

QUESTION RO 1

The plant was operating at 80% power when the following occurred:

- Annunciator HOT SURGE TANK LEVEL HI, H13-P680-02-E2 alarmed
- Hot Surge Tank level indicates 132" and rising

The first action the Reactor Operator needs to take to restore HST level is to adjust the (1).
The valve(s) that respond(s) to restore HST level is/are (2).

	<u>(1)</u>	<u>(2)</u>
A.	HOT SURGE TANK LEVEL Controller, 1N21-R475	<u>only</u> the Hot Surge Tank Level Control Valve, 1N21-F230
B.	HOT SURGE TANK LEVEL Controller, 1N21-R475	both the Hot Surge Tank Level Control Valve 1N21-F230 and the Hot Surge Tank Level Control Bypass Valve, 1N21-F220
C.	HST LVL CV Manual Control switch/potentiometer, 1N21-R708	<u>only</u> the Hot Surge Tank Level Control Valve, 1N21-F230
D.	HST LVL CV Manual Control switch/potentiometer, 1N21-R708	both the Hot Surge Tank Level Control Valve 1N21-F230 and the Hot Surge Tank Level Control Bypass Valve, 1N21-F220

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QUESTION RO 1

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #	3	
	Group #		
	K/A#	Generic	2.1.32
	Importance Rating	3.8	
K&A: Ability to explain and apply system limits and precautions.			
Generic			
<p>Explanation: Answer A – Training strategy in the simulator reinforces taking manual control of the HST Level with the 1N21-R475 controller. This is reinforced by the ARI. Per SOI-N21 P&L 2.9 the HOT SURGE TANK LEVEL CONTROL 1N21-F230 controller 1N21-R475 controls only the operation of its respective control valve (1N21-F230).</p> <p>B – Incorrect – The 1N21-F475 controller does not change the position of the Hot Surge Tank Level Control Bypass Valve, 1N21-F220.</p> <p>C – Incorrect– The first action ARI says to take is to use the 1N21-F475 controller, not the 1N21-R708 potentiometer.</p> <p>D – Incorrect – The first action ARI says to take is to use the 1N21-F475 controller, not the 1N21-R708 potentiometer. ARI says to control 1N21-F230 valve not both.</p>			
Technical Reference(s): SOI-N21 Rev 25 and ARI-H13-P680-02, Rev 12		Reference Attached: SOI-N21 p 5 and ARI-H13-P680-02 pp. 53 and 54	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT- COMBINED-N21_N61 (#27)			
Question Source:	<div style="display: flex; justify-content: space-between;"> Bank # Perry 2013 # RO-72 </div> <div style="display: flex; justify-content: space-between;"> Modified Bank # </div> <div style="display: flex; justify-content: space-between;"> New </div>		
Question History:	<div style="display: flex; justify-content: space-between;"> Previous 2 NRC Exams No </div>		
Question Cognitive Level:	<div style="display: flex; justify-content: space-between;"> Memory or Fundamental Knowledge x </div> <div style="display: flex; justify-content: space-between;"> Comprehension or Analysis </div>		
10 CFR Part 55 Content:	<div style="display: flex; justify-content: space-between;"> 55.41 x </div> <div style="display: flex; justify-content: space-between;"> 55.43 </div>		
Comments: x			

QUESTION RO 2

Plant is in Mode 1. It is January 20th 2019.

While trying to assume the shift as the Reactor Operator At The Controls, eSOMS would not allow a “Red Hand” turnover.

A check of My Career Map shows that you are not a qualified Reactor Operator.

Which condition would have caused you to be unqualified as a Reactor Operator?

- A. RO License was issued in December of 2013.
- B. Last quarter you stood 7 – 8-hour watches as the BOP and 4 – 12-hour watches as the Field Supervisor.
- C. NRC Form 396 Certification of Medical Examination by Facility Licensee completed in December of 2016.
- D. Successfully completed a re-qualification exam in October 2016 in training cycle 11 and then again in December 2018 in training cycle 11.

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QUESTION RO 2

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #	3	
	Group #		
	K/A#	Generic	2.1.4
	Importance Rating	3.3	
<p>K&A: Knowledge of individual licensed operator responsibilities related to shift staffing, such as medical requirements, “no-solo” operation, maintenance of active license status, 10CFR55, etc.</p>			
Generic			
<p>Explanation: Answer C – 10CFR55 requires a medical exam every 2 years as documented on NRC form 396. With the last form completed > 2 years ago, the RO would become decertified.</p> <p>A – Incorrect – The License would expire in December of 2019.</p> <p>B – Incorrect – The minimum number of watches in either the ATC or BOP positions is 7 8-hour shifts or 5 12-hour shifts.</p> <p>D – Incorrect – Requal exam exceeded 2 years, but was still within the 24-month training cycle.</p>			
Technical Reference(s): 10CFR55		Reference Attached: 10CFR pp. 1, 7-8, & 17-20	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-LICENSE-HOLDER-RESPONSIBILITIES			
Question Source:	Bank # Modified Bank # New	Perry 2009 # SRO-19	
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		
<p>Comments: x</p>			

QUESTION RO 3

The plant is starting up following a forced outage IAW IOI-001, Startup with the following conditions:

- The moderator temperature coefficient is positive
- Rx water temperature is rising slowly due to decay heat
- Control rods are being withdrawn in single notch for criticality

When control rod 30-31 is withdrawn from notch 20 to notch 22, a reactor period of 30 seconds was achieved.

What action should be taken based on the above conditions?

- A. Shutdown the Rx by manual scram.
- B. Insert control rods in reverse order only until the Rx is subcritical.
- C. Insert control rod 30-31 as required to obtain a stable period greater than 60 seconds.
- D. Stop control rod withdrawal and monitor conditions, allowing period to decay to greater than 160 seconds.

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QUESTION RO 3

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #	3	
	Group #		
	K/A#	Generic	2.1.39
	Importance Rating	3.6	
K&A: Knowledge of conservative decision-making practices.			
Generic			
<p>Explanation: Answer C – IAW IOI-1 and FTI-B002, a Rx startup with a positive temperature coefficient and rising moderator temperature can require inserting control rods to maintain a reasonable period. Inserting the last rod withdrawn 1 or 2 notches will lengthen Rx period.</p> <p>A – Incorrect – The Rx operator has time to insert control rods to achieve a reasonable period. No scram is required.</p> <p>B – Incorrect – Insertion of control rods until sub-critical is not necessary, nor desired.</p> <p>D – Incorrect – Stopping rod withdrawal is required for a short period condition. However, without operator action, period will not shorten until the POAH or Rx scram on IRM.</p>			
Technical Reference(s): IOI-1 Rev. 49, FTI-B002 Rev, 16, & ARI-H13-P680-06 Rev.9		Reference Attached: IOI-1 p 30, FTI-B002 p 3 & ARI-H13-P680-06 p 19	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3039-01-O & OT-3046-02(LP)			
Question Source:	Bank # Browns Ferry 2008 # RO-66 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: x			

QUESTION RO 4

Which of the following is an acceptable method to alert the Operator of Control Room annunciators that have been removed from service?

- A. Danger Tag
- B. Information Tag
- C. Temporary Modification Tag
- D. Minor Deficiency Monitoring (MDM) Tag

QUESTION RO 4

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #	3	
	Group #		
	K/A#	Generic	2.2.43
	Importance Rating	3	
K&A: Knowledge of the process used to track inoperable alarms.			
Generic			
<p>Explanation: Answer B – IAW PAP-1404, Info tags or Caution tags are to be used to identify Control Room annunciators that are removed from service.</p> <p>A – Incorrect – Although the Caution Tags can be used to track annunciators removed from service, Danger Tags are not used. Plausible if operator not very familiar with tagging procedure.</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. 6		Reference Attached: PAP-1404 pp. 4-5 & NOP-OP-1014 p 20-22	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3039-02			
Question Source:	Bank # Perry 2015 # RO-06 Modified Bank # New		
Question History:	Previous 2 NRC Exams Perry 2015		
Question Cognitive Level:	Memory or Fundamental Knowledge x Comprehension or Analysis		
10 CFR Part 55 Content:	55.41 x 55.43		
Comments: x			

QUESTION RO 5

A dollar sign (\$) step that does not meet the Acceptance Criteria in a Surveillance test constitutes a failure ____.

- A. to adequately prevent preconditioning
- B. of the Preventive Maintenance Program
- C. to meet the requirements of the Surveillance Program
- D. to comply with the applicable Technical Specification LCO

QUESTION RO 5

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #	3	
	Group #		
	K/A#	Generic	2.2.12
	Importance Rating	3.7	
K&A: Knowledge of surveillance procedures.			
Generic			
<p>Explanation: Answer D – Per NOP-WM-2003, WM Surveillance Process, a (\$) sign step is a surveillance requirement from Tech Specs. TS SR 3.0.1 states that failure to meet the surveillance is failure to meet the LCO.</p> <p>A – Incorrect – Preconditioning is a term used to describe the act of operating a piece of equipment prior to performing the surveillance. Plausible since this term it association with surveillances.</p> <p>B – Incorrect – Not necessarily impacted by the PM program but could be selected by the candidate due to possibly degraded equipment causing failure to meet acceptance criteria.</p> <p>C – Incorrect – Failure to meet acceptance criteria does not impact the Surveillance Program but may be selected by the candidate due to its reference to surveillances. The Surveillance Program (per NOP-WM-2003) includes aspects of scheduling surveillances, updating databases, tracking surveillances, etc.</p>			
Technical Reference(s): NOP-WM-2003 Rev 9, PAP-0500 Rev 10 & TS SR 3.0.1 Rev Amend. 125		Reference Attached: NOP-WM-2003 pp. 26-29, PAP-0500 p 78 & TS SR p 3.0-4	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3037-04-T			
Question Source:	Bank # Modified Bank # New	Perry 2013 # 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: x			

QUESTION RO 6

IAW Tech Spec 3.1.1, Shutdown Margin (SDM), if the highest worth control rod is determined by test, then SDM must be no less than (1) $\Delta k/k$.
The APPLICABILITY for Tech Spec 3.1.1 is (2) .

- | | <u>1</u> | <u>2</u> |
|----|----------|-----------------------------|
| A. | .28 | Modes 3, 4, & 5 <u>only</u> |
| B. | .28 | Modes 1, 2, 3, 4, & 5 |
| C. | .38 | Modes 3, 4, & 5 <u>only</u> |
| D. | .38 | Modes 1, 2, 3, 4, & 5 |

QUESTION RO 6

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #	3	
	Group #		
	K/A#	Generic	2.2.38
	Importance Rating	3.6	
K&A: Knowledge of conditions and limitations in the facility license.			
Generic			
<p>Explanation: Answer B – Per TS 3.1.1 SDM must be $\geq .28 \Delta k/k$ if the highest worth control rod is determined by test. And, the Applicability is Modes 1, 2, 3, 4, & 5.</p> <p>A – Incorrect – Plausible if candidate thinks SDM is only applicable in shutdown Modes.</p> <p>C – Incorrect – This is correct for SDM if highest worth rod is determined analytically.</p> <p>D – Incorrect – This is correct for SDM if highest worth rod is determined analytically. Plausible if candidate thinks SDM is only applicable in shutdown Modes.</p>			
Technical Reference(s): TS 3.1.1 Rev. Amend 69		Reference Attached: TS 3.1.1 p 3.1-1	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3037-05-B			
Question Source:	<div style="display: flex; justify-content: space-between;"> Bank # Modified Bank # New </div> <div style="display: flex; justify-content: flex-end; margin-top: -10px;"> x </div>		
Question History:	<div style="display: flex; justify-content: space-between;"> Previous 2 NRC Exams No </div>		
Question Cognitive Level:	<div style="display: flex; justify-content: space-between;"> Memory or Fundamental Knowledge Comprehension or Analysis </div> <div style="display: flex; justify-content: flex-end; margin-top: -10px;"> x </div>		
10 CFR Part 55 Content:	<div style="display: flex; justify-content: space-between;"> 55.41 55.43 </div> <div style="display: flex; justify-content: flex-end; margin-top: -10px;"> x </div>		
Comments: x			

QUESTION RO 7

The plant is operating at rated power.

An NLO must enter the RWCU pump room to isolate the B RWCU pump.

RP surveyed the RWCU pump room in preparation of the Radiation Work Permit and found the following conditions:

- The highest general area dose rate is 120 mrem/hr.
- The highest loose surface contamination level is 10K dpm/100 cm².

What will be the radiation and contamination designations on the RWP for the RWCU pump room?

	<u>Radiation designation</u>	<u>Contamination designation</u>
A.	Radiation Area	Contaminated Area
B.	Radiation Area	High Contamination Area
C.	High Radiation Area	Contaminated Area
D.	High Radiation Area	High Contamination Area

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QUESTION RO 7

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #	3	
	Group #		
	K/A#	Generic	2.3.7
	Importance Rating	3.5	
K&A: Ability to comply with radiation work permit requirements during normal or abnormal conditions.			
Generic			
<p>Explanation: Answer C – The threshold for a High Radiation Area is 100 mrem/hr (posted at 80 mrem/hr). And the threshold for a High Contamination Area is 100,000 dpm/100 cm². Therefore the RWCU pump room would be designated a High Rad Area and a Contaminated area.</p> <p>A – Incorrect – Dose rates exceed criteria for only a Radiation Area.</p> <p>B – Incorrect – Dose rates exceed criteria for only a Radiation Area. And, contamination level does not meet criteria for a High Contamination Area.</p> <p>D – Incorrect – Contamination level does not meet criteria for a High Contamination Area.</p>			
Technical Reference(s): NORM-OP-4000 Rev. 5 & NOP-OP-4102 Rev. 13		Reference Attached: NORM-OP-4000 pp. 8, 11-12, & 15 and NOP-OP-4102 pp. 12 & 14.	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3039-03			
Question Source:	Bank # Modified Bank # FitzPatrick 2014 # RO-72 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: x			

QUESTION RO 8

A high radiation signal on the ____, radiation monitor will result in an automatic initiation of a Post-Accident Radiation Monitoring System (D19) rad monitor.

- A. Offgas Vent Pipe, D17-K830
- B. Drywell Atmosphere, D17-K670
- C. Offgas Building Ventilation Exhaust, D17-K760
- D. Containment Vessel and Drywell Purge Exhaust, D17-K660

QUESTION RO 8

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #	3	
	Group #		
	K/A#	Generic	2.3.15
	Importance Rating	2.9	
<p>K&A: Knowledge of radiation monitoring systems, such as fixed radiation monitors and alarms, portable survey instruments, personnel monitoring equipment, etc.</p>			
Generic			
<p>Explanation: Answer A – The D19 (Post Accident Rad Monitor) will start on a High Rad signal from the Offgas Vent Pipe Rad monitor.</p> <p>B – Incorrect – Plausible since the DW rad monitor will have increased readings during an accident</p> <p>C – Incorrect – Plausible if the Candidate mistakes the OG Bldg Exh for the OG Vent Pipe.</p> <p>D – Incorrect – Plausible since the CVDWP Exh will have increased readings during an accident until an isolation occurs.</p>			
Technical Reference(s): SDM-D17(ABRM) Rev. 12		Reference Attached: SDM-D17(ABRM) pp. 15 & 42	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-COMBINED-D19-F			
Question Source:	<div style="display: flex; justify-content: space-between;"> Bank # Perry 201628 </div> <div style="display: flex; justify-content: space-between;"> Modified Bank # </div> <div style="display: flex; justify-content: space-between;"> New </div>		
Question History:	<div style="display: flex; justify-content: space-between;"> Previous 2 NRC Exams No </div>		
Question Cognitive Level:	<div style="display: flex; justify-content: space-between;"> Memory or Fundamental Knowledge x </div> <div style="display: flex; justify-content: space-between;"> Comprehension or Analysis </div>		
10 CFR Part 55 Content:	<div style="display: flex; justify-content: space-between;"> 55.41 x </div> <div style="display: flex; justify-content: space-between;"> 55.43 </div>		
<p>Comments: x</p>			

QUESTION RO 9

In accordance with NOBP-OP-1002, Operation's Administrative Guidelines and Common Processes, during an emergency condition, if a Reactor Operator must take actions that deviate from Perry Technical Specifications to protect the health and safety of the public, the RO is responsible to obtain direction from ____ prior to taking the actions.

- A. the NRC Operations Center
- B. the Perry General Plant Manager
- C. a licensed Senior Reactor Operator
- D. a second licensed Reactor Operator

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QUESTION RO 9

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #	3	
	Group #		
	K/A#	Generic	2.4.12
	Importance Rating	4	
K&A: Knowledge of general operating crew responsibilities during emergency operations.			
Generic			
<p>Explanation: Answer C – Actions that deviate from TS may be performed when directed by an SRO.</p> <p>A – Incorrect – Plausible since the NRC should be notified if time permits.</p> <p>B – Incorrect – Plausible since the plant management should be notified if time permits.</p> <p>D – Incorrect – Plausible since most actions in the horseshoe require a peer check by another RO.</p>			
Technical Reference(s): NOBP-OP-1002 Rev. 4		Reference Attached: NOBP-OP-1002 p 8	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3039-01			
Question Source:	Bank # Modified Bank # New	Perry 2002 # RO-60	
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: x			

QUESTION RO 10

The plant is operating at rated power.

You have the shift as the Field Supervisor/Fire Brigade Leader.

While preparing for shift turnover, you receive a phone call from the on-coming Field Supervisor/Fire Brigade Leader stating that he will be one hour late arriving to work.

You must leave on time because of a scheduled medical appointment.

Both the on-coming and off-going crew's Reactor Operators are qualified Fire Brigade.

Which of the following describes the action that is required to allow you, the off-going Fire Brigade Leader to leave on time?

- A. One of the off-going Reactor Operators must hold over until the Fire Brigade Leader arrives.
- B. The Fire Brigade Leader position may remain unfilled for up to two hours to allow the Fire Brigade Leader to arrive.
- C. The on-coming BOP Reactor Operator may serve as the Fire Brigade Leader until the on-coming Fire Brigade Leader arrives.
- D. The most senior Plant Operator (PPO) may assume Fire Brigade Leader position for one hour until the Fire Brigade Leader arrives.

QUESTION RO 10

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #	3	
	Group #		
	K/A#	Generic	2.4.26
	Importance Rating	3.1	
K&A: Knowledge of facility protection requirements, including fire brigade and portable fire fighting equipment usage.			
Generic			
<p>Explanation: Answer A – Since the on-coming crew would be below minimum manning, one of the off-going RO must stay over until the on-coming FBL arrives per NOP-OP-1002.</p> <p>B – Incorrect – If the FBP must leave during his shift for an emergency, the FBP position may remain unfilled. This does not allow the position to go unmanned during shift change.</p> <p>C – Incorrect – The minimum shift manning for Mode 1 is 2 ROs and 1 FBL.</p> <p>D – Incorrect – Plausible since the NOP allows the FBP position to be filled by a person with equivalent knowledge of plant safety systems which is simulator certification with plant systems familiarity, not the most senior PPO.</p>			
Technical Reference(s): NOP-OP-1002 Rev. 13		Reference Attached: NOP-OP-1002 pp. 21 & 100	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3039-01			
Question Source:	Bank # Modified Bank # New	Perry Vision # 207843	
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: x			

QUESTION RO 11

The plant was operating at rated power with OPRMs INOPERABLE.

Then, Reactor Recirculation Pump 'B' tripped.

The current conditions are as follows:

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

What action is required?

Reference Provided:

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

QUESTION RO 11

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #	1	
	Group #	1	
	K/A#	295001	AK1.02
	Importance Rating	3.3	
<p>K&A: Knowledge of the operational implications of the following concepts as they apply to PARTIAL OR COMPLETE LOSS OF FORCED CORE FLOW CIRCULATION: Power/flow distribution.</p>			
Partial or Complete Loss of Forced Core Flow Circulation			
<p>Explanation: Answer B – With OPRMs INOP, with the given power/flow conditions, the operating point is shifted to the scram required region of the correct P/F map and a manual scram is required.</p> <p>A – Incorrect – This would be the correct action if OPRMs were Operable.</p> <p>C – Incorrect – 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 – Inserting control rods in reverse order is an acceptable method to lower power in other circumstances. However, based on the position on the on the P/F map a scram is required.</p>			
Technical Reference(s): PDB-A06 Rev 15 and ONI-C51 Rev. 29		Reference Attached: PDB-A06 pp. 5 & ONI-C51 p 6	
Proposed references to be provided to applicants during examination: PDB-A06 pp. 3-7 (modified)			
Learning Objective (As available): OT-Combined-C51-AP-OPRM-1.21			
Question Source:	Bank # Modified Bank # Perry 2015 # RO-11 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: x			

QUESTION RO 12

Refer to the attached pictures.

The attached pictures show various instruments energized by their normal power sources.

Then, a loss of offsite power occurs concurrent with a failure of Division 1 and 2 diesel generators to start.

Which of the instruments will continue to provide accurate indications?

Attachment Provided:

- A. 1, 3, 5
- B. 1, 4, 6
- C. 2, 3, 5
- D. 2, 4, 6

QUESTION RO 12

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #	1	
	Group #	1	
	K/A#	295003	2.4.3
	Importance Rating	3.7	
K&A: Ability to identify post-accident instrumentation.			
Partial or Complete Loss of AC Power			
<p>Explanation: Answer D – Containment Pressure & Temperature indicators D23-R024B & D23R200B, Wide Range RPV Level and Pressure recorder, B21-R623B and multi parameter recorder D23-R090A are powered by DC so that during a loss of AC, readings will not be affected.</p> <p>A – Incorrect – RPV Level indicator B21-R723 and Recirc Loop Flow recorder C51-R614 are powered by AC and will lose indication during a loss of AC.</p> <p>B – Incorrect – RPV Level indicator B21-R723 is powered by AC and will lose indication during a loss of AC.</p> <p>C – Incorrect – Recirc Loop Flow recorder C51-R614 is powered by AC and will lose indication during a loss of AC.</p>			
Technical Reference(s): ONI-SPI-H3 Rev. 1		Reference Attached: ONI-SPI-H3 p 2	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-COMBINED-B21(INST)-1.2 & OT-3039-04			
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: x			

QUESTION RO 13

In the event of a loss of the battery chargers, the Unit 1, Division 1 and 2 Batteries are sized to supply loads for a minimum time of (1) hours with a minimum voltage of (2) VDC.

	<u> (1) </u>	<u> (2) </u>
A.	2	105
B.	4	105
C.	2	119
D.	4	119

QUESTION RO 13

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #	1	
	Group #	1	
	K/A#	295004	AA2.03
	Importance Rating	2.8	
K&A: Ability to determine and/or interpret the following as they apply to PARTIAL OR COMPLETE LOSS OF D.C. POWER: Battery voltage.			
Partial or Total Loss of DC Power			
<p>Explanation: Answer A – The design bases for the Div. 1 & Div. 2 is to maintain ≥ 105 VDC (80% of nameplate rating) for a minimum of 2 hours on the loss of the battery charger.</p> <p>B – Incorrect – Plausible as 4 hours is the design time for the 'B' non-divisional battery.</p> <p>C – Incorrect – Plausible since 119 VDC is the low voltage value that annunciates in the Control Room.</p> <p>D – Incorrect – Plausible since 119 VDC is the low voltage value that annunciates in the Control Room and 4 hours is the design time for the 'B' non-divisional battery.</p>			
Technical Reference(s): SDM OT-Combined-R42 Rev 10 and Lesson Plan OT-Combined-R42 Rev 3		Reference Attached: SDM OT-Combined-R42 pp. 10-11 and Lesson Plan OT-Combined-R42 p 71	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-COMBINED-R42 (#34)			
Question Source:	<div style="display: flex; justify-content: space-between;"> Bank # Modified Bank # </div> <div style="display: flex; justify-content: space-between;"> New x </div>		
Question History:	<div style="display: flex; justify-content: space-between;"> Previous 2 NRC Exams No </div>		
Question Cognitive Level:	<div style="display: flex; justify-content: space-between;"> Memory or Fundamental Knowledge x </div> <div style="display: flex; justify-content: space-between;"> Comprehension or Analysis </div>		
10 CFR Part 55 Content:	<div style="display: flex; justify-content: space-between;"> 55.41 x </div> <div style="display: flex; justify-content: space-between;"> 55.43 </div>		
Comments: x			

QUESTION RO 14

With the plant at rated power, which of the following conditions will result in a reactor scram and a direct automatic transfer of the Recirculation Pumps from fast speed to slow speed?

- A. Main turbine trip
- B. Reactor feedwater pump trip
- C. Drywell pressure rising to 2.0 psig
- D. RPV pressure increasing to 1066 psig

QUESTION RO 14

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #	1	
	Group #	1	
	K/A#	295005	AA1.01
	Importance Rating	3.1	
K&A: Ability to operate and/or monitor the following as they apply to MAIN TURBINE GENERATOR TRIP: Recirculation system: Plant-Specific.			
Main Turbine Generator Trip			
<p>Explanation: Answer A – A main turbine trip from >38% Rx power initiate a reactor scram and EOC-RPT logic will initiate a downshift of Recirc pumps. This is based on the Main Turbine Stop valve position (direct)</p> <p>B – Incorrect – A RFPT trip will cause a FCV runback when RPV level lowers to Level 4.</p> <p>C – Incorrect – A high DW pressure (>1.68 psig) will cause a Rx scram, but not a direct down shift of Recirc pumps – the subsequent lowering of feedwater flow will cause a RR Pump downshift after a time delay</p> <p>D – Incorrect – A high RPV pressure (>1065) will cause a Rx scram, but not a direct downshift of Recirc pumps. Following the scram, the subsequent lowering of feedwater flow may cause a RR Pump downshift after a time delay. Plausible since RPV pressure of 1083 psig will cause a RR pump downshift</p>			
Technical Reference(s): ONI-N32 Rev. 14 and ARI-H13-P680-004-A3 Rev. 26		Reference Attached: ONI-N32 p 4 and ARI-H13-P680-004-A3 p 7	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-COMBINED-B33-F			
Question Source:	<div style="display: flex; justify-content: space-between;"> Bank # Perry 2010 # RO-14 </div> <div style="display: flex; justify-content: space-between;"> Modified Bank # </div> <div style="display: flex; justify-content: space-between;"> New </div>		
Question History:	<div style="display: flex; justify-content: space-between;"> Previous 2 NRC Exams No </div>		
Question Cognitive Level:	<div style="display: flex; justify-content: space-between;"> Memory or Fundamental Knowledge </div> <div style="display: flex; justify-content: space-between;"> Comprehension or Analysis x </div>		
10 CFR Part 55 Content:	<div style="display: flex; justify-content: space-between;"> 55.41 x </div> <div style="display: flex; justify-content: space-between;"> 55.43 </div>		
Comments: x			

QUESTION RO 15

The following conditions exist:

- The plant is at 100% power
- Digital Feedwater Operator Rx Level Setpoint was 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.

QUESTION RO 15

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #	1	
	Group #	1	
	K/A#	295006	AK3.01
	Importance Rating	3.8	
K&A: Knowledge of the reasons for the following responses as they apply to SCRAM: Reactor water level response.			
Scram			
<p>Explanation: Answer D – 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 & B – Incorrect – The scram signal does not initiate Setpoint Setdown logic.</p> <p>A & C – Incorrect – the Operator Rx Level Setpoint was set at 200". Therefore the Setpoint Setdown logic demands 200" not 196".</p>			
Technical Reference(s): Lesson Plan OT-COMBINED-C34 Rev. 6		Reference Attached: : Lesson Plan OT-COMBINED-C34 p 70	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-COMBINED-C34-1.7			
Question Source:	Bank # Perry 2015 # RO-55 Modified Bank # New		
Question History:	Previous 2 NRC Exams Perry 2015		
Question Cognitive Level:	Memory or Fundamental Knowledge x Comprehension or Analysis		
10 CFR Part 55 Content:	55.41 x 55.43		
Comments: x			

QUESTION RO 16

The Control Room was evacuated due toxic gas.

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

No other operator actions have been performed.

Which of the following describes the RPV level instrumentation available on the Remote Shutdown Panel(s) that is(are) indicating accurate RPV level, if any, at this time?

- A. No Remote Shutdown Panel RPV level instrumentation.
- B. Only the Division 1 Remote Shutdown Panel RPV level instrumentation.
- C. Only the Division 2 Remote Shutdown Panel RPV level instrumentation.
- D. Both the Division 1 and Division 2 Remote Shutdown Panels RPV level instrumentation.

QUESTION RO 16

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #	1	
	Group #	1	
	K/A#	295016	AK2.02
	Importance Rating	4	
K&A: Knowledge of the interrelations between CONTROL ROOM ABANDONMENT and the following: Local control stations: Plant-Specific.			
Control Room Abandonment			
<p>Explanation: Answer C – The Div.2 Remote Shutdown Panel instruments do not have transfer switches. And, they are normally energized.</p> <p>A – Incorrect – The Div.2 RSD RPV level instrument is providing accurate information.</p> <p>B – Incorrect – The Div. 1 RSD panel instruments are energized via a transfer switch. This action has not been completed yet.</p> <p>D – Incorrect – The Div. 1 RSD panel instruments are energized via a transfer switch. This action has not been completed yet.</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: x			

QUESTION RO 17

The plant is shutdown with Fuel Pool Cooling and Cleanup System (FPCC) heat exchanger 'A' in service.

A large leak in the 30 inch header off the NCC heat exchangers resulted in a loss of Nuclear Closed Cooling to the FPCC heat exchangers.

Names of the associated valves as follows:

P42-F380A, NCC TO FPCC HX IN VLV

P42-F390A, NCC TO FPCC HX OUT VLV NCC

P42-F260A, ECC TO FPCC HX IN VLV

P42-F265A, ECC TO FPCC HX OUT VLV NCC

Based on this information P42-F380A and P42-F390A (1) .

and

P42-F260A and P42-F265A (2) to cool the FPCC heat exchangers.

- | | <u>(1)</u> | <u>(2)</u> |
|----|---------------------------|---------------------------|
| A. | automatically isolate | automatically line up |
| B. | automatically isolate | must be manually lined up |
| C. | must be manually isolated | automatically line up |
| D. | must be manually isolated | must be manually lined up |

QUESTION RO 17

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #	1	
	Group #	1	
	K/A#	295018	AK1.01
	Importance Rating	3.5	
<p>K&A: Knowledge of the operational implications of the following concepts as they apply to PARTIAL OR COMPLETE LOSS OF COMPONENT COOLING WATER: Effects on component/system operations.</p>			
Partial or Complete Loss of CCW			
<p>Explanation: Answer D – On a loss of NCC, the FPCC can be cooled by ESW via ECC valves. Original plant design had the automatic valve realignment. However, now, except for a RHR LOCA or a LOOP, the NCC valves must be manually isolated and the ECC valves that supply ESW must be manually lined up.</p> <p>A – Incorrect – Automatic isolation of the NCC valves only occurs on a RHR LOCA or LOOP signal. There is no automatic realignment of ECC (ESW) valves to the FPCC HX.</p> <p>B – Incorrect – Automatic isolation of the NCC valves only occurs on a RHR LOCA or LOOP signal.</p> <p>C – Incorrect – There is no automatic realignment of ECC (ESW) valves to the FPCC HX.</p>			
Technical Reference(s): SDM-P42 Rev.12 and SOI-G41(FPCC) Rev. 39		Reference Attached: SDM-P42 pp.14-15 and SOI-G41(FPCC) pp. 42-43	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-COMBINED-G41-Q			
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: x			

QUESTION RO 18

The plant is operating at rated power.

The Safety Related Instrument Air Compressor is out of service due to a failed motor.

Air pressures as indicated on ADS AIR STRG PRESS, 1P57-R026A and 1P57-R026B, are 155 psig and slowly lowering.

Restore air pressure using (1) .

If the ADS air pressure continues to lower, the (2) MSIV's will be affected.

- | | <u> (1) </u> | <u> (2) </u> |
|----|-----------------------------|----------------|
| A. | portable air cylinders | inboard |
| B. | portable air cylinders | outboard |
| C. | Instrument Air System (P52) | inboard |
| D. | Instrument Air System (P52) | outboard |

QUESTION RO 18

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #	1	
	Group #	1	
	K/A#	295019	2.1.7
	Importance Rating	4.4	
K&A: Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation.			
Partial or Complete Loss of Instrument Air			
<p>Explanation: Answer B – IAW SOI-P57 P&L 2.2, if ADS B air pressure lowers to 90 psig, TS 3.6.1.3 needs to be entered. At <45 psig, the outboard MSIV's may not be leak tight following a DBA LOCA.</p> <p>A – Incorrect – Inboard MSIV's are not affected by lowering ADS pressure.</p> <p>C – Incorrect – Inboard MSIV's are not affected by lowering ADS pressure. Cannot use Instrument Air (P52) as Safety Related Instrument Air (P57) is normally 160 psig. Instrument air pressure is normally only ~ 125 psig.</p> <p>D – Incorrect – Cannot use Instrument Air (P52) as Safety Related Instrument Air (P57) is normally 160 psig. Instrument air pressure is normally only ~ 125 psig.</p>			
Technical Reference(s): SOI-P57 Rev 18, ARI-H13-P601-019 Rev 20		Reference Attached: SOI-P57 pp. 3 & 13, ARI-H13-P601-019 p 130	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-COMBINED-P57 (#9 & #12)			
Question Source:	<div style="display: flex; justify-content: space-between;"> Bank # Perry 2013 # RO-18 </div> <div style="display: flex; justify-content: space-between;"> Modified Bank # </div> <div style="display: flex; justify-content: space-between;"> New </div>		
Question History:	<div style="display: flex; justify-content: space-between;"> Previous 2 NRC Exams No </div>		
Question Cognitive Level:	<div style="display: flex; justify-content: space-between;"> Memory or Fundamental Knowledge </div> <div style="display: flex; justify-content: space-between;"> Comprehension or Analysis x </div>		
10 CFR Part 55 Content:	<div style="display: flex; justify-content: space-between;"> 55.41 x </div> <div style="display: flex; justify-content: space-between;"> 55.43 </div>		
Comments: x			

QUESTION RO 19

The plant is in Mode 3 with RHR Loop A in Shutdown Cooling.

Then a trip of RHR Pump A occurs.

Efforts are being made to place RHR Pump B into Shutdown Cooling.

Reactor Pressure is currently 85 psig.

SPDS indicates a constant heat-up rate of 30°F/hr.

The maximum amount of time available to place RHR Loop B into Shutdown Cooling and terminate the heat-up is ____ minutes.

Reference provided:

- A. 61
- B. 68
- C. 78
- D. 100

QUESTION RO 19

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #	1	
	Group #	1	
	K/A#	295021	AA2.01
	Importance Rating	3.5	
K&A: Ability to determine and/or interpret the following as they apply to LOSS OF SHUTDOWN COOLING: Reactor water heatup/cooldown rate.			
Loss of Shutdown Cooling			
<p>Explanation: Answer A – RHR SDC will isolate when RPV pressure exceeds 135 psig. In order to calculate the time for pressure to increase from 85 psig to 135 psig, convert 85 psig to 100 psia (327 °F). Convert 135 psig to 150 psia (358 °F). The difference is 30.7 °F. Thus, with a 30 °F/hr H/U rate, SDC will isolate in 61 minutes.</p> <p>B – Incorrect – This answer would be obtained without converting psig to psia.</p> <p>C – Incorrect – This answer would be obtained by converting psig to psia backwards</p> <p>D – Incorrect – This answer would be obtained using the 50 psig pressure difference instead of the 30°F temperature difference.</p>			
Technical Reference(s): ABB Steam Tables, ONI-E12-2 Rev. 40, and SDM-OTCOMBINEDE12 Rev.3		Reference Attached: ONI-E12-2 p 5, and SDM-OTCOMBINEDE12 p 50	
Proposed references to be provided to applicants during examination: Steam Tables			
Learning Objective (As available): OT-COMBINED-F and OT-3035-11(LP)-A1			
Question Source:	Bank # Perry 2007-2 # RO-29 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: x			

QUESTION RO 20

The plant is in Mode 5 with Refuel operation in progress.

The Refuel SRO reports that the grapple failed while moving a once-burned bundle and the fuel bundle was dropped adjacent to control rod 42-19.

Refer to the attached picture of the reactor core.

Which SRM would be the first to respond to the dropped fuel bundle?

Attachment Provided:

- A. A
- B. B
- C. C
- D. D

QUESTION RO 20

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #	1	
	Group #	1	
	K/A#	295023	AA1.06
	Importance Rating	3.3	
K&A: Ability to operate and/or monitor the following as they apply to REFUELING ACCIDENTS: Neutron monitoring.			
Refueling Accidents			
Explanation: Answer C – Control rod 42-19 is adjacent to SRM C. Therefore, it would be the first SRM to respond to a dropped fuel bundle. At Perry SRM arrangement is A – B – C – D, counterclockwise starting in the upper left-hand quadrant. A, B, C – Incorrect – These SRM are not the closest SRMs to the location of the dropped fuel bundle.			
Technical Reference(s): IOI-9 Rev. 41 and SOI-F15 Rev. 22		Reference Attached: IOI-9 p 7 and SOI-F15 p 134	
Proposed references to be provided to applicants during examination: Core Map			
Learning Objective (As available): OT-COMBINED-C51_SRM-1.3			
Question Source:	Bank # Modified Bank # Dresden 2009 # RO-69 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: x			

QUESTION RO 21

The plant was operating at rated power when a transient occurred resulting in a large leak in the drywell. The resultant high drywell pressure caused drywell bypass leakage to increase challenging containment integrity.

If the situation continues to degrade, in order to maintain (1) within limits, Preparation for Containment Venting must be started when containment pressure cannot be maintained less than (2) psig.

	<u> (1) </u>	<u> (2) </u>
A.	PCL	8
B.	PCL	15
C.	PSP	8
D.	PSP	15

QUESTION RO 21

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #	1	
	Group #	1	
	K/A#	295024	EK3.03
	Importance Rating	3.6	
K&A: Knowledge of the reasons for the following responses as they apply to HIGH DRYWELL PRESSURE: Containment venting: Mark-III.			
High Drywell Pressure			
<p>Explanation: Answer B – Per the EOP Bases, PCL is not exceeded if containment venting is performed. Also, Preparation for containment venting is not performed until containment pressure reaches 15 psig. At Perry, a failure of the DW could result in challenging containment integrity.</p> <p>A – Incorrect – 8 psig is plausible since Containment Spray must be performed if containment pressure reaches 8 psig.</p> <p>C – Incorrect – Containment venting is not performed in response to a challenge to PSP. However, the PSP limit is 15 psig and ED is required.</p> <p>D – Incorrect – Containment venting is not performed in response to a challenge to PSP.</p>			
Technical Reference(s): EOP-2 Bases Rev. 5		Reference Attached: EOP-2 Bases pp. 62-63 & 66-68	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3402-09			
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: x			

QUESTION RO 22

The plant is operating at rated power.

The B channel of the C85 Pressure Regulator is out of service.

The A channel of the C85 Pressure Regulator failed closed.

The following annunciators alarmed:

- RX PRESS HIGH (H13-P680-07-D1)
- RPS RX PRESS HIGH, (H13-P680-05-A8)

What is the status of the Main Turbine Control (CVs) and Bypass Valves (BPVs)?

	<u>CVs)</u>	<u>BPVs</u>
A.	Open	Open
B.	Closed	Open
C.	Open	Closed
D.	Closed	Closed

QUESTION RO 22

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #	1	
	Group #	1	
	K/A#	295025	EK2.08
	Importance Rating	3.7	
K&A: Knowledge of the interrelations between HIGH REACTOR PRESSURE and the following: Reactor/turbine pressure regulating system: Plant-Specific.			
High Reactor Pressure			
<p>Explanation: Answer D – A failure of the A Pressure Regulator with the backup (B) Pressure Regulator out of service will result in a high Rx pressure condition. Rx pressure will increase until the Rx scrams on high pressure (EOP-1 entry). The failed regulator prevents either the BPVs or CVs from opening.</p> <p>A, B, C – Incorrect – When the Pressure Regulator fails closed, both the BPVs and CVs will close.</p>			
Technical Reference(s): ONI-C85 Rev. 1 and ARI-H13-P680-05 Rev. 16		Reference Attached: ONI-C85 p 3 and ARI-H13-P680-05 p 19	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-COMBINED-N32_C85-J			
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: x			

QUESTION RO 23

Compared to its normal heat capacity, the ability of the Suppression Pool to condense steam from RCIC during an extended Station Blackout is reduced by which of the following initial conditions?

- A. Reactor pressure of 900 psig
- B. Suppression Pool level of 18.6 feet
- C. Suppression Pool Temperature of 96 °F
- D. A stuck closed Containment Vacuum Breaker

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QUESTION RO 23

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #	1	
	Group #	1	
	K/A#	295026	EK1.02
	Importance Rating	3.5	
K&A: Knowledge of the operational implications of the following concepts as they apply to SUPPRESSION POOL HIGH WATER TEMPERATURE: Steam condensation.			
Suppression Pool High Water Temperature			
<p>Explanation: Answer C – HCL is a function of SP level, SP temperature and RPV pressure. Suppression Pool temperature of 96 °F is higher than normal. This moves the closer to the UNSAFE region. This will inhibit the ability of the SP to condense steam sooner.</p> <p>A – Incorrect – Rx press of 900 psig is lower than normal value and increases margin to HCL.</p> <p>B – Incorrect – SP level of 18.6' is higher than normal (17.8→18.5') and increases margin to HCL.</p> <p>D – Incorrect – This could decrease margin to PSP not HCL.</p>			
Technical Reference(s): EOP Bases Rev. 7 and EOP-2 Rev. 5		Reference Attached: EOP Bases pp. 82, & 84-85 and EOP-2 p 60	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3402-06-C.1.A & C.1.B			
Question Source:	Bank # Perry 2015 # RO-23 Modified Bank # New		
Question History:	Previous 2 NRC Exams Perry 2015		
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis x		
10 CFR Part 55 Content:	55.41 x 55.43		
Comments: x			

QUESTION RO 24

The plant is operating at rated power when the following annunciators alarm:

- RWCU ISOL B/W OR F/D RM TEMP HI (H13-P680-01-B2)
- RWCU AREA LD TEMP P632 (H13-P680-01-D4)
- CONTAINMENT TEMP A HIGH (H13-P601-20-F4)
- CONTAINMENT TEMP B HIGH (H13-P601-17-D2)

The RO reports the following parameters:

- SPDS indicates Containment temperature is 97 °F
- E31-N700A, Leak Detection Monitor indicates RWCU Valve Demin Room temperature is 143 °F
- E31-N700B, Leak Detection Monitor indicates RWCU Valve Demin Room temperature is 145 °F

Which of the following is consistent with the above alarms and indications?

- A. Only Div. 1 RWCU Containment Isolation Valves should be closed.
- B. Only Div. 2 RWCU Containment Isolation Valves should be closed.
- C. Both Div. 1 and Div. 2 RWCU containment isolation valves should be closed.
- D. Neither Div. 1 nor Div. 2 RWCU containment isolation valves should be closed.

QUESTION RO 24

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #	1	
	Group #	1	
	K/A#	295027	2.4.46
	Importance Rating	4.2	
K&A: Ability to verify that the alarms are consistent with the plant conditions.			
High Containment Temperature (Mark III Containment Only)			
<p>Explanation: Answer C – The temperature alarms indicate a leak in containment. The Leak Detection monitor indications narrow it down to the RWCU demin room. Also, the LD indications are above the isolation setpoint for RWCU Inboard and Outboard containment isolation valves.</p> <p>A – Incorrect – Plausible since the alarm indication comes off the ‘A’ LD monitor. Additionally, even though the E31-N700A reading is lower than the ‘B’ reading, it is still above the isolation setpoint.</p> <p>B – Incorrect – Plausible since the E31-N700B reading is higher than the ‘A’ reading.</p> <p>D – Incorrect – Plausible since the RWCU ISOL B/W OR F/D RM TEMP alarm also comes in at a temperature of 117 °F with no isolation.</p>			
Technical Reference(s): ARI-H13-P680-01 Rev. 17, ARI-H13-P601-17 Rev. 19, and ARI-H13-P601-20 Rev. 23		Reference Attached: ARI-H13-P680-01 pp. 19-20 & 49-50, ARI-H13-P601-17 p 49, and ARI-H13-P601-20 p 83	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-COMBINED-E31 (#17)			
Question Source:	Bank # Clinton 2014 # RO-64 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: x			

QUESTION RO 25

The following conditions exist:

- The reactor was scrammed from 25% rated power
- A low power ATWS is in progress
- Emergency Depressurization was required
- All SRV's failed to open
- RCIC suction is on the Suppression Pool
- RCIC is providing RPV level and pressure control
- Suppression Pool level is lowering 1 inch per minute
- Current Suppression Pool level is 15 feet 2 inches

Per EOP Bases, the earliest that continued operation of RCIC will be threatened due to possible RCIC equipment damage is in ____ minutes.

- A. 11
- B. 35
- C. 95
- D. 113

QUESTION RO 25

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #	1	
	Group #	1	
	K/A#	295030	EA2.01
	Importance Rating	4.1	
K&A: Ability to determine and/or interpret the following as they apply to LOW SUPPRESSION POOL WATER LEVEL: Suppression pool level.			
Low Suppression Pool Water Level			
<p>Explanation: Answer C – With suppression pool level lowering at 1"/minute, it will take 95 minutes to reach 7.25'. At this level, pump damage from operation below the vortex limit becomes a concern.</p> <p>A – Incorrect – This is the time to uncover the SRV tailpipes.</p> <p>B – Incorrect – This is the time to uncover the horizontal vents.</p> <p>D – Incorrect – This is the time when damage to RHR and LPCS may occur.</p>			
Technical Reference(s): EOP Bases Rev. 7		Reference Attached: EOP Bases pp. 62-63	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3402-01-D			
Question Source:	Bank # Perry 2010 # RO-25 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: x			

QUESTION RO 26

The plant was initially operating at 100% power when the following occurred:

- All Feedwater was lost
- HPCS and RCIC were manually initiated
- HPCS INJECTION VALVE, E22-F004 was overridden closed when RPV level recovered to 185 inches
- RCIC continued to feed to Level 8

If RPV Level 2 is subsequently reached, HPCS Injection Valve E22-F004 will ____.

- A. automatically open
- B. open when E22-F004 control switch is taken to OPEN
- C. automatically open after depressing the RX WTR LVL HIGH SEAL IN RESET pushbutton
- D. only open when both the RX WTR LVL HIGH SEAL IN RESET pushbutton is depressed and the E22-F004 control switch is taken to OPEN

QUESTION RO 26

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #	1	
	Group #	1	
	K/A#	295031	EA1.04
	Importance Rating	4.3	
K&A: Ability to operate and/or monitor the following as they apply to REACTOR LOW WATER LEVEL: High pressure core spray: Plant-Specific.			
Reactor Low Water Level			
<p>Explanation: Answer B – When RPV level 2 is reached K13 deenergizes allowing the Injection Valve to open when control switch is taken to OPEN.</p> <p>A – Incorrect – Would be correct if valve was not overridden closed</p> <p>C – Incorrect – Depressing Reset PB is the same as reaching RPV Level 2. However, the Injection valve will not open until taken to OPEN because K14 is energized (override).</p> <p>D – Incorrect – Do not have to take both actions. When L2 is reached the L8 seal in is reset allowing injection.</p>			
Technical Reference(s): DWGs 208-065 Sh. 3 Rev. S. Sh. 4 Rev. R, & Sh. 14 Rev. R		Reference Attached: DWGs 208-065 Sh. 3. Sh. 4, & Sh. 14	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-COMBINED-E22A (#34)			
Question Source:	Bank # Perry 2009 # RO-27 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: x			

QUESTION RO 27

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

An ATWS is in progress with Rx power at 5%.

Suppression Pool temperature is 108 °F and rising.

Initiating Standby Liquid Control prior to Suppression Pool temperature exceeding (1) will ensure the Hot Shutdown Boron Weight will be injected before the Suppression Pool temperature exceeds the (2) .

- | | <u>(1)</u> | <u>(2)</u> |
|----|------------|--|
| A. | 120 °F | Boron Injection Initiation Temperature |
| B. | 120 °F | Heat Capacity Limit |
| C. | 110 °F | Boron Injection Initiation Temperature |
| D. | 110 °F | Heat Capacity Limit |

QUESTION RO 27

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #	1	
	Group #	1	
	K/A#	295037	EK3.02
	Importance Rating	4.3	
<p>K&A: Knowledge of the reasons for the following responses as they apply to SCRAM CONDITION PRESENT AND REACTOR POWER ABOVE APRM DOWNSCALE OR UNKNOWN: SBLC injection.</p>			
Scram Condition Present and Reactor Power Above APRM Downscale or Unknown			
<p>Explanation: Answer D – Per EOP Bases, BIIT is the highest SP temperature before which boron injection must be started to preclude the need to ED based on HCL. At Perry, BITT is 110 °F.</p> <p>A – Incorrect – Plausible since at 120 °F depressurization is required IAW TS 3.6.2.1. Also, BIIT is related to HCL in that SLC injection must be started before SP reaches BIIT to preclude exceeding HCL.</p> <p>B – Incorrect – Plausible since at 120 °F depressurization is required IAW TS 3.6.2.1.</p> <p>C – Incorrect – Plausible since BIIT is related to HCL in that SLC injection must be started before SP reaches BIIT to preclude exceeding HCL.</p>			
Technical Reference(s): EOP-Bases Rev. 7 and T.S. 3.6.2.1 Rev. Amend 69		Reference Attached: EOP Bases p 38 and T.S. 3.6.2.1 pp. TS 3.6-37 & 38	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3402-03			
Question Source:	Bank # Modified Bank # Clinton 2010 # RO-36 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: x			

QUESTION RO 28

A DBA LOCA has occurred.

In order to minimize off-site radioactivity release, Feedwater Leakage Control System (FWLCS) must be initiated.

- 1N27-F737, FEEDWATER LCS INBD SYS SHUTOFF valve failed to open
- 1N27-F740, FEEDWATER LCS OTBD SYS SHUTOFF valve opened as demanded

The maximum time to initiate FWLCS is (1) minutes from the LOCA.

1N27-F740, FEEDWATER LCS OTBD SYS SHUTOFF valve will provide sealing water to (2) .

	<u>(1)</u>	<u>(2)</u>
A.	60	1B21-F065A <u>only</u>
B.	60	1B21-F065A <u>and</u> 1B21-F065B
C.	90	1B21-F065A <u>only</u>
D.	90	1B21-F065A <u>and</u> 1B21-F065B

QUESTION RO 28

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #	1	
	Group #	1	
	K/A#	295038	EK2.12
	Importance Rating	3.5	
K&A: Knowledge of the interrelations between HIGH OFF-SITE RELEASE RATE and the following: Feedwater leakage control: BWR-6.			
High Offsite Radioactivity Release Rate			
<p>Explanation: Answer B – Perry has a Time Critical Operator Action to initiate FWLCS within 60 minutes of a DBA LOCA to minimize off-site release. Perry has two redundant systems. Even though one system is INBD and one is OTBD, either system will provide sealing water to both FW lines.</p> <p>A – Incorrect – Plausible since there are two FWCLSs. However, either FWLCS will provide sealing water to both FW lines.</p> <p>C & D (1st part) – Incorrect – All Perry TCOAs are contained in one procedure. Ninety minutes is plausible since there is a 90 minutes Time Critical Operator Action to verify 1G41-F145 (Containment FPCC isolation valve) closed during a Station Blackout to prevent draining the FPCC Surge tanks.</p> <p>D – Incorrect – (2nd part) Plausible since there are two FWCLSs. However, either FWLCS will provide sealing water to both FW lines.</p>			
Technical Reference(s): PYBP-POS-29 Rev. 4, ONI-C71-1 Rev. 22, & DWG 302-971 Rev. M		Reference Attached: PYBP-POS-29 pp. 7 & 24, ONI-C71-1 p 14, & DWG 302-971	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-COMBINED-N27 (#s 77 & 78)			
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: x			

QUESTION RO 29

The plant was operating at rated power when the following occurred:

- FCMS reports that all heat detectors for Reactor Recirculation Pump 'A' are in alarm
- The Unit Supervisor enters ONI-P54, Fire

For a fire in Reactor Recirculation Pump 'A', IAW ONI-P54, Fire, an Operator will ____ .

- A. confirm the CO₂ System has automatically discharged CO₂
- B. open 1P54-F395, DW CO₂ SUPPLY OTBD ISOL to commence CO₂ discharge
- C. open 1P54-F340, CTMT CO₂ SUPPLY OTBD ISOL to commence CO₂ discharge
- D. open 1P54-F3590, RX RCIRC PMP A SELECTOR VLV to commence CO₂ discharge

QUESTION RO 29

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #	1	
	Group #	1	
	K/A#	600000	AK1.02
	Importance Rating	2.9	
K&A: Knowledge of the operation applications of the following concepts as they apply to Plant Fire On Site: Fire Fighting.			
Plant Fire On Site			
<p>Explanation: Answer C – IAW ONI-P54 Immediate Operator Actions, the RO will open 1P54-F340 to allow CO2 to discharge onto the RR pump.</p> <p>A – Incorrect – With all the heat detectors for the 'A' pump in alarm, the correct combination of detectors will automatically initiate a CO2 discharge. However, The 1P54-F340 valve must be opened to allow the CO2 to be applied to the RR motor.</p> <p>B – Incorrect – Plausible since this the Drywell isolation valve. However, this valve is normally (already) open.</p> <p>D – Incorrect – Plausible if there was a problem indicated with the Master Valve. However, no problem with the Master Valve was given in the stem.</p>			
Technical Reference(s): ONI-P54 Rev. 24 and SOI-P54(GAS) Rev. 9		Reference Attached: ONI-P54 p 4 and SOI-P54(GAS)pp. 13-14	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-COMBINED-P54-CO2-O & OT-3035-05(LP)-A.1			
Question Source:	Bank # Modified Bank # New	Perry 2010 # RO-29	
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: x			

QUESTION RO 30

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

- The monthly load test SVI for Division 1 DG is in progress with DG load at 5800 KW
- Division 2 and Division 3 DG's are in Standby with respective buses lined up to the Preferred Source

Subsequently, the following conditions developed:

- ONI-S11, Degraded Grid, was entered due to Degraded Grid condition
- Annunciator VOLTS TO HERTZ RATIO HI, H13-P680-0009-B2 just alarmed
- Main Generator frequency is at 58 hz
- Main Generator terminal voltage is at 24,000 volts

What is the consequence if this alarm does not clear within a minute?

- A. The reactor will automatically scram on a main turbine trip.
- B. The Main Generator Voltage Regulator shifts to manual only.
- C. Div 1 DG output breaker EH1102 will trip on under-frequency.
- D. The breakers feeding Buses EH12 and EH13 will trip on under-frequency.

QUESTION RO 30

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #	1	
	Group #	1	
	K/A#	700000	2.4.31
	Importance Rating	4.2	
K&A: Knowledge of annunciator alarms, indications, or response procedures.			
Generator Voltage and Electric Grid Disturbances			
<p>Explanation: Answer A – The turbine will trip due to a generator trip. With the plant at rated power, a turbine trip will cause a reactor scram.</p> <p>B – Incorrect – The voltage regulator will shift to manual, but that is not the only thing that will happen.</p> <p>C – Incorrect – Plausible because the Preferred Source or Alt-Preferred Source breakers would trip at 59 hz with DG running in parallel to the bus. During the monthly load test, the DG runs in parallel to the Preferred or Alt-Preferred sources.</p> <p>D – Incorrect – Plausible because the Preferred Source breakers would trip at 59 hz if DG was running in parallel to the bus. With the DG's not running in parallel to the buses, the under-freq trips are not active.</p>			
Technical Reference(s): ARI-H13-P680-09 Rev. 17 & ONI-S11 Rev. 11		Reference Attached: ARI-H13-P680-09 p 17 & ONI-S11 p 3	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-COMBINED-N41_N51-F			
Question Source:	Bank # Perry 2013 # RO-30 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: x			

QUESTION RO 31

The plant was operating at rated power when the following occurred:

- A high Drywell pressure signal due to a loss of DW cooling caused a Rx scram
- HPCS was overridden off
- RPV level lowered to 145 inches before being recovered by Feedwater
- FW Hardcard actions were performed with the MFP feeding and both RFPTs tripped.
- The MFP FCV MAN/AUTO STATION is in Manual
- RPV pressure is 850 psig and rising slowly

At 215 inches, the ATC reduced the Output of the MFP FCV MAN/AUTO STATION to 0.0000%.

No other operator actions have been performed.

A few minutes later the following annunciators alarmed:

RPS RX LEVEL HI L8 (H13-P680-05-B5)

MAIN TURB & FEEDPUMP TRIP RCIC L8 (H13-P680-03-A8)

What would cause these alarms?

- A. RCIC was injecting
- B. CRD pump is injecting
- C. RFBPs are injecting per FW Hardcard
- D. Decay heat is causing RPV level to swell

QUESTION RO 31

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #	1	
	Group #	2	
	K/A#	295008	AA2.05
	Importance Rating	2.9	
K&A: Ability to determine and/or interpret the following as they apply to HIGH REACTOR WATER LEVEL: Swell			
High Reactor Water Level			
<p>Explanation: Answer D – As FW is injected into the RPV, decay heat will cause the density to decrease and water level to rise with no addition of water.</p> <p>A – Incorrect – Plausible since the RCIC-L8 annunciator alarmed. However, RPV level did not lower to the RCIC auto initiation setpoint.</p> <p>B – Incorrect – Plausible since CRD pumps are normally injecting ~60 gpm. However, with the Hi DW Pressure signal (RHR LOCA) the Stub Buses powering the CRD pumps would trip.</p> <p>C – Incorrect – Plausible since this is a method of feeding the RPV. However the max discharge pressure of the RFBP is ~ 200 psig.</p>			
Technical Reference(s): GFE (Components) Chapt. 7 Rev. 4		Reference Attached: GFE (Components) Chapt. 7 p 28	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3303-07			
Question Source:	<div style="display: flex; justify-content: space-between;"> Bank # Modified Bank # </div> <div style="display: flex; justify-content: space-between;"> New x </div>		
Question History:	<div style="display: flex; justify-content: space-between;"> Previous 2 NRC Exams No </div>		
Question Cognitive Level:	<div style="display: flex; justify-content: space-between;"> Memory or Fundamental Knowledge Comprehension or Analysis </div> <div style="display: flex; justify-content: space-between;"> x </div>		
10 CFR Part 55 Content:	<div style="display: flex; justify-content: space-between;"> 55.41 55.43 </div> <div style="display: flex; justify-content: space-between;"> x </div>		
Comments: x			

QUESTION RO 32

The plant was operating at rated power when the following alarms were received:

- CONTAINMENT TEMP A HIGH (H13-P601-20-F4)
- CONTAINMENT TEMP B HIGH (H13-P601-17-D2)

Containment temperature is 93 °F and rising slowly

Current equipment status as follows:

- CVCW Chiller 'A' is operating
- CVCW Chill Water Pump 'A' is operating
- Containment Vessel Cooling Fans 'A', 'C', 'D', and 'F' are operating

The Unit Supervisor has directed you to Maximize Containment Cooling IAW SOI-M11, Containment Vessel Cooling System

Which of the following is performed to Maximize Containment Cooling per SOI-M11?

- A. Start CVCW Chiller 'C'.
- B. Start CVCW Chill Water Pump 'C'.
- C. Start Containment Vessel Cooling Fans 'B' and 'E'.
- D. Manually close the CVCW three-way temperature control valve to isolate chill water bypass flow around the Containment Vessel Cooling Air Handling Units.

QUESTION RO 32

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #	1	
	Group #	2	
	K/A#	295011	AA1.01
	Importance Rating	3.6	
<p>K&A: Ability to operate and/or monitor the following as they apply to HIGH CONTAINMENT TEMPERATURE (MARK III CONTAINMENT ONLY): Containment ventilation/cooling system: Mark-III.</p>			
<p>High Containment Temperature (Mark III Containment only)</p>			
<p>Explanation: Answer C – IAW SOI-M11, Maximize Containment Cooling, all containment vessel cooling fans are operated. This is typically done in the hot summer months.</p> <p>A – Incorrect – “A” CVCW chiller and chill water pump are given as running. Only one CVCW chill water pump can be operation at a time. Starting an additional CVCW chill water pump would cause CVCW chill water pump A to trip. Plausible since Turbine Building CW allows multiple chillers/chill water pumps running simultaneously.</p> <p>B – Incorrect – A CVCW chiller needs its respective chill water pump running prior to starting the chiller. Starting an additional CW pump would trip the running CW pump. Plausible since Turbine Building CW allows multiple chillers/chill water pumps running simultaneously.</p> <p>D – Incorrect – The TCV is an automatically controlled valve that would already be in full flow to the AHU due to the elevated containment temperature.</p>			
<p>Technical Reference(s): SOI-M11 Rev. 9, ARI-H13-P601-20 Rev. 23 and ARI-H13-P601-17 Rev. 19</p>		<p>Reference Attached: SOI-M11 p 8, ARI-H13-P601-20 pp. 83-84, and ARI-H13-P601-17 pp. 49-50</p>	
<p>Proposed references to be provided to applicants during examination: None</p>			
<p>Learning Objective (As available): OT-COMBINED-M11 (#3)</p>			
Question Source:	<div style="display: flex; justify-content: space-between;"> Bank # Modified Bank # </div> <div style="display: flex; justify-content: space-between;"> New x </div>		
Question History:	<div style="display: flex; justify-content: space-between;"> Previous 2 NRC Exams No </div>		
Question Cognitive Level:	<div style="display: flex; justify-content: space-between;"> Memory or Fundamental Knowledge x </div> <div style="display: flex; justify-content: space-between;"> Comprehension or Analysis </div>		
10 CFR Part 55 Content:	<div style="display: flex; justify-content: space-between;"> 55.41 x </div> <div style="display: flex; justify-content: space-between;"> 55.43 </div>		
<p>Comments: x</p>			

QUESTION RO 33

A reactor startup from a forced outage is in progress with the following conditions:

- MODE Switch in STARTUP
- All APRMs are reading 2% power
- Withdrawal of a 4-rod gang is in progress

Then annunciator IRM D/H UPSC TRIP/INOP (H13-P680-0006-E3) alarms.

IRM H indicates upscale.

It is suspected that Control Rod 50-51 became uncoupled.

The response of the Reactor Protection System (RPS) and/or Rod Control and Information System (RC&IS) is to generate a _____.

- A. rod block only
- B. half scram only
- C. full reactor scram
- D. rod block and half scram

QUESTION RO 33

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #	1	
	Group #	2	
	K/A#	295014	AK3.02
	Importance Rating	3.7	
K&A: Knowledge of the reasons for the following responses as they apply to INADVERTENT REACTIVITY ADDITION: Control rod blocks.			
Inadvertent Reactivity Addition			
<p>Explanation: Answer D – The IRM H upscale trip is 120/125 and Rod Block is 108/125.with the Mode Switch in STARTUP. IRM H INOP would also cause ½ scram and Rod Block.</p> <p>A – Incorrect – This would be true if IRM H was above 108/125 and below 120/125.</p> <p>B – Incorrect – With IRM H above trip 120/125 it is also above RB 108/125. IRM H gives RB.</p> <p>C – Incorrect – This would be true if an additional IRM in different RPS Trip System also responded upscale.</p>			
Technical Reference(s): ARI-H13-P680-06 Rev. 9		Reference Attached: ARI-H13-P680-06 p 71	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-COMBINED-C51_IRM-1.9 & 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: x			

QUESTION RO 34

The plant is in MODE 4 with the following conditions:

- RHR A loop is operating in Shutdown Cooling (SDC)
- RHR B loop is operating in Suppression Pool Cooling/Test Mode Operation
- RHR C loop is in standby

An electrical disturbance resulted in all Division 1 and 2 RPV Level instruments indicating downscale for approximately 10 seconds before returning to normal.

Which of the following describes the response of the RHR system?

- A. RHR Pumps A and B trip
RHR C Loop remains in standby
- B. RHR Pump A trips
RHR B Loop realigns to LPCI mode
- C. RHR Pump A continues running on minimum flow
RHR C Loop initiates in LPCI mode
- D. RHR Pump A continues to operate in SDC
RHR B Loop continues to operate in Suppression Pool Cooling Mode

QUESTION RO 34

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #	1	
	Group #	2	
	K/A#	295020	AK2.09
	Importance Rating	3.1	
K&A: Knowledge of the interrelations between INADVERTENT CONTAINMENT ISOLATION and the following: RHR/shutdown cooling: Plant-Specific.			
Inadvertent Containment Isolation			
<p>Explanation: Answer B – When Div. 1 RPV level instruments indicated downscale (NR L3) a SDC isolation will occur causing E12-F008 & E12-F009 to shut. RHR A pump will trip in response to not having a clear suction path. Also, RHR B will realign to LPCI mode based on wide range (L1) instruments indicating downscale.</p> <p>A – Incorrect – RHR C pump remaining in standby is plausible since there is a 5 second time delay for RHR A & B starts. However, RHR B pump does not trip.</p> <p>C – Incorrect – Plausible since typically removing a discharge path for RHR will result in the pump running on min flow. However, while in SDC, the min flow valve is deenergized in the closed position.</p> <p>D – Incorrect – Plausible since both RHR A & B loops have a time delay to initiate, but it is only 5 seconds.</p>			
Technical Reference(s): SDM-E12 Rev. 3, and SOI-E12 Rev. 72		Reference Attached: SDM-E12 pp. 23-24, 30, 32, 37, & 50 and SOI-E12 pp. 22-23	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-COMBINED-E12-F			
Question Source:	<div style="display: flex; justify-content: space-between;"> Bank # Perry 2001 # RO-57 </div> <div style="display: flex; justify-content: space-between;"> Modified Bank # </div> <div style="display: flex; justify-content: space-between;"> New </div>		
Question History:	<div style="display: flex; justify-content: space-between;"> Previous 2 NRC Exams No </div>		
Question Cognitive Level:	<div style="display: flex; justify-content: space-between;"> Memory or Fundamental Knowledge </div> <div style="display: flex; justify-content: space-between;"> Comprehension or Analysis x </div>		
10 CFR Part 55 Content:	<div style="display: flex; justify-content: space-between;"> 55.41 x </div> <div style="display: flex; justify-content: space-between;"> 55.43 </div>		
Comments: x			

QUESTION RO 35

A transient occurred resulting in entry into EOP-02, Primary Containment Control.

Suppression Pool water level is approaching the SRV Tail Pipe Level Limit (SRVTPLL).

Which of the following actions would degrade the margin to the SRVTPLL?

- A. Lower RPV pressure.
- B. Lower Suppression Pool water level.
- C. Initiate the Suppression Pool Makeup System.
- D. Operate RHR in the Suppression Pool Cooling mode.

QUESTION RO 35

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #	1	
	Group #	2	
	K/A#	295029	EK1.01
	Importance Rating	3.4	
K&A: Knowledge of the operational implications of the following concepts as they apply to HIGH SUPPRESSION POOL WATER LEVEL: Containment integrity.			
High Suppression Pool Water Level			
<p>Explanation: Answer C – Raising Suppression Pool water level by initiating SPMU degrades the margin to SRVTPLL. Violation of SRVTPLL will threaten containment integrity.</p> <p>A – Incorrect – Lowering RPV pressure improves margin to SRVTPLL. Plausible if operator does not correctly recall relationship between RPV pressure and SRVTPLL</p> <p>B – Incorrect – Lowering SP water level will improve the margin to SRVTPLL. Plausible since this action would improve margin to SRVTPLL.</p> <p>D – Incorrect – Lowering SP water temperature has no effect on SRVTPLL. Plausible since this action would improve margin to HCL.</p>			
Technical Reference(s): EOP Bases Rev. 7 & EOP-SPI Supplement Rev. 8		Reference Attached: EOP Bases p 88 & EOP-SPI Supplement p 10	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3402-04A			
Question Source:	Bank # Modified Bank # Perry 2017 # RO-36 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: x			

QUESTION RO 36

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

- The Auxiliary Building Ventilation System is in operation in accordance with SOI-M38/47
- A steam leak is identified in the RCIC pump room
- Annunciator AIRBORNE RAD P804 (H13-P680-07-A10) has alarmed

The BOP reports ALERT radiation alarms have been received on the Aux Building Ventilation Exhaust GAS and IODINE modules and both readings are increasing.

If radiological condition trends continue to degrade in the Aux Building and HIGH radiation alarms are received on the Aux Building Ventilation Exhaust GAS and IODINE modules what will be the status of the Aux Bldg. Ventilation System?

- A. Only one Exhaust Fan is running due to the HIGH alarm on the GAS channel.
- B. Only one Exhaust Fan is running due to the HIGH alarm on the IODINE channel.
- C. One Exhaust Fan and one Supply Fan are running due to the HIGH alarm on the GAS channel.
- D. One Exhaust Fan and one Supply Fan are running due to the HIGH alarm on the IODINE channel.

QUESTION RO 36

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #	1	
	Group #	2	
	K/A#	295034	2.4.47
	Importance Rating	4.2	
K&A: Ability to diagnose and recognize trends in an accurate and timely manner utilizing the appropriate control room reference material.			
Secondary Containment Ventilation High Radiation			
<p>Explanation: Answer A – Since the AB ventilation was running IAW SOI-M38/47 (i.e. 1 Supply fan and 1 Exhaust fan running), a HIGH on the Aux Bldg. Vent Exhaust Gas channel will cause the running AB supply fan to trip. Therefore, only 1 exhaust fan would be running.</p> <p>B – Incorrect – The Iodine channel HIGH does not initiate any automatic trips.</p> <p>C – Incorrect – The AB Supply fan will trip.</p> <p>D – Incorrect – The Iodine channel HIGH does not initiate any automatic trips. But, the AB Supply fan will trip due to the HIGH on the gas channel.</p>			
Technical Reference(s): SOI-M38/47 Rev. 9, ARI-H13-P680-07 Rev. 28, EOP-3 Rev. 7, and ONI-D17 Rev. 19		Reference Attached: SOI-M38/47 p 18, ARI-H13-P680-07 p 13, EOP-3 pp. 13 & 18, & ONI-D17 p 19	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-COMBINED-M38 (#4)			
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: x			

QUESTION RO 37

The plant has experienced a LOCA and the following plant conditions exist:

- Containment Pressure 10 psig
- Containment Hydrogen Concentration 7.5%
- Drywell Hydrogen Concentration 9.5%

You have been directed to startup the Hydrogen Igniters per the Hydrogen Igniter Startup Hardcard.

Based on plant above conditions, Hydrogen Igniters should ____.

Reference Provided:

- A. be started because Drywell Hydrogen concentration is < HDOL
- B. not be started because Drywell Hydrogen concentration is > HDOL
- C. be started because Containment Hydrogen concentration is < HDOL
- D. not be started because Containment Hydrogen concentration is > HDOL

QUESTION RO 37

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #	1	
	Group #	2	
	K/A#	500000	EA2.03
	Importance Rating	3.3	
K&A: Ability to determine and / or interpret the following as they apply to HIGH PRIMARY CONTAINMENT HYDROGEN CONCENTRATIONS: Combustible limits for drywell.			
High Containment Hydrogen Concentration			
<p>Explanation: Answer B – The Drywell HDOL is a single value of 9%. Starting the Hydrogen Igniters requires both the Containment and Drywell H2 concentrations to be < HDOL. Operating the Igniters in either Division energizes igniters in both the Containment and Drywell.</p> <p>A – Incorrect – The memory item of DW HDOL has been removed from the H2 Igniter Hardcard reference. Therefore the operator must remember the correct value of HDOL for the DW.</p> <p>C – Incorrect – The H2 concentration is < HDOL for the Containment, but HDOL is exceeded for the DW. Energizing the igniters requires both Containment and Drywell to be < HDOL.</p> <p>D – Incorrect – Containment H2 is not > HDOL.</p>			
Technical Reference(s): OAI-1703 Rev. 35 and EOP-1A Rev. 11		Reference Attached: OAI-1703 pp. 60-61 and EOP-1A p 60	
Proposed references to be provided to applicants during examination: OAI-1703, Attachment 18 (modified)			
Learning Objective (As available): OT-3402-02			
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: x			

QUESTION RO 38

A LOCA occurred 5 minutes ago.

RHR A Loop is the only ECCS system injecting into the RPV.

All other ECCS systems tripped or failed to start.

RPV level has currently recovered to 25 inches and is stable.

Which of the following will have the largest effect on RPV level?

- A. Closing 1E12-F027A, RHR A TO CNTMT SHUTOFF
- B. Closing 1E12-F003A, RHR A HX'S OUTLET VALVE
- C. Opening 1E12-F064A, RHR PUMP A MIN FLOW VALVE
- D. Opening 1E12-F037A, RHR A UPPER POOL COOLING ISOL

QUESTION RO 38

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #	2	
	Group #	1	
	K/A#	203000	A1.01
	Importance Rating	4.2	
K&A: Ability to predict and/or monitor changes in parameters associated with operating the RHR/LPCI: INJECTION MODE (PLANT SPECIFIC) controls including: Reactor water level.			
RHR/LPCI: Injection Mode			
<p>Explanation: Answer A – During a LOCA, LPCI initiation will occur when RPV level lowers to 16". Closing the 1E12-F027A will stop all flow into the RPV. With a LOCA signal present, the F027 will reopen, but for the time it took to stroke (52 sec.), RPV level will lower. Thus, this will be the biggest effect on RPV level.</p> <p>B – Incorrect – A LOCA signal demands the RHR HX Outlet (F003) and HX Bypass (F048) to be full open for 10 minutes following a LOCA. Both valves have full flow capability. So closing the F003A will not affect level.</p> <p>C – Incorrect – The Min Flow Valve is a 6" line (vs. the 12" injection line) and will automatically reclose based on pump flow. Thus, this is not the largest effect. Stroke time is 12 seconds.</p> <p>D – Incorrect – The F037A valve feeds a line that has a blank flange normally installed. It is only removed during refueling.</p>			
Technical Reference(s): SOI-E12 Rev. 72, DWGs 302-641 Rev. JJJ & 302-642 Rev. MM		Reference Attached: SOI-E12 pp. 22-23 & 89, DWGs 302-641 & 302-642	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-COMBINED-E12-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 x 55.43		
Comments: x			

QUESTION RO 39

The plant is at rated power in a Division 2 work week with RHR C pump tagged out for breaker replacement.

The Division 2 Diesel Generator is operating in parallel with the grid for post maintenance testing.

The following events then occurred in rapid succession:

1. Annunciator DG TRIP* CRANKCASE PRESS HIGH (H13-P877-02-C2) alarms, for Div. 2 DG.
2. A plant operator reports that Div.2 DG crankcase pressure is high.
3. A leak from Reactor Recirc piping occurred in the drywell.

The following plant conditions exist:

- Reactor Scrammed - All Rods In
- EOP-01, RPV Control was entered
- Anticipate ED is being performed
- EOP-SPI 2.3 Bypass MSIVs And ECCS Interlocks has been performed
- Reactor Level lowered to 14 inches and is now rising
- Reactor Pressure is at 200 psig

Based on the above information:

(1) Which LPCI system(s) is (are) injecting into the RPV?

(2) Where can LPCI injection be directed?

- | | (1) | (2) |
|----|--------------------|-------------------------------------|
| A. | <u>only</u> LPCI A | <u>only</u> inside the shroud |
| B. | <u>only</u> LPCI A | inside <u>or</u> outside the shroud |
| C. | LPCI A & B | <u>only</u> inside the shroud |
| D. | LPCI A & B | inside <u>or</u> outside the shroud |

QUESTION RO 39

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #	2	
	Group #	1	
	K/A#	203000	A2.06
	Importance Rating	3.8	
<p>K&A: Ability to (a) predict the impacts of the following on the RHR/LPCI: INJECTION MODE (PLANT SPECIFIC); and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Emergency generator failure.</p>			
<p>RHR/LPCI: Injection Mode</p>			
<p>Explanation: Answer D – A high crankcase pressure indicates a failure of the crankcase fans and will trip the DG. However, during a LOCA, the DG trip on high crankcase pressure is bypassed. But, since the LOCA occurred after the high crankcase pressure the Div. 2 DG would have tripped but Bus EH12 would have remained energized. Also, since EOP-SPI 2.3, was performed, the SDC Interlocks are bypassed which allows injection using either E12-F053A/B (outside the shroud) or E12-F042A/B (inside the shroud).</p> <p>A – Incorrect – Plausible since the high crankcase pressure causes the DG to trip, but since it is in parallel with the Bus, only the DG output breaker opens. Since EOP-SPI 2.3 was performed, LPCI can be directed outside the shroud via the E12-F053A/B.</p> <p>B – Incorrect – Plausible since the high crankcase pressure causes the DG to trip, but since it is in parallel with the Bus, only the DG output breaker opens.</p> <p>C – Incorrect – Plausible since conditions given would indicate the SDC Isolations (L3 & 135 psig in the RPV) would prevent operating E12-F053A/B.</p>			
<p>Technical Reference(s): ARI-H13-P877-02 Rev. 16, EOP-SPI 2.3 Rev. 5, and SOI-E12 Rev. 72</p>		<p>Reference Attached: ARI-H13-P877-02 p 29, EOP-SPI 2.3 p. 5, and SOI-E12 Rev. 22-23</p>	
<p>Proposed references to be provided to applicants during examination: None</p>			
<p>Learning Objective (As available): OT-COMBINED-R43_48-B.5 & OT-COMBINED-E12-B & OT-3403-02B(SG)-B</p>			
Question Source:	<div style="display: flex; justify-content: space-between;"> <div>Bank # Modified Bank # New</div> <div style="text-align: right;">x</div> </div>		
Question History:	<div style="display: flex; justify-content: space-between;"> <div>Previous 2 NRC Exams</div> <div>No</div> </div>		
Question Cognitive Level:	<div style="display: flex; justify-content: space-between;"> <div>Memory or Fundamental Knowledge Comprehension or Analysis</div> <div style="text-align: right;">x</div> </div>		
10 CFR Part 55 Content:	<div style="display: flex; justify-content: space-between;"> <div>55.41 55.43</div> <div style="text-align: right;">x</div> </div>		
<p>Comments: x</p>			

QUESTION RO 40

The plant is cooling down in Mode 3.

RHR A Loop is operating in Shutdown Cooling.

RPV water level is 250 inches.

A leak occurs causing RPV water level to lower by 75 inches before the leak can be stopped.

Currently, 1E12-F006A, RHR A SHUTDOWN CLG SUCT valve is (1) and
1E12-F009, RHR SHUTDOWN COOLING INBD SUCT ISOL valve is (2) .

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

QUESTION RO 40

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #	2	
	Group #	1	
	K/A#	205000	K6.04
	Importance Rating	3.6	
<p>K&A: Knowledge of the effect that a loss or malfunction of the following will have on the SHUTDOWN COOLING SYSTEM (RHR SHUTDOWN COOLING MODE): Reactor water level.</p>			
Shutdown Cooling			
<p>Explanation: Answer B – When RPV water level dropped 75", it went below L3. When RPV level goes below L3, an RHR SDC isolation occurs. This cause E12-F009 to close, but E12-F006A receives no isolation signal.</p> <p>A – Incorrect – At RPV L3 the E12-F009 gets an isolation signal.</p> <p>C – Incorrect – E12-F006A receives no isolation signal, but E12-F009 gets an isolation signal.</p> <p>D – Incorrect – E12-F006A receives no isolation signal.</p>			
Technical Reference(s): OAI-1703 Rev. 35 and SDM OTCOMBINEDE12 Rev. 3		Reference Attached: OAI-1703 p 37 and SDM OTCOMBINEDE12 p 50	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-COMBINED-E12-F			
Question Source:	Bank # Limerick 2006 # RO-34 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: x			

QUESTION RO 41

The following plant conditions exist:

- A Loss of Coolant Accident has occurred
- The RPV is depressurized
- All control rods are fully inserted
- HPCS, LPCS and all LPCI loops are injecting into the reactor vessel at 6,000 gpm each
- RPV Water Level is +10 inches and rising

Then, LPCS System flow, pump amps and discharge pressure are observed fluctuating significantly. All LPCI System parameters are steady within their normal indications.

Which one of the following describes the condition of the LPCS Pump, including guidance for continued operation?

The LPCS Pump is ____ .

- A. cavitating and may be secured since adequate core cooling exists
- B. running out and may be secured since adequate core cooling exists
- C. cavitating and should not be secured since adequate core cooling does not exist
- D. running out and should not be secured since adequate core cooling does not exist

QUESTION **RO 41**

Examination Outline Cross-Reference

K&A: Knowledge of the operational implications of the following concepts as they apply to LOW PRESSURE CORE SPRAY SYSTEM: Indications of pump cavitation.

Low Pressure Core Spray

Explanation: **Answer A** – Pump cavitation is indicated by fluctuating amps, flow and discharge pressure. Since RPV Water Level is above Top of Active Fuel and is rising, adequate core cooling exists and the LPCS pump may be secured

B – Incorrect – This would be true for high pump flow and high pump amps with ACC.

C – Incorrect – This would be true if Adequate Core Cooling did not exist (i.e. level > TAF)

D – Incorrect – This would be true for high pump flow and high pump amps and if ACC did not exist.

Technical Reference(s): EOP Bases Rev. 7, ONI-G42, Rev. 5, and OT-3303-02 (Components) Chapt. 2 Lesson Plan Rev. 4

Reference Attached: EOP Bases p 35, ONI-G42,
pp. 4-5, and OT-3303-02 (Components) Chapt. 2
Lesson Plan pp. 12-13

Proposed references to be provided to applicants during examination: None

Learning Objective (As available): OT-3303-02-3 & OT-3402-01

Question Source: Bank #
Modified Bank # Perry 2007-1 # RO-40
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: x

QUESTION RO 42

The plant was operating at rated power when a LOCA occurred resulting in the following:

- The reactor scrammed
- RPV pressure has lowered to 510 psig
- RPV level is 14 inches and stable
- HPCS and RCIC are injecting to the RPV

Based on these conditions, the LPCS Injection Valve, 1E21-F005, is (1) and the LPCS Pump Min Flow Valve, 1E21-F011, is (2) .

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

QUESTION RO 42

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #	2	
	Group #	1	
	K/A#	209001	A1.08
	Importance Rating	3.3	
K&A: Ability to predict and/or monitor changes in parameters associated with operating the LOW-PRESSURE CORE SPRAY SYSTEM controls including: System lineup.			
Low Pressure Core Spray			
<p>Explanation: Answer A – LPCS will initiate and the pump will start when RPV level drops <L1 (16.5"). The Injection valve will open upon system initiation as long as the pressure between the injection valve and the RPV is < 600 psig. However, LPCS will not inject until RPV pressure is < ~480 psig. This will cause the min flow valve to be open. Per the LPCS pump curve, shutoff head for the LPCS pump is 508 psig.</p> <p>B – Incorrect – The min flow valve will be open (no injection flow).</p> <p>C – Incorrect – The Injection valve will be open (no injection flow).</p> <p>D – Incorrect – The Injection valve will be open and the min flow valve will be open (no injection flow).</p>			
Technical Reference(s): SOI-E21 Rev. 32 and SDM-E21 Rev. 1		Reference Attached: SOI-E21 p 13 and SDM-E21 p 9	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-COMBINED-E21-F			
Question Source:	Bank # Perry 2013 # RO-41 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: x			

QUESTION RO 43

A small break LOCA has occurred.

HPCS automatically started and is injecting into the RPV.

Current conditions are as follows:

- Rx shutdown
- RPV level is 220 inches
- CST level is 280 Kgal
- Suppression Pool level is 18.2 feet

The HPCS system response to these conditions will be that the HPCS ____.

- A. Pump, 1E22-C001 trips
- B. suction will shift to the CST
- C. Injection Valve 1E22-F004 closes
- D. suction will shift to the Suppression Pool

QUESTION RO 43

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #	2	
	Group #	1	
	K/A#	209002	K4.02
	Importance Rating	3.4	
<p>K&A: Knowledge of HIGH PRESSURE CORE SPRAY SYSTEM (HPCS) design feature(s) and/or interlocks which provide for the following: Prevents over filling reactor vessel: Plant-Specific.</p>			
High Pressure Core Spray			
<p>Explanation: Answer C – RPV level of 220" is > L8. At L8 the HPCS injection valve closes to prevent over filling the RPV.</p> <p>A – Incorrect – Plausible since this is an action for Inadvertent ECCS initiation. But, the HPCS pump will run on Min Flow.</p> <p>B – Incorrect – Plausible since there is an auto suction shift to the SP on high SP level or low CST level. Also, on an auto start of HPCS, the CST suction will auto open if the SP suction is not fully open. However. There is no automatic suction shift to the CST.</p> <p>D – Incorrect – Plausible since the auto shift occurs, but the SP level is < auto shift level (18.4')</p>			
Technical Reference(s): ARI-H13-P601-16 Rev. 19		Reference Attached: ARI-H13-P601-16 p 71.	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-COMBINED-E22A (#34)			
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: x			

QUESTION RO 44

The plant was at rated power when an ATWS occurred.

EOP-1A, Level Power Control was entered.

The contents of the SLC Storage Tank are being injected into the reactor.

Rx Engineering has determined that additional boron will need to be injected to shutdown the reactor due to a leak in the SLC discharge piping.

Transfer of boron solution using SOI-C41, SLC Transfer System Emergency Preparation/Transfer is in progress.

Which of the following plant conditions would hamper the shutdown of the reactor by causing a trip the SLC Transfer Pumps?

- A. Temperature < 70 °F in the SLC Auxiliary Mixing Tank
- B. SLC Storage Tank level instrument failed high
- C. RPV Level lowering to 10 inches
- D. Loss of off-site power

QUESTION RO 44

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #	2	
	Group #	1	
	K/A#	211000	K3.01
	Importance Rating	4.3	
K&A: Knowledge of the effect that a loss or malfunction of the STANDBY LIQUID CONTROL SYSTEM will have on following: Ability to shutdown the reactor in certain conditions.			
Standby Liquid Control			
<p>Explanation: Answer C – The SLC Transfer Pumps are powered from Safety Related buses but will trip if an RHR LOCA occurs (RPV L-1 or 1.68 psig in DW)</p> <p>A – Incorrect – This is the temperature required for SLC Operability and the low temperature that will alarm in the Control Room, but will not trip the transfer pumps.</p> <p>B – Incorrect – The SLC Tank level instrument is for indication in the Control Room only and will not trip the transfer pumps.</p> <p>D – Incorrect – This is a misconception that the transfer pumps are powered from non-Safety Related buses.</p>			
Technical Reference(s): SDM-C41 Rev. 10 and DWG 208-029 Sh. 100 Rev. H		Reference Attached: SDM-C41 p 19 and DWG 208-029 Sh. 100	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-COMBINED-C41-F.5			
Question Source:	Bank # Modified Bank # Perry Vision # 209410 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: x			

QUESTION RO 45

The plant is operating at 100% power with the Reactor Protection System MG SET TRANSFER switch in ALT A.

The following occurs:

- Numerous Control Room Alarms are received
- Half scram is indicated
- Inboard BOP isolation has occurred

This is an indication of a loss of power from Bus ____ .

- A. F1B08
- B. F1C08
- C. F1C12
- D. F1D12

QUESTION RO 45

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #	2	
	Group #	1	
	K/A#	212000	K2.01
	Importance Rating	3.2	
K&A: Knowledge of electrical power supplies to the following: RPS motor-generator sets.			
Reactor Protection			
<p>Explanation: Answer C – Bus F1C12 is the power Supply for the B RPS MG. With the RPS MG Set Transfer switch in ALT A, the B RPS system must be powered by the B RPS MG.</p> <p>A – Incorrect – This is the Normal power supply for RPS A (i.e. power to the MG set)</p> <p>B – Incorrect – This is the Alternate power supply to RPS A via a regulating transformer.</p> <p>D – Incorrect – This is the alternate power supply for RPS B via a regulating transformer.</p>			
Technical Reference(s): PDB-H014 Rev. 1, PDB-H15 Rev. 3, PDB-H16 Rev. 2, SOI-C71 Rev. 23 & SDM-C71 Rev. 12		Reference Attached: PDB-H014 p 3, PDB-H15 pp. 5 & 7, PDB-H16 p 7, SOI-C71 p 114 & SDM-C71 p 78	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-COMBINED-C71-1.3 & .16			
Question Source:	Bank # Modified Bank # New	Perry 2007 # RO-33	
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: x			

QUESTION RO 46

Plant startup is in progress with the following conditions:

- The unit operating at 30% of rated power
- The Main Generator on line

Then, Emergency Trip System (ETS) fluid pressure switch C71-N005, TURBINE CONTROL VALVE 'A' FAST CLOSURE drifts down below its trip setpoint.

The Turbine Control Valve fast closure RPS setpoint is (2) psig and based on the above information, an RPS ½ scram signal (1) be received.

	<u>(1)</u>	<u>(2)</u>
A.	530	will
B.	1100	will
C.	530	will not
D.	1100	will not

QUESTION RO 46

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #	2	
	Group #	1	
	K/A#	212000	K6.05
	Importance Rating	3.5	
K&A: Knowledge of the effect that a loss or malfunction of the following will have on the REACTOR PROTECTION SYSTEM: RPS sensor inputs			
Reactor Protection			
<p>Explanation: Answer C – With the plant operating <38% power, the turbine control valve fast closure scram is bypassed. Also, the ETS low pressure setpoint is 530 psig.</p> <p>A – Incorrect – Plausible since a ½ scram signal would be generated if the plant was operating >38% power.</p> <p>B – Incorrect – Plausible since a ½ scram signal would be generated if the plant was operating >38% power. Also, 1100 psig is the EHC system turbine trip setpoint.</p> <p>D – Incorrect – Plausible since 1100 psig is the EHC system turbine trip setpoint.</p>			
Technical Reference(s): ARI-H13-P680-05 Rev. 16, ARI-H13-P870-09 Rev. 12, ONI-N32 Rev. 14, PDB-I05 Rev. 10, and PDB-I10 Rev. 4		Reference Attached: ARI-H13-P680-05 p13, ARI-H13-P870-09 p 29, ONI-N32 p 12, PDB-I05 p 1, and PDB-I10 p 1	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-COMBINED-C71-1.2, 1.11, & 1.17			
Question Source:	Bank # Modified Bank # Hatch 2015 # RO-10 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: x			

QUESTION RO 47

Which of the following set of conditions would generate a half-scrum signal?

- A. Rx Mode Switch in RUN
APRM F is Downscale
IRM D fails upscale
- B. Rx Mode Switch in RUN
IRM B reading 115/125
Rx Mode Switch is placed in STARTUP
- C. Rx Mode Switch in STARTUP
IRM H on Range 4
IRM H detector is withdrawn
- D. Rx Mode Switch in STARTUP
APRM E is Downscale
IRM G Mode Switch placed in STANDBY

QUESTION RO 47

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #	2	
	Group #	1	
	K/A#	215003	K1.01
	Importance Rating	3.9	
K&A: Knowledge of the physical connections and/or cause effect relationships between INTERMEDIATE RANGE MONITOR (IRM) SYSTEM and the following: RPS.			
Intermediate Range Monitor			
<p>Explanation: Answer D – With the Rx Mode Switch in STARTUP, placing the IRM G Mode Switch in STANDBY will generate a ½ on RPS A system.</p> <p>A – Incorrect – With the Rx Mode switch in RUN, the APRM downscale will generate a rod block only.</p> <p>B – Incorrect – IRM reading is less than the value needed to generate a rod block or ½ scram.</p> <p>C – Incorrect – Withdrawing the IRM detector will generate a rod block only.</p>			
Technical Reference(s): ARI-H13-P680-05-B7 Rev. 16		Reference Attached: ARI-H13-P680-05-B7 p 31	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-COMBINED-C51_IRM-1.6			
Question Source:	Bank # RQL--1114 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: x			

QUESTION RO 48

A plant startup is in progress.

Annunciator ROD WITHDRAWAL BLOCK (H13-P680-05-H8) has alarmed.

The following conditions exist:

- Source Range Monitor (SRM) channel C is bypassed due to a stuck detector
- SRM channel B is reading about 95 counts per seconds (cps)
- All other SRM channels are reading greater than 8×10^4 cps
- Only SRM detector A is full in
- Intermediate range (IRM) channel B is on range 2 at 15/125
- All other IRM channels are on range 3

What has to be done to clear the ROD WITHDRAWAL BLOCK annunciator?

- A. Insert SRM B
- B. Withdraw SRM A
- C. Range up on IRM B to Range 3
- D. Inform US SRM B is INOPERABLE and bypass SRM B

QUESTION RO 48

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #	2	
	Group #	1	
	K/A#	215004	2.4.45
	Importance Rating	4.1	
K&A: Ability to prioritize and interpret the significance of each annunciator or alarm.			
Source Range Monitor			
<p>Explanation: Answer A – With SRM B count rate < 100 cps and IRM B on range 2, a rod block is generated. Since SRM B is withdrawn, inserting the SRM will raise the count rate and clear the rod block.</p> <p>B – Incorrect – Since SRM A's corresponding IRMs are on range 3, no rod block would be generated for this condition.</p> <p>C – Incorrect – Ranging up on IRM B with it reading 15/125 would cause another rod block due to IRM downscale.</p> <p>D – Incorrect – SRM is not indicated as INOP. But, bypassing SRM could not be performed with SRM C in bypass.</p>			
Technical Reference(s): ARI-H13-P680-06 Rev. 9 and SDM C11(RC&IS) Rev. 9		Reference Attached: ARI-H13-P680-06 p 69 and SDM C11(RC&IS) p 56	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-COMBINED-C51_SRM-1.6			
Question Source:	Bank # Perry 2005 # RO-38 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: x			

QUESTION RO 49

A reactor startup is in progress with the REACTOR MODE SWITCH in STARTUP/STANDBY.

The following is the present status of the APRM versus LPRM inputs, and the indicated power.

APRM:	A	B	C	D	E	F	G	H
LPRMs:								
D Level Inputs:	4	5	4	3	3	4	6	6
C Level Inputs:	4	3	3	4	4	2	4	4
B Level Inputs:	3	4	3	4	4	4	6	4
A Level Inputs:	3	3	3	4	6	4	4	2
Indicated Power:	11%	16%	12%	11%	12%	10%	12%	10%

What is the plant response, if any, to the conditions above?

- A. Full scram
- B. Rod block only
- C. Half scram only
- D. No RPS nor RC&IS trips

QUESTION RO 49

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #	2	
	Group #	1	
	K/A#	215005	K5.06
	Importance Rating	2.5	
<p>K&A: Knowledge of the operational implications of the following concepts as they apply to AVERAGE POWER RANGE MONITOR/LOCAL POWER RANGE MONITOR SYSTEM: Assignment of LPRM's to specific APRM channels.</p>			
Average Power Range Monitor/Local Power Range Monitor			
<p>Explanation: Answer A – With the Mode Switch in Startup/Standby and APRM B >15% a ½ scram is initiated on RPS B. Also, with < 14 LPRM inputs into APRM C a ½ scram is initiated on RPS A. This results in a full scram.</p> <p>B – Incorrect – Plausible since this is partially correct.</p> <p>C – Incorrect – Plausible since this is partially correct.</p> <p>B – Incorrect – Both RPS and RC&IS will respond to this APRM/LPRM configuration.</p>			
Technical Reference(s): ARI-H13-P680-06 Rev 9, ONI-C11-1 Rev 16		Reference Attached: ARI-H13-P680-06 p 39-40 & 57-58, ONI-C11-1 p 15	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-COMBINED-C51(AP_OPRM)-1.11			
Question Source:	Bank # Modified Bank # New	Perry Vision # 204696	
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: x			

QUESTION RO 50

The following conditions exist:

- A plant startup is in progress
- Reactor power 25%
- Reactor Recirculation Flow Control Valves are full open
- APRM A is in Bypass

Based on the above conditions, OPRM A receives a Core Flow signal from APRM (1) and if power oscillations occur, OPRM A (2) trip RPS.

	<u>(1)</u>	<u>(2)</u>
A.	C	will not
B.	E	will not
C.	C	will
D.	E	will

QUESTION RO 50

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #	2	
	Group #	1	
	K/A#	215005	A4.05
	Importance Rating	3.4	
K&A: Ability to manually operate and/or monitor in the control room: Trip bypasses.			
Average Power Range Monitor/Local Power Range Monitor (OPRM)			
<p>Explanation: Answer D – When an APRM is bypassed, the associated OPRM automatically receives a core flow signal from the other APRM in the same panel (A/E). The OPRM trip is enabled at > 23.3 % Rx power and drive flow < 63.5%.</p> <p>A – Incorrect – OPRM A receives input from APRM E when APRM A is bypassed. And the OPRM trips are enabled at this power/flow range. Plausible since APRMs A, C, E, & G are on RPS A side.</p> <p>B – Incorrect – The OPRM trips are enabled at this power/flow range.</p> <p>C – Incorrect – OPRM A receives input from APRM E when APRM A is bypassed. Plausible since APRMs A, C, E, & G are on RPS A side.</p>			
Technical Reference(s): SOI-C51(APRM) Rev. 19 and ARI-H13-P680-006-A2 Rev. 9		Reference Attached: SOI-C51(APRM) p 14 and ARI-H13-P680-006-A2 p 7	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-COMBINED-C51-AP_OPRM-1.12			
Question Source:	Bank # Perry 2010 # RO-40 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: x			

QUESTION RO 51

On a RCIC turbine startup:

The ramp generator function initiates upon opening of the (1) .

The ramp generator controls the position of (2) .

The names of the associated valves are listed below:

- 1E51-F013, RCIC INJECTION VALVE
- 1E51-F045, RCIC STEAM SHUTOFF
- 1E51-F510, RCIC TURB TRIP THRT V LATCH
- 1E51-F511, RCIC TURBINE GOVERNOR VALVE

	<u> (1) </u>	<u> (2) </u>
A.	1E51-F013	1E51-F510
B.	1E51-F013	1E51-F511
C.	1E51-F045	1E51-F510
D.	1E51-F045	1E51-F511

QUESTION RO 51

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #	2	
	Group #	1	
	K/A#	217000	A3.02
	Importance Rating	3.6	
K&A: Ability to monitor automatic operations of the REACTOR CORE ISOLATION COOLING SYSTEM (RCIC) including: Turbine startup.			
Reactor Core Isolation Cooling			
<p>Explanation: Answer D – The ramp generator initiates upon opening of the 1E51-F045 to prevent the turbine from overspeeding. Initially, the 1E51-F511 is full open. On startup, the ramp generator controls the F511 valve to control turbine speed for about 15 seconds while it spins up.</p> <p>E51-F510 – Plausible since this is the trip/throttle valve for the RCIC turbine.</p> <p>E51-F013 – Plausible since this valve also automatically opens on a turbine startup.</p>			
Technical Reference(s): SDM-E51 Rev. 13		Reference Attached: SDM-E51 p 22	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-COMBINED-E51-F.4 & G.2			
Question Source:	<div style="display: flex; justify-content: space-between;"> Bank # Modified Bank # </div> <div style="display: flex; justify-content: space-between;"> New x </div>		
Question History:	Previous 2 NRC Exams No		
Question Cognitive Level:	<div style="display: flex; justify-content: space-between;"> Memory or Fundamental Knowledge x </div> <div style="display: flex; justify-content: space-between;"> Comprehension or Analysis </div>		
10 CFR Part 55 Content:	<div style="display: flex; justify-content: space-between;"> 55.41 x </div> <div style="display: flex; justify-content: space-between;"> 55.43 </div>		
Comments: x			

QUESTION RO 52

A manual scram was inserted due to a leak in the Drywell.

The plant is operating in EOP-1, RPV Control.

The following conditions exist:

- RHR Pump A is in Suppression Pool Cooling
- RHR Pump B is tripped on overcurrent
- RHR C lined up for injection
- LPCS is running on minimum flow with injection valve closed
- Division 1 and 2 ADS LOGIC INHIBIT switches are in INHIBIT

Then a DBA LOCA occurs and Emergency Depressurization is directed.

Which of the following describes the method available to Emergency Depressurize?

- A. Arm and depress only Division 1 Manual Initiation pushbuttons
- B. Arm and depress only Division 2 Manual Initiation pushbuttons
- C. Arm and depress either Division 1 or 2 Manual Initiation pushbuttons
- D. Only the individual ADS - SRV control switches can be used to Emergency Depressurize

QUESTION RO 52

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #	2	
	Group #	1	
	K/A#	218000	A2.02
	Importance Rating	3.5	
<p>K&A: Ability to (a) predict the impacts of the following on the AUTOMATIC DEPRESSURIZATION SYSTEM; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Large break LOCA</p>			
<p>Automatic Depressurization</p> <p>Explanation: Answer C – Either Divisions logic will initiate ED. With RHR A in SP cooling and RHR C lined up for injection, the permissives for either Division are met.</p> <p>A – Incorrect – Plausible since the RHR A pump is running is SP Cooling.</p> <p>B – Incorrect – Plausible since RHR C is lined up for injection.</p> <p>D – Incorrect – Plausible since this method will always work, but it is not the only method available.</p>			
Technical Reference(s): EOP Bases Rev. 7, SDM-B21C Rev. 7, and SOI-B21 Rev. 20		Reference Attached: EOP Bases p 44, SDM-B21C p 22, and SOI-B21 pp. 19-20	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-COMBINED-B21C-N			
Question Source:	Bank # Modified Bank # New	Perry Vision # 204348	
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: x			

QUESTION RO 53

The plant was operating at rated power with SPCU in service transferring Suppression Pool water to Radwaste to lower Suppression Pool level from 18.15 ft. to 18.0 ft.

HPCS breaker is racked out for breaker testing.

Then a loss of feedwater occurs.

RCIC auto started and restored RPV level.

Only the Scram Hardcard Actions have been performed.

If no further operator actions are performed, what is the expected effect on plant or system parameters based on the above information?

- A. Drywell temperature is increasing
- B. Containment temperature is increasing
- C. CRD system flow decreased to zero gpm
- D. Suppression pool level continues to lower

QUESTION RO 53

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #	2	
	Group #	1	
	K/A#	223002	A1.02
	Importance Rating	3.7	
<p>K&A: Ability to predict and/or monitor changes in parameters associated with operating the PRIMARY CONTAINMENT ISOLATION SYSTEM/NUCLEAR STEAM SUPPLY SHUT-OFF controls including: Valve closures.</p>			
Primary Containment Isolation/Nuclear Steam Supply Shutoff			
<p>Explanation: Answer B – On a loss of FW, RPV level lowers. When RPV level lowers to L2, RCIC auto start and recover level. The Containment Vessel Chill Water containment isolation valves close at L2. Thus, with cooling lost to containment, the containment temperature would increase.</p> <p>A – Incorrect – Plausible as isolation of NCC to DW would occur at RPV L1. However, since HPCS and RCIC recovered RPV level, no indications or L1 were given.</p> <p>C – Incorrect – Plausible since the CRD pumps are fed from the Stub Buses and Stub Buses trip at L1.</p> <p>D – Incorrect – Plausible since SPCU was in-service prior to the transient. However the G42 SPCU pump suction valves isolate at L2</p>			
Technical Reference(s): OAI-1703 Rev. 35 and SOI-G42 Rev. 18		Reference Attached: OAI-1703 pp. 36-37 and SOI-G42 p 4	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-COMBINED-B21(NS4) (#s 8 & 21)			
Question Source:	Bank # Modified Bank # Grand Gulf 2011 # RO-66 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: x			

QUESTION RO 54

The plant was at rated power when Bus ED-1-B lost power.

Then, an MSIV isolation occurred.

In order to operate Safety/Relief Valves to control RPV pressure, operation of the individual SRV control switches on H13-P601 (1) work and operation of the individual SRV control switches on H13-P631 (2) work.

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

QUESTION RO 54

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #	2	
	Group #	1	
	K/A#	239002	K6.04
	Importance Rating	3	
K&A: Knowledge of the effect that a loss or malfunction of the following will have on the RELIEF/SAFETY VALVES: D.C. power: Plant-Specific.			
Safety Relief Valves			
<p>Explanation: Answer B – Individual control switches for the SRVs are located on H13-P601 and H13-P631. The SRVs have 2 solenoids, 1 powered from Div. 1 (A solenoid) and 1 powered from Div. 2. (B solenoid). Bus ED-1-B supplies power to the ‘B’ solenoid for the SRVs. The control switches on P631 control the B solenoids. Therefore, operation from P601 will work and operation from P631 will not work.</p> <p>A – Incorrect – Operation from P631 will not work.</p> <p>C – Incorrect – Operation from P601 will work and operation from P631 will not work.</p> <p>D – Incorrect – Operation from P601 will work.</p>			
Technical Reference(s): SDM-B21/ N11 Rev. 12 and DWGs 208-011 Sh. 4, Rev. H, Sh. 13 Rev. P, & Sh. 14 Rev. M		Reference Attached: SDM-B21/ N11 pp. 8 & 20-21 and DWGs 208-011 Sh. 4, Sh. 13, & Sh. 14	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-COMBINED-B21_N11-C			
Question Source:	Bank # Clinton 2010 # RO16 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: x			

QUESTION RO 55

The plant is operating at rated power with DFWCS in 3-E control.

If both speed sensors on RFPT 'A' fail to zero RPM, then RFPT 'A' ____.

- A. will trip
- B. speed will slowly increase
- C. speed will slowly decrease
- D. speed will remain the same

QUESTION RO 55

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #	2	
	Group #	1	
	K/A#	259002	K5.07
	Importance Rating	2.7	
<p>K&A: Knowledge of the operational implications of the following concepts as they apply to REACTOR WATER LEVEL CONTROL SYSTEM: Turbine speed control mechanisms: TDRFP.</p>			
Reactor Water Level Control			
<p>Explanation: Answer D – If both RFPT speed sensors are lost, then Digital Feedwater Control will use the last good speed signal in the Signal Memory Function (SMF) unit to hold RFPT speed stable.</p> <p>A – Incorrect – The RFPT will not trip. But plausible if the student thinks the RFPT will overspeed due to the loss of speed input to DFWCS.</p> <p>B – Incorrect – RFPT speed will remain unchanged.</p> <p>C – Incorrect – RFPT speed will remain unchanged.</p>			
Technical Reference(s): ARI-H13-P680-DFW Rev. 9 and Lesson Plan OTCOMBINEDN27 Rev. 8		Reference Attached: ARI-H13-P680-DFW p 34 and Lesson Plan OTCOMBINEDN27 pp. 26-27	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-COMBINED-N27 (#s 24 & 25)			
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: x			

QUESTION RO 56

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

- Annulus Exhaust Gas Treatment (AEGT) train 'A' in service
- Annulus Exhaust Gas Treatment (AEGT) train 'B' in standby

Rising drywell pressure due to a leak resulted in auto starting AEGT 'B' train.

The control switch for 1M15-C001B, AEGT FAN B is taken to STOP then placed in STANDBY.

The AEGT Fan B will stop, but will automatically start ____.

- A. if a low flow is sensed on AEGT Fan A
- B. if the annulus differential pressure is low
- C. due to the presence of the high drywell pressure signal
- D. on a HIGH alarm on D17K697, ANN EXH GAS rad monitor

QUESTION RO 56

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #	2	
	Group #	1	
	K/A#	261000	K4.01
	Importance Rating	3.7	
K&A: Knowledge of STANDBY GAS TREATMENT SYSTEM design feature(s) and/or interlocks which provide for the following: Automatic system initiation			
Standby Gas Treatment			
<p>Explanation: Answer A – A low flow (1550 SCFM) on the opposite AEGT fan will cause the standby AEGT fan to auto start, even if previously overridden off. The override function only applies to the RHR LOCA signal.</p> <p>B – Incorrect – Common misconception that the standby AEGT fan will start on low annulus Δp.</p> <p>C – Incorrect – The override signal will stay in place until the RHR LOCA signal is reset. Then a subsequent RHR LOCA signal can restart the fan.</p> <p>D – Incorrect – The radiation monitor only provides an alarm function.</p>			
Technical Reference(s): SDM-M15 Rev. 7		Reference Attached: SDM-M15 pp. 13-14	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-COMBINED-M15-F			
Question Source:	Bank # Perry Vision # 202198 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: x			

QUESTION RO 57

The plant was operating at rated power with all DC buses supplied by the Normal battery chargers.

Then a major electrical transient occurred causing a reactor scram.

A Plant Operator reports that Battery 1A is supplying Bus D-1-A with no battery chargers in service.

Based on this information which AC buses were lost?

- A. F-1-D and XH11
- B. F-1-D and XH12
- C. F-1-E and XH11
- D. F-1-E and XH12

QUESTION RO 57

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #	2	
	Group #	1	
	K/A#	262001	K3.03
	Importance Rating	2.9	
K&A: Knowledge of the effect that a loss or malfunction of the A.C. ELECTRICAL DISTRIBUTION will have on following: D.C. electrical distribution.			
AC Electrical Distribution			
<p>Explanation: Answer B – Charger FD-1-A (Normal charger for D-1-A battery) is powered from MCC F1D08 which is powered from Bus F-1-D. MCC F1D01 has an automatic throw-over to its alternate power supply which is Stub Bus XH12. A loss of both buses is necessary to lose power</p> <p>A – Incorrect – Stub Bus XH11 is not the alternate supply to F1D08. Plausible since there are 2 stub buses.</p> <p>C – Incorrect – Bus F-1-E and XH11 are not the power supplies to the charger.</p> <p>D – Incorrect – Bus F-1-E is not the power supply to the charger.</p>			
Technical Reference(s): DWGs 206-038 Rev. RRR & 206-052 Rev. DDD		Reference Attached: DWGs 206-038 & 206-052	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-COMBINED-R10 (#30) & OT-COMBINED-R42 (#2)			
Question Source:	Bank # Perry 2009 # RO-59 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: x			

QUESTION RO 58

A fire in the Control Room forced all personnel to abandon the Control Room.

A reactor scram could not be initiated prior to evacuating the Control Room.

Which of the following describes the preferred method for initiating a reactor scram, including the bases for this method?

Cycle the specified ____.

- A. ATWS UPS distribution panel breakers since this will not cause a MSIV closure
- B. RPS power distribution panel breakers since this will not cause a MSIV closure
- C. ATWS UPS distribution panel breakers since this will not cause a loss of LPRMs/APRMs
- D. RPS power distribution panel breakers since this will not cause a loss of LPRMs/APRMs

QUESTION RO 58

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #	2	
	Group #	1	
	K/A#	262002	K1.19
	Importance Rating	2.9	
<p>K&A: Knowledge of the physical connections and/or cause-effect relationships between UNINTERRUPTABLE POWER SUPPLY (A.C./D.C.) and the following: Power range neutron monitoring system: Plant-Specific.</p>			
Uninterruptable Power Supply (AC/DC)			
<p>Explanation: Answer A – Per a NOTE in ONI-C61, the preferred method to scram the Rx is to use the ATWS breakers since this method will not isolate the MSIVs. This causes a scram by causing ARPMS to be INOP.</p> <p>B – Incorrect – Cycling the RPS breakers will cause an MSIV isolation</p> <p>C – Incorrect – Cycling the ATWS breakers will de-energize the APRMs.</p> <p>D – Incorrect – Cycling RPS breakers is not the preferred method.</p>			
Technical Reference(s): ONI-C61 Rev. 9		Reference Attached: ONI-C61 p 5	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3035-13(LP)-A.2			
Question Source:	Bank # Perry 2010 # RO-56 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: x			

QUESTION RO 59

Which of the following identifies the power supply for the listed load?

	1N43-C007, <u>Turb Emg Bearing Oil Pump</u>	<u>RHR B/C Logic</u>	<u>Main Generator Trip Logic</u>
A.	D-1-A	ED-1-A	D-1-B
B.	D-1-B	ED-1-B	D-1-B
C.	D-1-A	ED-1-A	D-1-A
D.	D-1-B	ED-1-B	D-1-A

QUESTION RO 59

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #	2	
	Group #	1	
	K/A#	263000	K2.01
	Importance Rating	3.1	
K&A: Knowledge of electrical power supplies to the following: Major D.C. loads.			
DC Electrical Distribution			
<p>Explanation: Answer D – DC bus D1B supplies Emergency Bearing oil pump, D1A supplies the main generator trip logic, and ED1B supplies RHR B/C logic.</p> <p>A – Incorrect – All three power supplies are incorrect.</p> <p>B – Incorrect – D1B does not supply the main generator trip logic</p> <p>C – Incorrect – EBOP is supplied by D1B and RHR logic is supplied by ED-1-B.</p>			
Technical Reference(s): PDB-H002 Rev. 5, PDB-H004 Rev. 5, & PDB-H005 Rev. 4		Reference Attached: PDB-H002 p 12, PDB-H004 pp. 14, & PDB-H005 p 2	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-COMBINED-R42 (#s 4, 7, & 13)			
Question Source:	Bank # Modified Bank # New	Perry 2010 # RO-57	
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: x			

QUESTION RO 60

SVI-R43-T1318, Diesel Generator Start And Load Division 2, was performed as a post maintenance test for Division 2 DG.

Using the attached TRA computer printout, determine the Tech Spec Acceptability of the Div. 2 DG parameters.

Reference Provided:

Attachment Provided:

- A. Only Voltage is not acceptable.
- B. Only Frequency is not acceptable.
- C. Both Voltage and Frequency are acceptable.
- D. Both Voltage and Frequency are not acceptable.

QUESTION RO 60

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #	2	
	Group #	1	
	K/A#	264000	2.1.19
	Importance Rating	3.9	
K&A: Ability to use plant computers to evaluate system or component status.			
Emergency Generators (Diesel/Jet) EDG			
<p>Explanation: Answer B – Div.2 (and 1) DG must accelerate to ≥ 441 rpm and 58.5 HZ in ≤ 10 seconds. The plot shows both speed and frequency reach acceptable values at approximately 10.4 seconds.</p> <p>A – Incorrect – Voltage must be ≥ 3900 volts in ≤ 10 seconds. The plot shows voltage is acceptable at 7 seconds.</p> <p>C – Incorrect – Frequency is not acceptable since it does not reach 58.8 HZ (441 rpm) until 10.4 seconds.</p> <p>D – Incorrect – Voltage is acceptable since it is >3900 volts at 7 seconds.</p>			
Technical Reference(s): T.S. 3.8.1 Rev. Amend. 171, ARI-H13-P877-02 Rev. 16, and SVI-R43-T1318 Rev. 23		Reference Attached: T.S 3.8.1 p 3.8-7, ARI-H13-P877-02 p. 5, and SVI-R43-T1318 pp. 32-33	
Proposed references to be provided to applicants during examination: SVI-R43-T1318 (modified) and Attached Div. 2 DG TRA plot			
Learning Objective (As available): OT-COMBINED-R43_48-F.1 and -I.1			
Question Source:	<div style="display: flex; justify-content: space-between;"> Bank # Modified Bank # </div> <div style="display: flex; justify-content: space-between;"> New x </div>		
Question History:	<div style="display: flex; justify-content: space-between;"> Previous 2 NRC Exams No </div>		
Question Cognitive Level:	<div style="display: flex; justify-content: space-between;"> Memory or Fundamental Knowledge Comprehension or Analysis </div> <div style="display: flex; justify-content: space-between;"> x </div>		
10 CFR Part 55 Content:	<div style="display: flex; justify-content: space-between;"> 55.41 55.43 </div> <div style="display: flex; justify-content: space-between;"> x </div>		
Comments: x			

QUESTION RO 61

Which of the following will automatically trip on high lube oil temperature on a complete loss of Nuclear Closed Cooling?

- A. Control Complex Chiller B, P47-B001B
- B. Control Rod Drive Pump A, 1C11-C001A
- C. Reactor Recirculation Pump A, 1B33-C001A
- D. Unit 1 Instrument Air Compressor, 1P52-C001

QUESTION RO 61

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #	2	
	Group #	1	
	K/A#	300000	K4.03
	Importance Rating	2.8	
K&A: Knowledge of (INSTRUMENT AIR SYSTEM) design feature(s) and or interlocks which provide for the following: Securing of IAS upon loss of cooling water.			
Instrument Air			
<p>Explanation: Answer D – NCC cools the IAC lube oil. On a loss of NCC, lube oil will heat up to the trip setpoint.</p> <p>A – Incorrect – Control Complex Chiller B cooling water is supplied from ECC. Control Complex Chiller C is supplied from NCC.</p> <p>B – Incorrect – Control Rod Drive Pump does not automatically trip on high temp.</p> <p>C – Incorrect – Reactor Recirculation Pump does not automatically trip on high temp.</p>			
Technical Reference(s): ARI-H13-P680-007 Rev. 28, and ONI-P43 Rev. 14		Reference Attached: ARI-H13-P680-004 p 129, and ONI-P43 p 3	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-COMBINED-P43(#s 1 & 15) and OT-3035-A.1 & A.2			
Question Source:	<div style="display: flex; justify-content: space-between;"> Bank # Perry 2010 # RO-59 </div> <div style="display: flex; justify-content: space-between;"> Modified Bank # </div> <div style="display: flex; justify-content: space-between;"> New </div>		
Question History:	Previous 2 NRC Exams No		
Question Cognitive Level:	<div style="display: flex; justify-content: space-between;"> Memory or Fundamental Knowledge x </div> <div style="display: flex; justify-content: space-between;"> Comprehension or Analysis </div>		
10 CFR Part 55 Content:	<div style="display: flex; justify-content: space-between;"> 55.41 x </div> <div style="display: flex; justify-content: space-between;"> 55.43 </div>		
Comments: x			

QUESTION RO 62

The Unit 1 Instrument Air Compressor is running in LEAD.

Annunciator INST AIR COMP TRBL, (H13-P680-07-E11) alarms.

An NLO reports the following indications on U1 IAC:

1. Lube Oil Pressure is rising slowly
2. Final Discharge Air Pressure is lowering slowly
3. High Pressure Element Outlet Air Temperature is rising slowly
4. Inlet Air Filter ΔP is rising slowly

If the above trends continue which parameter would be the first to cause the Instrument Air Compressor to trip?

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

QUESTION RO 62

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #	2	
	Group #	1	
	K/A#	300000	A3.02
	Importance Rating	2.9	
K&A: Ability to monitor automatic operations of the INSTRUMENT AIR SYSTEM including: Air temperature.			
Instrument Air			
<p>Explanation: Answer C – A high HP Element Outlet Air Temperature of 428 °F will cause a compressor trip.</p> <p>A – Incorrect – The compressor will trip on low oil pressure of 17.4 psig, not high oil pressure.</p> <p>B – Incorrect – The Final Discharge Air Pressure is moving away from the trip condition.</p> <p>D – Incorrect – High Inlet Air Filter ΔP is alarm only and will not cause a trip.</p>			
Technical Reference(s): ARI-H13-P680-07 Rev. 28 and SOI-P51/52 Rev. 32		Reference Attached: ARI-H13-P680-07 p 129 and SOI-P51/52 p 24	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-COMBINED-P51_52 (# 12)			
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: x			

QUESTION RO 63

RCIC received an automatic start signal.

What ESW start sequence would you see in the Control Room?

- A. 20 seconds after RCIC starts the ESW discharge valve starts to open. When the ESW discharge valve reaches 5% open, the ESW pump starts.
- B. 28 seconds after RCIC starts the ESW discharge valve starts to open. When the ESW discharge valve reaches 10% open, the ESW pump starts.
- C. As soon as RCIC starts the ESW discharge valve starts to open. After opening the ESW discharge valve for 20 seconds, the ESW pump starts.
- D. As soon as RCIC starts the ESW discharge valve starts to open. After opening the ESW discharge valve for 28 seconds, the ESW pump starts.

QUESTION RO 63

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #	2	
	Group #	1	
	K/A#	400000	A4.01
	Importance Rating	3.1	
K&A: Ability to manually operate and / or monitor in the control room: CCW indications and control.			
Component Cooling Water			
<p>Explanation: Answer A – Approximately 20 seconds after a RCIC initiation, ESW receives a start signal. The ESW discharge valve will start to open. When it is 5% open the ESW pump will start.</p> <p>B – Incorrect – This is the time delay for the Div 3 (HPCS) ESW upon HPCS start. Also, 10% is the value for the HPCS ESW valve opening to start the HPCS ESW pump.</p> <p>C – Incorrect – If the ESW pump were taken to START, the sequence would start immediately. However, the 20 second time delay is on starting the valve opening, not starting the pump.</p> <p>C – Incorrect – If the ESW pump were taken to START, the sequence would start immediately. However, the 28 second time delay is on starting the valve opening for HPCS ESW, not starting the pump.</p>			
Technical Reference(s): SOI-P45/P49 Rev. 32		Reference Attached: SOI-P45/P49 pp. 13 & 22.	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-COMBINED-P45-F			
Question Source:	Bank # Modified Bank # Perry 2003 # RO-59 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: x			

QUESTION RO 64

Plant startup is in progress and currently at 25% power.

Control rod 30-31 is at position 14.

While attempting to WITHDRAW control rod 30-31, Drive Water Flow is observed to be 2.0 gpm.

The control rod 30-31 does not move.

The Rx engineer agrees to attempt to insert control rod 30-31 one notch.

While attempting to INSERT control rod 30-31, Drive Water Flow is observed to be 0.0 gpm.

Based on the above indications, Directional Control Valve ____ .

Reference provided:

- A. EP-122 is stuck closed
- B. EP-123 is stuck closed
- C. EP-122 is stuck open
- D. EP-123 is stuck open

QUESTION RO 64

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #	2	
	Group #	2	
	K/A#	201001	K3.03
	Importance Rating	3.1	
K&A: Knowledge of the effect that a loss or malfunction of the CONTROL ROD DRIVE HYDRAULIC SYSTEM will have on following: Control rod drive mechanisms.			
CRD Hydraulic			
<p>Explanation: Answer B – When a control rod is withdrawn, an insert signal is generated and DCVs 123 & 121 open to allow drive water to lift the index tube off the collet fingers. Then DCVs 122 & 120 open to allow rod withdrawal. When a control rod is inserted DCVs 123 & 121 open to allow rod insertion. If DCV 123 is stuck closed, no drive water flow is admitted to the CRDM and the rod will not move.</p> <p>A – Incorrect – If DCV 122 were stuck closed rod insertion would still be possible.</p> <p>C – Incorrect – If DCV 122 were open, Drive Water Flow would indicate > 0 gpm.</p> <p>D – Incorrect – If DCV 123 were open, Drive Water Flow would indicate > 0 gpm.</p>			
Technical Reference(s): SDM-C11(CRDH) Rev. 8 and DWG 302-872 Rev. EE		Reference Attached: SDM-C11(CRDH) pp. 5-6 and DWG 302-872	
Proposed references to be provided to applicants during examination: Drawing 302-872 (partial)			
Learning Objective (As available): OT-COMBINED-C11_CRDM-B			
Question Source:	Bank # Dresden 2001 # RO-01 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: x			

QUESTION RO 65

Plant startup is in progress with Rx water is being rejected to the main condenser via 1G33-F033, RWCU BLDWN TO CNDR/RW VALVE.

Which of the following conditions would cause G33-F033 to automatically close?

- A. Low upstream pressure
- B. Low downstream pressure
- C. High RWCU differential flow
- D. High Non-Regenerative Heat Exchanger outlet temperature

QUESTION RO 65

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #	2	
	Group #	2	
	K/A#	204000	K1.06
	Importance Rating	2.8	
K&A: Knowledge of the physical connections and/or cause-effect relationships between REACTOR WATER CLEANUP SYSTEM and the following: Main condenser			
Reactor Water Cleanup			
<p>Explanation: Answer A – A low upstream pressure condition (< 5 psig) cause 1G33-F033 to close to prevent vacuum dragging the RWCU system to the main condenser.</p> <p>B – Incorrect – Plausible since a high downstream pressure condition will isolate this valve to prevent over pressurizing RW piping.</p> <p>C – Incorrect – Plausible since a high Δ flow will cause the containment isolation valve in this line to isolate, but not the G33-F033.</p> <p>D – Incorrect – Plausible since a high NRHX outlet temp will cause a RWCU containment valve to isolate.</p>			
Technical Reference(s): ARI-H13-P680-01 Rev. 17 and SDM-G33 Rev. 10		Reference Attached: ARI-H13-P680-01 p 15 and SDM-G33 p 18	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-COMBINED-G33_G36-F.1			
Question Source:	Bank # Modified Bank # Perry Vision # 202523 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: x			

QUESTION RO 66

A loss of power from (1) will cause B21-N680A, REACTOR VESSEL LEVEL LOW – LEVEL 3 trip unit to fail (2) .

- | | <u>(1)</u> | <u>(2)</u> |
|----|------------|------------|
| A. | RPS A | as is |
| B. | ED-1-A | as is |
| C. | RPS A | down-scale |
| D. | ED-1-A | down-scale |

QUESTION RO 66

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #	2	
	Group #	2	
	K/A#	216000	K2.01
	Importance Rating	2.8	
K&A: Knowledge of electrical power supplies to the following: Analog trip system: Plant-Specific.			
Nuclear Boiler Instrumentation			
<p>Explanation: Answer C – RPS provides power to the Nuclear Boiler level and pressure instrumentation. Upon loss of power to a Rosemount trip unit, the trip unit will fail down-scale.</p> <p>A – Incorrect – Failing as is plausible, since the chart recorders will fail as is.</p> <p>B – Incorrect – ED-1-A is plausible as RPS provides power to DC power supplies for the NBPI and chart recorders will fail as is.</p> <p>D – Incorrect – ED-1-A is plausible as RPS provides power to DC power supplies for the NBPI</p>			
Technical Reference(s): PDB-I06 Rev. 5, DWGs 208-040-13 Rev. V & 208-040-15 Rev. W		Reference Attached: PDB-I06 p 45, DWGs 208-040-13 & 208-040-15	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-COMBINED-B21(INST)-1.2			
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: x			

QUESTION RO 67

IAW EOP-03 Secondary Containment Control Bases, before exceeding Fuel Pool Cooling and Cleanup (FPCC) heat exchanger outlet temperature of (1) , the Control Room will perform/direct (2) .

- | | <u> (1) </u> | <u> (2) </u> |
|----|----------------|---|
| A. | 135 °F | removal FPCC demineralizers to prevent resin breakdown |
| B. | 135 °F | opening Fuel Handling Building man doors to allow natural circulation |
| C. | 150 °F | removal FPCC demineralizers to prevent resin breakdown |
| D. | 150 °F | opening Fuel Handling Building man doors to allow natural circulation |

QUESTION RO 67

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #	2	
	Group #	2	
	K/A#	233000	2.4.18
	Importance Rating	3.3	
K&A: Knowledge of the specific bases for EOPs.			
Fuel Pool Cooling/Cleanup			
<p>Explanation: Answer A – IAW EOP-3 Bases, the FPCC demineralizers are removed from service prior to reaching 135 °F to prevent resin breakdown.</p> <p>B – Incorrect – Opening fuel handling building doors is done at 200 °F</p> <p>C – Incorrect – This is the temperature for shutting the plant down.</p> <p>D – Incorrect – This is the temperature for shutting the plant down. And opening fuel handling building doors is done at 200 °F.</p>			
Technical Reference(s): EOP-3 Bases Rev. 7		Reference Attached: EOP-3 pp. 53-54, 56, 58-59, & 61-62	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3402-17-D			
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: x			

QUESTION RO 68

A plant startup was in progress with the following conditions:

- RPV pressure is 940 psig
- Reactor power is 2%
- Main Turbine warm-up in progress

Then, power was lost to RPS Bus A.

The operator subsequently inserted a manual reactor scram and all control rods fully inserted.

During the transient the following conditions were observed:

- Reactor pressure lowered to 795 psig
- Reactor pressure is currently 935 psig and rising
- Condenser Vacuum is 20.5" HgA and degrading

Based on these conditions, the Outboard MSIVs are currently (1) .

Reactor pressure is being controlled using (2) .

- | | <u> (1) </u> | <u> (2) </u> |
|----|----------------|-----------------------|
| A. | shut | RCIC |
| B. | shut | SRVs |
| C. | open | SRVs |
| D. | open | Turbine Bypass Valves |

QUESTION RO 69

Power ascension is in progress following a refueling outage.

Reactor power is 50%.

It is observed that as Reactor power is increased, the difference between Reactor pressure and Turbine Throttle pressure (1).

Pressure input to the EHC system is (2).

- | | <u>(1)</u> | <u>(2)</u> |
|----|------------------|---------------------------|
| A. | becomes larger | reactor pressure |
| B. | becomes larger | turbine throttle pressure |
| C. | remains the same | reactor pressure |
| D. | remains the same | turbine throttle pressure |

QUESTION RO 69

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #	2	
	Group #	2	
	K/A#	241000	K5.04
	Importance Rating	3.3	
<p>K&A: Knowledge of the operational implications of the following concepts as they apply to REACTOR/TURBINE PRESSURE REGULATING SYSTEM: Turbine inlet pressure vs. reactor pressure.</p>			
Reactor/Turbine Pressure Regulating			
<p>Explanation: Answer B – The EHC system regulates Turbine Throttle pressure. As Rx pressure increases, the difference between Turbine Throttle pressure and Reactor pressure becomes larger based on frictional losses in the main steam lines. The EHC system senses pressure in the pressure averaging manifold immediately upstream of the turbine stop and control valves.</p> <p>A & C – Incorrect – 2nd part - Plausible since during Rx S/U and S/D, the EHC system is used to raise and lower reactor pressure.</p> <p>C & D – Incorrect – Plausible since at low power levels, the difference remains relatively small.</p>			
Technical Reference(s): SDM-N32 Rev. 6		Reference Attached: SDM-N32 pp. 15-16, 22-23, 121	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-COMBINED-N32_C85-A.2			
Question Source:	Bank # Modified Bank # New x		
Question History:	Previous 2 NRC Exams Perry 2017		
Question Cognitive Level:	Memory or Fundamental Knowledge x Comprehension or Analysis		
10 CFR Part 55 Content:	55.41 x 55.43		
Comments: x			

QUESTION RO 70

With the plant operating at 98% power, which of the following is the expected positions of the Main Turbine Control Valves?

	CV-1, CV-2, & CV-3	CV-4
A.	full open	closed
B.	throttled	throttled
C.	throttled	closed
D.	full open	throttled

QUESTION RO 70

Examination Outline Cross-Reference	Level:	RO	SRO								
	Tier #	2									
	Group #	2									
	K/A#	245000	A3.05								
	Importance Rating	3									
K&A: Ability to monitor automatic operations of the MAIN TURBINE GENERATOR AND AUXILIARY SYSTEMS including: Control valve operation.											
Main Turbine Generator/Auxiliary											
<p>Explanation: Answer D – Perry has a ‘partial arc admission’ control system where at 85% Rx power, CVs 1, 2, & 3 are ~85% open. At ~ 95% power CVs 1, 2, & 3 are full open. Between 85 to 100% Rx power, TCV #4 throttles. Therefore at 98% power, TCV #4 would be partially open and TCVs 1, 2, & 3 would be full open.</p> <p>A – Incorrect – Plausible since TCV #4 stays closed up to 85% Rx power.</p> <p>B – Incorrect – This would be true if Perry had a full arc admission control system.</p> <p>C – Incorrect – CVs 1, 2, & 3 would be full open. Plausible if operating less than 85% power with partial arc admission control system.</p>											
Technical Reference(s): SDM-N32/C85 Rev. 6		Reference Attached: SDM-N32/C85 p 69									
Proposed references to be provided to applicants during examination: None											
Learning Objective (As available): OT-COMBINED-N32_C85-C.1											
<table style="width: 100%; border: none;"> <tr> <td style="width: 30%;">Question Source:</td> <td style="width: 20%;">Bank #</td> <td style="width: 20%;">Modified Bank #</td> <td style="width: 30%;">River Bend 2008 # RO-61</td> </tr> <tr> <td></td> <td></td> <td>New</td> <td></td> </tr> </table>				Question Source:	Bank #	Modified Bank #	River Bend 2008 # RO-61			New	
Question Source:	Bank #	Modified Bank #	River Bend 2008 # RO-61								
		New									
<table style="width: 100%; border: none;"> <tr> <td style="width: 30%;">Question History:</td> <td style="width: 20%;">Previous 2 NRC Exams</td> <td style="width: 50%;">No</td> </tr> </table>				Question History:	Previous 2 NRC Exams	No					
Question History:	Previous 2 NRC Exams	No									
<table style="width: 100%; border: none;"> <tr> <td style="width: 30%;">Question Cognitive Level:</td> <td style="width: 40%;">Memory or Fundamental Knowledge</td> <td style="width: 30%;">x</td> </tr> <tr> <td></td> <td>Comprehension or Analysis</td> <td></td> </tr> </table>				Question Cognitive Level:	Memory or Fundamental Knowledge	x		Comprehension or Analysis			
Question Cognitive Level:	Memory or Fundamental Knowledge	x									
	Comprehension or Analysis										
<table style="width: 100%; border: none;"> <tr> <td style="width: 30%;">10 CFR Part 55 Content:</td> <td style="width: 20%;">55.41</td> <td style="width: 50%;">x</td> </tr> <tr> <td></td> <td>55.43</td> <td></td> </tr> </table>				10 CFR Part 55 Content:	55.41	x		55.43			
10 CFR Part 55 Content:	55.41	x									
	55.43										
Comments: x											

QUESTION RO 71

If Condensate Storage Tank (CST) level lowers to (1) gallons, annunciator CONDENSATE STORAGE TANK LEVEL LOW (H13-P870-02-F2) will alarm.

The operator will add water to the CST by (2) .

- | | <u>(1)</u> | <u>(2)</u> |
|----|------------|---|
| A. | 252,000 | throttling open 1P11-F110, CST ALTN SUP FROM MIXED BED WTR |
| B. | 308,000 | throttling open 1P11-F110, CST ALTN SUP FROM MIXED BED WTR |
| C. | 252,000 | placing controller 1N21-R012A, HOTWELL EMERGENCY DUMP TO CST CONTROL in MANUAL and throttle open 1N21-F010A |
| D. | 308,000 | placing controller 1N21-R012A, HOTWELL EMERGENCY DUMP TO CST CONTROL in MANUAL and throttle open 1N21-F010A |

QUESTION RO 71

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #	2	
	Group #	2	
	K/A#	256000	A2.14
	Importance Rating	3.3	
<p>K&A: Ability to (a) predict the impacts of the following on the REACTOR CONDENSATE SYSTEM; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations Low Condensate storage tank level.</p>			
<p>Condensate</p>			
<p>Explanation: Answer A – The normal CST M/U valve should control CST level between 282 and 308 Kgal. The Low CST Level alarm comes in at 252 Kgal. The Operator will use P11-F110 to add water to the CST.</p> <p>B – Incorrect – Plausible since 308 Kgal is the normal shutoff for the Normal M/U valve.</p> <p>C – Incorrect – Plausible since placing 1N21-R012A in manual and opening 1N21-F010 is done for a high HW level.</p> <p>D – Incorrect – Plausible since 308 Kgal is the normal shutoff for the Normal M/U valve and since placing 1N21-R012A in manual and opening 1N21-F010 is done for a high HW level.</p>			
Technical Reference(s): ARI-H13-P870-02 Rev. 7, SOI-P11 Rev. 14, and SOI-N21 Rev. 25		Reference Attached: ARI-H13-P870-02 p 27, SOI-P11 p 18, and SOI-N21 p. 12	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-COMBINED-P11 (#s 2 & 10)			
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: x			

QUESTION RO 72

The Plant is operating at 95% power.

The following valves failed closed and cannot be reopened.

- 1N25-F290A HEATER 6A DRN TO HTR 5A
- 1N25-F280A, HEATER 6A DRAIN TO CNDR

The appropriate ONI's have been entered.

If no operator action is taken, Reactor Power will initially ____.

- A. rise then return to the initial value
- B. rise then stabilize at a higher value
- C. lower then return to the initial value
- D. lower then stabilize at a lower value

QUESTION RO 72

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #	2	
	Group #	2	
	K/A#	259001	A1.06
	Importance Rating	2.7	
K&A: Ability to predict and/or monitor changes in parameters associated with operating the REACTOR FEEDWATER SYSTEM controls including: Feedwater heater level.			
Feedwater			
<p>Explanation: Answer B – Closing of 1N25-F280A and 1N25-F290A will isolate drain flow from the 6A FW heater. This will cause FW heater level to rise. When FW heater gets high enough, Extraction steam will isolate resulting in a loss of FW heating. This will put cooler water into the Rx and cause Rx power to increase. With no operator action (i.e. lower Rx power with Recirc flow) Rx power will remain above the initial power level.</p> <p>A – Incorrect – Rx power will not return to the initial value without operator intervention.</p> <p>C A – Incorrect – Rx power will rise due to a loss of FW heating not lower.</p> <p>D A – Incorrect – Rx power will rise due to a loss of FW heating not lower.</p>			
Technical Reference(s): ONI-N36 Rev. 18, ARI-H13-P870-05 Rev. 4, and GFE (Thermodynamics) Chapt. 5 Rev. 4		Reference Attached: ONI-N36 p 4, ARI-H13-P870-05 p 29, and GFE (Thermodynamics) Chapt. 5 p 15	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3302-05			
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: x			

QUESTION RO 73

The plant is operating at 95% power with the following conditions:

- Main condenser pressure is 3.3 inches HgA
- Offgas After Filter Flow is 30 SCFM and stable
- Outside ambient temperature is 73 °F and increasing slowly

If 1N71-F020B, CIRW PUMP B DISCH VLV, were to close, it is expected that Main condenser pressures will (1) and Offgas After Filter Flow will (2) .

- | | <u> (1) </u> | <u> (2) </u> |
|----|-----------------|-----------------|
| A. | increase | increase |
| B. | increase | remain the same |
| C. | remain the same | increase |
| D. | remain the same | remain the same |

QUESTION RO 73

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #	2	
	Group #	2	
	K/A#	271000	K6.11
	Importance Rating	3.2	
K&A: Knowledge of the effect that a loss or malfunction of the following will have on the OFFGAS SYSTEM: Condenser vacuum.			
Offgas			
<p>Explanation: Answer B – Closure of 1N71-F020B will result in a loss of Circ Water Pump B. With ambient temperature between 72 to 76 °F and Rx power >80% it is expected that condenser pressure will increase. Also, there was no indication of increased air in-leakage given. Therefore, Offgas flow would remain the same.</p> <p>A – Incorrect – Plausible if the loss of vacuum was due to an increase of air in-leakage into the condensers rather than ambient conditions.</p> <p>C – Incorrect – It is possible to increased air in-leakage causing increased Offgas flow while maintaining condenser vacuum stable. But with the given condition, this is incorrect.</p> <p>D – Incorrect – Plausible if operator does not connect the closure of the F020B valve with the loss of the pump.</p>			
Technical Reference(s): SOI-N64/62 Rev. 43, ARI-H13-P845-01 Rev. 15, and IOI-15 Rev. 32		Reference Attached: SOI-N64/62 p 85, ARI-H13-P845-01 p 107, and IOI-15 p 22	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-COMBINED-N64-H			
Question Source:	<div style="display: flex; justify-content: space-between;"> Bank # Modified Bank # </div> <div style="display: flex; justify-content: space-between;"> New x </div>		
Question History:	<div style="display: flex; justify-content: space-between;"> Previous 2 NRC Exams No </div>		
Question Cognitive Level:	<div style="display: flex; justify-content: space-between;"> Memory or Fundamental Knowledge Comprehension or Analysis </div> <div style="display: flex; justify-content: space-between;"> x </div>		
10 CFR Part 55 Content:	<div style="display: flex; justify-content: space-between;"> 55.41 55.43 </div> <div style="display: flex; justify-content: space-between;"> x </div>		
Comments: x			

QUESTION RO 74

The Halon fire suppression system for the Technical Support Center computer room received an initiation signal but has not yet discharged.

It has been confirmed that there is no fire in the TSC computer room.

In order to prevent a Halon discharge, depress and ____ .

- A. hold the ABORT pushbutton until the supervisory panel can be reset. The discharge timer will continue to count down to “00”
- B. release the ABORT pushbutton periodically until the supervisory panel can be reset. The discharge timer will reset each time
- C. hold the ABORT pushbutton until the supervisory panel can be reset. The discharge timer will immediately stop
- D. release the ABORT pushbutton. The discharge timer will immediately stop.

QUESTION RO 74

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #	2	
	Group #	2	
	K/A#	286000	K4.06
	Importance Rating	3.4	
K&A: Knowledge of FIRE PROTECTION SYSTEM design feature(s) and/or interlocks which provide for the following: Fire suppression capability that does not rely on the displacement of oxygen (Halon): Plant-Specific.			
Fire Protection			
Explanation: Answer C – The TSC Halon system Abort pushbutton must be held depressed to prevent a Halon discharge. Also, the TSC Halon count down will immediately stop. A – Incorrect – This is true for the Telephone Battery room Halon system. B – Incorrect – The countdown timer does not reset each time the Abort pushbutton is depressed. D – Incorrect – The Abort pushbutton does not seal-in. It must be held depressed.			
Technical Reference(s): SOI-P54(GAS) Rev. 9		Reference Attached: SOI-P54(GAS) pp. 47-48	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-COMBINED-P54_Halon-C			
Question Source:	Bank # Perry Vision # 204589 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: x			

QUESTION RO 75

The plant is at rated power with the following conditions:

- IOI-15, Seasonal Variations, actions for outside ambient air temperature $< 5^{\circ}\text{F}$ have been completed
- A failure of the Auxiliary Building Ventilation System supply air temperature controller has resulted in a trip of the Auxiliary Building Ventilation Supply Fan

Which statement describes the impact that this malfunction will have on plant operation?

- A. To prevent freezing of the cooling coils for the Steam Tunnel Cooling System, the coils will have to be drained.
- B. A plant shutdown will be required due to inability to maintain room air temperatures above the minimum required for operability of the ECCS components.
- C. A plant shutdown will be required due to inability to maintain room air temperatures below the maximum required for operability of the ECCS components.
- D. Elevated temperatures in the Reactor Water Cleanup pump and valve rooms may require a system shutdown in anticipation of automatic system isolation.

QUESTION RO 75

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #	2	
	Group #	2	
	K/A#	288000	K3.03
	Importance Rating	2.5	
K&A: Knowledge of the effect that a loss or malfunction of the PLANT VENTILATION SYSTEMS will have on following: Auxiliary building temperature: Plant-Specific.			
Plant Ventilation			
<p>Explanation: Answer D – Aux Bldg. Ventilation (M38) cools RWCU pump rooms. IAW SOI-M38/37 P&L 2.2, loss of Aux Bldg. ventilation can cause RWCU isolation.</p> <p>A – Incorrect – The Steam Tunnel Cooling System (M47) takes its suction on the Aux Building atmosphere which is expected to remain well above freezing due to heat generated from operating equipment.</p> <p>B – Incorrect – With the plant operating at rated conditions, Auxiliary Building temperatures are expected to remain well above freezing temperatures under the described condition.</p> <p>C – Incorrect – ECCS Pump Room Cooling System units can be run to maintain temperatures below any operability limits.</p>			
Technical Reference(s): SOI-M38/47 Rev 9		Reference Attached: SOI-M38/47 p 3	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-COMBINED-M38 (# 9)			
Question Source:	Bank # Perry 2009 # RO-73 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: x			

QUESTION SRO 1

A LOCA has occurred.

The crew is operating in EOP-1, RPV Control and EOP-2, Primary Containment Control
RPV water level is -50 inches and stable.

RPV pressure is 0 psig.

HPCS is injecting at 1500 gpm and is the only system available for injection.

Due to inclement weather, the TSC and EOF have not been made operational.

Based on this, the crew will enter _____.

- A. EOP-4-4, RPV Flooding and continue actions in EOP-1
- B. Severe Accident Management Guidance and continue actions in EOP-1
- C. EOP-4-1, Alternate Level/Pressure Control and discontinue actions of EOP-1
- D. Severe Accident Management Guidance and discontinue actions of all EOPs

QUESTION SRO 1

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #		3
	Group #		
	K/A#	Generic	2.1.23
	Importance Rating		4.4
K&A: Ability to perform specific system and integrated plant procedures during all modes of plant operation.			
Generic			
<p>Explanation: Answer D – Based on not being able to restore and maintain RPV level > 45", the SAMGs are entered. It is the responsibility of the Shift Manager to enter the SAMGs when the ERO has not yet responded.</p> <p>A – Incorrect – EOP-4-4 is entered when RPV water level cannot be determined. In this case RPV water level is given.</p> <p>B – Incorrect – EOP-1 actions are discontinued when the SAMGs are entered.</p> <p>C – Incorrect – EOP-4-1 would be entered, but EOP-1 would not be discontinued.</p>			
Technical Reference(s): EOP-1 Chart Rev H & EOP-1 Bases Rev 8		Reference Attached: EOP-1 Chart & EOP-1 Bases pp. 67-68	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3402-02-F.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>Comments: 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"> Knowledge of diagnostic steps and decision points in the emergency operating procedures (EOP) that involve transitions to event specific subprocedures or emergency contingency procedures. 			

QUESTION SRO 2

The plant is in end of cycle coast-down with the following conditions:

- Rx power is 96%
- All control rods are fully withdrawn
- Rx pressure is 1023 psig
- Core flow is 108 Mlbm/hr

Which of the following is an approved method of increasing Rx power during end of cycle coast-down?

- A. Raise the Pressure Regulator setpoint to 1030 psig IAW IOI-3, Power Changes.
- B. Raise Rx Recirculation flow to 110 Mlbm/hr IAW SOI-B33, Rx Recirculation System.
- C. Open 1N27-F135, HEATER 6A & 6B FDW BYPASS VLV, IAW SOI-N27, Feedwater.
- D. Isolate Extraction Steam to 2nd Stage Moisture Separator Reheaters IAW SOI-N11, Main And Reheat Steam.

QUESTION SRO 2

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #		3
	Group #		
	K/A#	Generic	2.1.43
	Importance Rating		4.3
K&A: Ability to use procedures to determine the effects on reactivity of plant changes, such as reactor coolant system temperature, secondary plant, fuel depletion, etc.			
Generic			
<p>Explanation: Answer C – Opening the #6 FW heater bypass valve lowers final FW temperature and results in about a 24 MwT increase in Rx power and is the only approved method for raising Rx power at the end of cycle under the listed conditions.</p> <p>A – Incorrect - The top end of the Rx pressure band is 1025 psig per IOI-3.</p> <p>B – Incorrect – Rx Recirculation flow is limited to 109.2 Mlbm/hr per IOI-3</p> <p>D – Incorrect – Steam to 2nd stage reheaters is not removed until the generator output is < 813 MwE, which is much lower than 96% Rx power. Additionally, with the recent installation of mono-block rotors, removing 2nd stage reheaters do not result in an increase in reactivity.</p>			
Technical Reference(s): IOI-3 Rev 71 and SOI-N27 Rev 57		Reference Attached: IOI-3 pp. 6, 21, & 84 and SOI-N27 pp. 103-104	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-COMBINED-N27 (#62)			
Question Source:	Bank # Modified Bank # Fermi 2008 # SRO-94 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>Comments: 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"> Knowledge of when to implement attachments and appendices, including how to coordinate these items with procedure steps. (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) 			

QUESTION SRO 3

The Reactor Coolant System Pressure Safety Limit requires reactor steam dome pressure to be \leq (1) psig, and is limited by the (2) .

- | | <u>(1)</u> | <u>(2)</u> |
|----|------------|-------------------------------|
| A. | 1325 | RPV Feedwater Nozzles |
| B. | 1325 | Reactor Recirc Suction piping |
| C. | 1375 | RPV Feedwater Nozzles |
| D. | 1375 | Reactor Recirc Suction piping |

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QUESTION SRO 3

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #		3
	Group #		
	K/A#	Generic	2.2.25
	Importance Rating		4.2
K&A: Knowledge of the bases in Technical Specifications for limiting conditions for operations and safety limits.			
Generic			
<p>Explanation: Answer B – Per TS Safety Limit 2.1.2, Rx steam dome pressure is required to be ≤ 1325 psig. The TS bases states that the RPV is designed to an ASME code which permits a maximum pressure transient of 110% (1375 psig) of design pressure (1250 psig). The safety limit value of 1325 psig as measured at the steam dome is equivalent to 1375 psig at the lowest elevation of the RPV. The Reactor Recirc suction piping is the limiting component. The pressure safety limit is selected to be the lowest transient overpressure allowed by the applicable code.</p> <p>A – Incorrect – The pressure is correct. However, the FW nozzles are not the limiting component. They are mentioned in the bases, but the bases states that a weld repair on the FW nozzles did not affect the max transient pressure limit.</p> <p>C – Incorrect – The pressure is plausible since it is the max transient pressure as felt at the lowest point in the RPV. However, the pressure is measured at the steam dome.</p> <p>D – Incorrect – See A & C explanation.</p>			
Technical Reference(s): TS 2.1.2 Rev. AMD-176 and TS 2.1.2 Bases Rev 4		Reference Attached: TS 2.1.2 p 2.0-1 and TS 2.1.2 Bases p B 2.0-8	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3037-03-G			
Question Source:	Bank # Modified Bank # Columbia 2015 # SRO-22 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.2		
Comments: SRO Justification: Facility operating limitations in the TS and their bases. [10 CFR 55.43(b)(2)] <ul style="list-style-type: none"> Knowledge of TS bases that are required to analyze TS required actions and terminology. 			

QUESTION SRO 4

The plant is shutdown with RHR Shutdown Cooling loop A in operation.

IAW OAI-0201, Operating Practices, when does manipulation of the RHR A system require Shift Manager or Unit Supervisor oversight?

- A. At all times.
- B. Only in Mode 3
- C. When any reference leg backfill system out of service.
- D. Only in Mode 5 with RPV level < 22' 9" above the RPV flange.

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QUESTION SRO 4

Examination Outline Cross-Reference	Level:	RO	SRO												
	Tier #		3												
	Group #														
	K/A#	Generic	2.2.14												
	Importance Rating		4.3												
K&A: Knowledge of the process for controlling equipment configuration or status.															
Generic															
<p>Explanation: Answer C – IAW OAI-0201, Section 4.2.2, anytime a reference leg backfill system is OOS, valve alignments and system manipulations on the RHR system must be supervised by the US/SM when the E12-F008 and E12-F009 valves (SDC Suctions) are open.</p> <p>A – Incorrect – Plausible since all system manipulations are peer checked.</p> <p>B – Incorrect – Plausible since the SM/US shall ensure other valve manipulations with OPDRV are not performed in Mode 3.</p> <p>D – Incorrect – Plausible since TS require an RHR system in operation with RPV level < 22' 9" above the RPV flange.</p>															
Technical Reference(s): OAI-0201 Rev 46		Reference Attached: OAI-0201 p 13													
Proposed references to be provided to applicants during examination: None															
Learning Objective (As available): OT-3039-01-F															
<table style="width: 100%; border: none;"> <tr> <td style="width: 30%;">Question Source:</td> <td style="width: 20%;">Bank #</td> <td style="width: 20%;"></td> <td style="width: 30%;"></td> </tr> <tr> <td></td> <td>Modified Bank #</td> <td></td> <td></td> </tr> <tr> <td></td> <td>New</td> <td style="text-align: center;">x</td> <td></td> </tr> </table>				Question Source:	Bank #				Modified Bank #				New	x	
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	Comprehension or Analysis														
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10 CFR Part 55 Content:	55.41														
	55.43	b.3													
<p>Comments: 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"> Facility licensee procedures required to obtain authority for design and operating changes in the facility. [10 CFR 55.43(b)(3)] <p>Unique SRO ONLY Task: 341-581-04-02 Comply with compensatory measures dealing with valve alignments and maintenance activities' that have a potential to drain the RPV.</p>															

QUESTION SRO 5

The following conditions exist:

- The plant start-up from a forced outage is in progress IAW IOI-1, Cold Startup.
- The plant is operating with a known fuel leak.
- Reactor Power is on range 8 of the IRM's.
- Main condenser vacuum is being maintained between 4" HgA and 5" HgA using the mechanical vacuum pumps.
- Annunciator H13-P680-07-A10, AIRBORNE RAD P804 alarmed.
- Radiation monitor OG VENT PIPE GAS, D17-K836 exceeded the HIGH alarm setpoint.

The Unit Supervisor will enter (1) and direct (2) .

	<u> (1) </u>	<u> (2) </u>
A.	ONI-N11, Pipe Break Outside Containment	stopping the Mechanical Vacuum Pump IAW SOI-N64/62 Off-Gas/Condenser Air Removal System
B.	ONI-D17, High Radiation levels Within Plant	stopping the Mechanical Vacuum Pump IAW SOI-N64/62 Off-Gas/Condenser Air Removal System
C.	ONI-N11, Pipe Break Outside Containment	isolating the Main Steam Lines IAW SOI-B21 Nuclear Steam Supply Shutoff, Automatic Depressurization And Nuclear Steam Supply Systems
D.	ONI-D17, High Radiation levels Within Plant	isolating the Main Steam Lines IAW SOI-B21 Nuclear Steam Supply Shutoff, Automatic Depressurization And Nuclear Steam Supply Systems

QUESTION SRO 5

Examination Outline Cross-Reference

K&A: Ability to control radiation releases.

Generic

Explanation: **Answer B** – IAW ONI-D17, the US should direct the stopping the MVP's when the OG Vent pipe rad monitor exceeds the HIGH alarm setpoint.

A – Incorrect – ONI-N11 is the wrong procedure to enter. This is for a pipe break. No indications of a pipe break were given in the stem. The second part contains the correct action.

C – Incorrect - ONI-N11 is the wrong procedure to enter. This is for a pipe break. No indications of a pipe break were given in the stem. The second part contains the wrong action of closing the main steam lines.

D – Incorrect – the first part is correct, but the second part contains the wrong action of closing the main steam lines.

Technical Reference(s): ONI-D17 Rev 19 and ARI-H13-P680-07 Rev 28

Reference Attached: ONI-D17 pp 3 & 7 and ARI-H13-P680-07 p 15

Proposed references to be provided to applicants during examination: None

Learning Objective (As available): OT-COMBINED-D17A-L

Question Source:	Bank #	Perry 2013 # SRO-05
	Modified Bank #	
	New	

Question History: Previous 2 NRC Exams No Perry 2013

Question Cognitive Level: Memory or Fundamental Knowledge
Comprehension or Analysis x

10 CFR Part 55 Content: 55.41
55.43 b.4

Comments: SRO Justification: Radiation hazards that may arise during normal and abnormal situations, including maintenance activities and various contamination conditions. [10 CFR 55.43(b)(4)]

- Analysis and interpretation of radiation and activity readings as they pertain to selection of administrative, normal, abnormal, and emergency procedures.

QUESTION SRO 6

An ALERT was declared by the Shift Manager.

Emergency Coordinator duties remain with the Shift Manager who is ready to terminate from event.

The Shift Manager is responsible to terminate the event ____.

- A. without consultation
- B. after consulting with the NRC only
- C. after consulting with the State and local counties only
- D. after consulting with the NRC, State of Ohio, and local counties

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QUESTION SRO 6

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #		3
	Group #		
	K/A#	Generic	2.4.38
	Importance Rating		4.4
K&A: Ability to take actions called for in the facility emergency plan, including supporting or acting as emergency coordinator if required.			
Generic			
<p>Explanation: Answer D – The Emergency Coordinator is responsible for Termination of all E-plan events. Per EPI-A2, for E-plan events classified as an ALERT or higher, the EC will consult with the NRC, State of Ohio, and the local counties.</p> <p>A – Incorrect – Plausible since Termination from an Unusual Event <u>may</u> be done without consultation.</p> <p>B – Incorrect – Plausible since there is a step in EPI-A2 to notify the NRC of the termination.</p> <p>C – Incorrect – Plausible since there is a step in EPI-A2 to perform an Initial Notification to the State and local counties of the termination.</p> <p>Plausibility – ALERT classification of HA1.1 could be entered and exited in short duration.</p>			
Technical Reference(s): EPI-A2 Rev.22		Reference Attached: EPI-A2 pp. 12 & 16	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): EPL-0804-01-23			
Question Source:	Bank # Perry 2009 # SRO-25 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 55.43 b.unique		
Comments: Justification for Plant Specific Exemptions- knowledge/ability “unique to the SRO position. SRO Specific task 344-531-05-02, Direct Emergency Response as the Site Emergency Coordinator (E-Plan)			

QUESTION SRO 7

A loss of offsite power occurred several hours ago.

All Divisional diesel generators started and are currently carrying their buses.

Off-site power will be restored no sooner than 2 hours.

Current conditions are:

- ED-1-A Voltage 100 VDC
- ED-1-B Voltage 0 VDC
- ED-1-C Voltage 90 VDC
- RHR A & B are running in Suppression Pool Cooling with Suppression Pool temperature rising slowly.

The Unit Supervisor should direct the ROs to ____.

- A. maintain all diesel generators running
- B. shutdown Division 2 diesel generator IAW ONI-R42-2, Loss of DC Bus ED-1-B
- C. shutdown Division 2 & 3 diesel generators IAW the appropriate ONI- R42_, Loss of DC Bus ED-1-__
- D. shutdown Division 1, 2, & 3 diesel generators IAW the appropriate ONI-R42_, Loss of DC Bus ED-1-__

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QUESTION SRO 7

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #		3
	Group #		
	K/A#	Generic	2.4.11
	Importance Rating		4.2
K&A: Knowledge of abnormal condition procedures.			
Generic			
<p>Explanation: Answer A – Entry into ONI-R42-2 is required with Div 2 DC bus voltage at 0 VDC. IAW ONI-R42-2, a diesel generator should only be secured if it is NOT needed for emergency power. In this case, with RHR A & B running in SP Cooling and SP temperature still rising, if the Div. 2 DG is tripped, SP temperature will rise faster.</p> <p>B – Incorrect – Div. 2 DG should be shutdown if it is NOT need to supply emergency power since the associated DC bus has lost power. Since SP temperature is rising, it is needed.</p> <p>C – Incorrect – Plausible since the bus voltage on ED-1-C is low and lower than Div 1 DC Bus.</p> <p>D – Incorrect – Plausible since the bus voltage on all 3 divisions is low.</p>			
Technical Reference(s): ONI-R42-1, Rev. 7, ONI-R42-2 Rev. 7, & ONI-R42-3 Rev 6		Reference Attached: ONI-R42-1, p 3, ONI-R42-2 p 3, & ONI-R42-3 p 3	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3035-05(LP)-A.2			
Question Source:	<div style="display: flex; justify-content: space-between;"> Bank # Modified Bank # </div> <div style="display: flex; justify-content: space-between;"> New x </div>		
Question History:	<div style="display: flex; justify-content: space-between;"> Previous 2 NRC Exams No </div>		
Question Cognitive Level:	<div style="display: flex; justify-content: space-between;"> Memory or Fundamental Knowledge Comprehension or Analysis </div> <div style="display: flex; justify-content: space-between;"> x </div>		
10 CFR Part 55 Content:	<div style="display: flex; justify-content: space-between;"> 55.41 55.43 </div> <div style="display: flex; justify-content: space-between;"> b.5 </div>		
<p>Comments: 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"> Knowledge of when to implement attachments and appendices, including how to coordinate these items with procedure steps. 			

QUESTION SRO 8

A loss of off-site power occurred several hours ago.

The Mode Switch is in SHUTDOWN and all control rods are inserted

Current RPV temperature is 380 °F

Off-site power should be restored in an hour.

At 0930, a seismic event occurred and the ATC informed the US that ED-1-A and ED-1-B buses indicated 110 VDC with voltages continuing to lower.

Current time is 0937.

Based on the above information:

- 1) What is the Emergency Plan Classification for this condition?
and
- 2) What is the latest time the E-Plan classification declaration can be made?

Reference Provided:

	<u>1</u>	<u>2</u>
A.	Alert	0945
B.	Alert	1000
C.	Site Area Emergency	0945
D.	Site Area Emergency	1000

QUESTION SRO 8

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #		1
	Group #		1
	K/A#	295004	2.4.41
	Importance Rating		4.6
K&A: Knowledge of the emergency action level thresholds and classifications.			
Partial or Total Loss of DC Power			
<p>Explanation: Answer C – With a LOOP occurring and off-site source of power restoration an hour away, there is no possibility of restoring DC Bus voltages within the next 8 minutes. Note 1 directs the EC to promptly declare the event upon determining that the time limit has been or will likely be exceeded. EPI-A1 says the Classification Clock starts at time of discovery (0930). With RCS temperature at 380 °F the plant is in Mode 3 and Systems Malfunctions (S) portion of the EAL Matrix is used to determine that an SAE (SS2.1) must be declared.</p> <p>A – Incorrect – Plausible because a seismic that affects a Safety System needed for the current operating mode would result in an ALERT (SA8.1) classification.</p> <p>B – Incorrect – Plausible because a seismic that affects a Safety System needed for the current operating mode would result in an ALERT (SA8.1) classification and waits 15 minutes to determine if voltage can be restored.</p> <p>D – Incorrect – Plausible if the candidate waits 15 minutes to determine if voltage can be restored.</p>			
Technical Reference(s): EAL Matrix Rev. 1/3/17 & EPI-A1 Rev. 28		Reference Attached: EAL Matrix & EPI-A1 p 11	
Proposed references to be provided to applicants during examination: EAL Classification Matrix			
Learning Objective (As available): EPL-0804-01-4			
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	
Comments: 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"> Knowledge of when to implement attachments and appendices, including how to coordinate these items with procedure steps. 			

QUESTION SRO 9

The plant was operating at 90% power.

At 1200 on June 2, I&C commenced Surveillance SVI-C71-T0046, TURBINE STOP VALVE CLOSURE AND TURBINE CONTROL VALVE FAST CLOSURE CHANNEL FUNCTIONAL FOR 1C71-N006A, B, C, D, E, F, G, H AND 1C71-N005A, B, C, D.

At 1400 on June 2, the Unit Supervisor signed the SVI for RPS channel C INOPERABILITY.

At 1600 on June 2, Turbine Control Valve #1 failed to initiate a half scram signal to RPS when tested.

The Technical Specification Required Action is to place channel in trip by (1) on June 3.
The Bases of the Turbine Control Valve closure scram is to ensure the (2) .

Reference Provided:

	<u> (1) </u>	<u> (2) </u>
A.	0400	Minimum Critical Power Ratio (MCPR) Safety Limit is not exceeded
B.	0400	fuel peak cladding temperature remains below the limits of 10CRF50.46
C.	0800	Minimum Critical Power Ratio (MCPR) Safety Limit is not exceeded
D.	0800	fuel peak cladding temperature remains below the limits of 10CRF50.46

QUESTION SRO 9

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #		1
	Group #		1
	K/A#	295005	AA2.03
	Importance Rating		3.1
K&A: Ability to determine and/or interpret the following as they apply to MAIN TURBINE GENERATOR TRIP: Turbine valve position.			
Main Turbine Generator Trip			
<p>Explanation: Answer A – On a turbine trip with Rx power > 38%, the Turbine Control valves generate a Rx scram signal when they go closed. Testing of the Control Valves includes cycling the TCV to ensure a ½ scram signal is generated when each valve's pressure < 465 psig (TS value). Time of Discovery of an INOP condition starts the clock for Required Actions. In this case, Time of Discovery was 1600. RA is to place channel in trip within 12 hours. The bases of the TCV closure scram is to prevent exceeding the MCPR safety limit.</p> <p>B & D – Incorrect – The TS bases of the TCV scram is to not exceed MCPR</p> <p>C & D – Incorrect – The Required Actions must be completed within 12 hours of time of discovery – this answer is plausible if candidate believes that the 6-hour note for surveillance testing applies to completing the Required Actions</p>			
Technical Reference(s): TS 1.3 & TS 3.3.1.1 Rev. Amend. 69 & TS Bases 3.3.1.1 Rev. 3 PDB-R02 Rev. 4		Reference Attached: TS 1.3 p 1.0-11, TS 3.3.1.1 pp. 3.3-1, -3, -4, & -9 and TS Bases pp. B-3.3-14 & -18 and PDB-R02 p 6	
Proposed references to be provided to applicants during examination: TS 3.3.1.1 Partial-Modified			
Learning Objective (As available): OT-3037-02-E			
Question Source:	Bank # Perry 2010 # SRO-10 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 55.43 b.2		
Comments: SRO Justification: Facility operating limitations in the TS and their bases. [10 CFR 55.43(b)(2)] <ul style="list-style-type: none"> Application of Required Actions (Section 3) and Surveillance Requirements (SR) (Section 4) in accordance with rules of application requirements (Section 1). Knowledge of TS bases that are required to analyze TS required actions and terminology. 			

QUESTION SRO 10

The plant was operating at 75% power when the following annunciator alarmed:

NCC PUMP DISCH HEADER PRESSURE LOW (H13-P970-02-B1)

Refer to the attached picture of panel H13-P970.

Based on the indications provided, which action will the US direct?

Attachment Provided:

- A. Starting a standby NCC pump IAW ONI-P43, Loss Of Nuclear Closed Cooling.
- B. Shutting down Reactor Recirc Pumps IAW SOI-B33, Reactor Recirculation System.
- C. Cooling the Fuel Pool Heat Exchanger with ESW IAW SOI-G41(FPCC), Fuel Pool Cooling And Cleanup System.
- D. Adjusting NCC System Flow to support One NCC Pump operation IAW ONI-P43, Loss Of Nuclear Closed Cooling.

QUESTION SRO 10

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #		1
	Group #		1
	K/A#	295018	2.2.44
	Importance Rating		4.4
<p>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.</p>			
Partial or Complete Loss of CCW			
<p>Explanation: Answer D – IAW ONI-P43 Section 4.1, if only 1 NCC pump is running and a standby pump is not available, then, the operator is to adjust NCC system flow to support 1 pump operation. The picture indicates 1 NCC pump running, 1 NCC pump tagged out, and 1 NCC pump with control power not available.</p> <p>A – Incorrect – This would be the correct answer for a partial or complete loss of NCC flow if a standby pump were available.</p> <p>B – Incorrect – This is the correct answer for a complete loss of NCC flow.</p> <p>C – Incorrect – This would be a correct action for a complete loss of NCC were to occur.</p>			
Technical Reference(s): ONI-P43 Rev. 14		Reference Attached: ONI-P43 pp. 3, 5-7	
Proposed references to be provided to applicants during examination: Attached Picture of H13-P970 (partial)			
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.5		
<p>Comments: 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"> Knowledge of when to implement attachments and appendices, including how to coordinate these items with procedure steps. 			

QUESTION SRO 11

A transient occurred. Current plant conditions as follows:

- After a scram, three control rods failed to fully insert
- RPV level is 120 inches and rising
- RPV pressure is 700 psig
- MSIV's isolated
- Containment temperature is 86 °F
- Containment pressure is 0.2 psig
- Appropriate EOPs have been entered

Then, the RO reports the following:

- Drywell temperature is 150 °F and rising
- Drywell Pressure is 2.1 psig and rising

Based on these conditions, the next action the US would direct is to _____.

Reference Provided:

- A. Re-enter EOP-1, RPV Control
- B. Transition to EOP-4-4 RPV Flooding
- C. Anticipate Emergency Depressurization
- D. Transition to EOP-4-2, Emergency Depressurization

QUESTION SRO 11

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #		1
	Group #		1
	K/A#	295024	EA2.02
	Importance Rating		4
K&A: Ability to determine and/or interpret the following as they apply to HIGH DRYWELL PRESSURE: Drywell temperature.			
High Drywell Pressure			
<p>Explanation: Answer A – Based on the DW Pressure and temperature, EOP-2 would be entered. In the DW temperature leg of EOP-2, the SRO is directed to enter EOP-1 prior to DW temperature reaching 330 °F. Of the choices provided, this is the next one to be performed.</p> <p>B – Incorrect – Based on the combination of DW pressure and temperature, RPV level indication would not be lost. Therefore transition to EOP-4-4 is not appropriate.</p> <p>C – Incorrect – AED used the MT B/P valves to lower RPV pressure. AED is not appropriate with control rods out. Also, it is not possible with MSIVs shut.</p> <p>D – Incorrect – This is the correct action once EOP-1 has been entered and it is determined that DW temperature cannot be maintained < 330 °F.</p>			
Technical Reference(s): EOP-2 Chart Rev. F and EOP Bases Rev. 7		Reference Attached: EOP-2 Chart and EOP Bases p. 29	
Proposed references to be provided to applicants during examination: EOP-02 Chart (partial-modified)			
Learning Objective (As available): OT-3402-08-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		
Comments: 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"> Knowledge of diagnostic steps and decision points in the emergency operating procedures (EOP) that involve transitions to event specific subprocedures or emergency contingency procedures. 			

QUESTION SRO 12

With the plant at rated power, the minimum total number of SRV required to have the Safety and/or Relief functions OPERABLE is (1) ?

And, IAW Tech Spec Bases, the overpressure event that bounds the number of OPERABLE SRVs is the (2) followed by a Rx scram.

- | | <u> (1) </u> | <u> (2) </u> |
|----|----------------|--------------------------|
| A. | 7 | Generator Load Rejection |
| B. | 13 | Generator Load Rejection |
| C. | 7 | MSIV closure |
| D. | 13 | MSIV closure |

QUESTION SRO 12

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #		1
	Group #		1
	K/A#	295025	2.2.40
	Importance Rating		4.7
K&A: Ability to apply Technical Specifications for a system.			
High Reactor Pressure			
<p>Explanation: Answer D – IAW TS 3.4.4, the Safety Function of 7 SRVs and the Relief of 6 additional SRVs must be Operable. Per TS 3.4.4 bases, the limiting overpressure event is the MSIV isolation with a Rx scram.</p> <p>A – Incorrect – This is the required number of SRVs that must have the Safety function only Operable. Additionally, the basis is plausible as this is correct for the EOC-RPT trip (TSV closure and TCV fast closure).</p> <p>B – Incorrect – This basis is plausible as this is correct for the EOC-RPT trip (TSV closure and TCV fast closure).</p> <p>C – Incorrect – This is the required number of SRVs that must have the Safety function only Operable.</p>			
Technical Reference(s): TS 3.4.4 Rev. Amend. 175 and TS 3.4.4 Bases Rev. 7		Reference Attached: TS 3.4.4 p. 3.4-10 and TS 3.4.4 Bases p. B 3.4-19	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3037-08-B -C			
Question Source:	Bank # Modified Bank # Brunswick 2010 # 81 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 55.43 b.2		
Comments: SRO Justification: Facility operating limitations in the TS and their bases. [10 CFR 55.43(b)(2)] <ul style="list-style-type: none"> Knowledge of TS bases that are required to analyze TS required actions and terminology. 			

QUESTION SRO 13

The plant was at rated power when a transient occurred.

The current plant conditions are as follows:

- Rx power 3%
- RPV level 75 inches
- RPV pressure 810 psig
- Suppression Pool level 19.2 feet
- Suppression Pool temperature 121 °F

Based on these conditions, HCL (1) been exceeded.
The Unit Supervisor should direct (2) .

Reference Provided:

- | | <u>(1)</u> | <u>(2)</u> |
|----|------------|---------------------------------------|
| A. | has | EOP-SPI 3.2 SPMU Initiation |
| B. | has | Anticipate ED per EOP-01, RPV Control |
| C. | has not | EOP-SPI 3.2 SPMU Initiation |
| D. | has not | Anticipate ED per EOP-01, RPV Control |

QUESTION SRO 13

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #		1
	Group #		1
	K/A#	295026	EA2.01
	Importance Rating		4.2
K&A: Ability to determine and/or interpret the following as they apply to SUPPRESSION POOL HIGH WATER TEMPERATURE: Suppression pool water temperature.			
Suppression Pool High Water Temperature			
Explanation: Answer C – Using EOP-SPI Supplement Fig 4, the values given do not exceed HCL. The US would direct SPMU to raise SP level and add additional heat capacity to the Suppression Pool. A – Incorrect – HCL has not been exceeded. Plausible if Candidate uses Fig 4a (Hi RPV Level) HCL curve. B – Incorrect – HCL has not been exceeded. Plausible if Candidate uses Fig 4a (Hi RPV Level) HCL curve. Also, AED is directed from EOP-2 if unable to maintain below HCL. However, AED not allowed with Rx at power. C – Incorrect – AED is directed from EOP-2 if unable to maintain below HCL. However, AED not allowed with Rx at power.			
Technical Reference(s): EOP-SPI Supplement Rev. 8, EOP-2 Chart Rev. F, and EOP-01 Bases Rev. 8		Reference Attached: EOP-SPI Supplement pp. 8-9, EOP-2 Chart (partial), and EOP-01 Bases p. 39	
Proposed references to be provided to applicants during examination: EOP-SPI Supplement Figures 4 & 4a			
Learning Objective (As available): OT-3402-06-C.1.C, -06.C.1.D, & -06.C.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.5		
Comments: 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"> Knowledge of diagnostic steps and decision points in the emergency operating procedures (EOP) that involve transitions to event specific subprocedures or emergency contingency procedures. 			

QUESTION SRO 14

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

- At 0800 Div. 3 DG was started and is idling IAW SVI-E22-T1319, Diesel Generator Start And Load Division 3
- At 0803 SCC called to inform the Control Room of a Degraded Grid Condition.

Then, the BOP operator reports the Div. 3 DG steady state voltage is reading 3900 volts

IAW Tech. Spec 3.8.1, enter ____ and perform the Required Actions.

Reference Provided:

- A. Only Condition A
- B. Only Condition B
- C. Only Conditions A and C
- D. Conditions A, B, C, and G

QUESTION SRO 14

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #		1
	Group #		1
	K/A#	700000	2.2.37
	Importance Rating		4.6
K&A: Ability to determine operability and/or availability of safety related equipment.			
Generator Voltage and Electric Grid Disturbances			
<p>Explanation: Answer C – Notification by SCC of a degraded grid conditions requires the Unit Supervisor to declare both sources of off-site power INOPERABLE. Therefore both Conditions A & C are entered.</p> <p>A – Incorrect – Plausible since Condition A is entered, but since both off-site circuits are INOP, it is not the only Condition entered.</p> <p>B – Incorrect – For the DG to be INOP, DG voltage needs to be < 3800 volts. Plausible since an EB-Bus voltage <3900 volts renders the EH-Bus INOP.</p> <p>D – Incorrect – Plausible if candidate considers the Div 3. DG INOP and both off-site circuits INOP</p>			
Technical Reference(s): ONI-S11 Rev. 11 and TS 3.8.1 Rev. Amend. 162		Reference Attached: ONI-S11 pp. 3 & 7 and TS 3.8.1 pp. 3.8-1 to -5	
Proposed references to be provided to applicants during examination: TS 3.8.1 (partial – no SRs)			
Learning Objective (As available): OT-3037-12-C			
Question Source:	Bank # Modified Bank # Columbia 2015 # SRO-07 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 55.43 b.2		
Comments: SRO Justification: Facility operating limitations in the TS and their bases. [10 CFR 55.43(b)(2)] <ul style="list-style-type: none"> Application of Required Actions (Section 3) and Surveillance Requirements (SR) (Section 4) in accordance with rules of application requirements (Section 1). 			

QUESTION SRO 15

Plant startup is in progress following a forced outage with the following conditions:

- The Unit Supervisor is operating in IOI-3, Power Changes
- The main generator was synchronized to the grid 5 minutes ago.
- The MFP is feeding the RPV.
- RFPT A is @ 1100 RPM

The following is then observed:

- Annunciator HP CNDR VACUUM LO (H13-P680-02-A3) has alarmed
- Main condenser pressure is 5.1”HgA and degrading slowly
- Aux condenser pressure is 5.0” HgA and degrading slowly
- Offgas After Filter Discharge flow is 33 SCFM and rising slowly
- RPV level is 208 inches and rising slowly

Based on this information, a leak in the (1) would be responsible for the Offgas and condenser pressure readings.

Unit Supervisors highest priority is to direct the actions contained in (2) .

	<u> (1) </u>	<u> (2) </u>
A.	inlet line to the on service Offgas preheater, 1N64-B001A	ONI-N62, Loss of Main Condenser Vacuum
B.	outlet line of 1N25-F060A, MOIS SEP DRN TK 1A DRAIN TO CNDR	ONI-N62, Loss of Main Condenser Vacuum
C.	inlet line to the on service Offgas preheater, 1N64-B001A	ONI-C71, Reactor Scram
D.	outlet line of 1N25-F060A, MOIS SEP DRN TK 1A DRAIN TO CNDR	ONI-C71, Reactor Scram

QUESTION SRO 15

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #		1
	Group #		2
	K/A#	295002	AA2.04
	Importance Rating		2.9

K&A: Ability to determine and/or interpret the following as they apply to LOSS OF MAIN CONDENSER VACUUM: Offgas system flow.

Loss of Main Condenser Vacuum

Explanation: **Answer B** – The outlet of 1N25-F060A is a 16" line that goes directly into the HP Condenser. A leak in this line would cause both condenser pressure to degrade and Offgas flow to increase. Per ONI-N62, Subsequent Actions direct tripping of the main turbine if condenser pressure degrades to > 5" HgA with generator load < 375 MWE. Since the generator was just synchronized to the grid, load would only be ~ 200 MWE. A turbine trip at this low power level would not cause a Rx scram.

A & C – Incorrect – First part – A leak in the 16" inlet line of the OG preheater would not cause vacuum to degrade.

C & D – Incorrect – Second part – with Rx level rising and vacuum degrading with Offgas flow rising, the Operator may think scrambling is appropriate. However, vacuum is already > 5" HgA. Therefore the trip of the main turbine has highest priority. This action is in ONI-N62.

Technical Reference(s): ARI-H13-P680-02 Rev 12, DWG 302-111 Rev. JJ, DWG 302-751 Rev. U, and ONI-N62 Rev 11	Reference Attached:): ARI-H13-P680-02 p 11, DWGs 302-111 & 302-751 and ONI-N62 pp. 3 & 5
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Proposed references to be provided to applicants during examination: None

Learning Objective (As available): OT-3035-10(LP)-A.1

Question Source:	Bank # Modified Bank # Perry 2015 # SRO-15 New
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Question History:	Previous 2 NRC Exams Perry 2015
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Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis x
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10 CFR Part 55 Content:	55.41 55.43 b.5
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Comments: SRO Justification: Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations. [10 CFR 55.43(b)(5)]

- Knowledge of when to implement attachments and appendices, including how to coordinate these items with procedure steps.
- Knowledge of administrative procedures that specify hierarchy, implementation, and/or coordination of plant normal, abnormal, and emergency procedures.

QUESTION SRO 16

The below table indicates reactor pressure and accumulator pressure information for selected control rods.

Control Rod	Steam Dome Pressure	Accumulator pressure
30-31	950	950
34-19	950	1520
42-51	600	950
50-23	600	1520

Regarding Technical Specification required rod scram insertion time, which control rod exhibits the minimum combination of Steam Dome Pressure and Accumulator Pressure that will assure the scram insertion time will continue to be met if the running CRD pump tripped?

- A. 30-31
- B. 34-19
- C. 42-51
- D. 50-23

QUESTION SRO 16

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #		1
	Group #		2
	K/A#	295022	2.1.25
	Importance Rating		4.2
K&A: Ability to interpret reference materials, such as graphs, curves, tables, etc.			
Loss of Control Rod Drive Pumps			
<p>Explanation: Answer B – Per TS Bases, RPV pressure \geq 950 psig or accumulator pressure \geq 1520 psig will ensure that the scram insertion time do not exceed TS requirements.</p> <p>A – Incorrect – Per TS 3.1.5 minimum accumulator pressure is \geq 1520 psig.</p> <p>C – Incorrect – Plausible Per TS 3.1.5, at 600 psig scram times may meet TS requirements but are not assured. Also, per TS 3.1.5 minimum accumulator pressure is \geq 1520 psig.</p> <p>D – Incorrect – Plausible Per TS 3.1.5, at 600 psig scram times may meet TS requirements but are not assured.</p>			
Technical Reference(s): TS 3.1.5 Rev. Amend. 171 and TS Bases 3.1.4 Rev 8 TS Bases 3.1.5 Rev 7		Reference Attached: TS 3.1.5 3.1-17 and TS Bases 3.1.4 p. B 3.1-25 TS Bases 3.1.5 pp. B 3-1-30 & 33	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3037-05-C			
Question Source:	Bank # Modified Bank # LaSalle 2012 # 85 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 b.2		
Comments: SRO Justification: Facility operating limitations in the TS and their bases. [10 CFR 55.43(b)(2)] <ul style="list-style-type: none"> Knowledge of TS bases that are required to analyze TS required actions and terminology. 			

QUESTION SRO 17

The plant was operating at rated power when the following annunciator alarmed:

RCIC ROOM dT HI-HI (H13-P601-21-E3)

Upon investigation, the RO reports the following:

- 1E31-N700A A5-1, RCIC EQUIP AREA dT (Ventilation differential Temperature) is tripped and reading 97 °F
- 1E31-N700A A6-1, RCIC EQUIP AREA T (Room ambient temperature) is not tripped and reading 128 °F and rising slowly
- 1E31-N700B A5-1, RCIC EQUIP AREA dT (Ventilation differential Temperature) is tripped and reading 97 °F
- 1E31-N700B A6-1, RCIC EQUIP AREA T (Room ambient temperature) is not tripped and reading 128 °F and rising slowly

Based on this information, the Unit Supervisor will (1).

At this time, the RCIC System (2) per Technical Specifications.

- | | <u>(1)</u> | <u>(2)</u> |
|----|--|------------------|
| A. | Immediately enter EOP-3, Secondary Containment Control | remains OPERABLE |
| B. | Immediately enter EOP-3, Secondary Containment Control | is INOPERABLE |
| C. | Delay entry into EOP-3, Secondary Containment Control until the RCIC pump room exceeds the ambient temperature trip setpoint | remains OPERABLE |
| D. | Delay entry into EOP-3, Secondary Containment Control until the RCIC pump room exceeds the ambient temperature trip setpoint | is INOPERABLE |

QUESTION SRO 17

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #		1
	Group #		2
	K/A#	295032	EA2.02
	Importance Rating		3.5
K&A: Ability to determine and/or interpret the following as they apply to HIGH SECONDARY CONTAINMENT AREA TEMPERATURE: Equipment operability.			
High Secondary Containment Area Temperature			
<p>Explanation: Answer A – Ventilation cooler ΔT is entry condition for EOP-3. Without RCIC EQUIP AREA T instrument being tripped, RCIC has not isolated and remains Operable. Per TS 3.5.3 SR 3.5.3.2 Bases, all valves must be in the correct alignment or be able to automatically realign for RCIC to be considered operable. The steam supply isolation valves are not capable of automatically realigning (opening).</p> <p>A – Incorrect – RCIC room temperature has not reached the RCIC Isolation setpoint yet. Therefore RCIC remains operable.</p> <p>C – Incorrect – Plausible if candidate thinks entry should be delayed until the high ambient trip is reached.</p> <p>D – Incorrect – Plausible if candidate thinks entry should be delayed until the high ambient trip is reached. And, RCIC room temperature has not reached the RCIC Isolation setpoint yet. Therefore RCIC remains operable.</p>			
Technical Reference(s): EOP-3 Chart Rev. G, ARI-H13-P601-21 Rev 15, TS 3.5.3 Rev. Amend. 171, & TS 3.5.3 Bases, Rev. 11		Reference Attached: EOP-3 Chart, ARI-H13-P601-21 pp. 53 & 65, TS 3.5.3 p 3.5-11, & TS 3.5.3 Bases, p B 3.5-24	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3037-09-B & OT-3402-17-B			
Question Source:	Bank # Modified Bank # Perry 2013 # SRO-17 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 55.43 b.2		
Comments: SRO Justification: Facility operating limitations in the TS and their bases. [10 CFR 55.43(b)(2)] <ul style="list-style-type: none"> • Knowledge of TS bases that are required to analyze TS required actions and terminology. 			

QUESTION SRO 18

The plant was operating at rated power when a transient occurred resulting in the following conditions:

- EOP-01, RPV Control, and EOP-02, Primary Containment Control have been entered
- All high pressure injection has been lost
- RPV pressure 16 psig
- Drywell temperature 255 °F and rising slowly
- Drywell pressure 3.6 psig and rising slowly
- Containment temperature 155 °F and rising slowly
- Containment pressure 5.3 psig and rising slowly
- Suppression Pool level 19.0 feet
- Suppression Pool temperature 120 °F
- RHR A & B are running in Suppression Pool Cooling

Of the following required actions, the Unit Supervisor's highest priority is:

Reference Provided:

- A. EOP-SPI 2.1, Bypass of NCC isolations and Maximize DW Cooling
- B. EOP-04-4, RPV Flooding and inject with LPCS and RHR A & B loops
- C. EOP-SPI 2.2, Bypass of CVCW isolations and Operate ALL Available Containment Cooling
- D. EOP-SPI 3.1, Containment Spray Operation and spray containment with RHR A and /or B loops

QUESTION SRO 18

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #		2
	Group #		1
	K/A#	203000	2.4.20
	Importance Rating		4.3
K&A: Knowledge of the operational implications of EOP warnings, cautions, and notes.			
RHR/LPCI: Injection Mode			
<p>Explanation: Answer B – At an RPV pressure of 16 psig, the saturation temperature is 251 °F. Per the EOP CAUTION, LEVEL, with DW temperature @ 255 °F (> RPV Sat. Temp) no valid level indication exists. At this point the US's highest priority is to transition to EOP-04-4, RPV Flooding and inject with RHR to assure adequate core cooling.</p> <p>A – Incorrect – Plausible, as this is a required action for the given conditions. However, maintaining ACC is a higher priority.</p> <p>C – Incorrect – Plausible, as this is a required action for the given conditions. However, maintaining ACC is a higher priority.</p> <p>D – Incorrect – Plausible, as this action will be required prior to reaching 8 psig or 185 °F in containment. However, maintaining ACC is a higher priority. With the Containment pressure given, CSIL has been met.</p>			
Technical Reference(s): EOP-01 Chart Rev. H, EOP-02 Chart Rev. F, EOP-Bases Rev. 7, & EOP-01 Bases Rev. 8		Reference Attached: EOP-01 Chart, EOP-02 Chart, EOP-Bases p. 18, and EOP-01 Bases pp. 32-33	
Proposed references to be provided to applicants during examination: Steam Tables			
Learning Objective (As available): OT-3402-01-D, OT-3402-13-A, & -B			
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		
Comments: 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"> Knowledge of diagnostic steps and decision points in the emergency operating procedures (EOP) that involve transitions to event specific subprocedures or emergency contingency procedures. 			

QUESTION SRO 19

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

- High Pressure Core Spray was running in CST to CST Mode per SVI-E22-T2001, HPCS Pump And Valve Operability Test

Then, the following annunciators alarmed:

- DIV 3 ISOLATOR 125V DC POWER LOSS (H13-P601-16-C4)
- HPCS OUT OF SERVICE (H13-P601-16-D4)
- DIV 3 DC BRKR CONTROL POWER LOSS (H13-P601-16-G2)
- DC BUS ED-1-C UNDERVOLTAGE (H13-P601-16-H1)

Based on this information, (1) have been affected.

If the HPCS pump must be stopped, use (2) .

	<u>(1)</u>	<u>(2)</u>
A.	only HPCS breakers	ONI-R42-3, LOSS OF BUS ED-1-C
B.	only HPCS breakers	SOI-E22A, HIGH PRESSURE CORE SPRAY SYSTEM
C.	HPCS breakers and HPCS SPDS computer alarms	ONI-R42-3, LOSS OF BUS ED-1-C
D.	HPCS breakers and HPCS SPDS computer alarms	SOI-E22A, HIGH PRESSURE CORE SPRAY SYSTEM

QUESTION SRO 19

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #		2
	Group #		1
	K/A#	209002	A2.05
	Importance Rating		2.9

K&A: Ability to (a) predict the impacts of the following on the HIGH PRESSURE CORE SPRAY SYSTEM (HPCS); and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: D.C. electrical failure: BWR-5,6.

High Pressure Core Spray

Explanation: **Answer C** – A loss of DC Bus ED-1-C will affect both breaker control (i.e. ability to operate the breakers from the control room) and the optical isolators that provide power to the SPDS computer alarms. Only procedures ONI-R42-3 and ARI-H13-P601-16-D4, HPCS OUT OF SERVICE provides guidance on stopping the HPCS pump without control power available.

A – Incorrect – Annunciator DIV 3 ISOLATOR 125V DC POWER LOSS (H13-P601-16-C4) indicates that the optical isolators that provide power to the SPDS computer points lost power.

B – Incorrect – Annunciator DIV 3 ISOLATOR 125V DC POWER LOSS (H13-P601-16-C4) indicates that the optical isolators that provide power to the SPDS computer points lost power. Also, SOI-E22A doesn't have any provisions for tripping breakers locally.

D – Incorrect – SOI-E22A doesn't have any provisions for operating breakers locally.

Technical Reference(s): ARI-H13-P601-16 Rev. 19 & ONI-R42-3 Rev. 6	Reference Attached: ARI-H13-P601-16 pp. 33, 45-47, 75-76, & 87 and ONI-R42-3 p 6
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Proposed references to be provided to applicants during examination: None

Learning Objective (As available): OT-COMBINED-E22A (#38)

Question Source:	Bank # Modified Bank # New x
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Question History:	Previous 2 NRC Exams No
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Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis x
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10 CFR Part 55 Content:	55.41 55.43 b.5
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Comments: SRO Justification: Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations. [10 CFR 55.43(b)(5)]

- Knowledge of when to implement attachments and appendices, including how to coordinate these items with procedure steps.

QUESTION SRO 20

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

Current conditions are as follows:

- Reactor power is 5% and stable
- RPV level is 80 inches and stable
- RPV pressure is 820 psig lowering slowly
- SLC Pumps A & B control switches in ON
- SLC A Squib Continuity light is ON
- SLC B Squib Continuity light is OFF
- SLC Pumps A & B Discharge Pressures are 1400 psig

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-1A
- B. Injecting boron into the RPV at 43 gpm. Direct crew to continue injecting boron until SLC tank level reaches 200 gallons Per EOP-1A
- 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

QUESTION SRO 20

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #		2
	Group #		1
	K/A#	211000	2.4.6
	Importance Rating		4.7
K&A: Knowledge of EOP mitigation strategies.			
Standby Liquid Control			
<p>Explanation: Answer D – With RPV pressure at ~800 psig, SLC discharge pressure should be only slightly greater than 800 psig. Discharge pressure of 1400 psig indicates the pump relief valves are lifting. EOP-SPI-1.8 contains direction for Alternate Boron Injection.</p> <p>A – Incorrect – Plausible as 86 gpm is the normal flow rate for 2 pumps. However, SLC is not being injected into the RPV. SLC discharge pressure should be only slightly above Rx pressure. 2nd part – correct action if injecting.</p> <p>B – Incorrect – Plausible as 43 gpm is the normal flow rate for 1 pump. However, SLC is not being injected into the RPV. SLC discharge pressure should be only slightly above Rx pressure. 2nd part – correct action if injecting.</p> <p>C – Incorrect – This procedure would be used to refill the SLC storage tank.</p>			
Technical Reference(s): GMI-008 Rev. 23, SOI-C41 Rev. 20, SDM-C41 Rev. 10, Dwg.. 302-691 Rev Z, EOP-1A Chart Rev I		Reference Attached: GMI-008 p18, SOI-C41 pp 9 & 60, SDM-C41 pp 8 & 11,Dwg. 302-691 partial, EOP-1A Chart partial	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): x			
Question Source:	Bank # Modified Bank # New	Perry 2017 # SRO 18	
Question History:	Previous 2 NRC Exams Perry 2017		
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis x		
10 CFR Part 55 Content:	55.41 55.43 b.2		
Comments: 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"> Knowledge of diagnostic steps and decision points in the emergency operating procedures (EOP) that involve transitions to event specific subprocedures or emergency contingency procedures. 			

QUESTION SRO 21

The plant was operating at rated power with SVI-C71-T0039, MSIV Closure Channel Functional in progress.

A test equipment failure during performance of this SVI resulted in a plant scram.
Current conditions as follows:

- Plant is operating in ONI-C71-1, Reactor Scram
- All control rods are inserted
- RPV pressure is 940 psig on Bypass Valves
- Feedwater malfunction occurred following the scram
- RCIC has been manually initiated and is controlling RPV level at 180 inches

A signal from (1) E51-N636A / E51-N636E (Suppression Pool Wtr Lvl Hi) trip unit(s) is needed to cause 1E51-F031, RCIC PUMP SUPR PL SUCT ISOL to open.

The Unit Supervisor would direct shifting RCIC suction back to the CST IAW (2) to minimize injection of Suppression Pool water.

- | | <u>(1)</u> | <u>(2)</u> |
|----|------------|--|
| A. | either | SOI-E51, Reactor Core Isolation Cooling System |
| B. | either | EOP-SPI 6.6, RCIC Injection And Pressure Control |
| C. | both | SOI-E51, Reactor Core Isolation Cooling System |
| D. | both | EOP-SPI 6.6, RCIC Injection And Pressure Control |

QUESTION SRO 21

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #		2
	Group #		1
	K/A#	217000	A2.12
	Importance Rating		3

K&A: Ability to (a) predict the impacts of the following on the REACTOR CORE ISOLATION COOLING SYSTEM (RCIC); and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Valve openings.

Reactor Core Isolation Cooling

Explanation: **Answer A** – A high signal from either channel will cause a shift from the CST to the SP. The correct procedure for shifting RCIC suction back to the CST is SOI-E51. Per TS bases, RCIC suction on the CST minimizes SP water injection.

B – Incorrect – Plausible since EOP-SPI 6.6 is directed from ONI-C71-1 – if the main condenser is not available. Since pressure control is on the MTBVPs, the condenser is available.

C – Incorrect – Plausible since most actions require 2 channels to trip. However, RCIC is unique in that it only requires a single channel trip to actuate.

D – Incorrect – Plausible since most actions require 2 channels to trip. However, RCIC is unique in that it only requires a single channel trip to actuate. Also, since EOP-SPI 6.6 is directed from ONI-C71-1 – if the main condenser is not available. Since pressure control is on the MTBVPs, the condenser is available.

Technical Reference(s): ARI-H13-P601-21 Rev. 15, SOI-E51 Rev. 35, EOP-SPI 6.6 Rev. 6, PDB-I05 Rev 10, ONI-C71-1 Rev. 22, and TS 3.5.3 Bases Rev 5	Reference Attached: ARI-H13-P601-21 p 89, SOI-E51 p 37, EOP-SPI 6.6 p 2, PDB-I05 p 15, ONI-C71-1 pp. 11-12, and TS 3.5.3 Bases p B 3.5-21
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Proposed references to be provided to applicants during examination: None

Learning Objective (As available): OT-COMBINED-E51-F.12

Question Source:	Bank # Modified Bank # New x
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Question History:	Previous 2 NRC Exams No
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Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis x
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10 CFR Part 55 Content:	55.41 55.43 b.5
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Comments: SRO Justification: Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations. [10 CFR 55.43(b)(5)]

- Knowledge of when to implement attachments and appendices, including how to coordinate these items with procedure steps.

QUESTION SRO 22

The plant is operating at full power.

The NI-Outs NLO reported the following diesel generator air receiver parameters:

Div 1 DG		Div 3 DG	
Right Bank 245 psig	Left Bank 207 psig	Right Bank 225 psig	Left Bank 205 psig

Based on the above conditions, _____.

Reference Provided:

- A. no Tech Spec ACTIONS are required
- B. the Unit Supervisor would take Tech Spec ACTIONS for Div 1 Starting Air
- C. the Unit Supervisor would take Tech Spec ACTIONS for Div 3 Starting Air
- D. the Unit Supervisor would take Tech Spec ACTIONS for Div 1 and Div 3 Starting Air

QUESTION SRO 22

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #		2
	Group #		1
	K/A#	264000	2.2.42
	Importance Rating		4.6
K&A: Ability to recognize system parameters that are entry-level conditions for Technical Specifications.			
Emergency Generators (Diesel/Jet) EDG			
<p>Explanation: Answer C – Per TS Bases, Div 3 requires BOTH air starting air systems for the DG to be operable, while for Div 1 & 2, only one air system is required.</p> <p>A – Incorrect – Plausible since Div 1 & 2 only require one receiver for Operability. TS LCO entry for Div 3 DG starting air is required</p> <p>B – Incorrect – Plausible since the Div DG left bank is low. However, Div 1 starting air is operable with one receiver > 210 psig</p> <p>D – Incorrect – Plausible since the Div DG left bank is low. However, Div 1 starting air is operable with one receiver > 210 psig</p>			
Technical Reference(s): TS 3.8.3 Rev. Amend. 177 and TS Bases 3.8.3 Rev. 3, 7, & 11		Reference Attached: TS 3.8.3 p 3.8-21-22 and TS 3.8.3 Bases pp. 3.8-41a, 42, 48, & 49	
Proposed references to be provided to applicants during examination: TS 3.8.3 (partial)			
Learning Objective (As available): OT-3037-12-C & D			
Question Source:	<div style="display: flex; justify-content: space-between;"> Bank # Perry 2013 # SRO-03 </div> <div style="display: flex; justify-content: space-between;"> Modified Bank # </div> <div style="display: flex; justify-content: space-between;"> New </div>		
Question History:	Previous 2 NRC Exams No		
Question Cognitive Level:	<div style="display: flex; justify-content: space-between;"> Memory or Fundamental Knowledge </div> <div style="display: flex; justify-content: space-between;"> Comprehension or Analysis x </div>		
10 CFR Part 55 Content:	<div style="display: flex; justify-content: space-between;"> 55.41 </div> <div style="display: flex; justify-content: space-between;"> 55.43 b.2 </div>		
<p>Comments: SRO Justification: Facility operating limitations in the TS and their bases. [10 CFR 55.43(b)(2)]</p> <ul style="list-style-type: none"> Knowledge of TS bases that are required to analyze TS required actions and terminology. 			

QUESTION SRO 23

The plant was operating at rated power with CRD B pump running when the following annunciator alarmed:

- CRD PUMP SUCTION FILTER DIFF PRESS HI (H13-P601-22-H3)

Based on this information, if conditions worsen, CRD B pump could trip on (1) .
The procedure that specifies the required actions to mitigate this condition is (2) .

(1)

(2)

- | | | |
|----|--|---|
| A. | low CRD pump suction pressure | ONI-C11, Inability To Move Control Rods |
| B. | low CRD pump suction pressure | SOI-C11, Control Rod Drive Hydraulic System |
| C. | high CRD pump suction filter Δ pressure | ONI-C11, Inability To Move Control Rods |
| D. | high CRD pump suction filter Δ pressure | SOI-C11, Control Rod Drive Hydraulic System |

QUESTION SRO 23

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #		2
	Group #		2
	K/A#	201001	A2.06
	Importance Rating		2.9

K&A: Ability to (a) predict the impacts of the following on the CONTROL ROD DRIVE HYDRAULIC SYSTEM; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Suction strainer(s) becoming plugged.

CRD Hydraulic

Explanation: **Answer B** – Alarm “CRD PUMP SUCTION FILTER DIFF PRESS HI” is indicative of suction strainers/filters clogging and comes in at 8 psid. If clogging gets worse, CRD suction pressure will also continue to degrade. However, the CRD pump will trip on ‘low suction pressure’ of 25.8” HgA not directly on ΔP. SOI-C11(CRDH) contains steps to shift suction strainers and if the CRD pump trips, to recover the CRD pump.

A – Incorrect – Plausible since ONI-C11-1 contains steps to mitigate other conditions, but refers the operator to SOI-C11 if no CRD pump is running.

C – Incorrect – The CRD pump will trip on low suction pressure, not high filter ΔP. Plausible since ONI-C11-1 contains steps to mitigate other conditions.

B – Incorrect – The CRD pump will trip on low suction pressure, not high filter ΔP.

Technical Reference(s): ARI-H13-P601-22 Rev. 9, SOI-C11(CRDH) Rev. 30, DWG 302-871 Rev. FF	Reference Attached: ARI-H13-P601-22 pp. 23 & 27, SOI-C11(CRDH) p 2, and DWG 302-871
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Proposed references to be provided to applicants during examination: None

Learning Objective (As available): OT-COMBINED-C11_CRDH-B

Question Source:	Bank #	
	Modified Bank #	
	New	x

Question History:	Previous 2 NRC Exams	No
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Question Cognitive Level:	Memory or Fundamental Knowledge	x
	Comprehension or Analysis	

10 CFR Part 55 Content:	55.41	
	55.43	b.5

Comments: SRO Justification: Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations. [10 CFR 55.43(b)(5)]

- Knowledge of when to implement attachments and appendices, including how to coordinate these items with procedure steps.

QUESTION SRO 24

The plant was operating at rated power.

At 0315 Tech Spec 3.0.3 was entered due to problems with M23/24 (MCC, SWGR, & MISC ELECT EQUIP AREA) system.

At 0415 power reduction was commenced using Reactor Recirc Flow.

At 1715 the plant entered Hot Shutdown by manual control rod insertion and the Mode Switch was placed in SHUTDOWN.

Excluding Events Of Potential Public Interest, notification to the NRC Operations Center via the Emergency Notification System must be completed no later than ____.

Reference Provided:

- A. 0415
- B. 0715
- C. 0815
- D. 1815

NRC Exam
2019-01

QUESTION SRO 24

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #		2
	Group #		2
	K/A#	202001	2.4.30
	Importance Rating		4.1
<p>K&A: Knowledge of events related to system operation/status that must be reported to internal organizations or external agencies, such as the State, the NRC, or the transmission system operator.</p>			
Recirculation			
<p>Explanation: Answer C – Per NOBP-OP-1015, Attachment 16, Notification within 4 hours of any deliberate action (i.e. reduction in Recirc flow) which reduces Rx power to satisfy TS Action statement, including initiation of a S/D due to unexpected inability to restore equipment prior to exceeding LCO action time.</p> <p>A – Incorrect – Plausible if being in TS 3.0.3 is considered a deviation from TS.</p> <p>B – Incorrect – Plausible since this is 4 hours from entering TS 3.0.3.</p> <p>D – Incorrect – Plausible if this is considered a deviation from TS rather than a violation of TS since S/D to Mode 3 did not occur within the 13 hour limit.</p>			
Technical Reference(s): NOBP-OP-1015 Rev. 13 and NOP-OP-1015 Rev. 7		Reference Attached: NOBP-OP-1015 pp. 59-60 and NOP-OP-1015 pp. 7-8	
Proposed references to be provided to applicants during examination: NOBP-OP-1015			
Learning Objective (As available): OT-3039-01-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 b.5		
<p>Comments: 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"> SRO is responsible for making NRC notifications. (SRO specific task 341-013-01-03 Report Safety Limit Violations and Reportable Occurrences.) 			

QUESTION SRO 25

The plant is in Mode 5, refueling operations are in progress.

A new fuel bundle is in the IFTS carriage on the Refuel Floor.

The Refuel Platform moves over IFTS and loads the hoist.

Then a PLC failure on the Refuel Platform occurs.

The Refuel Platform was then placed in Interlock Override.

With the Refuel Platform in this condition, the Refuel SRO ____.

- A. may continue in vessel fuel movement in Manual
- B. is not permitted to use the Refuel Platform until the PLC is repaired
- C. will complete the fuel move to the proper vessel location in Interlock Override
- D. will verify the fuel bundle is properly seated in IFTS with the Upender inclined

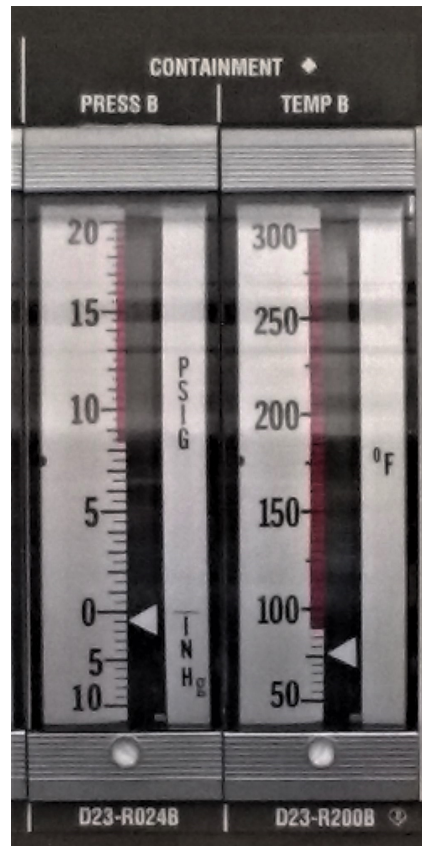
QUESTION SRO 25

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #		2
	Group #		2
	K/A#	234000	K1.07
	Importance Rating		3.4
K&A: Knowledge of the physical connections and/or cause-effect relationships between FUEL HANDLING EQUIPMENT and the following: Fuel transfer tube system: Mark-III.			
Fuel Handling Equipment			
<p>Explanation: Answer D – With a PLC failure, the Refuel Bridge will stop all movement. To move the platform, the Interlock Override Keylock switch must be placed in Override. With the switch in override the Refueling Interlocks must be declared Inop. The RA is to suspend in-vessel movement Immediately. With the Interlocks Inop, ORM 6.5.4 and SOI-F15 require placing fuel in a ‘safe condition’. In this case, that is in the IFTS carriage with the Upender inclined.</p> <p>A – Incorrect – Plausible since Manual operation of the bridge is allowed per SOI-F15. However, TS require suspension of in-vessel fuel movement.</p> <p>B – Incorrect – Plausible since the bridge will stop until repaired or overridden.</p> <p>C – Incorrect –Plausible since this is considered one of the ‘safe conditions’. However, TS require suspension of in-vessel fuel movement.</p>			
Technical Reference(s): SOI-F15 Rev. 22, TS 3.9.1 Rev. Amend. 171, and PDB-R001 (ORM) Rev. 37		Reference Attached: SOI-F15 pp. 6 & 80-82, TS 3.9.1 p 3.9-1, and PDB-R001 p 81	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-Combined-F11-F15 N			
Question Source:	<div style="display: flex; justify-content: space-between;"> Bank # Perry 2007 # SRO-25 </div> <div style="display: flex; justify-content: space-between;"> Modified Bank # </div> <div style="display: flex; justify-content: space-between;"> New </div>		
Question History:	Previous 2 NRC Exams No		
Question Cognitive Level:	<div style="display: flex; justify-content: space-between;"> Memory or Fundamental Knowledge </div> <div style="display: flex; justify-content: space-between;"> Comprehension or Analysis x </div>		
10 CFR Part 55 Content:	<div style="display: flex; justify-content: space-between;"> 55.41 </div> <div style="display: flex; justify-content: space-between;"> 55.43 b.7 </div>		
<p>Comments: SRO Justification: Fuel handling facilities and procedures. [10 CFR 55.43(b)(7)]</p> <ul style="list-style-type: none"> Refuel floor SRO responsibilities. 			

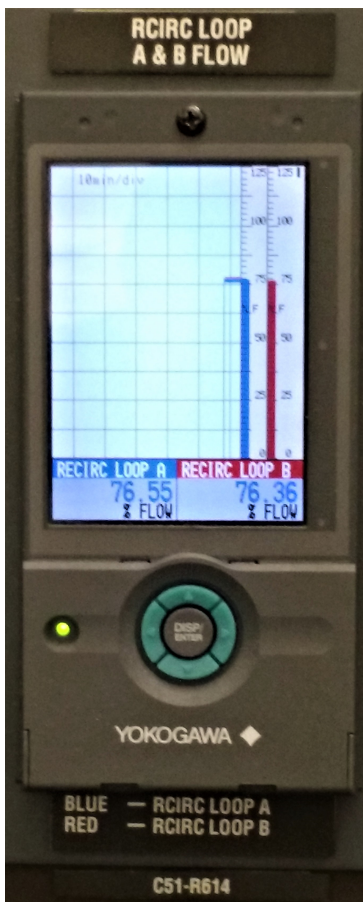
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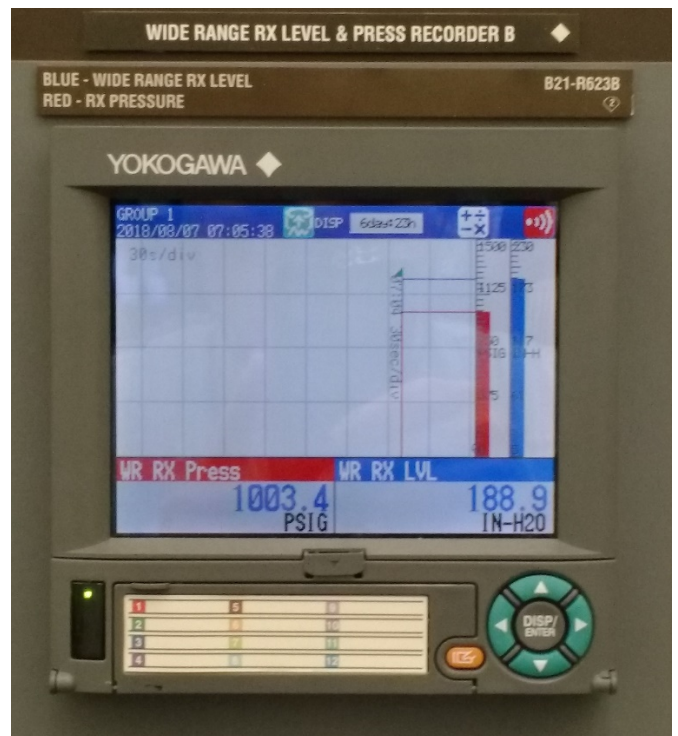
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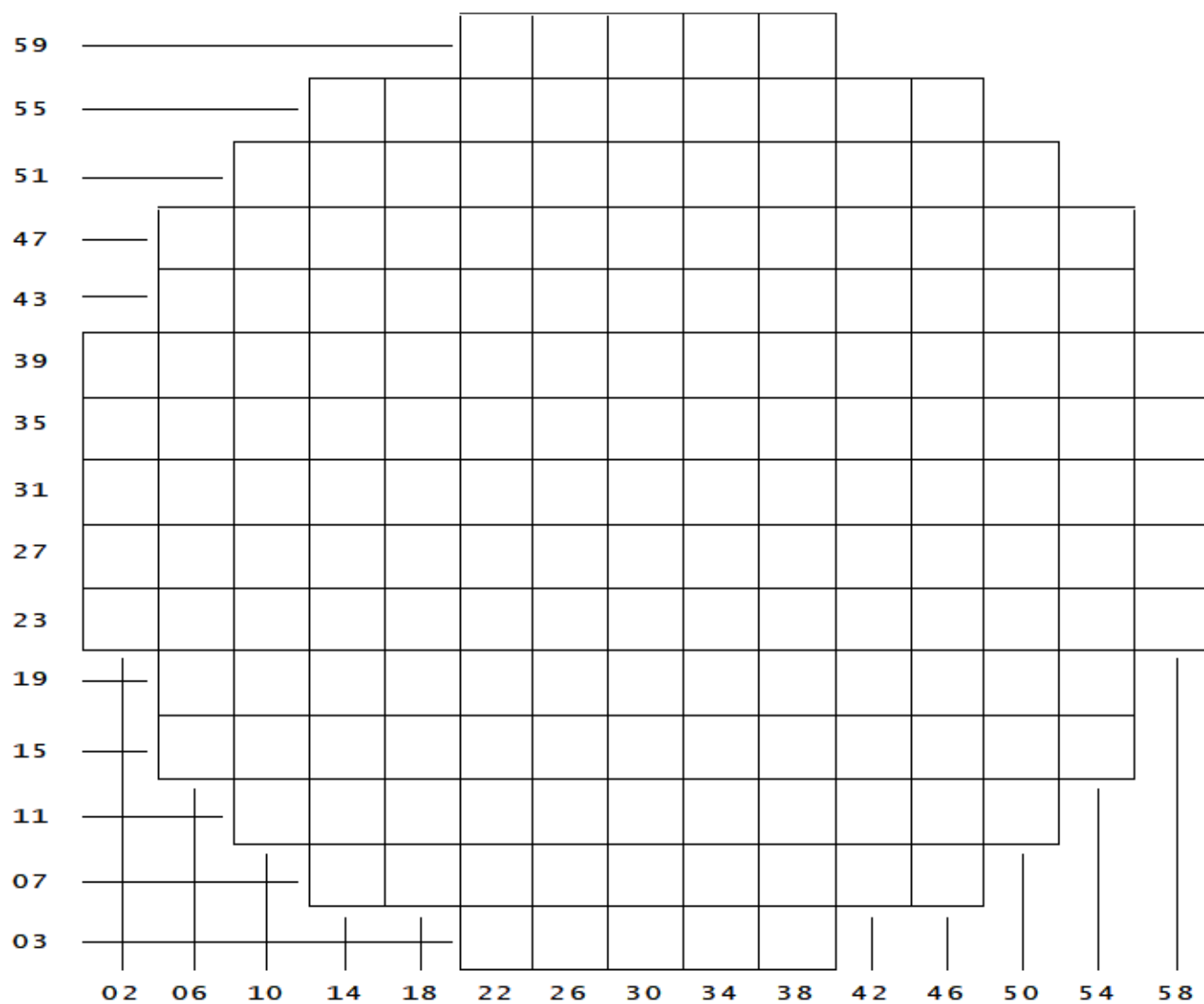
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4



QUESTION RO 20 - Attachment



Archive file ARCHIVE.D
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Data Stop Time: 28-FEB-2018 12:45:45.00

QUESTION RO 60 - Attachment Pg-1

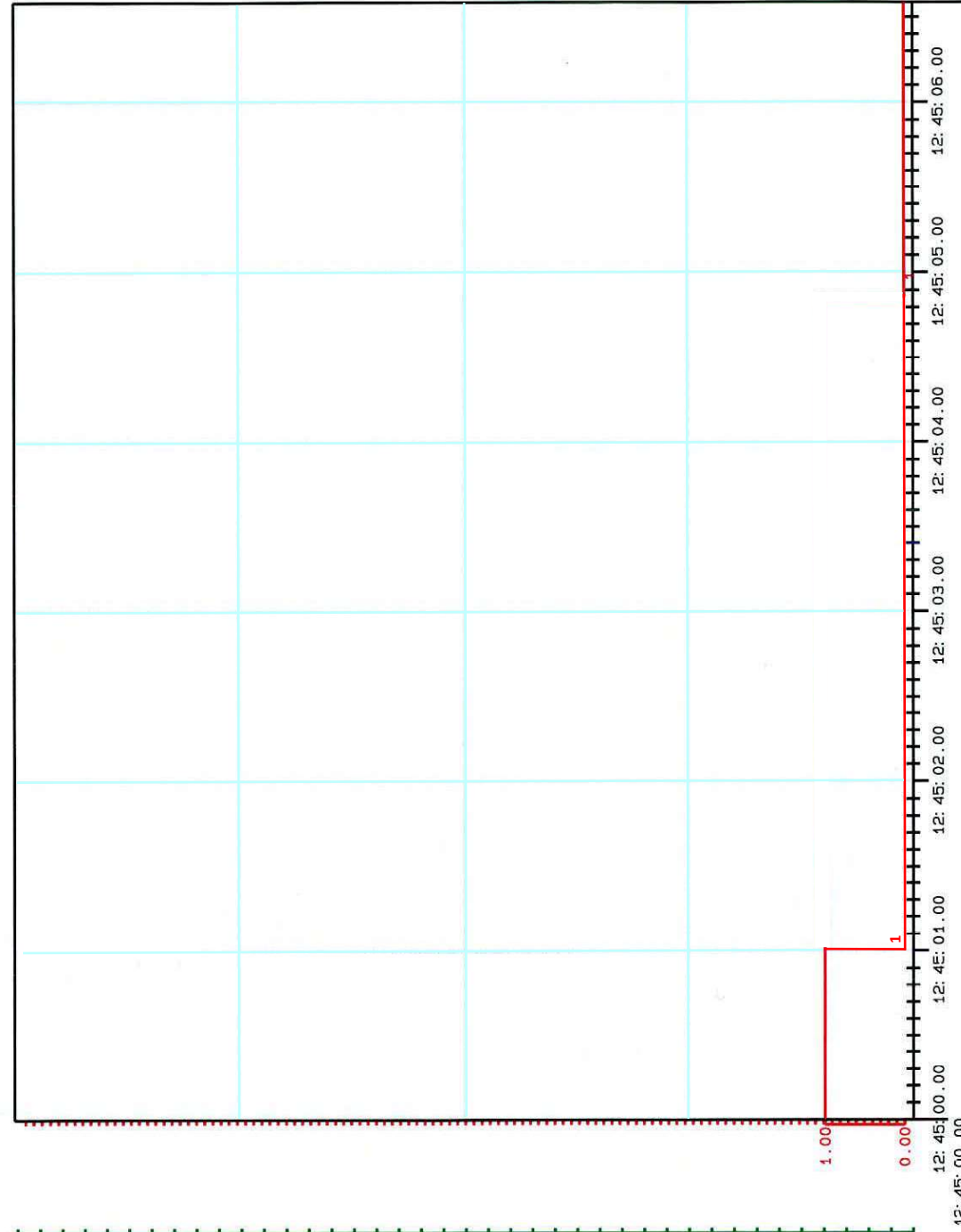
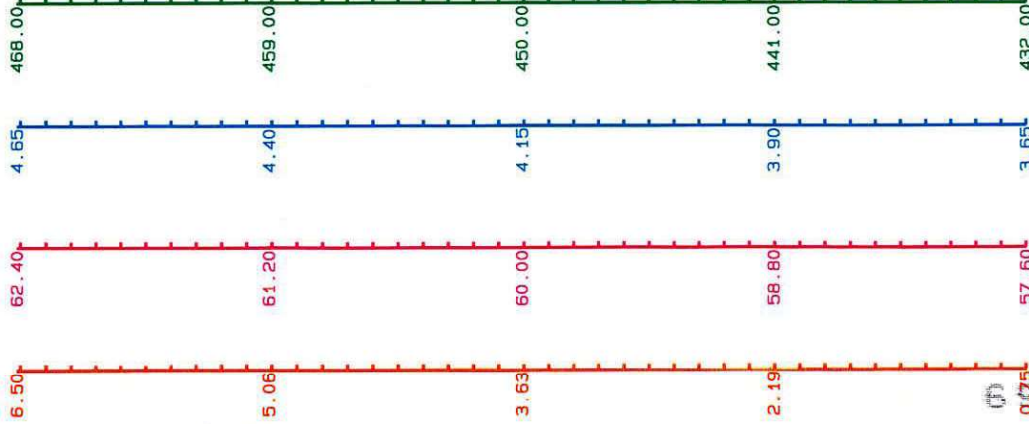
Report Start Time: 28-FEB-2018 13:36:18.12
X Grid Time: 1.00 seconds/inch

SVI-R43-T1318
2-28-18
[Signature]

(1) DIV 2 DG RUN

(5) 6.50 (4) 62.40 (3) 4.65 (2) 468.00

(1)



12: 45: 06.59

Line	Point ID	Type	Description
1	R43EC004	DI	DIV 2 DIESEL GEN INIT CMD
2	R43EA004	AI	DIV 2 DG SPEED
3	R22EA008	AI	DIV 2 DIESEL GEN VOLTAGE
4	R43EA006	AI	DIV 2 DG FREQUENCY
5	R43EA005	AI	DIV 2 DG LOAD

Engineering Units or Set/Reset or Quad-state mag	Maximum Value	Minimum Value
NO INIT/INIT	1.000	0.000
RPM	0.000	0.000
KVOLTS	0.000	0.000
HZ	0.000	0.000
MW	2.835	-2.100

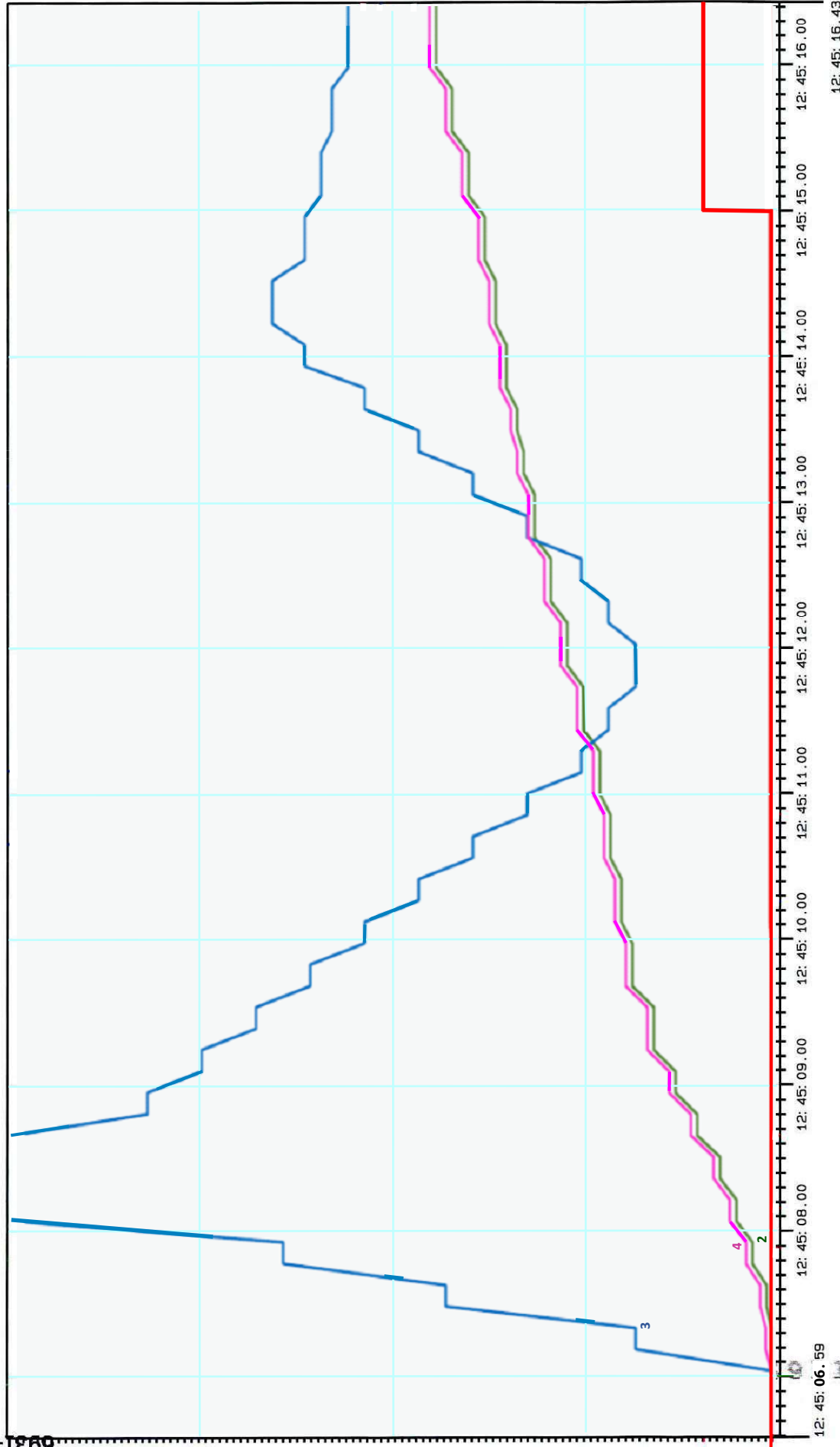
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SVI-R43-T1318
2-28-18 QUESTION RO 60 - Attachment Pg-2

Archive file ARCHIVE.D
Data Start Time: 28-FEB-2018 12:45:00.00
Data Stop Time: 28-FEB-2018 12:45:45.00

Report Start Time: 28-FEB-2018 13:36:18.12
X Grid Time: 1.00 seconds/inch

DIV 2 DG RUN



PAGE 2 OF 5
Time History Plot
Reported on node: ICSU1A
Configuration ID: R43T1318

Line	Point ID	Type	Description	Engineering Units or Set/Reset or Quad-state mag	Maximum Value	Minimum Value
1	R43EC004	DI	DIV 2 DIESEL GEN INIT CMD	NO INIT/INIT	1.000	0.000
2	R43EA004	AI	DIV 2 DG SPEED	RPM	449.125	0.000
3	R22EA008	AI	DIV 2 DIESEL GEN VOLTAGE	KVOLTS	4.746	0.000
4	R43EA006	AI	DIV 2 DG FREQUENCY	HZ	59.252	0.000
5	R43EA005	AI	DIV 2 DG LOAD	MW	2.835	-2.100

1 2 3 4 5

QUESTION SRO 10 - Attachment

