisolable primary system leak developed.

Which of the following conditions would require Emergency Depressurization?

- A. AEGTS Rad Monitor pegged high on Annulus Effluent Gas Treatment System, D17-K690A(B)
- B. Aux 574' Rad Monitor pegged high on AB EL 574' EAST(WEST), D21-K112(K122)
- C. RCIC pump room temp pegged high on NUMAC E31-N700A(B)
- D. RHR B PUMP ROOM SUMP LEVEL HIGH alarm

LOD = \_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_

QUESTION RO 38

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #	1			
	Group #	2			
	K/A#	295033	EA2.01		
	Importance Rating	4.1			
K&A: Ability to determine or interpret the following as they apply to High Secondary Containment Area Radiation Levels: Area radiation levels					
<b>High Secondary Containment Area Radiation Levels</b>					
<p>Explanation: <b>Answer B</b> – &gt; This is an EOP-03 entry condition. EOP-03 notes that if Aux 574' D21-K112 HIGH alarm is received, it is to be counted as 2 areas above MAX SAFE by preventing the access to any of the ECCS/RCIC rooms for monitoring. With 2 areas above MAX SAFE in the same parameter, ED is required.</p> <p>A – Incorrect – Plausible, this is an EOP-03 entry condition that is an indication of a leak in the annulus. However, there is no MAX SAFE condition associated with the annulus radiation.</p> <p>C – Incorrect – Plausible, this is an EOP-03 entry condition that is an indication of a leak in the RCIC room, but without a second AREA temperature high alarm, ED is not required.</p> <p>D – Incorrect – Plausible, this is an EOP-03 entry condition that is an indication RHR B Pump has a liquid leak in the room. Until determined that the leak was affecting other areas that are above MAX SAFE and was unisolable primary leakage, ED would not be required.</p>					
Technical Reference(s): EOP-03 Bases Rev. 0		Reference Attached: EOP-03 Bases pp. 6 & 26-27			
Proposed references to be provided to applicants during examination: None					
Learning Objective (As available): OT-3402-17-C					
Question Source:	Bank # Modified Bank # New x				
Question History:	Previous 2 NRC Exams? No				
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis x				
10 CFR Part 55 Content:	55.41 x 55.43				
Comments:					

**QUESTION RO 39**

An Instrument air leak in the Aux Building necessitated isolating Instrument Air to the Aux Building.

What is the impact of this Instrument Air loss on the Residual Heat Removal System?

The capability to \_\_\_\_ is lost.

- A. sample RHR A heat exchangers
- B. remotely place RHR A in Alternate Keep-fill
- C. place RHR B in Fuel Pool Cooling Assist mode
- D. pump down the suppression pool with RHR B to Radwaste

LOD = \_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_

## QUESTION RO 39

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #	2			
	Group #	1			
	K/A#	203000	K1.04		
	Importance Rating	2.8			
K&A: Sect. 5 291001 Valves: The failed-valve positions for different operators open, closed, and as-is positions; spring-loaded valves; hydraulically/pneumatically controlled valves; electric motor-driven valves					
<b>RHR/LPCI: Injection Mode</b>					
<p>Explanation: <b>Answer B</b> – &gt; RHR/LPCI is placed on Alternate Keepfill when the Keepfill pump is not available or can't maintain RHR system pressure. Valve 1E12-F300A is opened to place RHR A in Alt Keepfill and uses Instrument Air to be remotely operated. If Instrument Air is lost, E12-F300A will fail closed if operating remotely.</p> <p>A – Incorrect – Plausible, many plant sample valves are air operated valve, but RHR A HX sample valves E12-F060A and E12-F075A are solenoid operated valves – no air required.</p> <p>C – Incorrect – Plausible, the operation of RHR in fuel pool cooling assist requires the ability to throttle flow. Air operated valves are frequently used to throttle, but RHR in fuel pool cooling assist operation only uses MOV's and manually operated valves.</p> <p>D – Incorrect – Plausible, most Radwaste systems utilize air operated valves for flow control, but pumping down the SP to Radwaste only requires operation of MOV's and manually operated valves in the Aux Building.</p>					
Technical Reference(s): SOI-E12 Rev 78, DWGs 302-643 Rev CCC, 816-706 Rev N		Reference Attached: SOI-E12 pp. 51, 238-239, & 241, DWGs 302-642 & 816-706			
Proposed references to be provided to applicants during examination: None					
Learning Objective (As available): OT-COMBINED-P51_52-J.4					
Question Source:	Bank # Modified Bank # New	Perry 2015 Exam #RO-18			
Question History:	Previous 2 NRC Exams? No				
Question Cognitive Level:	Memory or Fundamental Knowledge x Comprehension or Analysis				
10 CFR Part 55 Content:	55.41 x 55.43				
Comments:					

**QUESTION RO 40**

The plant is shutdown in Mode 3 for a forced outage.

RHR A is operating in Shutdown Cooling Mode.

Electrical power to the ECC Temperature Control Valve, P42-F665A was lost.

Based on this information, RHR A Pump room temperature   (1)   expected to rise and RHR A Pump Seal temperature limits   (2)   be challenged.

- |    | <u>  (1)  </u> | <u>  (2)  </u> |
|----|----------------|----------------|
| A. | is             | will           |
| B. | is             | will not       |
| C. | is not         | will           |
| D. | is not         | will not       |

LOD = \_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_

# QUESTION RO 40

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #	2			
	Group #	1			
	K/A#	205000	K6.05		
	Importance Rating	3.2			
K&A: Knowledge of the effect of the following plant conditions, system malfunctions, or component malfunctions on the Shutdown Cooling System: Component cooling water systems					
<b>Shutdown Cooling System (RHR Shutdown Cooling Mode)</b>					
<p>Explanation: <b>Answer D</b>– ECC provides cooling to the RHR A Pump room cooler and cooling to the pump seals. The ECC TCV is a 3-way electro hydraulic valve that controls ECC temperature by bypassing some of the ECC flow around the ECC HX. With the plant in Mode 3, RPV temperature is &gt;200 °F. However, when electrical power is lost to the ECC TCV, it fails as is.</p> <p>A &amp; B – Incorrect – 1<sup>st</sup> part - Plausible if the ECC TCV failed to the full bypass position on a loss of power. Electro Hydraulic valves can be setup to FC, FO or FAI on a loss of power.</p> <p>A &amp; C – Incorrect – 2<sup>nd</sup> part – Plausible since the Rx is in Mode 3, RPV temperature is &gt;200 °F and if the ECC TCV failed to the full bypass position on a loss of power, then pump seal temperatures would rise. The limit for RHR A pump seal temperature is 150 °F</p>					
Technical Reference(s): SDM-P42 Rev. 12. ARI-H13-P601-20 Rev. 26, and 302-621 Rev. TT		Reference Attached: SDM-P42 pp. 16-17. ARI-H13-P601-20 p. 5, and 302-621 partial			
Proposed references to be provided to applicants during examination: None					
Learning Objective (As available): OT-COMBINED-P42 #13					
Question Source:	Bank #				
	Modified Bank #				
	New	x			
Question History:	Previous 2 NRC Exams?	No			
Question Cognitive Level:	Memory or Fundamental Knowledge				
	Comprehension or Analysis	x			
10 CFR Part 55 Content:	55.41	x			
	55.43				
Comments:					



**QUESTION RO 41**

The LPCS PUMP ROOM COOLER, M39-B006 is directly started when \_\_\_\_

- A. LPCS room temperature exceeds 90 °F
- B. the LPCS Pump breaker closes via a 52a contact
- C. an RHR LOCA initiation signal seals-in a K110A relay contact
- D. the LPCS/LPCI A MANUAL INITIATION SWITCH is armed and depressed

LOD = \_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_

## QUESTION RO 41

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #	2			
	Group #	1			
	K/A#	209001	K4.03		
	Importance Rating	2.9			
K&A: Knowledge of Low Pressure Core Spray System design features and/or interlocks that provide for the following: Motor cooling					
<b>Low Pressure Core Spray System</b>					
<p>Explanation: <b>Answer B</b> – The LPCS Pump room cooler provides motor cooling by discharging cooled air towards the motor. The cooling fan starts when a 52a contact in the LPCS Pump breaker, EH1111, closes</p> <p>A – Incorrect – Plausible as the divisional diesel generator rooms aux cooling fans automatically start when the respective room exceeds 90 °F</p> <p>C – Incorrect – Plausible as many pieces of equipment automatically start via the K110 relays. However, the LPCS room cooler is directly started via a 52a contact in the LPCS pump breaker.</p> <p>D – Incorrect – Plausible as the LPCS pump will start when the Initiation PB is armed and depressed. However, the LPCS room cooler is directly started via a 52a contact in the LPCS pump breaker.</p>					
Technical Reference(s): SOI-M39 Rev. 6 and 208-131 Sh. 2 Rev. T		Reference Attached: SOI-M39 p. 9 and 208-131 Sh. 2			
Proposed references to be provided to applicants during examination: None					
Learning Objective (As available): OT-COMBINED-M39-F					
Question Source:	Bank #				
	Modified Bank #				
	New		x		
Question History:	Previous 2 NRC Exams?	No			
Question Cognitive Level:	Memory or Fundamental Knowledge		x		
	Comprehension or Analysis				
10 CFR Part 55 Content:	55.41		x		
	55.43				
Comments:					

## QUESTION RO 42

The High Pressure Core Spray System was being operated in HPCS Full Flow Test To CST.

Then, while adjusting flow to 6100 gpm, the HPCS FIRST TEST VALVE TO CST, E22-F010 failed closed and cannot be reopened.

What is the effect of this failure?

- A. CST level lowers.
- B. CST level remains stable.
- C. Suppression Pool level lowers.
- D. Suppression Pool level remains stable.

LOD = \_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_

## QUESTION RO 42

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #	2			
	Group #	1			
	K/A#	209002	K3.08		
	Importance Rating	3.2			
K&A: Knowledge of the effect that a loss or malfunction of the High Pressure Core Spray System will have on the following systems or system parameters: Condensate storage tank level					
<b>High Pressure Core Spray System</b>					
<p>Explanation: <b>Answer A</b> – When E22-F010 failed closed, the HPCS Min Flow valve, E22-F012 automatically opens based on HPCS flow &lt;725 gpm and HPCS discharge pressure &gt;145 psig. HPCS suction remains on the CST, but the Min Flow Valve discharges to the Suppression Pool. Therefore, CST level will continue to lower until the HPCS pump is stopped.</p> <p>B – Incorrect – Plausible if the HPCS suction shifted to the Suppression Pool or the pump was stopped.</p> <p>C – Incorrect – Plausible if the HPCS suction was on the suppression pool and HPCS was being used for injection.</p> <p>D – Incorrect – Plausible if originally operating in HPCS Full Flow Test To Suppression Pool. However, SP level will raise as level in the CST lowers.</p>					
Technical Reference(s): 302-701 Rev. LL and SOI-E22A Rev. 41		Reference Attached: 302-701 and SOI-E22A pp. 46 & 48			
Proposed references to be provided to applicants during examination: None					
Learning Objective (As available): OT-COMBINED-E22A #36					
Question Source:	Bank #	Modified Bank #	New x		
Question History:	Previous 2 NRC Exams?	No			
Question Cognitive Level:	Memory or Fundamental Knowledge	Comprehension or Analysis	x		
10 CFR Part 55 Content:	55.41	x	55.43		
Comments:					

### QUESTION RO 43

Which of the following combinations of HPCS flow and RPV level are the minimum required to assure adequate core cooling?

	<u>RPV Level</u>	<u>HPCS Flow</u>
A.	-40 inches	2200 gpm
B.	-70 inches	2200 gpm
C.	-40 inches	6500 gpm
D.	-70 inches	6500 gpm

LOD = \_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_

## QUESTION RO 43

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #	2			
	Group #	1			
	K/A#	209002	K5.04		
	Importance Rating	4.5			
K&A: Knowledge of the operational implications or cause and effect relationships of the following concepts as they apply to the High Pressure Core Spray System: Adequate core cooling					
<b>High Pressure Core Spray System</b>					
<p>Explanation: <b>Answer C</b> – IAW EOP Bases, Adequate Core Cooling is defined for Spray Cooling as RPV level &gt; -45" and at least one spray system (HPCS) injecting ≥6200 gpm.</p> <p>A &amp; B – Incorrect – 2<sup>nd</sup> part – Plausible as this is the Minimum Core Steam Flow Injection Rate</p> <p>B &amp; C – Incorrect – 1<sup>st</sup> part – Plausible as -75 inches is the Minimum Zero-Injection RPV water level.</p>					
Technical Reference(s): EOP-Bases Rev.9		Reference Attached: EOP-Bases pp. 38-39 & 46			
Proposed references to be provided to applicants during examination: None					
Learning Objective (As available): OT-3402-01-C.1					
Question Source:	Bank # Modified Bank # New	Grand Gulf 2017 # RO-32			
Question History:	Previous 2 NRC Exams? No				
Question Cognitive Level:	Memory or Fundamental Knowledge x Comprehension or Analysis				
10 CFR Part 55 Content:	55.41 x 55.43				
Comments:					

QUESTION RO 44

The plant was operating at rated power with SLC Pump B tagged out for motor replacement.  
Then an ATWS occurred and SLC A pump was started.  
No other ATWS Actions have been performed.

Several minutes later which lights should be illuminated on the Isolation Matrix for G33-F001 & G33-F004?

- A.

G33  
F001

P882

G33  
F004

P881
- B.

G33  
F001

P882

G33  
F004

P881
- C.

G33  
F001

P882

G33  
F004

P881
- D.

G33  
F001

P882

G33  
F004

P881

LOD = \_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_

## QUESTION RO 44

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #	2			
	Group #	1			
	K/A#	211000	A1.10		
	Importance Rating	3.6			
K&A: Ability to predict and/or monitor changes in parameters associated with operation of the Standby Liquid Control System including: Lights and alarms					
<b>Standby Liquid Control System</b>					
<p>Explanation: <b>Answer D</b> – Each RWCU valve is automatically closed when the respective SLC pump control switch is taken to LN. When the B SLC Pump Keylock switch is taken to ON, a signal is sent to G33-F004 to close. This would result in a green light indication on the Isolation Matrix on P601. Since SLC B pump was not started. G33-F001 remained open</p> <p>A &amp; B – Incorrect – 1<sup>st</sup> part – Plausible since this would be correct if SLC A pump was started as a Green light indicates closed.</p> <p>A &amp; C – Incorrect – 2<sup>nd</sup> part – Plausible since this would be the correct indication if G33-F004 failed to close.</p>					
Technical Reference(s): LP OT-COMBINED-C41 Rev. 4 and SDM-C41 Rev. 10		Reference Attached: LP OT-COMBINED-C41 slide 38 and SDM-C41 p. 16			
Proposed references to be provided to applicants during examination: None					
Learning Objective (As available): OT-COMBINED-C41-I, G33_G36.F.2, G33_G36.L					
Question Source:	Bank # Modified Bank # New	Perry 2021 # RO-44			
Question History:	Previous 2 NRC Exams? No				
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis x				
10 CFR Part 55 Content:	55.41 x 55.43				
Comments:					



## QUESTION RO 45

The following conditions exist:

- One of the RPS CH A&C SCRAM SOL VALVES indicating lights on H13-P680 (lights are located above each scram pushbutton) for RPS channel 'A' is out due to a blown fuse.
- All RPS 'B' Scram Pilot Solenoid Valve lights are energized
- Several minutes later, Average Power Range Monitor (APRM) 'F' fails upscale

Which of the following describes the direct effect to the plant for these conditions?

- A. Full Scram
- B. Only  $\frac{1}{2}$  scram 'B' RPS Channel
- C.  $\frac{1}{2}$  of the control rods fully insert
- D.  $\frac{1}{4}$  of the control rods fully insert

LOD = \_\_\_\_ (1  $\rightarrow$  5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_

## QUESTION RO 45

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #	2			
	Group #	1			
	K/A#	212000	K5.02		
	Importance Rating	4.1			
K&A: Knowledge of the operational implications or cause and effect relationships of the following concepts as they apply to the Reactor Protection System: Logic channel arrangements					
<b>Reactor Protection System</b>					
<p>Explanation: <b>Answer D</b> – &gt; Only <math>\frac{1}{4}</math> of rods will insert – <math>\frac{1}{2}</math> scram signal on channel A and <math>\frac{1}{4}</math> scram signal on B channel of RPS</p> <p>A – Incorrect – Plausible, misconception that 1 light out is <math>\frac{1}{2}</math> scram signal</p> <p>B – Incorrect – Plausible, will not get ONLY <math>\frac{1}{2}</math> scram on B channel</p> <p>C – Incorrect – Plausible, misconception that that this situation would cause <math>\frac{1}{2}</math> rods to insert</p>					
Technical Reference(s): SVI-C71-T0051 Rev. 13 and 208-040 sh. 10 Rev. L		Reference Attached: SVI-C71-T0051 p 14 and. 208-040 sh. 10			
Proposed references to be provided to applicants during examination: None					
Learning Objective (As available): OT-Combined-C71-1.18, 1.19					
Question Source:	Bank # Modified Bank # New	Perry 2009 NRC # RO-46			
Question History:	Previous 2 NRC Exams? No				
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis x				
10 CFR Part 55 Content:	55.41 x 55.43				
Comments:					

**QUESTION RO 46**

The plant was operating at 50% rated power.

RPS Bus B EPAs tripped open.

When the RPS bus is reenergized, which of the following is required?

- A. Reboot ERIS computer.
- B. Place IRM H on Range 3.
- C. Reset  $\frac{1}{2}$  scram caused by APRM D failing down scale.
- D. Reopen DW VAC RLF MOV ISOL VALVE, 1M16-F010B.

LOD = \_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_

## QUESTION RO 46

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #	2			
	Group #	1			
	K/A#	215003	K2.01		
	Importance Rating	3.4			
K&A: Knowledge of electrical power supplies to the following: IRM channels/detectors					
<b>Intermediate Range Monitor System</b>					
<p>Explanation: <b>Answer B</b> – &gt; RPS B supplies IRM H. When power is lost to the IRM power supply, the IRM fails down scale. It needs to be re-ranged to Range 3 (in MODE 1) per SOI-C71 and IOI-1.</p> <p>A – Incorrect – Plausible, the ERIS computer is supplied from the ATWS UPS</p> <p>C – Incorrect – Plausible, APRMs are supplied from the ATWS UPSs</p> <p>D – Incorrect – Plausible, M16-F010B receives an isolation signal on loss of RPS B; however, it is normally closed and will only open on vacuum condition.</p>					
Technical Reference(s): SOI-C71 Rev. 25, SDM-C51 (IRM) Rev 8, IOI-1 Rev. <b>57</b>		Reference Attached: SOI-C71 pp. 56, & 113-114, SDM-C51 (IRM) p. 32 & 63, IOI-1 p. 58 & 59			
Proposed references to be provided to applicants during examination: None					
Learning Objective (As available): OT-COMBINED-C51_IRM-1.6					
Question Source:	Bank # Modified Bank # New	Perry 2021 #RO-48			
Question History:	Previous 2 NRC Exams?	Perry 2021 #RO-48			
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis	x			
10 CFR Part 55 Content:	55.41 55.43	x			
Comments:					

**QUESTION RO 47**

What will bypass IRM rod blocks?

- A. Mode Switch in RUN
- B. All APRMs reading >4%
- C. All IRMs fully withdrawn
- D. IRMs on Range 2 with all SRMs fully inserted

LOD = \_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_

## QUESTION RO 47

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #	2			
	Group #	1			
	K/A#	215003	K4.10		
	Importance Rating	3.6			
K&A: Knowledge of Intermediate Range Monitor System design features and/or interlocks that provide for the following: Automatically bypassing IRM rod block signals					
<b>Intermediate Range Monitor System</b>					
<p>Explanation: <b>Answer A</b> – &gt; With the mode switch in RUN, the IRM rod blocks are bypassed to allow for continued power ascension.</p> <p>B – Incorrect – Plausible, ≥4% on the APRMs clears the downscale APRM rod blocks when in RUN.</p> <p>C – Incorrect – Plausible, once the mode switch is placed in RUN, IRMs are withdrawn from the core to extend their life.</p> <p>D – Incorrect – Plausible, downscale rod blocks are bypassed on IRM range 1.</p>					
Technical Reference(s): SDM-C51(IRM) Rev. 8		Reference Attached: SDM-C51(IRM) p. 45			
Proposed references to be provided to applicants during examination: None					
Learning Objective (As available): OT-COMBINED-C51_IRM-1.6					
Question Source:	Bank #				
	Modified Bank #				
	New	x			
Question History:	Previous 2 NRC Exams?	No			
Question Cognitive Level:	Memory or Fundamental Knowledge	x			
	Comprehension or Analysis				
10 CFR Part 55 Content:	55.41	x			
	55.43				
Comments:					

## QUESTION RO 48

A reactor startup is in progress with power approximately  $3 \times 10^3$  CPS and stable on all SRMs.

- Annunciator H13-P680-06-C1, Rod Block SRM Upscale/INOP, alarmed.
- The I&C technician reports SRM D High Voltage Power Supply is reading 300 VDC

Based on the above information, SRM D has an (1) signal.

In order to continue plant startup, SRM D must be (2) IAW SOI-C51(SRM).

	<u>(1)</u>	<u>(2)</u>
A.	INOP	bypassed
B.	upscale trip	bypassed
C.	INOP	withdrawn
D.	upscale trip	withdrawn

LOD = \_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_

QUESTION RO 48

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #	2			
	Group #	1			
	K/A#	215004	A2.01		
	Importance Rating	3.1			
K&A: Ability to (a) predict the impacts of the following on the Source Range Monitor System and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operations: Degraded power supply					
<b>Source Range Monitor System</b>					
<p>Explanation: <b>Answer A</b> – &gt; SRM D High voltage power supply inputs 350-600 VDC (nominal) to the SRM detector. Typically, it is set at 500 VDC. The SRM circuit receives an INOP signal on low HVDC (96% of last calibration) power supply. Plant startup can continue if the INOP SRM is bypassed. IAW TS 3.3.1.2, only 3 SRM channels are required.</p> <p>B &amp; D 1<sup>st</sup> Part – Incorrect – Plausible, the annunciator window for the INOP alarm is common between all SRMs and both upscale and INOP signals. Low HVDC power supply is only an INOP condition.</p> <p>C &amp; D 2<sup>nd</sup> Part – Incorrect – Plausible, the required action for an upscale SRM is to withdraw the detector per the ARI. The upscale setpoint is <math>1 \times 10^5</math> cps.</p>					
Technical Reference(s): ARI-H13-P680-06 Rev. 9, LP330307 Rev.5, SDM-C51(SRM) Rev. 8		Reference Attached: ARI-H13-P680-06 p.29, LP330307 p.120, SDM-C51(SRM) pp.11&14			
Proposed references to be provided to applicants during examination: None					
Learning Objective (As available): OT-COMBINED-C51_SRM-1.7					
Question Source:	Bank #	Modified Bank #	New x		
Question History:	Previous 2 NRC Exams?	No			
Question Cognitive Level:	Memory or Fundamental Knowledge	Comprehension or Analysis	x		
10 CFR Part 55 Content:	55.41	x	55.43		
Comments:					



**QUESTION RO 49**

The plant is operating at 48% power and Total Core Flow is  $50 \times 10^6$  lbm/hr.

What is the current Upscale Thermal Power Trip setpoint rounded to the nearest percent (%)?

**Reference Provided:**

- A. 107%
- B. 108%
- C. 111%
- D. 113%

LOD = \_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_

QUESTION RO 49

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #	2			
	Group #	1			
	K/A#	215005	A1.04		
	Importance Rating	4.0			
K&A: Ability to predict and/or monitor changes in parameters associated with operation of the Average Power Range Monitor/Local Power Range Monitor including: SCRAM and rod block trip setpoints					
<b>Average Power Range Monitor/Local Power Range Monitor</b>					
<p>Explanation: <b>Answer C</b> – &gt; The APRM Upscale Thermal Power Trip setpoint is calculated using the formula <math>\text{Setpoint} = 0.628W_r + 61\%</math> (where <math>W_r</math> is the % drive flow) and is clamped at 111%</p> <p>A – Incorrect – Plausible, this is the current APRM Upscale Thermal Power Alarm setpoint</p> <p>B – Incorrect – Plausible, this is the clamped value for the APRM Upscale Thermal Power Alarm setpoint</p> <p>D – Incorrect – Plausible, this is the calculated setpoint (using 83% total core flow), however, it is clamped at 111%</p>					
Technical Reference(s): PDB-A12 Rev. 18 and ARI-H13-P680-06 Rev. 9		Reference Attached: PDB-A12 p. 6 and ARI-H13-P680-06 p. 25			
Proposed references to be provided to applicants during examination: PDB-A0012, Recirc Drive Flow vs. Total Core Flow					
Learning Objective (As available): OT-COMBINED-C51_AP-OPRM-1.12					
Question Source:	Bank #	Perry 2010 #RO-48			
	Modified Bank #				
	New				
Question History:	Previous 2 NRC Exams?	No			
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis                      x				
10 CFR Part 55 Content:	55.41      x 55.43				
Comments:					

**QUESTION RO 50**

The plant was operating at rated power when a load supply breaker on D-1-B tripped.

What is the consequence of the breaker tripping?

- A. Bus EH12 Control Power is lost.
- B. RCIC Gland Seal Compressor cannot be started.
- C. Combustible Gas Purge Unit B cannot be started.
- D. Reactor Recirc Pump Breakers 3B & 4B will trip open.

LOD = \_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_

# QUESTION RO 50

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #	2			
	Group #	1			
	K/A#	217000	K2.04		
	Importance Rating	2.6			
K&A: Knowledge of electrical power supplies to the following: Gland seal compressor vacuum pump					
<b>Reactor Core Isolation Cooling System</b>					
<p>Explanation: <b>Answer B</b> – &gt; Power to the RCIC Gland Seal Compressor is D-1-B-06.</p> <p>A – Incorrect – Plausible, since DC bus ED-1-B, supplies the control power to bus EH12.</p> <p>C – Incorrect – Plausible, Bus D-1-A supplies control power to the control panel, but as the Unit B, the misconception that the power supply is divisional would lead to the selection of D-1-B as the power supply.</p> <p>D – Incorrect – Plausible, D-1-B is the power supply to the optical isolators for the breaker controls. Without power, Recirc Pump breakers 3B &amp; 4B cannot be remotely tripped.</p>					
Technical Reference(s): PDB-H05 Rev. 5 & PDB-H04 Rev. 6		Reference Attached: PDB-H05 p. 22 & PDB-H04 p. 12			
Proposed references to be provided to applicants during examination: None					
Learning Objective (As available): OT-COMBINED-E51 #17					
Question Source:	Bank #				
	Modified Bank #				
	New		x		
Question History:	Previous 2 NRC Exams?	No			
Question Cognitive Level:	Memory or Fundamental Knowledge		x		
	Comprehension or Analysis				
10 CFR Part 55 Content:	55.41		x		
	55.43				
Comments:					

## QUESTION RO 51

The plant is operating at 93% power when the following annunciators on H13-P601 alarm:

- LPCS AUTO START RECEIVED
- LPCS & LPCI A RX LEVEL LO L1
- LPCI A AUTO START RECEIVED
- ADS A PERMISSIVE LPCS / RHR A RUN
- ADS A TIME DELAY LOGIC TIMER RUNNING
- ADS A TIMER 90 SEC & RUNNING

**Refer to the attached SPDS picture for current plant conditions**

In accordance with ONI-E12-1, INADVERTENT INITIATION OR ECCS/RCIC, which of the following IMMEDIATE ACTIONS is/are required?

**Attachment Provided:**

- A. Only place ADS A LOGIC INHIBIT Keylock Switch in INHIBIT
- B. Place ADS A and B LOGIC INHIBIT Keylock Switches in INHIBIT
- C. Depress the ADS A and B LOGIC SEAL IN RESET pushbuttons and only place ADS A LOGIC INHIBIT Keylock Switch in INHIBIT
- D. Depress the ADS A and B LOGIC SEAL IN RESET pushbuttons and place both ADS A and B LOGIC INHIBIT Keylock Switches in INHIBIT

LOD = \_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_

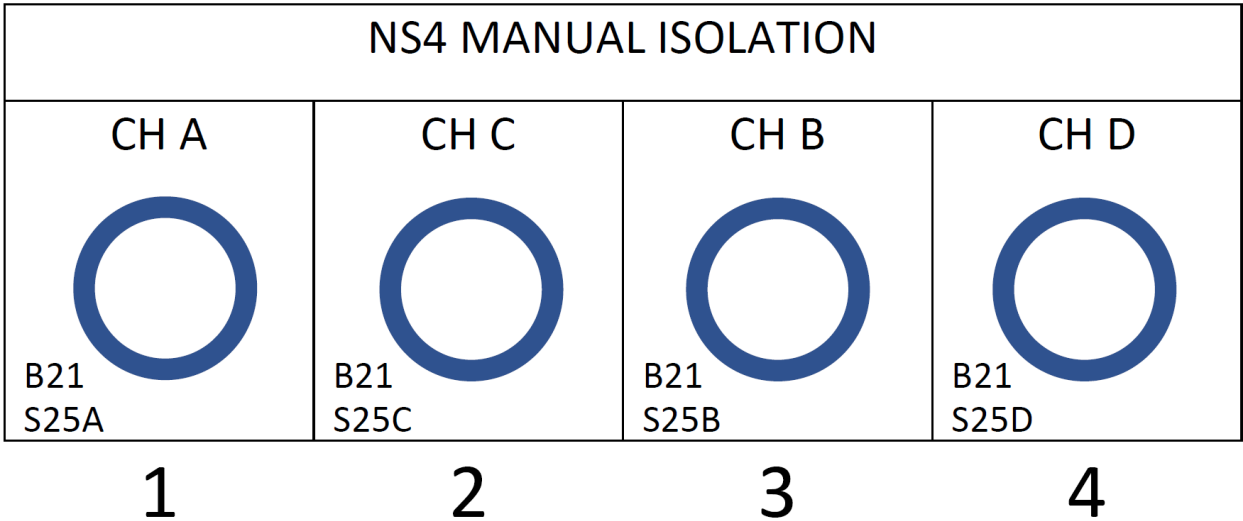
## QUESTION RO 51

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #	2			
	Group #	1			
	K/A#	218000	G2.2.44		
	Importance Rating	4.2			
K&A: Ability to interpret control room indications to verify the status and operation of a system and understand how operator actions and directives affect plant and system conditions					
<b>Automatic Depressurization System</b>					
<p>Explanation: <b>Answer C</b> – With RPV level and pressure normal, this is an inadvertent initiation of ADS. IAW ONI-E12-1, permissives for ADS A are met. Therefore, the ADS A and B Logic Seal In Reset PB are depressed and with the logic met for initiation, A Logic Inhibit Keylock switch must be placed in Inhibit.</p> <p>A – Incorrect – This is not the only Immediate Action required by ONI-E12-1. The Seal-in Reset pushbuttons must also be depressed.</p> <p>B – Incorrect – The permissives for ADS B are not satisfied – ONI says inhibit only the affected logic channel.</p> <p>D – Incorrect – ONI-E12-1 directs operator to inhibit only the channel associated with the inadvertent initiation.</p>					
Technical Reference(s): ONI-E12-1 Rev. 17, ARI-H13-P601-19 Rev. 22		Reference Attached: ONI-E12-1 p. 5, ARI-H13-P601-19 pp. 71 & 103			
Proposed references to be provided to applicants during examination: None					
Learning Objective (As available): OT-COMBINED-B21C-F, I.1, & J.2					
Question Source:	Bank #	Perry 2017 #RO-51			
	Modified Bank #				
	New				
Question History:	Previous 2 NRC Exams?	No			
Question Cognitive Level:	Memory or Fundamental Knowledge				
	Comprehension or Analysis	x			
10 CFR Part 55 Content:	55.41	x			
	55.43				
Comments: Attach SPDS OPERATOR ATC picture to question					

QUESTION RO 52

You have been directed to manually initiate an NS4 Inboard Isolation.

Which of the following actions will initiate the isolation?



- A. Sequentially depressing pushbuttons 1 and 4 or pushbuttons 2 and 3
- B. Sequentially depressing pushbuttons 1 and 2 or pushbuttons 3 and 4
- C. Arming switches 1 and 4, then simultaneously depressing pushbuttons 1 and 4
- D. Arming switches 2 and 3, then simultaneously depressing pushbuttons 2 and 3

LOD = \_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_

## QUESTION RO 52

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #	2			
	Group #	1			
	K/A#	223002	A4.01		
	Importance Rating	4.2			
K&A: Ability to manually operate and/or monitor the Primary Containment Isolation System / Nuclear Steam Supply Shutoff in the control room: System valve operations					
<b>Primary Containment Isolation System / Nuclear Steam Supply Shutoff</b>					
<p>Explanation: <b>Answer D</b> – The NS4 MANUAL isolation system uses arm and depress switches. This requires the collars to be rotated clockwise to “arm” the switch. Once the switches are armed, the inboard isolation signal is generated by depressing the Switch 2 (S25B) and Switch 3 (S25C) simultaneously.</p> <p>A – Incorrect – Plausible since 1 &amp; 4 are the proper switches for an Outboard isolation and 2 &amp; 3 are the proper switches for an Inboard isolation. But the collars must be armed and the switches must be depressed simultaneously for the isolation to occur.</p> <p>B – Incorrect – Plausible since depressing these pushbuttons would result in an MSIV isolation. But the collars must be armed and the switches must be depressed simultaneously for the isolation to occur.</p> <p>C – Incorrect – Plausible since these are the proper operation to actuate an Outboard isolation.</p>					
Technical Reference(s): SDM-B21 (NS <sup>4</sup> ) Rev. 7, SOI-B21 Rev. 23		Reference Attached: SDM-B21 (NS <sup>4</sup> ) pp. 1-2, SOI-B21 pp. 17-18			
Proposed references to be provided to applicants during examination: None					
Learning Objective (As available): OT-Combined-B21(NS4) #2, #20					
Question Source:	Bank #	Dresden 2017 #39			
	Modified Bank #				
	New				
Question History:	Previous 2 NRC Exams?	No			
Question Cognitive Level:	Memory or Fundamental Knowledge				
	Comprehension or Analysis	x			
10 CFR Part 55 Content:	55.41	x			
	55.43				
Comments:					



## QUESTION RO 53

The plant was operating at rated power when a Loss of Offsite Power (LOOP) occurred.

What affect does this have on SRV operation?

- A. Non-ADS SRVs cannot be cycled
- B. All SRVs will operate in Relief mode only
- C. ADS SRVs can be cycled for RPV Cooldown
- D. All SRVs will only operate under Spring Set Pressure

LOD = \_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_

# QUESTION RO 53

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #	2			
	Group #	1			
	K/A#	239002	K6.03		
	Importance Rating	3.2			
K&A: Knowledge of the effect of the following plant conditions, system malfunctions, or component malfunctions on the Safety Relief Valves: AC power					
<b>Safety Relief Valves</b>					
<p>Explanation: <b>Answer C</b> – &gt; ADS SRVs are supplied from Safety Related Instrument Air System (SRIA-P57) not Station Instrument Air. On a LOOP, most Containment Isolation valves fail as is then close when the DGs restore power. However, the SRIA isolation valves have no automatic isolations. Therefore, air is not lost to the ADS SRVs. The SRIA system has 2 1350 ft<sup>3</sup> air accumulators that are sized for RPV cooldown for 7 days.</p> <p>A – Incorrect – Non-ADS SRVs have individual accumulators to allow pneumatic operation. B21F051D is also supplied by the safety related instrument air accumulators for LLS operation.</p> <p>B – Incorrect – All SRVs have accumulators, but non-ADS SRV's accumulators are not sized for extended use.</p> <p>D – Incorrect – All SRVs have accumulators, and ADS SRVs have multiple accumulators for pneumatic operation.</p>					
Technical Reference(s): SDM-P57 Rev. 10 and 302-605 Rev. Z		Reference Attached: SDM-P57 pp. 2 & 4 and 302-605			
Proposed references to be provided to applicants during examination: None					
Learning Objective (As available): OT-COMBINED-B21C-L.2					
Question Source:	Bank #	Modified Bank #	New x		
Question History:	Previous 2 NRC Exams?	No			
Question Cognitive Level:	Memory or Fundamental Knowledge	Comprehension or Analysis	x		
10 CFR Part 55 Content:	55.41	x	55.43		
Comments:					

## QUESTION RO 54

The plant was operating at rated power when C34-N003A, A MSL Flow Transmitter failed.

The following P680 annunciators alarmed:

- Rx LVLHI/LO L7/L4
- FEED FLOW STEAM FLOW MISMATCH

Based on this information, IAW ONI-C34:

With no operator action, this RPV water level transient (1) cause an automatic Rx scram.

To control this transient, the operator will (2) .

- |    | <u>(1)</u> | <u>(2)</u>   |
|----|------------|--|
| A. | will       | place RFPT MAN/AUTO STATIONS in MANUAL using the DFWCS faceplate |
| B. | will       | maintain RPV water level 192 to 200 inches                       |
| C. | will not   | place RFPT MAN/AUTO STATIONS in MANUAL using the DFWCS faceplate |
| D. | will not   | maintain RPV water level 192 to 200 inches                       |

LOD = \_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_

# QUESTION RO 54

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #	2			
	Group #	1			
	K/A#	259002	A2.01		
	Importance Rating	3.8			
K&A: Ability to (a) predict the impacts of the following on the REACTOR WATER LEVEL CONTROL SYSTEM and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operations: Loss of any number of main steam flow inputs					
<b>Reactor Water Level Control System</b>					
<p>Explanation: <b>Answer D</b> – &gt; Due to the loss of the MSL Flow Transmitter, RPV water level lowered but did not reach L3 prior to recovering to normal. Also, DFWCS automatically shifts to 1E control. ONI-C34 is entered based on the level transient and alarms received. The only applicable actions in the ONI are to monitor and control RPV level. This transient was run on the simulator on 02/08/22.</p> <p>A &amp; B – Incorrect – 1<sup>st</sup> Part - Plausible, the RPV level transient would result in a Rx scram if DFWCS failed to transfer to 1E due to the loss of the steam flow transmitter.</p> <p>A &amp; C– Incorrect – 2<sup>nd</sup> Part - Plausible, the ONI directs the placing the MFP MAN/AUTO Station in Manual if it is malfunctioning. The MFP is not in-service.</p>					
Technical Reference(s): ONI-C34 Rev. 13		Reference Attached: ONI-C34 pp. 3-6			
Proposed references to be provided to applicants during examination: None					
Learning Objective (As available): OT-COMBINED-C34 -14					
Question Source:	Bank #	Modified Bank #	New x		
Question History:	Previous 2 NRC Exams?	No			
Question Cognitive Level:	Memory or Fundamental Knowledge	Comprehension or Analysis	x		
10 CFR Part 55 Content:	55.41	x	55.43		
Comments:					

## QUESTION RO 55

The plant was operating at 75% rated power with the following conditions:

- Bus EH12 was powered from the Alternate Preferred source
- All other electrical buses were powered from their Preferred or Normal sources
- AEGT Train B is in service and AEGT Train A is in standby

Then the following occurred:

- Transformer LH-2-A experienced a lockout
- The Diesel Generators responded as designed

Based on this information, \_\_\_\_ is/are running?

- A. only AEGT Fan A
- B. only AEGT Fan B
- C. neither AEGT Fan
- D. both AEGT Fans

LOD = \_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_

# QUESTION RO 55

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #	2			
	Group #	1			
	K/A#	261000	K2.01		
	Importance Rating	3.5			
K&A: Knowledge of electrical power supplies to the following: Standby gas treatment system fans					
<b>Standby Gas Treatment System</b>					
<p>Explanation: <b>Answer D – &gt;</b> The loss of LH-2-A resulted in a loss of power to AEGT fan B. This causes a low flow condition on AEGT B and the AEGT fan A will auto start when the AEGT B low flow is sensed. The AEGT fan control switches in the control room are spring return OFF to STANDBY and maintain in ON, so once power is restored to bus EH12 by the Div. 2 DG, AEGT Fan B will restart and run with AEGT Train A running.</p> <p>A – Incorrect – Plausible, on a loss of power to AEGT Fan B, AEGT Fan A will start. If the control switch is not in ON, AEGT Fan B would not start.</p> <p>B – Incorrect – Plausible, with the AEGT Fan A not in standby, after the power is restored to 1EF1D, AEGT B would restart and be the only train running.</p> <p>C – Incorrect – Plausible, AEGT trains are started manually from the control room for normal operations.</p>					
Technical Reference(s): ARI-H13-P800-1 Rev. 7, PDB-H10 Rev. 2, PDB-H06 Rev. 0, Drawings 206-010 Rev. FF, 206-017 Rev. GG, 208-109-02 Rev. V		Reference Attached: ARI-H13-P800-1 p. 37, PDB-10 p. 4, PDB-06 p.5; Drawings 206-010, 206-017, 208-109-02			
Proposed references to be provided to applicants during examination: None					
Learning Objective (As available): OT-COMBINED-M15-C.1, J					
Question Source:	Bank # Modified Bank # New <span style="float: right;">x</span>				
Question History:	Previous 2 NRC Exams? <span style="float: right;">No</span>				
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis <span style="float: right;">x</span>				
10 CFR Part 55 Content:	55.41 <span style="float: right;">x</span> 55.43				
Comments:					

**QUESTION RO 56**

The plant is at rated power when a lockout occurs on Unit 1 Startup Transformer.

This results in breaker \_\_\_\_\_ indicating open on P870.

- A. L1003, MAIN STARTUP SUPPLY BREAKER (FROM 100-PY-B)
- B. L1004, BUS TIE BREAKER (FROM 200-PY-B)
- C. L1102, NORMAL SUPPLY BREAKER
- D. L1202, NORMAL SUPPLY BREAKER

LOD = \_\_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_\_

## QUESTION RO 56

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	
	Group #	1	
	K/A#	262001	A3.01
	Importance Rating	3.6	
K&A: Ability to monitor automatic operation of the AC Electrical Distribution including: Breaker tripping			
AC Electrical Distribution			
<p>Explanation: <b>Answer A</b> – With the plant at rated power, U1 SUT is supplying Bus L10 through breaker L1003 and the Aux transformer is Supplying Buses L11 &amp; L12 through breakers L1102 and L1202 respectively. A lockout on U1 SUT will cause breaker L1003 to trip open. When this happens, breaker L1004 automatically closes. Thus, Bus L10 is now supplied from the U2 SUT.</p> <p>B – Incorrect – Plausible since this breaker is normally open in a normal lineup.</p> <p>C – Incorrect – Plausible since this breaker is normally open in a shutdown lineup.</p> <p>D – Incorrect – Plausible since this breaker is normally open in a shutdown lineup.</p>			
Technical Reference(s): LP OT-COMBINED-R10 Rev. 5, ARI-H13-P870-01 Rev. 20, 206-010 Rev. FF, and 208-206-02 Rev. U		Reference Attached: LP OT-COMBINED-R10 slide 102, ARI-H13-P870-01 p. 32, 206-010 and 208-206-02	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-COMBINED-R10 #65			
Question Source:	Bank #	Modified Bank #	New
			x
Question History:	Previous 2 NRC Exams?	No	
Question Cognitive Level:	Memory or Fundamental Knowledge	Comprehension or Analysis	x
10 CFR Part 55 Content:	55.41	x	55.43
Comments:			



## QUESTION RO 57

A transient occurred and all ECCS systems started automatically.

Then a loss of off-site power occurred.

Upon closing the respective diesel generator output breaker, the \_\_\_\_\_.

- A. LPCS and RHR C Pumps start immediately, RHR A and B Pumps start after a 5 second time delay
- B. LPCS and RHR B Pumps start immediately, RHR A and C Pumps start after a 5 second time delay
- C. RHR A and C Pumps start immediately and LPCS and RHR B Pumps start after a 5 second time delay.
- D. LPCS and RHR C Pumps start immediately and RHR A and B Pumps starts after a 10 second time delay

LOD = \_\_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_\_

# QUESTION RO 57

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #	2			
	Group #	1			
	K/A#	262001	K3.01		
	Importance Rating	4.1			
K&A: Knowledge of the effect that a loss or malfunction of the AC ELECTRICAL DISTRIBUTION will have on the following systems or system parameters: Operationally significant AC loads					
<b>AC Electrical Distribution</b>					
<p>Explanation: <b>Answer A</b> – &gt; When a LOOP occurs, if an ECCS initiation signal is present when power is restored to the EH Buses, the RHR C pump will start immediately and LPCS pump breaker remains closed (no UV trip) so it starts immediately. RHR A &amp; B pumps start after a 5 second time delay.</p> <p>B – Incorrect – Plausible, RHR C does start immediately after the bus is re-energized, but RHR B starts after a 5 second time delay</p> <p>C – Incorrect – Plausible, LPCS does start immediately, but RHR A starts after a 5 second time delay.</p> <p>D – Incorrect – Plausible since the HPCS pump will start after a 10 second time delay on a normal start. However, RHR A &amp; B start after a 5 second time delay.</p>					
Technical Reference(s): SDM-E12 Rev. 4, SDM-E21 Rev.1, 208-055-07 Rev. GG, and 208-055-17 Rev. X		Reference Attached: SDM-E12 pp. 37-38, SDM-E21 pp.24-25, 208-055-07, and 208-055-17			
Proposed references to be provided to applicants during examination: None					
Learning Objective (As available): x					
Question Source:	Bank # Modified Bank # New	Perry 2017 NRC # RO-57			
Question History:	Previous 2 NRC Exams?	No			
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis	x			
10 CFR Part 55 Content:	55.41 55.43	x			
Comments:					

**QUESTION RO 58**

Annunciator APRM DIV 1 INVERTER TROUBLE, H13-P680-06-A4 has alarmed.

The static transfer switch will shift to the Bypass Supply on an   (1)   condition.

When this condition is cleared, transfer back to the inverter will be done   (2)   .

- |    | <u>  (1)  </u> | <u>  (2)  </u> |
|----|----------------|----------------|
| A. | OVERCURRENT    | manually       |
| B. | OVERCURRENT    | automatically  |
| C. | OVERHEAT       | manually       |
| D. | OVERHEAT       | automatically  |

LOD = \_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_

# QUESTION RO 58

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #	2			
	Group #	1			
	K/A#	262002	A3.01		
	Importance Rating	3.4			
K&A: Ability to monitor automatic operation of the Uninterruptable Power Supply (AC/DC), including: Transfer of power sources					
<b>Uninterruptable Power Supply AC/DC</b>					
<p>Explanation: <b>Answer B</b> – Both an overcurrent condition and an overheat condition will cause annunciator APRM DIV 1 INVERTER TROUBLE to alarm in the control room. However, only an overcurrent or under voltage condition will cause the shift to the alternate supply. When the condition clears, the static transfer switch transfers back to the inverter without requiring manual reset.</p> <p>A – Incorrect – Plausible, as an overcurrent condition will cause the alarm, but the static transfer switch will automatically transfer back to the inverter if the overcurrent condition clears.</p> <p>C – Incorrect – Plausible, as an overheat condition will cause the alarm, but this does not cause a transfer.</p> <p>D – Incorrect – Plausible, as an overheat condition will cause the alarm, but this does not cause a transfer.</p>					
Technical Reference(s): ARI-H13-P680-06 Rev. 9 and LP OT-COMBINED-R14_15 Rev. 4		Reference Attached: ARI-H13-P680-06 pp. 11-12 and LP OT-COMBINED-R14_15 pp. 15 & 17			
Proposed references to be provided to applicants during examination: None					
Learning Objective (As available): OT-COMBINED-R14_15 #6					
Question Source:	Bank #				
	Modified Bank #				
	New	x			
Question History:	Previous 2 NRC Exams?	No			
Question Cognitive Level:	Memory or Fundamental Knowledge	x			
	Comprehension or Analysis				
10 CFR Part 55 Content:	55.41	x			
	55.43				
Comments:					

## QUESTION RO 59

The red light above the control switch on P601 for 1E12-C001A, RHR A Pump, is illuminated.

This indicates that RHR A Pump \_\_\_\_.

- A. breaker has tripped
- B. has been overridden OFF
- C. has an initiation signal present
- D. breaker can be opened from the control room

LOD = \_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_

## QUESTION RO 59

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #	2			
	Group #	1			
	K/A#	263000	A4.01		
	Importance Rating	3.7			
K&A: Ability to manually operate and/or monitor in the control room: Operationally significant breakers and control power fuses					
<b>DC Electrical Distribution</b>					
<p>Explanation: <b>Answer D</b> – The red light above the control switch indicates the RHR A Pump breaker is closed and is only illuminated if the TRIP control power fuse is installed. This allows the breaker to be opened from the control room.</p> <p>B – Incorrect – Plausible as there is an amber matrix status light that indicates a pump trip on P601</p> <p>C – Incorrect – Plausible as there is an amber override light directly above the RHR A Pump control switch.</p> <p>A – Incorrect – Plausible as there is a white light that indicates an initiation signal is present on P601.</p>					
Technical Reference(s): 208-055-17 Rev. X		Reference Attached: 208-055-17			
Proposed references to be provided to applicants during examination: None					
Learning Objective (As available): OT-COMBINED-E12-C					
Question Source:	Bank #	River Bend 2014 # RO-49			
	Modified Bank # New				
Question History:	Previous 2 NRC Exams?	No			
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis	x			
10 CFR Part 55 Content:	55.41      x 55.43				
Comments:					

**QUESTION RO 60**

The Division 2 Diesel Generator Right Air Bank relief valve failed open.

Then, 1R44-C001B, Div 2 Right Bank Air Compressor tripped on overload.

Based on this information, the Division 2 Diesel Generator is \_\_\_\_.

- A. not capable of starting due to the loss of starting air pressure
- B. not capable of starting due to the loss of control air pressure
- C. capable of starting only on a manual start signal using the left air bank
- D. capable of starting on a manual or automatic start signal using the left air bank

LOD = \_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_

# QUESTION RO 60

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #	2			
	Group #	1			
	K/A#	264000	K4.09		
	Importance Rating	3.8			
K&A: Knowledge of Emergency Generators Diesel/Jet design features and/or interlocks that provide for the following: Standby readiness					
<b>Emergency Generators Diesel/Jet</b>					
<p>Explanation: <b>Answer D</b> – &gt; With the relief valve failed open and the RB compressor not able to recharge the RB receiver, the RB will depressurize. Divisional DGs are designed with two redundant starting air subsystems systems. The DG only requires one subsystem to be at normal pressure to meet the design starting requirements. The two air systems are normally isolated from one another and only manually cross-connected when one compressor is out of service. This prevents the loss of air in one subsystem from affecting the other subsystem.</p> <p>A – Incorrect – Plausible as a loss of all starting air would result in the inability for the DG to be started from any location if the air banks were operated as a single system.</p> <p>B – Incorrect – Plausible as the control air system can be isolated from each air bank, but both air banks are normally aligned to supply control air via independent reducers and is isolated from the failed bank by check valves in the system.</p> <p>C – Incorrect – Plausible as once air pressure in both air banks is &lt;150 psig, the automatic starts on LOCA and LOOP are blocked. Manual starting of the DG is the only method of starting the DG.</p>					
Technical Reference(s): Lesson Plan OT-COMBINED-R43_48 Rev. 5, SOI-R44 Rev. 19, 302-351 Rev. GG		Reference Attached: Lesson Plan OT-COMBINED-R43_48 pp. 19-20 , SOI-R44 p. 4, 302-351			
Proposed references to be provided to applicants during examination: None					
Learning Objective (As available): OT-COMBINED-R43_48-B.1					
Question Source:	Bank # Modified Bank # New	Perry 2002 NRC #RO-79			
Question History:	Previous 2 NRC Exams? No				
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis x				
10 CFR Part 55 Content:	55.41 x 55.43				
Comments:					



## QUESTION RO 61

The plant was operating at rated power with the following conditions:

- Bus H22 is tagged out of service for planned maintenance
- Unit 1 Service Air Compressor is in LEAD.

Then the following occurs:

- Annunciator SERVICE AIR RECIEVER PRESSURE LOW, H13-P870-02-A2, alarms
- Service Air Header pressure is lowering

Based on this information, the first action to occur is the \_\_\_\_\_.

- A. SA/IA XCONN VALVE, 1P52-F050, will close
- B. U2 Service Air Compressor, 2P51-C001 will auto start
- C. U1 Instrument Air Compressor, 1P52-C001 will auto start
- D. U2 Instrument Air Compressor, 2P52-C001 will auto start

LOD = \_\_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_\_

## QUESTION RO 61

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #	2			
	Group #	1			
	K/A#	300000	A3.03		
	Importance Rating	3.5			
K&A: Ability to monitor automatic operation of the Instrument Air System including: Compressor automatic starts/trips					
<b>Instrument Air System</b>					
<p>Explanation: <b>Answer C</b> – &gt; Perry has 2 IA and 2 SA compressors. The IA &amp; SA systems are connected in such a way that any single compressor can supply all IA &amp; SA needs. The normal compressor line up has one compressor in LEAD and all others in STANDBY, if available. The LEAD compressor loads and unloads to maintaining IA/SA pressure between 120-125 psig. The SA Receiver LP alarm comes in at 112 psig. A standby compressor will auto start when the pressure sensed at its discharge lowers to 107 psig and will run loaded until pressure is restored to 125 psig. With Bus H22 tagged out, both U2 (SA &amp; IA) compressors are not available.</p> <p>A – Incorrect – Plausible, as pressure lowers to 90 psig in the IA receiver, the SA/IA x-conn isolation will close to maintain pressure in the IA system. This would not be the next automatic function of the system.</p> <p>B – Incorrect – Plausible since the U2 SA compressor would normally be in standby, but H22 supplies power to the U2 SA compressor.</p> <p>D – Incorrect – Plausible since the U2 IA compressor would normally be in standby, but H22 supplies power to the U2 IA compressor.</p>					
Technical Reference(s): ARI-H13-P870-02 Rev. 9, SP Sh. 1P52N0715 Rev. 0, 302-241 Rev. EE		Reference Attached: ARI-H13-P870-02 pp. 3 & 9, SP Sh. 1P52N0715, 302-241			
Proposed references to be provided to applicants during examination: None					
Learning Objective (As available): OT-COMBINED-P51_52 #23					
Question Source:	Bank #	Modified Bank #	New x		
Question History:	Previous 2 NRC Exams?	No			
Question Cognitive Level:	Memory or Fundamental Knowledge	Comprehension or Analysis	x		
10 CFR Part 55 Content:	55.41	x	55.43		
Comments:					

## QUESTION RO 62

The plant is operating at rated power.

Then the following occurred:

- TBCC HX OUTLET TEMP HIGH alarm is received on panel H13-P870
- TBCC Heat Exchanger Outlet Temperature Control Valve, 1P41-F003, was confirmed to have failed in the 'close' position

Which of the following describes the plant response to the loss of TBCC if no operator actions are taken?

- A. The running Service Air Compressor will trip on high lube oil temperature.
- B. The Main Turbine will trip on high Main Lube Oil Cooler outlet temperature.
- C. The Rx Feed Pump Turbines will trip on high RFPT lube oil cooler outlet temperature.
- D. The Main Generator will run back on high Stator Cooling Water Cooler return temperature.

LOD = \_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_

## QUESTION RO 62

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #	2			
	Group #	1			
	K/A#	400000	K1.15		
	Importance Rating	3.2			
K&A: Knowledge of the physical connections and/or cause and effect relationships between the Component Cooling Water System and the following systems: Turbine generator and auxiliary systems					
<b>Component Cooling Water System</b>					
<p>Explanation: <b>Answer D</b> – &gt; The Stator Water Cooling system is cooled by Turbine Building Closed Cooling (TBCC). On a loss of TBCC, Stator water cooling losses its heat sink and SWC temperature rises. At 81 °C (178 °F) SWC temperature, the turbine generator will run back to &lt;9900 amps. If the runback continues, this transient will result in a reactor scram from a turbine trip.</p> <p>A – Incorrect – Plausible since the Service Air compressors will trip on a high LO temperature of 158 °F, but the compressors are cooled by Nuclear Closed Cooling (NCC), not TBCC.</p> <p>B – Incorrect – Plausible since Main Turbine LO is cooled by Service Water and alarms at 125 °F, but there is no trip associated with high LO temperature on the Main Turbine.</p> <p>C – Incorrect – Plausible since RFPT's LO is cooled by TBCC and alarms at 135 °F, but there is no RFPT trip for high LO temperature.</p>					
Technical Reference(s): ARI-H13-P870-02 Rev. 8, ARI-H13-P870-08 Rev. 7, ONI-P44 Rev. 12, ARI-H13-P680-08 Rev. 21, ARI-H13-P680-15 Rev. 6, and 302-223 Rev. E		Reference Attached: ARI-H13-P870-02 p. 37, ARI-H13-P870-08 pp. 19- 20, ONI-P44 p. 3, ARI-H13-P680-08 p. 7, ARI-H13-P680-15 p. 3 , and 302-223			
Proposed references to be provided to applicants during examination: None					
Learning Objective (As available): OT-COMBINED-P44-J.2					
Question Source:	Bank #	Perry 2017 # RO-17			
	Modified Bank #				
	New				
Question History:	Previous 2 NRC Exams?	No			
Question Cognitive Level:	Memory or Fundamental Knowledge	x			
	Comprehension or Analysis				
10 CFR Part 55 Content:	55.41	x			
	55.43				
Comments:					

## QUESTION RO 63

The plant was operating at 50% power.

A total loss of Turbine Building Closed Cooling Water has occurred.

Based on this information, any running (1) is required to be shutdown if it reaches its temperature limit to prevent overheating of the motor (2).

	<u>(1)</u>	<u>(2)</u>
A.	Condensate Booster Pump	windings
B.	Condensate Booster Pump	bearings
C.	Turbine Building Chiller	windings
D.	Turbine Building Chiller	bearings

LOD = \_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_

## QUESTION RO 63

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #	2			
	Group #	1			
	K/A#	400000	K3.17		
	Importance Rating	3.1			
K&A: Knowledge of the effect that a loss or malfunction of the Component Cooling Water System will have on the following systems or system parameters: Reactor condensate system					
<b>Component Cooling Water System</b>					
<p>Explanation: <b>Answer B</b> – Condensate Booster Pump (CBP) motor bearings are cooled by the internal oil system. The LO is cooled by TBCC.</p> <p>A – Incorrect – Plausible as TBCC cools the motor windings on both the Motor Feed Pump and the Rx Feed Booster Pumps. The CBP motor windings are cooled by ambient air.</p> <p>C – Incorrect – Plausible as the TB Chillers cool the Turbine Bldg., but this load is cooled by ambient air.</p> <p>D – Incorrect – Plausible as the TB Chillers cool the Turbine Bldg., but the bearings are cooled by Nuclear Closed Cooling (NCC).</p>					
Technical Reference(s): ONI-P44 Rev. 12, 302-221 Rev. Y, and SDM-P44 Rev. 10		Reference Attached: ONI-P44 pp. 8 & 10, 302-221, and SDM-P44 p. 21			
Proposed references to be provided to applicants during examination: None					
Learning Objective (As available): OT-COMBINED-P44-N					
Question Source:	Bank #				
	Modified Bank #	2017 Susquehanna # RO-45			
	New				
Question History:	Previous 2 NRC Exams?	No			
Question Cognitive Level:	Memory or Fundamental Knowledge	x			
	Comprehension or Analysis				
10 CFR Part 55 Content:	55.41	x			
	55.43				
Comments:					

**QUESTION RO 64**

If the normal ESW Keepfill source is not available, Alternate ESW Keepfill is supplied by \_\_\_\_.

- A. P21, Makeup Water Treatment Two Bed
- B. P20, Makeup Water Pretreatment
- C. P54(WTR), Fire Protection
- D. N71, Circulating Water

LOD = \_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_

## QUESTION RO 64

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #	2			
	Group #	1			
	K/A#	510000	K1.09		
	Importance Rating	2.9			
K&A: Knowledge of the physical connections and/or cause and effect relationships between the SERVICE WATER SYSTEM and the following systems: Fire protection system					
<b>Service Water System</b>					
<p>Explanation: <b>Answer C</b> – &gt; The Service Water system is the normal keepfill source for the Emergency Service Water systems. If the normal source is not available, Alternate ESW keepfill is supplied by the Fire Protection System (water)</p> <p>A – Incorrect – Plausible as the Makeup Water Treatment Two Bed system provides system makeup for multiple plant systems.</p> <p>B – Incorrect – Plausible as the Makeup Water Pretreatment system supplies sealing water to various plant pumps.</p> <p>D – Incorrect – Plausible since the alternate supply for the Circ Water Pump seals is the Fire Protection System.</p>					
Technical Reference(s): SOI-P40/41 Rev. 18 and SOI-P54(WTR) Rev. 30		Reference Attached: SOI-P40/41 pp. 76-77 and SOI-P54(WTR) p. 7			
Proposed references to be provided to applicants during examination: None					
Learning Objective (As available): OT-COMBINED-P41-L					
Question Source:	Bank #				
	Modified Bank #				
	New		x		
Question History:	Previous 2 NRC Exams?	No			
Question Cognitive Level:	Memory or Fundamental Knowledge		x		
	Comprehension or Analysis				
10 CFR Part 55 Content:	55.41		x		
	55.43				
Comments:					



## QUESTION RO 65

A reactor startup is in progress following a refueling outage with Control Rod Sequence A selected.

All SRMs were reading 12-15 CPS

All Group-1 control rods have been withdrawn to position 48.

Currently, SRMs are reading 80-90 CPS

Which of the following describes the rod motion constraints imposed by RC&IS, if any?

Group-2 control rods \_\_\_\_.

- A. can be continuously withdrawn from 00 to 48
- B. must be single notch withdrawn from 00 to 48
- C. must be banked at 04, 08, 12 then continuous withdrawn to 48
- D. must be single notch withdrawn from 00 to 12 then continuous withdrawn to 48

LOD = \_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_

# QUESTION RO 65

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #	2			
	Group #	2			
	K/A#	201005	K5.03		
	Importance Rating	3.3			
K&A: Knowledge of the operational implications or cause and effect relationships of the following concepts as they apply to the Rod Control And Information System: Rod groups					
<b>Rod Control And Information System</b>					
<p>Explanation: <b>Answer A</b> – IAW FTI-B-1, with Groups 3 and 4 rods are fully inserted, Group 2 rods may be continuously withdrawn from full in to full out. RC&amp;IS controls which groups of rods can be withdrawn based on which Sequence is selected. Additionally, RC&amp;IS controls when rod groups are banked.</p> <p>B – Incorrect – Plausible, single notch rod withdrawal is enforced when power is above the low power setpoint. Also single notch withdrawal is required when SRM Counts are 10x initial count rate. This would not apply to Group 2 in A sequence. Rod density precludes this count rate.</p> <p>C – Incorrect – Plausible, with Groups 1 and 2 are fully withdrawn; groups 3 and 4 must be banked at 04, 08, 12 then can be continuous withdrawn to 48.</p> <p>D – Incorrect – Plausible, Groups 5 and 6 must be single notch withdrawn from 00 to 12 then continuous withdrawn to 48 in A sequence.</p>					
Technical Reference(s): FTI-B-01 Rev. 11		Reference Attached: FTI-B-01 pp. 31-32			
Proposed references to be provided to applicants during examination: None					
Learning Objective (As available): OT-3046-03-LP					
Question Source:	Bank #	Limerick 2015 # RO-5			
	Modified Bank #				
	New				
Question History:	Previous 2 NRC Exams?	No			
Question Cognitive Level:	Memory or Fundamental Knowledge	x			
	Comprehension or Analysis				
10 CFR Part 55 Content:	55.41	x			
	55.43				
Comments:					

## QUESTION RO 66

Power ascension is in progress with Rx power at 50%.

An adjustment to CRD Drive water  $\Delta P$  is required.

The operator takes the control switch for 1C11-F003, CRD DRIVE PRESS CONTROL VALVE to OPEN for 1 second.

When CRD system parameters stabilize:

CRD Drive Water  $\Delta P$  will be   (1)   than before the adjustment.

And CRD Cooling Water flow will be   (2)   before the adjustment

- |    | <u>  (1)  </u> | <u>  (2)  </u> |
|----|----------------|----------------|
| A. | lower          | the same as    |
| B. | lower          | lower than     |
| C. | higher         | the same as    |
| D. | higher         | lower than     |

LOD = \_\_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_\_

# QUESTION RO 66

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #	2			
	Group #	2			
	K/A#	201001	A3.03		
	Importance Rating	3.5			
K&A: Ability to monitor automatic operation of the CONTROL ROD DRIVE HYDRAULIC SYSTEM including: System pressure					
<b>CRD HYDRAULIC</b>					
<p>Explanation: <b>Answer A</b> – &gt; 1C11-F003 maintains backpressure in the drive water header while the flow control valve maintains the system (Cooling) flow rates constant. By throttling open 1C11-F003, <math>\Delta P</math> between the Drive Water Header and the reactor lowers as there is less headloss between the drive water header and the cooling water header. The Flow controller responds to the change in flow restriction and closes to return system (Cooling) flow to the previous value automatically.</p> <p>B &amp; D 2<sup>nd</sup> Part – Incorrect – Plausible since Cooling Water flow decreases on a scram.</p> <p>C &amp; D 1<sup>st</sup> Part – Incorrect – Plausible as 1C11-F003 does not operate intuitively. Typically, throttling open a valve will raise downstream pressure. However, 1C11-F003 is downstream of the pressure sensing line and is closed to raise drive water <math>\Delta P</math> and opened to lower it.</p>					
Technical Reference(s): LP OT-COMBINED-C11(CRDH) Rev. 3 and 302-872 Rev. FF		Reference Attached: LP OT-COMBINED-C11(CRDH) pp. 5-6 and 302-872			
Proposed references to be provided to applicants during examination: None					
Learning Objective (As available): OT-COMBINED-C11_CRDH-C					
Question Source:	Bank # Modified Bank # New	Hope Creek2012 # RO-35			
Question History:	Previous 2 NRC Exams? No				
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis x				
10 CFR Part 55 Content:	55.41 x 55.43				
Comments:					

## QUESTION RO 67

The plant was operating at rated power when a loss of feed occurred.

- HPCS Auto Started
- RCIC Auto Started
- HPCS Overridden for level control

At 1100, RPV water level was 137 inches.

At 1102, RPV water level was 142 inches.

Based on this information, what is the earliest time, RCIC STEAM SHTOF CL RX LVL HI L8 annunciator will alarm?

(To the nearest time listed)

- A. 1116
- B. 1127
- C. 1133
- D. 1137

LOD = \_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_

# QUESTION RO 67

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #	2			
	Group #	2			
	K/A#	216000	A1.05		
	Importance Rating	3.3			
K&A: Ability to predict and/or monitor changes in parameters associated with operation of the Nuclear Boiler Instrumentation including: Lights and alarms					
<b>Nuclear Boiler Instrumentation</b>					
<p>Explanation: <b>Answer C</b> – &gt; The RPV water level alarm for L8 warns the operator that RCIC is no longer injecting. RPV L8 is used to terminate RCIC injection following auto or manual initiation. The RCIC STEAM SHTOF CL RX LVL HI L8 alarms at 219.5". Given <math>142"-137"=5"</math>, <math>5"/2\text{min}=2.5"/\text{min}</math>, <math>219.5"-137"=82.5"</math>, <math>82.5"/2.5"/\text{min}=33\text{ min}</math>, <math>1100+33\text{min}=1133</math>.</p> <p>A – Incorrect – Plausible, if RCIC STEAM SHTOF CL RX LVL HI L8 alarmed at 178" (the L3 alarm), the time for the alarm would be <math>178"-137"=41"</math> <math>41"/2.5"/\text{min}=16.4\text{min}</math>. <math>1100+16.4\text{min}=1116</math></p> <p>B – Incorrect – Plausible, if RCIC STEAM SHTOF CL RX LVL HI L8 alarmed at 205" (the L7 alarm), the time for the alarm would be <math>205"-137"=68"</math> <math>68"/2.5"/\text{min}=27.2\text{ minutes}</math>. <math>1100+27.2\text{min}=1127</math></p> <p>D – Incorrect – Plausible, if RCIC STEAM SHTOF CL RX LVL HI L8 alarmed at 230" (top of the wide and narrow range level indications and 100" above the L2 start setpoint), the time for the alarm would be <math>230"-137"=93"</math> <math>93"/2.5"/\text{min}=37.2\text{ minutes}</math>. <math>1100+37.2\text{min}=1137</math>.</p>					
Technical Reference(s): ARI-H13-P601-21, Rev. 17		Reference Attached: ARI-H13-P601-21 p. 7			
Proposed references to be provided to applicants during examination: None					
Learning Objective (As available): OT-COMBINED-B21(INST)-1.2 and OT-COMBINED-E51 #5					
Question Source:	Bank #	Modified Bank #	New		
			x		
Question History:	Previous 2 NRC Exams?	No			
Question Cognitive Level:	Memory or Fundamental Knowledge	Comprehension or Analysis	x		
10 CFR Part 55 Content:	55.41	x	55.43		
Comments:					

## QUESTION RO 68

During quarterly pump and valve surveillance testing, 1G41-F140, CNTMT POOL RTN INBD ISOL valve, was closed and will not open.

How will this affect FPCC Surge Tank level, and what action will control the change FPCC Surge Tank level?

FPCC Surge Tank level \_\_\_\_.

- A. decreases; close 1G41-F100, CNTMT POOL SUPP ISOL valve
- B. increases; close 1G41-F090, CNTMT POOL SUPP FLOW CONT VLV
- C. decreases; open 1G41-F130, CNTMT POOL SUPP FROM CTS CONT V
- D. increases; open G41-F619A , FPCC Surge Tank A Drain To CRW valve

LOD = \_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_

QUESTION RO 68

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #	2			
	Group #	2			
	K/A#	233000	A4.02		
	Importance Rating	2.8			
K&A: Ability to manually operate and/or monitor the Fuel Pool Cooling/Cleanup in the control room: Fuel pool cooling system valves					
<b>Fuel Pool Cooling/Cleanup</b>					
<p>Explanation: <b>Answer A</b> – &gt; With 1G41-F140 closed, no path exists for water to return from the upper pool. This will result in a lowering level in the surge tank and rising level in the upper pools. ARI-H13-P970-01-D3 directs the closing of 1G41-F100 to stop the surge tank level decrease.</p> <p>B – Incorrect – Plausible, the upper pool level will increase but not level in the FPCC surge tank since there is not a return path for the water to return to the system from the upper pool with 1G41-F140 closed. Closing 1G41-F090 would work to stop level decrease in the FPCC surge tanks.</p> <p>C – Incorrect – Plausible, the surge tank level will lower, but opening 1G41-F130 will add water directly to the upper pool, not the surge tank.</p> <p>D – Incorrect – Plausible, the upper pool level will increase, but not level in the surge tank since there is not a return path for the water from the upper pool with 1G41-F140 closed. Opening 1G41-F619A will lower level in the FPCC surge tank.</p>					
Technical Reference(s): 302-651 Rev. PP, 302-654 Rev. U, 302-655 Rev. CC, ARI-H13-P970-01 Rev. 27		Reference Attached: 302-651, 302-654, 302-655, ARI-H13-P970-01 pp. 45-46			
Proposed references to be provided to applicants during examination: None					
Learning Objective (As available): OT-COMBINED-G41-R					
Question Source:	Bank # Modified Bank # New	Perry 2003 NRC Common #75			
Question History:	Previous 2 NRC Exams? No				
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis x				
10 CFR Part 55 Content:	55.41 x 55.43				
Comments:					



## QUESTION RO 69

As the Fuel Handling Supervisor, you are allowed to operate the Fuel Handling Platform in Interlock Override \_\_\_\_.

- A. in FAST or SLOW speed
- B. when moving test weights only
- C. with Unit Supervisor permission only
- D. when shutting down the PLC for maintenance

LOD = \_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_

# QUESTION RO 69

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #	2			
	Group #	2			
	K/A#	234000	G2.1.32		
	Importance Rating	3.8			
K&A: Ability to explain and apply system precautions, limitations, notes, or cautions					
<b>Fuel Handling</b>					
<p>Explanation: <b>Answer C</b> – SOI-F11, Fuel Handling Platform, contains a NOTE that states, “Except for testing, the Interlock Override Keylock Switch shall only be used in the event of a PLC failure.” And its use shall only be directed by the Control Room Unit Supervisor.</p> <p>A – Incorrect – Plausible since the platform can normally be operated in either Fast or Slow speed. However, when in Interlock Override, the platform can only be operated in SLOW, and is interlocked to prevent operating in FAST.</p> <p>B – Incorrect – Plausible since the Fuel Handling Platform is used to move test weights. However, the NOTE states the Interlock Override is used only in the event of a PLC failure.</p> <p>D – Incorrect – Plausible since Interlock Override must be used to move the Fuel Handling Platform if the PLC is not working. However, it is used for a PLC failure only, not PLC maintenance.</p>					
Technical Reference(s): SOI-F11 Rev. 25		Reference Attached: SOI-F11 pp. 6-7 & 70			
Proposed references to be provided to applicants during examination: None					
Learning Objective (As available): OT-COMBINED-F11_F15 #5					
Question Source:	Bank #				
	Modified Bank #				
	New	x			
Question History:	Previous 2 NRC Exams?	No			
Question Cognitive Level:	Memory or Fundamental Knowledge	x			
	Comprehension or Analysis				
10 CFR Part 55 Content:	55.41	x			
	55.43				
Comments:					

## QUESTION RO 70

The plant was operating at rated power.

- H13-P680-03-B7, FEED FLOW STEAM FLOW MISMATCH, is received.
- Currently, Feed Flow > Steam Flow

With no automatic actions, the consequence to the main steam system is moisture   (1)  .

The crew must   (2)   to mitigate this transient.

- |    | <u>  (1)  </u> | <u>  (2)  </u>  |
|----|----------------|---|
| A. | carryover      | transfer RFPT control to the Manual Speed Control Dials |
| B. | carryunder     | transfer RFPT control to the Manual Speed Control Dials |
| C. | carryover      | lower Reactor Recirculation flow                        |
| D. | carryunder     | lower Reactor Recirculation flow                        |

LOD = \_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_

# QUESTION RO 70

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	
	Group #	2	
	K/A#	239001	A2.13
	Importance Rating	2.9	
<p>K&amp;A: Ability to (a) predict the impacts of the following on the Main And Reheat Steam System and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operations: High reactor water level</p>			
<p><b>Main And Reheat Steam System</b></p>			
<p>Explanation: <b>Answer A</b> – &gt; With Feed flow &gt; Steam flow, RPV water level will rise. Correct diagnosis of this condition requires entry into ONI-C34, Feedwater Flow Malfunction. Immediate Actions in the ONI direct the operator to transfer RFPT control to the Manual Speed Control Dials and manually control RFPT speed. This action will minimize moisture carryover. Moisture carryover is a concern to the main steam system because moisture entrained in the steam causes erosion in downstream components.</p> <p>B &amp; D 1<sup>st</sup> Part – Incorrect – Plausible by incorrectly predicting the water level transient; if it is determined to be lowering, moisture carryunder is a condition that will allow for steam and water to bypass the moisture separator and heat the water in the downcomer. This begins to occur at RPV L4 and will result in Rx Recirc pump cavitation.</p> <p>C &amp; D 2<sup>nd</sup> Part – Incorrect – Plausible since carryover and carryunder are a concern at 100% power and lowering Rx Recirc flow will reduce Rx power. However, with the conditions given, over feeding is still a concern and will not be mitigated by lowering Rx Recirc flow.</p>			
<p>Technical Reference(s): ARI-H13-P680-03 Rev. 19, ONI-C34 Rev. 13, SDM-B21(NBPI) Rev. 11, Lesson Plan OT-3302-08 Rev. 4</p>		<p>Reference Attached: ARI-H13-P680-03 p. 43, ONI-C34 pp. 3&amp;5, SDM-B21(NBPI) pp. 5-6, Lesson Plan OT-3302-08 p. 25</p>	
<p>Proposed references to be provided to applicants during examination: None</p>			
<p>Learning Objective (As available): OT-COMBINED-B21(INST)-1.3, OT-3035-04 LP_A.1</p>			
Question Source:	<p>Bank # Modified Bank # New x</p>		
Question History:	<p>Previous 2 NRC Exams? No</p>		
Question Cognitive Level:	<p>Memory or Fundamental Knowledge Comprehension or Analysis x</p>		
10 CFR Part 55 Content:	<p>55.41 x 55.43</p>		
<p>Comments:</p>			

## QUESTION RO 71

The plant is operating at rated power with Steam Bypass And Pressure Regulator System (SB&PR) Channel B in TEST.

What is the impact on the Turbine Generator System if SB&PR Channel A begins to slowly fail low?

- A.      RPV pressure will remain stable
- B.      Main Generator load (MWe) will rise
- C.      Main Generator load (MWe) will lower
- D.      Main Generator Voltage Regulator will shift to MANUAL

LOD = \_\_\_\_ (1 → 5 - Easy to Hard)

Looked up?   Y   N

TIME TO COMPLETE \_\_\_\_

QUESTION RO 71

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	
	Group #	2	
	K/A#	241000	K1.24
	Importance Rating	3.3	
<p>K&amp;A: Knowledge of the physical connections and/or cause and effect relationships between the REACTOR/TURBINE PRESSURE REGULATING SYSTEM and the following systems: Main turbine generator and auxiliary systems</p>			
<p><b>Reactor/Turbine Pressure Regulating System</b></p>			
<p>Explanation: <b>Answer C</b> – The SB&amp;PR system maintains RPV pressure by throttling the Main Turbine Control Valves. It normally has 2 channels available. If 1 channel fails, it will shift to the other control channel. However, since Channel B is in TEST, it cannot shift. As Channel A fails low, the Control Valves start to close. It also prevents the Bypass valves from opening. As the Control Valves close, load on the generator is reduced.</p> <p>A – Incorrect – Plausible if both pressure regulators were available. However, with Channel B in TEST, the SB&amp;PR system cannot swap to B to hold Rx pressure stable.</p> <p>B – Incorrect – Plausible if the pressure regulator was failing high. This would cause the TCVs to open and increase the turbine load.</p> <p>D – Incorrect – Plausible since an increase in Generator Exciter Field current will cause the voltage regulator to shift to manual. However, the decrease in generator load would not cause a generator field over current condition.</p>			
<p>Technical Reference(s): SDM-N32/C85 Rev. 6, SDM-N41_N51 Rev. 5</p>		<p>Reference Attached: SDM-N32/C85 pp. 31-32, SDM-N41_N51 p. 24</p>	
<p>Proposed references to be provided to applicants during examination: None</p>			
<p>Learning Objective (As available): OT-COMBINED-N32_C85-C.3</p>			
Question Source:	Bank # Modified Bank # New	Oyster Creek 2007 #62	
Question History:	Previous 2 NRC Exams? No		
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis x		
10 CFR Part 55 Content:	55.41 x 55.43		
<p>Comments:</p>			

## QUESTION RO 72

Plant power was lowered from rated to approximately 50% power between noon and 13:00.

Load Set was not adjusted during the power reduction.

A problem with the Stator Cooling Water Temperature Control Valve caused temperature to rise before being corrected.

Annunciator LOAD SET RUNBACK STATOR CLG, H13-P680-08-B6 alarmed.

Below is the Stator Water generator outlet temperature trend.

Time	Temperature	Trend
13:07:00	79.0°C	Rising
13:07:30	79.4°C	Rising
13:08:00	80.0°C	Rising
13:08:30	80.5°C	Rising
13:09:00	81.0°C	Rising
13:09:30	81.4°C	Peak
13:10:00	81.0°C	Lowering
13:10:30	80.4°C	Lowering
13:11:00	80.0°C	Lowering
13:11:30	77.5°C	Lowering
13:12:00	77.3°C	Stable

Based on the data above, generator load at time 13:15 would be approximately \_\_\_\_ MWe.

- A. 650
- B. 390
- C. 325
- D. 0

LOD = \_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_

## QUESTION RO 72

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	
	Group #	2	
	K/A#	245000	K4.06
	Importance Rating	3.5	
K&A: Knowledge of the Main Turbine Generator And Auxiliary Systems design features and/or interlocks that provide for the following: Generator protection			
<b>Main Turbine Generator And Auxiliary Systems</b>			
<p>Explanation: <b>Answer A</b> – &gt; A SWC runback is initiated when SWC inlet temp is &gt;81 °C and stops when either generator load reaches 9900amps (25% load) or the runback signal clears (temp &lt;81°C). Since Load Set was not adjusted during the power reduction, the runback had to runback the load set motor from ~1450 MWe at a rate of ~1%/3 seconds. SW temperature was only &gt;81°C for 60 seconds. Therefore the Load set motor was only run back ~20%. – No change in generator load.</p> <p>B – Incorrect – Plausible, as this corresponds to the 25% self-cooling load.</p> <p>C – Incorrect – Plausible, as this corresponds to 20% runback if load set were just above generator load when the runback occurred.</p> <p>D – Incorrect – Plausible because if a runback is initiated from high power, the plant will scram on high Rx pressure.</p>			
Technical Reference(s): ARI-H13-P680-08 Rev 21, SDM-N32/C85 Rev 6, LP OT-COMBINED-N32_C85 Rev 5		Reference Attached: ARI-H13-P680-08 pp. 19-20, SDM-N32/C85 pp. 30-31, 116, LP OT-COMBINED-N32_C85 p. 43	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-COMBINED-N41_51-F, OT-COMBINED-N43-#6&9 and OT-COMBINED-N32_C85-F			
Question Source:	Bank # Modified Bank # New	Perry 2013 NRC #70	
Question History:	Previous 2 NRC Exams? No		
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis x		
10 CFR Part 55 Content:	55.41 x 55.43		
Comments:			



### QUESTION RO 73

The plant was operating at rated power when power was lost to MCC F1A07.

This will cause a loss of power to \_\_\_\_\_.

- A. HWL EMG M/U FM CST, 1N21-F135
- B. CNDS MIN RECIRC FLOW CONTROL, 1N21-F245
- C. HEATER 2A CNDS OUTLET VALVE, 1N21-F145A
- D. HOT SURGE TANK LEVEL CONTROL, 1N21-F230

LOD = \_\_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_\_

# QUESTION RO 73

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	
	Group #	2	
	K/A#	256000	K2.02
	Importance Rating	2.7	
K&A: Knowledge of electrical power supplies to the following: Motor-operated valves			
<b>Condensate System</b>			
<p>Explanation: <b>Answer C</b> – &gt; 1N21-F145A is a motor operated valve and is powered from F1A07.</p> <p>A – Incorrect –1N21-F135 is an air operated valve that has logic power supplied by K-1-A and V-1-A through an R41 power supply</p> <p>B – Incorrect –1N21-F245 is an air operated valve that has logic power supplied by V-1-A</p> <p>D – Incorrect –1N21-F230 is an air operated valve that has logic power supplied by V-1-A</p>			
Technical Reference(s): PBD-H13 Rev. 5, PDB-H44 Rev. 8, 208-143-207 Rev. G, 208-214-202 Rev. N, 208-214-200 Rev. K, 208-209-9 Rev. L, 208-209-39 Rev F		Reference Attached: PBD-H13 p 5, PDB-H44 p 8, 208-143-207, 208-214-202, 208-214-200, 208-209-9, 208-209-39	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-COMBINED-N21_N61 #20			
Question Source:	Bank # Modified Bank # New	x	
Question History:	Previous 2 NRC Exams?	No	
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis	x	
10 CFR Part 55 Content:	55.41 55.43	x	
Comments:			

## QUESTION RO 74

The plant is operating at rated power with the following conditions:

- Containment Vessel and Drywell Purge system operating in the Intermittent Mode
- D17-K690A, CNTMT VENT EXH A, radiation monitor is down-powered for maintenance

Then D17-K690B, CNTMT VENT EXH B, radiation monitor fails high.

Based on this information, \_\_\_\_\_ Containment Isolation valves closed.

- A. no
- B. only the Inboard
- C. only the Outboard
- D. both the Inboard and the Outboard

LOD = \_\_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_\_

## QUESTION RO 74

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #	2			
	Group #	2			
	K/A#	272000	K3.06		
	Importance Rating	3.3			
K&A: Knowledge of the effect that a loss or malfunction of the Radiation Monitoring System will have on the following systems or system parameters: Plant ventilations systems					
<b>Radiation Monitoring System</b>					
<p>Explanation: <b>Answer A</b> – The Containment Vessel and Drywell Purge ventilation system will isolate on a specific combination of HI-HI rad or a downscale signal from the vent exhaust rad monitors. Specifically, trip signals on rad monitors A &amp; D will close the outboard containment isolation valves. And, trip signals on rad monitors B &amp; C will close the inboard containment isolation valves. With D17-K690A down-powered, the logic sees it as downscale. Therefore, since one rad monitor in each trip system has tripped no isolation valves will close.</p> <p>B – Incorrect – Plausible since this is similar to some logic used in NSSSS.</p> <p>C – Incorrect – Plausible since this is similar to some logic used in NSSSS.</p> <p>D – Incorrect – Plausible since this is similar to some logic used in NSSSS.</p>					
Technical Reference(s): PDB-I05 Rev. 15 and ARI-H13-P680-07 Rev. 37		Reference Attached: PDB-I05 pp. 30-31 and ARI-H13-P680-07 p. 33			
Proposed references to be provided to applicants during examination: None					
Learning Objective (As available): OT-COMBINED-M14 #8					
Question Source:	Bank #				
	Modified Bank #				
	New	x			
Question History:	Previous 2 NRC Exams?	No			
Question Cognitive Level:	Memory or Fundamental Knowledge				
	Comprehension or Analysis	x			
10 CFR Part 55 Content:	55.41	x			
	55.43				
Comments:					

## QUESTION RO 75

The plant was shut down for a forced outage.

Control Room Airborne rad monitor, D17-K776 pegged upscale for several seconds.

Several minutes later, a solder joint severed on the Instrument Air line going to the J-headers that supply Instrument Air to Control Room HVAC components.

Control Room Operators have not yet performed any actions in response to the above failures.

Based on this information:

CONT RM HVAC SUP FAN A, M25-C001A is (1) .

Control Room dampers are aligned to the (2) position.

	<u>(1)</u>	<u>(2)</u>
A.	off	NORM
B.	off	EMERG RCIRC
C.	running	NORM
D.	running	EMERG RCIRC

LOD = \_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_

# QUESTION RO 75

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #	2			
	Group #	2			
	K/A#	290003	K6.03		
	Importance Rating	2.7			
K&A: Knowledge of the effect of the following plant conditions, system malfunctions, or component malfunctions on the CONTROL ROOM VENTILATION: Plant pneumatic system					
<b>CONTROL ROOM VENTILATION</b>					
<p>Explanation: <b>Answer D</b> – An upscale on the CR rad monitor will cause the CR HVAC to auto shift to Emergency Recirc (ER). The loss of Inst. Air also results in repositioning CR dampers to ER position and closing the vortex damper for the Return Fan (M25-C002A). Closing the vortex damper on the Return fan would normally trip the Return and Supply fans</p> <p>A &amp; B – Incorrect – 1<sup>st</sup> part – Plausible since on a loss of Inst. Air with no auto ER initiations the fan would be off.</p> <p>B &amp; C – Incorrect – 2<sup>nd</sup> part – Plausible since the CR dampers are lined up in the normal position with no ER auto initiation signal. However, both the loss of IA and the ER auto initiation signal realign the dampers to the ER position.</p>					
Technical Reference(s): ARI-H13-P680-08 Rev. 21, ONI-D17 Rev. 20, ONI-P52 Rev. 18, and SOI-M25/26 Rev. 27		Reference Attached: ARI-H13-P680-08 pp. 3-4, ONI-D17 pp. 3-4 & 20, ONI-P52 p. 29, and SOI-M25/26 pp. 4 & 63			
Proposed references to be provided to applicants during examination: None					
Learning Objective (As available): OT-COMBINED-M25_26-N					
Question Source:	Bank #	Modified Bank #	New		
			x		
Question History:	Previous 2 NRC Exams?	No			
Question Cognitive Level:	Memory or Fundamental Knowledge	Comprehension or Analysis	x		
10 CFR Part 55 Content:	55.41	x	55.43		
Comments:					

## QUESTION SRO 1

Which of the following conditions requires a Continuous Fire Watch Patrol?

### Reference Provided:

- A. RCIC Pump Room Wet-Pipe Sprinkler will not deliver water.
- B. Heat Detection for Reactor Recirculation Pump B is out of service.
- C. Unit 2 Division 1 Cable Spreading Pre-Action Spray System will not deliver water.
- D. General area smoke detectors in Containment are functional but the detection system will not transmit an alarm to FCMS.

LOD = \_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_

## QUESTION SRO 1

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #		3		
	Group #				
	K/A#	Generic	G2.1.25		
	Importance Rating		4.2		
K&A: Ability to interpret reference materials, such as graphs, curves, and tables (reference potential)					
Generic					
<p>Explanation: <b>Answer A</b> – This requires a continuous fire watch with backup fire suppression equipment.</p> <p>B – Incorrect - Fire watch is not required, hourly remote monitoring is required.</p> <p>C – Incorrect – The UNIT 2 requires hourly watch; UNIT 1 requires a continuous fire watch.</p> <p>D – Incorrect – This requires an hourly fire watch.</p>					
Technical Reference(s): PAP-1910 Rev. 43		Reference Attached: PAP-1910 pp. 58-60, 64, 78-79, & 82-84			
Proposed references to be provided to applicants during examination: PAP-1910, Fire Protection Program - Body & Attachment #3					
Learning Objective (As available): OT-3039- 07 Terminal Objective: From memory, EXPLAIN the Licensed Operator duties in accordance with approved procedures.					
Question Source:	Bank # Modified Bank # New	Perry 2015 # SRO-14			
Question History:	Previous 2 NRC Exams? No				
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis x				
10 CFR Part 55 Content:	55.41 55.43 Plant Specific				
<p>SRO Justification for Plant Specific Exemption - knowledge/ability is “unique to the SRO position” SRO Task:</p> <p>Applicable Task – 341-652-01-02 Initiate Adequate Fire Protection measures to compensate for Inoperable Fire Protection systems.</p>					



## QUESTION SRO 2

An equipment problem occurred that requires entry into the Operational Decision Making process.

Who is responsible for performing the R.E.A.D.E. evaluation?

- A. Site Vice President
- B. General Plant Manager
- C. Operations Manager
- D. Shift Manager

LOD = \_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_

## QUESTION SRO 2

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #		3
	Group #		
	K/A#	Generic	G2.1.39
	Importance Rating		4.3
K&A: Knowledge of conservative decision-making practices			
Generic			
<p>Explanation: <b>Answer D</b> – &gt; Per NOP-OP-1010, the Shift Manager is required to perform the ODMI R.E.A.D.E. evaluation and communicates the results of the evaluation.</p> <p>A Incorrect – Plausible as the Site Vice President is required to make decisions that address long term protection of the public, the workforce, and the overall site in support of the ODMI process.</p> <p>B Incorrect – Plausible as the Plant General Manager is required to approve the decisions evaluated by the ODMI process.</p> <p>C Incorrect – Plausible as the Operations Manager is the Process owner and reviews the decisions evaluated and prepared using this procedure. Also tracks open and pending ODIMs, verifying that open ODIMs are maintained in the control room.</p>			
Technical Reference(s): NOP-OP-1010, Rev. 11		Reference Attached: NOP-OP-1010, pp. 3, 6-9.	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3039-07 Terminal Objective: From memory, EXPLAIN the Licensed Operator duties in accordance with approved procedures.			
Question Source:	Bank #		
	Modified Bank #		
	New		x
Question History:	Previous 2 NRC Exams?		No
Question Cognitive Level:	Memory or Fundamental Knowledge		x
	Comprehension or Analysis		
10 CFR Part 55 Content:	55.41		
	55.43	Plant Specific	
SRO Justification for Plant Specific Exemption - knowledge/ability is "unique to the SRO position" SRO Task:			
<ul style="list-style-type: none"> <li>341-671-03-02 – Comply with the Operating Responsibilities of the Shift Manager.</li> </ul>			

### QUESTION SRO 3

Which of the following requires a 10CFR50.59, (Changes, tests, and experiments), evaluation?

- A. Installation of a jumper directed by SVI-B21-T0246A, ATWS-RPT Logic System Functional Test For Division 1.
- B. Change of responsibility from Shift Manager to Unit Supervisor for approving Liquid Radwaste Discharge permits.
- C. Removal of floor plugs in Aux-620' per a Maintenance Work Order for one month to support Turbine Bldg. Chill Water system work.
- D. Installation of a leak sealant device on 1G33-F107, RWCU HX SHELL SIDE BYPASS VALVE to maintain RWCU pressure boundary integrity for four months.

LOD = \_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_

## QUESTION SRO 3

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #		3		
	Group #				
	K/A#	Generic	G2.2.5		
	Importance Rating		3.2		
K&A: Knowledge of the process for making design or operating changes to the facility, such as 10 CFR 50.59, "Changes, Tests and Experiments," screening and evaluation processes, administrative processes for temporary modifications, disabling annunciators, or installation of temporary equipment.					
Generic					
<p>Explanation: <b>Answer D</b> – &gt; IAW NOBP-LP-4003A, installation of a leak sealant device requires a 50.59 evaluation since it is not a temp alt supporting maintenance. Additionally, ISS-2000 states that a housekeeping clamp installed for pressure boundary integrity needs to go through the evaluation process.</p> <p>A – Incorrect – Plausible, installation of jumpers to support maintenance do not require a 50.59 evaluation unless it were to be left installed &gt;90 days. In this case, the jumpers would be installed less than one shift.</p> <p>B – Incorrect – Plausible, while some 'managerial' changes require a 50.59 eval, this is specifically exempted in NOBP-LP-4003A</p> <p>C – Incorrect – Plausible, removal of floor plugs for less than 90 days do not require a 50.59 eval. If it was for &gt;90 days, an eval would be required.</p>					
Technical Reference(s): NOBP-LP-4003A Rev. 10, ISS-2000 Rev. 11		Reference Attached: NOBP-LP-4003A pp. 6, 10-11 & 16-17 and ISS-2000 p. 88			
Proposed references to be provided to applicants during examination: None					
Learning Objective (As available): OT-3039-02-B					
Question Source:	Bank # Modified Bank # New	2017 Perry NRC Exam SRO #4			
Question History:	Previous 2 NRC Exams?	No			
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis	x			
10 CFR Part 55 Content:	55.41 55.43	b(3)			
<p>SRO justification = Facility licensee procedures required to obtain authority for design and operating changes in the facility. [10 CFR 55.43(b)(3)]</p> <ul style="list-style-type: none"> <li>10 CFR 50.59 screening and evaluation processes.</li> </ul>					

## QUESTION SRO 4

The following plant conditions exist:

- Reactor Mode Switch in SHUTDOWN
- Reactor Coolant Temperature is 250 °F
- Unit 2 Div. 1 battery (2R42-S002) is INOPERABLE
- Unit 1 Div. 1 battery (1R42-S002) is on float
- RCIC System is in Secured Status

While performing monthly battery voltage surveillance the following was discovered:

- The Unit 1 Division 1 battery (1R42-S002) terminal voltage is 127 VDC
- All battery parameters are within TS 3.8.6 requirements

Which of the following describes the actions required?

**Reference provided:**

- A. Restore the Unit 1, Div. 1 battery to OPERABLE within 2 hours or be in COLD SHUTDOWN within the following 24 hours
- B. Restore either Div. 1 battery to OPERABLE within 2 hours or be in COLD SHUTDOWN within the following 36 hours
- C. Restore both Div.1 batteries to OPERABLE within 2 hours or be in Cold Shutdown within 36 hours
- D. Declare affected required feature(s) INOPERABLE, immediately

LOD = \_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_

## QUESTION SRO 4

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO					
	Tier #		3					
	Group #							
	K/A#	Generic	G2.2.36					
	Importance Rating		4.2					
K&A: Ability to analyze the effect of maintenance activities, such as degraded power sources, on the status of limiting conditions for operation								
Generic								
<p>Explanation: <b>Answer B</b> – &gt; With RCS temperature @ 250 °F, the Plant is in MODE 3. TS 3.8.4 is applicable. LCO Bases states either the Unit 1 or Unit 2 battery comprise the DC Power system.</p> <p>A – Incorrect – TS Bases allows either Unit 1 or Unit 2 batteries and Cold S/D is required in 36 hours not 24 hours. Plausible as multiple Mode 3 LCOs have a Completion Time of 24 hours to be in Mode 4.</p> <p>C – Incorrect – TS Bases requires only Unit 1 or Unit 2 battery to be Operable not both.</p> <p>D – Incorrect – This is the required action for Modes 4 &amp; 5 - the plant is in Mode 3.</p>								
Technical Reference(s): TS 3.8.4 Rev. Amend. 193, TS 3.8.5 Rev. Amend. 102 & 193, and TS 3.8.4 Bases Rev. 7 & 13		Reference Attached: TS 3.8.4 pp. 3.8-24 & -25, TS 3.8.5 pp. 3.8-28 & -29, and TS 3.8.4 Bases pp. 3.8-52-54						
Proposed references to be provided to applicants during examination: Technical Specifications 3.8.4 & 3.8.5								
Learning Objective (As available): OT-3037-12								
Question Source:	Bank # Modified Bank # New	Perry 2010 # SRO-04						
Question History:	Previous 2 NRC Exams? No							
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis x							
10 CFR Part 55 Content:	55.41 55.43 b(2)							
SRO Justification - . Facility operating limitations in the TS and their bases.								
<ul style="list-style-type: none"> <li>Knowledge of TS bases that are required to analyze TS required actions and terminology.</li> </ul>								

## QUESTION SRO 5

The Plant is shutdown for a refueling outage.

FDST 'B' discharge is in progress IAW SVI-G50-T5266, Liquid Radwaste Release Permit.

Rad Monitor D17-K606, LRW TO ESW RAD MONITOR fails downscale and is declared inoperable.

The crew terminates the discharge.

In order to re-start the discharge, what does the ODCM (Offsite Dose Calculation Manual) require?

### Reference Provided:

- A. Analyze at least two independent samples of the tanks content and have at least two technically qualified members of the facility staff independently verify the release rate calculation.
- B. Verification by at least two members of the facility staff of the discharge valve lineup and that the discharge valve position corresponds to the desired flow rate.
- C. Obtain and analyze grab samples for gross radioactivity at least every twelve hours.
- D. Estimate the flow rate at least every four hours during the actual release.

LOD = \_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_

## QUESTION SRO 5

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #		3
	Group #		
	K/A#	Generic	G2.3.11
	Importance Rating		4.3
K&A: Ability to control radiation releases			
Generic			
<p>Explanation: <b>Answer A</b> – D17-K606 is the rad monitor identified in table 4.3.7.9-1 of the ODCM. ACTION 110 must be completed to restart the discharge.</p> <p>B – Incorrect – Plausible since this is a required Action if G50-N445, Radwaste High Flow Discharge Header Flow rad monitor is OOS (Action 112).</p> <p>C – Incorrect – Plausible since this is a required Action if D17-K604, Emergency Service Water Loops rad monitor is OOS (Action 111).</p> <p>D – Incorrect – Plausible since this is a required Action if P41-N442, Service Water Discharge Header Flow rad monitor is OOS (Action 113).</p>			
Technical Reference(s): ODCM Rev. 24		Reference Attached: ODCM pp. 100-103	
Proposed references to be provided to applicants during examination: ODCM			
Learning Objective (As available): OT-3037-16 & OT-COMBINED-D17A-J			
Question Source:	Bank # Modified Bank # New	Perry 2017 # SRO-05	
Question History:	Previous 2 NRC Exams? No		
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis x		
10 CFR Part 55 Content:	55.41 55.43 b(2)		
<p><b>SRO justification</b> = Facility operating limitations in the TS and their bases. [10 CFR 55.43(b)(2)]</p> <ul style="list-style-type: none"> <li>Application of Required Actions (Section 3) and Surveillance Requirements (SR) (Section 4) in accordance with rules of application requirements (Section 1).</li> </ul> <p>Same items listed above for the Technical Requirements Manual (TRM) and Offsite Dose Calculation Manual (ODCM).</p>			



## QUESTION SRO 6

Which of the following responsibilities does the Shift Manager relinquish after transfer of Emergency Coordinator duties during implementation of the Emergency Plan?

1. Termination of the emergency event.
2. Re-classification of the emergency event.
3. Notification that Transition to the Severe Accident Management Guidelines is required.
4. Determination of protective action recommendations for the general public.

A. 1, 2, 3

B. 1, 3, 4

C. 1, 2, 4

D. 2, 3, 4

LOD = \_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_

## QUESTION SRO 6

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #		3
	Group #		
	K/A#	Generic	G2.4.16
	Importance Rating		4.4
K&A: Knowledge of emergency and abnormal operating procedures implementation hierarchy and coordination with other support procedures or guidelines such as, operating procedures, abnormal operating procedures, or severe accident management guidelines			
Generic			
<p>Explanation: <b>Answer C</b> – Transition into the SAMGs is directed by the EOPs and remains a responsibility of the Shift Manager. Responsibilities for 1, 2, and 4 are transferred with the Emergency Coordinator role upon transfer to the TSC Ops Manager and/or EOF Emergency Coordinator.</p> <p>A, B, D – Incorrect – Plausible - The inclusion of item 3 in these answers makes these incorrect, and ERO (Emergency Response Organization) concurrence is required to enter the SAMGs, but the decision to transition lies solely with the Shift Manager to make the initial decision to transition to SAMGs.</p>			
Technical Reference(s): EOP-01 Rev. 9, NOBP-LP-5509 Rev. 00, Form NOBP-LP-5505 Rev. 00		Reference Attached: EOP-01 pp. 13, NOBP-LP-5509 pp.7 & 8, and Form NOBP-LP-5505	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): EPL-0804-01-1			
Question Source:	Bank # Modified Bank # Perry 2021 SRO #6 New		
Question History:	Previous 2 NRC Exams? No		
Question Cognitive Level:	Memory or Fundamental Knowledge x Comprehension or Analysis		
10 CFR Part 55 Content:	55.41 55.43 (b)5		
<p>SRO Justification - Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.</p> <ul style="list-style-type: none"> <li>Knowledge of diagnostic steps and decision points in the emergency operating procedures (EOP) that involve transitions to event specific subprocedures or emergency contingency procedures.</li> </ul>			

## QUESTION SRO 7

The plant is operating at rated power when the following alarms are received:

- H13-P601-0020-E3 – DRYWELL PRESS A HIGH
- H13-P601-0017-D5 – DRYWELL PRESS B HIGH
- H13-P601-0020-F4 – CONTAINMENT TEMP A HIGH
- H13-P601-0017-D2 – CONTAINMENT TEMP B HIGH
- H13-P601-0020-F3 – DRYWELL AVERAGE TEMP A HIGH
- H13-P601-0017-F5 – DRYWELL AVERAGE TEMP B HIGH
- H13-P601-0018-A1 – DRYWELL IDENTIFIED LEAK RATE HIGH
- H13-P601-0018-A2 – CNTMT IDENTIFIED LEAK RATE HIGH

Validated SPDS indicates the following:

- Drywell pressure 0.8 psig and rising slowly
- Drywell temperature 146 °F and rising slowly
- Containment pressure 0.3 psig and rising
- Containment temperature 93 °F and rising

Based on the above conditions, which action has the highest priority?

- A. Shutdown the reactor and enter EOP-01, RPV Control
- B. Operate available Drywell cooling per EOP-02, Containment Control
- C. Operate available Containment cooling per EOP-02, Containment Control
- D. Initiate Containment Spray per EOP-SPI 3.1, Containment Spray Operation

LOD = \_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_

## QUESTION SRO 7

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #		3
	Group #		
	K/A#	Generic	G2.4.45
	Importance Rating		4.3
K&A: Ability to prioritize and interpret the significance of each annunciator or alarm			
Generic			
<p>Explanation: <b>Answer B</b> – &gt; Based on the indications, drywell temperature is above the EOP-02 entry criteria. Drywell cooling is maximized to control drywell temperature.</p> <p>A – Incorrect – Plausible after drywell cooling is maximized if drywell temperature continues to rise and challenges 330 °F. Elevated DW Identified leakage requires a normal Rx S/D if not corrected.</p> <p>C – Incorrect – Plausible if containment temperature was 95°F and rising. Containment Identified leakage requires a containment inspection.</p> <p>D – Incorrect – Plausible if containment temperature was approaching 185 °F. However, at 0.3 psig, the Containment Spray Initiation Limit has not yet been reached.</p>			
Technical Reference(s): ARI-H13-P601-20 Rev. 26, ARI-H13-P601-17 Rev. 22, ARI-H13-P601-18 Rev. 18, EOP-02 Chart Rev. G		Reference Attached: ARI-H13-P601-20 pp. 69, 81, 83; ARI-H13-P601-17 pp. 49, 55, 87; ARI-H13-P601-18 pp. 3, 4, 7-8; EOP-02 Chart (Partial)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3402-08-C			
Question Source:	Bank # Modified Bank # New	Perry 2015 SRO #11	
Question History:	Previous 2 NRC Exams?	No	
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis	x	
10 CFR Part 55 Content:	55.41 55.43 (b)5		
<p>SRO Justification - Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations. [10 CFR 55.43(b)(5)]</p> <ul style="list-style-type: none"> <li>Knowledge of diagnostic steps and decision points in the emergency operating procedures (EOP) that involve transitions to event specific subprocedures or emergency contingency procedures.</li> </ul>			

## QUESTION SRO 8

The plant was operating at rated power when a LOOP occurred.

The following conditions currently exist:

- Rx power                      Range 8 on IRMs
- RPV level                      Maintained in directed band using RCIC
- RPV pressure                  800-1000 psig on SRVs at P601
- Drywell pressure              2.0 psig, stable
- HPCS                              Tripped on overcurrent

Then Annunciator H13-P877-01-H1, DC BUS ED-1-A UNDERVOLTAGE alarms.

The NLO reports breaker ED-1-A-03, Main Breaker, is tripped with signs of damage on the bus.

What action should the Unit Supervisor direct?

- A.        Transfer RPV level control from RCIC to the Motor Feedpump
- B.        Lower RPV pressure and transfer RPV level control to LPCS
- C.        Transfer RPV pressure control to P631
- D.        Perform Emergency Depressurization

LOD = \_\_\_\_ (1 → 5 - Easy to Hard)

Looked up?   Y   N

TIME TO COMPLETE \_\_\_\_

## QUESTION SRO 8

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO					
	Tier #		1					
	Group #		1					
	K/A#	295004	AA2.01					
	Importance Rating		4.1					
K&A: Ability to determine or interpret the following as they apply to PARTIAL OR COMPLETE LOSS OF DC POWER Partial or complete loss of DC power								
<b>Partial Or Complete Loss Of DC Power</b>								
<p>Explanation: <b>Answer C</b> – &gt; The loss of power to the SRVs from Div. 1 DC, results in the loss of control from P601. SRV control from P631 is powered from Div. 2 DC. The required mitigating strategy in EOP-01-5, ATWS, dictates maintaining RPV pressure as high as practicable given the current conditions.</p> <p>A – Incorrect – Plausible, the MFP would be the desired source in the given plant conditions if offsite power was available. However, if running RCIC will remain running on a loss of ED-1-A.</p> <p>B – Incorrect – Plausible, LPCS is currently running in the given plant conditions, but the injection valve has been overridden closed and has no control power and could not be aligned for injection. Also pressure would have to be lowered to use for injection.</p> <p>D – Incorrect – Plausible, without an injection source or conditions degrade further, ED would be justified to lower pressure for RHR B/C injection.</p>								
Technical Reference(s): EOP-01-5 Chart Rev. A, EOP-01 Chart Rev. I, ONI-R42-1 Rev. 8, ARI-H13-P877-01 Rev.17		Reference Attached: EOP-01-5 Partial pp. , EOP-01-5 partial , EOP-01 Chart partial , ONI-R42-1 pp. 8, ARI-H13-P877-01 pp. 77						
Proposed references to be provided to applicants during examination: None								
Learning Objective (As available): OT-COMBINED-R42 – When provided with plant conditions, PREDICT how the DC Battery and Distribution systems and/or plant parameters will respond to changing plant conditions.								
Question Source:	Bank # Modified Bank # New x							
Question History:	Previous 2 NRC Exams? No							
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis x							
10 CFR Part 55 Content:	55.41 55.43 (b)5							
SRO Justification - Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations. [10 CFR 55.43(b)(5)]								
<ul style="list-style-type: none"> <li>Knowledge of diagnostic steps and decision points in the emergency operating procedures (EOP) that involve transitions to event specific subprocedures or emergency contingency procedures.</li> </ul>								

## QUESTION SRO 9

The plant is operating at 25% power.

Annunciator MAIN TURB BRG OIL TK LVL HI/LO, H13-P680-15-D2 alarmed.

The NLO sent to investigate reports the following:

- There is a fire in the Main Turbine Lube Oil Purifier room
- The CO2 system is not discharging
- Oil is spreading outside the MTLO Purifier room
- He recommends securing the MTLO system

Which of the following procedure(s) contain actions to mitigate this event?

1. IOI-14, FAST UNLOAD AND TRIP OF MAIN TURBINE
2. ONI-N32, TURBINE AND OR GENERATOR TRIP
3. ONI-P54, FIRE
4. ONI-R22-2, LOSS OF A NON-ESSENTIAL 13.8 KV OR 4.16 KV BUS

- A. 1 and 2 only
- B. 1 and 3 only
- C. 2 and 4 only
- D. 3 only

LOD = \_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_

## QUESTION SRO 9

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #		1		
	Group #		1		
	K/A#	295005	G2.4.4		
	Importance Rating		4.7		
K&A: Ability to recognize abnormal indications for system operating parameters that are entry-level conditions for emergency and abnormal operating procedures					
<b>Main Turbine Generator Trip</b>					
<p>Explanation: <b>Answer D</b> – &gt; ONI-P54 contains the actions to mitigate a fire in the MTLO system when oil is spreading. ONI-P54 Step 4.14 directs the actions of Attachment 6, Rapid Main Turbine Lube Oil Shutdown.</p> <p>A – Incorrect – Plausible as IOI-14 would be used if there were a lube oil leak with no fire. ONI-N32 would be entered upon a trip of the main turbine.</p> <p>B – Incorrect – Plausible as IOI-14 would be used if there were a lube oil leak with no fire.</p> <p>C – Incorrect – Plausible as ONI-N32 would be entered upon a trip of the main turbine and ONI-R22-2 would be entered if the fire caused a loss of a non-safety 13.8 KV or 4160 KV bus. The proximity of the fire to the buses would not cause of a loss of these buses.</p>					
Technical Reference(s): ONI-P54 Rev. 27, IOI-14 Rev. 7, ONI-N32 Rev. 17, and ONI-R22-2 Rev. 11		Reference Attached: ONI-P54 pp. 11, 17-77, IOI-14 p. 3, ONI-N32 p. 3, and ONI-R22-2 p. 3			
Proposed references to be provided to applicants during examination: None					
Learning Objective (As available): OT-3035-16(LP)-A.2					
Question Source:	Bank # Modified Bank # New		x		
Question History:	Previous 2 NRC Exams?	No			
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis		x		
10 CFR Part 55 Content:	55.41 55.43	(b)(2)			
<p>SRO Justification - Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations. [10 CFR 55.43(b)(5)]</p> <ul style="list-style-type: none"> <li>Knowledge of when to implement attachments and appendices, including how to coordinate these items with procedure steps.</li> </ul>					



## QUESTION SRO 10

The following conditions exist:

- The plant is in Hot Shutdown
- Control Rod Drive Hydraulic system is shutdown

Then 1P42-C001A, ECC A pump, trips on overcurrent.

Based on the above information, which of the following scheduled manipulations should be directed and requires supervision by the Shift Manager or Unit Supervisor per OAI-0201, Operations General Instructions and Operating Practices?

Shifting \_\_\_\_.

- A. FPCC Heat Exchangers from A to B
- B. Control Complex Chillers from C to B
- C. Control Room Ventilation from A to B
- D. Shutdown Cooling loops from RHR A to RHR B

LOD = \_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_

## QUESTION SRO 10

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #		1		
	Group #		1		
	K/A#	295018	G2.1.9		
	Importance Rating		4.5		
K&A: Ability to direct licensed personnel activities inside the control room (SRO Only)					
<b>Partial Or Complete Loss Of Component Cooling Water</b>					
<p>Explanation: <b>Answer D</b> – The loss of ECC A pump results in a loss of SDC IAW ONI-E12-2, Loss of decay heat removal, and requires shifting SDC loops. With CRDH shutdown, Reference Leg Purge is out of service. With Reference Leg Purge out of service, accuracy of the RPV water level instruments can be affected. OAI-0201 requires compensatory measures when performing activities with a potential to drain the vessel with the Reference Leg Purge out of service while in Modes 1, 2, or 3. With plant in Mode 3 and RHR in SDC, valve manipulations on any part of the RHR system must be supervised by the SM or US.</p> <p>A – Incorrect – Plausible since the FPCC HXs are cooled by a component cooling water system. However, these are normally cooled by Nuclear Closed Cooling and a loss of ECC will not affect them.</p> <p>B – Incorrect – Plausible since a loss of ECC A would require shift CC Chillers if Chiller A was in service. However, this would not require direct supervision.</p> <p>C – Incorrect – Plausible when control room ventilation cooling water is supplied by Control Complex Chiller A, ECC A supports the operation, but control room ventilation shift does not need to be directly supervised.</p>					
Technical Reference(s): SDM-C11(CRDH) Rev. 9, OAI-0201 Rev. 48.		Reference Attached: SDM-C11(CRDH) p. 1, OAI-0201 pp. 12-13			
Proposed references to be provided to applicants during examination: None					
Learning Objective (As available): OT-3039- 07 Terminal Objective: From memory, explain the Licensed Operator duties in accordance with approved procedures.					
Question Source:	Bank # Modified Bank # New	Perry 2010 # SRO-25			
Question History:	Previous 2 NRC Exams? No				
Question Cognitive Level:	Memory or Fundamental Knowledge x Comprehension or Analysis				
10 CFR Part 55 Content:	55.41 55.43 Plant Specific				
<p>Comments: SRO Justification for Plant Specific Exemption - knowledge/ability is "unique to the SRO position"</p> <p>SRO Task: The following is a unique SRO Task</p> <p>341-580-04-02 – Perform the required actions if a reference leg backfill flow rate is out of spec or if a backfill system is out of service.</p>					

## QUESTION SRO 11

The plant was at rated power when a load rejection occurred which resulted in a LOCA.

Plant conditions are as follows:

- Reactor Pressure 930 psig stable
- Reactor Water Level 165 inches stable
- Suppression Pool Level 24.2 feet slowly rising
- Suppression Pool Temperature 139 °F slowly rising
- Drywell Pressure 2 psig stable
- Containment Pressure 0.8 psig stable
- MSIVs closed

What actions are required to be directed?

### Reference Provided:

- A. Emergency Depressurize.
- B. Raise Suppression Pool Level.
- C. Lower RPV Pressure to 700 psig.
- D. Anticipate Emergency Depressurization.

LOD = \_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_

# QUESTION SRO 11

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #		1		
	Group #		1		
	K/A#	295025	EA2.03		
	Importance Rating		3.5		
K&A: Ability to determine or interpret the following as they apply to High Reactor Pressure: Suppression Pool Temperature					
<b>High Reactor Pressure</b>					
<p>Explanation: <b>Answer C</b> – &gt; With the given conditions, the Heat Capacity Limit has not been exceeded yet. Since SP temperature is rising, HCL will be exceeded. However, the operator is directed to take steps to restore/maintain margin to HCL. This includes raising SP level and lowering RPV pressure. Lowering RPV pressure to 700 psig will restore margin to HCL.</p> <p>A – Incorrect – Plausible since this the required action if margin to HCL cannot be restored and maintained. However, other actions are available that would not put the plant through such a severe transient.</p> <p>B – Incorrect – Plausible since this action would normally add margin to HCL. However, with SP level at 24.2', any water added to the SP would flow over the DW weir wall and not raise SP level appreciably.</p> <p>D – Incorrect – Plausible as this action could be used to prevent exceeding HCL. However, with the MSIVs closed AED is not possible</p>					
Technical Reference(s): EOP-01 Chart Rev. I, EOP-02 Chart Rev. G EOP Supplement Rev. 9		Reference Attached: EOP-01 Chart (partial), EOP-02 Chart (partial), EOP Supplement p. 16			
Proposed references to be provided to applicants during examination: EOP-SPI Supplement Figure #4					
Learning Objective (As available): OT-3403-03B(SG)-F.4					
Question Source:	Bank # Modified Bank # New	Duane Arnold 2017 # SRO-05			
Question History:	Previous 2 NRC Exams? No				
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis x				
10 CFR Part 55 Content:	55.41 55.43 b(5)				
<p>SRO Justification: Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations. [10 CFR 55.43(b)(5)]</p> <ul style="list-style-type: none"> <li>Knowledge of diagnostic steps and decision points in the emergency operating procedures (EOP) that involve transitions to event specific subprocedures or emergency contingency procedures.</li> </ul>					

## QUESTION SRO 12

The plant was operating at rated power with Containment Vessel Chiller A in service when the following occurred:

- Containment Vessel Chiller A tripped on low refrigerant pressure
- Containment temperature is 100 °F and continues to rise slowly.

Based on the above information, EOP-02, Primary Containment Control and \_\_\_\_ provides the required actions that mitigate these plant conditions?

- A. SOI-P50, Containment Vessel Chilled Water System
- B. SOI-M11, Containment Vessel Cooling System
- C. EOP-SPI 2.2, Bypass of CVCW Isolation
- D. ONI-C71, Reactor Scram

LOD = \_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_

## QUESTION SRO 12

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #		1
	Group #		1
	K/A#	295027	EA2.01
	Importance Rating		4.1
K&A: Ability to determine or interpret the following as they apply to High Containment Temperature: Containment Temperature			
High Containment Temperature (Mark III Containment Only)			
<p>Explanation: <b>Answer A</b> – EOP-02 is entered when containment temperature exceeds 95 °F. Since the containment vessel chiller tripped on low refrigerant pressure, SOI-P50 contains actions to start another chiller.</p> <p>B – Incorrect – SOI-M11 contains a section to “Maximize Containment Cooling” and EOP-02 directs Maximizing Containment Cooling. But, without a chiller, starting more cooling fans will have no effect.</p> <p>C – Incorrect – Although EOP-02 directs EOP-SPI 2.2, no isolation has occurred.</p> <p>D – Incorrect – If containment temperature rose high enough, EOP-01 and ONI-C71-1 would be entered. However, there is sufficient margin to EOP-01 entry to not require scrambling at this time.</p>			
Technical Reference(s): EOP-02 Chart Rev G, SOI-P50 Rev 13, & ARI-H13-P904-01 Rev 12		Reference Attached: EOP-02 chart (partial), SOI-P50 p, 12, & ARI-H13-P904-01 p 6	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3402-7-A & -C			
Question Source:	Bank # Modified Bank # New	Perry 2017 NRC SRO #13	
Question History:	Previous 2 NRC Exams? No		
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis x		
10 CFR Part 55 Content:	55.41 55.43 (b)5		
<p>SRO justification = Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations. [10 CFR 55.43(b)(5)]</p> <ul style="list-style-type: none"> <li>Knowledge of diagnostic steps and decision points in the emergency operating procedures (EOP) that involve transitions to event specific subprocedures or emergency contingency procedures.</li> </ul>			

## QUESTION SRO 13

The plant is operating at rated power.

Annunciator H13-P601-18-E1, HPCS PUMP ROOM SUMP LEVEL HIGH has alarmed

The HPCS room water tight door is closed.

Suppression Pool level is 17.4' and lowering.

EOP-02, Primary Containment Control and EOP-03, Secondary Containment Control have been entered.

What is the next action required?

- A. Transition to EOP-01, RPV Control and direct EOP-01-2, Emergency RPV Depressurization
- B. Commence Normal Rx shutdown IAW IOI-3, Power Changes and IOI-4, Shutdown
- C. Transition to EOP-01, RPV Control and direct Anticipate ED
- D. Direct EOP-SPI-3.2 SPMU Initiation

LOD = \_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_

## QUESTION SRO 13

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #		1		
	Group #		1		
	K/A#	295030	G2.1.20		
	Importance Rating		4.6		
K&A: Ability to interpret and execute procedure steps					
Low Suppression Pool Water Level					
<p>Explanation: <b>Answer D</b> – &gt; IAW PYBP-POS-30, a SP leak into the HPCS room will cause SP level lower to 13.47 feet with the WT door closed. EOP-02 identifies various methods of adding water to the SP in the event of lowering level. The most effective method is to initiate SPMU to raise level in the SP. This will also preclude the need to ED.</p> <p>A – Incorrect – Plausible, if SP level lowered to 14.25 ft. and no water was added, ED is required.</p> <p>B – Incorrect – Plausible, if an additional area water level was above max safe and the source was not a primary leak, the required action is to commence a normal reactor shutdown or enter ONI-C71-1 and scram.</p> <p>C – Incorrect – Plausible, If it is anticipated that SP level would lower below 14.25 ft., direction of Anticipate ED could be directed prior to reaching 14.25 ft.</p>					
Technical Reference(s): EOP-02 Rev. G, EOP-03/04 Rev. A, PYBP-POS-30 Rev. 7, ARI-H13-P601-18 Rev. 18		Reference Attached: EOP-02 Partial, EOP-03/04, PYBP-POS-30 p. 11, ARI-H13-P601-18 pp.47 & 48			
Proposed references to be provided to applicants during examination: None					
Learning Objective (As available): OT-3402-05-C.1					
Question Source:	Bank # Modified Bank # New	x			
Question History:	Previous 2 NRC Exams?	No			
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis	x			
10 CFR Part 55 Content:	55.41 55.43 (b)5				
<p>SRO justification = Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations. [10 CFR 55.43(b)(5)]</p> <ul style="list-style-type: none"> <li>Knowledge of diagnostic steps and decision points in the emergency operating procedures (EOP) that involve transitions to event specific subprocedures or emergency contingency procedures.</li> </ul>					



## QUESTION SRO 14

The reactor was operating at rated power when an ATWS occurred 20 minutes ago.

The following are the current plant conditions:

- All Control Rods Fully inserted
- HST Level 40 inches
- RPV Water Level -15 inches and lowering
- RPV Press 800 psig and stable
- RCIC Flow 700 gpm
- HPCS Tripped on over current

What is the next action required?

- A. Transition to EOP-01-1, Alternate Level/Pressure Control.
- B. Transition to EOP-01-2, RPV Emergency Depressurization.
- C. Establish 1.1 Mlbm/hr Steam Flow to maintain adequate core cooling.
- D. Lower RVP Pressure maintaining cooldown rate to  $< 100$  °F/hr. to allow for low pressure ECCS injection.

LOD = \_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_

## QUESTION SRO 14

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #		1
	Group #		1
	K/A#	295031	G2.1.7
	Importance Rating		4.7
K&A: Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation			
<b>Reactor Low Water Level</b>			
<p>Explanation: <b>Answer B</b> – &gt; EOP-01, Level Control Leg, directs the transition to ED when RPVWL cannot be maintained &gt; -25 inches. With only RCIC available and RPV level lowering, ED is required.</p> <p>A – Incorrect – Plausible, AED would be appropriate if RPV water level was higher. The EOP-01 Guidelines state that when RPV water level lowers to 0 inches, ED must be entered and Anticipate ED is not allowed.</p> <p>C – Incorrect – Plausible, Establishing 1.1 Mlbm/hr steam flow rate meets adequate core cooling requirements while in EOP ATWS, but is not directed in EOP-01.</p> <p>D – Incorrect –Plausible, the strategy for LPCS injection allows lowering pressure to approximately 420 psig to allow for injection. Use of this strategy would lower RPV water level &lt;-25 inches prior to injection.</p>			
Technical Reference(s): EOP-01 Chart Rev. I, EOP-01-5 Rev. A		Reference Attached: EOP-01 Chart Partial , EOP-01-5 Partial	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3402-02-F			
Question Source:	Bank # Modified Bank # New		x
Question History:	Previous 2 NRC Exams?	No	
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis		x
10 CFR Part 55 Content:	55.41 55.43 (b)5		
<p>SRO justification = Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations. [10 CFR 55.43(b)(5)]</p> <ul style="list-style-type: none"> <li>Knowledge of diagnostic steps and decision points in the emergency operating procedures (EOP) that involve transitions to event specific subprocedures or emergency contingency procedures.</li> </ul>			

## QUESTION SRO 15

The plant is operating at rated power, when a partial loss of Drywell Cooling occurs:

As a result:

- Drywell Average Air Temperature rises and stabilizes at 144.6°F
- Drywell-to-Primary Containment d/p rises and stabilizes at +2.1 psid
- Annunciator H13-P601-20-E3, Drywell Press A High - alarmed
- Annunciator H13-P601-17-D5, Drywell Press B High - alarmed

Based on the above information:

The required action is to restore the (1).

The consequence of not taking the action is (2).

	<u>(1)</u>	<u>(2)</u>
A.	Drywell-to-Primary Containment $\Delta p$ to within its Tech Spec limits	weir wall overflow, should an inadvertent upper pool dump occur
B.	Drywell-to-Primary Containment $\Delta p$ to within its Tech Spec limits	direct communication of the blowdown energy contained in the drywell airspace, to the suppression pool inventory, should a LOCA occur.
C.	Drywell Average Air Temperature to within its Tech Spec Limits	weir wall overflow, should an inadvertent upper pool dump occur
D.	Drywell Average Air Temperature to within its Tech Spec Limits	direct communication of the blowdown energy contained in the drywell airspace, to the suppression pool inventory, should a LOCA occur.

LOD = \_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_

## QUESTION SRO 15

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO					
	Tier #		1					
	Group #		2					
	K/A#	295010	AA2.06					
	Importance Rating		3.7					
K&A: Ability to determine or interpret the following as they apply to High Drywell Pressure: Drywell temperature								
<b>High Drywell Pressure</b>								
<p>Explanation: <b>Answer B</b> – &gt; With the plant in Mode 1, LCO 3.6.5.4 requires Drywell to Primary Containment Differential Pressure restored <math>\leq 2.0</math> psid. This LCO is based on preventing Horizontal Vent clearing at normal Suppression Pool Water Level. This discussion means that too high a drywell-to-CNMT <math>\Delta P</math> can cause the vents to be already uncovered ('cleared') at the onset of a DBA LOCA (as a result of the downward force on the annulus water level). If a LOCA, then, were to occur, the RPV blowdown energy would communicate directly into the suppression pool inventory.</p> <p>A – Incorrect – Second part - Plausible for negative differential pressure.</p> <p>C &amp; D – Incorrect – First part - Plausible if Drywell Temperature exceeded 145 °F.</p> <p>D – Incorrect – Second part - Plausible for negative differential pressure.</p>								
Technical Reference(s): ARI-H13-P601-20 Rev. 26, ARI-H13-P601-17 Rev. 22, TS 3.6.5.4 Amend. 69, TS Bases B3.6.5.4 Rev. 1		Reference Attached: ARI-H13-P601-20 p. 69, ARI-H13-P601-17 p. 55, TS 3.6.5.4 p. 3.6-69, TS Bases 3.6.5.4 p.B 3.6-145						
Proposed references to be provided to applicants during examination: None								
Learning Objective (As available): OT-3037-10-B								
Question Source:	Bank # Modified Bank # New	Perry 2015 NRC SRO #17						
Question History:	Previous 2 NRC Exams? No							
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis x							
10 CFR Part 55 Content:	55.41 55.43 (b)2							
SRO Justification - Facility operating limitations in the TS and their bases. [10 CFR 55.43(b)(2)]								
<ul style="list-style-type: none"> <li>Knowledge of TS bases that are required to analyze TS required actions and terminology.</li> </ul>								

**QUESTION SRO 16**

The plant was operating at rated power when a loss of RPS Bus A occurred.

Which of the following remain OPERABLE?

- 1 Containment Airlocks
- 2 Reactor Core Isolation Cooling
- 3 Drywell Gas Radiation Monitor
- 4 Rx Coolant Continuous Conductivity Monitor

- A. 1 only
- B. 1 and 2 only
- C. 1, 2, & 3 only
- D. 1, 2, 3, & 4

LOD = \_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_

## QUESTION SRO 16

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #		1		
	Group #		2		
	K/A#	295020	G2.2.37		
	Importance Rating		4.6		
K&A: Ability to determine operability or availability of safety-related equipment (SRO Only)					
<b>Inadvertent Containment Isolation</b>					
<p>Explanation: <b>Answer B – &gt; Loss of an RPS bus requires entry in ONI-C71-2. This ONI directs the operator to review Tech Specs for equipment lost.</b> Containment Airlocks remain operable. No functions are lost in the airlock during a loss of RPS. Reactor Core Isolation Cooling isolation logic power is supplied from 125 Divisional DC.</p> <p>A – Incorrect – Plausible, since the Containment Airlocks remain operable, but RCIC also remains operable since its isolation logic power is supplied from 125 Divisional VDC.</p> <p>C – Incorrect – Plausible, Drywell Gas Radiation Monitor is not operable due to the isolation of the sample flow path. The loss of RPS deenergizes the Containment Isolation logic.</p> <p>D – Incorrect – Plausible, Drywell Gas Radiation Monitor is not operable due to the isolation of the sample flow path. Rx Coolant Continuous Conductivity Monitoring is not operable due to the isolation of the sample flow path. The loss of RPS deenergizes the Containment Isolation logic.</p>					
Technical Reference(s): ONI-C71-2 Rev. 9, TS 3.4.7 Amend. 131, PDB-R01 Rev. 47		Reference Attached: ONI-C71-2 p. 5, 7-8, TS 3.4.7 p. 3.4-16, PDB-R01 p. 55-57			
Proposed references to be provided to applicants during examination: None					
Learning Objective (As available): OT-COMBINED-C71-1.17					
Question Source:	Bank # Modified Bank # New		x		
Question History:	Previous 2 NRC Exams?	No			
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis		x		
10 CFR Part 55 Content:	55.41 55.43	(b)2			
<p>SRO Justification - Facility operating limitations in the TS and their bases. [10 CFR 55.43(b)(2)]</p> <ul style="list-style-type: none"> <li>Knowledge of TS bases that are required to analyze TS required actions and terminology.</li> </ul>					

## QUESTION SRO 17

The plant was operating at rated power when the running CRD pump tripped.

A few minutes later, annunciator CRD MECHANISM TEMP HI, H13-P601-22-A3 alarmed.

The standby CRD pump was then started and CRD system parameters were restored.

Control Rods 30-27 and 22-23 remain in alarm at 1C11-R018 with temperatures as follows:

- Rod 30-27 370 °F and stable
- Rod 22-23 402 °F and stable

Both control rods are fully withdrawn.

Previous scram timing was performed at 1024 psig with data (in seconds) as follows:

<u>Notch</u>	<u>30-27</u>	<u>22-23</u>
43	0.288	0.279
29	0.771	0.768
13	1.411	1.497

Based on the above information, determine the status of control rods 30-27 and 22-23.

### Reference Provided:

	<u>(Rod 30-27)</u>	<u>(Rod 22-23)</u>
A.	Slow	Meets Scram Time
B.	Slow	Slow
C.	Meets Scram Time	Meets Scram Time
D.	Meets Scram Time	Slow

LOD = \_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_

## QUESTION SRO 17

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #		1		
	Group #		2		
	K/A#	295022	AA2.03		
	Importance Rating		3.1		
K&A: Ability to determine or interpret the following as they apply to Loss Of Control Rod Drive Pumps: CRD mechanism temperatures					
<b>Loss Of Control Rod Drive Pumps</b>					
<p>Explanation: <b>Answer D</b> – A CRD pump trio requires entry into ONI-C11-1, Inability To Move Control Rods. IAW ARI-H13-P601-22, with control rod 22-23 Mech Temp &gt;400 °F, a scram time penalty of 0.05 seconds is assessed to the 75% insertion time (notch 13). This exceeds the maximum scram time in TS table 3.1.4-1. Since the scram times are both &lt;7 seconds, neither rod is Inop.</p> <p>A – Incorrect – 1<sup>st</sup> part - Plausible since 30-27 10% insertion time would exceed the Max Scram time if the penalty were assessed. However, no penalty is assessed since the Mech Temp is &lt;400 °F.</p> <p>B – Incorrect – 1<sup>st</sup> part - Plausible since 30-27 10% insertion time would exceed the Max Scram time if the penalty were assessed. However, no penalty is assessed since the Mech Temp is &lt;400 °F. 2<sup>nd</sup> part - Plausible if penalty is not assessed to rod 22-23. However, since its associated Mech Temp is &gt;400 °F, it is considered slow.</p> <p>C – Incorrect – 2<sup>nd</sup> part - Plausible if penalty is not assessed to rod 22-23. However, since its associated Mech Temp is &gt;400 °F, it is considered slow.</p>					
Technical Reference(s): ARI-H13-P601-22 Rev. 9 and TS 3.1.4 Rev. Amends 157 & 171		Reference Attached: ARI-H13-P601-22 pp. 3-5 and TS 3.1.4 pp. 3.1-12 through -14			
Proposed references to be provided to applicants during examination: ARI-H13-P601-22-A3 & TS 3.1.4					
Learning Objective (As available): OT-3037-05 #8					
Question Source:	Bank # Modified Bank # New	x			
Question History:	Previous 2 NRC Exams?	No			
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis	x			
10 CFR Part 55 Content:	55.41 55.43	b(2)			
<p>SRO Justification: B. Facility operating limitations in the TS and their bases. [10 CFR 55.43(b)(2)]</p> <ul style="list-style-type: none"> <li>Application of Required Actions (Section 3) and Surveillance Requirements (SR) (Section 4) in accordance with rules of application requirements (Section 1).</li> </ul>					



## QUESTION SRO 18

The plant was at rated power when a LOCA occurred.

All ECCS systems automatically initiated on DW pressure.

Then a LOOP occurred coincident with a Div. 1 DG trip.

It is desired to use RHR A for RPV level control.

The problem with Div 1 DG has been corrected and the DG is ready to be restarted.

The current position of 1E12-F042A, LPCI INJECTION VALVE is   (1)  .

In order to reenergize Bus EH11 from Div. 1 DG, the Unit Supervisor would direct   (2)  .

	<u>  (1)  </u>	<u>  (2)  </u>
A.	Closed	ONI-SPI A-5, DIVISION 1 EDG RESTORATION
B.	Closed	ONI-SPI A-6, DIVISION 1 DIESEL EMERGENCY OPERATION
C.	Open	ONI-SPI A-5, DIVISION 1 EDG RESTORATION
D.	Open	ONI-SPI A-6, DIVISION 1 DIESEL EMERGENCY OPERATION

LOD = \_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_

## QUESTION SRO 18

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #		2		
	Group #		1		
	K/A#	203000	A2.06		
	Importance Rating		3.9		
K&A: Ability to (a) predict the impacts of the following on the RHR/LPCI Injection Mode and (b) based on those predictions, use procedures to correct, control, or mitigate the abnormal operations: consequences of those abnormal operations: Emergency generator failure					
<b>RHR/LPCI: Injection MODE</b>					
<p>Explanation: <b>Answer C</b> – &gt; The LPCI Inj Valve will open upon system initiation. When power was lost, the valve will fail as is. ONI-R22-1, Loss Of An Essential And/Or Stub Bus directs performance of ONI-SPI A5, which contains the steps to restart the DG. When the DG restarts, it will automatically energize Bus EH11.</p> <p>A – Incorrect – 1<sup>st</sup> part – plausible as the ECCS injection valves can be overridden closed for RPV level control. However, with the loss of AC power to Bus EH11 that would not have been possible.</p> <p>B – Incorrect – 1<sup>st</sup> part – plausible as the ECCS injection valves can be overridden closed for RPV level control. However, with the loss of AC power to Bus EH11 that would not have been possible. 2<sup>nd</sup> part – Plausible since this is an emergency condition. However, ONI-SPI A6 is for operation of the DG when a loss of DC Control Power exists.</p> <p>D – Incorrect – 2<sup>nd</sup> part – Plausible since this is an emergency condition. However, ONI-SPI A6 is for operation of the DG when a loss of DC Control Power exists.</p>					
Technical Reference(s): SOI-E12 Rev. 78, ONI-R22-1 Rev. 16, ONI-SPI A-5 Rev. 8, and ONI-SPI-A-6 Rev. 4		Reference Attached: SOI-E12 pp. 22-23, ONI-R22-1 p. 8, ONI-SPI A-5 pp. 2-3 & 6-7, and ONI-SPI-A-6 p. 2			
Proposed references to be provided to applicants during examination: None					
Learning Objective (As available): OT-3035-18(LP)-A.1 & OT-3403-10(LP)-C					
Question Source:	Bank # Modified Bank # New		x		
Question History:	Previous 2 NRC Exams?	No			
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis		x		
10 CFR Part 55 Content:	55.41 55.43	b(5)			
<p>SRO Justification - Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.</p> <ul style="list-style-type: none"> <li>Knowledge of when to implement attachments and appendices, including how to coordinate these items with procedure steps.</li> </ul>					

## QUESTION SRO 19

The plant was operating at rated power when a transient resulted in a lockout of Bus EH11 and a Rx scram.

Current conditions are as follows:

- Mode Switch Locked in SHUTDOWN
- Reactor power: 5% and stable
- RPV level: 80 inches and stable
- RPV pressure: 920 psig lowering slowly
- SLC Pumps A & B control switches: ON
- PUMP A DISCH PRESS & PUMP B DISCH PRESS, C41-R600A & B on P601 1000 psig

Then power was lost to Load Centers EF-1-C and EF-1-D.

Based on these conditions the SLC system is \_\_\_\_.

- A. Injecting boron into the RPV at 86 gpm. Direct crew to continue injecting boron until SLC tank level reaches 200 gallons Per EOP-01-5
- B. Injecting boron into the RPV at 43 gpm. Direct crew to continue injecting boron until SLC tank level reaches 200 gallons Per EOP-01-5
- C. Not injecting boron into the RPV. Direct crew to perform SOI-C41, SLC Transfer System Emergency Preparation/Transfer
- D. Not injecting boron into the RPV. Direct crew to perform EOP-SPI 1.8 Alternate Boron Injection

LOD = \_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_

## QUESTION SRO 19

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #		2		
	Group #		1		
	K/A#	211000	A2.03		
	Importance Rating		3.7		
K&A: Ability to (a) predict the impacts of the following on the Standby Liquid Control System and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operations: AC power failures					
<b>Standby Liquid Control System</b>					
<p>Explanation: <b>Answer D</b> – With a loss of Bus EH11, the A SLC pump could not be started and A Squib valve would not fire. Then, the subsequent loss of Load Center EF-1-C causes a loss of power to the MCC that powers the B SLC pump. Therefore, no SLC pumps are running. EOP-SPI-1.8 contains direction for Alternate Boron Injection.</p> <p>A – Incorrect – 1<sup>st</sup> part - Plausible as 86 gpm is the normal flow rate for 2 pumps. However, SLC is not being injected into the RPV since electrical power was lost to both SLC pumps. 2<sup>nd</sup> part – correct action if injecting.</p> <p>B – Incorrect – 1<sup>st</sup> part - Plausible as 43 gpm is the normal flow rate for 1 SLC pump. However, the loss of Bus EH11 and Load Center EF-1-C results in the loss of both SLC pumps. 2<sup>nd</sup> part – correct action if injecting.</p> <p>C – Incorrect – 1<sup>st</sup> part – Correct. 2<sup>nd</sup> part - This procedure would be used to refill the SLC storage tank.</p>					
Technical Reference(s): SOI-C41 Rev. 23, SDM-C41 Rev. 10, Dwg. EOP-01-5 Chart Rev. A, DWGs 208-030 Sh. 5 Rev. JJ, and Sh. 2 Rev. EE, & 206-053 Rev. HH		Reference Attached: SOI-C41 pp. 9 & 60, SDM-C41 pp. 8 & 11, EOP-01-5 Chart partial, DWGs 208-030 Sh. 5, and Sh. 2, & 206-053			
Proposed references to be provided to applicants during examination: None					
Learning Objective (As available): C41-G & O.2					
Question Source:	Bank # Modified Bank # New	Perry 2019-01 # SRO-20			
Question History:	Previous 2 NRC Exams?	No			
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis	x			
10 CFR Part 55 Content:	55.41 55.43 (b)5				
<p>SRO justification = Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations. [10 CFR 55.43(b)(5)]</p> <ul style="list-style-type: none"> <li>Knowledge of diagnostic steps and decision points in the emergency operating procedures (EOP) that involve transitions to event specific subprocedures or emergency contingency procedures.</li> </ul>					

## QUESTION SRO 20

The plant was at rated power when an ATWS occurred.

ATWS Actions were completed.

The US directed the following bands:

- RPV level 40-80 inches
- RPV pressure 800-1000 psig

Current conditions as follows:

- RPV level 5 inches – stable
- RPV pressure 850 psig – lowering slowly

RCIC is the only high-pressure injection source available.

What action should be directed?

- A. Continue RCIC injection until CSWB is injected
- B. Trip RCIC to maintain RPV pressure in directed band
- C. Perform Emergency depressurization to 200 psig to maintain RCIC injection
- D. Perform Emergency Depressurization to < 30 psig to allow low-pressure injection

LOD = \_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_

## QUESTION SRO 20

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #		2
	Group #		1
	K/A#	217000	G2.4.22
	Importance Rating		4.4
K&A: Knowledge of the bases for prioritizing safety functions during abnormal/emergency operations			
<b>Reactor Core Isolation Cooling System</b>			
<p>Explanation: <b>Answer A</b> – &gt; RCIC should continue to inject to maintain RPV level &gt; -25 “ to maintain adequate core cooling. Per EOP-01-5, maintain pressure &gt;350 psig to ensure no thermo-hydraulic instabilities are caused. Therefore, RCIC can continue to maintain injection (ACC) until RPV pressure is lowered to allow for LP injection.</p> <p>B – Incorrect – Plausible, Tripping of RCIC would allow for the stabilization of RPV Pressure IAW EOP-01-5 Pressure Leg, but priority for the current plant conditions is maintaining core cooling. As the only HP Injection source, RCIC injection is the priority.</p> <p>C – Incorrect – Plausible, In EOP-01-2, the strategy for a loss of All AC is lowering of pressure to 150-300 psig to maintain RCIC available and injecting.</p> <p>D – Incorrect – Plausible, If CSBW has been injected, lowering pressure to &lt;30 psig is allowed to allow the use of RHR and RHR S/D Cooling to maintain RPV temperature.</p>			
Technical Reference(s): EOP-01-5 Chart Rev. A		Reference Attached: EOP-01-5 Chart (Partial)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3402-11-D.1.D			
Question Source:	Bank #		
	Modified Bank #		
	New	x	
Question History:	Previous 2 NRC Exams?	No	
Question Cognitive Level:	Memory or Fundamental Knowledge		
	Comprehension or Analysis	x	
10 CFR Part 55 Content:	55.41		
	55.43 (b)5		
<p>SRO justification = Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations. [10 CFR 55.43(b)(5)]</p> <ul style="list-style-type: none"> <li>Knowledge of diagnostic steps and decision points in the emergency operating procedures (EOP) that involve transitions to event specific subprocedures or emergency contingency procedures.</li> </ul>			

## QUESTION SRO 21

The plant was operating at rated power when a TLAC occurred.  
The following conditions now exist:

- Reactor pressure is being maintained by manually cycling SRVs
- Reactor level is 3" and slowly lowering
- All control rods are fully inserted
- RCIC initiated and tripped
- EOP-SPI-4.6, Fast Fire Water, has just been directed
- No other injection systems are available

Considering only Reactor level, complete the following statement.

Based on the current status of injection systems, if Reactor level continues to lower, Rapidly Depressurization using SRVs \_\_\_\_.

- A. must be performed before Reactor level reaches -25"
- B. must not be performed until Reactor level reaches -75"
- C. may be performed anytime while Reactor level is between 0" and -25"
- D. may be performed anytime while Reactor level is between 0" and -75"

LOD = \_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_

## QUESTION SRO 21

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #		2		
	Group #		1		
	K/A#	239002	G2.4.6		
	Importance Rating		4.7		
K&A: Knowledge of emergency and abnormal operating procedures major action categories					
<b>Safety Relief Valves</b>					
<p>Explanation: <b>Answer B</b> – &gt; Operating in EOP-01.1, (Step C-1/P-1) with RCIC tripped and no other injection systems or injection sub-systems available, the SRO must stabilize RPV pressure C-1/P-3(1), if no injection sources are made available, RD is delayed until level lowers to -75" C-1/P-3(3)</p> <p>A – Incorrect – Plausible, This would be correct if any injection systems/sub-systems were available.</p> <p>C – Incorrect – Plausible, RD between 0 and -25" would be correct if any injection subsystem were lined-up for injection.</p> <p>D – Incorrect – Plausible, RD between 0 and -75" would be correct if any injection source became available and level could not be restored and maintained &gt; -25"</p>					
Technical Reference(s): EOP-01-1 Rev. A, EOP-01-1 Bases Rev. 0, ONI-R10, Rev. <b>17</b>		Reference Attached: EOP-01-1 Partial, EOP-01-1 Bases, p. 39, ONI-R10, p.3			
Proposed references to be provided to applicants during examination: None					
Learning Objective (As available): OT-3402-02 F					
Question Source:	Bank # Modified Bank # New	Perry NRC 2015 SRO #19			
Question History:	Previous 2 NRC Exams?	No			
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis	x			
10 CFR Part 55 Content:	55.41 55.43 b(5)				
<p>SRO justification = Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations. [10 CFR 55.43(b)(5)]</p> <ul style="list-style-type: none"> <li>Knowledge of diagnostic steps and decision points in the emergency operating procedures (EOP) that involve transitions to event specific subprocedures or emergency contingency procedures.</li> </ul>					



**QUESTION SRO 22**

The plant was operating at rated power when annunciator H13-P870-01-C5 INVERTER, DB-1-A TROUBLE, alarmed.

The inverter would shift to the alternate source if a low inverter (1) condition existed.

If the alternate source is also lost, the Unit Supervisor would direct the actions of (2).

	<u>(1)</u>	<u>(2)</u>
A.	input voltage	ONI-C11-1, Inability To Move Control Rods
B.	output frequency	ONI-C11-1, Inability To Move Control Rods
C.	input voltage	ONI-C71-1, Reactor Scram
D.	output frequency	ONI-C71-1, Reactor Scram

LOD = \_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_

## QUESTION SRO 22

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #		2		
	Group #		1		
	K/A#	262002	A2.05		
	Importance Rating		3.9		
K&A: Ability to (a) predict the impacts of the following on the UPS Uninterruptable Power Supply AC/DC and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operations: Loss of UPS					
<b>Uninterruptable Power Supply AC/DC</b>					
<p>Explanation: <b>Answer A</b> – Low DC voltage input to the inverter would cause the inverter to shift to the alternate source. If the alternate source was then lost, Bus V-1-A would be deenergized causing a lockup or RC&amp;IS. ONI-C11-1 would be entered since control rod movement would not be possible except by scram.</p> <p>B – Incorrect – 1<sup>st</sup> part – Plausible since the static transfer switch checks the inverter frequency and the alternate source frequency. However, low inverter frequency will not cause a shift to the alt source.</p> <p>C – Incorrect – 2<sup>nd</sup> part – Plausible as the loss of both ATWS inverters will result in a Rx scram.</p> <p>D – Incorrect – 1<sup>st</sup> part – Plausible since the static transfer switch checks the inverter frequency and the alternate source frequency. However, low inverter frequency will not cause a shift to the alt source. 2<sup>nd</sup> part – Plausible as the loss of both ATWS inverters will result in a Rx scram.</p>					
Technical Reference(s): ARI-H13-P870-01 Rev. 20, PDB-H044 Rev. 8, ONI-C11-1 Rev. 17		Reference Attached: ARI-H13-P870-01 pp. 47-48, PDB-H044 pp. 2 & 17, ONI-C11-1 pp. 3-4 & 9-11			
Proposed references to be provided to applicants during examination: None					
Learning Objective (As available): OT-COMBINED-R14_15					
Question Source:	Bank # Modified Bank # New	x			
Question History:	Previous 2 NRC Exams?	No			
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis	x			
10 CFR Part 55 Content:	55.41 55.43	b(5)			
<p>SRO justification = Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations. [10 CFR 55.43(b)(5)]</p> <ul style="list-style-type: none"> <li>Knowledge of when to implement attachments and appendices, including how to coordinate these items with procedure steps.</li> </ul>					

## QUESTION SRO 23

The plant was operating at rated power.

APRM A was in BYPASS for SVI-C51-T0024, APRM Gain Calibration.

If an upscale failure on APRM (1) occurs, the operators need to lockup both FCVs.

The procedure(s) that contains the actions to restore the FCVs is (2) .

	<u>(1)</u>	<u>(2)</u>
A.	E	ARI-H13-P680-04-A5, FCV A Motion Inhibited & A14 FCV B Motion Inhibited
B.	F	ARI-H13-P680-04-A5, FCV A Motion Inhibited & A14 FCV B Motion Inhibited
C.	E	SOI-B33, Reactor Recirculation System
D.	F	SOI-B33, Reactor Recirculation System

LOD = \_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_

## QUESTION SRO 23

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #		2		
	Group #		2		
	K/A#	202002	A2.12		
	Importance Rating		3.4		
K&A: Ability to (a) predict the impacts of the following on the Recirculation Flow Control System and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operations: APRM/LPRM					
<b>Recirculation Flow Control System</b>					
<p>Explanation: <b>Answer C</b> – &gt; (1<sup>st</sup> part) When APRM A is in BYPASS, APRM E is automatically monitored by the Reactor Recirc Sys Flux Control for AFDL. An upscale failure on APRM E will result in APRM power &gt; AFDL resulting in a flow control valve runback. (2<sup>nd</sup> part) Actions directed by the ARI-H13-P680-04-E9, AFDL in Control, direct the HPU to be locked-up. Recovery from this condition is in SOI-B33. ARI-H13-P680-04-A4 (A14) contains recovery actions for motion inhibit, but not recovery of the HPU from shutdown.</p> <p>A – Incorrect – Plausible, (1<sup>st</sup> part) Correct (2<sup>nd</sup> part) ARI-H13-P80-04-A4 (A14) contains recovery actions for motion inhibit, but not recovery of the HPU from shutdown.</p> <p>B – Incorrect – Plausible, (1<sup>st</sup> part) When APRM A is bypassed, APRM E, not APRM F, is monitored by the Reactor Recirc Sys Flux Control for AFDL. (2<sup>nd</sup> part) ARI-H13-P680-04-A4 (A14) contains recovery actions for motion inhibit, but not recovery of the HPU from shutdown.</p> <p>D – Incorrect – Plausible, (1<sup>st</sup> part) When APRM A is bypassed, APRM E, not APRM F, is monitored by the Reactor Recirc Sys Flux Control for AFDL. (2<sup>nd</sup> part) Correct</p>					
Technical Reference(s): SOI-C51(APRM) Rev.21, ARI-H13-P680-04 Rev. <b>27</b> , SOI-B33 Rev. <b>45</b>		Reference Attached: SOI-C51(APRM) p. 14, ARI-H13-P680-04 pp. 13, 15, 33, 35 & 137, SOI-B33 pp.22 & 30			
Proposed references to be provided to applicants during examination: None					
Learning Objective (As available): OT-COMBINED-B33-I.1					
Question Source:	Bank #				
	Modified Bank #				
	New	x			
Question History:	Previous 2 NRC Exams?	No			
Question Cognitive Level:	Memory or Fundamental Knowledge	x			
	Comprehension or Analysis				
10 CFR Part 55 Content:	55.41				
	55.43	(b)5			
<p>SRO justification = Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations. [10 CFR 55.43(b)(5)]</p> <ul style="list-style-type: none"> <li>Assessing plant conditions (normal, abnormal, or emergency) and then selecting a procedure or section of a procedure to mitigate, recover, or with which to proceed.</li> </ul>					

## QUESTION SRO 24

The plant was operating at rated power when a LOCA occurred.

The following conditions now exist:

- Hydrogen igniters Energized
- Drywell hydrogen concentration 6.5%
- Containment hydrogen concentration 6.5%
- Containment pressure 14 psig
- RPV water level -25 inches – slowly lowering
- All available systems are injecting

Based on the above information:

The next required action is to start the   (1)   .

If an ignition source from a shorted electrical motor inside containment were to occur before the next required action was completed, Containment PSP   (2)   be exceeded.

### Reference Provided:

- |    | <u>  (1)  </u>                     | <u>  (2)  </u> |
|----|------------------------------------|----------------|
| A. | combustible gas mixing compressors | would          |
| B. | hydrogen recombiners               | would          |
| C. | combustible gas mixing compressors | would not      |
| D. | hydrogen recombiners               | would not      |

LOD = \_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_

## QUESTION SRO 24

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #		2
	Group #		2
	K/A#	223001	A2.04
	Importance Rating		4.4
K&A: Ability to (a) predict the impacts of the following on the Primary Containment System And Auxiliaries and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operations: High containment/drywell hydrogen concentration			
<b>Primary Containment System And Auxiliaries</b>			
<p>Explanation: <b>Answer C</b> – &gt; 1<sup>st</sup> Part - Per EOP-02, step PC/G(c), if containment H2 concentration is &lt; HDOL curve, and H2 is detected in the drywell, operate Combustible Gas Mixing Compressor.</p> <p>2<sup>nd</sup> part – Per TS Bases 3.6.3.2 Primary Containment and Drywell Hydrogen Igniters, H2 igniters maintain H2 concentration low enough so a random ignition source would not cause a violent reaction.</p> <p>A – Incorrect – Plausible, 1<sup>st</sup> part – Correct. 2<sup>nd</sup> Part - TS Bases 3.6.3.2 Primary Containment and Drywell Hydrogen Igniters, state that H2 igniter use is sufficient to prevent ignition.</p> <p>B – Incorrect – Plausible, 1<sup>st</sup> part – since this is a H2 control action. However, starting H2 recombiners is prohibited with H2 concentration &gt; 6%. 2<sup>nd</sup> Part - TS Bases 3.6.3.2 Primary Containment and Drywell Hydrogen Igniters, state that H2 igniter use is sufficient to prevent ignition.</p> <p>D – Incorrect – Plausible, 1<sup>st</sup> Part - Plausible since this is a H2 control action. However, starting H2 recombiners is prohibited with H2 concentration &gt; 6%. 2<sup>nd</sup> part – Correct.</p>			
Technical Reference(s): EOP-02 Chart Rev. G, EOP-02 Bases Rev. 6, TS Bases 3.6.3.2 Rev.7		Reference Attached: EOP-02 Chart, EOP-02 Bases pp. 69, 70 & 72, TS Bases 3.6.3.2 p. B 3.6-96	
Proposed references to be provided to applicants during examination: EOP-SPI-Supplement Figure #6 HDOL			
Learning Objective (As available): OT-3403-01B(SG)-F.3			
Question Source:	Bank # Modified Bank # New	Grand Gulf NRC Exam 2008 #91	
Question History:	Previous 2 NRC Exams? No		
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis x		
10 CFR Part 55 Content:	55.41 55.43 (b)(5)		
<p><b>SRO Justification:</b> Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations. [10 CFR 55.43(b)(5)]</p> <ul style="list-style-type: none"> <li>Knowledge of diagnostic steps and decision points in the emergency operating procedures (EOP) that involve transitions to event specific sub procedures or emergency contingency procedures.</li> </ul>			

**QUESTION SRO 25**

While performing Cooling Tower Central Deicing Shutdown, Central Deicing MOV #6, 1N71-F355 did not fully open.

An Electrical Maintenance technician developed a Simple Troubleshooting Plan to monitor the MOV while cycling.

Approval of the Simple Troubleshooting Plan is the responsibility of the \_\_\_\_.

- A. Shift Manager
- B. Unit Supervisor
- C. Work Control SRO
- D. Duty Team Leader

LOD = \_\_\_\_ (1 → 5 - Easy to Hard)

Looked up? Y N

TIME TO COMPLETE \_\_\_\_

## QUESTION SRO 25

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #		2		
	Group #		2		
	K/A#	510001	G2.2.20		
	Importance Rating		3.8		
K&A: Knowledge of the process for managing troubleshooting activities					
<b>CIRCULATING WATER SYSTEM</b>					
<p>Explanation: <b>Answer A</b> – &gt; NOP-ER-3001 Att. 3, the Shift Manager's approval is required for the Simple Trouble Plan for Category C activities. Non-intrusive work on equipment of low risk that is not isolated by clearance evaluates to Category C troubleshooting.</p> <p>B – Incorrect – Plausible, as the Unit Supervisor is responsible to be aware of all work occurring in the plant.</p> <p>C – Incorrect – Plausible, the Simple Troubleshooting Plan process also follows the requirements of the normal work management process. However, approval of the Simple Troubleshooting Plan is the responsibility of the Shift Manager</p> <p>D – Incorrect – Plausible, the Duty Team Leader approval is required for Category A (complex work)</p>					
Technical Reference(s): NOP-ER-3001 Rev. 9, SOI-N71 Rev. 24		Reference Attached: NOP-ER-3001 pp. 14, 32, SOI-N71 pp. 46			
Proposed references to be provided to applicants during examination: None					
Learning Objective (As available): OT-JFG303905					
Question Source:	Bank # Modified Bank # New	Perry NRC Exam 2013 SRO #4			
Question History:	Previous 2 NRC Exams? No				
Question Cognitive Level:	Memory or Fundamental Knowledge x Comprehension or Analysis				
10 CFR Part 55 Content:	55.41 55.43 Plant Specific				
<p>SRO Justification for Plant Specific Exemption - knowledge/ability is "unique to the SRO position" SRO Task:</p> <ul style="list-style-type: none"> <li>341-671-03-02 – Comply with the Operating Responsibilities of the Shift Manager.</li> </ul>					