

2009 Reactor Operator Exam

1

This Exam Level RO  
Appears on: 2009 SRO  
EXAM  
Tier 1  
Group 1  
K/A # 2.4.11  
Importance 4.00  
Rating:

Unit 1 is operating at 100% power with the following conditions:

- RCP 1A Upper Thrust Bearing temperature is 190°F and stable.
- RCP 1A seal #2 inlet pressure is 1270 psig and stable.
- RCP 1A Seal Bleed Off flow is 2.6 gpm and stable.
- RCS pressure is 2170 psia and stable.
- Reactor Drain tank level is 55% and slowly increasing
- Pressurizer level is 54% and slowly increasing.
- Letdown flow is 74 gpm and slowly increasing.
- Nuclear Cooling water flow from the Letdown heat exchanger (NCN-FI-208) is slowly increasing.

The Crew should take actions per ....

- A. 40AO-9ZZ04, RCP Emergencies due to abnormal RCP seal parameters.
- B. 40AO-9ZZ04, RCP Emergencies due to abnormal RCP bearing parameters.
- C. 40AO-9ZZ02, Excessive RCS Leakrate due to a small Pressurizer steam space leak.
- D. 40AO-9ZZ02, Excessive RCS Leakrate due to a small RCS to Nuclear Cooling water leak.

Answer: C

Associated KA:  
L10166

Determine if the Excessive Leakage AOP should be executed

Reference Id: Q22486  
Difficulty: 3.00  
Time to complete: 3  
10CFR Category: CFR 55.41 (10) 55.41 (10) Administrative, normal, abnormal, and emergency operating procedures for the facility.  
Cognitive Level: Comprehension / Anal  
Question Source: New  
Comment:

**Proposed reference to be provided to applicant during examination:** NONE

**Technical Reference:** 40AO-9ZZ02, Excessive RCS Leakrate

**K&A:** Knowledge of abnormal condition procedures: [Pressurizer Vapor Space Accident](#)

**Justification:**

**A and B are Wrong** - Examinee will have to determine normal Seal and Bearing parameters for the 1A RCP. In addition 2.6 gpm is a normal SBO flow rate to the RDT

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**2009 Reactor Operator Exam**

**C is Correct** - Increasing pressurizer level above program band is a classic PZR steam space leak. RCS pressure may drop slightly but will remain essentially constant for a small RCS leak.

**D is Wrong** - Letdown increasing in response to PZR level increase will cause NCW flow to increase but examinee may believe that a leak to NCW will increase temperature requiring more NCW flow to provide cooling.

2009 Reactor Operator Exam

2

This Exam Level RO  
Appears on: 2009 SRO  
EXAM  
Tier 1  
Group 1  
K/A # 41009ea1.07  
Importance 3.70  
Rating:

Given the following conditions:

- Unit 2 was manually tripped per 40AO-9ZZ02, Excessive RCS Leakrate.
- The CRS has implemented 40EP-9EO03, Loss of Coolant Accident.
- Containment pressure peaked at 4.2 and is currently 3.8 psig.
- All the required automatic ESFAS actuations have properly initiated.

What is the expected status and required actions (if any) to recover the Containment Normal ACUs?

- A. The Containment Normal ACUs are running and Normal Chill Water (WC) is available.
- B. The Containment Normal ACUs are tripped, go to start twice to restart. Normal Chill Water (WC) is available.
- C. The Containment Normal ACUs are running but Normal Chill Water (WC) is isolated and the valves must be over-ridden to open.
- D. The Containment Normal ACUs are tripped, go to stop then start to restart. Normal Chill Water (WC) is isolated and the valves must be over-ridden to open.

Answer: D

Associated KA:  
L10469

Given conditions of a LOCA describe how the containment is cooled

Reference Id: Q22594  
Difficulty: 3.00  
Time to complete: 2  
10CFR Category: CFR 55.41 (7) 55.41 (7) Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.  
Cognitive Level: Comprehension / Anal  
Question Source: New  
Comment:

**Proposed reference to be provided to applicant during examination:** NONE

**Technical Reference:** 40EP-9EO10, Appendix 17

**K&A:** Ability to operate and monitor the following as they apply to a small break LOCA:  
[CCS](#)

**Justification:** Examinee will have to know that CIAS/SIAS initiates 3 psig. They will also need to know that the WC valves isolate and Containment ACUs trip on a SIAS/CIAS and require an override to start. Examinee may confuse NC isolation at CSAS setpoint with WC isolation.

**A is Wrong** - ACUs are tripped and WC is isolated.

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**2009 Reactor Operator Exam**

**B is Wrong** - Go to start twice is the required action to recover a CS pump following an inadvertent CSAS concurrent with a SIAS. WC is isolated.

**C is Wrong** - ACUs have tripped.

**D is Correct** - ACUs are tripped, WC is isolated both are recovered by going to override.

2009 Reactor Operator Exam

3

This Exam Level RO  
Appears on: 2009 SRO  
EXAM  
Tier 1  
Group 1  
K/A # 2.1.27  
Importance 3.90  
Rating:

Which one on the following correctly identifies the purpose or Design Criteria of the Safety Injection system as it relates to a Large Break LOCA event?

- A. Peak cladding temperature shall not exceed 2200°F.  
Local power density shall be maintained less than 21KW/ft.  
Maximum cladding oxidation shall nowhere exceed 17% times the cladding thickness.
- B. Peak cladding temperature shall not exceed 2200°F.  
Local power density shall be maintained less than 21KW/ft.  
Calculated changes in core geometry shall be such that the core remains amenable to cooling.
- C. Local power density shall be maintained less than 21KW/ft.  
Maximum cladding oxidation shall nowhere exceed 17% times the cladding thickness.  
Calculated changes in core geometry shall be such that the core remains amenable to cooling.
- D. Peak cladding temperature shall not exceed 2200°F.  
Maximum cladding oxidation shall nowhere exceed 17% times the cladding thickness.  
Calculated changes in core geometry shall be such that the core remains amenable to cooling.

Answer: D

Associated KA:  
[L65084](#)

Describe the design basis associated with the SI system.

Reference Id: Q22488  
Difficulty: 2.00  
Time to complete: 2  
10CFR Category: CFR 55.41 (7) 55.41 (7) Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

Cognitive Level: Memory  
Question Source: New  
Comment:

**Proposed reference to be provided to applicant during examination:** NONE

**Technical Reference:** LOCA tech guideline, 40DP-9AP08 / 40EP-9EO03, LOCA

**K&A:** Knowledge of system purpose and/or function. [Large Break LOCA](#)

**Justification:**

**A, B and C all include 21 KW/ft this is in the design of CPC and is the old PVNGS safety function not a function of the ECCS system**

**2009 Reactor Operator Exam**

**D is Correct - all design functions of the ECCS system during a LOCA**

2009 Reactor Operator Exam

4

This Exam Level RO  
Appears on: 2009 SRO  
EXAM  
Tier 1  
Group 1  
K/A # 42015aa2.02  
Importance 2.80  
Rating:

Given the following conditions:

- Unit 1 is operating at 100% power.
- 2A RCP Upper Thrust Bearing temperature is observed to be in alarm at 230 degrees and increasing.

In accordance with 40AO-9ZZ04 (RCP Emergencies) which one of the following actions can be performed to slow the rate of temperature rise?

- A. Start the 2A hydraulic oil lift pump PO2C.
- B. Start the standby Nuclear Cooling Water pump.
- C. Increase the output of CHN-FIC-243, Seal Injection Flow Controller.
- D. Stop all but one Normal Chiller, ensure that only one Nuclear Cooling Water outlet valve is open.

Answer: A

Associated KA:  
100866

Active Question Bank 2004

12077

Given RCP motor amps and Upper Thrust Bearing Temperature determine the appropriate action to take based on RCP motor amps and thrust bearing temperature

17327

Determine the Auxiliary Operator's actions for Reactor Coolant Pump Emergencies AOP.

L58304

RC

Reference Id: Q9503  
Difficulty: 3.00  
Time to complete: 3  
10CFR Category: CFR 55.41 (10) 55.41 (10) Administrative, normal, abnormal, and emergency operating procedures for the facility.

Cognitive Level: Memory  
Question Source: Modified PV Bank  
Comment:

**Proposed reference to be provided to applicant during examination: NONE**

**Technical Reference:** 40AO-9ZZ04, RCP Emergencies

**K&A:** Ability to determine and interpret the following as they apply to the Reactor Coolant Pump Malfunctions (Loss of RC Flow): [Abnormalities in RCP air vent flow paths and/or oil cooling system](#)

**Justification:**

**A is Correct** - procedurally directed for high temperature

**2009 Reactor Operator Exam**

**B is Wrong** - directed in the case of high temperature and loss of cooling water

**C is Wrong** - These are reverse acting controllers, increasing output would cause a reduction in flow and increase temperature.

**D is Wrong** - directed in the case of high temperature and a loss of cooling water

## 2009 Reactor Operator Exam

5

This Exam Level	RO
Appears on:	2009 SRO EXAM Tier 1 Group 1
K/A #	42022ak1.02
Importance	2.70
Rating:	

Given the following conditions:

- Unit 1 is operating at 100% power.
- CHN-UV-240, Charging Line to RC Loop 2A valve, has failed closed.

Which one of the following would be the effect on the Chemical and Volume Control system?

- A. Auxiliary Spray flow is not available.
- B. Seal Injection flow to the RCPs is lost.
- C. Regen HX outlet valve CHB-UV-515 will close on high temperature, isolating Letdown flow.
- D. Differential pressure between Charging and the RCS increases, charging flow to the loop is unchanged.

Answer: D

Associated KA:  
L67956

Explain the operation of the Charging Line Isolation Valve (CHN-HV-239), including the Control Room controls, under normal operating conditions.

Reference Id:  
Difficulty:  
Time to complete:  
10CFR Category:

Q22489  
2.00  
3  
CFR 55.41 (7) 55.41 (7) Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

Cognitive Level:  
Question Source:  
Comment:

Comprehension / Anal  
New

**Proposed reference to be provided to applicant during examination:** NONE

**Technical Reference:** CVCS LOIT Lesson Plan, ARP 40AL-9RK3A

**K&A:** Knowledge of the operational implications of the following concepts as they apply to Loss of Reactor Coolant Makeup: [Relationship of charging flow to pressure differential between charging and RCS.](#)

**Justification:** If CHN-HV-240 closes then charging flow is forced thru the spring loaded check valve CHN-V435 raising dp to 200 psid. Since we have positive displacement charging pumps flow to the RCS remains constant. Aux spray is unaffected with 240 failed closed, seal Injection controllers will respond to maintain desired flow and since charging flow is maintained LD will not isolate on high temperature.

**A is Wrong** - CHN-HV-240 going closed maintains adequate pressure to the aux. spray valves

**B is Wrong** - Seal Injection flow is isolated by either CHN-UV-231 or 255

**2009 Reactor Operator Exam**

**C is Wrong** - CHB-UV-515 closes on high temp out of the Regen HX, this will not occur since charging flow is maintained.

**D is Correct** -

2009 Reactor Operator Exam

6

This Exam Level RO  
Appears on: 2009 SRO  
EXAM  
Tier 1  
Group 1  
K/A # 42025ak2.02  
Importance 3.20  
Rating:

Given the following conditions:

- Unit 1 is in Mode 6
- LPSI pump "A" is in service providing Shutdown Cooling flow at 4200 gpm

Subsequently: The 4160 vac class bus (PBA-S03) de-energizes when a fault occurs on the ESF transformer NBN-X03.

1 minute after the fault, Shutdown Cooling (SDC) flow is ...

- A. 0 gpm, LPSI pump "A" breaker is anti-pumped.
- B. 0 gpm, LPSI pump "A" is available but did not receive a start signal.
- C. 4200 gpm after the "A" DG started and sequenced the LPSI pump on.
- D. 4200 gpm, after the Operator throttles the SDC injection valves back to their original position.

Answer: B

Associated KA:  
L65104

Describe the flowpath/s associated with the SDC system to include these major components:

- Safety Injection Pumps
- Refueling Water Tank
- Shutdown Cooling heat exchangers
- Injection valves

Reference Id: Q22490  
Difficulty: 3.00  
Time to complete: 2  
10CFR Category:

CFR 55.41 (7) 55.41 (7) Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

Cognitive Level: Comprehension / Anal  
Question Source: New  
Comment:

**Proposed reference to be provided to applicant during examination:** NONE

**Technical Reference:** 01-E-PEB-001, DG output breaker P&ID

**K&A:** Knowledge of the interrelations between the Loss of Residual Heat Removal System and the following: [LPSI or Decay Heat Removal/RHR pumps](#)

**Justification:**

**A is Wrong** - examinee may confuse this condition with similar events such as charging pumps which become anti-pumped following a LOP

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**2009 Reactor Operator Exam**

**B is Correct** - DG output breaker will close and energize the bus but there is no ESFAS signal present to close the A LPSI pump breaker.

**C is Wrong** - The LPSI pump would sequence on with a SIAS present but ESFAS signals are jumpered out during an outage but RCS pressure is < the SIAS setpoint.

**D is Wrong** - Same as above but this also assumes that the valves would go full open and have to be positioned back to their original value.

2009 Reactor Operator Exam

7

This Exam Level RO  
Appears on: 2009 SRO  
EXAM  
Tier 1  
Group 1  
K/A # 42026aa1.01  
Importance 3.10  
Rating:

The following changes are observed in Nuclear Cooling water (NCW) temperatures while operating at full power.

- NCW temperatures from the Reactor Coolant Pumps are increasing.
- Control Element Drive Mechanisms ACUs outlet temperatures are increasing.
- NCW temperature from Letdown heat exchanger is stable.
- The "in-service" Fuel Pool heat exchanger NCW return temperature is stable.

Which one of the following events could have occurred?

- A. Loss of Plant Cooling water (PW).
- B. Inadvertant Containment Spray Actuation (CSAS).
- C. Loss of Motor Control Center PHB-M34 (de-energized).
- D. Outside containment Instrument Air isolation valve IAA-UV-2 has failed closed.

Answer: B

Associated KA:  
64992

Describe the Control Room indications associated with the Nuclear Cooling Water system.

Reference Id: Q22565  
Difficulty: 3.00  
Time to complete: 3  
10CFR Category:

CFR 55.41 (7) 55.41 (7) Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

Cognitive Level: Comprehension / Anal  
Question Source: New  
Comment:

**Proposed reference to be provided to applicant during examination: NONE**

**Technical Reference:** LOIT lesson plans

**K&A:** Ability to operate and / or monitor the following as they apply to the Loss of Component Cooling Water: [CCW temperature indications](#)

**Justification:**

**A is Wrong - Loss of PW would cause all NCW return temp to increase**

**B is Correct - CSAS isolated containment**

**C and D are Wrong - examinee could believe that the isolation valves fail closed on a loss of IA or Power**

2009 Reactor Operator Exam

2009 Reactor Operator Exam

8

This Exam Level RO  
Appears on: 2009 SRO  
EXAM  
Tier 1  
Group 1  
K/A # 42027aa1.03  
Importance 3.60  
Rating:

Given the following conditions:

- Unit 1 is operating in Mode 1.
- The controlling pressurizer pressure channel has failed high.

Assuming **NO** operator actions are taken, which one of the following conditions would you expect to occur?

- A. RCS pressure increases until a reactor trip occurs from high pressurizer pressure.
- B. RCS pressure decreases until a reactor trip occurs from low DNBR or low pressurizer pressure.
- C. Backup heaters de-energize, pressurizer spray valves open, and pressurizer pressure stabilizes at a lower value than setpoint.
- D. Backup heaters energize, pressurizer spray valves open, and pressurizer pressure stabilizes at a higher value than setpoint.

Answer: B

Associated KA:  
L75231

Describe the automatic features associated with the Pressurizer Pressure Control System Bistables.

Reference Id: Q2601  
Difficulty: 4.00  
Time to complete: 4

10CFR Category: CFR 55.41 (7) 55.41 (7) Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

Cognitive Level: Comprehension / Anal  
Question Source: PV Bank Not Modified  
Comment:

**Proposed reference to be provided to applicant during examination: NONE**

**Technical Reference:** LOIT lesson plan

**K&A:** Ability to operate and / or monitor the following as they apply to the Pressurizer Pressure Control Malfunctions: Pressure control when on a steam bubble

**Justification:**

**A is Wrong - Examinee may confuse the operation of the PPCS and believe a malfunction could cause the high pressure trip. High pressure alarms will actuate**

**B is Correct - The controlling channel failing high will cause all heaters to de-energize and spray vales to open driving the plant to a low pressure trip.**

**2009 Reactor Operator Exam**

**C and D are Wrong - BU heaters will de-energize and spray valves will open but the plant will not stabilize either higher or lower than setpoint.**

2009 Reactor Operator Exam

9

This Exam Level RO  
Appears on: 2009 SRO  
EXAM  
Tier 1  
Group 1  
K/A # 41029ek1.03  
Importance 3.60  
Rating:

Given the following conditions:

- Unit 1 is at 30% power while shutting down in preparations for a refueling outage.
- Reactor Coolant pump 1A has tripped.
- The reactor did not automatically trip.
- All attempts to trip the reactor from the Control Room have failed.

Assuming no other operator actions, initiating an 80 gpm boration would add ...

- A. positive reactivity to the core and cause RCS temperature to increase.
- B. positive reactivity to the core and cause RCS temperature to decrease.
- C. negative reactivity to the core and cause RCS temperature to increase.
- D. negative reactivity to the core and cause RCS temperature to decrease.

Answer: D

Associated KA:  
56296

Given the FRP is being performed and given specific plant conditions determine if the selected Reactivity Control success path safety function status checks are being met

L10403

Given plant conditions following a reactor trip analyze whether the Reactivity Control Safety Function is met and what contingency actions are required if it is not

Reference Id: Q22491  
Difficulty: 3.00  
Time to complete: 3  
10CFR Category: CFR 55.41 (1) 55.41 (1) Fundamentals of reactor theory, including fission process, neutron multiplication, source effects, control rod effects, criticality indications, reactivity coefficients, and poison effects.  
Cognitive Level: Comprehension / Anal  
Question Source: New  
Comment:

**Proposed reference to be provided to applicant during examination:** NONE

**Technical Reference:** SPTA tech guideline, 40DP-9AP06

**K&A:** Knowledge of the operational implications of the following concepts as they apply to the ATWS: Effects of boron on reactivity

**Justification:** The examinee may confuse the purpose of boron and dilution as to which will add negative reactivity. Another consideration is that there is a time in core life (BOL, high boron concentration and low power) when a positive MTC could exist where the effects of temperature change don't follow the normal core dynamics.

**A, B and C are Wrong  
D is Correct –**

**2009 Reactor Operator Exam**

2009 Reactor Operator Exam

10

This Exam Level RO  
Appears on: 2009 SRO  
EXAM  
Tier 1  
Group 1  
K/A # 42040ak1.01  
Importance 4.10  
Rating:

During an Excessive Steam Demand event, why should safety injection be throttled as soon as the throttle criteria is met?

- A. Prevents excessive cooldown.
- B. Minimizes erosion damage to the injection valves.
- C. Minimizes the possibility of pressurized thermal shock.
- D. Minimizes the time SI pumps are running on mini-flow.

Answer: C

Associated KA:

100866	Active Question Bank 2004
61779	Increase in Heat Removal TAA
30074	As an operating crew Respond to Steam Line ESD event(s)
L11206	Given an ESD in progress describe the potential impact of an uncontrolled temperature rebound
L61356	Describe the potential impact of an uncontrolled temperature rebound during an ESD.
L61329	Given conditions of an ESD and appropriate reference material describe the mitigation strategy used during excessive steam demand accidents
L89130	Given an ESD in progress describe the potential impact of an uncontrolled temperature rebound
L62495	Given a ESD Event, Tailboard the guidance included in the ESD Emergency Procedure Technical Guideline.

Reference Id: Q3055  
 Difficulty: 3.00  
 Time to complete: 3  
 10CFR Category: CFR 55.41 (10) 55.41 (10) Administrative, normal, abnormal, and emergency operating procedures for the facility.  
 Cognitive Level: Memory  
 Question Source: PV Bank Not Modified  
 Comment:

**Proposed reference to be provided to applicant during examination:** NONE

**Technical Reference:** ESD tech guideline, 40DP-9AP10 / LOIT lesson plan

**K&A:** Knowledge of the operational implications of the following concepts as they apply to Steam Line Rupture: [Consequences of PTS](#)

**Justification:**

**A is Wrong** - Throttling HPSI may help limit the cooldown but is not the event of concern

**2009 Reactor Operator Exam**

**B is Wrong** - Erosion may occur to the downstream piping

**C is Correct** - As stated in the Tech Guideline limiting RCS repressurization will lessen PTS concerns

**D is Wrong** - may be true but not the event of concern

2009 Reactor Operator Exam

11

This Exam Level RO  
Appears on: 2009 SRO  
EXAM  
Tier 1  
Group 1  
K/A # 42054ak3.01  
Importance 4.10  
Rating:

The Steam Generator "low level" trip setpoint is approximately \_\_\_\_ WR and is designed to ...

- A. 25.8%, prevent exceeding the design pressure of the RCS.
- B. 44.2%, prevent exceeding the design pressure of the RCS.
- C. 25.8%, protect against core damage due to the occurrence of locally saturated conditions in the limiting (hot) channel.
- D. 44.2%, protect against core damage due to the occurrence of locally saturated conditions in the limiting (hot) channel.

Answer: B

Associated KA:  
L77058

Describe the PPS instrumentation associated with Wide range Steam generator Level including its function, bases, and setpoint (as described in the Technical Specifications).

Reference Id:  
Difficulty:  
Time to complete:  
10CFR Category:

Q22492  
4.00  
3  
CFR 55.41 (5)

55.41 (5) Facility operating characteristics during steady state and transient conditions, including coolant chemistry, causes and effects of temperature, pressure and reactivity changes, effects of load changes, and operating limitations and reasons for these operating characteristics.

Cognitive Level:  
Question Source:  
Comment:

Memory  
New

**Proposed reference to be provided to applicant during examination: NONE**

**Technical Reference:** Tech Specs and Bases (3.3.1 & 3.3.5)

**K&A:** Knowledge of the reasons for the following responses as they apply to the Loss of Main Feedwater (MFW): Reactor and/or turbine trip, manual and automatic

**Justification:** DNBR low can be caused by a loss primary coolant vs the loss of secondary cooling in a loss of MFW.

**A is Wrong - AFAS setpoint**

**B is Correct - Low SG trip setpoint is to prevent exceeding RCS design pressure**

**C is Wrong - AFAS setpoint**

**D is Wrong - DNB is caused by a loss of RCS water**

2009 Reactor Operator Exam

12

This Exam Level RO  
Appears on: 2009 SRO  
EXAM  
Tier 1  
Group 1  
K/A # 41055ek3.01  
Importance 2.70  
Rating:

Given the following conditions:

- Unit 1 has tripped from 100% power due to a Loss of Offsite power.
- The "B" DG is out of service for scheduled maintenance.
- The "A" DG failed to come up to speed.

Under these conditions the class (PK) batteries are designed to maintain rated voltage for ...

- A. 2 hours to provide continuous DC during a Design Basis Event.
- B. 4 hours to provide continuous DC during a Design Basis Event.
- C. 2 hours to provide sufficient power for the protection and control of transformers and switchgear.
- D. 4 hours to provide sufficient power for the protection and control of transformers and switchgear.

Answer: A

Associated KA:  
L74194

Discuss the purpose and conditions under which the 125 VDC Class IE Power System is designed to function.

Reference Id: Q22493  
Difficulty: 2.00  
Time to complete: 2  
10CFR Category: CFR 55.41 (5)

55.41 (5) Facility operating characteristics during steady state and transient conditions, including coolant chemistry, causes and effects of temperature, pressure and reactivity changes, effects of load changes, and operating limitations and reasons for these operating characteristics.

Cognitive Level: Memory  
Question Source: New  
Comment:

**Proposed reference to be provided to applicant during examination:** NONE

**Technical Reference:** FSAR, LOIT lesson plans

**K&A:** Knowledge of the reasons for the following responses as they apply to the Station Blackout: Length of time for which battery capacity is designed

**Justification:**

**A is Correct - 2 hours and concurrent DBE-LOCA concurrent with BO as found in FSAR**

**B is Wrong - 4 hours is the rating for the non-class NK batteries**

**2009 Reactor Operator Exam**

**C is Wrong - power for the protection and control of transformers is for the non-class NK batteries, examinee may choose this believing that the ESF transformers use class power**

**D is Wrong - 4 hours is the rating for the non-class NK batteries**

2009 Reactor Operator Exam

13

This Exam Level RO  
Appears on: 2009 SRO  
EXAM  
Tier 1  
Group 1  
K/A # 42056aa2.57  
Importance 3.90  
Rating:

Given the following conditions:

- Unit 1 has tripped from 100% power due to a Loss of Offsite power.
- The following report is made for B01 electric plant status:
  - 13.8 and 4.16 kVAC non class buses are de-energized.
  - 4.16 kVAC class busses are energized by their respective DGs
  - Class and non-class DC buses are energized.
  - 120 vac non class instrument buses were de-energized but have transferred to their class backup sources
  - 120 vac class instrument buses are energized.

Assuming no Operator action, which one of following Reactor Coolant system temperature responses should the crew expect to see in the 10 minutes following the LOOP.

- A. T-cold is stable at 564°F with T-hot approximately 3°F hotter.
- B. T-cold is stable at 564°F with T-hot approximately 30°F hotter.
- C. T-cold increases to 572°F with T-hot approximately 3°F hotter.
- D. T-cold increases to 572°F with T-hot approximately 30°F hotter.

Answer: D

Associated KA:  
L67245

Describe the Control Room indications associated with monitoring the RCS.

Reference Id:  
Difficulty:  
Time to complete:  
10CFR Category:

Q22494  
4.00  
5  
CFR 55.41 (5) 55.41 (5) Facility operating characteristics during steady state and transient conditions, including coolant chemistry, causes and effects of temperature, pressure and reactivity changes, effects of load changes, and operating limitations and reasons for these operating characteristics.

Cognitive Level:  
Question Source:  
Comment:

Comprehension / Anal  
New

**Proposed reference to be provided to applicant during examination:** NONE

**Technical Reference:** LOOP, 40EP-9EO07 / Switchyard drawings / simplified drawings / LOIT lesson plan

**K&A:** Ability to determine and interpret the following as they apply to the Loss of Offsite Power: [RCS hot-leg and cold-leg temperatures](#)

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**2009 Reactor Operator Exam**

**Justification:** On the loss of power the SBCS comes back in manual with 0% output. With no operation action, Tcold will be controlled by the safeties at 1250 (572 degrees) as T hot increases in Natural Circulation conditions. If SBCS was working it maintains 1170 (564 degrees). 30 degree delta T is a reasonable number for nat'l circ conditions.

**A is Wrong -**

**B is Wrong -**

**C is Wrong -**

**D is Correct -**

## 2009 Reactor Operator Exam

14

This Exam Level	RO
Appears on:	2009 SRO EXAM Tier 1 Group 1
K/A #	2.4.14
Importance	3.80
Rating:	

Given the following conditions:

- Unit 1 has tripped from 100% full power.
- A total loss of offsite power has occurred.
- Emergency diesel generator "A" tripped.
- AFB-P01 is providing feedwater flow.
- ADVs are in use for reactor coolant system heat removal.
- There are no abnormal radiation trends or alarms.
- PNA-D25, channel "A" 120 VAC, is deenergized.
- All other systems are operating as designed.

WHICH ONE of the following correctly identifies the optimal recovery strategy for plant stabilization?

- Enter the Functional Recovery Procedure due to the MVAC safety function being jeopardized.
- Enter the Functional Recovery Procedure because no other EOP will mitigate the events in progress.
- Complete the Loss of Forced Circulation (LOOP), only then may the Loss of Class Instrument Power procedure be addressed.
- The CRS may elect to perform the Loss of Forced Circulation (LOOP) and Loss of Class Instrument Power procedures concurrently.

Answer: D

Associated KA:  
56294

Given the FRP is being performed and given specific plant conditions determine if the selected MVAC success path safety function status checks are being met

Reference Id:	Q22567
Difficulty:	3.00
Time to complete:	3
10CFR Category:	CFR 55.41 (10) 55.41 (10) Administrative, normal, abnormal, and emergency operating procedures for the facility.
Cognitive Level:	Memory
Question Source:	Modified PV Bank
Comment:	

**Proposed reference to be provided to applicant during examination:** NONE

**Technical Reference:** 40EP-9EO09, FRP / 40DP-9AP16, EOP Users Guide / LOOP/LOFC

**K&A:** Knowledge of general guidelines for EOP usage. [Loss of Vital AC Instrument bus](#)

**Justification:**

**2009 Reactor Operator Exam**

A is Wrong - MVAC is met for the LOFC/LOOP procedure

B is Wrong - LOOP will mitigate the event

C is Wrong – This action is allowed per the users guide.

D is Correct - EOP users guide the concurrent use of EOPs and AOPs

Modified from Q8842

## 2009 Reactor Operator Exam

15

This Exam Level RO  
Appears on: 2009 SRO  
EXAM  
Tier 1  
Group 1  
K/A # 42058ak3.01  
Importance 3.40  
Rating:

Given the following conditions:

- Unit 1 is operating at 100% full power.
- NBN-X04, ESF Transformer, trips on sudden pressure.
- Emergency diesel generator "B" starts and loads.

What effect (if any) would a loss of the Class 1E 125 VDC bus, PKB-M42, have on the "B" DG?

The "B" DG ...

- A. trips and it's output breaker opens.
- B. trips and it's output breaker remains closed.
- C. continues to run and it's output breaker opens.
- D. continues to run and it's output breaker remains closed.

Answer: B

Associated KA:  
100866

Active Question Bank 2004

L11081

Given a loss of PKA or PKB with a DG that is connected to off-site power describe how a loss of its associated 125 Vdc control power impacts the DG operation, including operator action required to mitigate this impact

L58139

Given a loss of PKA or PKB with a DG that is connected to off-site power describe how a loss of its associated 125 Vdc control power impacts the DG operation, including operator action required to mitigate this impact

Reference Id: Q6854  
Difficulty: 3.00  
Time to complete: 3  
10CFR Category: CFR 55.41 (10) 55.41 (10) Administrative, normal, abnormal, and emergency operating procedures for the facility.  
Cognitive Level: Memory  
Question Source: PV Bank Not Modified  
Comment:

**Proposed reference to be provided to applicant during examination: NONE**

**Technical Reference:** LOIT lesson plan / 40AO-9ZZ13, Loss of Class Inst. or Control Power

**K&A:** Knowledge of the reasons for the following responses as they apply to the Loss of DC Power: [Use of dc control power by D/Gs](#)

**Justification: If running the DG trips but its output breaker remains closed. Any combination of these conditions could be plausible.**

**2009 Reactor Operator Exam**

A is Wrong -

B is Correct -

C is Wrong -

D is Wrong -

## 2009 Reactor Operator Exam

16

This Exam Level	RO
Appears on:	2009 SRO EXAM Tier 1 Group 1
K/A #	42065aa2.03
Importance	2.60
Rating:	

Given the following conditions:

- Unit 1 is operating at 100% power.
- RCS pressure is being maintained at 2230 psia.
- The pressurizer is in Boron Equalization.

Subsequently

- RCS pressure is slowly increasing.
- Letdown flow goes to 0 gpm.
- Main Spray valves RCN-PV-100E/F indicate closed.
- CHB-UV-515, Letdown to Regen HX isolation valve, indicates closed.
- CHA-UV-516, Letdown to Regen HX isolation valve, indicates closed.

Which one of the following is correct for these indications?

- CIAS has actuated. Verify containment parameters.
- Nuclear Cooling Water flow has been lost. Cross-tie Essential Cooling Water.
- Instrument air leak in Containment. Close IAA-UV-2, Instrument Air Outside Containment Isolation.
- NNN-D11 (Non-class instrument power) has de-energized. Align the instrument bus to it's alternate supply.

Answer: C

Associated KA:  
L56779

Determine what actions will be taken if IAA-UV-2, Outside Containment Isolation Valve has failed closed.

Reference Id:  
Difficulty:  
Time to complete:  
10CFR Category:

Q22572  
4.00  
3

CFR 55.41 (5)

55.41 (5) Facility operating characteristics during steady state and transient conditions, including coolant chemistry, causes and effects of temperature, pressure and reactivity changes, effects of load changes, and operating limitations and reasons for these operating characteristics.

Cognitive Level:  
Question Source:  
Comment:

Comprehension / Anal  
New

**Proposed reference to be provided to applicant during examination: NONE**

**Technical Reference: 40AO-9ZZ16, Loss of Instrument Air**

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**2009 Reactor Operator Exam**

**K&A:** Ability to determine and interpret the following as they apply to the Loss of Instrument Air: Location and isolation of leaks

**Justification:**

**A is Wrong - CIAS closes CHA-UV-516 not both**

**B is Wrong - A loss of NCW causes CH-HV-523 to close but would not account for the remaining events**

**C is Correct - A loss of IA closes the spray valve and containment Isolation valves**

**D is Wrong - A loss of D-11 has many effects on CVCS, PPCS and PLCS but with pressure increasing with spray valves closed the examinee should realize a loss of D-11 would not cause this combination of conditions.**

## 2009 Reactor Operator Exam

17

This Exam Level	RO
Appears on:	2009 SRO EXAM Tier 1 Group 1
K/A #	42077ak2.07
Importance	3.60
Rating:	

Given the following conditions:

- Unit 1 is operating at 100% power.
- A grid disturbance has occurred which has caused grid voltage to drop.
- Grid frequency is stable at 60 Hz.
- The Main Generator is responding per design and attempting to raise voltage.

Which one of the following automatic actions is designed to protect the Main Generator under these degraded grid conditions?

- The Power System Stabilizer (PSS) will activate.
- The Maximum Excitation Limit (MEL) circuit will activate.
- The Main Generator will shift to the DC mode of regulation.
- The Underexcited Reactive Ampere Limit (URAL) will activate.

Answer: B

Associated KA:  
L75019

Explain the operation of the Maximum Excitation Limit (MEL) circuit under normal operating conditions.

Reference Id:	Q22496
Difficulty:	4.00
Time to complete:	4
10CFR Category:	CFR 55.41 (4)      55.41 (4) Secondary coolant and auxiliary systems that affect the facility.

Cognitive Level:	Memory
Question Source:	New
Comment:	

**Proposed reference to be provided to applicant during examination:** NONE

**Technical Reference:** LOIT lesson plan / 40OP-9MB01, Main Generator and Excitation

**K&A:** Knowledge of the interrelations between Generator Voltage and Electric Grid Disturbances and the following: [Turbine / generator control](#)

**Justification:** each of the distracters is an automatic function of the Main Generator regulation system thus the examinee may consider any one of these as a plausible answer

**A is Wrong** - The PSS only activates to control voltage during frequency disturbances

**B is Correct** - The MEL is designed to protect against low grid voltage events to prevent over excitation of the main generator when trying to increase output to raise system voltage

**C is Wrong** - Only shifts to the DC mode on a loss of AC regulator input

**2009 Reactor Operator Exam**

**D is Wrong** - URAL acts to maintain generator excitation at an acceptable level if dropping to low

2009 Reactor Operator Exam

18

This Exam Level RO  
Appears on: 2009 SRO  
EXAM  
Tier 1  
Group 1  
K/A # 44E02ek2.1  
Importance 3.30  
Rating:

Unit 1 tripped from 100% power due to a trip of Reactor Coolant Pump 1B and has the following conditions:

- DFWCS is in a normal line up (no transmitters in maintenance)
- The Reactor Regulating System (RRS) T-avg has failed high.
- SG 1 level is recovering and currently 54% NR .
- SG 2 level is recovering and currently 45% NR.

Which one of the following describes the status of the Digital Feedwater Control System (DFWCS)?

- A. SG 1 and SG 2 are each feeding in single element control.
- B. SG 1 and SG 2 are each feeding at the maximum rate as allowed by Reactor Trip Override (RTO).
- C. SG 1 is feeding in single element control, SG 2 is feeding at the minimum rate as allowed by Reactor Trip Override (RTO).
- D. SG 1 is feeding in single element control, SG 2 is feeding at the maximum rate as allowed by Reactor Trip Override (RTO).

Answer: D

Associated KA: 30008	Given the new DFWCS simplified print describe the processing of inputs of the DFWCS and what happens on input failures
L82264	Describe the response of the DFWCS to a Reactor trip condition.
L60974	Given classroom instruction and reference material demonstrate the mastery of knowledge necessary to operate the feedwater control system.
L60974	Given classroom instruction and reference material demonstrate the mastery of knowledge necessary to operate the feedwater control system.

100866	Active Question Bank 2004
Reference Id:	Q8221
Difficulty:	4.00
Time to complete:	5
10CFR Category:	CFR 55.41 (7) 55.41 (7) Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.
Cognitive Level:	Comprehension / Anal
Question Source:	Modified PV Bank
Comment:	<b>Proposed reference to be provided to applicant during examination: NONE</b>

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**2009 Reactor Operator Exam**

**Technical Reference:** Simplified Drawings / LOIT lesson plan / 40AO-9ZZ16, RRS malfunctions

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

**Justification:** Examinee may think that either A or B could be correct in the belief that one SG in a condition requires both to be the same, as is true for swapover. The examinee may also confuse feedrate for a failed T-ave instrument.

**A is Wrong - SG 2 level is low for single element control, 51.9% NR is when they come out of RTO**

**B is Wrong - SG 1 is feeding at max rate in RTO but SG 2 is out of RTO, level > 51.6 % NR**

**C is Wrong - SG 2 feeding at the max rate with T-ave high**

**D is Correct - SG 1 is out of RTO with level > 51.6 NR and SG 2 is feeding at max in RTO with Tave failed high**

2009 Reactor Operator Exam

19

This Exam Level RO  
Appears on: 2009 SRO  
EXAM  
Tier 1  
Group 2  
K/A # 42001ak3.02  
Importance 3.20  
Rating:

Given the following conditions:

- Unit 3 is operating at rated power.
- Regulating group 5 CEAs are inserted to 115 inches for ASI control.
- CEA 17 (group 5) begins withdrawing with no Operator action.
- The crew has placed CEDMCS in standby.
- CEA motion has stopped.

Which one of the following represent the maximum acceptable CEA deviation and why?

- A. Any uncontrolled outward deviation requires an immediate reactor trip due to the potential loss of Shutdown Margin.
- B. 5.25 inches to ensure acceptable core power distributions are maintained.
- C. 6.6 inches to ensure acceptable core power distributions are maintained.
- D. 9.9 inches to ensure Shutdown Margin is maintained.

Answer: C

Associated KA:  
L78796

Describe LCO 3.1.5, Control Element Assembly (CEA) Alignment, including its bases.

Reference Id: Q22604  
Difficulty: 4.00  
Time to complete: 3  
10CFR Category: CFR 55.41 (10)

55.41 (10) Administrative, normal, abnormal, and emergency operating procedures for the facility.

Cognitive Level: Memory  
Question Source: New  
Comment:

**Proposed reference to be provided to applicant during examination: NONE**

**Technical Reference:** LCO 3.1.5 and Bases / 40AO-9ZZ11, CEA Malfunctions /LOIT lesson plan

**K&A:** Knowledge of the reasons for the following responses as they apply to the Continuous Rod Withdrawal : [Tech-Spec limits on rod operability](#)

**Justification:**

**A is Wrong - some outward deviation is allowed per the LCO and the CEA malfunction AOP, it will be treated as a slipped CEA**

**B is Wrong - 5.25 is the alarm setpoint for major group deviation**

**C is Correct - per LCO 3.1.5, LOIT lesson plan and bases**

**2009 Reactor Operator Exam**

**D is Wrong - 9.9 is the limit for tripping the reactor if 2 CEAs are deviating. In addition the loss of SDM is not greatly affected by mis-aligned but trippable CEAs.**

2009 Reactor Operator Exam

20

This Exam Level RO  
Appears on: 2009 SRO  
EXAM  
Tier 1  
Group 2  
K/A # 42024aa2.05  
Importance 3.30  
Rating:

Given the following conditions:

- Unit 1 is in Mode 3 following a refueling outage.
- 72ST-9RX14, Shutdown Margin - Modes 3, 4 and 5 is in progress.
- It has been determined that Shutdown Margin is not being met.

In order to meet the **minimum** required actions, the crew must borate the RCS at  $\geq$  ...

- A. 26 gpm with a solution containing  $\geq$  3000 ppm Boron.
- B. 26 gpm with a solution containing  $\geq$  4000 ppm Boron.
- C. 44 gpm with a solution containing  $\geq$  2300 ppm Boron.
- D. 44 gpm with a solution containing  $\geq$  4400 ppm Boron.

Answer: B

Associated KA:  
L11752

Given that plant conditions warrant describe how SDM is ensured procedurally

Reference Id:	Q22571
Difficulty:	3.00
Time to complete:	3
10CFR Category:	CFR 55.41 (10) 55.41 (10) Administrative, normal, abnormal, and emergency operating procedures for the facility.
Cognitive Level:	Memory
Question Source:	New
Comment:	

**Proposed reference to be provided to applicant during examination:** NONE

**Technical Reference:** 72ST-9RX14, Shutdown Margin Modes 3, 4 and 5 / 40AO-9ZZ01, Emergency Boration / TS bases

**K&A:** Ability to determine and interpret the following as they apply to the Emergency Boration: Amount of boron to add to achieve required SDM

**Justification:** Per Tech Specs and as found in 9RX14 the minimum requirement is 26 gpm of greater than a 4000 ppm solution. The upper RWT limit is 4400 ppm and the required flow rate for SA 103 which is used to post trip to establish SDM is 44 gpm

**A is Wrong - 3000 is the refueling pool lower limit**

**B is Correct -**

**C is Wrong - 2300 is the lower SIT limit, 44 gpm is per SA-103**

**D is Wrong - 4400 is the upper RWT limit, 44 gpm is per SA-103**

2009 Reactor Operator Exam

21

This Exam Level RO  
Appears on: 2009 SRO  
EXAM  
Tier 1  
Group 2  
K/A # 2.1.28  
Importance 4.10  
Rating:

Given the following conditions:

- Unit 1 is maintaining 52% power following a Main Turbine trip.
- Pressurizer level control is in LOCAL-AUTO with a setpoint of 50%.
- Heater Control Selector Level Trip Channel X/Y (RCN-HS-100-3) is positioned to BOTH
- Level Control Channel X/Y selector (RCN-HS-110) is positioned to CH-Y

Which one of the following correctly identifies the results of RCN-LT-110X failing low?

- A. Standby Charging pump starts.
- B. All Pressurizer heaters de-energize.
- C. Pressurizer Backup heaters energize.
- D. Letdown flow goes to minimum, 35 gpm.

Answer: B

Associated KA:  
L18799

Describe the function of the Function Generator input to the Pressurizer Level Control System.

L75122

Describe the response of the Pressurizer Level Control System to a failure of a Pressurizer Level Transmitter.

Reference Id: Q22499  
 Difficulty: 3.00  
 Time to complete: 3  
 10CFR Category: CFR 55.41 (7) 55.41 (7) Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.  
 Cognitive Level: Comprehension / Anal  
 Question Source: Modified PV Bank  
 Comment:

**Proposed reference to be provided to applicant during examination: NONE**

**Technical Reference:** 40AO-9ZZ16, RRS Malfunctions / LOIT Lesson plan / Simplified Drawings

**K&A:** Knowledge of the purpose and function of major system components and | controls. [Pressurizer Level Malfunctions](#)

**Justification:**

**A is Wrong - Standby pump would start if the selected channel failed low**

**B is Correct - even though the "Level Trip Selector" is on both either channel failing low will interlock all heaters OFF**

**2009 Reactor Operator Exam**

**C is Wrong - heaters energize on a 3% PZR level deviation high of the selected channel**

**D is Wrong - Letdown flow goes to minimum if selected channel fails low**

## 2009 Reactor Operator Exam

22

This Exam Level RO  
 Appears on: 2009 SRO  
 EXAM  
 Tier 1  
 Group 2  
 K/A # 42037aa2.16  
 Importance 4.10  
 Rating:

Given the following conditions:

- A SGTR has occurred on SG 2.
- RCS pressure is 1500 psia.
- That is 551°F and lowering.
- REP CET is 554°F and lowering.
- RCPs 1B and 2B are in service.
- SBCS is controlling SG pressure at 1050 psia.
- The CRS directs depressurizing the RCS while maintaining pressurizer pressure within ALL of the following criteria per the Steam Generator Tube Rupture procedure.
  - Less than 1135 psia
  - Approximately equal to the pressure of the ruptured SG ( $\pm 50$  psia)
  - Within the PT limits

Based on **current** temperature conditions, which one of the following is the minimum acceptable pressure which will meet the SGTR guidance?

- A. 1050 psia
- B. 1100 psia
- C. 1200 psia
- D. 1325 psia

Answer: D

Associated KA:  
100866

Active Question Bank 2004

LOCT 2004-04

A large tube rupture, with full HPSI available, but on natural circulation

L11226

Given the SGTR EOP is being used and given plant conditions determine an appropriate pressure target for depressurization and state the basis for this value

L61098

Given conditions of a SGTR and appropriate reference material describe the mitigation strategy used during steam generator tube ruptures

L61309

Determine an appropriate pressure target for depressurization during a SGTR and state the basis for this value.

L61301

Describe the SGTR EOP mitigation strategy.

L61309

Determine an appropriate RCS target pressure for depressurization during a SGTR and state the basis for this value.

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**2009 Reactor Operator Exam**

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L62497

Given an SGTR Event, Tailboard the guidance included in the SGTR ORP.

Reference Id: Q9224  
Difficulty: 3.00  
Time to complete: 4  
10CFR Category: CFR 55.41 (10) 55.41 (10) Administrative, normal, abnormal, and emergency operating procedures for the facility.  
Cognitive Level: Comprehension / Anal  
Question Source: PV Bank Not Modified  
Comment:

**Proposed reference to be provided to applicant during examination:** Standard Appendix 2 / PT curves / Steam Tables

**Technical Reference:** SGTR, 40EP-9EO04

**K&A:** Ability to determine and interpret the following as they apply to the Steam Generator Tube Leak: Pressure at which to maintain RCS during S/G cooldown

**Justification: Any pressure below 1300 psia is to low for continued RCP operation**

**A is Wrong** - with no RCPs running it would meet the PT curve for normal Cntmt conditions and  $\pm 50$  psia of SG criteria

**B is Wrong** - as stated in the SGTR procedure  $< 1135$  and  $\pm 50$  psia

**C is Wrong** - meets the PT curve for harsh Cntmt conditions but still low for RCPs in operation

**D is Correct** - min pressure for continued RCP operation

2009 Reactor Operator Exam

23

This Exam Level RO  
 Appears on: 2009 SRO  
 EXAM  
 Tier 1  
 Group 2  
 K/A # 42068ak2.01  
 Importance 3.90  
 Rating:

Which of the following describes the nuclear instruments that are available at the Remote Shutdown Panel to monitor the Reactivity Safety Function?

- A. Two Linear Channels.
- B. Both Startup Channels.
- C. Two Log Safety Channels.
- D. Two "Rate of Change" Channels.

Answer: C

Associated KA:  
L11130

State the indications available to the operator at the Remote Shutdown Panel (RSP).

Reference Id: Q0662  
 Difficulty: 2.00  
 Time to complete: 3  
 10CFR Category: CFR 55.41 (7)

55.41 (7) Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

Cognitive Level: Memory  
 Question Source: PV Bank Not Modified  
 Comment:

**Proposed reference to be provided to applicant during examination: NONE**

**Technical Reference:** Simplified Drawings / LOIT lesson plan

**K&A:** Knowledge of the interrelations between the Control Room Evacuation and the following: [Auxiliary shutdown panel layout](#)

**Justification: only the A & B Log Channels are available at the RSD Panel**

**A is Wrong -**

**B is Wrong -**

**C is Correct -**

**D is Wrong -**

2009 Reactor Operator Exam

24

This Exam Level RO  
Appears on: 2009 SRO  
EXAM  
Tier 1  
Group 2  
K/A # 42069aa1.03  
Importance 2.80  
Rating:

Given the following plant conditions:

- Unit 1 is at 100% power.
- Charging pump "A", CHA-P01 is out of service.
- Pressurizer level is 52% and stable.
- ERFDADS indicates a 20 gpm RCS leakrate.
- The CRS enters the Excessive RCS Leakrate AOP, 40AO-9ZZ02.
- Readings on RU-6, Nuclear Cooling Water, is trending up.
- Letdown flow is slowly lowering.
- Letdown Heat Exchanger Outlet Temperature Controller, CHN-TIC-223, output has stabilized at a new lower value
- RCP 1A NCW temperature, NCN-TI-471 is slowly increasing.
- The Area Operator informs the Control Room that Nuclear Cooling Water Surge Tank Level is slowly rising.

Which one of the following actions should be taken to mitigate these conditions?

- A. Cross connect Essential Cooling Water to Nuclear Cooling water.
- B. Trip the reactor and initiate a Containment Isolation Actuation Signal (CIAS).
- C. Trip the reactor, stop the 1A RCP, secure seal bleedoff and isolate the high pressure seal coolers for the 1A RCP.
- D. Close CHB-UV-515 (Letdown to Regen HX Isolation Valve) and take actions per appendix C (Extended Operations without Letdown) of 40AO-9ZZ05.

Answer: C

Associated KA:  
L10169

Given indications of RCS or a Steam Generator Tube Leak, describe the basic procedure methodology, including Reactor Trip is thresholds,

Reference Id: Q22592  
Difficulty: 3.00  
Time to complete: 3  
10CFR Category: CFR 55.41 (7) 55.41 (7) Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.  
Cognitive Level: Comprehension / Anal  
Question Source: New  
Comment:

**Proposed reference to be provided to applicant during examination: NONE**

**Technical Reference:** 40AO-9zz02, Excessive RCS leakrate / 40AL-9RK4A RCP alarm response

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**2009 Reactor Operator Exam**

**K&A:** Ability to operate and / or monitor the following as they apply to the Loss of Containment Integrity: [Fluid systems penetrating containment](#)

**Justification:**

**A is Wrong** - This could be appropriate for some NCW leaks but not for High Pressure Seal Coolers.

**B is Wrong** - Tripping the reactor is correct for a loss of containment integrity but CIAS will not isolate the leak in this case.

**C is Correct** - per 40AO-9ZZ02

**D is Wrong** - This would be correct for an NC leak into the Letdown Heat Exchanger

## 2009 Reactor Operator Exam

25

This Exam Level RO  
 Appears on: 2009 SRO  
 EXAM  
 Tier 1  
 Group 2  
 K/A # 42076ak2.01  
 Importance 2.60  
 Rating:

A high alarm on RU-155D, RCS Letdown monitor, is indicative of ...

- A. RCS fuel cladding failure.
- B. high activity levels in the Purification IX area.
- C. RCS leakage into the Nuclear Cooling Water system.
- D. high activity levels in the Letdown heat exchanger area.

Answer: A

Associated KA:  
[L67628](#)

Explain the operation of the Letdown Process Radiation Monitor (SQN-RE-155D) under normal operating conditions.

Reference Id: Q22501  
 Difficulty: 3.00  
 Time to complete: 2  
 10CFR Category: CFR 55.41 (11) 55.41 (11) Purpose and operation of radiation monitoring systems, including alarms and survey equipment.  
 Cognitive Level: Memory  
 Question Source: PV Bank Not Modified  
 Comment:

**Proposed reference to be provided to applicant during examination:** NONE

**Technical Reference:** Radiation Monitoring System Alarm Response, 74RM-9EF41 / LOIT lesson plan

**K&A:** Knowledge of the interrelations between the High Reactor Coolant Activity and the following: [Process radiation monitors](#)

**Justification:** Letdown monitor is a process rad monitor

**A is Correct - design of the Letdown process rad monitor**

**B is Wrong - This function would be performed by Aux Building area monitors RU-8, 9 or 10**

**C is Wrong - This function would be performed by RU-6, NCW**

**D is Wrong - This function would be performed by Aux Building area monitors RU-8, 9 or 10**

2009 Reactor Operator Exam

26

This Exam Level RO  
Appears on: 2009 SRO  
EXAM  
Tier 1  
Group 2  
K/A # 44A16aa1.3  
Importance 3.00  
Rating:

Given the following conditions:

- Unit 1 is operating at 100% power.
- A 22 gpm leakrate has been verified.
- Pressurizer level is 52% and stable.
- Charging pumps A and B are running.
- Letdown flow is 50 gpm.
- The leak is at the discharge of the Charging pumps.
- In accordance with 40AO-9ZZ02, Excessive RCS Leakrate, the CRS has directed that all charging pumps be stopped.

Which one of the following actions or requirements must be performed?

- A. An immediate Reactor trip is required.
- B. Ensure letdown is isolated in order to prevent purification IX resin damage.
- C. Seal Injection must be restored within 10 minutes or the Reactor Coolant pumps must be secured.
- D. Comply with the actions of LCO 3.4.14, RCS Operational Leakage due to "identified leakage" being in excess of 10 gpm.

Answer: B

Associated KA:  
L10173

Describe the impact that the Charging Pump alternate discharge has on plant operations.

Reference Id: Q22502  
Difficulty: 3.00  
Time to complete: 3  
10CFR Category:

CFR 55.41 (7) 55.41 (7) Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

Cognitive Level: Comprehension / Anal  
Question Source: New  
Comment:

**Proposed reference to be provided to applicant during examination:** NONE

**Technical Reference:** Excessive RCS Leakrate AOP / 40ST-9RC02, RCS Water Inventory / TRM / Tech Specs

**K&A:** Ability to operate and / or monitor the following as they apply to the (Excess RCS Leakage) Desired operating results during abnormal and emergency situations.

**Justification:**

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**2009 Reactor Operator Exam**

**A is Wrong** - TRIP is required for a more severe leak. Pzr level dropping with all available charging pumps running and LD isolated. Which is where Examinee may believe they are headed

**B is Correct** - CH-515 will auto close at approx. 450 °F if the crew doesn't perform actions first

**C is Wrong** - This the action for a loss NCW to the RCPs

**D is Wrong** - This is a connecting system and not part of RCS leakage.

2009 Reactor Operator Exam

27

This Exam Level RO  
Appears on: 2009 SRO  
EXAM  
Tier 1  
Group 2  
K/A # 45E09ek1.1  
Importance 3.40  
Rating:

Given the following conditions:

- Unit 1 is in Mode 3 following an automatic Reactor trip.
- A manual SIAS/CIAS has been initiated.
- Pressurizer level is 35% and slowly lowering.
- Pressurizer pressure is 1900 psia and slowly lowering.
- Safety Injection flow is 0 gpm.
- HPSI pump "A" breaker tripped due to a ground fault and 86 lockout.
- DG "B" is running unloaded at 60.1 Hz and 4150 volts.
- PBB-S04 normal supply breaker, PBB-S04K, has a brighter than normal green light illuminated.
- Containment pressure is 1.5 psig and slowly increasing

In the current condition Safety Injection flow can be ...

- A. established by energizing PBB-S04 with the "A" DG.
- B. verified adequate when RCS pressure lowers to approximately 1600 psia.
- C. established by performing an RCS cooldown and de-pressurization to below LPSI pump shut-off head.
- D. established by placing the "B" DG in override and adjusting its output voltage until the minimum voltage requirement is satisfied.

Answer: C

Associated KA:  
56280

Given the FRP is being performed and RC-3 (HPSI Boration) is in progress describe the conditions that would require RCS depressurization

Reference Id: Q22503  
Difficulty: 4.00  
Time to complete: 3  
10CFR Category: CFR 55.41 (8) 55.41 (8) Components, capacity, and functions of emergency systems.  
Cognitive Level: Comprehension / Anal  
Question Source: New  
Comment:

**Proposed reference to be provided to applicant during examination:** NONE

**Technical Reference:** FRP, 40EP-9EO09 / Electrical print, 01-PEB-001

**K&A:** Knowledge of the operational implications of the following concepts as they apply to the (Functional Recovery) Components, capacity, and function of emergency systems.

**Justification:**

**2009 Reactor Operator Exam**

**A is Wrong - A DG breaker will not close on bus with an 86 on the normal supply breaker**

**B is Wrong - B DG output breaker will not close on the PBB-S04 bus with a faulted normal supply breaker**

**C is Correct - per the FRP Depressurize the RCS by RCS Heat Removal (IC-2, step 3b)**

**D is Wrong - The DG already meets minimum voltage requirements 4080 volts and the examinee should realize the DG output breaker is locked out with a fault on the normal supply breaker**

2009 Reactor Operator Exam

28

This Exam Level RO  
Appears on: 2009 SRO  
EXAM  
Tier 2  
Group 1  
K/A # 34003k5.02  
Importance 2.80  
Rating:

Given the following conditions:

- Unit 1 has been manually tripped in preparations for a refueling outage.
- The plant is currently being maintained in Mode 3, normal operating pressure and temperatures.
- A Loss of Offsite Power occurs.

Which one of the following correctly represents RCS parameters while the Reactor Coolant pumps are in **COASTDOWN?**

- A. Steam Generator DPs lower and Core DP lowers.
- B. Steam Generator DPs lower and Core DP is unchanged.
- C. Steam Generator DPs are unchanged and Core DP lowers.
- D. Steam Generator DPs are unchanged and Core DP is unchanged.

Answer: A

Associated KA:  
67761

State the RCS conditions used to verify subcooled natural circulation is occurring in the RCS.

Reference Id: Q22504  
Difficulty: 2.00  
Time to complete: 2  
10CFR Category:

CFR 55.41 (5) 55.41 (5) Facility operating characteristics during steady state and transient conditions, including coolant chemistry, causes and effects of temperature, pressure and reactivity changes, effects of load changes, and operating limitations and reasons for these operating characteristics.

Cognitive Level: Comprehension / Anal  
Question Source: New  
Comment:

**Proposed reference to be provided to applicant during examination: NONE**

**Technical Reference:** LOIT lesson plan

**K&A:** Knowledge of the operational implications of the following concepts as they apply to the RCPS: [Effects of RCP coastdown on RCS parameters](#)

**Justification:** SG and Core DPs are driven by RCP flow. T-cold will remain constant since it is controlled by the SBCS. Examinee may choose any of the distracters if they do not understand the relationships between SG/core DP and RCP flow. Tcold increase from 555 to 564 degrees on Rx trip.

**A is Correct -**

**B, C and D are Wrong -**

**2009 Reactor Operator Exam**

2009 Reactor Operator Exam

29

This Exam Level RO  
Appears on: 2009 SRO  
EXAM  
Tier 2  
Group 1  
K/A # 32004k3.08  
Importance 3.60  
Rating:

Given the following plant conditions:

- Unit 1 is at 100% power in a normal lineup.
- All RCP seal injection controllers (CHN-FIC-241-244) are in automatic.
- 2 charging pumps are in operation.

Which one of the following would cause the output signal of CHN-FIC-244, 2B RCP controller, to lower?

- A. A charging pump trips.
- B. An inadvertent CIAS has occurred.
- C. A different RCP's seal injection control valve has failed closed.
- D. A loss of instrument air to the CHN-FIC-244, 2B RCP controller.

Answer: A

Associated KA:  
L68108

Explain the operation of the RCP Seal Injection Flow Control Valves (CHE-FV-241,242,243, and 244), including their Control Room controls, under normal operating conditions.

Reference Id: Q22605  
Difficulty: 4.00  
Time to complete: 3  
10CFR Category: CFR 55.41 (7) 55.41 (7) Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.  
Cognitive Level: Comprehension / Anal  
Question Source: Modified PV Bank  
Comment:

**Proposed reference to be provided to applicant during examination: NONE**

**Technical Reference:** LOIT lesson plan / print 01-E-CHB-0053

**K&A:** Knowledge of the effect that a loss or malfunction of the CVCS will have on the following: [RCP seal injection](#)

**Justification:** These controllers are reverse acting so a lowering output means it is looking to raise seal injection flow to that RCP.

**A is Correct - A loss of a charging pump will cause all RCP's seal injection flow to lower and each controller including CHN-FIC-244 will lower output to increase flow back to setpoint.**

**B is Wrong - CIAS closes various Letdown valves but will have no effect on charging.**

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**2009 Reactor Operator Exam**

C is Wrong - A different RCP's Seal Injection control valve failing closed will cause the remaining Injection flow to rise and the controller will increase output to lower flow.

D is Wrong - CHN-FIC-244 fails open on a loss of IA therefore the controller to raise output in an attempt to lower Seal Injection flow.

2009 Reactor Operator Exam

30

This Exam Level RO  
Appears on: 2009 SRO  
EXAM  
Tier 2  
Group 1  
K/A # 32004k6.22  
Importance 2.60  
Rating:

Given the following conditions:

- Unit 1 is currently at 20% power.
- All control systems are in their normal automatic alignment.
- Pressurizer level control is selected to Channel "Y".
- T-hot instrument, RCN-TT-111X fails high.

Which one of the following conditions will or could occur?

- A. A continuous turbine runback demand to the Reactor Cutback System would be generated in case of a main feedpump trip.
- B. A Quick Open signal is blocked in the Steam Bypass Control System to prevent an excessive cooldown if a reactor trip were to occur.
- C. A high rate insertion demand will be generated by the Control Element Drive Mechanism Control System and will drive CEAs inward if CEDMCS is in Auto Sequential.
- D. A high level error signal will be generated by the Pressurizer Level Control System, letdown control valves will maintain a minimum flow to avoid thermal shock of the RCS charging nozzle.

Answer: D

Associated KA:  
L75121

Describe the response of the Pressurizer Level Control System to a failure of a Temperature transmitter.

Reference Id: Q22506  
Difficulty: 4.00  
Time to complete: 4  
10CFR Category:

CFR 55.41 (7) 55.41 (7) Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

Cognitive Level: Comprehension / Anal  
Question Source: New  
Comment:

**Proposed reference to be provided to applicant during examination: NONE**

**Technical Reference:** LOIT lesson plan / PLCS drawing / 40AO-9ZZ16, RRS malfunctions

**K&A:** Knowledge of the effect of a loss or malfunction on the following CVCS components: Design minimum and maximum flow rates for letdown system.

**Justification:**

**A is Wrong - High T-ave prevents Turbine Runback**

**2009 Reactor Operator Exam**

**B is Wrong - High T-ave prevents a Quick Open block**

**C is Wrong - High insertion demand will be generated but the AMI (5°F T-ave deviation) will prevent CEA movement if in Auto Sequential**

**D is Correct - High Tave generates a high level program setpoint. Level at 20% power is approximately 34% pwr level so letdown will go to minimum flow to raise level. Letdown flow must be maintained high enough to pre-heat charging flow injecting to the 2A loop.**

## 2009 Reactor Operator Exam

31

This Exam Level RO  
Appears on: RO EXAM  
20082009  
SRO EXAM

K/A # 3.4005K2.03  
Importance  
Rating:

What are the power supplies to the Shutdown Cooling Isolation valves, SIA-HV-651 (a) and SIC-HV-653 (b) ?

- A. (a) 480 VAC Class LC, PG  
(b) 480 VAC Class LC, PG
- B. (a) 480 VAC Class LC, PG  
(b) 125 VDC Class MCC, PK
- C. (a) 480 VAC Class MCC, PH  
(b) 480 VAC Class MCC, PH
- D. (a) 480 VAC Class MCC, PH  
(b) 125 VDC Class MCC, PK

Answer: D

Associated KA:  
65136

Identify the power supplies to SI related equipment.

Reference Id: Q10504  
Difficulty: 2.00  
Time to complete: 2  
10CFR Category:

CFR 55.41 (7) 55.41 (7) Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

Cognitive Level: Memory  
Question Source: PV Bank Not Modified  
Comment:

**Proposed reference to be provided to applicant during examination:** None

**Technical Reference:** Electrical prints, 01-E-SIB-013 & 014

**K&A:** Knowledge of bus power supplies to the following: RCS pressure boundary motor-operated valves

**Justification:**

A is wrong -

B is wrong -

C is wrong -

D is CORRECT - SI-651 is supplied by a class MCC (PH) and SI-654 is supplied by class DC (PK) thru an inverter N43

2009 Reactor Operator Exam

32

This Exam Level RO  
Appears on: 2009 SRO  
EXAM  
Tier 2  
Group 1  
K/A # 32006k1.02  
Importance 4.30  
Rating:

Given the following plant conditions:

- Containment pressure (NR) Channel A 3.2 psig.
- Containment pressure (NR) Channel B 2.7 psig.
- Containment pressure (NR) Channel C 3.1 psig.
- Containment pressure (NR) Channel D 2.6 psig.

What is the effect on the Emergency Core Cooling System?

- A. No CIAS/SIAS actuation, no Safety Injection pumps or valves have gone to their actuated condition.
- B. Full CIAS/SIAS actuation, both trains of Safety Injection pumps and valves are in their actuated condition.
- C. "A" train CIAS/SIAS actuation, only the "A" train Safety Injection pumps and valves have gone to their actuated condition.
- D. "A" train 1-3 Half Leg CIAS/SIAS actuation, only the "A" train Safety Injection valves have gone to their actuated condition, no pumps are running.

Answer: B

Associated KA:  
L77167

Describe what automatically initiates the Containment Isolation Actuation System (CIAS) and its function.

Reference Id: Q22508  
Difficulty: 3.00  
Time to complete: 3  
10CFR Category:

CFR 55.41 (7) 55.41 (7) Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

Cognitive Level: Comprehension / Anal  
Question Source: New  
Comment:

**Proposed reference to be provided to applicant during examination: NONE**

**Technical Reference:** Simplified drawings, ESFAS overview

**K&A:** Knowledge of the physical connections and/or cause effect relationships between the ECCS and the following systems: ESFAS

**Justification:** CIAS/SIAS setpoint is 3.0 psig, channels A and C have exceeded setpoint

**A is Wrong - If this had been actuation relays instead of matrix relays this would be a correct answer**

**2009 Reactor Operator Exam**

**B is Correct - Any 2 of 4 matrix relays will cause full actuation of CIAS/SIAS**

**C is Wrong - Examinee may believe that an A and C signal will create only an "A" train actuation**

**D is Wrong - This condition can occur on a loss of power to the initiation circuits**

2009 Reactor Operator Exam

33

This Exam Level RO  
Appears on: 2009 SRO  
EXAM  
Tier 2  
Group 1  
K/A # 35007a4.09  
Importance 2.50  
Rating:

Given the following conditions:

- Unit 1 is operating at 100% power.
- Reactor Coolant pump 1A has a degraded 3rd seal.
- The crew has verified a 12 gpm leakrate per the Excessive RCS Leakrate procedure.

Referring to the table below which set of trends would you expect to observe over the next 15 minutes?

	Volume Control Tank level (42%)	Reactor Drain Tank level (61%)	Pressurizer level (52.5%)	Containment temperature (90°F) and humidity (4%)
A	stable	increasing	lowering	stable
B	lowering	increasing	stable	stable
C	stable	stable	stable	increasing
D	lowering	stable	lowering	increasing

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

Answer: B

Associated KA:  
L57131

Given a loss of letdown describe the PZR level response when the plant is aligned for extended operations without letdown

L68040

Explain the operation of the Reactor Drain Tank (CHN-X02) under normal operating conditions.

Reference Id: Q22578  
Difficulty: 4.00  
Time to complete: 5  
10CFR Category: CFR 55.41 (7)

55.41 (7) Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

Cognitive Level: Comprehension / Anal  
Question Source: New

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**2009 Reactor Operator Exam**

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Comment:

**Proposed reference to be provided to applicant during examination:** NONE

**Technical Reference:** LOIT lesson plan / RCP emergencies 40AO-9ZZ04

**K&A:** Ability to manually operate and/or monitor in the control room: [Relationships between PZR level and changing levels of the PRT and bleed holdup tank](#)

**Justification:** VCT level will drop due to the loss of inventory. PZR level will remain stable as letdown flow lowers. RDT level will increase as the RCS fluid flows past the failed seal. Containment temp and humidity are unaffected as failed RCP seal flow is collected in the RDT. 12 gpm is not enough to cause the RDT rupture disc to release in 15 minutes.

**A is Wrong -**

**B is Correct -**

**C is Wrong -**

**D is Wrong -**

2009 Reactor Operator Exam

34

This Exam Level RO  
Appears on: 2009 SRO  
EXAM  
Tier 2  
Group 1  
K/A # 35007a2.03  
Importance 3.60  
Rating:

Given the following plant conditions:

- The reactor is tripped due to an Excessive Steam Demand event.
- HPSI pumps are running, with Safety Injection valves full open.
- The "always running" charging pump continues to run.
- Pressurize pressure is 2280 psia and increasing.
- RCPs 1A and 2A were secured when RCS pressure dropped below the SIAS setpoint.
- Pressurizer level is now above the indicating range.

With no Operator action, these conditions will result in a high pressure in the ....

- A. Equipment Drain Tank but can be mitigated by initiating auxiliary spray to lower RCS pressure.
- B. Equipment Drain Tank but can be mitigated by venting the pressurizer utilizing Reactor Coolant Gas Vent System.
- C. Reactor Drain Tank but can be mitigated by throttling closed the HPSI injection valves to reduce RCS makeup flow.
- D. Reactor Drain Tank but can be mitigated by increasing secondary plant heat removal to control RCS temperature.

Answer: D

Associated KA:  
L11208

Given the EOPs are being performed and the plant is water solid describe how and why RCS pressure control differs from pressure control with a PZR bubble

Reference Id:  
Difficulty:  
Time to complete:  
10CFR Category:

Q22509  
4.00  
4  
CFR 55.41 (5) 55.41 (5) Facility operating characteristics during steady state and transient conditions, including coolant chemistry, causes and effects of temperature, pressure and reactivity changes, effects of load changes, and operating limitations and reasons for these operating characteristics.

Cognitive Level:  
Question Source:  
Comment:

Comprehension / Anal  
Modified PV Bank

**Proposed reference to be provided to applicant during examination:** NONE

**Technical Reference:** 40EP-9EO05, ESD /

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

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**2009 Reactor Operator Exam**

**Justification: The Pzr must be solid or Pressure would not be increasing. The safeties relieve to the RDT. The EDT does collect coolant from primary systems, so it is plausible as a distracter**

**A is Wrong - EDT is incorrect. A solid RCS means auxiliary spray is not an effective means of pressure control**

**B is Wrong - EDT wrong but physically venting the PZR could work and can be found in procedures**

**C is Wrong - RDT is correct and examinee may want to apply the normal level control of throttling HPSI valves but the running charging pump is increasing RCS pressure.**

**D is Correct - Reliefs go to the RDT and then ESD provides guidance to control RCS temperature**

2009 Reactor Operator Exam

35

This Exam Level RO  
Appears on: 2009 SRO  
EXAM  
Tier 2  
Group 1  
K/A # 2.1.1  
Importance 3.80  
Rating:

Given the following conditions:

- Unit 1 is in Mode 3 following a Reactor trip.
- You are a "license trainee" on shift.
- Nuclear Cooling Water pump, NCN-P01A needs to be tagged out for scheduled maintenance.

As a license trainee you may manipulate NCN-HS-1 ...

- A. only under the direct supervision of a licensed operator.
- B. in the current mode since this is not an "Irretrievable Action".
- C. at any time since this action does not directly affect reactivity or power level.
- D. provided that this action causes no change in system status, NCN-P01B already is in service.

Answer: A

Associated KA:  
72275

Routine Shift Operations

Reference Id: Q22511  
 Difficulty: 2.00  
 Time to complete: 2  
 10CFR Category: CFR 55.41 (10) 55.41 (10) Administrative, normal, abnormal, and emergency operating procedures for the facility.  
 Cognitive Level: Memory  
 Question Source: New  
 Comment:

**Proposed reference to be provided to applicant during examination:** NONE

**Technical Reference:** Conduct of Shift OPS, 40DP-9OP02

**K&A:** Knowledge of conduct of operations requirements. [Component Cooling Water](#)

**Justification:**

**A is Correct - step 5.1.6**

**B is Wrong - there is procedure guidance for these actions examinee may believe manipulations are permitted in mode 3**

**C is Wrong - this action never directly affects power level**

**D is Wrong - no change in system status examinee may believe this is permitted.**

2009 Reactor Operator Exam

36

This Exam Level RO  
Appears on: 2009 SRO  
EXAM  
Tier 2  
Group 1  
K/A # 33010k6.03  
Importance 3.20  
Rating:

Given the following conditions:

- Unit 1 is at 100% power.
- Pressurizer pressure is 2100 psia and lowering.
- Pressurizer backup heaters are energized.
- Pressurizer Pressure Master Controller RCN-PIC-100 is in AUTO with 0% output.
- Pressure Control Channel X/Y selector, RCN-HS-100 is selected to channel X .

Which one of the following malfunctions or conditions would cause these conditions in the Pressurizer Pressure Control system?

- A. Pressurizer main spray valves have failed open.
- B. Pressure transmitter RCN-PT-100X has failed high.
- C. Pressure Spray Control RCN-PIK-100 has failed low.
- D. Pressurizer Pressure Master Controller RCN-PIC-100 has failed low.

Answer: A

Associated KA:  
L75344

Describe the response of the Pressurizer Pressure Control System to a failure of an input transmitter.

Reference Id: Q22512  
 Difficulty: 3.00  
 Time to complete: 3  
 10CFR Category: CFR 55.41 (7) 55.41 (7) Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.  
 Cognitive Level: Comprehension / Anal  
 Question Source: New  
 Comment:

**Proposed reference to be provided to applicant during examination:** NONE

**Technical Reference:** LOIT lesson plan / Simplified drawings

**K&A:** Knowledge of the effect of a loss or malfunction of the following will have on the PZR PCS: [PZR sprays and heaters](#)

**Justification:**

**A is Correct - spray valves failed open = low pressure and full 0% output of master controller**

**B is Wrong - 100X failing high would cause low pressure conditions but the RCN-PIC-100, master controller, would have 50% output for full spray**

**2009 Reactor Operator Exam**

C is Wrong - failing low would be no output = no spray flow

D is Wrong - examinee could believe that 0% output is correct for full spray flow vs full proportional heater output

2009 Reactor Operator Exam

37

This Exam Level RO  
Appears on: 2009 SRO  
EXAM  
Tier 2  
Group 1  
K/A # 37012k5.01  
Importance 3.30  
Rating:

Which one of the following conditions will cause the calculated value of Departure from Nucleate Boiling Ratio (DNBR) to come closer to the Reactor Trip setpoint.

- A. Grid frequency increases slightly.
- B. Pressurizer pressure is increased by 15 psia.
- C. Power is increased with CEAs remaining ARO.
- D. RCS temperature is lowered while maintaining power constant.

Answer: C

Associated KA:

[L78284](#) Explain how DNBR is calculated in the Core Protection Calculators.

[100866](#) Active Question Bank 2004

[L78284](#) Explain how DNBR is calculated in the Core Protection Calculators.

[29616](#) Describe the process by which CPCs determine Core Delta-T power

Reference Id: Q63823  
 Difficulty: 3.00  
 Time to complete: 4  
 10CFR Category: CFR 55.41 (5) 55.41 (5) Facility operating characteristics during steady state and transient conditions, including coolant chemistry, causes and effects of temperature, pressure and reactivity changes, effects of load changes, and operating limitations and reasons for these operating characteristics.

Cognitive Level: Comprehension / Anal  
 Question Source: PV Bank Not Modified  
 Comment:

**Proposed reference to be provided to applicant during examination: NONE**

**Technical Reference:** LOIT lesson plan

**K&A:** Knowledge of the operational implications of the following concepts as the apply to the RPS: DNB

**Justification:**

**A is Wrong - Freq. increases flow increases DNBR better**

**B is Wrong - Pressure increases DNBR better**

**C is Correct - power increases, CEAs unchanged DNBR worse**

**D is Wrong - temperature lowers DNBR better**

2009 Reactor Operator Exam

38

This Exam Level RO  
Appears on: 2009 SRO  
EXAM  
Tier 2  
Group 1  
K/A # 2.2.44  
Importance 4.20  
Rating:

Given the following conditions:

- Unit 1 is at 100% power.
- Channel "C" parameter 5 HI PZR PRESS is bypassed for I&C maintenance.
- Channel "B" HI PZR PRESS has just tripped due to an instrument failure.

Which one of the following correctly describes the status of the Reactor Protection System if the Channel "B" parameter 5 bypass pushbutton is depressed?

- A. Both Channels "B & C" are in bypass.
- B. Neither Channel "B or C" is in bypass.
- C. Channel "B" parameter 5 goes in bypass, Channel "C" comes out of bypass.
- D. Channel "C" parameter 5 stays in bypass, Channel "B" parameter 5 is not in bypass.

Answer: C

Associated KA:  
L77088

Describe the RPS Trip Channel bypass interlock.

Reference Id: Q22514  
Difficulty: 2.00  
Time to complete: 2  
10CFR Category:

CFR 55.41 (5) 55.41 (5) Facility operating characteristics during steady state and transient conditions, including coolant chemistry, causes and effects of temperature, pressure and reactivity changes, effects of load changes, and operating limitations and reasons for these operating characteristics.

Cognitive Level: Comprehension / Anal  
Question Source: New  
Comment:

**Proposed reference to be provided to applicant during examination: NONE**

**Technical Reference:** LOIT lesson plan

**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. [Reactor Protection](#)

**Justification:** The highest priority channel is the only one that will be in bypass. The Lower channel "C" will come out of bypass

**A, B and D are Wrong -**

**C is Correct - -**

## 2009 Reactor Operator Exam

39

This Exam Level RO  
 Appears on: 2009 SRO  
 EXAM  
 Tier 2  
 Group 1  
 K/A # 32013k2.01  
 Importance 3.60  
 Rating:

The "A" train BOP/ESFAS cabinet, SAA-C02A, has two power supplies which are ...

- A. PHA-M31 and PNC-D27
- B. PHA-M31 and PKA-D21.
- C. PNA-D25 and PNC-D27
- D. PNA-D25 and PKA-D21.

Answer: D

Associated KA:  
65032

Explain the operation of the BOP ESFAS Cabinets under normal operating conditions.

Reference Id: Q22538

Difficulty: 3.00

Time to complete: 2

10CFR Category: CFR 55.41 (7)

55.41 (7) Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

Cognitive Level: Memory

Question Source: New

Comment:

**Proposed reference to be provided to applicant during examination: NONE**

**Technical Reference:** LOIT lesson Plan / Board 5 ARP 41AL-1RK5A

**K&A:** Knowledge of bus power supplies to the following: [ESFAS/safeguards equipment control](#)

**Justification:** employee could believe any combination of class power supplies from different sources could power the cabinets

**A is Wrong -**

**B is Wrong -**

**C is Wrong -**

**D is Correct - PNA and PKA are correct**

2009 Reactor Operator Exam

40

This Exam Level RO  
Appears on: 2009 SRO  
EXAM  
Tier 2  
Group 1  
K/A # 32013k4.03  
Importance 3.90  
Rating:

Which one of the following combination of setpoints/interlocks will **ALL** initiate a Main Steam Isolation Signal (MSIS).

- A. SG pressure 920 psia, Containment pressure 3.5 psig, SG level 46% WR.
- B. SG level 89% NR, SG pressure 920 psia and Pressurizer pressure 1850 psia.
- C. Containment pressure 3.1 psig, SG level 92% NR and SG pressure 950 psia.
- D. SG level 40% WR, Containment pressure 3.5 psig and Pressurizer pressure 1800 psia.

Answer: C

Associated KA:  
L77170

Describe what will automatically initiate a Main Steam Isolation Signal (MSIS) and its function.

Reference Id: Q22539  
Difficulty: 3.00  
Time to complete: 2  
10CFR Category: CFR 55.41 (7)

55.41 (7) Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

Cognitive Level: Memory  
Question Source: New  
Comment:

**Proposed reference to be provided to applicant during examination: NONE**

**Technical Reference:** LOIT lesson plan / 40AO-9ZZ17, Inadvertant PPS-ESFAS Actuations

**K&A:** Knowledge of ESFAS design feature(s) and/or interlock(s) which provide for the following: [Main Steam Isolation System](#)

**Justification: MSIS is generated by:**

- SG NR level 91% or more
- Ctmt pressure 3.0 psig or more
- SG pressure 960 psia or less

Pressurizer pressure of 1837 psia will generate a SIAS, SG level of 45% WR generates a Reactor trip.

**A is Wrong -**

**B is Wrong -**

**C is Correct -**

**D is Wrong -**

**2009 Reactor Operator Exam**

2009 Reactor Operator Exam

41

This Exam Level RO  
Appears on: 2009 SRO  
EXAM  
Tier 2  
Group 1  
K/A # 35022k4.01  
Importance 2.50  
Rating:

Which one of the following correctly describes the operation of the Main Steam Support Structure (MSSS) Penetration Cooling system?

- A. One MSSS Penetration AFU Fan in operation, two MSSS Penetration Exhaust Fans in operation. The other MSSS Penetration AFU fan will auto-start on low D/P.
- B. Two MSSS Penetration AFU Fans in operation, one MSSS Penetration Exhaust Fan in operation. The other MSSS Penetration AHU fan will auto-start on low D/P.
- C. One MSSS Penetration AFU Fan in operation, one MSSS Penetration Exhaust Fans in operation. There are no auto-start features associated with the MSSS Penetration Cooling system.
- D. Two MSSS Penetration AFU Fans in operation, two MSSS Penetration Exhaust Fans in operation. A low D/P on the MSSS Penetration AFU fan will initiate a trip of the associated MSSS AHU fan.

Answer: A

Associated KA:  
74478

Explain the operation of the MSSS Ventilation Supply Fans (HCN-A05-A, & B) under normal operating conditions.

Reference Id: Q22540  
Difficulty: 3.00  
Time to complete: 3  
10CFR Category: CFR 55.41 (7)

55.41 (7) Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

Cognitive Level: Memory  
Question Source: New  
Comment:

**Proposed reference to be provided to applicant during examination: NONE**

**Technical Reference:** 40OP-9HC01, Cntmt HVAC / 40AL-9RK7A, B07A Alarm Response

**K&A:** Knowledge of CCS design feature(s) and/or interlock(s) which provide for the following: [Cooling of containment penetrations](#)

**Justification:**

**A is Correct - One AFU and two AHU is the normal alignment. The standby AFU auto starts on low D/P**

**B, C and D are all Wrong but could be reasonable alignments for the MSSS penetration cooling system. Standby starts, trips or lack of auto functions are reasonable for a non-class system**

## 2009 Reactor Operator Exam

42

This Exam Level	RO
Appears on:	2009 SRO EXAM Tier 2 Group 1
K/A #	2.2.41
Importance	3.50
Rating:	

Given the following conditions:

- Unit 1 is operating at 100% power.
- Containment Spray pump "A" is going to be run on miniflow for surveillance testing.
- Refer to the provided electrical print 01-E-SIB-003.

Which one of the following is true regarding alarm window 2B06A, SDC Train A/B Flow LO?

Alarm window 2B06A ...

- A. is only active when shutdown cooling flow is in service.
- B. will annunciate immediately after CS pump "A" is started.
- C. will annunciate 20 seconds after CS pump "A" is started.
- D. will annunciate 50 seconds after CS pump "A" is started.

Answer: C

Associated KA:  
15946

Check of print logic

Reference Id:	Q22576
Difficulty:	3.00
Time to complete:	3
10CFR Category:	CFR 55.41 (10) 55.41 (10) Administrative, normal, abnormal, and emergency operating procedures for the facility.
Cognitive Level:	Comprehension / Anal
Question Source:	New
Comment:	

**Proposed reference to be provided to applicant during examination:** 01-E-SIB-003

**Technical Reference:** electrical print and 2B06A

**K&A:** Ability to obtain and interpret station electrical and mechanical drawings.

**Justification:** Per the print the time delay is set for 20 seconds

**A is Wrong - this alarm is not de-activated when not in SDC operations. Examinee may believe that since this alarm is designed for a Loss of SDC that it is disabled when at power. (SIAS alarms are disabled below 400#, LOG trips are bypassed at power)**

**B is Wrong - there is a time delay**

**C is Correct -**

**D is Wrong - 50 seconds is the max TD available**

2009 Reactor Operator Exam

2009 Reactor Operator Exam

43

This Exam Level RO  
Appears on: 2009 SRO  
EXAM  
Tier 2  
Group 1  
K/A # 35026a1.06  
Importance 2.70  
Rating:

Given the following Unit 2 conditions:

- Time 0 - The 120 VAC control circuit fuse for the CS pump room essential ACU (PHA-M3533) blows.
- Time 1 - An inadvertent "A" train CSAS actuates.

Assuming that the blown fuse has not been replaced, which one of the following is correct regarding the White (SEAS) and Blue (SEIS) lights on the Safety Equipment Status System ESA-UA-2A alarm panel?

- A. Time 0 - White light off, Blue light on.  
Time 1 - White light on, Blue light on.
- B. Time 0 - White light on, Blue light off.  
Time 1 - White light on, Blue light off.
- C. Time 0 - White light on, Blue light off.  
Time 1 - White light on, Blue light on.
- D. Time 0 - White light off, Blue light on.  
Time 1 - White light off, Blue light on.

Answer: C

Associated KA:  
74567

Describe the conditions required to generate the following SESS alarms associated with the Auxiliary Building HVAC System:

- Aux Bldg Basement Pmp Rms HVAC Isol Dmprs
- HPSI Pmp Rm ESS ACU Z01
- LPSI Pmp Rm ESS ACU Z02
- CS Pmp Rm ESS ACU Z03
- Aux FW Pmp Rm ESS ACU Z04
- ECW Pmp Rm ESS ACU Z05
- Elect Pen Rm ESS ACU Z06

Reference Id:  
Difficulty:  
Time to complete:  
10CFR Category:

Q22606  
3.00  
2  
CFR 55.41 (5)

55.41 (5) Facility operating characteristics during steady state and transient conditions, including coolant chemistry, causes and effects of temperature, pressure and reactivity changes, effects of load changes, and operating limitations and reasons for these operating characteristics.

Cognitive Level:  
Question Source:  
Comment:

Comprehension / Anal  
New

**Proposed reference to be provided to applicant during examination: NONE**

**Technical Reference:** LOIT lesson plan / 41AL-1ES2A, SESS alarm response

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**2009 Reactor Operator Exam**

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

**Justification:** White is for Inoperable and blue is for an ESFAS start signal has been generated and the equipment (fan) did not start.

**A is Wrong - White light should be on at t-0, blue light off**

**B is Wrong - White and Blue light should be on at t-1**

**C is Correct -**

**D is Wrong - White light should be on at t-0 and t-1**

2009 Reactor Operator Exam

44

This Exam Level RO  
Appears on: 2009 SRO  
EXAM  
Tier 2  
Group 1  
K/A # 34039a1.06  
Importance 3.00  
Rating:

Given the following conditions:

- Unit 1 is operating at 100% power.
- Steam pressure transmitter SGN-PT-1027 has failed low.
- The Steam Bypass Control System (SBCS) is aligned for Remote/Auto operation.
- The Main Turbine trips.

After the Quick Open has cleared and assuming NO operation action, which one of the following is correct regarding the SBCS and main steam pressure?

- A. The SBCS will not function and the main steam header pressure will increase to Main Steam Safety setpoint.
- B. Only SBCVs 7 and 8 will function and the main steam header pressure will be controlled at the automatic setpoint.
- C. All SBCVs will function and the main steam header pressure will be controlled at a slightly higher than normal setpoint due to the bias applied by the failure of SGN-PT-1027.
- D. All SBCVs will function and the main steam header will be controlled approximately 20 psia below the automatic setpoint due to the "locked in" permissive signal.

Answer: A

Associated KA:  
L65645

Describe how the SBCS generates its demand and permissive setpoints.

L65649

Describe the response of the SBCS to a failure of the following transmitters:

- PT-1024 (Steam header pressure)
- PT-1027 (Steam header pressure)
- Pressurizer pressure
- Tavg from RRS
- Power from RRS
- TLI from RRS

Reference Id:  
Difficulty:  
Time to complete:  
10CFR Category:

Q22573  
4.00  
4  
CFR 55.41 (5)

55.41 (5) Facility operating characteristics during steady state and transient conditions, including coolant chemistry, causes and effects of temperature, pressure and reactivity changes, effects of load changes, and operating limitations and reasons for these operating characteristics.

Cognitive Level:  
Question Source:  
Comment:

Comprehension / Anal  
New

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**2009 Reactor Operator Exam**

**Proposed reference to be provided to applicant during examination:** NONE

**Technical Reference:** LOIT lesson plan / Operations simplified drawings

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

**Justification:**

**A is Correct - SBCVs are locked out due to a loss of permissive signal pressure increases to MSSV setpoint**

**B is Wrong - no valves will function but this is similar to how SBCVs function with a loss of vacuum**

**C is Wrong - No valves will function but this is similar to how the SBCVs function with a failed high PZR instrument applying the BIAS to the automatic setpoint**

**D is Wrong - No valves will function but the permissive setpoint has a minus 20 psia signal applied to ensure it is below the modulation setpoint.**

2009 Reactor Operator Exam

45

This Exam Level RO  
Appears on: 2009 SRO  
EXAM  
Tier 2  
Group 1  
K/A # 34059a4.03  
Importance 2.90  
Rating:

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

- An increase to 20% power is in progress.
- The plant is currently at 14.5% power by control channel indication.
- Steam Generator #1 downcomer valve position is 80% and is opening slowly.
- Steam Generator #2 downcomer valve position is 70% and is opening slowly.

Under these conditions which one of the following is the expected response of the DFWCS system?

- A. Only SG 1 should now go through swapover.
- B. Both SGs 1 and 2 should now go through swapover.
- C. Neither SG will go through swapover until > 15% power is reached.
- D. Neither SG will go through swapover until both SG downcomer valves are > 80% open.

Answer: C

Associated KA:  
L82255

Describe the response of the DFWCS to an increase in reactor power to include the following:

- Swapover
- Single - three element control change
- Downcomer reopening

Reference Id: Q22542  
Difficulty: 3.00  
Time to complete: 3  
10CFR Category: CFR 55.41 (7)

55.41 (7) Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

Cognitive Level: Memory  
Question Source: Modified PV Bank  
Comment:

**Proposed reference to be provided to applicant during examination:** NONE

**Technical Reference:** LOIT lesson plan / OPS simplified drawings

**K&A:** Ability to manually operate and monitor in the control room: [Feedwater control during power increase and decrease](#)

**Justification:**

**A is Wrong - when setpoint is reached both SG act together, 80% is one of the interlocks**

**B is Wrong - do not meet setpoints at this time of control channels > 15%**

**2009 Reactor Operator Exam**

C is Correct - as soon as 15% is reached with either SG downcomer greater than 80% open then swapover occurs

D is Wrong – even if both valves are 80% open > 15% power is required.

2009 Reactor Operator Exam

46

This Exam Level RO  
Appears on: 2009 SRO  
EXAM  
Tier 2  
Group 1  
K/A # 34061k3.02  
Importance 4.20  
Rating:

Given the following conditions:

- Unit 1 has tripped from 100% power due to a failure of a condenser vacuum breaker.
- Condenser vacuum is degrading rapidly.
- Aux. Feedwater pump "B" is tagged out.
- Class 4.160 kV bus PBA-S03 has faulted and is de-energized.
- Aux. Feedpump "A" has tripped on overspeed and will not reset.
- SG levels are 40% WR and lowering.
- RCS T-ave is 560°F and rising.

SG levels will continue to lower until ...

- A. Condensate pumps are aligned.
- B. Aux. Feedwater pump AFN-P01 is aligned.
- C. SG levels reach 25.8% WR level then AFAS will actuate.
- D. T-ave is greater than 564°F then Main Feedwater will feed in Reactor Trip Override (RT0).

Answer: A

Associated KA:  
78325

Discuss the purpose and conditions under which the Auxiliary Feedwater System is designed to function.

Reference Id:  
Difficulty:  
Time to complete:  
10CFR Category:

Q22547  
3.00  
3  
CFR 55.41 (7) 55.41 (7) Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

Cognitive Level:  
Question Source:  
Comment:

Comprehension / Anal  
New

**Proposed reference to be provided to applicant during examination:** NONE

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

**K&A:** Knowledge of the effect that a loss or malfunction of the AFW will have on the following: S/G

**Justification:** No AFW pumps are available; AFB is OOS, AFN-P01 bus is de-energized and AFA tripped on overspeed. MFW pumps trip on vacuum greater than 13.5 inches HgA

**2009 Reactor Operator Exam**

**A is Correct - Condensate pumps are the only available FW source**

**B is Wrong - could believe that manual alignment is available**

**C is Wrong - NO AFW pumps are available**

**D is Wrong – 564 is the RTO feed interlock, below 564 feed would be 0 gpm in RTO**

2009 Reactor Operator Exam

47

This Exam Level RO  
 Appears on: 2009 SRO  
 EXAM  
 Tier 2  
 Group 1  
 K/A # 34061k3.02  
 Importance 3.60  
 Rating:

Given the following Unit 1 conditions:

- Main condenser vacuum has degraded rapidly.
- A manual reactor trip has been initiated.
- The Crew is proceeding through the SPTAs.
- ADVs are being used to maintain SG pressure.
- SG pressures are 1190 psia and increasing slowly.
- Tcold is 568°F and increasing slowly.
- AFB-P01 is feeding each SG at 250 gpm.
- SG levels are 52% WR and slowly lowering.
- 

Per the EOP Operations Expectations, which one of the following is the recommended method to control/maintain the RCS heat transfer rate?

- A. Raise AFB-P01 feedwater flow rate to restore both SGs to within the level band.
- B. Increase ADV demand position and reduce SG pressures to the low end of the control band.
- C. Lower RCS temperature to the low end of the band to allow Main Feedwater to restore SG levels in "RTO".
- D. No action should be taken as long as both RCS temperature and SG pressure are within their control bands.

Answer: A

Associated KA:  
L10441

Given a reactor trip describe the EOP expectation concerning feeding and steaming as they relate to RCS heat removal

Reference Id:  
Difficulty:  
Time to complete:  
10CFR Category:

Q22569  
2.00  
3  
CFR 55.41 (5) 55.41 (5) Facility operating characteristics during steady state and transient conditions, including coolant chemistry, causes and effects of temperature, pressure and reactivity changes, effects of load changes, and operating limitations and reasons for these operating characteristics.

Cognitive Level:  
Question Source:  
Comment:

Comprehension / Anal  
New

**Proposed reference to be provided to applicant during examination:** NONE

**Technical Reference:** EOP Operations Expectations

**2009 Reactor Operator Exam**

**K&A:** Knowledge of the operational implications of the following concepts as they apply to the AFW: [Relationship between AFW flow and RCS heat transfer](#)

**Justification:**

**A is Correct - OPS Expectations is feed over steam**

**B is Wrong - this would increase the heat transfer rate but not preferred and still need to increase AFW flow**

**C is Wrong - RTO will not work with loss of Condenser vacuum**

**D is Wrong - ROs are permitted to take actions in the SPTAs based on trend to maintain the plant**

2009 Reactor Operator Exam

48

This Exam Level RO  
Appears on: 2009 SRO  
EXAM  
Tier 2  
Group 1  
K/A # 36062a2.04  
Importance 3.10  
Rating:

Given the following conditions:

- Unit 1 is operating at 100% power.
- The electric plant is in a normal alignment.
- The local handswitch for 13.8kV breaker NAN-S01A, S01 Normal Supply, has been inadvertently taken to OFF.

Which one of the following conditions is correct?

- A. both NAN-S01 and NBN-S01 will de-energize. Take actions per the Reactor trip procedure.
- B. NAN-S01 will undergo a fast bus transfer to NAN-S03. Take actions per the alarm response procedure.
- C. only NAN-S01 will de-energize, NBN-S01 will fast bus transfer to NBN-S02. Take actions per the Large Load Reject procedure.
- D. only NAN-S01 will de-energize, NBN-S01 remains energized from its normal source. Take actions per the Degraded Electrical procedure.

Answer: A

Associated KA:  
L73616

Explain the operation of Switchgear NAN-S01 and NAN-S02 under normal operating conditions.

Reference Id:  
Difficulty:  
Time to complete:  
10CFR Category:

Q22546  
4.00  
3  
CFR 55.41 (5)

55.41 (5) Facility operating characteristics during steady state and transient conditions, including coolant chemistry, causes and effects of temperature, pressure and reactivity changes, effects of load changes, and operating limitations and reasons for these operating characteristics.

Cognitive Level:  
Question Source:  
Comment:

Comprehension / Anal  
Modified PV Bank

**Proposed reference to be provided to applicant during examination:** NONE

**Technical Reference:** LOIT lesson plans

**K&A:** Ability to (a) predict the impacts of the following malfunctions or operations on the ac distribution system; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: [Effect on plant of de-energizing a bus](#)

**Justification:**

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**2009 Reactor Operator Exam**

A is Correct - neither bus will auto transfer due to no transformer faults. Reactor trip will occur due to loss of 2 RCPs

B is Wrong - there is a fast bus transfer function that activates on a Main Turbine trip

C is Wrong - NAN-S01 will de-energize but NBN-S01 will not transfer to S02 without an associated transformer fault

D is Wrong – NAN-S01 is the normal source but an examinee may confuse the proper alignments

2009 Reactor Operator Exam

49

This Exam Level RO  
Appears on: RO EXAM  
20072009  
SRO EXAM  
  
K/A # 36062K104  
Importance  
Rating:

Given the following conditions:

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

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

- A. PBA-S03 is energized by its respective DG.
- B. PBB-S04 is energized by its respective DG.
- C. PBA-S03 and PBB-S04 are both energized by offsite power.
- D. Both PBA-S03 and PBB-S04 are both energized by their respective DGs.

Answer: A

Associated KA:  
100866

Active Question Bank 2004

L73566

Explain the operation of the Startup Transformers under normal operating conditions.

L73566

Explain the operation of the Startup Transformers under normal operating conditions.

Reference Id: Q66163  
Difficulty: 3.00  
Time to complete: 2

10CFR Category:

CFR 55.41 (5)

55.41 (5) Facility operating characteristics during steady state and transient conditions, including coolant chemistry, causes and effects of temperature, pressure and reactivity changes, effects of load changes, and operating limitations and reasons for these operating characteristics.

Cognitive Level:  
Question Source:  
Comment:

Comprehension / Anal  
PV Bank Not Modified

**Proposed reference to be provided to applicant during examination:** NONE

**Technical Reference:** simplified drawings

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

**Justification:**

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**2009 Reactor Operator Exam**

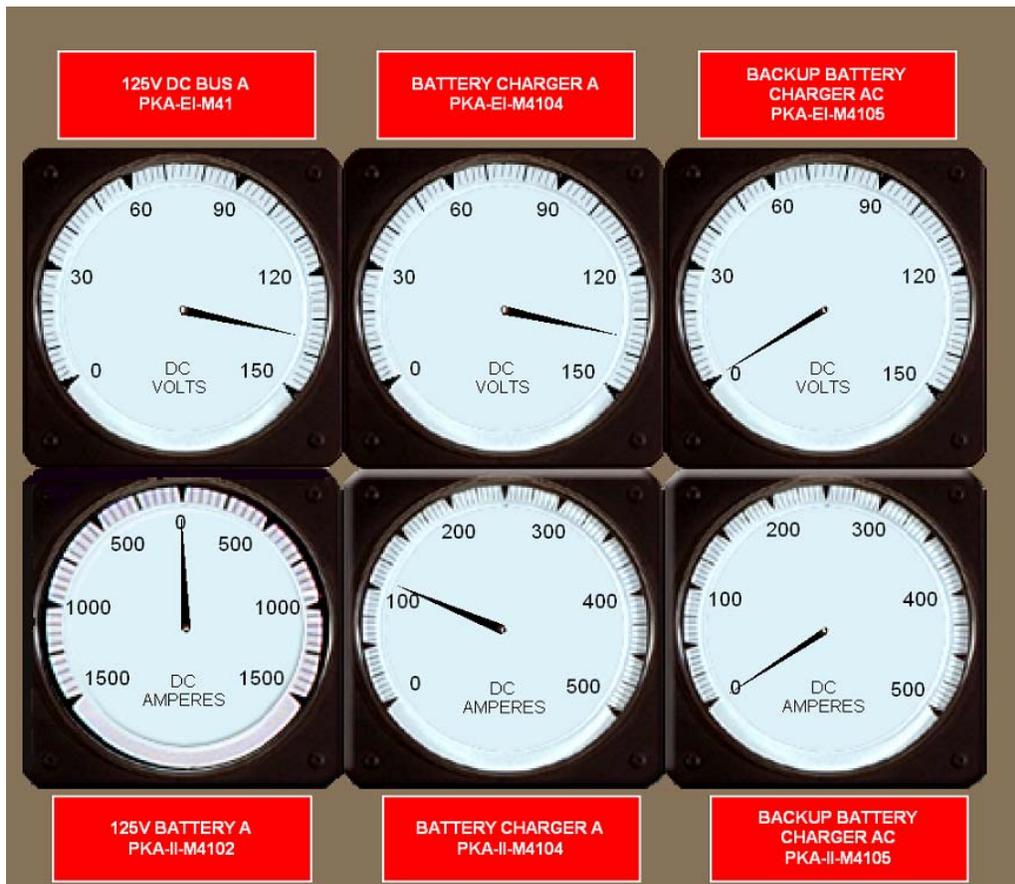
A is the correct answer. Referring to drawing 1-E-MAA-001, Startup Transformer 1 is the normal offsite supply to Unit 3 SO6 and Unit 2 SO5, as well as Alternate supply to Unit 1's SO5 and SO6. Therefore, if this transformer is lost, only PBA-S03 will lose power in Unit 2 and have its Diesel Generator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

## 2009 Reactor Operator Exam

50

This Exam Level RO  
 Appears on: 2009 SRO  
 EXAM  
 Tier 2  
 Group 1  
 K/A # 36063a4.02  
 Importance 2.80  
 Rating:

Given the following B01 indications:



Which one of the following conditions is indicated?

- A. The "A" PK train is in a normal alignment.
- B. The "A" Battery output breaker has tripped.
- C. The "A" Battery charger output breaker has tripped.
- D. The "A" Battery charger AC supply voltage has been lost.

Answer: A

**2009 Reactor Operator Exam**

Associated KA:

[L74229](#)

Describe the Control Room indications associated with the Class IE 125 VDC Power system.

[100866](#)

Active Question Bank 2004

Reference Id:

Q19151

Difficulty:

2.00

Time to complete:

2

10CFR Category:

CFR 55.41 (7)

55.41 (7) Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

Cognitive Level:

Comprehension / Anal

Question Source:

PV Bank Not Modified

Comment:

**Proposed reference to be provided to applicant during examination: NONE****Technical Reference:** LOIT lesson plans / Simulator and CR normal readings**K&A:** Ability to monitor automatic operation of the DC electrical system, including: [Battery voltage indicator](#)**Justification:** This is a picture of a normal PK "A" alignment in the simulator which was verified to match the unit 1 readings.**A is Correct -****B is Wrong -****C is Wrong -****D is Wrong -**

2009 Reactor Operator Exam

51

This Exam Level RO  
Appears on: 2009 SRO  
EXAM  
Tier 2  
Group 1  
K/A # 36064k402  
Importance 3.90  
Rating:

When the Diesel Generator is running in the EMERGENCY MODE after a Loss of Power (LOP), what trips are enabled to protect it?

- A. Overspeed, reverse power, crankcase overpressure.
- B. Low lube oil pressure, overspeed, generator differential.
- C. Excess engine vibration, low lube oil pressure, overspeed.
- D. Main bearing high temperature, turbocharger bearing failure, overspeed.

Answer: B

Associated KA: <a href="#">L75068</a>	List and Describe the Emergency Mode Shutdowns associated with the Diesel Generators.
<a href="#">L75068</a>	List and Describe the Emergency Mode Shutdowns associated with the Diesel Generators.
<a href="#">L75068</a>	List and Describe the Emergency Mode Shutdowns associated with the Diesel Generators.
<a href="#">L75141</a>	List and Describe the Emergency Mode Shutdowns associated with the Diesel Generators.
<a href="#">100866</a>	Active Question Bank 2004

Reference Id: Q11991  
 Difficulty: 2.00  
 Time to complete: 2  
 10CFR Category: CFR 55.41 (7) 55.41 (7) Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.  
 Cognitive Level: Memory  
 Question Source: PV Bank Not Modified  
 Comment:

**Proposed reference to be provided to applicant during examination: NONE**

**Technical Reference:** LOIT lesson plan

**K&A:** Knowledge of ED/G system design feature(s) and/or interlock(s) which provide for the following: [Trips for ED/G while operating \(normal or emergency\)](#)

**Justification: the 3 emergency shutdowns are:**

- **Overspeed**
- **Low Engine Oil pressure**
- **Generator Differential**

**The others are test run trips**

**A, C and D are Wrong -**

**B is Correct -**

52

2009 Reactor Operator Exam

This Exam Level RO  
 Appears on: 2009 SRO  
 EXAM  
 Tier 2  
 Group 1  
 K/A # 37073k1.01  
 Importance 3.60  
 Rating:

Given the following conditions:

- Unit 1 has entered 40AO-9ZZ03. Loss of Cooling Water.
- Essential Cooling Water train "A" has been cross-tied to the Nuclear Cooling Water system.
- An RCS leak into the Nuclear Cooling Water system now occurs.

The Process Radiation Monitoring system will respond by ...

- A. no monitors going into alarm.
- B. alarming RU-6 Nuclear Cooling Water only.
- C. alarming RU-2, "A" Essential Cooling Water only.
- D. alarming RU-2, "A" Essential Cooling Water and RU-6 Nuclear Cooling Water.

Answer: C

Associated KA:  
67128

Explain the operation of the Process Radiation Monitors under normal operating conditions.

Reference Id: Q22549  
 Difficulty: 3.00  
 Time to complete: 3  
 10CFR Category: CFR 55.41 (4) 55.41 (4) Secondary coolant and auxiliary systems that affect the facility.  
 Cognitive Level: Comprehension / Anal  
 Question Source: New  
 Comment:

**Proposed reference to be provided to applicant during examination:** NONE

**Technical Reference:** RMS Alarm Response, 74RM-9EF41

**K&A:** Knowledge of the physical connections and/or causeeffect relationships between the PRM system and the following systems: Those systems served by PRMs

**Justification:** Only the essential loads of NCW are supplied by the EW system when x-tied. Examinee may not understand this physical relationship. Only RU-2 would be expected to alarm.

**A is Wrong -**

**B is Wrong -**

**C is Correct -**

**D is Wrong -**

2009 Reactor Operator Exam

53

This Exam Level RO  
Appears on: 2009 SRO  
EXAM  
Tier 2  
Group 1  
K/A # 34076a1.02  
Importance 2.60  
Rating:

Given the following conditions:

- Circulating Water pumps CWN-P01A - D are all in service.
- Plant Cooling Water pump, PWN-P01A is in service with PWN-P01B tagged out.
- Nuclear Cooling Water (NCW) pump, NCN-P01B is in service with NCN-P01A in standby.
- Turbine Cooling Water (TCW) pump, TCN-P01B is in service with TCN-P01A in standby.
- An 86 bus fault relay is accidentally tripped on NBN-S01, 4160 non class bus.

Which of the following is correct?

- A. There will be no change in CW or PW pump status because the NBN cross tie breaker, NBN-S01C, will close maintaining power to NBN-S01.
- B. NCW and TCW temperatures will increase. The 86 Lockout can only be reset locally. PWN-P01A pump will auto start when PWN-HS-5 is taken out of the PTL position and power has been restored to NBN-S01.
- C. 2 Circulating Water pumps will trip causing a degradation of Main Condenser vacuum. The 86 Lockout can be reset from the Control Room. The Circulating Water pumps must be manually started once power is restored to NBN-S01.
- D. 2 CW pumps and PWN-P01A will trip causing a degraded Main Condenser Vacuum as well as increasing temperatures in the NCW and TCW systems. All 3 pumps must be manually started once power is restored to NBN-S01.

Answer: B

Associated KA:  
74244

Describe the automatic functions associated with the Plant Cooling Water Pumps.

Reference Id: Q22590  
Difficulty: 3.00  
Time to complete: 3  
10CFR Category: CFR 55.41 (5)

55.41 (5) Facility operating characteristics during steady state and transient conditions, including coolant chemistry, causes and effects of temperature, pressure and reactivity changes, effects of load changes, and operating limitations and reasons for these operating characteristics.

Cognitive Level: Comprehension / Anal  
Question Source: New  
Comment:

**Proposed reference to be provided to applicant during examination:** NONE

**Technical Reference:** LOIT lesson plan / Electric prints

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**2009 Reactor Operator Exam**

**K&A:** Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the SWS controls including: Reactor and turbine building closed cooling water temperatures.

**Justification:**

**A is Wrong - NBN-S01C will not close with an 86 trip on the bus. It also requires a transformer fault in conjunction with the Loss of power to meet closing requirements.**

**B is Correct - NC/TC temp will increase with no PCW flow. NO 86 lockout reset from the control room on non-class buses (only class components have this ability) and PW/NC/TC do have time delay auto starts once the bus is recovered**

**C is Wrong - CW is supplied by NAN buses 13.8 kV No 86 from CR but must be manually started**

**D is Wrong - CW is from 13.8 kV buses.**

2009 Reactor Operator Exam

54

This Exam Level RO  
Appears on: 2009 SRO  
EXAM  
Tier 2  
Group 1  
K/A # 38078k3.02  
Importance 3.40  
Rating:

Given the following conditions:

- Unit in mode 1.
- A Loss of Instrument Air is occurring.
- Nitrogen backup has failed.
- IA header pressure currently 40 psig
- NO operator action has been taken.

Based on these conditions, the Main Steam Isolation Valves fail...

- A. AS-IS, but can be fast closed.
- B. AS-IS, but can be slow closed.
- C. fully OPEN and can not be closed.
- D. fully SHUT and can not be opened.

Answer: A

Associated KA:  
100866

Active Question Bank 2004

L56751

Determine the major effects on plant operation as instrument air pressure degrades.

L105694

Respond to a reactor trip with a total loss of instrument air

L58190

Determine the major effects on plant operation as instrument air pressure degrades.

Reference Id: Q15890  
 Difficulty: 3.00  
 Time to complete: 2  
 10CFR Category: CFR 55.41 (7) 55.41 (7) Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.  
 Cognitive Level: Memory  
 Question Source: PV Bank Not Modified  
 Comment:

**Proposed reference to be provided to applicant during examination: NONE**

**Technical Reference:** Loss of Instrument Air, 40AO-9ZZ06

**K&A:** Knowledge of the effect that a loss or malfunction of the IAS will have on the following: [Systems having pneumatic valves and controls](#)

**Justification:** Examines may make any of the other choices since these would be true for another valve in another system

**A is Correct - MSIVs fail AS-IS with fast close available**

**B, C and D are Wrong -**

## 2009 Reactor Operator Exam

55

This Exam Level	RO
Appears on:	2009 SRO EXAM Tier 2 Group 1
K/A #	35103a3.01
Importance	3.90
Rating:	

Given the following conditions:

- HPSI pump "A" is out of service.
- RCS Hot Leg sample valves SSA-UV-203 and SSB-UV-200 are open for Chemistry sampling.

Subsequently

- Unit 1 automatically trips due to a large steam line break.
- 4.160 kV bus PBB-S04 faulted and is de-energized.
- Containment pressure is 3.2 psig and increasing.
- Containment temperature is 140°F and increasing.
- Pressurizer pressure is 1900 psia and lowering.
- Pressurizer level is 24% and lowering.
- Any required ESFAS signals have initiated.
- The CRS has directed you to verify the RCS Hot Leg sample valves status.

Which one of the following conditions is correct?

- A. Both Hot Leg sample will be open. No SESS lights will be initiated.
- B. The "A" train Hot Leg sample valves will be closed, the "B" train valve will be open and the associated white SEIS lights will be illuminated for the "B" train sample valve.
- C. Both Hot Leg sample valves will be closed and can be opened by positioning their handswitch to close then open. A blue SEAS light will initiate when the valves are opened.
- D. Both Hot Leg sample valves will be closed and can be opened by positioning their handswitch to open. No blue or white SESS lights will initiate when the valves are opened.

Answer: C

Associated KA:  
L77229

Explain the operation of the Safety Equipment Status System under normal operating conditions.

Reference Id:	Q22550
Difficulty:	3.00
Time to complete:	3
10CFR Category:	CFR 55.41 (7) 55.41 (7) Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.
Cognitive Level:	Comprehension / Anal

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**2009 Reactor Operator Exam**

Question Source:  
Comment:

New

**Proposed reference to be provided to applicant during examination: NONE**

**Technical Reference:** LOIT lesson plan

**K&A:** Ability to monitor automatic operation of the containment system, including:  
[Containment isolation](#)

**Justification:** Greater than 3.0 psia in contmt will generate a CIAS, RCS Hot Leg sample valves close

**A is Wrong - valves will close, if open their would be a SEAS light**

**B is Wrong - Valves will be closed on the CIAS signal. The loss of "B" class power may confuse the examinee**

**C is Correct - Going to over-ride will open valves and the blue SEAS light will alarm**

**D is Wrong – Must go to over-ride**

2009 Reactor Operator Exam

56

This Exam Level RO  
Appears on: 2009 SRO  
EXAM  
Tier 2  
Group 2  
K/A # 31001a1.09  
Importance 4.20  
Rating:

Given the following conditions:

- The Reactor is stable at 50% power.
- The Main Turbine has tripped.
- The Steam Bypass Master controller, SGN-PIC-1010, is in Auto/Remote operation.
- Normal CEA overlap has been established.

Subsequently

- CEAs are withdrawn 10 inches in Manual Sequential.
- You have been directed to monitor the "D" channel instrumentation for RCS temperature, pressure and power.

Which one of the following correctly describes the expected response and location of these instruments?

- A. Reactor power increases, RCS T-cold increases but returns to program, Pressurizer pressure remains unchanged. The "D" channel indications can be monitored from B05 only.
- B. Reactor power increases slightly but returns to 50%, RCS T-cold increases and remains higher, Pressurizer pressure increases and remains higher. These indications can be found on B05 only.
- C. Reactor power increases, RCS T-cold increases and remains higher, Pressurizer pressure increases and remains higher. The "D" channel indications can be monitored from either QSPDS or B05.
- D. Reactor power increases slightly but returns to 50%, RCS T-cold increases but returns to program, Pressurizer pressure remains unchanged. The "D" channel indications can be monitored from either QSPDS or B05.

Answer: A

Associated KA:  
L67245

Describe the Control Room indications associated with monitoring the RCS.

Reference Id: Q22551  
Difficulty: 4.00  
Time to complete: 4  
10CFR Category: CFR 55.41 (5)

55.41 (5) Facility operating characteristics during steady state and transient conditions, including coolant chemistry, causes and effects of temperature, pressure and reactivity changes, effects of load changes, and operating limitations and reasons for these operating characteristics.

Cognitive Level: Comprehension / Anal  
Question Source: New

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**2009 Reactor Operator Exam**

Comment:

**Proposed reference to be provided to applicant during examination:** NONE

**Technical Reference:** Board Layout /

**K&A:** Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the CRDS controls including: Location and interpretation of RCS temperature and pressure indications

**Justification:**

**SBCS in auto means it is controlling temperature not power. Examinees may confuse 100% power response with what happens when SBCS is maintaining the plant. This is an old PVNGS event, in an attempt to raise temp post cutback the RO pulled CEAs until a VOPT trip occurred. Only A and B instruments feed the QSPDS system.**

**A is Correct -**

**B is Wrong -**

**C is Wrong -**

**D is Wrong -**

2009 Reactor Operator Exam

57

This Exam Level RO  
Appears on: 2009 SRO  
EXAM  
Tier 2  
Group 2  
K/A # 32002k4.02  
Importance 3.50  
Rating:

Which one of the following accurately describes the Reactor Vessel Level Monitoring system (RVLMS)?

- A. Two trains with four (4) sets of heated and unheated thermocouples, 2 located in the Upper Head and 2 located in the Outlet Plenum.
- B. Two trains with eight (8) sets of heated and unheated thermocouples, 4 located in the Upper Head and 4 located in the Outlet Plenum.
- C. Four trains with four (4) sets of heated and unheated thermocouples, 2 located in the Upper Head and 2 located in the Outlet Plenum.
- D. Four trains with eight (8) sets of heated and unheated thermocouples, 4 located in the Upper Head and 4 located in the Outlet Plenum.

Answer: B

Associated KA:  
L76532

Describe the operation of the Reactor Vessel Level Monitoring System (RVLMS).

Reference Id: Q73263  
Difficulty: 3.00  
Time to complete: 2  
10CFR Category:

CFR 55.41 (7) 55.41 (7) Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

Cognitive Level: Memory  
Question Source: Modified PV Bank  
Comment:

**Proposed reference to be provided to applicant during examination: NONE**

**Technical Reference:** SA 101, Reactor Vessel Level Monitoring

**K&A:** Knowledge of the RCS design feature(s) and/or interlocks that provide for the following: [Monitoring reactor vessel level](#)

**Justification:** RVLMS is made of two trains with 8 probes

**A is Wrong - 4 sets could seem reasonable if the examinee does not know the system**

**B is Correct -**

**C and D are Wrong - 4 trains is the normal configuration for class instrumentation**

2009 Reactor Operator Exam

58

This Exam Level RO  
Appears on: 2009 SRO  
EXAM  
Tier 2  
Group 2  
K/A # 32011k2.02  
Importance 3.10  
Rating:

Which one of the following correctly identifies the power supplies to the Pressurizer heaters?

- A. Proportional Heaters, 480 Load Centers (NG), Backup heaters, 480 Load Centers (NG and PG)
- B. Proportional Heaters, 480 Motor Control Centers (NH), Backup heaters, 480 Load Centers (NG and PG)
- C. Proportional Heaters, 480 Motor Control Centers (NH), Backup heaters, 480 Motor Control Centers (NH and PH)
- D. Proportional heaters, 480 Motor Control Centers (NH), Class Backup heaters, 480 Motor Control Centers (PH) and Non class Backup heaters 480 Load Centers (NG)

Answer: A

Associated KA:  
L75210

Describe the interrelationship between the Pressurizer Pressurizer Control System and the following systems:

- Instrument Air System
- 480 VAC Class IE Power
- 480 VAC Non-Class IE Power
- 125 VDC Non-Class IE Power
- 125 VDC Class IE Power
- 120 VAC Non-Class IE Power
- Pressurizer Level Control System
- Reactor Coolant System

Reference Id:  
Difficulty:  
Time to complete:  
10CFR Category:

Q22552  
2.00  
3  
CFR 55.41 (7)

55.41 (7) Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

Cognitive Level:  
Question Source:  
Comment:

Memory  
New

**Proposed reference to be provided to applicant during examination:** NONE

**Technical Reference:** LOIT lesson plan

**K&A:** Knowledge of bus power supplies to the following: [PZR heaters](#)

**Justification:** Non-class heaters (prop and backup) NGN-L11 & 12, Class backups PGA-L33 & 34

**A is Correct -**

**B, C and D are Wrong -**

**2009 Reactor Operator Exam**

2009 Reactor Operator Exam

59

This Exam Level RO  
Appears on: 2009 SRO  
EXAM  
Tier 2  
Group 2  
K/A # 31014k5.01  
Importance 2.70  
Rating:

Given the following conditions:

- Unit 1 is operating at 100% power.
- Rod testing is in progress.
- CEA-18 has been inserted and then withdrawn 5 inches.
- Plant Monitoring System (PMS) computer indicates CEA-18 position at 148.5 inches
- Control Element Assembly Calculators (CEACs) indicate CEA-18 position at 144 inches.

CEA-18 is at ...

- A. 148.5 inches. The PMS computer uses the reed switch position indication system giving actual CEA position while the CEACs use the pulse counters which indicate demand input.
- B. 144 inches. The CEACs indicate actual CEA positions using the pulse counters while the PMS computer uses the Reed Switch Position Indication system which uses CEA demand input.
- C. 148.5 inches. The PMS computer uses the pulse counters which indicate actual CEA position while the CEACs use the reed switch position indication system which indicate demand input.
- D. 144 inches. The CEACs indicate actual CEA positions using the reed switch position indication system while the PMS computer uses the pulse counters which indicate demand input.

Answer: D

Associated KA:  
L78791

Describe the Control Room indications associated with the Control Element Drive Mechanism Control System (CEDMCS).

Reference Id: Q22553  
Difficulty: 3.00  
Time to complete: 3  
10CFR Category:

CFR 55.41 (5)

55.41 (5) Facility operating characteristics during steady state and transient conditions, including coolant chemistry, causes and effects of temperature, pressure and reactivity changes, effects of load changes, and operating limitations and reasons for these operating characteristics.

Cognitive Level: Memory  
Question Source: New  
Comment:

**Proposed reference to be provided to applicant during examination: NONE**

**Technical Reference: LOIT lesson plan**

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**2009 Reactor Operator Exam**

**K&A:** Knowledge of the operational implications of the following concepts as they apply to the RPIS: [Reasons for differences between RPIS and step counter](#)

**Justification:** RSPTs signals are from the CEA extension shaft using actual CEA position to generate CEA position indication, this is used by CPCs and CEACs. The pulse counters derive CEA position based on demand signal not actual position and this information is sent to the Plant Computer.

A is Wrong -

B is Wrong -

C is Wrong -

D is Correct –

2009 Reactor Operator Exam

60

This Exam Level RO  
Appears on: 2009 SRO  
EXAM  
Tier 2  
Group 2  
K/A # 37015k1.03  
Importance 3.10  
Rating:

Given the following plant conditions:

- Unit is operating at 100% power.
- Regulating Group 5 is at 135" for ASI control.
- RRS selected to Control Channel #1.
- Control Channel #1 fails high.

Which one of the following is correct?

- A. CEAs may insert a few steps.
- B. CEAs may withdraw a few steps.
- C. CEAs will insert until CEDMCS is taken out of automatic.
- D. No CEA motion will occur due to an AMI being generated.

Answer: A

Associated KA:  
100866

Active Question Bank 2004

L75467

Describe the response of the Reactor Regulating System to a failure of a Control Channel Power input.

LOCT 91321

As an operating crew mitigate various failures to the Reactor Regulating System

L75467

Describe the response of the Reactor Regulating System to a failure of a Control Channel Power input.

Reference Id: Q6159  
Difficulty: 3.00  
Time to complete: 5

10CFR Category:

CFR 55.41 (7) 55.41 (7) Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

Cognitive Level:  
Question Source:  
Comment:

Comprehension / Anal  
PV Bank Not Modified

**Proposed reference to be provided to applicant during examination: NONE**

**Technical Reference:** LOIT lesson plan

**K&A:** Knowledge of the physical connections and/or causeeffect relationships between the NIS and the following systems: CRDS

**Justification:**

**A is Correct - CEAs will insert until the rate of change signal is gone**

**2009 Reactor Operator Exam**

**B is Wrong - wrong direction for failed high**

**C is Wrong - CEA motion stops when the rate of change decays away.**

**D is Wrong – AMI only occurs when selected to average**

## 2009 Reactor Operator Exam

61

This Exam Level	RO
Appears on:	2009 SRO EXAM Tier 2 Group 2
K/A #	35028k6.01
Importance	2.60
Rating:	

Which one (if any) of the following actions should be taken to control containment hydrogen levels if no Hydrogen Recombiners are available during a Loss of Coolant Accident?

- A. Place the Hydrogen Purge Exhaust unit in service.
- B. Place the Containment Power Access Purge system in service.
- C. No action required unless hydrogen concentration approaches 4%.
- D. Ensure the Containment Spray system is in service and providing greater than 4350 gpm flow.

Answer: A

Associated KA:  
L75177

Describe the flowpaths of the Hydrogen Control System to include these major components:

- Hydrogen Recombiners
- Hydrogen Analyzers
- Hydrogen Purge Unit
- Containment Isolation Valves
- Outside Air Dampers
- Hydrogen Purge Unit Air Regulators

Reference Id:	Q22554
Difficulty:	3.00
Time to complete:	3
10CFR Category:	CFR 55.41 (7)      55.41 (7) Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.
Cognitive Level:	Comprehension / Anal
Question Source:	New
Comment:	

**Proposed reference to be provided to applicant during examination:** NONE

**Technical Reference:** LOCA tech guideline, 40DP-9AP08 / LOIT lesson plan

**K&A:** Knowledge of the effect of a loss or malfunction on the following will have on the HRPS: [Hydrogen recombiners](#)

**Justification:**

**A is Correct - Purge units are placed in service as directed by Tech Support Center**

**B is Wrong - This would get the H2 out of containment but is an untreated pathway**

**C is Wrong – If CS has actuated or H2 concentration is > 0.7% Hydrogen control is required**

**D is Wrong - Containment spray is used for Iodine removal not H2 control**

**2009 Reactor Operator Exam**

2009 Reactor Operator Exam

62

This Exam Level RO  
Appears on: 2009 SRO  
EXAM  
Tier 2  
Group 2  
K/A # 2.4.31  
Importance 4.20  
Rating:

Given the following Unit 1 post trip conditions:

- SG 1 level is 42% WR and lowering.
- SG 1 pressure is 760 psig and lowering.
- SG 2 level is 60% WR and lowering.
- SG 2 pressure is 950 psig and rising.
- Containment pressure is 1.8 psig and rising.
- RCS T-ave is 535°F and lowering.
- Alarm window 5B08C "SG-2 > SG-1 CH TRIP" has locked in.
- Any required ESFAS signals have properly actuated.

The Digital Feedwater Control system (DFWCS) is in Reactor Trip Override (RTO) and ...

- A. neither SG is currently being fed. AFAS-1 will not initiate but AFAS-2 will at the required level.
- B. only SG 2 is currently being fed. AFAS-1 will not initiate but AFAS-2 will at the required level.
- C. neither SG is currently being fed. Neither AFAS-1 or AFAS-2 will initiate at the required level.
- D. both SGs are currently being fed. Neither AFAS-1 or AFAS-2 will initiate at the required level.

Answer: A

Associated KA:  
72281

SG alarms

Reference Id: Q22555  
Difficulty: 3.00  
Time to complete: 4  
10CFR Category: CFR 55.41 (10) 55.41 (10) Administrative, normal, abnormal, and emergency operating procedures for the facility.  
Cognitive Level: Comprehension / Anal  
Question Source: New  
Comment:

**Proposed reference to be provided to applicant during examination:** NONE

**Technical Reference:** 40AL-9RK5B, Board ARP

**K&A:** Knowledge of annunciator alarms, indications, or response procedures. [Steam Generator](#)

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**2009 Reactor Operator Exam**

Justification: neither SG is being fed in RTO due SG 1 pressure below MSIS setpoint of 960 psia and RTO does not feed at RCS < 564 degrees. The DP inhibits AFAS if not already actuated.

A is Correct -

B is Wrong - neither SG is being fed in RTO

C is Wrong - AFAS-2 will initiate if required

D is Wrong – neither SG is being fed in RTO and AFAS-2 will initiate as required

## 2009 Reactor Operator Exam

63

This Exam Level	RO
Appears on:	2009 SRO EXAM Tier 2 Group 2
K/A #	34041A2.02
Importance	3.60
Rating:	

Given the following conditions:

- Reactor power is stable at 99%.
- ECC Directed Turbine Unloading, 40AO-9ZZ25, is in progress.
- Turbine load has been lowered approximately 11%.
- SBCS Master Controller SGN-PIC-1010 is in Local Auto with it's setpoint lowered to 1075 psia.
- CEDMCS is in manual sequential.
- Reg Group 5 is 120 inches withdrawn.
- SBCV #1 is 70% open in automatic with a manual permissive.
- SBCV #4 is 30% open in manual with a manual permissive.

Subsequently

- SBCV #4 fails 100% open.
- Tavg-Tref Hi-Lo window is in alarm (4A08B).
- COLSS CMC (5B01C) & PC (5B01D) windows are in alarm.
- CEA insertion demand (green lights) are present on Board 5.

SBCV 1001 will ...

- fast close. Withdraw CEAs to clear the Tavg - Tref alarm window.
- modulate closed. Reduce power to clear the COLSS Master alarm window.
- not close until the manual permissive is removed. Reduce power to clear the COLSS Master alarm window.
- only modulate closed if SGN-PIC-1010 is returned to Auto/Auto control. Withdraw CEAs to clear the Tavg - Tref alarm window.

Answer: B

Associated KA:  
L65679

Describe the Control Room controls associated with the individual SBCS valves including:

- Emergency Off Reset
- Valve Mode Select

Reference Id:  
Difficulty:  
Time to complete:  
10CFR Category:

Q10487  
4.00  
5  
CFR 55.41 (5)

55.41 (5) Facility operating characteristics during steady state and transient conditions, including coolant chemistry, causes and effects of temperature, pressure and reactivity changes, effects of load changes, and operating limitations and reasons for these operating

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**2009 Reactor Operator Exam**

Cognitive Level:  
Question Source:  
Comment:

characteristics.  
Comprehension / Anal  
Modified PV Bank

**Proposed reference to be provided to applicant during examination:** None

**Technical Reference:** 40AL-9RK5B, ARPs / 40AO-9ZZ25, ECC Directed Turbine Unloading

**K&A:** Ability to (a) predict the impacts of the following malfunctions or operations on the SDS; and (b) based on those predictions or mitigate the consequences of those malfunctions or operations: Steam valve stuck open

**Justification:**

A is Wrong - Tavg/Tref is a low alarm due to 1004 coming open. CEA wd demand would be expected for turbine power > reactor power.

B is Correct - 1001 will modulate closed. manual permissive and Local/Auto will not effect valve operation. COLSS alarms need to be cleared.

C is Wrong - SBCV 1001 will modulate closed as 1004 comes open

D is Wrong - SBCV 1001 will modulate close as 1004 comes open

## 2009 Reactor Operator Exam

64

This Exam Level	RO
Appears on:	2009 SRO EXAM Tier 2 Group 2
K/A #	34045a3.07
Importance	3.50
Rating:	

Given the following conditions:

- The CRS has implemented 40AO-9ZZ07, Loss of Condenser Vacuum.
- Reactor power is currently 92% and lowering due to a boration.
- Condenser Vacuum has suddenly degraded to 8 inches HgA.

The Main Turbine is expected to ...

- A. have not tripped. The main stop, control and combined intercept valves will be open.
- B. have tripped. The main stop, control and combined intercept valves all indicating closed.
- C. have tripped. The main stop valves will be closed while the control and combined intercept valves remain open.
- D. have tripped. The main stop and control valves are closed but the combined intercept valves remain open.

Answer: B

Associated KA:  
L65971

Identify the Main Turbine trips.

Reference Id:	Q22556
Difficulty:	2.00
Time to complete:	2
10CFR Category:	CFR 55.41 (7)      55.41 (7) Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.
Cognitive Level:	Comprehension / Anal
Question Source:	New
Comment:	

**Proposed reference to be provided to applicant during examination:** NONE

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

**K&A:** Ability to monitor automatic operation of the MT/G system, including: Turbine stop/governor valve closure on turbine trip

**Justification:**

**A is Wrong - MT trips at 7.5 inches HgA**

**B is Correct -**

**C is Wrong - Stop, Control and Intercept valves will all be closed**

2009 Reactor Operator Exam

D is Wrong – Stop, Control and Intercept valves will all be closed

65

This Exam Level RO  
Appears on: 2009 SRO  
EXAM  
Tier 2  
Group 2  
K/A # 37017k3.01  
Importance 3.50  
Rating:

A loss of the Core Exit Thermocouples (CETs) would result in a ...

- A. Core Protection Calculators (CPCs) losing the ability to calculate Quality Margin.
- B. a loss of the ability to monitor outlet plenum levels during a Design Bases Accident.
- C. reduced ability to verify adequate RCS subcooling during Natural Circulation conditions.
- D. loss of the ability of the Core Operating Limits Supervisory System (COLSS) to perform a primary power calculation, NKBDELTA.

Answer: C

Associated KA:  
L77368

Explain the operation of the Core Exit Thermocouples (CETs) associated with the Incore Instrumentation System.

Reference Id:  
Difficulty:  
Time to complete:  
10CFR Category:

Q22570  
4.00  
5  
CFR 55.41 (7) 55.41 (7) Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

Cognitive Level:  
Question Source:  
Comment:

Memory  
New

**Proposed reference to be provided to applicant during examination:** NONE

**Technical Reference:** LOCA, 40EP-9EO03 / LOIT lesson plan

**K&A:** Knowledge of the effect that a loss or malfunction of the ITM system will have on the following: [Natural circulation indications](#)

**Justification:**

**A is Wrong - CETs are not an input to CPCs they use Thot**

**B is Wrong - RVLMS uses the HJTC system for level indication**

**C is Correct - CETs are needed during Nat'l Circ conditions**

**D is Wrong - COLSS uses the in-cores for power indications but does not use the CETs for temperature inputs**

2009 Reactor Operator Exam

66

This Exam Level RO  
Appears on: 2009 SRO  
EXAM  
Tier 3  
K/A # 2.1.17  
Importance 3.90  
Rating:

Given the following conditions:

- Unit 1 has automatically tripped from 100% power.
- Standard Post Trip Actions (SPTAs) are in progress.
- You are the "At the Controls" operator.
- SIAS/CIAS have just actuated.

In accordance with Operations Department Practices (ODP-1) which one of the following is the correct method to communicate this information to the "Crew"?

- A. Inform the CRS of the SIAS/CIAS, then wait for a Control Room Brief to inform the remaining crew members.
- B. Announce "Crew Update" wait for all crew members to respond ready then announce the SIAS/CIAS. State "End of Update".
- C. Wait for SPTAs to be completed, then ensure that the CRS is aware of the SIAS/CIAS prior to them choosing which EOP to implement.
- D. Announce "Attention for a Brief". The CRS will wait for all crew members to report ready, you can then inform the crew of the SIAS/CIAS when the CRS asks you to report any problems or concerns. CRS announces "End of Brief".

Answer: B

Associated KA:  
L59592

Provide accurate, clear and concise verbal communications.

Reference Id: Q22557  
Difficulty: 2.00  
Time to complete: 2  
10CFR Category: CFR 55.41 (10) 55.41 (10) Administrative, normal, abnormal, and emergency operating procedures for the facility.

Cognitive Level: Memory  
Question Source: New  
Comment:

**Proposed reference to be provided to applicant during examination: NONE**

**Technical Reference: ODP-1**

**K&A:** Ability to make accurate, clear, and concise verbal reports.

**Justification:**

**A is Wrong - It is important for the CRS to know this information and this is how it was done prior to implementation of the current communication standards.**

**B is Correct - The entire crew needs of know of the plant status as it occurs. Making a "Crew Update" is the directed method iaw ODP-1.**

**2009 Reactor Operator Exam**

**C is Wrong - This is the correct practice for minor information such as which AFP is being used.**

**D is Wrong – This would be a "Transient Brief" but the CRS calls for one as needed to inform the crew of plant status or information gathering.**

## 2009 Reactor Operator Exam

67

This Exam Level	RO
Appears on:	2009 SRO EXAM Tier 3
K/A #	2.4.3
Importance	3.70
Rating:	

What is the significance of the Control Room instruments that have a white placard attached?

These instruments ...

- A. are appendix "R"/fire qualified.
- B. are associated with ESFAS actuation setpoints.
- C. can also be found at the Remote Shutdown panel.
- D. are post accident monitoring/harsh containment qualified.

Answer: D

Associated KA:  
L10341

Given that an ORP is being implemented describe how a parameter's value should be obtained

Reference Id:	Q22611
Difficulty:	2.00
Time to complete:	2
10CFR Category:	CFR 55.41 (6)      55.41 (6) Design, components, and functions of reactivity control mechanisms and instrumentation.
Cognitive Level:	Memory
Question Source:	New
Comment:	

**Proposed reference to be provided to applicant during examination: NONE**

**Technical Reference:** 01-J-RMP-0002

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

**JUSTIFICATION:**

**A is wrong** - appendix "R" components are identified by a yellow attachment

**B is wrong** - ESFAS components would have a red arrow indicating setpoint

**C is wrong** - The RSDP has duplicate instruments but are not identified by the white placard

**D is correct** - per 01-J-RMP-0002

2009 Reactor Operator Exam

68

This Exam Level RO  
Appears on: 2009 SRO  
EXAM  
Tier 3  
K/A # 2.1.29  
Importance 4.10  
Rating:

Per 40AC-0ZZ06, (Locked Valve, Breaker, and Component Control), when verifying the position of a locked throttled valve, the second checker must:

- A. check the valve closed and return it to throttled position and install lock.
- B. independently verify the valve is throttled by position indication then lock it.
- C. concurrently verify the correct throttled position and verify the lock installed correctly.
- D. verifies proper position by redundant means (proper flow, temperature, or pressure).

Answer: C

Associated KA:  
100866

Active Question Bank 2004

L10563

From memory describe how independent verification (IV) is accomplished with locked valves, breakers or components

N74569

From memory describe how independent verification (IV) is accomplished with locked valves, breakers or components

Reference Id: Q7885  
Difficulty: 3.00  
Time to complete: 2  
10CFR Category: CFR 55.41 (10) 55.41 (10) Administrative, normal, abnormal, and emergency operating procedures for the facility.  
Cognitive Level: Memory  
Question Source: PV Bank Not Modified  
Comment:

**Proposed reference to be provided to applicant during examination:** NONE

**Technical Reference:** 40AC-0ZZ06, Locked Valve, Breaker, and Component Control

**K&A:** Knowledge of how to conduct system lineups, such as valves, breakers, switches, etc.

**Justification:** Any of these methods could seem reasonable to the examinee but only the concurrent verification is permitted for a locked valve.

**A is Wrong -**

**B is Wrong -**

**C is Correct -**

**D is Wrong -**

## 2009 Reactor Operator Exam

69

This Exam Level RO  
Appears on: 2009 SRO  
EXAM  
Tier 3  
K/A # 2.2.22  
Importance 4.00  
Rating:

Pressurizer Safety Valves are designed to maintain the Reactor Coolant System less than or equal to (a) psia and Core Protection Calculators are designed to prevent the Reactor Coolant System from exceeding a Departure from Nucleate Boiling Ration (DNBR) of less than or equal to (b).

- A. (a) 2500 (b) 1.30  
B. (a) 2500 (b) 1.34  
C. (a) 2750 (b) 1.30  
D. (a) 2750 (b) 1.34

Answer: D

Associated KA:  
72283

What are the Safety Limits

Reference Id: Q22558  
Difficulty: 3.00  
Time to complete: 3  
10CFR Category:

CFR 55.41 (5)

55.41 (5) Facility operating characteristics during steady state and transient conditions, including coolant chemistry, causes and effects of temperature, pressure and reactivity changes, effects of load changes, and operating limitations and reasons for these operating characteristics.

Cognitive Level: Memory  
Question Source: New  
Comment:

**Proposed reference to be provided to applicant during examination:** NONE

**Technical Reference:** Tech Specs and Bases

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

**Justification:**

**A is Wrong - RCS pressure design limit with old (<11 EFPY) DNBR SL**

**B is Wrong - RCS pressure design limit with correct DNBR SL**

**C is Wrong - RCS pressure design limit is correct but with old (<11 EFPY) DNBR SL**

**D is Correct – Pressure SL is design 2500 psia + 10%. DNBR is 1.34**

## 2009 Reactor Operator Exam

70

This Exam Level	RO
Appears on:	2009 SRO EXAM Tier 3
K/A #	2.2.36
Importance	3.10
Rating:	

Given the following conditions:

- Unit 2 is operating at 100% power
- The "C" class inverter, PNC-N13, is being removed from service for scheduled maintenance.
- The "C" class instrument bus has been transferred to the Voltage Regulator, PNC-V27.

What impact (if any) does this maintenance have on LCO 3.8.7, Inverters - Operating? LCO is provided.

- Immediate entry into LCO 3.8.7 is required.
- No impact, this LCO applies to the class "A & B" train inverters only.
- No entry into LCO 3.8.7 is required as long as the "C" instrument bus remains energized by PNC-V27.
- Entry into LCO 3.8.7 may be delayed up to 24 hours provided that the "C" instrument bus remains energized by PNC-V27.

Answer: **A**

Associated KA:  
**L74145**

Describe LCO 3.8.7, Inverters - Operating, including it's bases.

Reference Id:	Q22559
Difficulty:	4.00
Time to complete:	3
10CFR Category:	CFR 55.41 (10) 55.41 (10) Administrative, normal, abnormal, and emergency operating procedures for the facility.
Cognitive Level:	Memory
Question Source:	New
Comment:	

**Proposed reference to be provided to applicant during examination:** LCO 3.8.7

**Technical Reference:** Tech Specs

**K&A:** Ability to analyze the effect of maintenance activities, such as degraded power sources, on the status of limiting conditions for operations.

**Justification:**

**A is Correct -**

**B is Wrong - The LCO statement reads required Train A and B inverters. Examinee may not understand that the "A" train includes "A & C" inverters**

**C is Wrong - Examinee may believe that an energized PN bus meets TS requirements**

**D is Wrong – This exception is used Battery equalizing charge**

2009 Reactor Operator Exam

71

This Exam Level RO  
Appears on: 2009 SRO  
EXAM  
Tier 3  
K/A # 2.2.39  
Importance 3.90  
Rating:

Which one of the following would require entry into a one hour or less LCO condition while in Mode 1, steady state conditions?

- A. Pressurizer level is 57%.
- B. Reactor Coolant system T-cold is 540°F.
- C. An 86 lockout of SIA-P01, High Pressure Safety Injection pump "A".
- D. WCB-UV-63, chill water supply header outside cntmt isolation valve, has failed it's stroke time surveillance test.

Answer: B

Associated KA:  
L89788

Given a set of plant conditions apply the one hour or less actions statements of T.S. 3.6

L89782

Given a set of plant conditions apply the one hour or less actions statements of T.S. 3.5

Reference Id: Q22560  
Difficulty: 3.00  
Time to complete: 3  
10CFR Category: CFR 55.41 (10) 55.41 (10) Administrative, normal, abnormal, and emergency operating procedures for the facility.  
Cognitive Level: Memory  
Question Source: New  
Comment:

**Proposed reference to be provided to applicant during examination: NONE**

**Technical Reference:** Tech Specs

**K&A:** Knowledge of less than or equal to one hour Technical Specification action statements for systems.

**Justification:**

**A is Wrong - LCO 3.4.9 - 6 hour action**

**B is Correct - LCO 3.4.2 - 30 minute action**

**C is Wrong - LCO 3.5.3 - 72 hours. one hour if its the only HPSI pump in Mode 5/6**

**D is Wrong – LCO 3.6.3 - 4 hours for cntmt isolation valves**

## 2009 Reactor Operator Exam

72

This Exam Level	RO
Appears on:	2009 SRO EXAM Tier 3
K/A #	2.3.12
Importance	3.20
Rating:	

You have been directed to perform a valve lineup on the Purification filters with the following conditions:

- General area dose rate is 90 mrem/hr.
  - Airborne Radioactivity exists due to ongoing maintenance activities.
  - No environmental conditions exist that preclude the use of a respirator.
- Internal dose rate if respirator is worn is 0 mrem/hour.
  - Internal dose rate without respirator is 22 mrem/hour.
  - Time to complete job while wearing a respirator is 3.0 hours.
  - Time to complete job without a respirator is 2.5 hours.

Which one of the following describes whether a respirator will be worn and why?

- A. No, wearing a respirator will raise total exposure.
- B. Yes, wearing a respirator will lower total exposure.
- C. No, wearing a respirator will make no difference to the total exposure.
- D. Yes, a respirator must be worn anytime that airborne radiation is present.

Answer: B

Associated KA:  
72284

Radiological questions

Reference Id:	Q22577
Difficulty:	3.00
Time to complete:	3
10CFR Category:	CFR 55.41 (12) 55.41 (12) Radiological safety principles and procedures.
Cognitive Level:	Memory
Question Source:	New
Comment:	

**Proposed reference to be provided to applicant during examination: NONE**

**Technical Reference:** Radworker Practices, ALARA principles

**K&A:** Knowledge of radiological safety principles pertaining to licensed operator duties, such as containment entry requirements, fuel handling responsibilities, access to locked high-radiation areas, aligning filters, etc.

**Justification: with respirator 270 mrem, without respirator 280 mrem**

**A is Wrong - exposure will be lower by wearing Respirator**

**B is Correct -**

**C is Wrong - exposure will be lower by wearing Respirator**

**D is Wrong - not required if exposure would be lower**

## 2009 Reactor Operator Exam

73

This Exam Level	RO
Appears on:	2009 SRO EXAM Tier 3
K/A #	2.3.14
Importance	3.40
Rating:	

The following information is posted on a survey map outside a room you are about to enter.

- General Area Radiation levels of 75 mrem/hr.
- Swipes of 75,000 dpm/100cm<sup>2</sup>.

The posting of this room should be a ...

- A. Radiation Area only.
- B. Radiation Area and Contamination Area.
- C. Radiation Area and High Contamination Area.
- D. High Radiation Area and High Contamination Area.

Answer: B

Associated KA:  
72284

Radiological questions

Reference Id:	Q22574
Difficulty:	3.00
Time to complete:	3
10CFR Category:	CFR 55.41 (12) 55.41 (12) Radiological safety principles and procedures.
Cognitive Level:	Memory
Question Source:	New
Comment:	

**Proposed reference to be provided to applicant during examination:** NONE

**Technical Reference:** Rad Worker Training

**K&A:** Knowledge of radiation or contamination hazards that may arise during normal, abnormal, or emergency conditions or activities.

**Justification:**

**Radiation areas are 5 to 100 mrem/hr  
Contamination areas are 1000 to 100,000 dpm/100cm<sup>2</sup>**

**A is Wrong -**

**B is Correct -**

**C is Wrong -**

**D is Wrong -**

2009 Reactor Operator Exam

74

This Exam Level RO  
Appears on: 2009 SRO  
EXAM  
Tier 3  
K/A # 2.4.21  
Importance 4.00  
Rating:

Given the following conditions:

- Unit 1 has automatically tripped from 100% power.
- The CRS has implemented 40EP-9EO03, LOCA.
- Both trains of "Fast Bus Transfer" failed following the Main Turbine trip.
- Pressurizer pressure is 1460 psia and slowly lowering.
- RCS T-hot is 570°F and rising.
- Rep CET is 575°F and rising.
- Pressurizer level is 8% and stable.
- RVLMS indicates 100% level in the RVUH.
- Containment temperature is 187°F and slowly increasing.

The STA is not available and the CRS has directed you to determine if Condition 1 of RCS Inventory Control is met in accordance with the following table.

**SAFETY FUNCTION:**

3. RCS Inventory Control

**NOTE**

Meeting the provisions of Condition 1 or Condition 2 will satisfy the RCS Inventory Control Safety Function.

**ACCEPTANCE CRITERIA:**

**CRITERIA SATISFIED**

**Condition 1**

a. Pressurizer level greater than 10% [15%].

<input type="checkbox"/>					
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b. RCS is 24°F [44°F] or more subcooled.

<input type="checkbox"/>					
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c. RVLMS indicates that RVUH level is 16% or more.

<input type="checkbox"/>					
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Which one of the following identifies the **minimum** required actions which would satisfy the RCS Inventory Control Safety Function, Condition 1?

## 2009 Reactor Operator Exam

- A. Raise Pressurizer to 12% level and lower T-hot temperature to less than 568°F.
- B. Raise Pressurizer to 16% level and lower T-hot temperature to less than 568°F.
- C. Raise Pressurizer to 12% level and lower Rep CET temperature to less than 548°F.
- D. Raise Pressurizer to 16% level and lower Rep CET temperature to less than 548°F.

Answer: D

Associated KA:  
93004

Given the plant is in Mode 3 or 4 Determine whether or not entry into the FRP is appropriate

Reference Id:  
Difficulty:  
Time to complete:  
10CFR Category:

Q22593  
4.00  
5  
CFR 55.41 (7) 55.41 (7) Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

Cognitive Level:  
Question Source:  
Comment:

Comprehension / Anal  
New

**Proposed reference to be provided to applicant during examination:** Steam Tables

**Technical Reference:** 40EP-9EO03, LOCA Safety Function Status Checks

**K&A:** Knowledge of the parameters and logic used to assess the status of safety functions, such as reactivity control, core cooling and heat removal, reactor coolant system integrity, containment conditions, radioactivity release control, etc.

**Justification:** Harsh containment exists values must be used [ ] at greater than 170 degrees and a failure of fast bus transfer causes a loss of all RCPs.  
1460 psia = 592.6 degrees - 44 = 548 / minus 24 degrees = 568

**A is Wrong - must be > 15% and T-hot may not be used**

**B is Wrong - 16% is correct, but T-hot may not be used**

**C is Wrong - 12% is wrong, but CET is correct**

**D is Correct – 16% and CET temperatures**

2009 Reactor Operator Exam

75

This Exam Level RO  
Appears on: 2009 SRO  
EXAM  
Tier 3  
K/A # 2.4.45  
Importance 4.10  
Rating:

Unit 1 is operating at 100% power when the following 3 alarm windows annunciate. (Refer to the attached picture of Annunciator Window Box 6B).

The highest priority colored window is the .....

- A. Green window. The Main Turbine should have tripped and immediate operator action is required.
- B. Amber window. The Main Turbine should have tripped and immediate operator action is required.
- C. Green window. The Main Turbine will trip if Stator Cooling Water flow is not restored within 70 seconds.
- D. Amber window. The Main Turbine will trip if Stator Cooling Water flow is not restored within 70 seconds.

Answer: C

Associated KA:  
L78799

Given an alarm condition respond to a Plant Annunciator alarm

L12042

Describe the alarm response expectations.

Reference Id: Q22564  
 Difficulty: 3.00  
 Time to complete: 3  
 10CFR Category: CFR 55.41 (10) 55.41 (10) Administrative, normal, abnormal, and emergency operating procedures for the facility.  
 Cognitive Level: Comprehension / Anal  
 Question Source: New  
 Comment:

**Proposed reference to be provided to applicant during examination:** Picture of alarm window box 6B

**Technical Reference:** 40AL-9RK6B, Panel 6B alarm responses / LOIT lesson plan

**K&A:** Ability to prioritize and interpret the significance of each annunciator or alarm.

**Justification:** All the alarm points that bring in window 6B07B have a 70 second time delay to Main Turbine trip. The Amber alarm window 6B07C alarm points has a higher threshold value and does not require a manual trip.

A is Wrong -

B is Wrong -

C is Correct -

D is Wrong -

## 2009 Reactor Operator Exam

## Cognitive Level Summary

Number of questions linked:	75	Percentage
Memory	32	32
Comprehension	0	0
Analysis	0	0

## Question Source Summary

Number of questions linked to source:	75	Percentage
<b>New</b>		
New	51	51
<b>Modified</b>		
INPO Bank Modified	0	
PV Bank Modified	10	
Total Modified	10	10
<b>Bank</b>		
INPO Bank Not Modified	0	
PV Bank Not Modified	14	
PV NRC Exam Question Not Modified	0	
Total BANK	14	14

2009 Senior Reactor Operator Exam

1

This Exam Level Appears on:	SRO
	SRO EXAM 2009 Tier 1 Group 1
K/A #	2.1.23
Importance Rating:	4.40

Given the following conditions:

- Unit 1 automatically tripped due to a fault on the 13.8 Kv bus NAN-S01.
- Offsite power was lost on the trip.
- Steam Bypass Control System is maintaining SG pressures at 1170 psia.
- SG #1 level is 65% WR and increasing.
- SG #2 level is 67% WR and increasing.
- Pressurizer pressure is 2240 psia and stable.
- PZR level is 33% and stable.
- 3 Charging pumps are in service
- Containment pressure is 0.4 psig and increasing.
- Containment temperature is 120°F and increasing.
- Containment humidity is 28% and increasing.

The CRS should implement ...

- A. 40EP-9EO02, Reactor Trip and shift Heat Removal to the ADVs.
- B. 40EP-9EO03, Loss of Coolant Accident and commence a cooldown.
- C. 40EP-9EO04, Steam Generator Tube Rupture and isolate the faulted SG.
- D. 40EP-9EO07, Loss of Offsite Power/Loss of Forced Circulation and verify Natural Circulation.

Answer: B

Associated KA:  
L10454

Given conditions of LOCA analyze whether or not entry into the LOCA EOP is appropriate

Reference Id:  
Difficulty:  
Time to complete:  
10CFR Category:

Q22515  
4.00  
3  
CFR 55.43 (5)      55.43 (5) Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.

Cognitive Level:  
Question Source:  
Comment:

Comprehension / Anal  
New

**Proposed reference to be provided to applicant during examination:** NONE

**Technical Reference:** LOCA tech guideline, 40DP-9AP08 / 40EP-9EO03, LOCA

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

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**2009 Senior Reactor Operator Exam**

**Justification: The reactor trip was caused by the loss of RCPs. The cause of a small LOCA could be due to the lack of main spray (RCPs) when offsite power was lost creating a pressure spike. Containment parameters increasing causes Rx trip, SGTR and LOOP to not meet "Containment Temperature and Pressure Control" Safety Function. No RMS values are available with a loss of non-class power.**

**A is Wrong -**

**B is Correct - Entry condition. Rise in containment pressure, temp, radiation, humidity and level**

**C is Wrong -**

**D is Wrong -**

2009 Senior Reactor Operator Exam

2

This Exam Level Appears on:	SRO
	SRO EXAM 2009 Tier 1 Group 1
K/A #	2.4.47
Importance Rating:	4.20

Given the following conditions:

- Unit 1 is operating at 100% power.
- Both Nuclear Cooling water pumps are in Pull-to-Lock due to a leak in the NC system.
- The "A" train Essential Cooling water system is aligned to supply the NC priority loads.
- The "B" charging pump, CHB-P01, is in Pull-to-Lock and unavailable due to an oil leak.
- The "E" charging pump, CHE-P01, is aligned to PGA-L35.

Subsequently

- The class 4160 Vac bus, PBA-S03, faults and is de-energized.
- DG "A" is running at rated speed and voltage.

Which one of the following actions is required?

- A. Within 10 minutes secure the RCPs per appendix E of 40AO-9ZZ04, RCP Emergencies.
- B. Perform appendix M of 40AO-9ZZ12, Degraded Electrical Power to close the "A" DG output breaker.
- C. Secure the RCPs within 3 minutes and enter 40EP-9EO07, Loss of Offsite Power/Loss of Forced Circulation.
- D. Operations may continue but a 2nd charging pump must be returned to Operable status within 72 hours per TLCO 3.1.103, Charging Pumps - Operating.

Answer: C

Associated KA:  
12079

Given an RCP in hot standby describe when seal damage can be experienced when seal injection and nuclear cooling water are removed from service

Reference Id:	Q22600
Difficulty:	3.00
Time to complete:	3
10CFR Category:	CFR 55.43 (5)      55.43 (5) Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.
Cognitive Level:	Comprehension / Anal
Question Source:	New
Comment:	

**Proposed reference to be provided to applicant during examination: NONE**

**Technical Reference: 40AO-9ZZ04, RCP Emergencies**

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**2009 Senior Reactor Operator Exam**

**K&A:** Ability to diagnose and recognize trends in an accurate and timely manner utilizing the appropriate control room reference material. [Loss of Rx Coolant Makeup \(Seal Injection\)](#)

**Justification:** EW A and all charging pumps have been lost due to the LOP

**A is Wrong** - This would be true for a loss of cooling water only, NCW or in this case a loss of EW which was supplying the RCPs

**B is Wrong** - This would be correct if PBA-S03 did not have a fault on the bus

**C is Correct** - per appendix E (Information Aid) which is mounted on B04: for a loss of Seal Injection and Cooling water the pumps must be secured within 3 minutes

**D is Wrong** - This is the TLCO action for a loss of two charging pumps

2009 Senior Reactor Operator Exam

3

This Exam Level	SRO
Appears on:	SRO EXAM 2009 Tier 1 Group 1
K/A #	42026aa2.02
Importance	3.60
Rating:	

Given the following conditions:

- Unit 1 is operating at rated power.
- Pressurizer level is 52.5%.
- Letdown flow is 78 gpm.
- Charging flow is 88 gpm.
- Alarm window 7A07A (NUC CLG SYS TRBL) is in alarm.
- Nuclear Cooling Water Surge Tank Press Hi-Lo is alarming .
- Nuclear Cooling Water Surge Tank Level Hi-Lo is alarming.
- Containment sump levels and humidity are increasing.
- Containment Temperature is stable.
- Nuclear Cooling Water flow to all 4 RCPs is lowering.

These events are due to ...

- A. a half leg CIAS initiation. Implement 40AL-9RK5B, panel B05B alarm response.
- B. a full CSAS actuation. Implement 40AO-9ZZ17, Inadvertant PPS-ESFAS actuations.
- C. RCS leak to the Nuclear Cooling System. Implement 40AO-9ZZ02, Excessive RCS Leakrate.
- D. the Nuclear Cooling Water relief inside containment lifting. Implement 40AO-9ZZ03, Loss of Cooling Water.

Answer: D

Associated KA:  
100866

Active Question Bank 2004

L74494

As an operating crew respond to a Steam Generator tube leak

L10105

Given plant conditions diagnose an NC leak inside containment and describe the required actions

Reference Id:	Q10025
Difficulty:	3.00
Time to complete:	3
10CFR Category:	CFR 55.43 (5)      55.43 (5) Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.

Cognitive Level: Comprehension / Anal  
Question Source: Modified PV Bank  
Comment:

**Proposed reference to be provided to applicant during examination: NONE**

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**2009 Senior Reactor Operator Exam**

**Technical Reference:** Loss of Cooling Water, 40AO-9ZZ03

**K&A:** Ability to determine and interpret the following as they apply to the Loss of Component Cooling Water: The cause of possible CCW loss

**Justification:**

**A is Wrong - CIAS does not close NCW containment Isolation valves**

**B is Wrong - a full CSAS closes both supply and return valves. This would not cause cntmt indications. An "A" train only CSAS which closes only the NCW return valve has the potential to cause this event.**

**C is Wrong - RCS leak to NCW could have some of these same effects on the NCW header but not the containment conditions, containment temps would be increasing.**

**D is Correct - relief lifting would cause the cntmt conditions as well as the NCW conditions**

2009 Senior Reactor Operator Exam

4

This Exam Level Appears on:	SRO SRO EXAM 2009 Tier 1 Group 1
K/A # Importance Rating:	2.4.38 4.40

Given the following conditions:

- The CRS has implemented 40AO-9ZZ19, Control Room Fire.
- Reactor trip from the PPS pushbuttons on Board 5 was not successful.
- A Manual reactor trip was initiated at 1459 by opening NGN-L03B2 and NGN-L10B2 supply breakers from the Control Room.
- An MSIS was initiated at 1500.
- The Control Room was evacuated at 1500.
- The CRS is the first to arrive at the Remote Shutdown Panel at 1520.

Which one of the following actions is correct in regards to E-plan (NEI-99) implementation?

- A. Classify as a Alert, assembly is optional.
- B. Classify as a Alert, assembly is required.
- C. Classify as a Site Area Emergency, assembly is optional.
- D. Classify as a Site Area Emergency, assembly is required.

Answer: D

Associated KA:  
[100866](#)

Active Question Bank 2004

[L58622](#)

Given an Emergency Plan condition, use the EAL tables and basis document to determine the emergency plan classification

[96192](#)

Classify events requiring emergency plan implementation

[29167](#)

Describe why steam should not be released to the atmosphere during a SGTR

Reference Id:	Q2933
Difficulty:	4.00
Time to complete:	5
10CFR Category:	CFR 55.43 (5)      55.43 (5) Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.
Cognitive Level:	Comprehension / Anal
Question Source:	Modified PV Bank
Comment:	

**Proposed reference to be provided to applicant during examination:** NEI-99 table

**Technical Reference:** NEI-99 / EPIP-01

**K&A:** Ability to take actions called for in the facility emergency plan, including supporting or acting as emergency coordinator if required. [0068 Control Room Evacuation](#)

**2009 Senior Reactor Operator Exam**

**Justification:**

**A and B are Wrong - examinee may choose the Fire/Explosion (HA2) or malfunction of Reactor trip (MA2) and determine that Alert is the correct classification**

**C is Wrong - Assembly/Accountability is mandatory at SAE**

**D is Correct - Control not established within 15 minutes of evacuating the Control Room is HS2, SAE and Assembly/Accountability is mandatory at SAE**

2009 Senior Reactor Operator Exam

5

This Exam Level Appears on:	SRO
	SRO EXAM 2009 Tier 1 Group 1
K/A #	44E02ea2.1
Importance Rating:	3.70

The following conditions exist during the SPTAs, post reactor trip:

- RCS pressure 2150 psia and recovering.
- Tcold 560°F and recovering.
- DFWCS is in Reactor Trip Override with 0 gpm to each SG.
- 13.8 Kv non class bus NAN-S02 has a fault and is de-energized.
- DG "B" is out of service for scheduled maintenance.
- Class 125 VDC Battery Bus PKC-M43 is de-energized

Which recovery procedure is designed specifically to mitigate this set of symptoms?

- A. Reactor Trip
- B. Loss of all Feedwater
- C. Loss of Offsite Power/Loss of Forced Circulation
- D. Functional Recovery procedure, MVDC is jeopardized.

Answer: A

Associated KA:  
L10350

Given conditions of a reactor trip analyze whether or not entry into the Reactor Trip EOP is appropriate

100866

Active Question Bank 2004

Reference Id:	Q67609
Difficulty:	3.00
Time to complete:	2
10CFR Category:	CFR 55.43 (5)      55.43 (5) Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.
Cognitive Level:	Comprehension / Anal
Question Source:	PV Bank Not Modified
Comment:	

**Proposed reference to be provided to applicant during examination:** NONE

**Technical Reference:** 40EP-9EO02, Reactor Trip procedure / 40EP-9EO01, SPTAs

**K&A:** Ability to determine and interpret the following as they apply to the (Reactor Trip Recovery) Facility conditions and selection of appropriate procedures during abnormal and emergency operations

**Justification:**

**A is Correct - uncomplicated Rx trip**

**B is Wrong - RTO does not feed with T-avg < 564 degrees**

**2009 Senior Reactor Operator Exam**

**C is Wrong - Partial loss of Offsite power, NAN-S01 is not listed as de-energized and PBB-S04 is still supplied by the switchyard.**

**D is Wrong - PBB-S04 is still energized from offsite power there is jeopardized safety function which requires restoration of a vital DC bus. If examinee believes that PBB-S04 lost power this would appear to be correct.**

2009 Senior Reactor Operator Exam

6

This Exam Level Appears on:	SRO
	SRO EXAM 2009 Tier 1 Group 1
K/A #	44E05ea2.2
Importance Rating:	4.20

A plant transient has resulted in the following conditions:

- Pressurizer pressure is 1600 psia and stable.
- RCS temperature is being controlled with SG 2
- Loop 1 T-cold is 362°F and stable.
- Loop 1 T-hot is 390°F and stable.
- Loop 2 T-cold is 380°F and stable..
- Loop 2 T-hot is 395°F and stable.
- REP CET is 397°F and stable.
- SIAS, CIAS, MSIS, and CSAS have automatically actuated.
- Safety Injection flow is adequate.
- There is no activity present in the steam plant or containment.
- SG 1 WR level is 0%.
- SG 2 WR level is 65% and rising.

The CRS should implement the \_\_\_\_\_ procedure and .....

- A. Functional Recovery, equalize loop T-colds at 380°F then lower RCS pressure.
- B. Excess Steam Demand, equalize loop T-colds at 362°F then initiate a cooldown.
- C. Functional Recovery, heatup the RCS to within the Pressure/Temperature limits.
- D. Excess Steam Demand, lower RCS pressure to within Pressure/Temperature limits.

Answer: **D**

Associated KA:  
L11210

Given that the EOPs are being performed and specific plant conditions are given determine whether or not the plant is over subcooled, and if it is what actions must be taken

Reference Id:	Q22431
Difficulty:	4.00
Time to complete:	4
10CFR Category:	CFR 55.43 (5)      55.43 (5) Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.
Cognitive Level:	Comprehension / Anal
Question Source:	Modified PV Bank
Comment:	

**Proposed reference to be provided to applicant during examination:** Standard appendix 2

**Technical Reference:** ESD, 40EP-9EO06 / Tech guide and standard appendices

**K&A:** Adherence to appropriate procedures and operation within the limitations in the

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**2009 Senior Reactor Operator Exam**

facility's license and amendments. [Excess Steam Demand](#)

**Justification: There is a single event in progress, ESD, no reason to implement the FRP.**

**A is Wrong** - reduce temp to higher t-cold is old guidance, soak is required.

**B is Wrong** - Coldest t-cold is correct but the 2 hour soak is required and the CD rate would be limited to 100 degrees per hour

**C is Wrong** - we would de-pressurize not heat-up to restore limits

**D is Correct** - if PT limits were exceeded and RCPs are secured then a 2 hour soak is required at current conditions.

2009 Senior Reactor Operator Exam

7

This Exam Level Appears on:	SRO
	SRO EXAM 2009 Tier 1 Group 2
K/A #	42003AA203
Importance Rating:	3.80

Unit 1 was operating at 100% power when the following occurred:

- Excore power decreases to 98%.
- RCS Loop T-hots are lowering.
- RCS Loop T-colds are lowering.
- Pressurizer level and pressure are lowering.
- COLSS, CPC and PDIL alarms.
- Letdown flow is decreasing.

10 minutes later the following conditions are observed:

- Excore power has recovered to ~ 100%.
- T-avg has stabilized, but 2°F off program low.
- Pressurizer level and pressure have recovered.
- COLSS, CPC and PDIL alarms are still active.
- Letdown flow is increasing.

Which ONE of the following events is in progress?

- A. Letdown leak, perform recovery actions per Loss of Letdown AOP.
- B. Partial load reject, perform recovery action per Load Rejection AOP.
- C. Slipped/dropped CEA, perform recovery actions per CEA Malfunctions AOP.
- D. Instrument malfunction, perform recovery actions per RRS Malfunctions AOP.

Answer: C

Associated KA:  
L56648

Describe how the plant is stabilized to counter the effect of the dropped/slipped CEA.

Reference Id:  
Difficulty:  
Time to complete:  
10CFR Category:

Q0978  
4.00  
3  
CFR 55.43 (5) 55.43 (5) Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.

Cognitive Level:  
Question Source:  
Comment:

Comprehension / Anal  
Modified PV Bank

**Proposed reference to be provided to applicant during examination: NONE**

**Technical Reference: 40A0-9ZZ11 (CEA Malf.)**

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**2009 Senior Reactor Operator Exam**

**K&A:** Ability to determine and interpret the following as they apply to the Dropped Control Rod: Dropped rod, using in-core/ex-core instrumentation, in-core or loop temperature measurements

**Justification:**

**A reactivity insertion due to CEA malfunction should be diagnosed. Should diagnose that temperature changes are driving other plant responses making RCS inventory losses incorrect. An instrument failure would not have resulted in all the listed alarms.**

**A is Wrong - LD would not have these effects on power, COLSS, CPCs or PDILs**

**B is Wrong - Load reject w could have some of the effects but not Tav<sub>g</sub> low with power recovery**

**C is Correct - Temps initially drop then power would recover with a lower than normal Tav<sub>g</sub>**

**D is Wrong - Should not affect CPCs or PDILs**

2009 Senior Reactor Operator Exam

8

This Exam Level Appears on:	SRO
	SRO EXAM 2009 Tier 1 Group 2
K/A #	42024aa2.04
Importance Rating:	4.20

Given the following Unit 1 conditions:

- Core re-load in progress.
- Refueling Water Tank level is 14%.
- Chemistry reports that the Refueling Pool boron concentration is not within limits.

Which one of the following actions is both available and procedurally directed as a makeup path that can be used to restore the refueling pool boron concentration?

- A. Implement 40AO-9ZZ01, Emergency Boration, align HPSI pumps.
- B. Implement 40AO-9ZZ01, Emergency Boration, align charging pump suction through CHN-UV-514 with BAMP pumps not available.
- C. Implement 40EP-9EO11, Lower Mode Functional Recovery procedure, align charging pump suction to the alternate suction per SA-10, Charging Pump Alternate Suction to the RWT.
- D. Implement 40EP-9EO11, Lower Mode Functional Recovery procedure, align charging pump suction to the Spent Fuel Pool per SA-11, Charging Pump Alternate Suction to the SFP.

Answer: A

Associated KA:  
L58916

Given plant conditions choose which emergency boration flowpath would be selected

Reference Id:	Q22520
Difficulty:	4.00
Time to complete:	3
10CFR Category:	CFR 55.43 (5)      55.43 (5) Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.
Cognitive Level:	Comprehension / Anal
Question Source:	New
Comment:	

**Proposed reference to be provided to applicant during examination:** NONE

**Technical Reference:** Emergency Boration, 40AO-9ZZ01

**K&A:** Ability to determine and interpret the following as they apply to the Emergency Boration: Availability of BWST

**Justification:**

**A is Correct - RWT is available for HPSI make-up with level greater than 8% (above RAS setpoint)**

**2009 Senior Reactor Operator Exam**

**B is Wrong - not available with RWT level less than 73%**

**C is Wrong - This aligns thru RWT bottom CH-327 but appendix states that charging pumps must in PTL with level less than 44%**

**D is Wrong - Spent Fuel pool is common to Refueling pool with Core Reload in progress**

2009 Senior Reactor Operator Exam

9

This Exam Level Appears on:	SRO
	SRO EXAM 2009 Tier 1 Group 2
K/A #	2.3.14
Importance Rating:	3.80

Given the following conditions:

- Unit 1 manually tripped due to lowering Pressurizer level and pressure.
- SIAS/CIAS were manually initiated on trend.
- T-cold is 564 °F controlled by SBCS in auto.
- RCS pressure is 1850 psia and lowering.
- Containment pressure is 0.3 psig and stable.
- SGs are being fed by Main Feed pumps in RTO.
- SG 1 level is 55% WR and rising.
- SG 2 level is 47% WR and dropping.

A Loss of Offsite Power (LOOP) would ...

- A. result in an increasing radiation hazard or release to the public.
- B. result in a loss of Seal Injection that requires all charging pumps to be manually restarted.
- C. require the CRS to transition to the Functional Recovery procedure due to "dual" events in progress.
- D. require the alignment of Essential Cooling Water to Nuclear Cooling Water priority loads to maintain forced circulation.

Answer: A

Associated KA:  
L11218

Given that the SGTR EOP is being implemented describe the SGTR EOP mitigation strategy

Reference Id:  
Difficulty:  
Time to complete:  
10CFR Category:

Q10473  
4.00  
3  
CFR 55.43 (4) 55.43 (4) Radiation hazards that may arise during normal and abnormal situations, including maintenance activities and various contamination conditions.

Cognitive Level:  
Question Source:  
Comment:

Comprehension / Anal  
Modified PV Bank

**Proposed reference to be provided to applicant during examination:** None

**Technical Reference:** 40EP-9EO04, SGTR / LOIT lesson plan

**K&A:** Knowledge of radiation or contamination hazards that may arise during normal, abnormal, or emergency conditions or activities. Loss of Condenser Vacuum

**Justification:** examinee has adequate information to determine that a SGTR on SG #1 is occurring

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**2009 Senior Reactor Operator Exam**

**A is Correct** - a loss of Offsite power will cause a loss of vacuum leading to the use of ADVs or SBCVs 7 and 8 either one will cause a release to atmosphere

**B is Wrong** - this would be the condition for a LOP with no SIAS

**C is Wrong** - SGTR with a concurrent LOOP does not require the FRP

**D is Wrong** - Power to the RCPs is from 13.8Kv which is lost during a LOOP event. Cross connecting EW would be of no value since the RCPs have tripped.

2009 Senior Reactor Operator Exam

10

This Exam Level Appears on:	SRO
	SRO EXAM 2009 Tier 1 Group 2
K/A #	2.3.11
Importance Rating:	4.30

Given the following conditions:

- Unit 1 is operating at 55% power following a Large Load Reject event.
- RU-155D, RCS Letdown is in high alarm
- Chemistry analysis confirms that DOSE EQUIVALENT I-131 is in the **unacceptable** region of Tech Spec figure 3.4.17-1.
- The CRS directs that a Unit shutdown be performed.

In accordance with LCO 3.4.17, RCS Specific Activity, which one of the following actions is subsequently performed to limit the release of radioactivity?

- A. The main steam isolation valves (MSIVs) are closed.
- B. The RCS temperature is lowered to a T-cold of less than 500°F.
- C. The maximum number of condensate polishers are placed in service.
- D. Letdown is isolated by closing CHB-UV-515, Letdown to Regen HX Isolation valve.

Answer: **B**

Associated KA:  
30221

bases for Tech Spec 3.4.17

Reference Id:  
Difficulty:  
Time to complete:  
10CFR Category:

Q22522  
4.00  
4  
CFR 55.43 (4)

55.43 (4) Radiation hazards that may arise during normal and abnormal situations, including maintenance activities and various contamination conditions.

Cognitive Level:  
Question Source:  
Comment:

Memory  
INPO Bank modified

**Proposed reference to be provided to applicant during examination: NONE**

**Technical Reference:** Tech Specs, LCO 3.4.17

**K&A:** Ability to control radiation releases. [High Reactor Coolant Activity](#)

**Justification:**

**A is Wrong - Closing MSIVs is an action taken to isolate a faulted SG during a SGTR event. This action would not prevent an MSSV from lifting**

**B is Correct - per 3.4.17 Tcold is lowered to be below the MSSV setpoint in the event of a SGTR**

**C is Wrong - actions taken for SGTR**

**D is Wrong - Action that could be taken to limit rad levels in the aux building**

2009 Senior Reactor Operator Exam

11

This Exam Level Appears on:	SRO
	SRO EXAM 2009 Tier 2 Group 1
K/A #	2.1.4
Importance Rating:	3.80

Given the following Unit 1 conditions:

- Pressurizer pressure is 250 psia.
- Reactor Coolant System T-cold is 190°F.
- Shutdown Cooling train "A" is in service.
- The crew attended training last week.
- The Control Operator did not attend training but is scheduled to attend next week.
- The Reactor Operator attended and successfully completed her training week.
- The CRS failed the weekly exam and is scheduled to be remediated next week.
- The 3rd Reactor Operator holds an active SRO license and successfully completed his training week.

Per 40DP-9OP02, Conduct of Shift Operations, \_\_\_\_\_ may be designated to maintain the Control Room command function for this shift?

- A. only the 3rd Reactor Operator
- B. either the 3rd Reactor Operator or CRS
- C. either the Reactor Operator or 3rd Reactor Operator
- D. either the Reactor Operator, Control Operator or 3rd Reactor Operator

Answer: D

Associated KA:  
L12034

State the requirement concerning licensed operators "at the control area" when fuel is in the vessel.

Reference Id: Q22586  
Difficulty: 4.00  
Time to complete: 3  
10CFR Category: CFR 55.43 (2)

55.43 (2) Facility operating limitations in the technical specifications and their bases.

Cognitive Level: Memory  
Question Source: New  
Comment:

**Proposed reference to be provided to applicant during examination:** None

**Technical Reference:** 40DP-9OP02, Conduct of Shift Operations

**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. Residual Heat Removal

**Justification:** In Modes 5 and 6 command function will normally be the CRS but may either be a qualified SRO or RO.

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**2009 Senior Reactor Operator Exam**

The CRS failed the weekly exam and shall be removed from license duties until remediation is complete. Those who do not attend training have 6 weeks from completion of the current cycle to make-up the missed training.

A is Wrong -

B is Wrong -

C is Wrong -

D is Correct - This means that the CO, RO and 3rd Operator are all permitted to hold the command function in Mode 5

2009 Senior Reactor Operator Exam

12

This Exam Level Appears on:	SRO
	SRO EXAM 2009 Tier 2 Group 1
K/A #	34039a2.05
Importance Rating:	3.60

Unit 1 was operating at 100% power when the following conditions were observed:

- COLSS calculated primary calorimetric power (NKBDELTA) is rising.
- COLSS calculated turbine power (NKTFSP) is lowering.
- T-cold is 555°F and lowering.
- Pressurizer pressure is 2210 psia and lowering.
- Pressurizer level is lowering.
- Containment pressure is 0.3 psig and stable.
- Containment temperature is 112°F and stable.

In addition the crew should expect to observe ...

- A. CEA mis-alignment due to a slipped 4 finger CEA. Implement 40AO-9ZZ11, CEA malfunctions.
- B. lowering Main Generator megawatt output due to the partial load reject. Implement 40AO-9ZZ08, Load Rejection.
- C. letdown flow lowering due to the RCS leak outside containment. Trip the reactor and implement 40EP-9EO03, Loss of Coolant Accident.
- D. lowering SG pressures due to the steam leak outside containment. Trip the reactor and implement 40EP-9EO05, Excess Steam Demand.

Answer: D

Associated KA:  
L11200

Given conditions of an ESD analyze whether or not entry into the ESD EOP is appropriate

Reference Id:	Q22524
Difficulty:	3.00
Time to complete:	3
10CFR Category:	CFR 55.43 (5)      55.43 (5) Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.
Cognitive Level:	Comprehension / Anal
Question Source:	New
Comment:	

**Proposed reference to be provided to applicant during examination:** NONE

**Technical Reference:** ESD procedure, 40EP-9EO05

**K&A:** Ability to (a) predict the impacts of the following malfunctions or operations on the MRSS; and (b) based on predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Increasing steam demand, its relationship to increases in reactor power

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**2009 Senior Reactor Operator Exam****Justification:**

**A is Wrong - slipped CEA would cause lowering pressure and temperature but not the power increase**

**B is Wrong - load reject will cause lowering power and T-cold to increase. Examinee could confuse lowering first stage pressure with lowering turbine load.**

**C is Wrong - RCS leak would cause the PZR indications but not the power indications.**

**D is Correct - A steam leak outside of containment will lower Steam Header pressure resulting in a lower first stage pressure = NKTFSP lowering. However primary power (NKBDEL) will increase as steam demand increases. T-cold and pressurizer indications are consistent with ESD.**

2009 Senior Reactor Operator Exam

13

This Exam Level Appears on:	SRO
	SRO EXAM 2009 Tier 2 Group 1
K/A #	34059a2.02
Importance Rating:	2.50

Given the following conditions:

- Unit 1 is operating at 100% power.
- Alarm window 6B13A, EXTR DRN SYS TRBL is alarming.
- Alarm point EDLS709, Heater 7A Level Hi is in alarm.
- An AO has verified that both the normal and high level dump valves for the High Pressure feedwater heater 7A indicate open.

Which of the following is correct for these circumstances?

- A. If level continues to rise and the Hi-Hi setpoint is reached, feedwater flow through the A train high pressure heater string will isolate, take actions per 40AL-9RK6B.
- B. Removing the 7A heater from service causes a reduction in feedwater temperature to both SGs and a power reduction is required per 40OP-9ZZ05 (Power Operations).
- C. Prior to removing the 7A feedwater heater from service the crew must reduce power to either 50% or until the High Level Control valve is less than 25% open per 40OP-9ED01, Feedwater Heater Extraction Steam and Drain System.
- D. 40OP-9ZZ14 (Feedwater & Condensate) allows 100% operation with a high pressure feedwater string removed from service if FWN-HV-103, train A/B heater bypass valve is open since there would not be a significant change in feedwater temperatures.

Answer: B

Associated KA:  
L10015

From memory explain why Main Turbine load must be reduced when feedwater heaters are removed from service

Reference Id: Q22525  
 Difficulty: 3.00  
 Time to complete: 4  
 10CFR Category: CFR 55.43 (5)

55.43 (5) Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.

Cognitive Level: Memory  
 Question Source: New  
 Comment:

**Proposed reference to be provided to applicant during examination:** NONE

**Technical Reference:** ARP, 40AL-9RK6B / LOIT lesson plan / Power Ops, 40OP-9ZZ05

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**2009 Senior Reactor Operator Exam**

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

**Justification:**

**A is Wrong - Hi-Hi isolation is for the low pressure FW heaters**

**B is Correct - Temperature lower to both SG as flow combines and power must be lowered per the Power Operations procedure**

**C is Wrong - this action would be taken when removing a Heater Drain pump from service**

**D is Wrong - power must be lowered to 1109 MW even with the bypass valve open**

2009 Senior Reactor Operator Exam

14

This Exam Level Appears on:	SRO
	SRO EXAM 2009 Tier 2 Group 1
K/A #	2.1.23
Importance Rating:	4.40

Given the following conditions:

- A Loss of Coolant event is in progress.
- SIAS/CIAS/MSIS have initiated.
- HPSI pump "B", SIB-P01, has faulted and is not available.
- A Loss of Offsite Power occurred on the reactor trip.
- ESF transformer NBN-X03 has a sudden pressure fault.
- PBA-S03, Class 4160 Kv bus is de-energized.
- PKA-M41, 125 VDC bus, has faulted and is de-energized.

Adequate Safety Injection flow can be restored by ...

- A. aligning the "B" DG per Standard Appendix 58, Cross-Tie DG B to PBA-S03.
- B. aligning the Station Blackout Generators per Standard Appendix 80, SBOG to PBA-S03 (BO).
- C. performing contingency actions of the Standard Post Trip Actions (40EP-9EO01) to restore the "A" DG.
- D. energizing PBA-S03 from NBN-X04 (ESF transformer) per MVAC-1 of the Functional Recovery procedure, 40EP-9EO09.

Answer: **A**

Associated KA:  
56294

Given the FRP is being performed and given specific plant conditions determine if the selected MVAC success path safety function status checks are being met

Reference Id:	Q22526
Difficulty:	3.00
Time to complete:	3
10CFR Category:	CFR 55.43 (5)      55.43 (5) Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.

Cognitive Level:	Comprehension / Anal
Question Source:	New
Comment:	

**Proposed reference to be provided to applicant during examination:** NONE

**Technical Reference:** FRP, 40EP-9EO09 / Loss of Class Instrument Power, 40AO-9ZZ13 / Electrical prints

**K&A:** Ability to perform specific system and integrated plant procedures during all modes of plant operation. 064 [Emergency Diesel Generators](#)

**Justification:**

**2009 Senior Reactor Operator Exam**

**A is Correct - power can be supplied by x-tying DG b to PBA-S03**

**B is Wrong - SBOGs must have NBN-X03 available to supply the unit with power**

**C is Wrong - A loss PKA-M41 kills the "A" DG therefore the MVAC contingency actions of the SPTAs are not available**

**D is Wrong - LOOP occurred therefore the other ESF transformer is not available**

2009 Senior Reactor Operator Exam

15

This Exam Level Appears on:	SRO
	SRO EXAM 2009
K/A #	35022a2.01
Importance Rating:	2.70

Given the following conditions:

- Unit 1 is operating at rated power
- The "A" train CEDM cooling fans (A02A/A02C) are running.
- The "B" train CEDM cooling fans (A02B/A02D) are in standby.

Subsequently

- Alarm window 7A9B, CEDM ACU COOLS SYS TRBL alarms.
- The Operator observes that CEDM cooling fan A02A has a brighter than normal green light.

Assuming no Operator action ...

- A. only A02C is running, full power operation may continue per 40AO-9ZZ20, Loss of HVAC.
- B. A02B will start after a 120 second time delay, full power operation may continue per 40AL-9RK7A, panel B07A alarm response.
- C. only A02C is running, start an additional CEDM cooling fan within 10 minutes or perform a Rapid Shutdown per 40OP-9ZZ05 Power Operations.
- D. only A02C is running, start an additional CEDM cooling fan within 40 minutes or trip the reactor and cooldown the RCS to less than 300°F within 4 hours per 40OP-9ZZ10, Mode 3 to Mode 5 operations.

Answer: A

Associated KA:  
74465

Describe the automatic functions associated with the CEDM Normal ACU fans (HCN-A02-A, & C and HCN-A02-B, & D).

Reference Id:  
Difficulty:  
Time to complete:  
10CFR Category:

Q22591  
0.00  
0  
CFR 55.43 (5) 55.43 (5) Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.

Cognitive Level:  
Question Source:  
Comment:

Comprehension / Anal  
Modified PV Bank

**Proposed reference to be provided to applicant during examination:** NONE

**Technical Reference:** Panel B07A Alarm Responses (40AL-9RK7A), Loss of HVAC (40AO-9ZZ20)

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**2009 Senior Reactor Operator Exam**

**K&A:** Ability to (a) predict the impacts of the following malfunctions or operations on the CCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Fan motor over-current

**Justification:**

**A is Correct** - There is no low D/P with a single fan running, no additional fans start and full power operation is permitted with a single fan running.

**B is Wrong** - no low D/P start signal is generated, both fans would have to trip.

**C is Wrong** - only A02C is running but the actions stated (10 minutes) apply to no CEDM cooling fans running.

**D is Wrong** - only A02C is running but the actions stated (40 minutes) apply to no CEDM cooling fans running.

2009 Senior Reactor Operator Exam

16

This Exam Level Appears on:	SRO
	SRO EXAM 2009 Tier 2 Group 2
K/A #	34002a2.03
Importance Rating:	4.30

Unit 1 is operating at 100% power when the following events occur:

- NAN-S02 (13.8 Kv non class bus) faulted and is de-energized.
- An automatic reactor trip occurs.
- Standard Post Trip Actions (SPTAs) are completed.
- Pressurize level is 33% and stable.
- NO operator actions have been taken or are required.

Subsequently

- Start-up transformer NAN-X03 faults and is de-energized.

The CRS should now anticipate that Pressurizer level will ...

- A. increase above the control band, level should be controlled by initiating a cooldown per 40EP-9EO07, LOOP/LOFC.
- B. increase above the control band, level should be controlled by securing all charging pumps per 40EP-9EO02, Reactor Trip.
- C. drop below the control band, level should be controlled by green flagging the always running charging pump per 40EP-9EO02, Reactor Trip.
- D. drop below the control band, level should be restored by green flagging the always running charging pump per 40EP-9EO07, LOOP/LOFC

Answer: A

Associated KA:  
L56289

Given conditions of a LOOP or LOFC determine whether or not entry into the LOOP/LOFC EOP is appropriate

Reference Id:	Q22527
Difficulty:	3.00
Time to complete:	3
10CFR Category:	CFR 55.43 (5)      55.43 (5) Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.

Cognitive Level:                      Comprehension / Anal  
Question Source:                      New  
Comment:

**Proposed reference to be provided to applicant during examination: NONE**

**Technical Reference:** LOOP, 40EP-9EO07/ LOIT lesson plan

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**2009 Senior Reactor Operator Exam**

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

**Justification:**

**A is Correct - Increasing  $T_{hot}$  and loss of Letdown will cause Pzr level to go high. With no cooling flow (NC) to the RCPs charging flow must be maintained, level is controlled by initiating a cooldown.**

**B is Wrong - This is a LOOP event, stopping charging pumps is wrong.**

**C and D are Wrong - level will go high. Examinee may not correctly associate which buses have de-energized or think that charging pumps have become anti-pumped due to the LOP signals.**

2009 Senior Reactor Operator Exam

17

This Exam Level Appears on:	SRO
	SRO EXAM 2009 Tier 2 Group 2
K/A #	2.4.40
Importance Rating:	4.50

Given the following time line:

- 1310 - An Alert, (FA1) was declared due to a LOCA and the RCS being at saturation conditions.
- 1330 - REP CET readings are 710°F.
- 1330 - RVLMS indicates 0% in the plenum.

It is the Emergency Coordinator responsibility to inform the State/County agencies no later than (a) of the upgrade to a (b).

- A. (a) 1400 (b) Site Area Emergency
- B. (a) 1400 (b) General Emergency
- C. (a) 1430 (b) Site Area Emergency
- D. (a) 1430 (b) General Emergency

Answer: A

Associated KA: 100866	Active Question Bank 2004
L92711	Identify the time restrictions for both classification of an emergency and notification of city, state, county and federal agency.
64124	Identify the specific E-Plan time requirements and responsibilities of the STSC Communicator.
96192	Classify events requiring emergency plan implementation
L65140	Given an emergency event, direct emergency plan actions as the Emergency Coordinator
L60153	Given the Emergency Classification procedure Describe the changes to the Emergency Classification procedure

Reference Id:	Q6652
Difficulty:	2.00
Time to complete:	5
10CFR Category:	CFR 55.43 (5) 55.43 (5) Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.
Cognitive Level:	Comprehension / Anal
Question Source:	PV Bank Not Modified
Comment:	

**Proposed reference to be provided to applicant during examination:** NEI-99

**Technical Reference:** EPIP-01

**K&A:** Knowledge of SRO responsibilities in emergency plan implementation. [\(017\) In-core Temperature Monitor](#)

**2009 Senior Reactor Operator Exam**

**Justification:**

**A is Correct - per EPIP-01. 2 potential and one loss of a barrier, notification required in <15 minutes**

**B and D are Wrong - could confuse potential losses and come up with a GE**

**C is Wrong - SAE is correct but 1 hour is the NRC notification time**

2009 Senior Reactor Operator Exam

18

This Exam Level Appears on:	SRO
	SRO EXAM 2009 Tier 2 Group 2
K/A #	38033a2.03
Importance Rating:	3.50

Given the following conditions:

- Unit 1 is in Mode 5 during a refueling outage.
- "A" Train shutdown cooling is in service.
- Spent Fuel Pool Level Hi or Lo is in alarm.
- Spent Fuel Pool level Lo-Lo is in alarm.
- An Auxiliary Operator confirms Spent Fuel Pool level is 136 ft 6 inches and slowly lowering.

What is the current status of (a) LCO 3.7.14, Fuel Storage Pool Water Level (b) Spent Fuel Pool Cooling (c) and which procedure should be implemented to correct this condition?

- A. (a) Entry in to LCO 3.7.14 is not required (b) SFP cooling must be secured at this level (c) 40AO-9ZZ23, Loss of SFP Level or Cooling.
- B. (a) Entry in to LCO 3.7.14 is required (b) SFP cooling can remain in operation at this level (c) 40AO-9ZZ23, Loss of SFP Level or Cooling.
- C. (a) Entry in to LCO 3.7.14 is required (b) SFP cooling must be secured at this level (c) 40EP-9EO11, Lower Mode Functional Recovery Procedure.
- D. (a) Entry in to LCO 3.7.14 is not required (b) SFP cooling can remain in operation at this level (c) 40EP-9EO11, Lower Mode Functional Recovery Procedure.

Answer: B

Associated KA:  
LS94317

Given plant conditions determine whether or not entry into or exit from the Loss of SFP Level or Cooling abnormal operating procedure is appropriate

Reference Id:	Q22528	
Difficulty:	2.00	
Time to complete:	3	
10CFR Category:	CFR 55.43 (5)	55.43 (5) Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.
Cognitive Level:	Memory	
Question Source:	New	
Comment:		

**Proposed reference to be provided to applicant during examination: NONE**

**Technical Reference:** LCO 3.4.17 / 40AO-9ZZ23, Loss of SFP Level or Cooling / SFP alarm Response, 41AL-1PC01

**K&A:** Ability to (a) predict the impacts of the following malfunctions or operations on the Spent Fuel Pool Cooling System ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations:  
Abnormal spent fuel pool water level or loss of water level

**2009 Senior Reactor Operator Exam**

Justification: LCO entry is 137 feet 4 inches, SFP cooling suction level is 131 ft 10 inches and ZZ23 is the correct procedure, Unit is in Mode 5 but refueling pool has no level (Inv. Control) that would involve the LMFRP

A is Wrong - LCO entry is required at < 137.33 feet

B is Correct -

C is Wrong - SFP cooling can continue and LMFRP is wrong

D is Wrong - LCO entry is required, LMFRP is wrong

2009 Senior Reactor Operator Exam

19

This Exam Level Appears on:	SRO
	SRO EXAM 2009 Tier 3
K/A #	2.1.7
Importance Rating:	4.70

Unit 1 has stabilized power at 52% following a trip of the B Main Feedwater pump.

30 minutes later the following conditions are noted:

- Reactor power is stable at 52%.
- T-cold is lowering.
- T-avg is dropping below T-ref
- CEA overlap has not been restored.

Which one of the following events/actions would cause these conditions?

- A. A small steam leak has occurred, trip the reactor and implement 40EP-9EO05, Excess Steam Demand.
- B. A slipped/dropped CEA has occurred, implement 40AO-9ZZ11, CEA Malfunctions and restore CEA positions.
- C. A HI-HI level has caused extraction steam to be isolated to a High Pressure feedwater heater, implement 40OP-9ZZ14, Feedwater and Condensate.
- D. These are expected xenon responses, lower turbine load and continue performance of 40AO-9ZZ09, Reactor Power Cutback (Loss of Feedpump)..

Answer: D

Associated KA:  
L56805

Determine if the RPCB (LOFP) AOP should be executed.

Reference Id:  
Difficulty:  
Time to complete:  
10CFR Category:

Q22534  
3.00  
3  
CFR 55.43 (5) 55.43 (5) Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.

Cognitive Level:  
Question Source:  
Comment:

Comprehension / Anal  
New

**Proposed reference to be provided to applicant during examination:** NONE

**Technical Reference:** 40AO-9ZZ09, RPCB (loss of Feedpump)

**K&A:** Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation.

**Justification:** The Xerho program showed 93 pcm xenon at 30 minutes

**A is Wrong - A steam leak would cause power to increase and temp to lower**

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**2009 Senior Reactor Operator Exam**

**B is Wrong - a slipped CEA could give these conditions but the procedure directs a Reactor trip if this should happen**

**C is Wrong - HI-HI level isolates extraction steam to the FW heater causing a drop in FW temp and a lowering of Tcold but power would also increase with the colder Feedwater**

**D is Correct - as xenon builds in temp will lower to maintain the given power with the Main Turbine on line. Procedure provides guidance to lower turbine load**

2009 Senior Reactor Operator Exam

20

This Exam Level Appears on:	SRO
	SRO EXAM 2009 Tier 3
K/A #	2.2.20
Importance Rating:	3.80

Per 01DP-9ZZ01, Systematic Troubleshooting, who is responsible to determine the level of troubleshooting gameplan?

- A. Shift Manager
- B. System Engineer
- C. Shift Technical Advisor
- D. Unit Department Leader

Answer: A

Associated KA:  
01DP-9ZZ01

Systematic Troubleshooting - 01DP-9ZZ01

Reference Id:  
Difficulty:  
Time to complete:  
10CFR Category:

Q22531  
3.00  
3  
CFR 55.43 (5)      55.43 (5) Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.

Cognitive Level:  
Question Source:  
Comment:

Memory  
New

**Proposed reference to be provided to applicant during examination:** NONE

**Technical Reference:** 01DP-9ZZ01, Systematic Troubleshooting

**K&A:** Knowledge of the process for managing troubleshooting activities.

**Justification:**

**A is Correct - Listed under the responsibilities section.**

**B, C and D are Wrong - Any of these could seem reasonable to the examinee.**

2009 Senior Reactor Operator Exam

21

This Exam Level Appears on: SRO SRO EXAM 2009 Tier 3  
K/A # 2.2.38  
Importance Rating: 4.50

Given the following conditions:

Unit 1 is operating at rated power with the following Safety Injection Tank (SIT) parameters:

PARAMETER	Pressure (psig)	Level (% NR)	Boron (ppm)
1A	592	45	4005
1B	605	32	4210
2A	610	50	3925
2B	615	20	4100

Which one of the following correctly describes the operability status of the Safety Injection Tanks?

- A. only 1A is Inoperable
- B. only 2A is Inoperable.
- C. 1A and 2B are Inoperable.
- D. 1A, 2A and 2B are Inoperable.

Answer: C

Associated KA:  
L89782

Given a set of plant conditions apply the one hour or less actions statements of T.S. 3.5

Reference Id: Q22612  
Difficulty: 4.00  
Time to complete: 3  
10CFR Category: CFR 55.43 (1) 55.43 (1) Conditions and limitations in the facility license.  
Cognitive Level: Memory  
Question Source: New  
Comment:

**Proposed reference to be provided to applicant during examination: NONE**

**Technical Reference:** Tech Specs LCO 3.5.1

**K&A:** Knowledge of conditions and limitations in the facility license.

**Justification:**

- $\geq 2300$  ppm (Boron concentration)  $\leq 4400$  ppm
- $\geq 600$  psig ppm (Pressure)  $\leq 625$  psig
- $\geq 28$  (%NR level)  $\leq 72$

**A is Wrong -**

**B is Wrong -**

**C is Correct - low pressure and level**

**D is Wrong -**

2009 Senior Reactor Operator Exam

## 2009 Senior Reactor Operator Exam

22

This Exam Level Appears on:	SRO
K/A #	SRO EXAM 2009 Tier 3
Importance Rating:	4.30
	2.3.11

Given the following Unit -1 conditions:

- SG 2 has a 75 gpd tube leak.
- The CRS is taking actions to be in Mode 3 within 24 hours per appendix F of 40AO-9ZZ02, Excessive RCS Leakrate.

Subsequently

- A safety on SG 2 fails partially open.
- A manual reactor trip is initiated.

After completion of the Standard Post Trip Actions the CRS should implement ...

- 40EP-9EO09, FRP and secure feedwater flow to SG 2.
- 40EP-9EO05, ESD and initiate an MSIS to isolate SG 2.
- 40EP-9EO09, FRP and feed SG 2 to greater than 45% NR.
- 40EP-9EO05, ESD and stabilize RCS temperatures using SG 1 only.

Answer: C

Associated KA:  
L11218

Given that the SGTR EOP is being implemented describe the SGTR EOP mitigation strategy

Reference Id:  
Difficulty:  
Time to complete:  
10CFR Category:

Q22596  
3.00  
3  
CFR 55.43 (4) 55.43 (4) Radiation hazards that may arise during normal and abnormal situations, including maintenance activities and various contamination conditions.

Cognitive Level:  
Question Source:  
Comment:

Comprehension / Anal  
New

**Proposed reference to be provided to applicant during examination:** NONE

**Technical Reference:** 40EP-9EO09, FRP

**K&A:** Ability to control radiation releases.

**Justification:**

**A is Wrong - This would be correct for a SGTR/ESD in containment. We would stop feeding in order to minimize the cooldown of the RCS with no release to atmosphere.**

**B is Wrong - The examinee may believe that the MSIS will stop the release when the MSIV close.**

**2009 Senior Reactor Operator Exam**

**C is Correct - This action is taken for ESD/SGTR outside containment. Feed 1360 to 1600 gpm to reach 45% NR level**

**C is Wrong - This would be correct for an ESD only event, examinee may believe that for such a small SGTL the FRP is not required.**

2009 Senior Reactor Operator Exam

23

This Exam Level Appears on:	SRO
	SRO EXAM 2009 Tier 3
K/A #	2.3.12
Importance Rating:	3.70

Given the following conditions:

- Unit 1 is in Mode 6
- Core off-load is in progress
- The CRS is informed that a Fuel Assembly has been dropped in the Spent Fuel Pool.
- The Fuel Assembly is being placed in a stable condition.
- RU 31 is in alert alarm and readings are trending up
- Ru-145 is in alert alarm and readings are trending up.

In addition to initiating a FBEVAS the crew is expected to ....

- A. ensure all personnel have evacuated the area, no other actions are required.
- B. initiate or verify initiated CRVIAS and ensure all personnel have evacuated the area.
- C. initiate or verify initiated CREFAS and ensure all non-essential personnel have evacuated the area.
- D. initiate or verify initiated CREFAS, CRVIAS and ensure all non-essential personnel have evacuated the area.

Answer: C

Associated KA:  
L96631

Determine whether or not the Irradiated Fuel Damage AOP should be executed.

Reference Id:  
Difficulty:  
Time to complete:  
10CFR Category:

Q22597  
3.00  
2  
CFR 55.43 (4) 55.43 (4) Radiation hazards that may arise during normal and abnormal situations, including maintenance activities and various contamination conditions.

Cognitive Level:  
Question Source:  
Comment:

Memory  
New

**Proposed reference to be provided to applicant during examination:** NONE

**Technical Reference:** Irradiated Fuel Damage, 40AO-9ZZ22 / LOIT Lesson Plan / RMS alarm response, 74RM-9EF41

**K&A:** Knowledge of radiological safety procedures pertaining to licensed operator duties, such as response to radiation monitor alarms, containment entry requirements, fuel handling responsibilities, access to locked high-radiation areas, aligning filters, etc.

**Justification:** per the RMS alarm response and 40AO-9ZZ22 the crew should initiate a CREFAS only in addition ZZ22 directs that non-essential personnel be evacuated. CRIVAS is for toxic conditions.

**2009 Senior Reactor Operator Exam**

**A is Wrong - Initiate/verify CREFAS and evacuate non-essential personnel**

**B is Wrong - CRIVAS is not directed (containment)**

**C is Correct - CREFAS should cross trip and non-essential personnel should be evacuated**

**D is Wrong - CRIVAS is not directed**

2009 Senior Reactor Operator Exam

24

This Exam Level      SRO  
Appears on:

K/A #                  2.4.11  
Importance  
Rating:

Given the following conditions:

- Unit 1 is operating at 100% power.
- An Abnormal Operating procedure has been implemented.
- The following step has been completed.

If cooling water can not be restored, **THEN** perform the following:

- 1) Ensure the Reactor is tripped
- 2) Stop all of the RCPs.
- 3) Isolate controlled bleedoff.
- 4) PERFORM the appropriate procedure for current plant conditions.

Which statement below best describes the use of Abnormal Operating Procedures (AOPs) after the crew has entered the Emergency Operating procedures (EOPs)?

- A. Immediately exit the AOP being performed.
- B. No further AOP actions are permitted until after the SPTAs are completed.
- C. Any AOP that has been started prior to a reactor trip must be performed through completion.
- D. Continue through the AOP until a step is reached that directs exiting the procedure.

Answer:                  D

Associated KA:  
54860

AOPs

L82065

Given indications for entry into an Abnormal Operating Procedure define the required actions for the conditions given

Reference Id:                  Q8781  
Difficulty:                      3.00  
Time to complete:              5  
Cognitive Category:            Not LINKED to a Cognitive Question Category  
Question Source:               Not LINKED to a SOURCE  
Comment:

**Proposed reference to be provided to applicant during examination:** NONE

**Technical Reference:** 40DP-9AP18, AOP Users Guide

**K&A:** Knowledge of abnormal condition procedures.

**2009 Senior Reactor Operator Exam**

**Justification:**

**A is Wrong - This would be true for a "GO TO" step in the AOPs**

**B is Wrong - No actions are permitted until the Reactivity Safety Function is complete**

**C is Wrong - Some AOPs must be exited such as the "Go To" direction**

**D is Correct - As found in section 17 of the users guide**

2009 Senior Reactor Operator Exam

25

This Exam Level Appears on:	SRO
	SRO EXAM 2009 Tier 3
K/A #	2.4.30
Importance Rating:	4.10

In accordance with PVNGS Policies, Practices and Procedures, which one of the following conditions/actions requires notification of the NRC?

- A. Single PPS channel trip.
- B. Loss of both Nuclear Cooling Water pumps.
- C. Fire in the Operations Support Building that is extinguished within 10 minutes.
- D. Auxiliary Operator is referred to medical due to a finger laceration while operating a manual valve.

Answer: B

Associated KA:  
72279

LCO 3.0.3

Reference Id:  
Difficulty:  
Time to complete:  
10CFR Category:

Q22537  
3.00  
2  
CFR 55.43 (5)      55.43 (5) Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.

Cognitive Level:  
Question Source:  
Comment:

Memory  
New

**Proposed reference to be provided to applicant during examination:** NONE

**Technical Reference:** ODP-10, Ops External Communications Practices / Policy No.1504, Ops NRC Communications Policy

**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.

**Justification:**

**A is Wrong - Single trip is a TS entry nothing more. No AOP entry or reduced power ops**

**B is Correct - Entry into AOP requires NRC notification**

**C is Wrong - Fire < 10 requires no implementation of e-plan**

**D is Wrong - might be true for a licensed operator or if evacuation or contamination were involved**

## 2009 Senior Reactor Operator Exam

## Cognitive Level Summary

Number of questions linked:	24	Percentage
Memory	8	8
Comprehension	0	0
Analysis	0	0

## Question Source Summary

Number of questions linked to source:	24	Percentage
<b>New</b>		
New	15	15
<b>Modified</b>		
INPO Bank Modified	0	
PV Bank Modified	6	
Total Modified	6	6
<b>Bank</b>		
INPO Bank Not Modified	0	
PV Bank Not Modified	2	
PV NRC Exam Question Not Modified	0	
Total BANK	2	2