Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank: 1610 **Rev:** 2 **Rev Date:** 3/17/2009 3:22:05 **QID #:** 1 **Author:** Coble

Lic Level: R **Difficulty:** 3 **Taxonomy:** H **Source:** NRC Exam Bank 0027

Search 000008K301 **10CFR55:** 41.5 / 41.10 / 45.6 / 45 **Safety Function** 3

System Title: Pressurizer (PZR) Vapor Space Accident (Relief **System Number** 008 **K/A** AK3.01

Tier: 1 **Group:** 1 **RO Imp:** 3.7 **SRO Imp:** 4.4 **L. Plan:** A2LP-RO-ELOCA **OBJ** 14

Description: Knowledge of the reasons for the following responses as they apply to the Pressurizer Vapor Space Accident: - Why PZR level may come back on scale if RCS is saturated

Question:

Given the following:

* The reactor has tripped and safety injection has actuated.
* The RCS has a stuck open Pressurizer Safety valve.
* The RCS has rapidly depressurized to saturation conditions during the cooldown.
* Pressurizer level initially dropped below zero and now has risen to 46% and is rising rapidly.

Which one (1) of the following characterizes the relationship between indicated pressurizer level and RCS inventory and the reason for these conditions?

A. Level is NOT an accurate indication of inventory. The cold calibrated pressurizer level channels indicate high during high temperature, low pressure conditions.

B. Level is an accurate indication of inventory. Voiding would occur first in the pressurizer steam space due to the higher temperature of the pressurizer walls.

C. Level is NOT an accurate indication of inventory. Reactor vessel voiding may result in a rapidly rising pressurizer level.

D. Level is an accurate indication of inventory. RCP flow would sweep any voids from the RCS to the pressurizer steam space and out the safety.

QID use History

	RO	SRO
2003	☐	☐
2005	☑	☑
2006	☐	☐
2008	☐	☐
2009	☑	☑

Audit Exam History

2009	☐

Answer:

C. Level is NOT an accurate indication of inventory. Reactor vessel voiding may result in a rapidly rising pressurizer level.

Notes:

A is true but its contribution to a false level is not significant in this event and the level instruments are density compensated to prevent this. B is incorrect because voiding would occur in the top of the reactor vessel head first. D is incorrect because RCPs would be secured for the above saturated conditions.

References:

2202.003 Rev 10, Section 3, Step 11 (Loss of Coolant Accident).
2202.010 Rev 11, Attachment 9, Void Elimination (Standard Attachments).
Lesson Plan A2LP-RO-ELOCA Rev 6, Obi 14: Given a LOCA event and a set of plant conditions, determine if voiding has occurred during a cooldown.

Historical Comments:

Used on the 2005 NRC Exam

Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank:	1611	**Rev:**	0	**Rev Date:**	3/18/2009 11:09:4	**QID #:**	2	**Author:**	Coble		
Lic Level:	R	**Difficulty:**	3	**Taxonomy:**	H	**Source:**	New				
Search	000009A209	**10CFR55:**	41.7 / 41.10 / 43.5 / 45	**Safety Function**	3						
System Title:	Small Break LOCA			**System Number**	009	**K/A**	EA2.09				
Tier:	1	**Group:**	1	**RO Imp:**	2.8	**SRO Imp:**	3.3	**L. Plan:**	A2LP-RO-CCW	**OBJ**	13
Description:	Ability to determine and interpret the following as they apply to a small break LOCA: - Low-pressure SWS activity monitor										

Question:

With the plant at 100% full power, which one of the following radiation monitors would indicate a small inter-system LOCA starting to develop from the RCS?

A. The in service Containment Atmospheric Monitors (CAMS)

B. Loop 1 Service Water return from the SDC Heat Exchanger Radiation Monitor

C. Loop 2 Service Water return from the Containment Cooling Coils Radiation Monitor

D. Loop 2 Component Cooling Water Radiation Monitor

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☑	☑

Audit Exam History

2009	☐

Answer:

D. Loop 2 Component Cooling Water Radiation Monitor

Notes:

Distracter A is wrong because these monitors sample the Containment Atmosphere for small RCS leaks that develop directly from the RCS piping to the Containment Atmosphere.
Distracter B is incorrect because there is no SW flow through this HX at 100% power.
Distracter C is incorrect because this monitor would not see an RCS inter-system leak, only one that has pressurized the containment atmosphere.
D is correct because any leak from a RCP cooling HX or the Letdown HX would be detected at full power as soon as the leak started to develop.

References:

STM 2-43, CCW System, Section 2.5 and 4.0.
STM 2-62 Rev 15, Radiation Monitoring System, Sections 2.2.2, 2.2.3, 2.2.7.3, and 2.2.12.
Lesson Plan A2LP-RO-CCW Rev. 3 Objective 13: Describe an Interfacing System LOCA (ISLOCA) and describe the method used to protect against an ISLOCA used at ANO Unit 2.

Historical Comments:

New Question for 2009 NRC Exam

Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank:	1612	**Rev:**	0	**Rev Date:**	10/31/2004	**QID #:**	3	**Author:**	Coble		
Lic Level:	R	**Difficulty:**	3	**Taxonomy:**	H	**Source:**	NRC Exam Bank 0486				
Search	000011K101	**10CFR55:**	41.8 / 41.10 / 45.3	**Safety Function**	3						
System Title:	Large Break LOCA			**System Number**	011	**K/A**	EK1.01				
Tier:	1	**Group:**	1	**RO Imp:**	4.1	**SRO Imp:**	4.4	**L. Plan:**	A2LP-RO-ELOCA	**OBJ**	11
Description:	Knowledge of the operational implications of the following concepts as they apply to the Large Break LOCA: - Natural circulation and cooling, including reflux boiling										

Question:

Given the following conditions:

* The plant experienced a Loss of Coolant Accident (LOCA) and has tripped.
* All RCPs have been secured.
* A plant cooldown is in progress.
* RCS Thot indicates 553°F and rising.
* RCS Tcold indicates 520°F and lowering.
* RCS Average CET Temperatures indicate 565°F.
* RCS Pressure is 1100 psia and lowering.
* Steam Generator levels are 30% Narrow Range each and slowly rising.
* RVLMS level 7 and below are WET

Based on the above conditions, the method of RCS heat removal would be:

A. Reflux Boiling natural circulation cooling.

B. Subcooled nucleate boiling heat removal.

C. Single Phase Natural Circulation cooling.

D. Once through cooling with HPSI and ECCS Vents.

QID use History

	RO	SRO
2003	☐	☐
2005	☑	☑
2006	☐	☐
2008	☐	☐
2009	☑	☑

Audit Exam History

2009	☐

Answer:

A. Reflux Boiling natural circulation cooling.

Notes:

Distracter B is incorrect because the fluid is saturated not subcooled.
Distracter C is incorrect due to CET and Thot being greater than 10°F out from each other and also Margin To Saturation is less than 30°F.
Distracter D is incorrect, this action would only be taken if SG levels dropped to < 70 inches wide range which is well below 30% Narrow Range in the SGs.
Answer A is the only method available to remove RCS heat at this time.

References:

GFES PWR Thermodynamics Rev. 2 Chapter 8 Thermal Hydraulics. Objective 26 and section on Determination of Natural Circulation Flow.
EOP 2203.003 Rev. 10 , LOCA, Section 3, Step 6
Lesson Plan A2LP-RO-ELOCA Rev. 6 OBJ 10: Given a LOCA event and a set of plant conditions, determine if Natural Circulation has been established in at least one loop.
A2LP-RO-ELOCA Rev. 6 OBJ 11: Given a LOCA event and a set of plant conditions, describe the conditions required to be met if Natural Circulation conditions can not be confirmed.

Historical Comments:

Used on the 2005 NRC Exam

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Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank:	1613	**Rev:**	0	**Rev Date:**	3/18/2009 1:02:49	**QID #:**	4	**Author:**	Coble		
Lic Level:	R	**Difficulty:**	3	**Taxonomy:**	H	**Source:**	IH bank OPS2-9730 Modified				
Search	000015K210	**10CFR55:**	41.7 / 45.7	**Safety Function**	4						
System Title:	017 Reactor Coolant Pump (RCP) Malfunction			**System Number**	015	**K/A**	AK2.10				
Tier:	1	**Group:**	1	**RO Imp:**	2.8	**SRO Imp:**	2.8	**L. Plan:**	A2LP-RO-RCP	**OBJ**	8
Description:	Knowledge of the interrelations between the Reactor Coolant Pump Malfunctions and the following: - RCP indicators and controls										

Question:

The plant is at 100% operation with the following data being observed on "A" Reactor Coolant Pump (RCP).

* Middle Seal Pressure - 2200 psia
* Upper Seal Pressure - 2160 psia
* Vapor Seal pressure - 60 psia

Based on these conditions, which seal (s) have failed?

A. Lower seal only.

B. Lower and Middle seals.

C. Lower, Middle and Upper seals.

D. Lower and Upper seals.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☑	☑

Audit Exam History

2009	☐

Answer:

B. Lower and Middle seals.

Notes:

A is incorrect because 2 seals have failed - lower and middle.
C is incorrect because only 2 seals have failed not three.
D is incorrect because the upper seal has not failed.

References:

OP 2203.025 Rev. 12 RCP Emergencies, Step 5, Attachment B and Attachment D.
Lesson Plan A2LP-RO-RCP Rev. 1 Objective 8: Evaluate a given set of plant conditions and appropriate reference material, determine what actions should be taken for any RCP emergency.

Historical Comments:

Has not been used on an NRC Exam

Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank: 1614 **Rev:** 0 **Rev Date:** 3/18/2009 1:53:04 **QID #:** 5 **Author:** Coble

Lic Level: R **Difficulty:** 2 **Taxonomy:** F **Source:** New

Search 000022K305 **10CFR55:** 41.5 / 41.10 / 45.6 / 45 **Safety Function** 2

System Title: Loss of Reactor Coolant Makeup **System Number** 022 **K/A** AK3.05

Tier: 1 **Group:** 1 **RO Imp:** 3.2 **SRO Imp:** 3.4 **L. Plan:** A2LP-RO-EAOP **OBJ** 26

Description: Knowledge of the reasons for the following responses as they apply to the Loss of Reactor Coolant Makeup: - Need to avoid plant transients

Question:

Given the following:

* The plant is at 100% full power.
* The Loss of Charging AOP 2203.036 has been entered due to gas binding of the Suction Path.

During the time it takes to vent and restore the Charging system to service, why does reactor power, temperature and pressure need to be maintained as stable as possible.

A. To prevent hydrogen from coming out of solution and adding to the gas binding problem.

B. To allow Letdown to restore Pressurizer level within the 100% power operating limits.

C. To minimize the contraction of RCS inventory during any potential RCS cooldown.

D. To prevent the degradation of RCP seals due to a loss of charging seal injection flow.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☑	☑

Audit Exam History

2009	☐

Answer:

C. To minimize the contraction of RCS inventory during any potential RCS cooldown.

Notes:

A is incorrect because the suction source for the charging pumps is the VCT which is not affected by changes in RCS pressure and temperature.
B is incorrect because Letdown will be isolated along with securing of Charging pumps in this condition.
D is incorrect because seal injection for RCPs is not aligned to the seals at full power.
C is correct because any transient will lower power causing the RCS to potentially shrink and empty the Pressurizer causing a loss of PZR heaters and spray causing a loss of Pressure Control

References:

OP 2203.036 Rev. 8, Loss of Charging AOP, Steps 3, 8.G and 18.
Lesson Plan A2LP-RO-EAOP Rev. 12, Objective 26: Discuss the Mitigation strategy, Entry Conditions, applicable industry events, Instructions and Exit Conditions (as per AOP and Tech Guide) of OP 2203.036, Loss Of Charging.

Historical Comments:

Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank: 1615 **Rev:** 0 **Rev Date:** 10/5/2004 **QID #:** 6 **Author:** Coble

Lic Level: R **Difficulty:** 3 **Taxonomy:** H **Source:** NRC Exam Bank 0455

Search 0000262244 **10CFR55:** 41.10 / 43.5 / 45.12 **Safety Function** 8

System Title: Loss of Component Cooling Water (CCW) **System Number** 026 **K/A** 2.2.44

Tier: 1 **Group:** 1 **RO Imp:** 4.2 **SRO Imp:** 4.4 **L. Plan:** A2LP-RO-EAOP **OBJ** 29

Description: Equipment Control - 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.

Question:

While at 100% power, CCW is isolated to the RCPs.

The decision to quickly restore CCW to containment is based on a RCP controlled bleedoff temperature indication of less than _____ °F. If above this limit, then CCW should be restored slowly to cooldown the RCP seals at less than _____ °F per hour.

A. 100; 180

B. 100; 100

C. 180; 180

D. 180; 100

QID use History

	RO	SRO
2003	☐	☐
2005	☑	☑
2006	☐	☐
2008	☐	☐
2009	☑	☑

Audit Exam History

2009	☐

Answer:

D. 180; 100

Notes:

Maintaining a cooldown rate of less than 100°F per hour if greater than 180°F seal temperature will prevent thermal shocking the RCP seals and prevents a potential LOCA condition.

Distracters A and B have incorrect bleedoff temperature limits.
Distracters A and C has incorrect cooldown limits.

References:

Standard Attachment 21 of OP 2202.010 Rev. 11
Lesson Plan A2LP-RO-EAOP Rev. 12 OBJ. 29, Discuss the Mitigation strategy, Entry Conditions, Instructions and Exit Conditions (as per AOP and Tech Guide) of OP 2203.039, Inadvertent CIAS.

Historical Comments:

Used on the 2005 NRC Exam

Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank:	1616	**Rev:**	0	**Rev Date:**	3/19/2009 1:05:55	**QID #:**	7	**Author:**	Coble		
Lic Level:	R	**Difficulty:**	2	**Taxonomy:**	F	**Source:**	IH Bank 02699 OPSCOMMON				
Search	000027K103	**10CFR55:**	41.8 / 41.10 / 45.3	**Safety Function**	3						
System Title:	Pressurizer Pressure Control (PZR PCS) Malfun	**System Number**	027	**K/A**	AK1.03						
Tier:	1	**Group:**	1	**RO Imp:**	2.6	**SRO Imp:**	2.9	**L. Plan:**	ASLP-RO-TM003	**OBJ**	11
Description:	Knowledge of the operational implications of the following concepts as they apply to Pressurizer Pressure Control Malfunctions: - Latent heat of vaporization/condensation										

Question:

The plant is shut down with the following pressurizer conditions:

* Pressurizer liquid temperature: 587°F.
* Pressurizer vapor temperature: 587°F
* Pressurizer pressure: 1,400 psia
* The in-service Pressurizer spray valve fails open.
* When the spray valve is subsequently closed, Pressurizer Pressure is 1200 psia

At this point the pressurizer bulk liquid temperature will have

A. risen due to evaporation of liquid.

B. risen due to condensation of vapor.

C. lowered due to evaporation of liquid.

D. lowered due to condensation of vapor.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☑	☑

Audit Exam History

2009	☐

Answer:

C. lowered due to evaporation of liquid.

Notes:

A and B are incorrect because the liquid temperature is in a P-Sat/T-Sat condition and will lower as pressure is reduced.
D is incorrect because condensation will only occur if pressure is raised.

References:

PWR GFES Thermodynamics Chapter 3 Rev. 2 Steam.
Lesson Plan ASLP-RO-TM003 Rev. 2, Steam, Objectives 8 and 11: Apply saturated and superheated steam tables in solving liquid-vapor problems. Define the following terms:
a. Latent heat of vaporization.

Historical Comments:

This question has not been used on a NRC exam.

Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank:	1617	**Rev:**	0	**Rev Date:**	3/19/2009 1:33:42	**QID #:**	8	**Author:**	Coble
Lic Level:	R	**Difficulty:**	4	**Taxonomy:**	H	**Source:**	New		
Search	0000292236	**10CFR55:**	41.10 / 43.2 / 45.13	**Safety Function**	1				
System Title:	Anticipated Transient Without Scram (ATWS)	**System Number**	029	**K/A**	2.2.36				
Tier:	1	**Group:**	1	**RO Imp:**	3.1	**SRO Imp:**	4.2	**L. Plan:**	A2LP-RO-DSS	**OBJ**	2

Description: Equipment Control - Ability to analyze the effect of maintenance activities, such as degraded power sources, on the status of limiting conditions for operations.

Question:

Given the following:

* A plant startup is in progress and currently at 3% power and steady.
* Electrical Supply bus 2Y3 feeder breaker fails open and the 2Y3 bus is de-energized.
* After troubleshooting, maintenance says it will take 4 hours to restore bus 2Y3.

How does this loss of power affect the limiting conditions for operations of the Diverse Scram System (DSS)?

A. These conditions will not affect the limiting conditions for operations for DSS because 2Y3 does not supply power to the DSS.

B. These conditions will not affect the limiting conditions for operations for DSS because the system is not required in this mode.

C. The DSS is required to be operable in this mode so plant power should be reduced to Mode 3 within the next 60 minutes.

D. The DSS is required to be operable in this mode so plant power should be reduced to Mode 2 within the next 60 minutes.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☑	☑

Audit Exam History

2009	☐

Answer:

B. These conditions will not affect the limiting conditions for operations for DSS because the system is not required in this mode.

Notes:

A is incorrect because 2Y3 does supply power to the DSS.
B is correct because DSS is only required to be operable in MODE 1 and these are MODE 2 conditions.
C and D are incorrect because the DSS is not required to be operable at this time so no action is required.

References:

STM 2-63-1 Rev. 1, DSS, Section 2.0 and 3.0
Lesson plan A2LP-RO-DSS Rev.6, Objectives 2 and 11: Describe the commitment made by ANO to the NRC concerning DSS. List the power supplies to the DSS logic cabinet 2C409 and the DSS contactor panels 2C407/408.

Historical Comments:

Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank: 1618 **Rev:** 0 **Rev Date:** 6/2/1998 **QID #:** 9 **Author:** Hatman

Lic Level: R **Difficulty:** 2 **Taxonomy:** F **Source:** NRC Exam Bank 0139

Search 000038K302 **10CFR55:** 41.5 / 41.10 / 45.6 / 45 **Safety Function** 3

System Title: Steam Generator Tube Rupture (SGTR) **System Number** 038 **K/A** EK3.02

Tier: 1 **Group:** 1 **RO Imp:** 4.4 **SRO Imp:** 4.5 **L. Plan:** A2LP-RO-ESGTR **OBJ** 4

Description: Knowledge of the reasons for the following responses as they apply to the SGTR: - Prevention of secondary PORV cycling

Question:

Which one of the following states the basis for lowering RCS T-hot less than 535°F prior to isolating the Steam Generator with a tube rupture?

A. Prevents lifting Steam Generator (SG) safety valves on the isolated SG.

B. Corresponds to a secondary side pressure of 1078 psig, the SG safety valves lift setpoint.

C. Minimize primary inventory loss by stabilizing at a high SG pressure.

D. Minimize any dilution of the RCS when primary pressure is decreased to below the isolated SG pressure.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☑	☑

Audit Exam History

2009	☐

Answer:

A. Prevents lifting Steam Generator (SG) safety valves on the isolated SG.

Notes:

B is incorrect because 535°F corresponds to a ~ 925 psia.
C is incorrect because this is not the basis for the 535°F but is a goal of the EOP.
D is incorrect because the goal is to minimize the leakage from the RCS to the secondary not from the secondary to the primary.

References:

OP 2202.004 SGTR EOP Rev. 9 Step 11.
TG 2202.004 SGTR Tech Guide Rev. 9 Step 11
Lesson Plan A2LP-RO-ESGTR Rev. 5 Objective 4: State the purpose of cooling down the Reactor Coolant System (RCS) to less than 535oF hot leg temperature

Historical Comments:

Used on the 1998 NRC exam

Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank: 1619 **Rev:** 0 **Rev Date:** 1/10/2002 **QID #:** 10 **Author:** Coble

Lic Level: R **Difficulty:** 3 **Taxonomy:** F **Source:** NRC Exam Bank 0334

Search 0000542406 **10CFR55:** 41.10 / 43.5 / 45.13 **Safety Function** 4

System Title: Loss of Main Feedwater (MFW) **System Number** 054 **K/A** 2.4.6

Tier: 1 **Group:** 1 **RO Imp:** 3.7 **SRO Imp:** 4.7 **L. Plan:** A2LP-RO-ELOSF **OBJ** 5

Description: Emergency Procedures/Plan - Knowledge of EOP mitigation strategies.

Question:

Given the following plant conditions:

* Plant was operating at 100% Power.
* AFW Pump 2P75 is OOS for Pump bearing replacement.
* Both Main Feedwater Pumps tripped on low suction pressure.
* EFW Pump 2P7B fails to start.
* EFW Pump 2P7A trips on overspeed.
* CRS has completed SPTAs and diagnosed entry into 2202.006, Loss of Feedwater.
* All other components operate as designed.

Given these conditions, the crew should:

A. Secure all running RCPs to minimize the amount of heat input into the RCS.

B. Maintain two (2) RCPs running with one in each loop to balance SG heat removal.

C. Cooldown and depressurize the RCS to maximize margin to saturation.

D. Maximize steam generator blowdown to increase the heat removal rate from the RCS.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☑	☑

Audit Exam History

2009	☐

Answer:

A. Secure all running RCPs to minimize the amount of heat input into the RCS.

Notes:

With no feedwater available, the SG inventory would be rapidly depleted with the 4 MW of heat input to the RCS per RCP. The ORP for Loss of Feedwater directs securing of all RCPs thus preventing a more rapid loss of SG inventory due to this heat input.
B is incorrect because two RCPs are left running.
C is incorrect because this would deplete Steam Generator inventory with no means to replace it.
D is incorrect because this would also deplete Steam Generator inventory with no means to replace it.

References:

OP 2202.006, Loss of Feedwater ORP, Step 5.A
OP 2202.006, Loss of Feedwater ORP, Step 6
Lesson plan A2LP-RO-ELOSF, Objective 5: Analyze a set of plant conditions, during a loss of feedwater event, and determine if adequate RCS heat removal exists and the actions required to restore RCS heat removal if ii is inadequate

Historical Comments:

Used on the 2002 NRC Exam

Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank:	1620	**Rev:**	0	**Rev Date:**	3/20/2009 12:31:4	**QID #:**	11	**Author:**	Coble		
Lic Level:	R	**Difficulty:**	2	**Taxonomy:**	F	**Source:**	New				
Search	000055A105	**10CFR55:**	41.7 / 45.5 / 45.6	**Safety Function**	6						
System Title:	Loss of Offsite and Onsite Power (Station Black	**System Number**	055	**K/A**	EA1.05						
Tier:	1	**Group:**	1	**RO Imp:**	3.3	**SRO Imp:**	3.6	**L. Plan:**	A2LP-RO-ED125	**OBJ**	7
Description:	Ability to operate and/or monitor the following as they apply to a Station Blackout: - Battery, when approaching fully discharged										

Question:

Given the following:

* The plant has been shutdown due to loss of offsite power (LOOP).
* Station Blackout conditions exist and all attempts to restore AC power to the safety buses have failed.
* The Vital DC batteries are discharging at their normal rated capacity.

If NO loads are removed from the batteries, the maximum expected duration of available DC power would be _____ hours before the batteries would be fully discharged.

A. 2

B. 4

C. 6

D. 8

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☑	☑

Audit Exam History

2009	☐

Answer:

D. 8

Notes:

The vital batteries (2D11 and 2D12) are each rated as follows:
2064 amp hours over an eight hour discharge.
This rating is designed to last for 8 hours during a discharge
to 105 VDC. The ratings are at a nominal cell temperature of 77°F.

References:

STM 2-32-5, 125 VDC Electrical Distribution, Rev. 15 Section 2.4
Lesson Plan A2LP-RO-ED125 Rev. 6 Objective 7: Describe the operation and ratings of the following: Batteries 2D11 and 2D12

Historical Comments:

Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank:	1621	**Rev:**	0	**Rev Date:**	3/20/2009 12:50:0	**QID #:**	12	**Author:**	Coble		
Lic Level:	R	**Difficulty:**	3	**Taxonomy:**	H	**Source:**	New				
Search	000056K103	**10CFR55:**	41.8 / 41.10 / 45.3	**Safety Function**	6						
System Title:	Loss of Offsite Power	**System Number**	056	**K/A**	AK1.03						
Tier:	1	**Group:**	1	**RO Imp:**	3.1	**SRO Imp:**	3.4	**L. Plan:**	A2LP-RO-ELOOP	**OBJ**	5

Description: Knowledge of the operational implications of the following concepts as they apply to Loss of Offsite Power: - Definition of subcooling: use of steam tables to determine it

Question:

Given the following plant conditions:

* Reactor is in Mode 3 due to a loss of offsite power.
* RCS pressure is 2000 psia and slowly rising.
* Tcold is 550°F and constant.
* Thot is 588°F and slowly lowering.
* Average CET temperature is 597°F.
* Steam Generator "A" & "B" levels are 26% NR and slowly rising.

Currently the amount of subcooling margin is _____ °F and natural circulation conditions _____ satisfied at this time.

A. 39; are NOT

B. 39; are

C. 48; are NOT

D. 48; are

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☑	☑

Audit Exam History

2009	☐

Answer:

B. 39; are

Notes:

The subcooled margin must be determined from the steam tables and is 39°F if using CET temperatures (Hottest Temperature). During natural circulation CET subcooling should be used to determine if adequate subcooling exists. The CETs do not rely on loop flow (as do the RTDs) for detecting fluid conditions adjacent to the core and would therefore be the most accurate indication of core temperature. The subcooling margin would be 48°F if Thot is used instead of CET temp. All the other criteria for proper natural circulation are met. Thus B is correct and A, C and D are incorrect.

References:

OP2202.007, LOOP, Rev 9, Step 24
STM 2-73, Saturation Margin Monitor Rev. 3, Section 4.3
Lesson Plan A2LP-RO-ELOOP Rev. 7 Objective 5: Given a set of plant conditions determine if the conditions for Natural Circulation are being met during the Loss Of Offsite Power optimal recovery EOP.

Historical Comments:

Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank:	1622	**Rev:**	0	**Rev Date:**	3/20/2009 3:03:52	**QID #:**	13	**Author:**	Coble		
Lic Level:	R	**Difficulty:**	2	**Taxonomy:**	H	**Source:**	New				
Search	000057A105	**10CFR55:**	41.7 / 45.5 / 45.6	**Safety Function**	6						
System Title:	Loss of Vital AC Electrical Instrument Bus	**System Number**	057	**K/A**	AA1.05						
Tier:	1	**Group:**	1	**RO Imp:**	3.2	**SRO Imp:**	3.4	**L. Plan:**	A2LP-RO-NI	**OBJ**	4
Description:	Ability to operate and/or monitor the following as they apply to the Loss of Vital AC Instrument Bus: - Backup instrument indications										

Question:

Given the following plant conditions:

* Plant is in Mode 2 performing a reactor startup.
* CEA Regulating Group "P" is currently 65 inches withdrawn
* Reactor power is currently 1.0 E-8% power
* 120 Vital AC Electrical Bus 2RS1 is inadvertently de-energized.

Which ONE of the following sets of instruments should be used to monitor the status of the reactor?

A. Startup Channel Number 1 and Excore Log Safety Channel A.

B. Startup Channel Number 2 and Excore Log Safety Channel A.

C. Startup Channel Number 1 and Excore Log Safety Channel B.

D. Startup Channel Number 2 and Excore Log Safety Channel B.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☑	☑

Audit Exam History

2009	☐

Answer:

D. Startup Channel Number 2 and Excore Log Safety Channel B.

Notes:

Channel A Log Safety Power indications and Startup Channel Number 1 indications are powered from 2RS1 so they would not have power but Channel B Log Safety Power indications and Startup Channel Number 2 indications are powered from Vital AC instrument bus 2RS2 and would provide the needed backup instrument indications.
This would make distracters A, B, and C incorrect.

References:

STM 2-67-1, Rev 8, Excore Nuclear Instrumentation, Section 2.3.1.
Lesson Plan A2LP-RO-NI, Rev 11, Excore Nuclear Instrumentation, Objectives 4 and 6:Describe the components, operation, and outputs of the start-up channels. Describe components, operations, and outputs of the Safety Channels.

Historical Comments:

Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank:	1623	**Rev:**	0	**Rev Date:**	3/27/2009 10:42:1	**QID #:**	14	**Author:**	Coble		
Lic Level:	R	**Difficulty:**	3	**Taxonomy:**	H	**Source:**	New				
Search	000058A202	**10CFR55:**	41.7 / 41.10 / 43.5 / 45	**Safety Function**	6						
System Title:	Loss of DC Power			**System Number**	058	**K/A**	AA2.02				
Tier:	1	**Group:**	1	**RO Imp:**	3.3	**SRO Imp:**	3.6	**L. Plan:**	A2LP-RO-EAOP	**OBJ**	27
Description:	Ability to determine and interpret the following as they apply to the Loss of DC Power: - 125V dc bus voltage, low/critical low, alarm										

Question:

Given the following:

* The plant is at full power.
* Annunciator 2K01 A-10 "CONT CENTER 2D01 UNDERVOLT" has come in.
* The CRS has entered Loss of 125 VDC AOP 2203.037 due to a loss of 2D01.
* The Reactor has not tripped.
* The CRS has given direction to place ALL PPS points on the appropriate PPS channel (s) in bypass.

Which ONE of the following would be the appropriate PPS channel (s) to bypass?

A. PPS Channel 1 AND PPS Channel 2.

B. PPS Channel 1 OR PPS Channel 3.

C. PPS Channel 3 AND PPS Channel 4.

D. PPS Channel 2 OR PPS Channel 4.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☑	☑

Audit Exam History

2009	☐

Answer:

B. PPS Channel 1 OR PPS Channel 3.

Notes:

Battery 2D01 supplies 125 VDC bus power to RPS channels 1 and 3 (Red 'A' Train). Interlocks in the PPS system only allow bypassing points on one RPS channel only to ensure the appropriate PPS trip logic is still valid. Distracter A is incorrect because it attempts to bypass more than one PPS channel and 2D01 does not supply power to Channel 2. Distracter C is incorrect because it attempts to bypass more than one PPS channel and 2D01 does not supply power to Channel 4. Distracter D is incorrect because 2D01 does not supply power to PPS Channel 2 or 4.

References:

AOP 2203.037, Loss of 125 VDC , Rev. 6 Section 2 Step 5.
Tech Guide 2203.037, Loss of 125 VDC , Rev. 6 Section 2 Step 5.
Annunciator Corrective Action (ACA) 2203.012A Alarm 2K01 A-10.
Lesson Plan A2LP-RO-EAOP Rev. 12, Objective 27: Discuss the Mitigation strategy, Entry Conditions, applicable industry events, Instructions and Exit Conditions (as per AOP and Tech Guide) of OP 2203.037, Loss Of 125VDC.

Historical Comments:

Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank:	1624	**Rev:**	0	**Rev Date:**	3/27/2009 11:23:4	**QID #:**	15	**Author:**	Coble		
Lic Level:	R	**Difficulty:**	3	**Taxonomy:**	H	**Source:**	New				
Search	000062A103	**10CFR55:**	41.7 / 45.5 / 45.6	**Safety Function**	4						
System Title:	Loss of Nuclear Service Water	**System Number**	062	**K/A**	AA1.03						
Tier:	1	**Group:**	1	**RO Imp:**	3.6	**SRO Imp:**	3.6	**L. Plan:**	A2LP-RO-SWACW	**OBJ**	11
Description:	Ability to operate and/or monitor the following as they apply to the Loss of Nuclear Service Water (SWS): - SWS as a backup to the CCWS										

Question:

Given the following plant conditions:

* The plant is 10 minutes post trip from full power operation.
* RCS pressure is 1800 psia and lowering.
* Both SG Pressures just went below 750 psia.
* Containment Pressure is 14.7 psia and steady.
* All 4 RCPs are running.

Which ONE of the following actions will restore the heat sink for the RCP Heat Exchangers?

A. Override and Restore CCW to RCPs.

B. Override and Restore SW to ACW.

C. Override and Restore SW to CCW.

D. Override and Restore SW Returns to the Lake.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☑	☑

Audit Exam History

2009	☐

Answer:

C. Override and Restore SW to CCW.

Notes:

Service Water (SW) provides the heat sink for the Component Cooling Water system which provides cooling for the RCPs. On a MSIS which will be received by the low Steam Generator (SG) pressures, SW will be isolated to the CCW Heat Exchanger. EOPs for ESD will direct restoration of SW to the CCW system to ensure RCP cooling during the event.
Distracter A is incorrect because CCW has not been isolated to the RCPs because there is no CIAS.
Distracter B would be an action directed by the EOP but only to restore cooling to Turbine Cooling HXs thus is incorrect.
Distracter D is incorrect because SW returns to the Lake or Emergency Cooling Pond will allow the RCP system to be cooled as long as the SW supply to the CCW HX is restored.

References:

EOP 2202.005, Excess Steam Demand (ESD), Rev. 9 Step 8 H.
Tech Guide 2202.005 Rev. 9 Step 8.
STM 2-42, Service Water and Auxiliary Cooling Water Systems, Rev. 28, Section 3.5.12. and Drawing of the SW system.
Lesson Plan A2LP-RO-SWACW Rev. 14 Objective 11: Given a set of plant conditions, describe the response of the Service Water/Auxiliary Cooling Water systems to ANY ESFAS actuation.

Historical Comments:

Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank:	1625	**Rev:**	0	**Rev Date:**	3/27/2009 4:25:04	**QID #:**	16	**Author:**	Coble		
Lic Level:	R	**Difficulty:**	3	**Taxonomy:**	H	**Source:**	New				
Search	000077K206	**10CFR55:**	41.4 / 41.5 / 41.7 / 41.	**Safety Function**	6						
System Title:	Generator Voltage and Electric Grid Disturbanc	**System Number**	077	**K/A**	AK2.06						
Tier:	1	**Group:**	1	**RO Imp:**	3.9	**SRO Imp:**	4.0	**L. Plan:**	A2LP-RO-EAOP	**OBJ**	18

Description: Knowledge of the interrelations between Generator Voltage and Electric Grid Disturbances and the following: - Reactor power

Question:

Given the following:

* The plant is at full power at 250 EFPD and Arkansas is under a tornado watch.
* RCS Tave is currently 579°F.
* Unit 1 is shutdown for a refueling outage.
* The system dispatcher calls the control room to let them know that the Pleasant Hill 500 KV transmission line has been removed from service due to tornado damage.
* The Grid has become unstable and 500 KV Voltage has risen to 525 KV.
* The system dispatcher orders the control room to reduce generator load to 900 MW immediately.
* The CBOT lowers Generator load to 900 MW using the turbine load pot.
* No other operator action has been taken.

When condition stabilizes, Reactor Power will be _____ than before the grid disturbance and RCS Tave will be _____ than before the grid disturbance.

A. lower; higher

B. lower; lower

C. higher; lower

D. higher, higher

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☑	☑

Audit Exam History

2009	☐

Answer:

A. lower; higher

Notes:

Based on the reduction of load on the turbine and loss of steam flow, RCS Tcold should rise and at 250 EFPD, the negative Moderator temperature coefficient should cause Reactor Power to lower. This would make A the correct answer and the others incorrect.

References:

NOP 2107.001, Electrical System Operation, Rev. 70, Section 17.0.
AOP 2203.024, Loss of Turbine Load, Rev. 7 Step 2.0
Tech Guide 2203.024, Rev.7, Step 2.0.
Lesson Plan A2LP-RO-EAOP Rev. 12, Objective 18: Discuss the Mitigation strategy, Entry Conditions, applicable industry events, Instructions and Exit Conditions (as per AOP and Tech Guide) of OP 2203.024, Loss Of Turbine Load.

Historical Comments:

Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank: 1626 **Rev:** 0 **Rev Date:** 10/4/2004 **QID #:** 17 **Author:** Coble

Lic Level: R **Difficulty:** 3 **Taxonomy:** F **Source:** NRC Exam Bank 0451

Search 00CE02K201 **10CFR55:** 41.7 / 45.7 **Safety Function** 1

System Title: Reactor Trip Recovery **System Number** E02 **K/A** EK2.1

Tier: 1 **Group:** 1 **RO Imp:** 3.3 **SRO Imp:** 3.7 **L. Plan:** A2LP-RO-CVENT **OBJ** 18

Description: 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

Question:

Given the following:

* The plant has tripped from 100% Power
* RCS Pressure is 1700 psia and dropping
* Steam Generator pressures are 800 psia and dropping
* Containment pressure is 19.3 psia and rising.

What equipment status would the Control Room Operators expect to see when checking Containment Cooling (CC) Fan operations?

A. Chilled Water isolated by CCAS signal, 3 CC fans running, Service Water aligned, and bypass dampers Open.

B. Chilled Water isolated by CIAS signal, all CC fans running, Service Water aligned, and bypass dampers Open .

C. Chilled Water aligned for cooling, 3 CC fans running, Service Water isolated, and bypass dampers Closed,

D. Chilled Water aligned for cooling, all CC fans running, Service Water aligned, bypass dampers Closed.

QID use History

	RO	SRO
2003	☐	☐
2005	☑	☑
2006	☐	☐
2008	☐	☐
2009	☑	☑

Audit Exam History

2009	☐

Answer:

B. Chilled Water isolated by CIAS signal, all CC fans running, Service Water aligned, and bypass dampers Open .

Notes:

Distracter A is incorrect because Containment Chill Water isolations are actuated closed by CIAS and the bypass dampers would be Open.
Distracter C is incorrect because Chill Water isolation would have been closed by the CIAS.
Distracter D is incorrect because the bypass dampers should be Open.

References:

EOP 2202.001, Standard Post trip Actions, Rev. 9, Contingency Action 9.A.2.
STM 2-09, Containment Cooling and Purge Systems, Rev. 16, Section 10.2.1
Lesson Plan A2LP-RO-CVENT Rev. 4, Objective 18: Describe the emergency operation of the Containment Building Ventilation System.

Historical Comments:

Used on the 2005 NRC Exam

Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank: 1627 **Rev:** 0 **Rev Date:** 3/27/2009 5:20:13 **QID #:** 18 **Author:** Coble

Lic Level: R **Difficulty:** 4 **Taxonomy:** H **Source:** New

Search 00CE05A202 **10CFR55:** 41.7 / 41.10 / 43.5 / 45 **Safety Function** 4

System Title: Excess Steam Demand **System Number** E05 **K/A** EA2.2

Tier: 1 **Group:** 1 **RO Imp:** 3.4 **SRO Imp:** 4.2 **L. Plan:** A2LP-RO-EESD **OBJ** 5

Description: Ability to determine and interpret the following as they apply to the (Excess Steam Demand): - Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments

Question:

Consider the following for an ESD event in progress:

* ADV 2CV-1001 is in manual and steaming 'A' SG
* 'A' SG pressure is 800 psia and slowly rising
* 'B' SG pressure is 20 psia and stable
* RCS pressure is 1500 psia and slowly rising
* Pressurizer level is 35% and slowly rising
* Containment temperature is 233 °F and lowering
* Average CET temperature is 480 °F and rising
* SG 'A' level is 25% Narrow Range and steady.
* SG 'B' level is 30 inches Wide Range and lowering.

Concerning HPSI termination, which of the following statements is TRUE and what action needs to be taken?

A. HPSI termination criteria satisfied; raise steaming rate from 'A' SG.

B. HPSI termination criteria satisfied; lower steaming rate from 'A' SG.

C. HPSI termination criteria NOT satisfied; raise steaming rate from 'A' SG.

D. HPSI termination criteria NOT satisfied; lower steaming rate from 'A' SG.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☑	☑

Audit Exam History

2009	☐

Answer:

C. HPSI termination criteria NOT satisfied; raise steaming rate from 'A' SG.

Notes:

Distracters A and B are incorrect because HPSI termination is not satisfied because there is a harsh containment environment with temperature above 200°F, thus PZR level has to be above 50% to satisfy HPSI termination criteria. Distracter D is incorrect because RSC temperature and pressure are rising which means post cooldown conditions are now present and the operator needs to raise the steaming rate on the intact steam generator to prevent pressurized thermal shock of the RCS.

References:

EOP 2202.005, Excess Steam Demand, Rev. 9, Note prior to Step 1, Steps 19 and 20.
Lesson Plan A2LP-RO-EESD, Excess Steam Demand, Rev. 5, Objective 4: Given a set of plant conditions during an ESD, determine the actions necessary to maintain post-cooldown RCS temperature and pressure and Objective 5: Given a set of plant conditions during an ESD, determine if HPSI termination criteria is satisfied.

Historical Comments:

Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank: 1628 **Rev:** 1 **Rev Date:** 3/30/2009 12:58:3 **QID #:** 19 **Author:** Hatman

Lic Level: R **Difficulty:** 3 **Taxonomy:** H **Source:** NRC Exam Bank 0163

Search 000001A205 **10CFR55:** 41.7 / 41.10 / 43.5 / 45 **Safety Function** 1

System Title: Continuous Rod Withdrawal **System Number** 001 **K/A** AA2.05

Tier: 1 **Group:** 2 **RO Imp:** 4.4 **SRO Imp:** 4.6 **L. Plan:** ASLP-RO-RXT11 **OBJ** 3

Description: Ability to determine and interpret the following as they apply to the Continuous Rod Withdrawal: - Uncontrolled rod withdrawal, from available indications

Question:

The plant was at steady state and now the following plant conditions exist:

* No operator actions have been taken.
* Power level is 80% and rising.
* Tave is rising.
* Containment pressure and temperature are normal.
* Pressurizer pressure and level are rising.
* All systems are in their normal mode.

Which of the following can cause these conditions?

A. Continuous rod withdrawal.

B. Partial loss of feedwater heating.

C. Steam leak outside containment.

D. Slow closure of an MSIV

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☑	☑

Audit Exam History

2009	☐

Answer:

A. Continuous rod withdrawal.

Notes:

B is incorrect because a loss of Feedwater heating will cause a power rise and an RCS temperature drop.
C is incorrect because a steam leak will cause a power rise and an RCS Temperature drop.
D is incorrect because an MSIV closure will cause an RCS temperature rise and a power drop.
A is the only option that would cause both a power rise and a temperature rise as given in the plant conditions..

References:

GP PWR Reactor Theory Chapter 5 Control Rods Rev. 2, Control Rod Effects on Neutron Flux.
Lesson Plan ASLP-RO-RXT11 Rev. 2 Objective 3: Predict the direction of change in reactor power for a change in control rod position.

Historical Comments:

Used on the 2000 NRC Exam

Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank:	1629	**Rev:**	0	**Rev Date:**	3/30/2009 2:04:11	**QID #:**	20	**Author:**	Coble		
Lic Level:	R	**Difficulty:**	2	**Taxonomy:**	F	**Source:**	New				
Search	000003K205	**10CFR55:**	41.7 / 45.7	**Safety Function**	1						
System Title:	Dropped Control Rod			**System Number**	003	**K/A**	AK2.05				
Tier:	1	**Group:**	2	**RO Imp:**	2.5	**SRO Imp:**	2.8	**L. Plan:**	A2LP-RO-CEDM	**OBJ**	8

Description: Knowledge of the interrelations between the Dropped Control Rod and the following: - Control rod drive power supplies and logic circuits

Question:

Given the following at full power:

* Both CEA MG Sets are in service with TCB 9 closed.

Which ONE of the following combinations of actuated PPS trip paths relays would cause the CEAs to drop into the core?

A. Trip Path K1 and Trip Path K2

B. Trip Path K2 and Trip Path K3

C. Trip Path K3 and Trip Path K4

D. Trip Path K4 and Trip Path K5

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☑	☑

Audit Exam History

2009	☐

Answer:

B. Trip Path K2 and Trip Path K3

Notes:

Any combination of K1 and K3 or K4 (OR) K2 and K3 or K4 will cause CEAs to loose power and CEAs to drop into the core. (Refer to the STM Drawing). Thus B is the correct answer and the others are incorrect.

References:

STM 2-02, CEDM Control System, Rev. 18, Power supply figure to CEDM Bus 2C70 and 2C71.
Lesson Plan A2LP-RO-CEDM Rev. 11 Objective 8. From memory draw a one-line diagram of the CEDMCS electrical distribution from the MG Sets to the cabinets 2C-70 and 2C71.

Historical Comments:

Has not been used on any previous NRC Exams.

Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank:	1630	**Rev:**	0	**Rev Date:**	10/6/2004	**QID #:**	21	**Author:**	Blanchard		
Lic Level:	R	**Difficulty:**	2	**Taxonomy:**	F	**Source:**	NRC Exam Bank 460				
Search	0000322128	**10CFR55:**	41.7	**Safety Function**	7						
System Title:	Loss of Source Range Nuclear Instrumentation			**System Number**	032	**K/A**	2.1.28				
Tier:	1	**Group:**	2	**RO Imp:**	4.1	**SRO Imp:**	4.1	**L. Plan:**	A2LP-RO-NI	**OBJ**	5
Description:	Conduct of Operations - Knowledge of the purpose and function of major system components and controls.										

Question:

Given the following conditions:

* The plant is in Mode 6 with core alterations in progress.
* A complete Station Blackout occurs due to severe weather.
* Directions are given to secure core alterations.

Which of the following indications would be an available and accurate monitor to detect changes in core reactivity if core alterations are not secured properly?

A. All 4 log power meters on 2C03.

B. Refueling Bridge portable area radiation monitor.

C. Containment low range radiation monitors.

D. Boron Dilution Monitors 1 and 2 on 2C09.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☑	☑

Audit Exam History

2009	☐

Answer:

D. Boron Dilution Monitors 1 and 2 on 2C09.

Notes:

The student should have knowledge of the power supplies to the source range nuclear instrumentation which feed the input for the boron dilution monitors which monitor source range counts during refueling. This is their major function. Distracter A would be available but not accurate to detect small changes in core reactivity due to the log scale. Distracter B and C would not be available due to not being powered from an Vital AC inverter supplied from DC batteries. Answer D is powered from Vital 120 VAC which is powered from the station batteries.

References:

STM 2-67-1, Excore Nuclear Instrumentation, Section 2.3.
A2LP-RO-NI, Nuclear Instrumentation, OBJ 5, Describe the operation and indications of the Boron Dilution Monitors.

Historical Comments:

Question was used on the 2005 NRC Exam.

Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank:	1631	**Rev:**	0	**Rev Date:**	4/1/2009 8:46:27	**QID #:**	22	**Author:**	Coble		
Lic Level:	R	**Difficulty:**	2	**Taxonomy:**	H	**Source:**	New				
Search	000036A103	**10CFR55:**	41.7 / 45.5 / 45.6	**Safety Function**	8						
System Title:	Fuel Handling Incidents	**System Number**	036	**K/A**	AA1.03						
Tier:	1	**Group:**	2	**RO Imp:**	3.5	**SRO Imp:**	3.9	**L. Plan:**	A2LP-RO-FH	**OBJ**	4

Description: Ability to operate and/or monitor the following as they apply to the Fuel Handling Incidents: - Reactor building containment evacuation alarm enable switch

Question:

The following plant conditions exist:

* Mode 6 with core on load in progress.
* The control room receives a report that as a spent fuel assembly was being inserted into the core, the refueling machine started moving on its own.
* A lot of bubbles are rising around the fuel assemblies in the Core.
* Containment Low Range Rad Monitors on the 404 elevation are indicating a large rise in radiation.

Which of the following actions should be performed for the given conditions?

A. Sound the Containment Evacuation alarm on 2C22 by taking the Evacuation Warning Handswitch, 2HS-EVAC, to CNTMT AUX.

B. Sound the Containment Evacuation alarm on 2C14 by taking the Evacuation Warning Handswitch, 2HS-EVAC, to CNTMT AUX.

C. Sound the Containment Evacuation alarm on 2C22 by taking the Evacuation Warning Handswitch, 2HS-EVAC, to CNTMT.

D. Sound the Containment Evacuation alarm on 2C14 by taking the Evacuation Warning Handswitch, 2HS-EVAC, to CNTMT.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☑	☑

Audit Exam History

2009	☐

Answer:

C. Sound the Containment Evacuation alarm on 2C22 by taking the Evacuation Warning Handswitch, 2HS-EVAC, to CNTMT.

Notes:

The Plant/Containment Evacuation alarm switch is located on panel 2C22 (which is next to the radiation monitoring panel 2C25) and has four positions: OFF, CNTMT, CNTMT AUX, and PLANT which will sound the alarms in the Containment, Containment Auxiliary Building, and the General Plant respectively. Distracters A and B are incorrect because they have the switch placed in CNTMT AUX. Distracters B and D are incorrect because the switch is not located on 2C14.

References:

NOP 2502.001, Refueling Shuffle, Rev. 37, Attachment M, Refueling Accident, Step 2.5.6.
NOP 2105.016, Radiation Monitoring and Evacuation System, Rev. 26, Attachment D Step 2.0.
Lesson Plan A2LP-RO-FH, Rev. 1, Objective 4: Given a fuel handling evolution or condition, determine the correct response.

Historical Comments:

Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank:	1632	**Rev:**	0	**Rev Date:**	4/1/2009 9:50:24	**QID #:**	23	**Author:**	Coble		
Lic Level:	R	**Difficulty:**	3	**Taxonomy:**	H	**Source:**	New				
Search	000051A202	**10CFR55:**	41.7 / 41.10 / 43.5 / 45	**Safety Function**	4						
System Title:	Loss of Condenser Vacuum			**System Number**	051	**K/A**	AA2.02				
Tier:	1	**Group:**	2	**RO Imp:**	3.9	**SRO Imp:**	4.1	**L. Plan:**	A2LP-RO-EAOP	**OBJ**	14

Description: Ability to determine and interpret the following as they apply to the Loss of Condenser Vacuum: - Conditions requiring reactor and/or turbine trip

Question:

The plant was at full power in the middle of August when the following occurred:

* Circulating Water Pump 2P3A tripped and its associated discharge valve went closed.
* Plant Power is being reduced in accordance with Loss of Condenser Vacuum AOP 2203.019.
* Current plant power is 93% and Condenser Pressure is 7.2 inches of HgA.

Which ONE of the following actions should be taken? (Reference Provided)

A. Trip the Reactor and perform the Standard Post Trip Actions.

B. Trip the Main Turbine and perform actions for Loss of Turbine Load.

C. Verify all ADVs in AUTO and open the Upstream ADV isolation valves.

D. Verify Both Condenser Vacuum Pumps running and vacuum lowering.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☑	☑

Audit Exam History

2009	☐

Answer:

A. Trip the Reactor and perform the Standard Post Trip Actions.

Notes:

The Available Atmospheric Dump Valve Capacity is only 22% during normal condition and can be made up to 44% if operator action is taken to open the upstream ADV isolation valves. 93% power is well above the available ADV capacity and vacuum has exceeded the 7 inches of Hg Absolute threshold for a reactor/plant trip. Distracter B is incorrect because tripping the turbine would only be a viable option if plant power were within ADV capacity. Distracter C is incorrect because aligning upstream ADVs would only be a viable option if plant power were within ADV capacity. Distracter D would be the goal to restore vacuum but vacuum has already exceeded the tripping requirement thus is incorrect.

AOP 2203.019, Loss of Condenser Vacuum, Rev. 8, Attachment 'A' Backpressure Limits should be provided as a reference for this question.

References:

AOP 2203.019, Loss of Condenser Vacuum, Rev. 8, Step 7.A Contingency Action.
AOP 2203.019, Loss of Condenser Vacuum, Rev. 8, Attachment 'A' Backpressure Limits.
Lesson Plan A2LP-RO-EAOP, Rev. 12, Objective 14: Discuss the Mitigation strategy, Entry Conditions, Instructions and Exit Conditions (as per AOP and Tech Guide) of OP 2203.019, Loss Of Condenser Vacuum.

Historical Comments:

Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank: 1633 **Rev:** 0 **Rev Date:** 11/1/2004 **QID #:** 24 **Author:** Coble

Lic Level: R **Difficulty:** 3 **Taxonomy:** F **Source:** NRC Exam Bank 0503

Search 0000602127 **10CFR55:** 41.7 **Safety Function** 9

System Title: Accidental Gaseous Radwaste Release **System Number** 060 **K/A** 2.1.27

Tier: 1 **Group:** 2 **RO Imp:** 3.9 **SRO Imp:** 4.0 **L. Plan:** A2LP-RO-RWST **OBJ** 4.c.8

Description: Conduct of Operations - Knowledge of system purpose and/or function.

Question:

Given the following:

* The plant is at full power
* A gaseous radwaste release from Gas Decay Tank 2T-18A is in progress.
* An inadvertent electrical signal causes both Radwaste Exhaust Fans (2VEF8A/B) to stop.

Which of the following actions should occur to prevent an accidental gaseous radwaste release without dilution air flow?

A. Release flow will be diverted back to the in service Gas Decay Tank 2T-18B or 2T-18C.

B. Waste Gas Decay Tanks Discharge to Vent Plenum Valve 2CV-2428 will automatically close.

C. The WCO will be sent to locally close Release Path Isolation Needle Valve 2GZ-15.

D. The control room will manually close Waste Gas Decay Tanks Discharge Isolation 2CV-2428.

QID use History

	RO	SRO
2003	☐	☐
2005	☑	☑
2006	☐	☐
2008	☐	☐
2009	☑	☑

Audit Exam History

2009	☐

Answer:

B. Waste Gas Decay Tanks Discharge to Vent Plenum Valve 2CV-2428 will automatically close.

Notes:

2CV-2428 is the release path isolation and is interlocked to close if there are no exhaust ventilation fans operating to prevent an accidental buildup of gas in the Aux Building since the release path goes to the suction of these fans and now there will be no dilution flow. Distracter A is an available path but is not available because the Gas compressors are normally shutdown. Distracter C is an option but the path will already be isolated. Distracter D is an option but the path will already be isolated.

References:

STM 2-54, Gaseous Radwaste System, Section 2.8
Lesson Plan A2LP-RO-RWST, Rev. 6, Objective 4.c.8,: Describe the following Radwaste System Components and Instrumentation: Gaseous Rad Waste System: Waste Gas Discharge Flow path Isolation 2CV-2428.

Historical Comments:

Used on the 2005 NRC Exam.

Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank:	1634	**Rev:**	0	**Rev Date:**	4/1/2009 3:18:50	**QID #:**	25	**Author:**	Coble		
Lic Level:	R	**Difficulty:**	2	**Taxonomy:**	F	**Source:**	New				
Search	000074K305	**10CFR55:**	41.5 / 41.10 / 45.6 / 45	**Safety Function**	4						
System Title:	Inadequate Core Cooling			**System Number**	074	**K/A**	EK3.05				
Tier:	1	**Group:**	2	**RO Imp:**	4.2	**SRO Imp:**	4.5	**L. Plan:**	A2LP-RO-ELOCA	**OBJ**	3
Description:	Knowledge of the reasons for the following responses as they apply to the Inadequate Core Cooling: - Activating the HPI system										

Question:

Given the following:

* The plant was tripped from full power due to lowering RCS pressure.
* All CEAs fully insert into the core on the reactor trip.
* Pressurizer level is 12% and lowering rapidly.
* RCS pressure is 1575 psia and lowering rapidly.
* Containment pressure is 24.7 psia and rising rapidly.
* Containment Low Range radiation monitors are rising.

Which of the following is the MAIN reason for activating the High Pressure Safety Injection (HPSI) pumps during these conditions?

A. To provide adequate core Shutdown Margin (SDM) during the RCS depressurization.

B. To provide adequate RCS subcooling during and after initial RCS depressurization.

C. To restore RCS pressure control by refilling the pressurizer during depressurization

D. To restore RCS inventory control when RCS pressure goes below HPSI shut off head.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☑	☑

Audit Exam History

2009	☐

Answer:

D. To restore RCS inventory control when RCS pressure goes below HPSI shut off head.

Notes:

HPSI pumps will be actuated on the ensuing SIAS based on low RCS pressure. HPSI pumps will be needed to restore RCS inventory after the RCS pressure drops below ~1450 psia shutoff head of the pumps.. Distracter A is incorrect because all the CEAs inserted on the trip and reactivity control and shutdown margin are met. Distracter B is incorrect because subcooling will be lost during the LOCA and cannot be regained without isolating the leak. Distracter C is incorrect because the pressurizer will refill and potentially allow RCS pressure control to be restored but the main reason for HPSI injection is to keep the core covered to provide for adequate cooling of the core during a large break LOCA.

References:

EOP 2202.003, Loss of Coolant Accident, Rev. 10 Step 5
EOP TG 2202.002, Loss of Coolant Accident, Rev. 10 Step 5
EOP 2202.003, Loss of Coolant Accident, Rev. 10, Page 49, Major Recovery Strategies for LOCA.
Lesson Plan A2LP-RO-ELOCA, Rev. 6 Objective 3: Discuss each of the 6 Major strategy steps used in the LOCA EOP.

Historical Comments:

Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank: 1635 **Rev:** 0 **Rev Date:** 9/17/2001 **QID #:** 26 **Author:** Blanchard

Lic Level: R **Difficulty:** 3 **Taxonomy:** H **Source:** NRC Exam Bank 314

Search 00CA11K201 **10CFR55:** 41.7 / 45.7 **Safety Function** 4

System Title: RCS Overcooling **System Number** A11 **K/A** EK2.1

Tier: 1 **Group:** 2 **RO Imp:** 3.2 **SRO Imp:** 3.4 **L. Plan:** A2LP-RO-ESPTA **OBJ** 11

Description: Knowledge of the interrelations between the (RCS Overcooling) and the following: - Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features

Question:

Given the following conditions:

* Reactor tripped, SIAS, CCAS, CIAS, CSAS and MSIS have actuated.
* RCS Pressure is 1475 psia and dropping.
* 'A' SG pressure is 900 psia and dropping slowly.
* 'B' SG pressure is 200 psia and dropping rapidly.
* All non-vital electrical busses are deenergized.
* All other systems are operating as designed.

Which of the following correctly describes how RCS temperature will be maintained post SG blowdown?

A. Depressurize the RCS and allow HPSI injection flow to cool the RCS.

B. Open the SDBCS Upstream ADV and throttle the Upstream ADV isolation on 'A' SG.

C. Open the SG blowdown valves on 'A' SG and maintain SG level with 'A' EFW pump.

D. Bypass 'A' MSIV and open a SDBCS bypass valve to the condenser.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☑	☑

Audit Exam History

2009	☐

Answer:

B. Open the SDBCS Upstream ADV and throttle the Upstream ADV isolation on 'A' SG.

Notes:

Distracter A is incorrect due to HPSI filling the PZR and taking the RCS solid.
Distracter C is incorrect due to the required large volume of water usage to feed and bleed a SG to remove decay heat with this method and ADV available.
Distracter B is incorrect due to no circulating water available on LOOP.

References:

EOP 2202.001, SPTAs, Rev. 9 Contingency Action 8.E.1
EOP TG 2202.001, SPTAs, Rev. 9 Step 8 (page 21 of 44)
Lesson Plan A2LP-RO-ESPTA, Rev.8, Objective 11: Describe the major actions taken during the performance of SPTA and the basis for each.

Historical Comments:

Used on the 2002 NRC Exam

Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank:	1636	**Rev:**	0	**Rev Date:**	4/1/2009 5:00:14	**QID #:**	27	**Author:**	Coble		
Lic Level:	R	**Difficulty:**	4	**Taxonomy:**	H	**Source:**	New				
Search	00CE09K101	**10CFR55:**	41.8 / 41.10 / 45.3	**Safety Function**	4						
System Title:	Functional Recovery			**System Number**	E09	**K/A**	EK1.1				
Tier:	1	**Group:**	2	**RO Imp:**	3.4	**SRO Imp:**	3.7	**L. Plan:**	A2LP-RO-EFRP	**OBJ**	3

Description: Knowledge of the operational implications of the following concepts as they apply to the (Functional Recover): - Components, capacity, and function of emergency systems

Question:

Given the following conditions:

* Plant tripped due to a loss of offsite power.
* A 300 gpm LOCA develops.
* A complete loss of feedwater occurs.
* Pressurizer pressure 1600 psia and stable.
* RCS Tcold is 525°F and stable
* Both Steam Generator levels 85 inches wide range indication and dropping.

If Feedwater cannot be restored to the Steam Generators, the _____ will be used to mitigate this event when _____ Steam Generator levels drop below _____ inches to allow HPSI injection flow to the RCS.

A. ECCS Vents; both; 70

B. PZR Vents; one; 70

C. ECCS Vents; one; 60

D. PZR Vents; both; 60

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☑	☑

Audit Exam History

2009	☐

Answer:

A. ECCS Vents; both; 70

Notes:

A determination must be made first as to which EOP procedure is applicable. With 2 EOP events in progress, the Functional Recovery Procedure (FRP) would apply. The Loss of Feed Water EOP requires Once Through Cooling if a single SG goes below 70 inches WR but the FRP requires both SG to go below 70 inches WR prior to using Once Through Cooling. The ECCS Vents must be used because their Capacity (3 inch pipe) is large enough to get RCS pressure below the shutoff head of the HPSI Pumps (1450 psia). The PZR Vents (1 inch line with a 1/4 inch orifice) will not lower pressure enough to allow HPSI flow. Distracter B is incorrect because it uses PZR vents and only requires one SG below 70 inches.
Distracter C is incorrect because it requires only one SG below the limit and the level limit should be 70 vice 60 inches. Distracter D is incorrect because it uses the PZR vents and the level limit is 60 vice 70 inches.

References:

EOP 2202.009, Functional Recovery, Rev. 9, HR-2 SG Heat Sink with SIAS, Step 45
EOP 2202.009, Functional Recovery, Rev. 9, HR-3 Once Through Cooling, Step 1. K & L.
EOP TG 2202.009, Functional Recovery, Rev. 9, for the above steps.
Lesson Plan A2LP-RO-EFRP, Rev. 3 Objective 3: Describe the use and sections of the FRP to include Floating Steps.

Historical Comments:

Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank: 1637 **Rev:** 0 **Rev Date:** 4/2/2009 9:51:08 **QID #:** 28 **Author:** Coble

Lic Level: R **Difficulty:** 3 **Taxonomy:** H **Source:** New

Search 003000K503 **10CFR55:** 41.5 / 45.7 **Safety Function** 4

System Title: Reactor Coolant Pump System (RCPS) **System Number** 003 **K/A** K5.03

Tier: 2 **Group:** 1 **RO Imp:** 3.1 **SRO Imp:** 3.5 **L. Plan:** A2LP-RO-MTS **OBJ** 11

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

Question:

Given the following:

* The plant was tripped from full power due a Main Turbine trip.
* Just After the trip RCS Tcold is 546°F.
* Just After the trip RCS Thot is 548°F.
* 15 minutes after the trip, a loss of offsite power occurs.
* All systems operate as designed.

Based on these conditions, RCS Tave will _____ and the reason we use Core Exit Thermocouples (CETs) for calculation of Margin to Saturation (MTS) is _____.

A. lower; CETs are always used since they are the most accurate indications of core temperature.

B. lower; lower flow past the RCS Thot and Tcold RTDs could cause an error in MTS calculation.

C. rise; CETs are always used since they are the most accurate indications of core temperature.

D. rise; lower flow past the RCS Thot and Tcold RTDs could cause an error in MTS calculation.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☑	☑

Audit Exam History

2009	☐

Answer:

D. rise; lower flow past the RCS Thot and Tcold RTDs could cause an error in MTS calculation.

Notes:

RCS Tcold will be maintained relatively constant after RCPs are secured due to the Steam Bypass system maintaining SG pressures at 1000 psia in automatic. RCS Thot will rise significantly due to establishing natural circulation flow therefore RCS Tave will rise. Normally the hottest Thot, Tcold, or CET temperature is compared to PZR pressure to determine MTS with RCPs running. With no RCPs running, lower flow past the loop RTDs will provide a less accurate MTS calculation. Distracters A and B are incorrect because Tave will rise. Distracters A and C are incorrect because we do not always use CETs.

References:

STM 2-33, Steam Dump and Bypass Control System, Rev. 12, Section 2.3.2.
STM 2-73, Saturation Margin Monitor, Rev. 3 Section 4.3.
NOP 2105.012, RCS Saturation Monitor Calculator Operation, Rev. 8, Step 5.2.
Lesson Plan A2LP-RO-MTS, Rev. 9, Objective 11: Describe the purpose of the limits and precautions associated with 2105.012, RCS Saturation Margin Calculator Operations.

Historical Comments:

Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank:	1638	**Rev:**	0	**Rev Date:**	9/17/2001	**QID #:**	29	**Author:**	Coble		
Lic Level:	R	**Difficulty:**	3	**Taxonomy:**	H	**Source:**	NRC Exam Bank 0348				
Search	004000K117	**10CFR55:**	41.2 to 41.9 / 45.7 to 4	**Safety Function**	1						
System Title:	Chemical and Volume Control System (CVCS)	**System Number**	004	**K/A**	K1.17						
Tier:	2	**Group:**	1	**RO Imp:**	3.4	**SRO Imp:**	3.4	**L. Plan:**	A2LP-RO-PZR	**OBJ**	9/10
Description:	Knowledge of the physical connections and/or cause-effect relationships between the CVCS and the following systems: - PZR										

Question:

The plant status is as follows:

* Reactor power is 72% and stable.
* Tave = Tref at 570°F.
* Pressurizer Level indicates 49%.
* Pressurizer Level Controller is in Remote Auto.
* Letdown Flow Controller is in Automatic.
* All three Charging Pump hand switches are in Automatic.
* Charging Pump Selector switch is in the "B & C" position.

The correct alignment regarding the status of Charging and Letdown for this condition would be: (Reference Provided)

A. Three (3) Charging Pumps will be running with maximum letdown flow

B. Two (2) Charging Pumps will be running with maximum letdown flow

C. Three (3) Charging Pumps will be running with minimum letdown flow

D. Two (2) Charging Pumps will be running with minimum letdown flow

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☑	☑

Audit Exam History

2009	☐

Answer:

C. Three (3) Charging Pumps will be running with minimum letdown flow

Notes:

Distracters B and D are wrong because the level deviation between the actual pressurizer level and the pressurizer level setpoint for the above stated conditions is ~ 6%. This would start both backup charging pumps along with the running lead Pump A for a total of 3 running charging pumps. A would be wrong because the level deviation would also make the letdown flow controller output go to its minimum automatic control level output to attempt to raise Pressurizer level.

This question will require 2102.004 Attachments C and E to be used as a reference.

References:

STM 2-3-1, Rev 13, PZR Pressure and Level Control, Sections 3.2.4, through 3.2.9
2103.005, Rev 41, Pressurizer Operations, Steps 6.8 and 6.9
2102.004, Rev 41, Power Operations, Attachments C and E
Lesson Plan A2-LP-RO-PZR, Rev. 3 Objectives 9 and 10: Explain the following for the automatic operation of the Coolant Charging Pumps with a change in PZR level and Explain the following for the operation of the Letdown Flow Control Valve with PZR level changing.

Historical Comments:

Used on the 2002 NRC Exam

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Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank:	1639	**Rev:**	0	**Rev Date:**	4/2/2009 11:22:57	**QID #:**	30	**Author:**	Coble		
Lic Level:	R	**Difficulty:**	3	**Taxonomy:**	H	**Source:**	New				
Search	005000K603	**10CFR55:**	41.7 / 45.7	**Safety Function**	4						
System Title:	Residual Heat Removal System (RHRS)			**System Number**	005	**K/A**	K6.03				
Tier:	2	**Group:**	1	**RO Imp:**	2.5	**SRO Imp:**	2.6	**L. Plan:**	A2LP-RO-SDC	**OBJ**	4

Description: Knowledge of the effect of a loss or malfunction of the following will have on the RHRS: - RHR heat exchanger

Question:

Given the following:

* The plant has been Shutdown for a refueling outage.
* PZR level is 41%.
* SDC Pump 2P-60A has been placed in service through SDC HX 2E-35A
* The last 2 RCPs have been secured.

If Instrument Air is lost to the SDC Temperature Control Valve 2CV-5093 and SDC Flow Control Valve 2CV-5091, which of the following would be the correct response of the SDC system.

A. SDC flow would lower and RCS heat removal would rise.

B. SDC Flow would lower and RCS heat removal would lower.

C. SDC flow would rise and RCS heat removal would rise.

D. SDC flow would rise and RCS heat removal would lower.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☑	☑

Audit Exam History

2009	☐

Answer:

D. SDC flow would rise and RCS heat removal would lower.

Notes:

A loss of Instrument Air will cause the SDC flow control valve to fail open and the SDC temperature control valve (outlet of the SDC HX) to fail closed. This will raise the SDC flow bypassing the SDC HX which will reduce the amount of heat removal from the RCS. Distracters A and B are incorrect because SDC flow will rise. Distracters A and C are incorrect because the RCS heat removal will lower.

References:

STM 2-14, SDC System, Rev. 8, Sections 2.5, 2.6 and Figure on page 48.
Lesson plan A2LP-RO-SDC, Rev. 11, Objective 4: Given a set of off-normal SDC system parameters for selected evolutions: Determine potential causes AND actions necessary to correct.

Historical Comments:

Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank: 1640 **Rev:** 0 **Rev Date:** 10/12/2004 **QID #:** 31 **Author:** Coble

Lic Level: R **Difficulty:** 3 **Taxonomy:** F **Source:** NRC Exam Bank 0475

Search 006000K103 **10CFR55:** 41.2 to 41.9 / 45.7 to 4 **Safety Function** 2

System Title: Emergency Core Cooling System (ECCS) **System Number** 006 **K/A** K1.03

Tier: 2 **Group:** 1 **RO Imp:** 4.2 **SRO Imp:** 4.3 **L. Plan:** A2LP-RO-ECCS **OBJ** 6

Description: Knowledge of the physical connections and/or cause-effect relationships between the ECCS and the following systems: - RCS

Question:

Given the following conditions:

* An unisolable 500 gpm LOCA has occurred.
* RCS pressure is 750 psia and lowering.
* RWT level is 5.8% on all indicators.
* All components are actuated and operate as designed.

Which of the following components is maintaining the RCS inventory safety function?

A. High Pressure Safety Injection Pumps through their open injection MOVs.

B. Safety Injection Tanks through their associated outlet isolations.

C. Low Pressure Safety Injection Pumps through their open injection MOVs.

D. Normal Charging Pumps through their associated RCS loop isolations.

QID use History

	RO	SRO
2003	☐	☐
2005	☑	☑
2006	☐	☐
2008	☐	☐
2009	☑	☑

Audit Exam History

2009	☐

Answer:

A. High Pressure Safety Injection Pumps through their open injection MOVs.

Notes:

Distracter B is incorrect because RCS Pressure is above SIT pressure.
Distracter C is incorrect because LPSI pumps trip on RAS caused by Low RWT level <6%.
Distracter D is incorrect because Charging pump capacity is not enough to ensure RCS inventory in a large break LOCA.

References:

EOP 2202.003, LOCA EOP, Rev. 10, Safety Function Status Check Step 3, RCS Inventory Control.
STM 2-05, ECCS, Rev. 20, Section 1.1 and Figure on page 50
A2LP-RO-ECCS, Rev. 10, Objective 6: Describe the function, construction, and operation of ECCS system components including tanks, pumps, and valves; pump capacities and ratings; tank capacities; and associated area cooling systems.

Historical Comments:

Used on the 2005 NRC Exam

Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank: 1641 **Rev:** 0 **Rev Date:** 4/2/2009 2:34:22 **QID #:** 32 **Author:** Jim Wright

Lic Level: R **Difficulty:** 2 **Taxonomy:** F **Source:** NRC Exam Bank 1520 Modified

Search 007000K401 **10CFR55:** 41.7 **Safety Function** 5

System Title: Pressurizer Relief Tank/Quench Tank System (**System Number** 007 **K/A** K4.01

Tier: 2 **Group:** 1 **RO Imp:** 2.6 **SRO Imp:** 2.9 **L. Plan:** A2LP-RO-RCS **OBJ** 25

Description: Knowledge of PRTS design feature(s) and/or interlock(s) which provide for the following: - Quench tank cooling

Question:

Given the following:

* The plant is at 100% power with indications of a Pressurizer Safety Valve leaking.
* Annunciator 2K10-F4, "QUENCH TANK TEMPERATURE HIGH " has actuated.

During the quench tank feed and bleed to cool the tank, the makeup water source to the quench tank will come from the _____ and the Quench Tank will be drained to the _____.

A. Reactor Makeup Water Tank; Reactor Drain Tank

B. Boric Acid Makeup Tank ; Containment Sump

C. Boric Acid Makeup Tank ; Reactor Drain Tank

D. Reactor Makeup Water Tank; Containment Sump

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☑	☑

Audit Exam History

2009	☐

Answer:

A. Reactor Makeup Water Tank; Reactor Drain Tank

Notes:

Makeup water to the reactor drain tank can only be aligned from the reactor makeup water tank, no other source exists. The quench tank can be aligned to drain to the RDT through 2CV-4692. It cannot be aligned to drain to the Containment sump unless a tank relief opens or rupture disc ruptures.

References:

NOP 2103.007 Rev. 19 Section 7.1/7.2
STM 2-03, RCS Rev. 18 Section 2.3 Quench Tank
A2LP-RO-RCS Rev. 20 Reactor Coolant System Objective 25

Historical Comments:

Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank:	1642	**Rev:**	0	**Rev Date:**	4/2/2009 2:18:22	**QID #:**	33	**Author:**	Coble		
Lic Level:	R	**Difficulty:**	3	**Taxonomy:**	H	**Source:**	New				
Search	008000A101	**10CFR55:**	41.5 / 45.5	**Safety Function**	8						
System Title:	Component Cooling Water System (CCWS)			**System Number**	008	**K/A**	A1.01				
Tier:	2	**Group:**	1	**RO Imp:**	2.8	**SRO Imp:**	2.9	**L. Plan:**	A2LP-RO-CCW	**OBJ**	12
Description:	Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the CCWS controls including: - CCW flow rate										

Question:

Given the following:

* The plant is at 100% power.
* RCS Tave is 580°F.
* The Main Turbine is on the Load Limit Pot.
* The Instrument Air (IA) supply to the Letdown Temperature Control Valve is inadvertently isolated and the valve fails open.

With no operator action, which ONE of the following would be the correct RCS Tave/Plant Power response to the loss of IA and the reason for this response.

A. Tave and Plant Power would rise due to excessive Letdown flow through the Letdown HX.

B. Tave and Plant Power would lower due to excessive CCW flow through the Letdown HX.

C. Tave and Plant Power would rise due to excessive CCW flow through the Letdown HX.

D. Tave and Plant Power would lower due to excessive Letdown flow through the Letdown HX..

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☑	☑

Audit Exam History

2009	☐

Answer:

C. Tave and Plant Power would rise due to excessive CCW flow through the Letdown HX.

Notes:

A loss of IA to the Letdown Temperature Control Valve will cause the valve to fail open causing a large rise in CCW flow to the Letdown HX. This in turn will lower the Letdown fluid temperature entering the Letdown Demineralizer/IX which will remove additional boron from the Letdown fluid causing a dilution of the VCT/RCS. This will cause RCS Tave to rise. Since the Main Turbine is on the load limit pot (set position on the control valves), RCS Tave rising will cause steam pressure to rise and more steam flow to the turbine causing Plant power to rise above 100% which is our licensed limit. Distracters A and D are incorrect because CCW flow will rise due to the loss of IA. Distracters B and D are incorrect because RCS Tave and Plant Power will rise.

References:

STM 2-43, CCW System, Rev. 12, Section 3.2.17.
PWR GP Components Chapter 4 Demineralizers and Ion Exchangers - Temperature (Page 12 below equation 4-9).
Lesson Plan A2LP-RO-CCW, Rev. 3, Objective 12: List the loads supplied by CCW to include fail position of any flow control valves. Lesson Plan ASLP-RO-CMP07, Rev. 2 PWR GP Components Chapter 4 Demineralizers and Ion Exchangers, Objective 28: Describe the effect of temperature on saturated ion exchangers.

Historical Comments:

Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank: 1643 **Rev:** 0 **Rev Date:** 4/2/2009 4:22:09 **QID #:** 34 **Author:** Jim Wright

Lic Level: R **Difficulty:** 2 **Taxonomy:** F **Source:** New

Search 010000K402 **10CFR55:** 41.7 **Safety Function** 3

System Title: Pressurizer Pressure Control System (PZR PCS) **System Number** 010 **K/A** K4.02

Tier: 2 **Group:** 1 **RO Imp:** 3.0 **SRO Imp:** 3.4 **L. Plan:** A2LP-RO-PZR **OBJ** 3

Description: Knowledge of PZR PCS design feature(s) and/or interlock(s) which provide for the following: - Prevention of uncovering PZR heaters

Question:

Given the following:

* Unit 2 has a small break LOCA in progress.
* Pressurizer Proportional Heaters Bank #1 and #2 are in Automatic.
* Backup Heater Bank #1 handswitch is in On.

When Pressurizer level drops to _____ to prevent uncovering the heaters.

A. 30%, all PZR HTRs will be de-energized except BU HTR Bank #1

B. 30%, all PZR HTRs will be de-energized

C. 29%, all PZR HTRs will be de-energized except BU HTR Bank #1

D. 29%, all PZR HTRs will be de-energized

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☑	☑

Audit Exam History

2009	☐

Answer:

D. 29%, all PZR HTRs will be de-energized

Notes:

A. is incorrect because 30% is the reset value for pressurizer heater low level cutout on rising level and all PZR heaters will be deenergized.
B. is incorrect because 30% is the reset value for pressurizer heater low level cutout on rising level.
C. is incorrect because all heater will deenergize without exception even though the low level interlock is correctly stated at 29%

References:

STM 2-03-1 Rev.13 Pressurizer Pressure and Level Control Section 2.2.4 and 2.2.5
NOP 2103.005 Change 29 Section 6.0 Setpoints and Interlocks.
Lesson Plan A2LP-RO-PZR Rev.3 Pressurizer Pressure and Level Control System. Objective 3: Explain the following for the Pressurizer Heaters: The low level interlock associated with the PZR Heaters.

Historical Comments:

Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank: 1644 **Rev:** 0 **Rev Date:** 4/2/2009 3:27:44 **QID #:** 35 **Author:** Coble

Lic Level: R **Difficulty:** 2 **Taxonomy:** H **Source:** New

Search 010000A401 **10CFR55:** 41.7 / 45.5 to 45.8 **Safety Function** 3

System Title: Pressurizer Pressure Control System (PZR PCS) **System Number** 010 **K/A** A4.01

Tier: 2 **Group:** 1 **RO Imp:** 3.7 **SRO Imp:** 3.5 **L. Plan:** A2LP-RO-PZR **OBJ** 4

Description: Ability to manually operate and/or monitor in the control room: - PZR spray valve

Question:

When operating a Pressurizer Spray valve in MANUAL, the AMBER light above the control switch being ON indicates the valve is approximately _____ Open and when the RED light above the control switch is the only light ON, the spray valve is _____.

A. 40%; 100% Closed

B. 40%; 100% Open

C. 25%; 100% Closed

D. 25%; 100% Open

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☑	☑

Audit Exam History

2009	☐

Answer:

B. 40%; 100% Open

Notes:

The PZR Spray valve will start to come open automatically when PZR pressure rises to 25 psia above setpoint but the amber light comes on when the valve is approximately 40% open. The Red light and Green light will be on when the valve is intermediate but when the valve is full 100% open, the red light will be the only light on. Distracters A and C are incorrect because the red light indicates 100% open. Distracters C and D are incorrect because the amber light indicates 40% open.

References:

STM 2-03-01, PZR Pressure and Level Control, Rev. 13, Section 2.2.6 and 2.3.
Lesson Plan A2LP-RO-PZR, Rev. 3 Objective 4: Explain the following concerning the operation of the Pressurizer Spray Valve: Automatic Operation and Manual Operation.

Historical Comments:

Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank:	1645	**Rev:**	0	**Rev Date:**	4/2/2009 4:38:20	**QID #:**	36	**Author:**	Coble		
Lic Level:	R	**Difficulty:**	2	**Taxonomy:**	F	**Source:**	New				
Search	012000K201	**10CFR55:**	41.7	**Safety Function**	7						
System Title:	Reactor Protection System			**System Number**	012	**K/A**	K2.01				
Tier:	2	**Group:**	1	**RO Imp:**	3.3	**SRO Imp:**	3.7	**L. Plan:**	A2LP-RO-RPS	**OBJ**	5
Description:	Knowledge of bus power supplies to the following: - RPS channels, components, and interconnections										

Question:

Which of the following channels of PPS bistables have auctioneered power supplies from multiple 120 Volt Vital AC buses 2RS1 through 2RS4?

A. Channels A and B

B. Channels A and C

C. Channels B and C

D. Channels B and D

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☑	☑

Audit Exam History

2009	☐

Answer:

C. Channels B and C

Notes:

Auctioneered power supplies were removed from RPS channels A and D during the Steam Generator replacement outage due to a single failure scenario identified in Condition Report 2-96-0293. (See STM 2-63 Section 4.1.1 provided). Distracters A and B are incorrect because channel A does not have auctioneered power supplies. Distracter D is incorrect because channel D does not have auctioneered power supplies.

References:

STM 2-63, RPS, Rev. 9, Sections 4.1 and 4.1.1 and Figures on pages 56 and 57.
Lesson Plan A2LP-RO-RPS Rev. 9, Objective 5: Describe the power supplies to the Reactor Protection System.

Historical Comments:

Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank:	1646	**Rev:**	0	**Rev Date:**	4/6/2009 2:48:19	**QID #:**	37	**Author:**	Coble		
Lic Level:	R	**Difficulty:**	2	**Taxonomy:**	H	**Source:**	New				
Search	0130002244	**10CFR55:**	41.10 / 43.5 / 45.12	**Safety Function**	2						
System Title:	Engineered Safety Features Actuation System (	**System Number**	013	**K/A**	2.2.44						
Tier:	2	**Group:**	1	**RO Imp:**	4.2	**SRO Imp:**	4.4	**L. Plan:**	A2LP-RO-ESFAS	**OBJ**	2

Description: Equipment Control - 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.

Question:

The following conditions exist:

* A Steam Generator Tube Rupture has occurred on the "A" SG.
* PZR pressure is 1575 psia.
* SG pressures are (SG"A") 1025 psia, (SG"B") 1000 psia.
* SG levels are (SG"A") 46% NR, (SG"B") 35% NR

Which of the following ESF signals should be actuated and what manual operator action should be taken in the SGTR EOP to minimize any release to the atmosphere?

A. SIAS; Override SW to ACW

B. SIAS; Override SW to CCW

C. EFAS; Override SW to ACW

D. EFAS; Override SW to CCW

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☑	☑

Audit Exam History

2009	☐

Answer:

A. SIAS; Override SW to ACW

Notes:

PZR pressure is below the SIAS setpoint and SG level is above the EFAS setpoint so SIAS should be actuated and not EFAS. SW is restored to ACW to ensure cooling to the condenser vacuum pumps so that we can maintain a condenser vacuum to allow steaming to the condenser vice to the atmosphere. SW is restored to CCW to ensure cooling to RCP seals.
Distracter "B" is incorrect because restoring SW to CCW is not to minimize steaming to the atmosphere
Distracter "C" is incorrect because EFAS will not actuate until 22.2% NR SG level.
Distracter "D" is incorrect because restoring SW to CCW is not to minimize steaming to the atmosphere and EFAS will not actuate until 22.2% NR SG level.

References:

EOP 2202.004, SGTR, Rev. 9, Step 7.H Contingency Action.
EOP TG 2202.004, SGTR, Rev. 9, Step 7
STM 2-70, ESF System Rev 14, Table on Page 8
Lesson Plan A2LP-RO-ESFAS,ESF System Rev. 11 Objective 2: List the ESFAS actuations. Include for each actuation. Inputs required for actuation signal. Setpoints for each actuation input parameter.
Reason for each system actuation.

Historical Comments:

Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank: 1647 **Rev:** 0 **Rev Date:** 4/7/2009 10:44:47 **QID #:** 38 **Author:** Coble

Lic Level: R **Difficulty:** 3 **Taxonomy:** H **Source:** NRC Exam Bank 0104 Modified

Search 013000K502 **10CFR55:** 41.5 / 45.7 **Safety Function** 2

System Title: Engineered Safety Features Actuation System (**System Number** 013 **K/A** K5.02

Tier: 2 **Group:** 1 **RO Imp:** 2.9 **SRO Imp:** 3.3 **L. Plan:** A2LP-RO-ESFAS **OBJ**

Description: Knowledge of the operational implications of the following concepts as they apply to the ESFAS: - Safety system logic and reliability

Question:

An EFAS 2 signal will be present and feeding the 'B' Steam Generator for which of the following indications? (consider each answer separately).

A. SG "A" Level = 20% NR & Press = 700 psia SG "B" Level = 21.5% NR & Press = 700 psia.

B. SG "A" Level = 20% NR & Press = 575 psia SG "B" Level = 26% NR & Press = 700 psia.

C. SG "A" Level = 20% NR & Press = 400 psia SG "B" Level = 15% NR & Press = 200 psia.

D. SG "A" Level = 20% NR & Press = 375 psia SG "B" Level = 18% NR & Press = 500 psia.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☑	☑

Audit Exam History

2009	☐

Answer:

D. SG "A" Level = 20% NR & Press = 375 psia SG "B" Level = 18% NR & Press = 500 psia.

Notes:

An EFAS 1 or EFAS 2 will be generated on a low SG level signal of 22.2% NR level but will reset if level rises to >25% NR. This will stop feed to the respective SG. Also with a low SG pressure at less than 751 psia, the EFAS logic will stop feeding the SGs until it can determine the intact SG by looking at the differential pressure between the two. The SG with a DP of 90 psid higher than the other will open the feed valves feeding the intact SG and close the ruptured SG feed valves. Distracter A is incorrect because SG Pressure is less than 751 psia but no SG has a DP from the other so neither SG will be fed. Distracter B is incorrect because level in the B SG is not low enough to imitate feed. Distracter C is incorrect because the A SG is the one with the high DP not B SG. Answer D is correct because the DP is higher on B SG with a low level.

References:

STM 2-19-2, EFW System, Rev. 29, Section 2.3.3.1
STM 2-70 ESFAS, Rev. 14 Section 4.9.1 and Figure on Page 79.
Lesson Plan A2LP-RO-ESFAS, Rev. 11 Objective 2: List the ESFAS actuations, including :
Inputs required for actuation signal. Setpoints for each actuation parameter. Reason for each actuation and
Objective 8: Discuss the differences between the typical ESFAS system flow path, and the signal for
:Emergency Feed

Historical Comments:

Original Question was used on the 1998 NRC Exam

Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank: 1648 **Rev:** 0 **Rev Date:** 4/7/2009 1:39:05 **QID #:** 39 **Author:** Coble

Lic Level: R **Difficulty:** 4 **Taxonomy:** H **Source:** New

Search 022000A402 **10CFR55:** 41.7 / 45.5 to 45.8 **Safety Function** 5

System Title: Containment Cooling System (CCS) **System Number** 022 **K/A** A4.02

Tier: 2 **Group:** 1 **RO Imp:** 3.2 **SRO Imp:** 3.1 **L. Plan:** A2LP-RO-CVENT **OBJ** 19

Description: Ability to manually operate and/or monitor in the control room: - CCS pumps

Question:

Given the following:

* Unit 2 is at normal full power operation in the middle of a summer afternoon.
* Containment Cooling Fans 2VSF-1A, 2VSF-1B AND 2VSF-1D are in service.

Which one of the following alarms would be the MOST DIRECT confirmation of a loss or malfunction of the containment cooling water supply pump.

A. Annunciator 2K06 H-7 "CNMT CLG COILS A/B SW FLOW LOW".

B. Annunciator 2K12 A-7 "CCW LOOP 2 FLOW LO".

C. Annunciator 2K13 B-4 "CONTAINMENT COOLING COILS WATER FLOW LOW".

D. Annunciator 2K13 C-2 "CHILLED WATER FLOW LOW".

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☑	☑

Audit Exam History

2009	☐

Answer:

C. Annunciator 2K13 B-4 "CONTAINMENT COOLING COILS WATER FLOW LOW".

Notes:

At normal full power, cooling water for the CCS coils is supplied from Main Chilled Water pump. Service water will only supply the CCS fans on a SIAS or MSIS accident. CCW supplies cooling to RCPs only in Containment. Distracter A is incorrect because this alarm is only active during an SIAS or MSIS. Distracter B is incorrect because CCW does not cool the CCS coolers. Distracter D is incorrect because this alarm will come in on loss of flow in Main Chill Water, Aux Extension Chill Water, or Control Room Chill Water Systems so this alarm could indicate a loss of a pump that does not supply the containment coolers. C is correct because this alarm only comes in on low chill water flow to the containment cooling coils which is the cooling medium at 100% power.

References:

STM 2-09, Containment Cooling and Purge System, Rev. 16, Section 2.1 and 2.2.
Annunciator Corrective Action 2203.012F Window 2K06 H-7 "CNMT CLG COILS A/B SW FLOW LOW". Annunciator Corrective Action 2203.012L Window 2K12 A-7 " CCW LOOP 2 FLOW LO". Annunciator Corrective Action 2203.012M Window 2K13 B-4 " CONTAINMENT COOLING COILS WATER FLOW LOW". Annunciator Corrective Action 2203.012M Window 2K13 C-2 "CHILLED WATER FLOW LOW". Lesson Plan A2LP-RO-CVENT Rev. 4 Objective 19:Describe the Alarms associated with the Containment Ventilation Systems and based on given plant conditions, determine the correct course of action to take.

Historical Comments:

Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank:	1649	**Rev:**	0	**Rev Date:**	4/7/2009 4:44:09	**QID #:**	40	**Author:**	Coble
Lic Level:	R	**Difficulty:**	3	**Taxonomy:**	H	**Source:**	NRC Exam Bank 0483 Modified		
Search	022000A201	**10CFR55:**	41.5 / 43.5 / 45.3 / 45.	**Safety Function**	5				
System Title:	Containment Cooling System (CCS)			**System Number**	022	**K/A**	A2.01		
Tier:	2	**Group:**	1	**RO Imp:**	2.5	**SRO Imp:**	2.7	**L. Plan:**	A2LP-RO-CVENT	**OBJ**	15

Description: 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

Question:

Consider the following:

QID use History

	RO	SRO
2003	☐	☐
2005	☑	☑
2006	☐	☐
2008	☐	☐
2009	☑	☑

- * Unit 2 is at normal full power operation in the middle of a summer afternoon.
- * Containment Cooling Fans 2VSF-1A, 2VSF-1B AND 2VSF-1D are in service.
- * The CTMT BLDG CLG FANS C/D TROUBLE alarm comes in and locks in solid when acknowledged.
- * All indicating lights on the 2VSF-1D are extinguished.
- * The Inside AO reports that the thermal overloads on the 2VSF-1D Supply Breaker 2B63 J2 appear to be tripped and will not reset.
- * Containment pressure and temperature has risen to 15.7 psia and 118°F.

Based on these conditions, which of the following will ensure compliance with the Containment Internal Pressure and Temperature Technical Specification action 3.6.1.4 to prevent a shutdown? (Reference Provided)

Audit Exam History

2009	☐

A. Containment Cooling Fan 2VSF-1C automatically starts and Containment temperature and pressure must be restored to within TS limits within 30 minutes.

B. Manually start Containment Cooling Fan 2VSF-1C and Containment temperature and pressure must be restored within TS limits within 1 hour.

C. Manually start Containment Cooling Fan 2VSF-1C and Containment temperature and pressure must be restored within TS limits within 30 minutes.

D. Containment Cooling Fan 2VSF-1C automatically starts and Containment temperature and pressure must be restored to within TS limits within 1 hour.

Answer:

B. Manually start Containment Cooling Fan 2VSF-1C and Containment temperature and pressure must be restored within TS limits within 1 hour.

Notes:

Distracter A is incorrect because the Containment Cooling Fans only get an auto start signal on a Containment Cooling Actuation signal not low air flow and the time limit is one hour. Distracter C is incorrect because the TS limit is one hour. Distracter D is incorrect because the Containment Cooling Fans only get an auto start signal on a Containment Cooling Actuation signal not low air flow

Provide a copy of TS 3.6.1.4 Figure 3.6-1 as a reference.

References:

STM 2-09, Containment Cooling and Purge Systems, Sections 2.8, and 2.10.1.
TS 3.6.1.4, Containment Internal Pressure and Temperature with Figure 3.6-1
Annunciator Corrective Action 2203.012E Window 2K05 J-7 "CNMT BLDG CLG FANS C/D TROUBLE.
Lesson Plan A2LP-RO-CVENT Rev. 4 Objective 3: Describe the construction and operation of the Containment Cooling Units and OBJ. 15, Describe the conditions required to satisfy the TS LCOs and TRM TROs associated with the Containment Ventilation System including the basis for each LCO/TRO.

Historical Comments:

Original Question Used on the 2005 NRC Exam

Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank:	1650	**Rev:**	0	**Rev Date:**	4/9/2009 4:00:28	**QID #:**	41	**Author:**	Coble		
Lic Level:	R	**Difficulty:**	2	**Taxonomy:**	F	**Source:**	IH Exam Bank Unit 2 10091 Modified				
Search	026000K302	**10CFR55:**	41.7 / 45.6	**Safety Function**	5						
System Title:	Containment Spray System (CSS)	**System Number**	026	**K/A**	K3.02						
Tier:	2	**Group:**	1	**RO Imp:**	4.2	**SRO Imp:**	4.3	**L. Plan:**	A2LP-RO-SPRAY	**OBJ**	2
Description:	Knowledge of the effect that a loss or malfunction of the CSS will have on the following: - Recirculation spray system										

Question:

Consider the following:

* The reactor has tripped due to a LOCA.
* Containment Pressure peaked at 49 psia and is trending down.
* Four Containment Cooling Units are in operation in the emergency mode.
* Containment Spray pump, 2P-35A is running.
* Containment Spray pump, 2P-35 B is tagged out for bearing replacement.
* All other ECCS components are operating as designed.

One hour later, the conditions are as follows:

* Containment Pressure is 34 psia and lowering.
* Four Containment Cooling Units are in operation in the emergency mode.
* After 45 minutes of operation Containment Spray pump, 2P-35A tripped due to a short in the motor.
* All other ECCS components are operating as designed.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☑	☑

Audit Exam History

2009	☐

Considering the above conditions, all Containment Safety Functions _____satisfying the design basis requirements because _____?

A. are NOT; containment pressure has NOT been reduced to within 10 psia of the CSAS reset value.

B. are; four containment cooling units are sufficient to remove the energy in the containment.

C. are NOT; a containment spray pump is required to be running following a RAS for iodine removal.

D. are, containment pressure has been reduced by greater than 10 psia from the peak pressure.

Answer:

C. are NOT; a containment spray pump is required to be running following a RAS for iodine removal.

Notes:

4 Containment fan coolers will remove 100% of the Design Heat addition to the Containment on the DBA LOCA or 2 Trains of Containment Spray will remove the same amount of heat. However, the Spray system is still needed to recirculate fluid through the chemical baskets in the containment basement to raise the PH of the fluid to help remove the radioactive gaseous iodine from the Containment Atmosphere to meet the design basis of the Containment Heat Removal System.

Distracters A and D are incorrect because there is no requirement in the design basis that requires pressure to be with 10 psid of the setpoint or reduced by 10 psia from the peak pressure.

References:

STM 2-08, Containment Spray System Rev. 20 Section 1.3.
Lesson Plan A2LP-RO-SPRAY: Objective 2 Given a set of plant conditions determine if the Containment Heat Removal System is satisfying its design bases.

Historical Comments:

This question has not been used on any previous NRC Exam

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Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank:	1651	**Rev:**	0	**Rev Date:**	4/9/2009 5:11:39	**QID #:**	42	**Author:**	Coble		
Lic Level:	R	**Difficulty:**	2	**Taxonomy:**	F	**Source:**	New				
Search	039000K304	**10CFR55:**	41.7 / 45.6	**Safety Function**	4						
System Title:	Main and Reheat Steam System (MRSS)	**System Number**	039	**K/A**	K3.04						
Tier:	2	**Group:**	1	**RO Imp:**	2.5	**SRO Imp:**	2.6	**L. Plan:**	A2LP-RO-MFPTC	**OBJ**	10
Description:	Knowledge of the effect that a loss or malfunction of the MRSS will have on the following: - MFW pumps										

Question:

Given the following:

* The plant is at full power.
* The Main Steam Supply Valve to MFW Pump Turbine 2K-2A, 2CV-0320 goes closed.

Which one of the following would be the correct response of the MFW pumps and the final plant conditions with no operator action.

A. The 'A' MFW Pump would go to zero speed and the plant would be in mode 3.

B The 'A' MFW Pump speed would not change and the plant would be at full power.

C. The 'A' MFW Pump would go to zero speed and the plant would be at ~ 90% power.

D. The 'B' MFW Pump speed would rise to compensate and the plant would be at full power.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☑	☑

Audit Exam History

2009	☐

Answer:

B The 'A' MFW Pump speed would not change and the plant would be at full power.

Notes:

Main Steam is aligned to the MFW pump turbine to be used for startup and low power conditions when the Reheat steam supply is not available. At full power, the Reheat Steam supply is operating the MFW pump turbines through the low pressure control valve. Distracters A and C are incorrect because the speed would remain the same. Distracter D is incorrect because the B MFW pump speed will not need to rise to compensate.

References:

STM 2-19-1, MFW Pump and Turbine Control System, Rev. 17, Sections 6.3.and 6.4. and figure on page 84.
STM 2-15, SG and Main Steam System, Rev. 11 Section 2.0 - 1st paragraph on page 5
Lesson Plan A2LP-RO-MFPTC, Rev. 4 Objective 10: Describe the purpose, construction and operation of the following control system components: Low Pressure Stop Valves (2CV-0330 /350) Low Pressure Control Valves (2CV-0331 / 0351) High Pressure Stop Valves (2CV-0316A / 0321A) High Pressure Control Valves (2CV-0331 / 0351)

Historical Comments:

Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank: 1652 **Rev:** 0 **Rev Date:** 4/13/2009 10:29:2 **QID #:** 43 **Author:** Coble

Lic Level: R **Difficulty:** 2 **Taxonomy:** F **Source:** New

Search 059000K419 **10CFR55:** 41.7 **Safety Function** 4

System Title: Main Feedwater (MFW) System **System Number** 059 **K/A** K4.19

Tier: 2 **Group:** 1 **RO Imp:** 3.2 **SRO Imp:** 3.4 **L. Plan:** A2LP-RO-FWCD **OBJ** 14

Description: Knowledge of MFW System design feature(s) and/or interlock(s) which provide for the following: - Automatic feedwater isolation of MFW

Question:

Which one of the following ESFAS actuation will cause the Main Feedwater Isolation (Block) Valves to automatically close?

A. SIAS

B. CCAS

C. EFAS

D. CSAS

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☑	☑

Audit Exam History

2009	☐

Answer:

D. CSAS

Notes:

The MFWIVs are safety related valves that will automatically close upon receipt of a Main Steam Isolation Signal (MSIS) or a Containment Spray Actuation Signal (CSAS) from the Engineered Safety Features Actuation System (ESFAS).

References:

STM 2-19, Main Feedwater System, Rev. 11, Section 1.2 (2nd Page) and Section 2.7.
Lesson Plan A2LP-RO-FWCD, Rev. 7, Objective 14: Describe the interlocks and automatic actuations of the following Feedwater System components: Main Feedwater Isolation Valves (2CV-1023-2, 1073-2, 1024-1 & 1074-1)

Historical Comments:

Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank: 1653 **Rev:** 0 **Rev Date:** 4/13/2009 10:53:5 **QID #:** 44 **Author:** Coble

Lic Level: R **Difficulty:** 2 **Taxonomy:** F **Source:** New

Search 059000A303 **10CFR55:** 41.7 / 45.5 **Safety Function** 4

System Title: Main Feedwater (MFW) System **System Number** 059 **K/A** A3.03

Tier: 2 **Group:** 1 **RO Imp:** 2.5 **SRO Imp:** 2.6 **L. Plan:** A2LP-RO-FWCD **OBJ** 14

Description: Ability to monitor automatic operation of the MFW System, including: - Feedwater pump suction flow pressure

Question:

At full power, if the Main Feedwater Pump suction pressure drops below _____ psig, the standby Condensate pump will automatically start and if Main Feedwater Pump suction pressure drops below _____ psig, the Main feedwater pumps will trip. (assume all time delays have been completed and any associated logic has been satisfied)

A. 425; 325

B. 450; 300

C. 425; 350

D. 450; 375

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☑	☑

Audit Exam History

2009	☐

Answer:

A. 425; 325

Notes:

The standby Condensate Pump will start if suction pressure drops below 425 psig but a warning alarm will sound at 450 psig. The MFW Pumps will trip if pressure continues to drop below 325 psig on 2 out of 3 pressure sensing switches after a 30 second time delay.

References:

STM 2-19, MFW System, Rev. 11, Section 3.2
Lesson Plan A2LP-RO-FWCD, Rev. 7, Objective 14: Describe the interlocks and automatic actuations of the following Feedwater System components: Main Feedwater Pumps (2P-1A/B) and Objective 6: Describe the interlocks and automatic actuations of the following components:
Condensate pumps

Historical Comments:

Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank:	1654	**Rev:**	0	**Rev Date:**	4/13/2009 2:06:59	**QID #:**	45	**Author:**	Coble		
Lic Level:	R	**Difficulty:**	3	**Taxonomy:**	H	**Source:**	New				
Search	061000K502	**10CFR55:**	41.5 / 45.7	**Safety Function**	4						
System Title:	Auxiliary / Emergency Feedwater (AFW) Syste	**System Number**	061	**K/A**	K5.02						
Tier:	2	**Group:**	1	**RO Imp:**	3.2	**SRO Imp:**	3.6	**L. Plan:**	A2LP-RO-ESPTA	**OBJ**	11

Description: Knowledge of the operational implications of the following concepts as they apply to the AFW System: - Decay heat sources and magnitude

Question:

Given the following:

* The plant has tripped due to a loss of Off Site Power.
* The plant had been at 100% power for the last 100 days.
* SPTAs are in progress.
* SG A level is 8% NR and SG B level is 7% NR.
* All EFW components actuated as designed.

Which ONE of the following combinations of EFW flow would be the MINIMUM required to meet the RCS Heat Removal Safety Function just after the trip? (assume no recirculation flow)

A. A SG 150 gpm; B SG 150 gpm

B. A SG 315 gpm; B SG 155 gpm

C. A SG 211 gpm; B SG 275 gpm

D. A SG 250 gpm; B SG 260 gpm

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☑	☑

Audit Exam History

2009	☐

Answer:

C. A SG 211 gpm; B SG 275 gpm

Notes:

With SG level less than 10% Narrow Range, total EFW flow post trip from 100% power with at least a 30 day history at 100% power is required to greater than 485 gpm. Answer C is 486 gpm total. Distracter A and B do not meet the minimum but may have to start out at 150 gpm to each SG in certain EOPs under loss of feed conditions. Distracter D is more than the minimum required.

References:

EOP 2202.001, SPTAs, Rev. 9, Contingency Action Step 8 A.2.
EOP TG 2202.001, SPTAs, Rev. 9 Step 8, RCS Heat Removal, Step 8.
Lesson Plan A2LP-RO-ESPTA, Rev. 8, Objective 11: Describe the major actions taken during the performance of SPTAs and the basis for each.

Historical Comments:

Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank:	1655	**Rev:**	0	**Rev Date:**	4/13/2009 2:52:02	**QID #:**	46	**Author:**	Coble
Lic Level:	R	**Difficulty:**	4	**Taxonomy:**	H	**Source:**	New		
Search	062000A103	**10CFR55:**	41.5 / 45.5	**Safety Function**	6				
System Title:	A.C. Electrical Distribution System	**System Number**	062	**K/A**	A1.03				
Tier:	2	**Group:**	1	**RO Imp:**	2.5	**SRO Imp:**	2.8	**L. Plan:**	A2LP-RO-ED480	**OBJ**	7

Description: Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the A.C. Distribution System controls including: - Effect on instrumentation and controls of switching power supplies

Question:

Consider the following:

* Unit 2 is at full power.
* The Main Turbine Trips.
* Electrical Loads transfer to offsite as designed.
* Red Vital 480V Bus (2B5) is reading 426 VAC (lowest reading).
* Green Vital 480V Bus (2B6) is reading 441 VAC (lowest reading).
* No Operator Action is taken.

One minute after these conditions are established, what would be the status of the Emergency Diesel Generators?

A. Both Emergency Diesels would be running and neither of the Emergency Diesels would have its output breaker Closed.

B. Both Emergency Diesels would be running but only the Red Emergency Diesel Generator (2DG1) would have its output breaker Closed.

C. Only the Red Emergency Diesel Generator (2DG1) would start and it would be running with its output breaker Open.

D. Only the Red Emergency Diesel Generator (2DG1) would start and it would be running with its output breaker Closed.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☑	☑

Audit Exam History

2009	☐

Answer:

D. Only the Red Emergency Diesel Generator (2DG1) would start and it would be running with its output breaker Closed.

Notes:

The millstone relays actuate at 429.6 plus or minus 6.4 volts AC and are designed to protect the vital AC buses from low offsite voltage. They are designed to strip the vital buses from offsite and then the respective diesel will start on undervoltage on the bus will be re-energized from the respective diesel. There is also a Green (B Train) millstone relay that would start the B Diesel and power up the Green Vital AC buses if actuated. In this case only the A (red) train bus is energized since its millstone relay is the only one actuated.

References:

T.S 3.3.2.1 Table 3.3-4 Item 7b.
STM 2-32-1, Rev. 13, 480 VAC Distribution System, Section 2.2.2, Bus Protection Relays.
Lesson Plan A2LP-RO-ED480, Rev. 3 Objective 7: Explain the following for a 480V Load Center Bus: Millstone Relays on 480V Vital Buses 2B5 and 2B6 and the sequence of events for a Millstone Event

Data for 2009 NRC RO/SRO Exam

18-Jun-09

Historical Comments:

Bank: 1656 **Rev:** 0 **Rev Date:** 4/13/2009 3:47:17 **QID #:** 47 **Author:** Coble

Lic Level: R **Difficulty:** 2 **Taxonomy:** F **Source:** New

Search 0630002127 **10CFR55:** 41.7 **Safety Function** 6

System Title: D.C. Electrical Distribution System **System Number** 063 **K/A** 2.1.27

Tier: 2 **Group:** 1 **RO Imp:** 3.9 **SRO Imp:** 4.0 **L. Plan:** A2LP-RO-ED125 **OBJ** 1

Description: Conduct of Operations - Knowledge of system purpose and/or function.

Question:

Which ONE of the following would be a function of 125 VDC Green Electrical Bus 2D02?

A. Provide DC power input to the PMS Inverter 2Y25.

B. Provide DC power to EFW Pump 2P-7A governor control.

C. Provide DC power input to the SPDS Inverter 2Y26.

D. Provide DC control power to Vital 4160 VAC Electrical Bus 2A3

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☑	☑

Audit Exam History

2009	☐

Answer:

B. Provide DC power to EFW Pump 2P-7A governor control.

Notes:

The turbine driven EFW pump 2P-7A has DC power to its governor controls so that the pump would be operable during a station blackout condition. This DC power comes from the green train "B" DC bus 2D24 which receives its power from the Green DC Bus 2D01. PMS Inverter 2Y25 gets its DC power from the Red train DC Bus 2D01. SPDS Inverter gets its DC power from the black train (non-safety) DC Bus 3D03. Vital Red Train 4160 VAC Bus 2A3 gets its control power from the Red DC Train Bus 2D01.

References:

STM 2-19-2, EFW System, Rev. 29, Sections 2.1 and 2.1.1.6.
STM 2-32-5, 125 VDC Electrical Distribution, Rev. 15, section 1.1 and figure on page 22.
Lesson plan A2LP-RO-ED125, 125 VDC Electrical Distribution, Rev. 6. Objective 1 Describe the Function of the 125 VDC Distribution System. (Obj. 1)

Historical Comments:

Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank:	1657	**Rev:**	0	**Rev Date:**	4/13/2009 4:33:27	**QID #:**	48	**Author:**	Coble		
Lic Level:	R	**Difficulty:**	2	**Taxonomy:**	H	**Source:**	IH Exam Bank OPS2-6884				
Search	063000A301	**10CFR55:**	41.7 / 45.5	**Safety Function**	6						
System Title:	D.C. Electrical Distribution System			**System Number**	063	**K/A**	A3.01				
Tier:	2	**Group:**	1	**RO Imp:**	2.7	**SRO Imp:**	3.1	**L. Plan:**	A2LP-RO-ED125	**OBJ**	6
Description:	Ability to monitor automatic operation of the D.C. Electrical System, including: - Meters, annunciators, dials, recorders, and indicating lights										

Question:

Consider the following:

* The plant is at full power.
* Green Vital Electrical DC Bus 2D02 voltage is 130V DC
* Battery Charger 2D32A load is 135 amps.
* The Green Vital Battery 2D12 Disconnect is now opened by maintenance personnel without letting the Control Room staff know ahead of time.

Given these conditions, the _____ alarm would annunciate in the Control Room and the Battery Charger load would _____ due to the loss of the battery.

A. 2D02 undervoltage; rise significantly

B. 2D02 undervoltage; stay approximately the same

C. Battery NOT Available; rise significantly

D. Battery NOT Available; stay approximately the same

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☑	☑

Audit Exam History

2009	☐

Answer:

D. Battery NOT Available; stay approximately the same

Notes:

As long as the Battery charger has AC input, then the battery charger is supplying the loads on the Green DC busses and the battery is acting as a backup. Disconnecting the battery from the bus in this case would result in a "Not Available" alarm only and no change in amps/load.

References:

STM 2-32-5, 125 VDC Electrical Distribution, Rev. 15, sections 2.3, 2.4,and 3.0 and figure on page 22. Lesson plan A2LP-RO-ED125, 125 VDC Electrical Distribution, Rev. 6. Objective 6: Describe the operation of the following Battery Chargers: The Battery Chargers associated with 2D01 and 2D02
and Objective 7 Describe the operation and ratings of the following: Battery Disconnect and Fuses for 2D01 and 2D02.

Historical Comments:

Never been used on a NRC Exam

Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank:	1658	**Rev:**	0	**Rev Date:**	4/13/2009 4:32:17	**QID #:**	49	**Author:**	Coble		
Lic Level:	R	**Difficulty:**	3	**Taxonomy:**	H	**Source:**	IH Exam Bank OPS2-6461 Modified				
Search	064000A401	**10CFR55:**	41.7 / 45.5 to 45.8	**Safety Function**	6						
System Title:	Emergency Diesel Generator (ED/G) System	**System Number**	064	**K/A**	A4.01						
Tier:	2	**Group:**	1	**RO Imp:**	4.0	**SRO Imp:**	4.3	**L. Plan:**	A2LP-RO-EDG	**OBJ**	2/6
Description:	Ability to manually operate and/or monitor in the control room: - Local and remote operation of the ED/G										

Question:

Consider the following:

* Unit 2 is at normal full power operation.
* The Red Emergency Diesel Generator, 2DG1, output breaker is in pull-to-lock (PTL).
* The Green Emergency Diesel Generator, 2DG2, is in normal standby.
* The reactor trips and Pressurizer pressure is 1600 psia.
* All other systems and components function as designed.
* Assume NO operator action.

Given these conditions 2DG1 would be _____ and 2DG2 would be _____.

A. shutdown; running at NO load

B. running at NO load; shutdown

C. running at NO load; running at NO load

D. shutdown; shutdown

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☑	☑

Audit Exam History

2009	☐

Answer:

A. shutdown; running at NO load

Notes:

Both EDG will be sent a start signal on an SIAS when RCS pressure drops below 1650 psia. However, with the output breaker for 2DG1 (152-308) in PTL this start signal cannot energize the air start solenoids for 2DG1 therefore it will not start. 2DG2 will start but since the supply breaker from offsite 152-409 has not tripped and is still supplying power to the 4160 safety bus 2A4, then 2DG2 will be running unloaded.

References:

Alarm Corrective Action (ACA) 2203.012U, EDG1 NOT AVAILABLE, Rev. 18, Step 1.2
STM 2-31, EDGs, Rev. 26, Section 3.2.1 and 3.3.1. Also Figures on pages 121 and 128.
Lesson Plan A2LP-RO-EDG, Rev. 10, Objectives 2: Explain the operation of the Engine Start Circuit and 6: Explain the operation of the Emergency Diesel Generator output breaker.

Historical Comments:

This question has not been used on any previous NRC Exams.

Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank: 1659 **Rev:** 0 **Rev Date:** 4/16/2009 2:57:05 **QID #:** 50 **Author:** Coble

Lic Level: R **Difficulty:** 3 **Taxonomy:** H **Source:** New

Search 064000K608 **10CFR55:** 41.7 / 45.7 **Safety Function** 6

System Title: Emergency Diesel Generator (ED/G) System **System Number** 064 **K/A** K6.08

Tier: 2 **Group:** 1 **RO Imp:** 3.2 **SRO Imp:** 3.3 **L. Plan:** A2LP-RO-EDG **OBJ** 12

Description: Knowledge of the effect of a loss or malfunction of the following will have on the ED/G System: - Fuel oil storage tanks

Question:

Given the following at full power:

* Emergency Diesel Generator 2DG1 surveillance is in progress.
* 2DG1 is currently tied to the grid and is consuming 2.2 gallons of fuel oil each minute.
* Fuel oil transfer pump 2P-16A is running filling 2DG1 Day Tank 2T-30A.
* At 500 gallons in 2T-30A, 2P-16A breaker trips open on thermal overload and fuel oil flow stops.
* NO operator action is taken.

Based on these conditions, approximately how long can 2DG1 continue to operate at the current load until the T.S. Minimum Day Tank Volume is reached?

A. 1 hour

B. 1.5 hours

C. 2 hours

D. 2.5 hours

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☑	☑

Audit Exam History

2009	☐

Answer:

B. 1.5 hours

Notes:

The T.S. Minimum Day Tank Volume is 300 gallons. 500 -300 gallons divided by 2.2 gpm is equal to 90.9 minutes or ~ 1.5 hours.

References:

T.S 3.8.1.1 part b.
STM 2.31, EDGs Rev. 26, Sections 2.3.3, 2.3.4, 2.3.5, and 2.3.6.
Lesson Plan A2LP-RO-EDG, Rev. 10 Objective 12 Explain the Technical Specifications associated with the Emergency Diesel Generators. (Obj 12)

Historical Comments:

Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank:	1660	**Rev:**	0	**Rev Date:**	6/30/1998	**QID #:**	51	**Author:**	Hatman		
Lic Level:	R	**Difficulty:**	2	**Taxonomy:**	F	**Source:**	NRC Exam Bank 0092				
Search	073000K301	**10CFR55:**	41.7 / 45.6	**Safety Function**	7						
System Title:	Process Radiation Monitoring (PRM) System			**System Number**	073	**K/A**	K3.01				
Tier:	2	**Group:**	1	**RO Imp:**	3.6	**SRO Imp:**	4.2	**L. Plan:**	A2LP-RO-RWST	**OBJ**	9

Description: Knowledge of the effect that a loss or malfunction of the PRM System will have on the following: - Radioactive effluent releases

Question:

With an inoperable Liquid Radwaste Discharge Radiation Monitor (2RITS-2330), all of the following are required to perform a discharge from the Waste Condensate Tanks EXCEPT:

A. Perform an independent verification of proper Unit 1 Circ Water flow.

B. Perform an independent verification of discharge valve lineup.

C. Perform an independent verification of release rate calculation.

D. Obtain and analyze independent samples from the Waste Condensate Tank.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☑	☑

Audit Exam History

2009	☐

Answer:

A. Perform an independent verification of proper Unit 1 Circ Water flow.

Notes:

Per the Offsite Dose Calculation Manual, Rev. 16, Limitation L2.1.1 Table 2.1-1 Action 1, with an inoperable rad monitor, effluent releases may be resumed provided that prior to initiating a release: a. At least two independent samples are analyzed; and b. At least two technically qualified members of the Facility Staff independently verify the release rate computer input data; and c. At least two technically qualified members of the Facility Staff independently verify the discharge valve lineup.

References:

NOP 2104.014, (LRW & BMS Operations) Rev 48, Supplement 1, Steps 1.5, 2.3 & 2.8 and Supplement 2, Step 12.0.
Offsite Dose Calculation Manual, Rev. 16, Limitation L2.1.1 Table 2.1-1 Action 1
Lesson Plan A2LP-RO-RWST Rev. 6, Objective 9: Describe the Technical Specifications and Offsite Does Calculation Manual Requirements associated with the following Radwaste Systems: Liquid Rad Waste System

Historical Comments:

Question was used on the 1998 NRC Exam

Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank: 1661 **Rev:** 0 **Rev Date:** 4/16/2009 10:30:1 **QID #:** 52 **Author:** Coble

Lic Level: R **Difficulty:** 3 **Taxonomy:** H **Source:** New

Search 076000A202 **10CFR55:** 41.5 / 43.5 / 45.3 / 45. **Safety Function** 4

System Title: Service Water System (SWS) **System Number** 076 **K/A** A2.02

Tier: 2 **Group:** 1 **RO Imp:** 2.7 **SRO Imp:** 3.1 **L. Plan:** A2LP-RO-SWACW **OBJ** 15

Description: Ability to (a) predict the impacts of the following malfunctions or operations on the SWS and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: - Service water header pressure.

Question:

Given the following:

* The plant is at full power.
* Service Water (SW) Pumps 2P-4A and 2P-4C are in service.
* Service Water Pump 2P-4B is aligned to Loop 1 Service Water.
* Alarm "SW HEADER LOOP 2 PRESS LO" comes in.
* The WCO call the control room and informs them of a large SW leak just upstream of the Loop 2 ESF Supply Header Isolation Valve 2CV-1406-2
* The CRS enters the Loss of Service Water AOP 2203.022.

Based on the actions in the AOP, what would be the status of the Service Water System and the correct contingency action to take?

A. Loop 2 SW and ACW isolated; start a plant down power and take the Main Turbine off line.

B. Loop 2 SW and CCW HX cooling isolated; trip the Reactor/Turbine and secure all 4 RCPs.

C. Loop 2 SW isolated, place Emergency Diesel 2DG2 Engine Start Handswitch in Pull to Lock.

D. Loop 2 and Cooling Tower Make up isolated; commence a rapid plant shutdown to mode 3.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☑	☑

Audit Exam History

2009	☐

Answer:

C. Loop 2 SW isolated, place Emergency Diesel 2DG2 Engine Start Handswitch in Pull to Lock.

Notes:

Based on the steps in the procedure, the actions taken would isolate Loop 2 SW only and the swing pump would be started to supply ACW (Turbine Loads) and CCW cooling would still be available from Loop 1 SW. The SW returns to the lake and Cooling Tower would not be affected. The plant would not need to reduce power or trip. The only action would be to protect safety related equipment on Loop 2 SW. The major load that could be damaged without cooling water is the #2 Emergency Diesel.

References:

ACA 2203.012E Alarm A-6, "SW HEADER LOOP 2 PRESS LO", Rev. 32.
STM 2-42, SWACW, Rev. 28, Figure on Page 81.
AOP 2203.022, Loss of SW, Rev. 10, Steps 3, and 6.C Contingency Action 7.
Lesson Plan A2LP-RO-SWACW, Rev. 14, Objective 15: Given a set of plant conditions and appropriate reference material, determine the cause of an alarm associated with the Service Water System or the Auxiliary Cooling Water system and the corrective actions necessary to be taken.

Historical Comments:

Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank: 1662 **Rev:** 0 **Rev Date:** 4/16/2009 4:12:20 **QID #:** 53 **Author:** Coble

Lic Level: R **Difficulty:** 2 **Taxonomy:** F **Source:** New

Search 078000K201 **10CFR55:** 41.7 **Safety Function** 8

System Title: Instrument Air System (IAS) **System Number** 078 **K/A** K2.01

Tier: 2 **Group:** 1 **RO Imp:** 2.7 **SRO Imp:** 2.9 **L. Plan:** A2LP-AO-IA **OBJ** 4

Description: Knowledge of bus power supplies to the following: - Instrument air compressor

Question:

Which of the following are the power supplies to the Instrument Air Compressors 2C-27A and 2C-27B?

A. Vital 480 Volt Load Centers 2B5 and 2B6.

B. Non-Vital 480 Volt Load Centers 2B7 and 2B8.

C. Vital 480 Volt Motor Control Centers 2B54 and 2B64.

D. Non-Vital 480 Volt Load Centers 2B1 and 2B2.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☑	☑

Audit Exam History

2009	☐

Answer:

D. Non-Vital 480 Volt Load Centers 2B1 and 2B2.

Notes:

2C-27A is powered from 480V AC Load Center 2B1 and 2C-27B is powered from 480V AC Load Center 2B2.

References:

STM 2-48, IA System, Rev. 11, Section 2.1 and figure on page 50.
Lesson Plan A2LP-AO-IA, Rev. 13, Objective 4: State the purpose, construction, and principle of operation of the Instrument Air Compressors.

Historical Comments:

Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank: 1663 **Rev:** 0 **Rev Date:** 4/21/2009 9:31:00 **QID #:** 54 **Author:** Coble

Lic Level: R **Difficulty:** 3 **Taxonomy:** H **Source:** NRC Exam Bank 0495 Modified

Search 103000A205 **10CFR55:** 41.5 / 43.5 / 45.3 / 45. **Safety Function** 5

System Title: Containment System **System Number** 103 **K/A** A2.05

Tier: 2 **Group:** 1 **RO Imp:** 2.9 **SRO Imp:** 3.9 **L. Plan:** A2LP-RO-TS **OBJ** 4b

Description: Ability to (a) predict the impacts of the following malfunctions or operations on the Containment System and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: - Emergency Containment Entry .

Question:

Given the following:

* The plant is at full power
* Annunciator 2K11-A9 "Fire Alarm" has come in.
* On 2C343-1 Detector 1-4-4-T, the South Containment Cable Spreading Areas is in Alarm
* The Shift Manager has determined that an immediate emergency Containment entry is required to access the potential fire in Containment.
* The Containment entry is made and it is determined that a false alarm has occurred.
* When exiting Containment, the Personnel Hatch air lock door interlocks fail allowing both doors to be opened at the same time.

Based on the given conditions and in accordance with Technical Specifications which one of the following actions is required to be taken?

A. Verify at least one Personnel Hatch air lock door is Operable and Closed within 1 hour.

B. Verify the interlock for the Personnel Hatch air lock doors is Operable within 30 minutes.

C. Commence placing the plant in Hot Standby conditions within the next 30 minutes.

D. Start the Containment Purge and verify a negative pressure in Containment within 1 hour.

QID use History

	RO	SRO
2003	☐	☐
2005	☑	☑
2006	☐	☐
2008	☐	☐
2009	☑	☑

Audit Exam History

2009	☐

Answer:

A. Verify at least one Personnel Hatch air lock door is Operable and Closed within 1 hour.

Notes:

Containment Integrity is lost when the interlock on the doors failed. This requires Containment integrity to be restored in 1 hour in Mode 1 per TS 3.6.1.1.
TS 3.6.1.3 allows closing of one operable air lock door to restore Containment integrity.
Distracter B is incorrect because TS 3.6.1.3 allows 24 hours to restore the interlock to Operable Status.
Distracter C is incorrect because TS 3.6.1.3 allows closing of one operable air lock door to restore Containment integrity instead of a plant shutdown or the plant shutdown can be started later than 1 hour as long as hot standby is achieved in 6 hours.
Distracter D is incorrect because Containment Purge is not allowed in this mode.

References:

TS 3.6.1.1, Primary Containment Integrity, Amendment 269
TS 3.6.1.3, Containment Air Locks, Amendment 175
T.S Definition 1.8, Containment Integrity, Amendment 157
STM 2-13, Containment Building Rev. 14, Sections 4.3.2 and 4.3.2.1
Lesson Plan A2LP-RO-TS, OBJ. 4.b, From memory, discuss the LCOs and actions statements for all LCOs with

action statements less than or equal to one hour.
A2LP-WCO-CBLDG, OBJ. 23 List the components required to be OPERABLE to satisfy the Containment Related System LCOs.

Historical Comments:

Original Question was used on the 2005 NRC Exam

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Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank:	1664	**Rev:**	0	**Rev Date:**	5/21/2009 1:46:15	**QID #:**	55	**Author:**	Coble		
Lic Level:	R	**Difficulty:**	3	**Taxonomy:**	H	**Source:**	New				
Search	1030002123	**10CFR55:**	41.10 / 43.5 / 45.2 / 45	**Safety Function**	5						
System Title:	Containment System			**System Number**	103	**K/A**	2.1.23				
Tier:	2	**Group:**	1	**RO Imp:**	4.3	**SRO Imp:**	4.4	**L. Plan:**	A2LP-RO-ELOCA	**OBJ**	6

Description: Conduct of Operations - Ability to perform specific system and integrated plant procedures during all modes of plant operation.

Question:

Consider the following:

* Unit 2 has tripped from full power due to a Large break LOCA
* RCS Pressure is 52 psia and slowly lowering
* Containment pressure is 47 psia and slowly lowering
* RWT Level has been 5.7% for about 20 minutes
* There are indications of rising radiation in containment

Given these conditions the minimum required Containment Spray Header flow would be _____ and this required flow is based on _____.

A. 2000 gpm; providing adequate flow through the reactor core

B. 1875 gpm; providing adequate flow through the reactor core

C. 2000 gpm; cooling containment and associated components

D. 1875 gpm; cooling containment and associated components

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☑	☑

Audit Exam History

2009	☐

Answer:

C. 2000 gpm; cooling containment and associated components

Notes:

A flow of greater than 1875 should be verified prior to Recirculation Actuation Signal (RAS) conditions (< 6% in the RWT) but after the RAS, the Spray pump mini recircs isolations close and flow should be verified at > 2000 gpm. The spray flow cools the containment and the water in the Containment Sump which the HPSI pumps uses to cool the core. Distracters B and D are incorrect because of the lower flow. Distracters A and B are incorrect because the spray pumps are not providing the flow through the core.

References:

EOP 2202.003 LOCA, Rev. 10, Section 1 Step 16.E and Section 3 Step 21 C.
EOP Tech Guide 2202.003 LOCA, Rev. 10, Section 3 Step 21
Lesson Plan A2LP-RO-ELOCA, Rev. 6, Objective 6:Given a set of plant conditions during a LOCA, demonstrate understanding of the LOCA EOP and ability to use the LOCA EOP to control the plant

Historical Comments:

Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank: 1665 **Rev:** 0 **Rev Date:** 4/21/2009 11:03:1 **QID #:** 56 **Author:** Coble

Lic Level: R **Difficulty:** 2 **Taxonomy:** F **Source:** New

Search 001000K205 **10CFR55:** 41.7 **Safety Function** 1

System Title: Control Rod Drive System **System Number** 001 **K/A** K2.05

Tier: 2 **Group:** 2 **RO Imp:** 3.1 **SRO Imp:** 3.5 **L. Plan:** A2LP-RO-CEDM **OBJ** 8

Description: Knowledge of bus power supplies to the following: - M/G sets

Question:

Given the following conditions:

* A manual reactor trip is attempted and the reactor does NOT trip after depressing ALL the manual trip pushbuttons including DSS.
* A SPTA contingency action requires the power supply to the CEDM MG Sets to be de-energized.

Which ONE of the following will accomplish this action from the control room?

A. Open 480V Load Center 2B5 and 2B6 feeder breakers (2B-512 and 2B-612).

B. Open 480V Load Center 2B7 and 2B8 feeder breakers (2B-712 and 2B-812).

C. Open 480V MCC 2B31 and 2B41 feeder breakers (2B-321 and 2B-421).

D. Open 480V MCC 2B71 and 2B81 feeder breakers (2B-732 and 2B-823).

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☑	☑

Audit Exam History

2009	☐

Answer:

B. Open 480V Load Center 2B7 and 2B8 feeder breakers (2B-712 and 2B-812).

Notes:

Unit 2 De-energizing 2B7 and 2B8 will de-energize power to the CEDM MG Sets which will cause a loss of Power to the CEA drives which will cause them to Scram the Reactor. Distracters A, C, and D are incorrect because they will not de-energize the CEA Drives to cause a Scram.;

References:

EOP 2202.001, SPTAs, Rev. 9, Step 3 Contingency Action A. 2.a.
STM 2-02, CEDMCS, Rev. 18, Section 5.2 and Figure on page 82..
Lesson Plan A2LP-RO-CEDM, Rev. 11, Objective 8: From memory draw a one-line diagram of the CEDMCS electrical distribution from the MG Sets to the cabinets 2C-70 and 2C71.

Historical Comments:

Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank: 1666 **Rev:** 0 **Rev Date:** 4/21/2009 3:13:02 **QID #:** 57 **Author:** Coble

Lic Level: R **Difficulty:** 3 **Taxonomy:** H **Source:** New

Search 014000K406 **10CFR55:** 41.7 **Safety Function** 1

System Title: Rod Position Indication System (RPIS) **System Number** 014 **K/A** K4.06

Tier: 2 **Group:** 2 **RO Imp:** 3.4 **SRO Imp:** 3.7 **L. Plan:** A2LP-RO-CPC **OBJ** 17

Description: Knowledge of RPIS design feature(s) and/or interlock(s) which provide for the following: - Individual and group misalignment

Question:

During an approach to criticality in Manual Sequential (MS) Mode a CEA Withdrawal Prohibit (CWP) will stop subgroup misalignment if one subgroup within a regulating group is deviated by _____ and will stop an individual CEA deviation within a subgroup if a CEA is deviated by _____.

A. 4.95 inches as detected by CPCs; 5.0 inches as detected by CEACs

B. 5.0 inches as detected by CPCs; 4.95 inches as detected by CEACs

C. 4.95 inches as detected by CEACs; 5.0 inches as detected by CPCs

D. 5.0 inches as detected by CEACs; 4.95 inches as detected by CPCs

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☑	☑

Audit Exam History

2009	☐

Answer:

A. 4.95 inches as detected by CPCs; 5.0 inches as detected by CEACs

Notes:

A CEA Withdrawal Prohibit, CWP, will stop subgroup misalignment if one subgroup within a regulating group is deviated by 4.95 inches as detected by CPC target rods and will stop an individual CEA deviation within a subgroup if a CEA is deviated by 5.0 inches as detected by CEACs.

References:

ACA 2203.012J, Annunciator 2K10 Corrective Actions, Rev 35, Window 2K10-B1.
STM 2-02, CEDMCS, Rev 18 Section 8.2
STM 2-65-1, Core Protection Calculator System, Rev 13, Section 2.4.3.
Lesson Plan A2LP-RO-CPC, Rev. 12, Objective 17: List the conditions that will cause a CEA Withdrawal Prohibit (CWP).

Historical Comments:

Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank: 1667 **Rev:** 0 **Rev Date:** 4/22/2009 9:48:08 **QID #:** 58 **Author:** Coble

Lic Level: R **Difficulty:** 2 **Taxonomy:** H **Source:** New

Search 016000A402 **10CFR55:** 41.7 / 45.5 to 45.8 **Safety Function** 7

System Title: Non-Nuclear Instrumentation System (NNIS) **System Number** 016 **K/A** A4.02

Tier: 2 **Group:** 2 **RO Imp:** 2.7 **SRO Imp:** 2.6 **L. Plan:** A2LP-RO-FWCS **OBJ** 13

Description: Ability to manually operate and/or monitor in the control room: - Recorders

Question:

Consider the following:

* Unit 2 is at 50% power during a power ascension
* FWCS is in Automatic.
* The Red and Blue pen on the 'A' SG Narrow Range Level Recorder (2LR-1033/1034) is indicating 66%.
* The Red and Blue pen on the 'B' SG Narrow Range Level Recorder (2LR-1133/1134) is indicating 64%.

Based on these conditions, the Level Deviation alarm for the 'A' SG on 2K03 _____ be in and the Level Deviation alarm for the 'B' SG on 2K03 _____ be in.

A. would; would NOT

B. would NOT; would

C. would; would

D. would NOT; would NOT

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☑	☑

Audit Exam History

2009	☐

Answer:

B. would NOT; would

Notes:

The SG Narrow Range Setpoint changes from 60% level to 70 % level based on approximately 25% Turbine first stage pressure. At 50 % power, the Main turbine will be on line and would already be above 25% turbine first stage pressure so SG level setpoint would be 70% instead of 60%. The level deviation alarm comes in when actual SG level as indicated on the recorders deviates by more than 5% from setpoint.
'A' SG level has only deviated 4% from setpoint so its deviation alarm would not be in. 'B' SG level has deviated 6% from setpoint so its alarm should be in.

References:

STM 2-69, FWCS, Rev. 9 Section 2.3.7 and 4.2
ACA 2203.012C, Rev. 26, Alarm for Window 2K03 H-3, Level Deviation.
Lesson Plan A2LP-RO-FWCS. Rev. 12: Discuss the alarms associated with the FWCS.

Historical Comments:

This Question has never been used on a NRC Exam

Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank:	1668	**Rev:**	0	**Rev Date:**	4/22/2009 11:35:1	**QID #:**	59	**Author:**	Coble		
Lic Level:	R	**Difficulty:**	2	**Taxonomy:**	F	**Source:**	New				
Search	017000K601	**10CFR55:**	41.7 / 45.7	**Safety Function**	7						
System Title:	In-Core Temperature Monitor (ITM) System			**System Number**	017	**K/A**	K6.01				
Tier:	2	**Group:**	2	**RO Imp:**	2.7	**SRO Imp:**	3.0	**L. Plan:**	A2LP-RO-ICI	**OBJ**	6
Description:	Knowledge of the effect of a loss or malfunction of the following will have on the ITM System components: - Sensors and detectors										

Question:

There are 42 Core Exit Thermocouples (CETs) at the top of each incore instrument.

If some of the incore instruments and their associated CET were to fail, how many CET indications must be left to monitor the core temperature during post accident conditions and not require a T.S LCO entry.

A. Greater than 75% of 42 or 32 total CETs available..

B. At least 6 CETs per core quadrant available.

C. At least 2 CETs per core quadrant available.

D. Greater than 19% of 42 or 8 total CETs available.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☑	☑

Audit Exam History

2009	☐

Answer:

C. At least 2 thermocouples per core quadrant available.

Notes:

Post Accident TS. 3.3.3.6 requires 2 CETs per core quadrant or Action 1 LCO will be applicable. The SAR requires 75% of all incore instruments to be operable and at least enough incore instruments to provide 6 tilt estimates; however, these are not TS requirements nor requirements for the CETs. If 2CETs are available per core quadrant then 8 total would be available which is 19% of 42. Distracter D is incorrect because the 8 could all be in one quadrant which would not meet the T.S.

References:

T. S 3.3.3.6, Post Accident Monitoring, Table 3.3-10, Amendment 255
STM 2-67-2, Incore Flux Monitoring System, Rev. 4, Sections 2.1 and 5.0.
Lesson Plan A2LP-RO-ICI, Rev. 11, Objective 6: Explain the applicable Operating requirements and surveillances for the Incore Flux Monitoring System as described in the SAR.

Historical Comments:

Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank:	1669	**Rev:**	0	**Rev Date:**	4/22/2009 1:38:50	**QID #:**	60	**Author:**	Coble		
Lic Level:	R	**Difficulty:**	2	**Taxonomy:**	H	**Source:**	New				
Search	028000A102	**10CFR55:**	41.5 / 45.5	**Safety Function**	5						
System Title:	Hydrogen Recombiner and Purge Control Syste	**System Number**	028	**K/A**	A1.02						
Tier:	2	**Group:**	2	**RO Imp:**	3.4	**SRO Imp:**	3.7	**L. Plan:**	A2LP-RO-CONH2	**OBJ**	13

Description: Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the HRPS controls including: - Containment pressure.

Question:

Given the following:

* The plant has tripped due to a Loss of Coolant Accident.
* Currently Containment temperature is 178°F.
* Containment Pressure is currently 23 psia.
* Prior to the accident, Containment temperature was 115°F.
* Prior to the accident, Containment pressure was 14.6 psia.
* Hydrogen Recombiner 2M-55A has been started for hydrogen control.

Once 2M-55A is warmed up, which of the following would be the power requirement for these conditions.? (Reference Provided)

A. 65 MW

B. 66 MW

C. 65 KW

D. 66 KW

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☑	☑

Audit Exam History

2009	☐

Answer:

C. 65 KW

Notes:

Based on a pre-LOCA containment temperature of 115°F and a post LOCA pressure of 23 psia, the Recombiner Power Requirement will be 65 KW.

Provide 2104.044 Attachment F as a reference.

References:

NOP 2104.044, Containment Hydrogen Control Operations, Rev. 31, Step 9.1.13 and Attachment F.
Lesson Plan A2LP-RO-CONH2 Rev. 3, Objective 13: From memory, describe the operation of the hydrogen recombiner system

Historical Comments:

Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank:	1670	**Rev:**	0	**Rev Date:**	4/23/2009 8:33:43	**QID #:**	61	**Author:**	Jim Wright		
Lic Level:	R	**Difficulty:**	3	**Taxonomy:**	F	**Source:**	New				
Search	034000A303	**10CFR55:**	41.7 / 45.5	**Safety Function**	8						
System Title:	Fuel Handling Equipment System (FHES)	**System Number**	034	**K/A**	A3.03						
Tier:	2	**Group:**	2	**RO Imp:**	2.9	**SRO Imp:**	3.3	**L. Plan:**	A2LP-RO-NI	**OBJ**	5

Description: Ability to monitor automatic operation of the Fuel Handling System, including: - High flux at shutdown

Question:

Given the following plant condition:

* Unit 2 is in Mode 6 with a core reload in progress.
* Source range neutron flux monitor #1 indication has failed low and is declared inoperable.

Which of the following is required to comply with technical specifications ?

A. Core alterations may continue because technical specifications only require one channel of visible indication of source range monitoring to be operable.

B. Core alterations may NOT continue because technical specifications require two channels of visible indication of source range monitoring to be operable.

C. Core alterations may continue because technical specifications require only one channel of source range monitoring operable with audible counts available.

D. Core alterations may NOT continue because technical specifications require two channels of source range monitoring operable with audible counts available on both.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☑	☑

Audit Exam History

2009	☐

Answer:

B. Core alterations may not continue because technical specifications require two channels of visible indication of source range monitoring to be operable.

Notes:

Technical Specification 3.9.2 requires 2 visual and 1 audible indication of neutron flux levels available to the control room crew during core alterations. Distracters A and C are correct because two channels are required to be operable to move fuel. Distracter D is incorrect because audible counts are only required on one channel.

References:

Technical Specification 3.9.2 LCO
NOP 2502.001, Refueling Shuffle, Revision 37, Step 6.20
Lesson Plan A2LP-RO-NI, Nuclear Instrumentation, Rev. 11 Objective 5: Describe the operation and indications of the Boron Dilution Monitors. Lesson Plan A2LP-RO-TS, Rev. 11 Objective 4b: From memory, discuss the LCOs and actions statements for all LCOs with action statements less than or equal to one hour.

Historical Comments:

Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank:	1671	**Rev:**	0	**Rev Date:**	2/7/2000	**QID #:**	62	**Author:**	Hatman		
Lic Level:	R	**Difficulty:**	3	**Taxonomy:**	H	**Source:**	NRC Exam Bank 0261				
Search	045000K301	**10CFR55:**	41.7 / 45.6	**Safety Function**	4						
System Title:	Main Turbine Generator (MT/G) System			**System Number**	045	**K/A**	K3.01				
Tier:	2	**Group:**	2	**RO Imp:**	2.9	**SRO Imp:**	3.2	**L. Plan:**	A2LP-RO-SDBCS	**OBJ**	19
Description:	Knowledge of the effect that a loss or malfunction of the MT/G System will have on the following: - Remainder of the plant										

Question:

With no operator action, which of the following sets of parameters match plant response for a turbine trip from 50% Reactor Power?

A. Reactor tripped, Tave approximately 545°F.

B. Reactor tripped, Tave approximately 562°F.

C. Reactor power approximately 50%, Tave approximately 545°F.

D. Reactor power approximately 50%, Tave approximately 562°F.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☑	☑

Audit Exam History

2009	☐

Answer:

D. Reactor power approximately 50%, Tave approximately 562°F.

Notes:

Available Steam Dump capacity on Unit 2 in a normal line up is approximately 50%. Therefore on a trip from 50% power, the Steam Dumps should be able to maintain the reactor online at ~50% power. Tave should be higher than no load Tave of 545°F and should be ~562°F at 50% power.

References:

NOP 2102.004, Power Operation, Rev. 41, Attachment C, RCS Temperature verses Reactor Power.
STM 2-23, SDBCS, Rev. 12, Section 1.2
Lesson Plan A2LP-RO-SDBCS, Rev. 11, Objective 19: With regards to the SDBCS, describe the normal system parameter values expected during various plant operating modes.

Historical Comments:

Question was used on the 2000 NRC exam.

Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank:	1672	**Rev:**	0	**Rev Date:**	4/22/2009 4:19:24	**QID #:**	63	**Author:**	Coble		
Lic Level:	R	**Difficulty:**	3	**Taxonomy:**	H	**Source:**	New				
Search	068000A202	**10CFR55:**	41.5 / 43.5 / 45.3 / 45.	**Safety Function**	9						
System Title:	Liquid Radwaste System (LRS)			**System Number**	068	**K/A**	A2.02				
Tier:	2	**Group:**	2	**RO Imp:**	2.7	**SRO Imp:**	2.8	**L. Plan:**	A2LP-RO-RWST	**OBJ**	6.b.3

Description: Ability to (a) predict the impacts of the following malfunctions or operations on the Liquid Radwaste System and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: - Lack of tank recirculation prior to release.

Question:

Given the following:

* Unit 2 is at normal full power operation.
* Unit 1 has 3 Circulating Water (CW) pumps operating.
* Liquid Waste Condensate Tank 2T-21A release has just started at 50 gpm.
* Annunciator 2K11 C-10 "PROC LIQUID RADIATION HI/LO" come in.
* A check of BMS/LRW Radiation Monitor 2RE-2330 shows a rising radiation trend prior to the annunciator coming in.
* The setpoint of BMS/LRW Radiation monitor 2RE-2330 was exceeded.

Which one of the following conditions could have caused this rise in activity and what action should be taken?

A. Unit 1 secured a CW pump reducing dilution flow; secure the release until adequate CW flow is established.

B. The radiation monitor setpoint was set too high prior to the release; reset the radiation monitor to the correct setpoint and restart release.

C. The 2T-21A tank was not adequately recirculated prior to chemistry sample; secure the release and obtain a new sample after adequate recirc time.

D. The 2T-21A discharge pump recirculation valve, 2LRW-32A was inadvertently opened; throttle the recirculation valve closed until activity lowers.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☑	☑

Audit Exam History

2009	☐

Answer:

C. The 2T-21A tank was not adequately recirculated prior to chemistry sample; secure the release and obtain a new sample after adequate recirc time.

Notes:

Inadequate recirc time could cause the sample results to be in error and predict a lower activity in the tank than actually exist at the time of the release which would drive the Alarm setpoint to be set too low. Distracter A is incorrect because only 2 CW pumps on Unit One are required for a release because 2 provide enough dilution flow. Also this change in flow is downstream of the radiation monitor and would not be seen by the monitor. Distracter B is incorrect because if the setpoint is set higher than required, the release alarm would not come in. Distracter D is incorrect because throttling open the recirc valve would lower process flow and actually lower activity at the monitor.

References:

NOP 2104.014, LRW and BMS Operations. Rev. 48, Step 29 and Supplement 1 Step 1.8.
Chemistry procedure 2607.009, Sampling the 2T-21A/B Tank, Rev. 9, Step 7.3.
STM 2-52, LRW/BMS, Rev. 14, Drawing on Page 36.
Lesson Plan A2LP-RO-RWST, Radwaste Systems, Rev. 6, Objective 6.a.1: Describe the following tasks associated with the radioactive waste operating procedures: Perform a Waste Condensate Tank 2T-21A/B Release.

Historical Comments:

Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank:	1673	**Rev:**	0	**Rev Date:**	4/23/2009 9:42:19	**QID #:**	64	**Author:**	Coble		
Lic Level:	R	**Difficulty:**	3	**Taxonomy:**	H	**Source:**	New				
Search	0750002128	**10CFR55:**	41.7	**Safety Function**	8						
System Title:	Circulating Water System			**System Number**	075	**K/A**	2.1.28				
Tier:	2	**Group:**	2	**RO Imp:**	4.1	**SRO Imp:**	4.1	**L. Plan:**	A2LP-RO-CWS	**OBJ**	2
Description:	Conduct of Operations - Knowledge of the purpose and function of major system components and controls.										

Question:

Given the following:

* The Service Water Squeeze Valve, (2CV-1460) is in automatic.

If the Circulating Water cooling tower basin rises above its current setpoint of 80%, then the Service Water Squeeze Valve, 2CV-1460, will _____ to provide _____ Service Water makeup flow to the Circulating Water cooling tower.

A. open; less

B. close; more

C. open; more

D. close; less

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☑	☑

Audit Exam History

2009	☐

Answer:

A. open; less

Notes:

The position of 2CV 1460 determines the back pressure on the service water and auxiliary cooling water return headers, and thus the flow of service water and auxiliary cooling water to the circulating water cooling tower basin. When 2CV 1460 is open minimum makeup flow is directed to the cooling tower basin. When the squeeze valve is throttled closed, the back pressure on the service water return header rises. This causes water from the return header to divert to the cooling tower basin if service water valve 2CV-1540 is open.

References:

STM 2-40-1, CWS, Rev. 24, Section 2.1.6.
STM 2-42, Service Water System, Rev. 28, Figure on page 61.
Lesson Plan A2LP-RO-CWS, Rev. 8, Objective 2: Describe the operation of the CWS cooling tower including de-icing, bypassing, and makeup.

Historical Comments:

Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank:	1674	**Rev:**	0	**Rev Date:**	4/23/2009 11:03:4	**QID #:**	65	**Author:**	Coble		
Lic Level:	R	**Difficulty:**	3	**Taxonomy:**	F	**Source:**	New				
Search	086000K504	**10CFR55:**	41.5 / 45.7	**Safety Function**	8						
System Title:	Fire Protection System (FPS)			**System Number**	086	**K/A**	K5.04				
Tier:	2	**Group:**	2	**RO Imp:**	2.9	**SRO Imp:**	3.5	**L. Plan:**	ASLP-FP-ELEC	**OBJ**	1.2

Description: Knowledge of the operational implications of the following concepts as they apply to the Fire Protection System: - Hazards to personnel as a result of fire type and methods of protection

Question:

Given the following:

* Unit 2 is in a refueling outage.
* A report comes in from the fire brigade leader that a Class 'C" fire is in progress on the 372 elevation in containment.

What kind of hazards exist to the personnel during this fire and which action can be taken to reduce this hazard?

A. Smoke inhalation from burning trash; evacuate the containment building.

B. Intense heat from burning oil; align fire water to the containment building.

C. Potential electrocution; de-energized the applicable power supply to containment.

D. Flying sparks from burning metal; evacuate the local area on the 372 elevation.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☑	☑

Audit Exam History

2009	☐

Answer:

C. Potential electrocution; de-energized the applicable power supply to containment.

Notes:

There are 2 480 Volt MCC electrical buses on the 372 elevation in containment (2B71 and 2B81). A class C fire would be in one of those buses as they are the only major electrical components on that elevation. A trash fire is a Class A fire. Oil is a Class B fire and burning metal is a Class D fire.

References:

STM 2-32-3, 480 Volt Distribution System, Rev. 13, Table 2 on page 42.
Lesson Plan ASLP-FP-ELEC, Fighting Electrical Fires.Rev.2, Objectives 1.2: Discuss the hazards associated with fires involving energized electrical equipment and cables and 1.4: Describe the actions necessary to control a Class "C" Fire.

Historical Comments:

Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank: 1675 **Rev:** 0 **Rev Date:** 4/28/2009 9:20:15 **QID #:** 66 **Author:** Coble

Lic Level: R **Difficulty:** 2 **Taxonomy:** F **Source:** New

Search 1940012115 **10CFR55:** 41.10 / 45.12 **Safety Function**

System Title: Generic **System Number** GENERIC **K/A** 2.1.15

Tier: 3 **Group:** 1 **RO Imp:** 2.7 **SRO Imp:** 3.4 **L. Plan:** ASLP-RO-OPSPR **OBJ** 4.e.1

Description: Conduct of Operations - Knowledge of administrative requirements for temporary management directives, such as standing orders, night orders, Operations memos, etc.

Question:

Which one of the following contains the Reactor Coolant Pumps (RCPs) that have Operational Decision Making Issues (ODMIs) associated with them and the correct trigger point that would cause further action to be taken?

A. RCPs 2P-32A and 2P-32B; High Seal DP

B. RCPs 2P-32B and 2P-32C; Low Seal DP

C. RCPs 2P-32C and 2P-32D; High Controlled Bleed off Flow

D. RCPs 2P-32A and 2P-32C; Low Controlled Bleed off Flow

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☑	☑

Audit Exam History

2009	☐

Answer:

B. RCPs 2P-32B and 2P-32C; Low Seal DP

Notes:

RCPs B and C have degraded seals during this current operating cycle. The lower seal on 2P-32B and the middle seal on 2P-32C. The ODMIs are like standing orders to take further action is the seals continue to degrade. Normal Seal DP is around 700 psid for each seal. Currently the DP across the degraded seals are 575 to 650 psid. The ODMIs establishes 300 psid as a trigger point to take further action above monitoring. There are programmable alarms set in the control room that will come in if the trigger point is reached on either pump.

References:

ODMI Procedure EN-OP-111, Rev. 1 Purpose 1.
ODMIs for 2P-32B Rev. 1 and 2P-32C Rev. 2.
EN-OP-115, Conduct of Operations, Rev. 6, Attachment 9.1, Beginning of Shift Brief Checklist - Review all current Operations Shift Standing Orders.
Lesson Plan ASLP-RO-OPSPR Rev. 11, Objective 4.e.1 Describe the requirements associated with: Shift Turnovers and Relief.

Historical Comments:

Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank:	1676	**Rev:**	0	**Rev Date:**	4/28/2009 4:34:18	**QID #:**	67	**Author:**	Coble		
Lic Level:	R	**Difficulty:**	2	**Taxonomy:**	F	**Source:**	IH Exam Bank OPS2-10632 Modified				
Search	1940012118	**10CFR55:**	41.10 / 45.12 / 45.13	**Safety Function**							
System Title:	Generic			**System Number**	GENERIC	**K/A**	2.1.18				
Tier:	3	**Group:**	1	**RO Imp:**	3.6	**SRO Imp:**	3.8	**L. Plan:**	ASLP-RO-OPSPR	**OBJ**	4.e.3
Description:	Conduct of Operations - Ability to make accurate, clear, and concise logs, records, status boards, and reports.										

Question:

Given the following:

* The plant is at full power.
* An ECCS pump becomes inoperable.

Which ONE of the following contains all of the required information that should be included when making entries onto the Plant/Safety System Status Board in the Control Room?

A. Component name/number, component status, date and time, initials of person making entry.

B. Component name/number, date and time, last name of the CRS, plant power level.

C. Plant power level, component name/number, last name of the CRS, date of TS entry.

D. Component status, plant power level, initials of person making entry, component name/number.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☑	☑

Audit Exam History

2009	☐

Answer:

A. Component name/number, component status, date and time, initials of person making entry.

Notes:

Entries on Plant/Safety System Status Board should be brief, but contain all of the following: Component name/number. Component status (isolated, bypassed, etc.) and associated LCO time clock if applicable. WR/WO/CR number as applicable. Date/Time, if in TS/TRM/ODCM/AOT time clock (Time not required if time clock does not apply. Initials of person making the entry.

References:

COPD-001 Operations Expectations and Standards, Rev. 38, Step 12.1.7.
Lesson Plan ASLP-RO-OPSPR, OPS Admin Procedures, Rev. 11, Objective 4.e.3: Describe the requirements associated with: Use of Status Boards

Historical Comments:

Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank: 1677 **Rev:** 0 **Rev Date:** 4/29/2009 9:11:33 **QID #:** 68 **Author:** Coble

Lic Level: R **Difficulty:** 2 **Taxonomy:** F **Source:** New

Search 1940012207 **10CFR55:** 41.10 / 43.3 / 45.13 **Safety Function**

System Title: Generic **System Number** GENERIC **K/A** 2.2.7

Tier: 3 **Group:** 1 **RO Imp:** 2.9 **SRO Imp:** 3.6 **L. Plan:** ASLP-RO-PRCON **OBJ** 15

Description: Equipment Control - Knowledge of the process for conducting special or infrequent tests.

Question:

Which one of the following evolutions requires a Infrequently Performed Test or Evolution (IPTE) brief prior to conducting and also list the appropriate management oversight for the IPTE?

A. Turbine Generator Valve Stroke Test offline; The onshift Shift Manager

B. Beginning of cycle Reactor Startup from outage; The onshift Shift Manager

C. Turbine Generator Valve Stroke Test online; Assistant OPS Manager

D. Mid cycle Reactor Startup from post trip; Assistant OPS Manager

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☑	☑

Audit Exam History

2009	☐

Answer:

D. Mid cycle Reactor Startup from post trip; Assistant OPS Manager

Notes:

A Reactor Startup at any point in the cycle requires a IPTE to be performed. The Valve stroke surveillance is a quarterly and thus does not meet the infrequent requirement. The definition of senior line management in the IPTE procedure is someone senior to the shift manager (he/she is considered senior line management at all other times) These Senior Line Managers are designated by a letter from the GMPO to be the IPTE representatives.

References:

Procedure EN-OP-116, IPTEs, Rev. 2 Section 3.0 Steps 3 and 5. Also Attachment 9.1,
Designation letter from the GMPO on who can be the Senior Line Manager for the brief.
OP-2102.016, Reactor Startup Procedure, Rev. 13, Note above step 7.32.
OP-2106.009, Supplement 3, Rev. 51, Turbine Generator Valve Stroke Test, Section 1.0.
Lesson Plan, ASLP-RO-PRCON, Describe the mandatory requirements for any activity designated as an Infrequently Performed Test or Evolution.

Historical Comments:

Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank: 1678 **Rev:** 0 **Rev Date:** 4/29/2009 11:19:5 **QID #:** 69 **Author:** Coble

Lic Level: R **Difficulty:** 2 **Taxonomy:** F **Source:** New

Search 1940012221 **10CFR55:** 41.10 / 43.2 **Safety Function**

System Title: Generic **System Number** GENERIC **K/A** 2.2.21

Tier: 3 **Group:** 1 **RO Imp:** 2.9 **SRO Imp:** 4.1 **L. Plan:** ASLP-RO-OPSPR **OBJ** 4.j.2.h

Description: Equipment Control - Knowledge of pre- and post-maintenance operability requirements.

Question:

Given the following:

* The plant is at full power.
* Emergency Diesel Generator 2DG1 outage in progress.
* The Service Water Outlet Valve from 2DG1, 2CV-1503-1, needs to be repacked due to leakage.

Prior to performing maintenance on 2CV-1503-1, the valve should be _____ and after maintenance on 2CV-1503-1, the valve should be _____stroked to ensure operability with the new packing.

A. isolated and tagged out; manually

B. placed on the backseat; electrically

C. placed on the backseat; manually

D. isolated and tagged out; electrically

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☑	☑

Audit Exam History

2009	☐

Answer:

D. isolated and tagged out; electrically

Notes:

2CV-1503-1 is an electrical MOV butterfly isolation valve and cannot be back seated to isolate the packing. All MOVs are required to be stroked electrically after maintenance to verify operability.

References:

OP 1015.001, Conduct of Operations, Rev.72. Note above Step 11.2
STM 2-42, Service Water, Rev. 28, Section 3.5.8.
Lesson Plan ASLP-RO-OPSPR, OPS Admin Procedures, Rev. 11, Objective 4.j.2.h: Steps taken to restore MOV to operable status following maintenance.

Historical Comments:

Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank: 1679 **Rev:** 0 **Rev Date:** 4/29/2009 1:18:59 **QID #:** 70 **Author:** Coble

Lic Level: R **Difficulty:** 2 **Taxonomy:** F **Source:** New

Search 1940012223 **10CFR55:** 41.7 / 41.10 / 43.2 / 45 **Safety Function**

System Title: Generic **System Number** GENERIC **K/A** 2.2.23

Tier: 3 **Group:** 1 **RO Imp:** 3.1 **SRO Imp:** 4.6 **L. Plan:** ASLP-RO-OPSPR **OBJ** 4.d.1

Description: Equipment Control - Ability to track Technical Specification limiting conditions for operations.

Question:

Given the following:

* The plant is at full power at 0900 on dayshift.
* Charging Pump 2P36C is tagged out for cracked plunger block replacement.
* Charging Pump 2P-36A has been declared inoperable for maintenance to perform pulsation damper checks prior to the upcoming quarterly surveillance.
* Total estimated time prior to returning pump back to operable status is 1 hour.

Which one of the following list the required documentation needed to track the Technical Requirements for Operation (TRO) entry and exit for this maintenance?

A. Inoperable Equipment Checklist, Station Log entry, and a Status Board entry.

B. Station Log entry, LCO Tracking Record, and a Status Board entry.

C. LCO Tracking Record , Station Log entry, and an Inoperable Equipment Checklist.

D. Status Board entry, Station Log entry, and a TRO tracking Record.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☑	☑

Audit Exam History

2009	☐

Answer:

A. Inoperable Equipment Checklist, Station Log entry, and a Status Board entry.

Notes:

These condition would require an entry into TRM 3.1.2.4, Charging Pumps. A LCO Tracking Record is required for any TS, TRM, ODCM, or Fire Spec entry that is expected to last more than a shift (12 hours). An Inoperable Equipment Checklist, Station Log entry, and a Status Board update are required for all TS, TRM, ODCM, or Fire Spec entries. This evolution will last less than a shift so no LCO Tracking Record is required. TRO tracking records are not used.

References:

T.S. 3.1.2.4, Charging Pumps.
OP 1015.001, Conduct of Operations, Rev.72. Step 8.1.2 6th bullet and step 8.1.3.C.
COPD-001 Operations Expectations and Standards, Rev. 38, Step 12.1.9.
Lesson Plan ASLP-RO-OPSPR, OPS Admin Procedures, Rev. 11, Objective 4.d.1/2/3: Describe the Operating Logs and Records taken by Operations Personnel, Describe the Narrative Logs maintained by Operations and Describe the actions and occurrences that are required to be recorded in the Station and Control Room logs.

Historical Comments:

Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank:	1680	**Rev:**	0	**Rev Date:**	3/12/2000	**QID #:**	71	**Author:**	Woolf		
Lic Level:	R	**Difficulty:**	3	**Taxonomy:**	H	**Source:**	NRC Exam Bank 0297				
Search	1940012304	**10CFR55:**	41.12 / 43.4 / 45.10	**Safety Function**							
System Title:	Generic			**System Number**	GENERIC	**K/A**	2.3.4				
Tier:	3	**Group:**	1	**RO Imp:**	3.2	**SRO Imp:**	3.7	**L. Plan:**	ASLP-RO-RADP	**OBJ**	14
Description:	Radiological Controls - Knowledge of radiation exposure limits under normal or emergency conditions.										

Question:

Plant conditions are:

* Plant has been shutdown for refueling.
* Acid reducing chemistry has created a large RCS crud burst.
* Whole body general area dose rates are 3 Rem/hr in the "B" ESF Room.

A female WCO who is NOT declared pregnant with complete exposure records is assigned to align the "B" SDC train for decay heat removal. This job is expected to take 30 minutes.

The WCO has a radiation history of 1000 mrem exposure for this year.

Which of the following statements is correct for the additional dose that will be received by performing this system alignment with the above conditions?

A. WCO will NOT exceed routine annual ANO Admin whole body (TEDE) limits for radiation workers.

B. WCO will NOT exceed routine annual ANO Admin whole body (TEDE) limits for female radiation workers.

C. WCO will exceed annual Federal whole body (TEDE) limits for this female radiation workers.

D. WCO will exceed routine annual ANO Admin whole body (TEDE) limits for radiation workers.

QID use History

	RO	SRO
2003	☐	☐
2005	☑	☑
2006	☐	☐
2008	☐	☐
2009	☑	☑

Audit Exam History

2009	☐

Answer:

D. WCO will exceed routine annual ANO Admin whole body (TEDE) limits for radiation workers.

Notes:

Radiation history of 1000 mrem shows that WCO is a radiation worker with limits the same as males.
A is incorrect because the TEDE ANO Routine Admin limit is 2 Rem/yr for rad workers. Total exposure after this job would be 2.5 Rem.
B is incorrect because the ANO Routine Admin limits are the same for Female rad worker who is not pregnant and rad worker.
C is incorrect because Federal limits are 5 Rem/yr..
D is correct because the additional dose is 1500 mrem which is added to 1000 mrem to make 2500 mrem which exceeds the admin limit of 2.0 Rem/yr.

References:

Procedure RP-201, Rev. 2, Dosimetry Administration, Step 5.3 [3]
Lesson Plan ASLP-RO-RADP, Rev. 5, Radiation Protection, OBJ. 14, Define the ANO Administrative Exposure Limits.

Data for 2009 NRC RO/SRO Exam

18-Jun-09

Historical Comments:

Last used on the 2005 NRC exam.

Bank: 1681 **Rev:** 0 **Rev Date:** 4/29/2009 3:16:08 **QID #:** 72 **Author:** Coble

Lic Level: R **Difficulty:** 3 **Taxonomy:** H **Source:** New

Search 1940012311 **10CFR55:** 41.11 / 43.4 / 45.10 **Safety Function**

System Title: Generic **System Number** GENERIC **K/A** 2.3.11

Tier: 3 **Group:** 1 **RO Imp:** 3.8 **SRO Imp:** 4.3 **L. Plan:** A2LP-RO-EAOP **OBJ** 15

Description: Radiological Controls - Ability to control radiation releases.

Question:

Given the following plant conditions:

* Plant is operating at 100% power.
* Chemistry reports that RCS activity has risen to 66 micro curies/gram DOSE EQUVALENT I-131.

Which one of the following states the required action(s) for this condition?

A. Restore RCS activity to within limits within 1 hour or go to HOT STANDBY in case of a SGTR.

B. Be in at least HOT STANDBY within six hours to limit offsite dose in case of a SGTR.

C. Trip the Reactor, reduce RCS T-hot to less then 535°F and isolate Steam Generators.

D. Verify DOSE EQUIVALENT I-131 is less than the limit once every 4 hours by sampling RCS.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☑	☑

Audit Exam History

2009	☐

Answer:

B. Be in at least HOT STANDBY within six hours to limit offsite dose in case of a SGTR.

Notes:

Distracter A is incorrect because T.S 3.4.8 does not allow a time period to restore RCS activity to below the limit when activity is > 60 micro curies/gram. T.S 3.4.8 requires the plant to be in Hot Standby in 6 hours when the 60 micro curies/gram activity threshold is reached. Distracter C is incorrect in this case but would be the required action to take if indications of a SGTR were present. Distracter D is incorrect because the limit of 60 micro curies/gram has been reached but would be a correct action prior to 60 micro curies/gram activity.

References:

T.S 3.4.8, RCS Specific Activity, Amendment 282.
AOP 2203.020, High RCS Activity, Rev. 10, Step 4.
Lesson Plan A2LP-RO-EAOP, Rev. 12, Objective 15: Discuss the Mitigation strategy, Entry Conditions, Instructions and Exit Conditions (as per AOP and Tech Guide) of OP 2203.020, High Activity In The RCS.

Historical Comments:

Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank: 1682 **Rev:** 0 **Rev Date:** 4/29/2009 5:29:52 **QID #:** 73 **Author:** Coble

Lic Level: R **Difficulty:** 3 **Taxonomy:** H **Source:** New

Search 1940012312 **10CFR55:** 41.12 / 45.9 / 45.10 **Safety Function**

System Title: Generic **System Number** GENERIC **K/A** 2.3.12

Tier: 3 **Group:** 1 **RO Imp:** 3.2 **SRO Imp:** 3.7 **L. Plan:** A2LP-RO-FH **OBJ** 4

Description: Radiological Controls - 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.

Question:

Given the following:

* Unit 2 is in Mode 6 with a fuel off-load in progress.
* Containment Purge is in the continuous ventilating mode.
* The SRO in charge of refueling notifies the Control Room that an incident has caused damage to a spent fuel assembly in the Containment building.
* Airborne activity is rising in Containment

Based on the responsibilities of a licensed operator, which one of the following would be the FIRST action for the control room to take as far as the health and safety of the public is concerned?

A. Ensure Containment Closure is set.

B. Ensure Containment Evacuated.

C. Verify Containment Purge is secured.

D. Verify Containment Fan coolers secured.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☑	☑

Audit Exam History

2009	☐

Answer:

C. Verify Containment Purge is secured.

Notes:

Verify Containment Purge is secured after a fuel handling accident in Containment is the first action direction that the Control Room is given per the Refueling Shuffle procedure Attachment M, Refueling Accident, Step 2.5.1. This will prevent most activity from leaving the Containment and affecting the larger population outside of Containment. It is also the quickest action to take. Setting Containment Closure is directed from the Control room but is not performed by the control room and takes up to 30 minutes. Evacuation is also an action to take but affects fewer people than securing purge thus is directed later in the Attachment M. Securing Containment Fans is not a directed action and could cause activity to be higher if secures due to the filtering of the air in Containment.

References:

NOP 2502.001, Refueling Shuffle, Rev. 37, Attachment M, Refueling Accident, Step 2.5.1.
Lesson Plan A2LP-RO-FH, Rev. 1, Objective 4: Given a fuel handling evolution or condition, determine the correct response.

Historical Comments:

Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank: 1683 **Rev:** 0 **Rev Date:** 4/30/2009 2:06:41 **QID #:** 74 **Author:** Coble

Lic Level: R **Difficulty:** 2 **Taxonomy:** F **Source:** New

Search 1940012406 **10CFR55:** 41.10 / 43.5 / 45.13 **Safety Function**

System Title: Generic **System Number** GENERIC **K/A** 2.4.6

Tier: 3 **Group:** 1 **RO Imp:** 3.7 **SRO Imp:** 4.7 **L. Plan:** A2LP-RO-EFRP **OBJ** 2

Description: Emergency Procedures/Plan - Knowledge of EOP mitigation strategies.

Question:

During the implementation of the Functional Recovery Procedure, all the following safety functions are Jeopardized.

Which one of the following safety functions should be addressed FIRST by the crew?

A. RCS Inventory Control

B Maintenance of Vital Auxiliaries

C. RCS Pressure Control

D. Containment Isolation

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☑	☑

Audit Exam History

2009	☐

Answer:

B Maintenance of Vital Auxiliaries

Notes:

The safety functions in order of priority are 1. Reactivity Control 2. Vital DC Auxiliaries 3. Vital AC Auxiliaries 4.RCS Inventory Control 5.RCS Pressure Control 6. RCS & Core Heat Removal 7. CNTMT Isolation 8.CNTMT Temp. & Pressure Control 9. CNTMT Combustible Gas Control
Jeopardized Safety functions are addressed first in order of priority from safety function 1 through 9.
Maintenance of Vital Auxiliaries would be the highest priority safety function in the list above and should be addressed first.

References:

EOP 2202.009, Functional Recovery Procedure (FRP), Rev. 9, Entry Section Steps 13 and 14 and Success Path Tracking Page.
Lesson Plan A2LP-RO-EFRP, Rev. 3, Objective 2: Describe the Safety Functions checked by FRP.

Historical Comments:

Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank:	1684	**Rev:**	0	**Rev Date:**	4/30/2009 2:53:50	**QID #:**	75	**Author:**	Coble		
Lic Level:	R	**Difficulty:**	2	**Taxonomy:**	F	**Source:**	NRC Exam Bank 8 Modified				
Search	1940012426	**10CFR55:**	41.10 / 43.5 / 45.12	**Safety Function**							
System Title:	Generic			**System Number**	GENERIC	**K/A**	2.4.26				
Tier:	3	**Group:**	1	**RO Imp:**	3.1	**SRO Imp:**	3.6	**L. Plan:**	ASLP-FP-ELEC	**OBJ**	1.3

Description: Emergency Procedures/Plan - Knowledge of facility protection requirements, including fire brigade and portable fire fighting equipment usage.

Question:

Given the following:

* A small fire has started due to burning insulation inside breaker cubicle 2B52-A4.
* Power to the breaker cannot be interrupted.

With the exception of the Fire Brigade Leader, which one of the following describes the makeup of the Fire Brigade Members for this event and the best type of extinguisher to use on this fire.

A. Unit 1 Operators; CO2 extinguisher

B. Unit 1 Operators; H2O extinguisher

C. Unit 2 Operators; CO2 extinguisher

D. Unit 2 Operators; H2O extinguisher

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☑	☑

Audit Exam History

2009	☐

Answer:

A. Unit 1 Operators; CO2 extinguisher

Notes:

The three members of the fire brigade that report to the Leader come from the unaffected unit thus distracters C and D are incorrect. Breaker cubicle 2B52-A4 is on Unit 2. CO2 should be used over H2O due to the increased shock hazard potential from the water. thus distracters B and D are incorrect.

References:

NOP 1015.007, Fire Brigade Organization and Responsibilities, Rev. 19 Section 6.1 and 6.2..
Lesson Plan ASLP-FP-INTRO, Introduction to Fire Protection, Rev. 9, Objective 2: Explain which personnel make-up the Fire Brigade, and describe their duties and responsibilities.
Lesson Plan ASLP-FP-ELEC, Fighting Electrical Fires, Rev. 2, Objective 1.3: Describe the types of extinguishing agents and equipment that can be used effectively on Class C Fires.

Historical Comments:

Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank:	1685	**Rev:**	0	**Rev Date:**	5/6/2009 2:20:56	**QID #:**	76	**Author:**	Coble		
Lic Level:	S	**Difficulty:**	3	**Taxonomy:**	F	**Source:**	New				
Search	0000072445	**10CFR55:**	41.10 / 43.5 / 45.3 / 45	**Safety Function**	1						
System Title:	Reactor Trip - Stabilization			**System Number**	007	**K/A**	2.4.45				
Tier:	1	**Group:**	1	**RO Imp:**	4.1	**SRO Imp:**	4.3	**L. Plan:**	A2LP-RO-EAOP	**OBJ**	28

Description: Emergency Procedures/Plan - Ability to prioritize and interpret the significance of each annunciator or alarm.

Question:

Given the following:

* The plant is at full power.
* There are indications of a rising RCS leak.
* Annunciator 2K11 K-8 "TROUBLE LKRT HI" is locked in.
* Annunciator 2K11 J-8 " RATE OF CHANGE HI" is locked in.
* Current RCS leak rate is 50 gpm.

Which of the following is the correct action to take and list the correct implementing procedure?

A. Commence a Plant Shutdown; AOP 2203.016, Excess RCS Leakage.

B. Commence a Plant Shutdown; AOP 2203.038, Primary to Secondary Leakage.

C. Trip the Reactor and perform SPTAs; EOP 2202.003, Loss of Coolant Accident.

D. Trip the Reactor and perform SPTAs; EOP 2202.004, Steam Generator Tube Rupture.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☑

Audit Exam History

2009	☐

Answer:

D. Trip the Reactor and perform SPTAs; EOP 2202.004, Steam Generator Tube Rupture.

Notes:

These alarms along with indications of a RCS leak provide indications form the N16 Main Steam line radiation monitors of activity in the secondary from the RCS. The Alarm response procedure refers the SRO to the Primary to Secondary Leakage AOP which has a contingency step that directs tripping of the reactor if RCS leakage exceeds the capacity of one charging pump which is 44 gpm. Distracters A and C list the wrong implementing procedure but correct action to take if those procedures were applicable. Distracter B list the first implementing procedure entered but ultimately the EOP would be the guiding procedure based on this leak rate and alarms.

References:

Annunciator 2K11 K-8 "TROUBLE LKRT HI", Rev. 35.
Annunciator 2K11 J-8 " RATE OF CHANGE HI, Rev. 35
AOP 2203.038, Primary to Secondary Leakage, Rev. 10, Entry Conditions and Floating Step 12.
EOP 2202.004, Steam Generator Tube Rupture, Rev. 9 Entry Conditions.
AOP 2203.016, Excess RCS Leakage, Rev. 13, Entry Conditions.
Lesson Plan A2LP-RO-EAOP, Rev. 12, Objective 28: Discuss the Mitigation strategy, Entry Conditions, applicable industry events, Instructions and Exit Conditions of OP 2203.038, Primary To Secondary Leakage.

Historical Comments:

Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank: 1686 **Rev:** 0 **Rev Date:** 1/4/2005 **QID #:** 77 **Author:** Coble

Lic Level: S **Difficulty:** 4 **Taxonomy:** H **Source:** NRC Exam Bank 0548

Search 000025A204 **10CFR55:** 41.7 / 41.10 / 43.5 / 45 **Safety Function** 4

System Title: Loss of Residual Heat Removal System (RHRS) **System Number** 025 **K/A** AA2.04

Tier: 1 **Group:** 1 **RO Imp:** 3.3 **SRO Imp:** 3.6 **L. Plan:** A2LP-RO-EAOP **OBJ** 22

Description: Ability to determine and interpret the following as they apply to the Loss of Residual Heat Removal System: - Location and isolability of leaks

Question:

Given the following:

* 'A' SDC Loop was placed in service 5 minutes ago with a normal system lineup.
* PZR level is 37% and dropping
* RCS temperature is 280°F and constant.
* PZR pressure is 260 psia and dropping
* RWT level is rising slowly
* VCT level is constant.
* Hold Up Tank (2T-12) levels are constant.

Based on these conditions, the correct procedure to enter would be the _____and the RCS draining would be stopped by closing _____.

A. Lower Mode Functional Recovery EOP; 2P-60A Normal LPSI Recirc Valve (2CV-5123-1)

B. Lower Mode Functional Recovery EOP; Letdown Divert Valve (2CV-4826)

C. Loss of Shutdown Cooling AOP; 2P-60A Normal LPSI Recirc Valve (2CV-5123-1)

D. Loss of Shutdown Cooling AOP; Letdown Divert Valve (2CV-4826)

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☑

Audit Exam History

2009	☐

Answer:

C. Loss of Shutdown Cooling AOP; 2P-60A Normal LPSI Recirc Valve (2CV-5123-1)

Notes:

The entry conditions for Loss of Shutdown cooling are met since there is an unexplained loss of RCS inventory. The leak is going through the 'A' LPSI Recirc valve that should have been closed when the SDC loop was placed in service. Distracter A and B are incorrect because RCS temperature is above the 275°F entry limit for the lower mode functional procedure. Distracter B is also incorrect since selected Hold Up tank 2T12 level is constant thus the leak is not going through the Divert Valve. Distracter D is incorrect since selected Hold Up tank 2T12 level and VCT levels are constant thus the leak is not going through the Divert Valve.

References:

STM 2-14, SDC System, Rev. 8, Figure on page 48.
NOP 2104.004, Shutdown Cooling System, Rev. 39, Step 7.13.1.B
AOP 2203.029, Loss of SDC, Rev. 13. Entry Conditions and Contingency Step 4.A
EOP 2202.011, Lower Mode Functional Recovery. Rev. 5, Entry Conditions.
Lesson Plan A2LP-RO-EAOP, Rev. 12, Abnormal Operating Procedure, Objective 22, Discuss the Mitigation strategy, Entry Conditions, applicable industry events, Instructions and Exit Conditions of OP 2203.029, Loss of Shutdown Cooling.

Historical Comments:

Used on the 2005 NRC Exam.

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Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank:	1687	**Rev:**	0	**Rev Date:**	5/14/2009 9:23:08	**QID #:**	78	**Author:**	Coble		
Lic Level:	S	**Difficulty:**	4	**Taxonomy:**	H	**Source:**	NRC Exam Bank 0282 Modified				
Search	000040A201	**10CFR55:**	41.7 / 41.10 / 43.5 / 45	**Safety Function**	4						
System Title:	Steam Line Rupture			**System Number**	040	**K/A**	AA2.01				
Tier:	1	**Group:**	1	**RO Imp:**	4.2	**SRO Imp:**	4.7	**L. Plan:**	A2LP-RO-EESD	**OBJ**	3

Description: Ability to determine and interpret the following as they apply to the Steam Line Rupture: - Occurrence and location of a steam line rupture from pressure and flow indications

Question:

Given the following plant conditions:

* Ten (10) minutes post trip from full power.
* Pressurizer pressure is 1400 psia and lowering.
* Both Steam Generator Pressures are 715 psia and lowering.
* Steam Generator Levels are 250 inches wide range and lowering.
* Steam flow from both Steam Generators indicate 300 KLB/HR
* All Main Steam safety valves are closed.
* Containment Temperature and Pressure are normal and stable
* All ESFAS signals and components have actuated as designed.
* The only operator actions taken are those directed by the SPTA procedure.

Which of the following would be the correct procedure to diagnose after SPTAs, and the correct action to take for the given conditions?

A. EOP 2205.005, Excess Steam Demand; Close MSIVs (2CV-1010-1 and 2CV-1060-2).

B. EOP 2205.005, Excess Steam Demand; Close Main Steam to EFW Pump 2P-7A (2CV-1000-1 and 2CV-1050-2).

C. AOP 2203.001, RCS Overcooling; Close MSIVs (2CV-1010-1 and 2CV-1060-2).

D. AOP 2203.001, RCS Overcooling; Close Main Steam to EFW Pump 2P-7A (2CV-1000-1 and 2CV-1050-2).

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☑

Audit Exam History

2009	☐

Answer:

B. EOP 2205.005, Excess Steam Demand; Close Main Steam to EFW Pump 2P7A 2CV-1000-1 and 2CV-1050-2.

Notes:

Below 751 psia in the SGs, a Main Steam Isolation signal would have already closed the MSIVs. The only common line upstream of the MSIVs that would equally affect the SG pressures after the MSIS ESFAS signal would be the line to the steam driven EFW pump. During diagnostics with an MSIS, the chart will direct entry into the Excess Steam Demand procedure if SG pressure are less than 800 psia. If no MSIS is present and SG pressures are less than 950 psia than RCS Overcooling should be entered. Distracters C and D are incorrect because SG pressure are less than 800 psia and MSIS is present. Distracters A and C are incorrect because MSIVs should have automatically closed on the MSIS.

References:

EOP 2202.010, Standard Attachments, Rev. 11, Exhibit 8, Diagnostic Actions.
EOP 2202.005, Excess Steam Demand, Rev. 9, Steps 13 and 16.
Lesson Plan A2LP-RO-EESD, Rev. 5, Given a set of plant conditions during an ESD, determine which SG is

most affected by the event.

Historical Comments:

Original question was used on the 2000 NRC Exam.

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Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank:	1688	**Rev:**	0	**Rev Date:**	5/14/2009 11:17:4	**QID #:**	79	**Author:**	Coble
Lic Level:	S	**Difficulty:**	4	**Taxonomy:**	H	**Source:**	New		
Search	0000582420	**10CFR55:**	41.10 / 43.5 / 45.13	**Safety Function**	6				
System Title:	Loss of DC Power			**System Number**	058	**K/A**	2.4.20		
Tier:	1	**Group:**	1	**RO Imp:**	3.8	**SRO Imp:**	4.3	**L. Plan:**	A2LP-RO-ELOSF	**OBJ**	1/3

Description: Emergency Procedures/Plan - Knowledge of operational implications of EOP warnings, cautions, and notes.

Question:

Given the following plant conditions at full power :

* The plant has experienced a loss of Green DC Bus 2D02.
* Subsequently a complete Loss of Offsite Power (LOOP) trips the plant.
* SPTAs are entered and all required actions are taken.
* EFW pump 2P-7B starts on EFAS signal then trips on motor overload.
* Steam Generator Levels are 20% and slowly lowering.

Which of the following procedures should be entered after SPTAs and which of the following actions can be taken FROM the CONTROL ROOM to mitigate this event?

A. EOP 2202.006, Loss of Feedwater; Tie AACG to 4160 VAC Bus 2A1 and commence feeding SGs with AFW Pump 2P-75 at less than 150 gpm.

B. EOP 2202.007, Loss of Offsite Power; Tie AACG to 4160 VAC Bus 2A4 and commence feeding SGs with EFW Pump 2P-7A at less than 150 gpm.

C. EOP 2202.006, Loss of Feedwater; Tie AACG to 4160 VAC Bus 2A4 and commence feeding SGs with EFW Pump 2P-7A at full EFW flow.

D. EOP 2202.007, Loss of Offsite Power; Tie AACG to 4160 VAC Bus 2A1 and commence feeding SGs with AFW Pump 2P-75 at full AFW flow.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☑

Audit Exam History

2009	☐

Answer:

A. EOP 2202.006, Loss of Feedwater; Tie AACG to 4160 VAC Bus 2A1 and commence feeding SGs with AFW Pump 2P-75 at less than 150 gpm.

Notes:

The loss of Green DC will cause the steam driven EFW pump 2P-7A to overspeed and trip and thus is not available. The loss of Green DC will also prevent the 'B' Green Train Emergency Diesel from starting and supplying power to green vital bus 2A4. The loss of Offsite power along with the trip of EFW pump 2P-7B leaves no feedwater available. The Diagnostic flow chart will direct implementing the Loss of Feedwater EOP even if a LOOP has occurred since all optimum EOPs have steps to address a LOOP. A caution in the Loss of Feed EOP States: Feed to an impacted SG should be maintained less than 150 gpm until SG level rises or flow has been maintained for greater than 5 minutes. An impacted SG is one that is less than 49% level. Distracter B and C are incorrect because 2P-7A is not available. Distracters C and D are incorrect because feed flow should be limited to less than 150 gpm with SG levels less than 49%.

References:

EOP 2202.010, Standard Attachments, Rev. 11, Exhibit 8, Diagnostic Actions.
EOP 2202.006, Loss of Feedwater, Rev. 6, Caution above Step 13.E.
Lesson Plan A2LP-RO-ELOSF, Rev. 4, Objective 1 and 3: Analyze a set of plant conditions, and determine if

the entry conditions for the Loss of Feedwater EOP exist and Analyze a set of plant conditions, during a loss of feedwater event, and determine the actions necessary to restore feedwater flow to the Steam Generators.

Historical Comments:

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Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank:	1689	**Rev:**	0	**Rev Date:**	5/14/2009 12:53:4	**QID #:**	80	**Author:**	Coble		
Lic Level:	S	**Difficulty:**	3	**Taxonomy:**	F	**Source:**	New				
Search	000065A201	**10CFR55:**	41.7 / 41.10 / 43.5 / 45	**Safety Function**	8						
System Title:	Loss of Instrument Air			**System Number**	065	**K/A**	AA2.01				
Tier:	1	**Group:**	1	**RO Imp:**	2.9	**SRO Imp:**	3.2	**L. Plan:**	A2LP-RO-EAOP	**OBJ**	16
Description:	Ability to determine and interpret the following as they apply to the Loss of Instrument Air: - Cause and effect of low-pressure instrument air alarm										

Question:

Given the following plant conditions:

* The following event occurs on Unit 2 at 100% Power.
* Annunciator 2K12 A-8, INSTR AIR PRESS HI/LO, comes in.
* The CBOT reports that Instrument Air (IA) Header Pressure is 53 psig and dropping.
* Unit 1 reports that their IA Header Pressure is 59 psig and also dropping.

Which of the following is the required procedure to implement mitigating actions for these conditions and the correct course of action?

A. AOP 2203.021, Loss of Instrument Air; Close the cross-connect valves with Unit 1 to prevent a loss of IA on Unit 1.

B. AOP 2203.021, Loss of Instrument Air; Open the cross-connect valves with Unit 1 to prevent a loss of IA on Unit 2.

C. EOP 2202.001 SPTAs; Close the cross-connect valves with Unit 1 to prevent a loss of IA on Unit 1.

D. EOP 2202.001 SPTAs; Open the cross-connect valves with Unit 1 to prevent a loss of IA on Unit 2.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☑

Audit Exam History

2009	☐

Answer:

A. AOP 2203.021, Loss of Instrument Air; Close the cross-connect valves with Unit 1 to prevent a loss of IA on Unit 1.

Notes:

With Unit 2 undergoing a Loss of Instrument Air event, under normal circumstances Unit 1 instrument air should be capable of supplying Unit 2. If a pipe rupture exists on Unit 2, it is possible that Unit 1 IA will not be able to supply both units. If Unit 1 (unaffected unit/IA supplier) IA pressure drops to less than 60 psig, the units' IA should be split out as Unit 1 is now being threatened. The Loss Of IA AOP will be entered for these condition and tripping the plant and entering SPTAs is only directed in the AOP if IA header pressure on Unit 2 drops below 35 psig. Distracters C and D are incorrect because there is specific guidance on when to enter SPTAs (35 psig) and those conditions are not present. Distracters B and D are incorrect because the units normally have IA cross connected to supply the other in case of a leak/rupture.

References:

AOP 2203.021, Loss of IA, Rev. 11, Entry Conditions and Steps 2, 3, 4, and 5.
Tech Guide 2203.021, Loss of IA, Rev. 11, Steps 2, 3, and 4.
Lesson Plan A2LP-RO-EAOP, Rev. 12, Objective 16: Discuss the Mitigation strategy, Entry Conditions, Instructions and Exit Conditions (as per AOP and Tech Guide) of OP 2203.021, Loss Of Instrument Air.

Historical Comments:

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Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank:	1690	**Rev:**	0	**Rev Date:**	5/14/2009 2:24:02	**QID #:**	81	**Author:**	Coble		
Lic Level:	S	**Difficulty:**	4	**Taxonomy:**	H	**Source:**	New				
Search	00CE062123	**10CFR55:**	41.10 / 43.5 / 45.2 / 45	**Safety Function**	4						
System Title:	Loss of Feedwater			**System Number**	E06	**K/A**	2.1.23				
Tier:	1	**Group:**	1	**RO Imp:**	4.3	**SRO Imp:**	4.4	**L. Plan:**	A2LP-RO-EFRP	**OBJ**	1/2
Description:	Conduct of Operations - Ability to perform specific system and integrated plant procedures during all modes of plant operation.										

Question:

Given the following plant conditions at full power:

* Emergency Diesel Generator 2DG1 is out of service for maintenance.
* The plant is tripped due to power > 100% and rising rapidly.
* Pressurizer Pressure is 1625 psia and dropping during SPTAs.
* RCS T-hot is 520°F and dropping during SPTAs.
* Steam Generator 'A" pressure is 725 psia and dropping.
* Steam Generator 'B" pressure is 785 psia and slowly rising.
* An electrical bus 2A1 lockout alarm actuates during SPTAs.
* Containment Pressure is 26 psia and rising during SPTAs.
* Steam Generator Levels are 15% and dropping during SPTAs.
* Emergency Feedwater Pump 2P-7A, over speeds and cannot be reset during SPTAs.
* All other components operate as designed.

Following completion of the Standard Post Trip Actions (SPTA's), which of the following procedures should be entered and which of the following concerns should be addressed to prevent core damage?

A. EOP 2202.005, Excess Steam Demand; restoring power to electrical bus 2A3.

B. EOP 2202.006, Loss of Feedwater; restoring RCS Margin to Saturation (MTS) to > 30°F.

C. EOP 2202.010, Functional Recovery; restoring power to electrical bus 2A3.

D. EOP 2202.010, Functional Recovery; restoring RCS Margin to Saturation (MTS) to > 30°F.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☑

Audit Exam History

2009	☐

Answer:

C. EOP 2202.010, Functional Recovery; restoring power to electrical bus 2A3.

Notes:

Based on these conditions, there are indications of an excess steam demand with no feedwater available. Vital 4160 bus 2A3 will be de-energized due to 2DG1 OOS and Bus 2A1 lockout. Containment Pressure > 23.3 will initiate CSAS which will trip out the Main Feedwater and Condensate Pumps. A loss of Bus 2A1 will also make the AFW pump inoperable. With these 2 events in progress, the Functional Recovery procedure should be entered and a Feedwater pump should be started ASAP to address the RCS and Core heat removal Safety Function.. Electrical Bus 2A3 supplies power to EFW pump 2P-7B which is the only Feedwater pump available. Margin to Saturation will not be an issue with these conditions. Distracters A, B, C are incorrect because there are 2 events in progress.

References:

EOP 2202.010, Standard Attachments, Rev. 11, Exhibit 8, Diagnostic Actions.
EOP 2202.009, Functional Recovery Procedure (FRP), Rev. 09, Entry Conditions and Step 11.F.1.
Lesson Plan A2LP-RO-EFRP, Rev. 3, Objectives 1 and 2: Describe the purpose of the FRP and when it should

be used and Describe the Safety Functions checked by FRP.

Historical Comments:

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Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank:	1691	**Rev:**	0	**Rev Date:**	5/14/2009 4:39:30	**QID #:**	82	**Author:**	Coble		
Lic Level:	S	**Difficulty:**	4	**Taxonomy:**	H	**Source:**	New				
Search	000037A206	**10CFR55:**	41.7 / 41.10 / 43.5 / 45	**Safety Function**	3						
System Title:	Steam Generator (S/G) Tube Leak			**System Number**	037	**K/A**	AA2.06				
Tier:	1	**Group:**	2	**RO Imp:**	4.3	**SRO Imp:**	4.5	**L. Plan:**	A2LP-RO-EAOP	**OBJ**	28
Description:	Ability to determine and interpret the following as they apply to the Steam Generator Tube Leak: - S/G tube failure										

Question:

Given the following at full power:

* Steam Generator (SG) 'A' N-16 monitor is reading 140 GPD.
* Steam Generator (SG) 'B' N-16 monitor is reading 280 GPD.
* Main Steam Line 'A' Radiation monitor is reading 0.2 MR/HR
* Main Steam Line 'B' Radiation monitor is reading 0.5 MR/HR
* These indications have been rising from 75 GPD to these levels over the past hour.

Which one of the following is correct concerning Technical Specification (TS) 3.4.6.2 RCS Leakage and also lists the correct action to take?

A. TS 3.4.6.2 would NOT apply; Enter AOP 2203.038, Primary to Secondary Leakage and commence a plant shutdown due to a tube leak.

B. TS 3.4.6.2 would apply; Enter AOP 2203.038, Primary to Secondary Leakage and commence a plant shutdown due to a tube leak.

C. TS 3.4.6.2 would NOT apply; Continue to monitor for a SG tube leak or failure and commence a plant shutdown if leakage exceeds the limits..

D. TS 3.4.6.2 would apply; Trip the Reactor and enter EOP 2202.004, Steam Generator Tube Rupture after SPTAs due to a tube failure.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☑

Audit Exam History

2009	☐

Answer:

B. TS 3.4.6.2 would apply; Enter AOP 2203.038, Primary to Secondary Leakage and commence a plant shutdown due to a tube leak.

Notes:

RCS leakage through the 'B' SG is approximately 0.2 gpm which is well below the trip criteria for a Steam Generator Tube Rupture (44 gpm) thus the Primary to Secondary Leakage AOP would be applicable in this case and would direct a plant shutdown. T.S 3.4.6.2 limit for SGs is 150 gallons per day primary to secondary leakage through ANY ONE steam generator thus the TS would apply. Distracters A and C are incorrect because the TS would apply. Distracters C and D are incorrect because the leak does not meet the trip criteria but does meet shutdown criteria.

References:

Technical Specification (TS) 3.4.6.2 RCS Leakage, Amendment # 280.
AOP 2203.038, Primary to Secondary Leakage, Rev. 10, Entry Conditions, Floating Step 12, Step 18 and Attachment 'A' Action Two.
Lesson Plan A2LP-RO-EAOP, Rev. 12, Objective 28: Discuss the Mitigation strategy, Entry Conditions, applicable industry events, Instructions and Exit Conditions of OP 2203.038, Primary To Secondary Leakage.

Historical Comments:

Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank:	1692	**Rev:**	0	**Rev Date:**	5/15/2009 11:24:0	**QID #:**	83	**Author:**	Jim Wright		
Lic Level:	S	**Difficulty:**	4	**Taxonomy:**	H	**Source:**	NRC Exam Bank 606 Modified				
Search	0000592441	**10CFR55:**	41.10 / 43.5 / 45.11	**Safety Function**	9						
System Title:	Accidental Liquid Radwaste Release			**System Number**	059	**K/A**	2.4.41				
Tier:	1	**Group:**	2	**RO Imp:**	2.9	**SRO Imp:**	4.6	**L. Plan:**	ASLP-RO-EPLAN	**OBJ**	7
Description:	Emergency Procedures/Plan - Knowledge of the emergency action level thresholds and classifications.										

Question:

Given the following:

* The plant is at full power.
* Unit 2 is transferring resin from 2T13 Spent Resin Storage Tank to a cask in the train bay.
* While removing water from the cask, a hose ruptures releasing 400 gallons of highly contaminated water into a nearby storm drain that drains directly to Lake Dardanelle.
* Chemistry is notified to take lake water samples at the site boundary and perform a dose assessment.
* Chemistry determines that the release has exceeded the ODCM limits by a factor of 11.

Which of the following would be the REQIURED actions to take? (Reference Provided)

A. Declare a NUE, complete 1903.011 ATT. 1, and notify the State within 15 minutes.

B. Declare an Alert, complete 1903.011 ATT. 2, and notify the State within 15 minutes.

C. Declare a NUE, complete 1903.011 ATT. 1, and notify the NRC within 15 minutes.

D. Declare an Alert,, complete 1903.011 ATT. 2, and notify the NRC within 15 minutes.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☑

Audit Exam History

2009	☐

Answer:

B. Declare an Alert, complete 1903.011 ATT. 2, and notify the State within 15 minutes.

Notes:

Question will require OP 1903.010 and OP 1903.011 to be provided as a reference.

Greater than the ODCM limits would be a NUE call but greater than 10 times the ODCM limit would be an ALERT call. State and local agencies are required to be notified within 15 minutes of the E-plan Call. The NRC will be notified as soon as possible but is required to be notified within one hour.
Distracters A and C are incorrect because an dose assessment indicates ODCM limits are at the ALERT level.
Distracters C and D are incorrect because notifications are required to be made in 15 minutes to the State.

References:

EPLAN procedure 1903.010 Pages 13 and 14 (Situation 3)and Page 21 Step 5.2 (Rev 42).
EPLAN procedure 1903.011 Pages 1 and 17 (Rev 31)
Lesson Plan ASLP-RO-EPLAN, Rev. 1, Objective 7: Using references, discuss the requirements for classifying and upgrading, downgrading, and terminating an emergency including any time limitations that may apply.

Historical Comments:

Original Question was used on the 2006 NRC Exam

Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank:	1693	**Rev:**	0	**Rev Date:**	5/15/2009 9:39:19	**QID #:**	84	**Author:**	Coble		
Lic Level:	S	**Difficulty:**	3	**Taxonomy:**	H	**Source:**	NRC Exam Bank 1571 Modified				
Search	000068A205	**10CFR55:**	41.7 / 41.10 / 43.5 / 45	**Safety Function**	8						
System Title:	Control Room Evacuation			**System Number**	068	**K/A**	AA2.05				
Tier:	1	**Group:**	2	**RO Imp:**	4.2	**SRO Imp:**	4.3	**L. Plan:**	A2LP-RO-EAOP	**OBJ**	10

Description: Ability to determine and interpret the following as they apply to the Control Room Evacuation: - Availability of heat sink

Question:

Given the following:

* A confirmed fire has developed in the Cable Spreading Room (elevation 372).
* The carpet in the Unit 2 Control Room "At The Controls Area" is getting very warm.

Which procedure should be entered AND which action should be taken to ensure an adequate heat sink with a feed source is available for plant cooldown after a Reactor Trip?

A. Enter 2203.049, Fires in Areas Affecting Safe Shutdown; Ensure Main Feedwater (MFW) system is in Reactor Trip Override (RTO) prior to leaving the Control Room.

B. Enter 2203.049, Fires in Areas Affecting Safe Shutdown; Trip the MFW Pumps, Start both Emergency Feedwater (EFW) pumps from the Remote Shutdown Panel 2C-80.

C. Enter 2203.014, Alternate Shutdown; Ensure Main Feedwater system is in Reactor Trip Override (RTO) prior to leaving the Control Room.

D. Enter 2203.014, Alternate Shutdown; Trip the Main Feedwater Pumps, Start both EFW pumps by actuating EFAS prior to leaving the Control Room.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☑

Audit Exam History

2009	☐

Answer:

D. Enter 2203.014, Alternate Shutdown; Trip the Main Feedwater Pumps, Start both EFW pumps by actuating EFAS prior to leaving the Control Room.

Notes:

The alternate shutdown procedure is written to address a fire in a set of specific areas as addressed in its entry conditions. The fires in areas affecting safe shutdown procedure is used when the areas listed in its entry section have a severe fire. These are areas other than the ones listed in the Alternate Shutdown Procedure. In this case the Reactor and Main Feedwater pumps will be tripped by the Reactor Operators then EFAS will be actuated by the Shift Manager or STA while every one else is evacuating. Distracters A, and B are incorrect because the implementing procedure is incorrect. Distracters A and C are incorrect because the MFW pumps will be tripped. Distracter B is incorrect because the EFW pumps cannot be operated from the remote shutdown panel.

References:

OP 2204.014, Alternate Shutdown, Rev. 23, Entry Conditions and then Section 1 Steps 1, 5, and Note above step 8. Then step 18.
OP 2203.049, Fires In Areas Affecting Safe Shutdown, Rev. 7, Entry Conditions.
Lesson Plan A2LP-RO-EAOP, Rev. 12, Objective 10: Discuss the Mitigation strategy, Entry Conditions, Instructions and Exit Conditions (as per AOP and Tech Guide) of OP 2203.014, Alternate Shutdown.

Historical Comments:

Original Question was used on the 2008 NRC exam.

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Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank:	1694	**Rev:**	0	**Rev Date:**	5/15/2009 1:53:14	**QID #:**	85	**Author:**	Coble		
Lic Level:	S	**Difficulty:**	4	**Taxonomy:**	H	**Source:**	New				
Search	0000692446	**10CFR55:**	41.10 / 43.5 / 45.3 / 45	**Safety Function**	5						
System Title:	Loss of Containment Integrity			**System Number**	069	**K/A**	2.4.46				
Tier:	1	**Group:**	2	**RO Imp:**	4.2	**SRO Imp:**	4.2	**L. Plan:**	A2LP-RO-ELOCA	**OBJ**	4
Description:	Emergency Procedures/Plan - Ability to verify that the alarms are consistent with the plant conditions.										

Question:

Given the following Conditions:

* The plant was tripped due to low RCS pressure 10 minutes ago.
* RCS pressure is 1150 psia and dropping rapidly
* Containment Pressure is 27 psia and rising.
* Steam Generator pressures are 995 psia and steady.
* Annunciator 2K06 E-1 "A SPRAY HDR FLOW LO" is locked in.
* Annunciator 2K10 B-7 "CNTMT SUMP LEVEL HI" is locked in
* 'A' Spray Header flow indicates zero gpm on 2FIS-5610.
* CNTMT Spray Pump 2P-35A Breaker is closed.
* CNTMT Spray Header 'A' Isolation 2CV-5612-1 is Open
* CNTMT Spray Header 'A" Level on 2LIS-5691 on 2C-14 is reading 10% and dropping.
* Annunciator 2K12 H-8 "ESF ROOM (S) LEVEL HI" comes in.
* Containment and Aux Building radiation levels are rising.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☑

Audit Exam History

2009	☐

Which of the following is the correct procedure to enter following SPTAs and also contains the correct action to take for the above conditions to protect Containment integrity?

A. EOP 2202.010, Functional Recovery; Keep 2P-35A running and Close 2CV-5612-1 using Handswitch 2HS-5612-1 on 2C17.

B. EOP 2202.010, Functional Recovery; Secure 2P-35A, Close 2CV-5612-1 using CLOSE Contactors inside its associated breaker cubicle then open the breaker.

C. EOP 2202.003, Loss of Coolant Accident; Keep 2P-35A running and Close 2CV-5612-1 using Handswitch 2HS-5612-1 on 2C17.

D. EOP 2202.003, Loss of Coolant Accident; Secure 2P-35A, Close 2CV-5612-1 using CLOSE Contactors inside its associated breaker cubicle then open the breaker.

Answer:

D. EOP 2202.003, Loss of Coolant Accident; Secure 2P-35A, Close 2CV-5612-1 using CLOSE Contactors inside its associated breaker cubicle then open the breaker.

Notes:

These plant conditions are indications of a medium break LOCA with no other event in progress so only the LOCA EOP needs to be implemented and not the Functional. The Annunciator Corrective action is where the direction for taking action on a failed Containment Spray train is located and will be implemented along with the EOP. The direction is to secure the pump and locally close the isolation valve using the breaker close contactors. Distracters A and C are incorrect because the isolation valve cannot be closed using the control room handswitch with a CSAS signal present. Distracters A and B are incorrect because of the incorrect implementing procedure.

References:

EOP 2202.010, Standard Attachments, Rev. 11, Exhibit 8, Diagnostic Actions.
EOP 2202.003, Loss of Coolant Accident, Rev 10. Entry Conditions
Annunciator 2K06 E-1 "A SPRAY HDR FLOW LO" ACA Rev. 32, Step 2.3.
STM 2-08, Containment Spray System, Rev. 20, Section 3.6.1.
Lesson Plan A2LP-RO-ELOCA, Rev. 6, Objective 4: Given a set of plant conditions, determine if the required Entry Conditions exist to enter the LOCA EOP.

Historical Comments:

Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank:	1695	**Rev:**	0	**Rev Date:**	5/15/2009 4:20:17	**QID #:**	86	**Author:**	Coble		
Lic Level:	S	**Difficulty:**	4	**Taxonomy:**	H	**Source:**	New				
Search	006000A207	**10CFR55:**	41.5 / 43.5 / 45.3 / 45.	**Safety Function**	2						
System Title:	Emergency Core Cooling System (ECCS)	**System Number**	006	**K/A**	A2.07						
Tier:	2	**Group:**	1	**RO Imp:**	2.8	**SRO Imp:**	3.1	**L. Plan:**	A2LP-RO-TS	**OBJ**	3

Description: Ability to (a) predict the impacts of the following malfunctions or operations on the ECCS and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: - Loss of heat tracing

Question:

Given the following:

* The plant is at full power in the middle of January.
* Outside ambient air temperature is 10°F.
* Heat Tracing (HT) Panel 2C322 has lost power.
* This panel supplies the NaOH Tank, the CSTs (2T41A/B) and RWT level transmitter sensing lines.
* RWT water temperature is 58°F.
* RWT level is reading 98% on all level instruments.

If ALL the RWT sensing lines were to freeze, which one of the following would be the correct T.S LCO action to implement and the correct action to take?

A. T.S 3.0.3, LCOs for Operation and Surveillance Requirements; Thaw the lines out using an alternate heating source or initiate a shutdown to Hot Standby within one hour.

B. T.S 3.3.2.1, ESFAS Instrumentation; Place the inoperable channels for these level transmitters in bypass and/or trip within one hour.

C. T.S. 3.5.4, ECCS - Refueling Water Tank; Thaw the lines out using an alternate heating source or initiate a shutdown to Hot Standby within one hour.

D. T.S. 3.5.2, ECCS - ECCS Subsystems for Tave > 300°F; Place the inoperable channels for these level transmitters in bypass and/or trip within one hour.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☑

Audit Exam History

2009	☐

Answer:

A. T.S 3.0.3, LCOs for Operation and Surveillance Requirements; Thaw the lines out using an alternate heating source or initiate a shutdown to Hot Standby within one hour.

Notes:

If all the sensing lines on the RWT were to freeze, then none of the HPSI or Spray Trains would be able to swap over to the containment sump on a low RWT level thus T.S 3.0.3 would apply. Distracter B and D are incorrect because 4 channels of ESFAS are affected and interlock prevent bypassing and/or tripping more than 2 channels thus these also list the incorrect T.S. Distracter C is incorrect because there is still appropriate volume in the tank and the tank heaters are still keeping the solution temperature within the T.S. allowed range.

References:

STM 2-08, Containment Spray System, Rev. 20, Section 3.1.4.
NOP 2106.032, Unit 2 Freeze Protection, Rev. 19, Att. A Step 2.6 and Att. C Page 1.
T.S. LCO 3.0.3 Amendment 283.
T.S. 3.3.2.1 Amendment 189 Action b, Table 3.3-3 - 6.b and Action 11.

T.S. 3.5.2 Amendment 255.
T.S 3.5.4 Amendment 244.
Lesson Plan A2LP-RO-TS,Rev. 10, Objective 3: Discuss sections 3.0 & 4.0, technical specification applicability.

Historical Comments:

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Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank:	1696	**Rev:**	0	**Rev Date:**	5/15/2009 5:58:25	**QID #:**	87	**Author:**	Jim Wright		
Lic Level:	S	**Difficulty:**	4	**Taxonomy:**	H	**Source:**	New				
Search	012000A201	**10CFR55:**	41.5 / 43.5 / 45.3 / 45.	**Safety Function**	7						
System Title:	Reactor Protection System			**System Number**	012	**K/A**	A2.01				
Tier:	2	**Group:**	1	**RO Imp:**	3.1	**SRO Imp:**	3.6	**L. Plan:**	A2LP-RO-RPS	**OBJ**	5

Description: Ability to (a) predict the impacts of the following malfunctions or operations on the RPS and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: - Faulty bistable operation

Question:

Given the following:

* Unit 2 is at 100% power.
* 2RS-1 is deenergized due to a ground fault.
* Pressurizer pressure channel 2PT-4624-3 Pressurizer pressure transmitter fails low.
* No operator action has been taken.

What is the current mode of plant operation and what procedure should be referenced first as a result of the given failures?

A. Mode 3 , EOP-2202.002 Reactor Trip Recovery

B. Mode 1, AOP-2203.037 Loss of 125 VDC.

C. Mode 3 , EOP-2202.001 Standard Post Trip Actions

D. Mode 1, NOP-2105.001 CPC/CEAC Operations.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☑

Audit Exam History

2009	☐

Answer:

C. Mode 3 , EOP-2202.001 Standard Post Trip Actions

Notes:

Distracter A is incorrect because Reactor Trip Recovery would be reference only after being directed by standard post trip actions.
Distracters B and D are not correct because the reactor would trip for the given conditions.

References:

AOP Technical Guide 2203.037 Loss of 125VDC Technical Guidelines page 2 of 69 (Rev 6).
STM 2-63 Reactor Protective System Pages 33,34,35 and 46 (Rev. 9)
Lesson Plan A2LP-RO-RPS, Rev. 9) Objective (5) and (8): Describe the power supplies to the Reactor Protection System and Describe the operation of the Reactor Protection System.

Historical Comments:

Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank: 1697 **Rev:** 0 **Rev Date:** 5/15/2009 6:01:50 **QID #:** 88 **Author:** Jim Wright

Lic Level: S **Difficulty:** 4 **Taxonomy:** H **Source:** New

Search 0390002411 **10CFR55:** 41.10 / 43.5 / 45.13 **Safety Function** 4

System Title: Main and Reheat Steam System (MRSS) **System Number** 039 **K/A** 2.4.11

Tier: 2 **Group:** 1 **RO Imp:** 4.0 **SRO Imp:** 4.2 **L. Plan:** A2LP-RO-STEAM **OBJ** 3

Description: Emergency Procedures/Plan - Knowledge of abnormal condition procedures.

Question:

Given the following plant conditions:

* S/U #2 Transformer is out of service for maintenance.
* The plant has tripped from 100% power.
* S/U #3 Transformer sustains a fault and is locked out.
* 2A3 and 2A4 are energized from the Emergency Diesel Generators .
* RCS pressure is 2100 psia and slowly dropping.
* Steam Generator pressure is 935 psia and slowly dropping in both SGs.

Which ONE of the following actions should be taken to prevent further pressure reduction and which event should be diagnosed based on current plant conditions

A. Close the MSR 2nd stage reheat isolations valves in SPTAs; EOP 2202.007 Loss of Offsite Power.

B. Close the MSIVs in SPTAs; EOP 2202.007 Loss of Offsite Power.

C. Close the MSR 2nd stage reheat isolations valves in SPTAs; EOP 2202.005 Excess Steam Demand.

D. Close the MSIVs in SPTAs; EOP 2202.005 Excess Steam Demand.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☑

Audit Exam History

2009	☐

Answer:

B. Close the MSIVs in SPTAs; Loss of Offsite Power EOP 2202.007.

Notes:

A and C are incorrect, the MSR 2nd stage reheat isolations valves fail as is on Loss of Power and cannot be closed from the control room. Excess steam demand is not correct because MSIS has not actuated and S/G pressure is not less than 800psia. D is incorrect because MSIS has not actuated and S/G pressure is not less than 800psia.

References:

EOP-2202.001 Standard Post Trip Actions, Rev 9, Steps 4 D/E and Step 8 E.3.
EOP 2202.010, Standard Attachments, Rev. 11, Exhibit 8, Diagnostic Actions.
EOP OP 2202.007, LOOP EOP, Rev.9, Entry Conditions.
STM 2-16, Rev. 7, Section 3.3.1.2 and figure on page 17
Lesson Plan A2LP-RO-STEAM, Rev.14, Objective 3: Describe the construction and operation of the Reheat Steam System - The configuration of the Moisture Separator Reheaters during accident scenarios.

Historical Comments:

Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank: 1698 **Rev:** 0 **Rev Date:** 5/16/2009 2:41:02 **QID #:** 89 **Author:** Coble

Lic Level: S **Difficulty:** 4 **Taxonomy:** H **Source:** NRC Bank 0361 Modified

Search 061000A203 **10CFR55:** 41.5 / 43.5 / 45.3 / 45. **Safety Function** 4

System Title: Auxiliary / Emergency Feedwater (AFW) Syste **System Number** 061 **K/A** A2.03

Tier: 2 **Group:** 1 **RO Imp:** 3.1 **SRO Imp:** 3.4 **L. Plan:** A2LP-RO-EFW **OBJ** 10

Description: Ability to (a) predict the impacts of the following malfunctions or operations on the AFW System and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: - Loss of dc power

Question:

Given the following plant conditions:

* Plant is operating at 100% power.
* 125 VDC Panel 2D26 supply breaker trips open due to a fault on the bus.
* 10 minutes later, the plant trips due to a breaker fault on one RCP.
* A lockout on SU #3 Transformer occurs when the turbine trips.
* Both SG pressures have stabilized at 1050 psia.
* Both steam Generator levels drop to 21% Narrow Range Level.
* All systems operate as designed under these conditions.

Which of the following would be the response of the Emergency Feedwater System and which procedure should be diagnosed after SPTAs?

A. 2P-7A automatically starts and feeds both SG's; EOP 2202.002, Reactor Trip Recovery.

B. 2P-7B automatically starts and feeds both SG's; EOP 2202.002, Reactor Trip Recovery.

C. 2P-7A automatically starts and feeds both SG's; AOP 2203.013, Natural Circulation Operations.

D. 2P-7B automatically starts and feeds both SG's; AOP 2203.013, Natural Circulation Operations.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☑

Audit Exam History

2009	☐

Answer:

D. 2P-7B automatically starts and feeds both SG's; AOP 2203.013, Natural Circulation Operations.

Notes:

A loss of the 2D26 bus would prevent the normally closed upstream discharge MOVs (2CV 1076-2 and 2CV 1026-2) from the 2P-7A EFW pump from opening so no flow would come from the 2P-7A pump. Both AC powered MOVs on the discharge of the 2P-7B (2CV 1075-1 and 2CV 1025-1) would come open providing a flow path through the downstream MOVs to provide flow to both steam generators. A SU #3 Transformer lockout will cause a loss of both 6900 KV electrical busses which will cause a loss of all RCPs but power will still be available to one non vital 4160 VAC bus and both vital 4160 VAC busses. The plant will be in Natural Circulation conditions with no other events in progress. The SRO should determine that the Vital AC (6900 KV Busses) and Core Heat Removal (No RCPs) Safety functions are not met thus Reactor Trip Recovery will not apply and should transition to the Natural Circulation Operations. Distracters A and C are incorrect because 2P7A will not feed either SG. Distracters A and B are incorrect because safety function are not met thus this is not an uncomplicated trip.

References:

EFW STM 2-19-2, Rev. 29, Sections 2.3.3, 2.3.3.1, 2.3.3.2,; and Figure on page 36.
EOP 2202.01, SPTAs, Rev. 9, Steps 4.D and 7.A.
EOP 2202.010, Standard Attachments, Rev. 11, Exhibit 8, Diagnostic Actions.
AOP 2203.013, Natural Circulation Operations, Entry Conditions.
EOP 2202.002, Reactor Trip Recovery, Entry Conditions.
Lesson Plan A2LP-RO-EFW, Rev. 11, OBJ. 10: Describe the operation of the EFW system during a: loss of Green DC event.
Lesson Plan A2LP-RO-EAOP, Rev. 12, Objective 9: Discuss the Mitigation strategy, Entry Conditions, applicable industry events, Instructions and Exit Conditions (as per AOP and Tech Guide) of OP 2203.013, Natural Circulation

Historical Comments:

Original Question used on the 2002 NRC Exam.

Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank:	1699	**Rev:**	0	**Rev Date:**	5/16/2009 5:24:45	**QID #:**	90	**Author:**	Coble		
Lic Level:	S	**Difficulty:**	4	**Taxonomy:**	H	**Source:**	New				
Search	0780002236	**10CFR55:**	41.10 / 43.2 / 45.13	**Safety Function**	8						
System Title:	Instrument Air System (IAS)	**System Number**	078	**K/A**	2.2.36						
Tier:	2	**Group:**	1	**RO Imp:**	3.1	**SRO Imp:**	4.2	**L. Plan:**	A2LP-RO-EAOP	**OBJ**	16
Description:	Equipment Control - Ability to analyze the effect of maintenance activities, such as degraded power sources, on the status of limiting conditions for operations.										

Question:

Given the following:

* The plant is at 100% power in the middle of August.
* A through wall Instrument Air (IA) leak has developed on the 2 inch IA line just downstream of 2IA-407 located on Turbine Building 368 elevation.
* Emergency Maintenance has patched the leak to within acceptable limits.
* A work order package has been developed to replace the leaking section of pipe.
* The work order requires that 2IA-407 be closed and the downstream line depressurized.
* The maintenance is expected to last approximately 8 hours.

Analyze this maintenance request and determine if 2IA-407 could be isolated or not with the plant online without any adverse effects and select the correct response below. (References Provided)

A. Can be isolated as long as Steam Generator Blowdown is isolated prior to closing.

B. Can be isolated as long as makeup water to the CSTs is isolated prior to closing.

C. Cannot be isolated because it could cause Containment Pressure and Temperature to rise above T.S LCO Limits.

D. Cannot be isolated because it could cause an Atmospheric Dump Valve (ADV) to fail open causing a plant transient.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☑

Audit Exam History

2009	☐

Answer:

C. Cannot be isolated because it could cause Containment Pressure and Temperature to rise above T.S LCO Limits.

Notes:

Two of the loads supplied off of the header downstream of 2IA-407 are the Main Chill Water supply and return Isolations to Containment Fan Coolers (2CV-3852-1 and 2CV-3851-1) and they fail closed on loss of IA. These valves would close when the IA header was de-pressurized and Containment temperature and pressure would rise rapidly placing the plant in a one hour LCO 3.6.1.4, Containment Internal Pressure and Temperature. Distracters A and B are viable options to take for this maintenance but are incorrect because the loss of Main Chill water to Containment would cause a LCO entry and a plant shutdown. Distracter D is incorrect because this load is not supplied off of this header.

The following References need to be supplied for this question:
AOP 2203.021, Loss of IA AOP, Rev. 11, Attachment G, Page 3 of 6 of Attachment F; Pages 14, 15,18, 19, and 20 of Attachment E.

References:

STM 2-45, Main Chill Water System, Rev. 16, Figure on Page 32
AOP 2203.021, Loss of IA AOP, Rev. 11, Step 13, Attachment G, Page 3 of 6 of Attachment F; Pages 14, 15,18, 19, and 20 of Attachment E.
T.S 3.6.1.4. Containment Internal Pressure and Temperature, Amendment 225.
Lesson Plan A2LP-RO-EAOP , Rev. 12, Objective 16: Discuss the Mitigation strategy, Entry Conditions, Instructions and Exit Conditions (as per AOP and Tech Guide) of OP 2203.021, Loss Of Instrument Air.

Historical Comments:

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Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank:	1700	**Rev:**	0	**Rev Date:**	5/18/2009 9:37:29	**QID #:**	91	**Author:**	Coble
Lic Level:	S	**Difficulty:**	4	**Taxonomy:**	H	**Source:**	New		
Search	071000A209	**10CFR55:**	41.5 / 43.5 / 45.3 / 45.	**Safety Function**	9				
System Title:	Waste Gas Disposal System (WGDS)	**System Number**	071	**K/A**	A2.09				
Tier:	2	**Group:**	2	**RO Imp:**	3.0	**SRO Imp:**	3.5	**L. Plan:**	A2LP-RO-CVCS	**OBJ**	8

Description: Ability to (a) predict the impacts of the following malfunctions or operations on the Waste Gas Disposal System and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: - Stuck open relief valve

Question:

Given the following:

* The plant has been shutdown for refueling.
* RCS Degas evolution is in progress.
* Nitrogen is being added to the VCT
* Annunciator 2K12 K-5 " VCT 2T4 PRESS HI/LO" comes in.
* The chart recorder for VCT Pressure shows that pressure in the VCT went up to 72 psig and then dropped rapidly to 40 psig and stabilized..
* VCT level is currently 70% and steady.
* VCT Vent Valve 2SV-4837 is Closed and has not been Opened.

Which of the following caused the drop in pressure in the VCT, how can the diagnosis be confirmed and what action, if any, should be done about these indications?

A. Temporary stuck Open VCT relief valve; rise in the in-service Hold UP Tank (2T-12) pressure; Secure all addition of Gas to the VCT in accordance with the ACA and re-brief the evolution.

B. Temporary stuck Open VCT relief valve; rise in the in-service Gas Surge Tank (2T-17) Pressure; Secure all addition of Gas to the VCT and enter AOP 2203.010, H2O2 Concentration High.

C. WCO manually venting the VCT in accordance with the RCS DEGAS procedure OP 2104.002, CVCS, Attachment E, RCS Degas; rise in the in-service Gas Decay Tank, No action required.

D. WCO manually venting the VCT in accordance with the RCS DEGAS procedure OP 2104.002, CVCS, Att. E; rise in plant stack radiation readings; Have Chemistry perform dose assessment.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☑

Audit Exam History

2009	☐

Answer:

A. Temporary stuck Open VCT relief valve; rise in the in-service Hold UP Tank (2T-12) pressure; Secure all addition of Gas to the VCT in accordance with the ACA and re-brief the evolution.

Notes:

The procedure for RCS degas has the Control room align the VCT vent (2SV-4837) to the suction of the Waste Gas compressors when pressurizing with nitrogen. Is this case it was not and the VCT pressure went above the relief setpoint of 70 psig and opened. The relief did not reseat until 40 psig. The evolution should be stopped until the line up is correct and personnel counseled. The relief valves on the VCT are currently lined up to relieve to the Hold up tanks. They used to be lined up to the Waste Gas Surge Tank and could be manually aligned to the Waste Gas collection header which goes to the Plant Stack Exhaust vent. Distracter B is incorrect because the relief path to the Gas Surge Tank has been cut and blanked off and there is no explosive mixture of gas in this question. Distracter C is incorrect because the Vent valve is controlled form the control room not a

manual valve. Distracter D is incorrect because the manual vent to the Gas Collection Header is locked closed and is not part of the procedure.

References:

STM 2-04, CVCS, Rev. 27, Sections 2.1.21, 2.1.21.2, and drawing of VCT to Gaseous Rad Waste Compressors.
STM 2-54, Gaseous Radwaste System, Rev. 7, Section 2.1, 2.2, and figures on pages 17 and 18. STM 2-52, Boron Management System, Rev. 14, Figure on page 41.
Annunciator Corrective Action 2203.012L, Rev. 37, Window 2K12 K-5, VCT 2T4 PRESS HI/LO.
NOP 2104.002, CVCS, Rev. 56, Attachment E. RCS Degas and VCT Purge.
AOP 2203.010, H2O2 Concentration High, Rev. 7, Entry Conditions.
Lesson Plan A2LP-RO-CVCS, Rev 11, Objective 8: Given an alarm associated with the CVCS, describe the cause of the alarm, including setpoint and the expected operator response.

Historical Comments:

Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank: 1701 **Rev:** 0 **Rev Date:** 10/30/2001 **QID #:** 92 **Author:** Coble

Lic Level: S **Difficulty:** 3 **Taxonomy:** F **Source:** NRC Exam Bank 0415

Search 0720002240 **10CFR55:** 41.10 / 43.2 / 43.5 / 45 **Safety Function** 7

System Title: Area Radiation Monitoring (ARM) System **System Number** 072 **K/A** 2.2.40

Tier: 2 **Group:** 2 **RO Imp:** 3.4 **SRO Imp:** 4.7 **L. Plan:** A2LP-RO-RMON **OBJ** 18

Description: Equipment Control - Ability to apply Technical Specifications for a system.

Question:

Given the following:

* The plant is at 100% Power steady state.
* Technical Specification 3.4.6.2, RCS Leakage, requires a RCS Water Inventory Balance surveillance be completed once every 72 hours in Modes 1 through 4.
* Chemistry is not available to perform any samples at this time.

Which ONE of the following radiation monitors being inoperable would REQUIRE the frequency of the RCS Water inventory balance surveillance to be increased to once every 24 hours?

A. Containment High Range Radiation Monitors 2RITS-8925-1 and 2RITS-8925-2.

B. Containment elevation 404 South West end of the Refueling Deck 2RITS-8912.

C. Containment Atmosphere Monitors (CAMS) 2RITS-8231-1 and 2RITS-8271-2.

D. Containment Purge Exhaust, 2VEF-15 Discharge, Radiation Monitor 2RITS-8233.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☑

Audit Exam History

2009	☐

Answer:

C. Containment Atmosphere Monitors (CAMS) 2RITS-8231-1 and 2RITS-8271-2.

Notes:

Technical Specification 3.4.6.1 requires a containment atmosphere particulate and gaseous radioactivity monitor to be operable or the action requires grab samples or an RCS leak rate every 24 hours. Distracter A is incorrect because both Containment High Range monitors being OOS require alternate method of monitoring within 72 hours. Distracter B requires an alternate method of monitoring if refueling operations is in progress. Distracter D requires discontinuation of containment Purge which should not be in operation in Mode 1.

References:

Technical Specification 3.4.6.1, Amendment 281, Action A.2
Technical Specification 3.4.6.2, Amendment 280 surveillance 4.4.6.2.1
Lesson Plan A2LP-RO-RMON, Rev. 12, Objective 18: Explain the Technical Specifications/ODCM associated with the Radiation Monitoring System to include the reason for spec and actions required if inoperable.

Historical Comments:

Used on the 2002 NRC Exam

Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank:	1702	**Rev:**	0	**Rev Date:**	11/7/2004	**QID #:**	93	**Author:**	Coble		
Lic Level:	S	**Difficulty:**	4	**Taxonomy:**	H	**Source:**	NRC Exam Bank 0530				
Search	029000A201	**10CFR55:**	41.5 / 43.5 / 45.3 / 45.	**Safety Function**	8						
System Title:	Containment Purge System (CPS)			**System Number**	029	**K/A**	A2.01				
Tier:	2	**Group:**	2	**RO Imp:**	2.9	**SRO Imp:**	3.6	**L. Plan:**	A2LP-RO-CVENT	**OBJ**	15

Description: Ability to (a) predict the impacts of the following malfunctions or operations on the Containment Purge System and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: - Maintenance or other activity taking place inside Containment.

Question:

Given the following:

* The plant is in Mode 6 with Core Alterations in progress.
* The Containment Purge system is in operation continuously ventilating.
* The Equipment and Personnel Hatches are Open but capable of being Closed.
* I&C is performing maintenance on the Auxiliary Building 2VEF8A/B Exhaust Radiation Monitor 2RE-8245 when they inadvertently de-energize the Containment Purge Exhaust Radiation Monitor 2RE-8233.
* All attempts to restore power to 2RE-8233 have failed.
* Containment Purge Exhaust SPING 5 is Operable and in service.

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

A. Secure Containment Purge, Close the isolation valves, Core Alterations can continue without interruption as long as SPING 5 is operable.

B. Continue with Containment Purge and Core Alterations since the Containment Purge Isolations will automatically close on a high activity signal from SPING 5.

C. Immediately Suspend Core Alterations since the automatic closure function of the Containment Purge isolation valves is inoperable.

D. Restore the Containment Purge Exhaust Radiation Monitor 2RE-8233 to Operable status within one hour or suspend Core Alterations in the next 6 hours.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☑
2006	☐	☐
2008	☐	☐
2009	☐	☑

Audit Exam History

2009	☐

Answer:

C. Immediately Suspend Core Alterations since the automatic closure function of the Containment Purge Isolation valves is inoperable.

Notes:

Distracter A is incorrect because core alteration should be suspended until the purge containment isolations are verified closed. Distracter B is incorrect because the SPING does not provide auto closure of the containment isolation valves. Distracter D is incorrect because the TS action is to immediately suspend core alteration if a Containment penetration cannot be automatically closed if open.

References:

NOP 2104.033, Containment Atmosphere Control, Rev. 55, Section 12.1.
T.S. 3.9.4, Containment Building Penetrations, LCO c.1 and ACTION, Amendment 230.
T.S. 3.3.3.1, Radiation Monitoring Instrumentation, Table 3.3-6, Action 16.a, Amendment 255
STM 2-09, Rev.16, Containment Cooling and Purge Systems, Sections 7.6 and 7.7

Lesson Plan A2LP-RO-CVENT, Rev. OBJ. 15: Describe the conditions required to satisfy the TS LCOs associated with the Containment Ventilation System and based on given plant conditions, determine the correct course of action.

Historical Comments:

Question was used on the 2005 NRC Exam.

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Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank:	1703	**Rev:**	0	**Rev Date:**	5/19/2009 11:52:4	**QID #:**	94	**Author:**	Coble		
Lic Level:	S	**Difficulty:**	4	**Taxonomy:**	H	**Source:**	NRC Exam Bank 1427				
Search	1940012107	**10CFR55:**	41.5 / 43.5 / 45.12 / 45	**Safety Function**							
System Title:	Generic			**System Number**	GENERIC	**K/A**	2.1.7				
Tier:	3	**Group:**	1	**RO Imp:**	4.4	**SRO Imp:**	4.7	**L. Plan:**	A2LP-RO-COLSS	**OBJ**	17
Description:	Conduct of Operations - Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation.										

Question:

Consider the following:

* The plant has been returned to full power following the restoration from a loss of COLSS.
* OP 2105.013, COLSS Operations, Attachment F, COLSS Return to Service Checks has been completed.
* Annunciator 2K10-A2 "COLSS POWER MARGIN EXCEEDED" alarms
* Smoothed Plant Power (PMS Point CV5993) indicates 100%
* Smoothed KW/FT Power Operating Limit (POL) (PMS Point CV5997) indicates 99.7%

Which of the following actions is REQUIRED be taken for this alarm and indications?

A. Reduce plant power below 99.7% within 1 hour using Power OPs Procedure 2102.004.

B. Commence reducing power within 15 minutes to a power below KW/FT POL with 2102.004.

C. Trip the Reactor within 15 minutes due to exceeding KW/FT POL and enter SPTAs.

D. Declare COLSS inoperable and perform the actions required by 2203.043, Loss of COLSS.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☑

Audit Exam History

2009	☐

Answer:

B. Commence reducing power within 15 minutes to a power below KW/FT POL with 2102.004.

Notes:

This question is based on an actual event that occurred on Unit 2 where Axial Shape Index (ASI) was diverging quickly to the top of the core. When the 2K10-A2 alarm came in, the crew mistakenly declared COLSS inoperable again (even though they had just verified COLSS operable a couple of hours earlier) instead of taking the correct action of starting a power reduction within the 15 minute time limit of T.S. 3.2.1 Action a. Distracter A is incorrect because the required action is to restore the limit within 1 hour and commence the restoration within 15 minutes. Distracter C is incorrect because a trip is not required. Distracter D is incorrect because COLSS is still operable and calculating a POL.

References:

T.S 3.2.1 Linear Heat Rate, Amendment 157, Action a.1.
Annunciator Corrective Action 2K10-A2 "COLSS POWER MARGIN EXCEEDED" Rev. 35, Step 2.3.1.
OP 2105.013, COLSS Operations, Rev. 29, Attachment F, COLSS Return to Service Checks.
Lesson Plan A2LP-RO-COLSS, Rev. 14, Objective 17: EVALUATE a set of plant conditions that is causing an alarm on the following and determine the cause of the alarm and any action required to be taken. - 2K10 A2 - COLSS Power Margin Alarm.

Historical Comments:

Question has never been used on an initial NRC Exam (Modified slightly from a previous Biennial Exam)

Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank: 1704 **Rev:** 0 **Rev Date:** 5/19/2009 3:20:19 **QID #:** 95 **Author:** Coble

Lic Level: S **Difficulty:** 3 **Taxonomy:** H **Source:** New

Search 1940012123 **10CFR55:** 41.10 / 43.5 / 45.2 / 45 **Safety Function**

System Title: Generic **System Number** GENERIC **K/A** 2.1.23

Tier: 3 **Group:** 1 **RO Imp:** 4.3 **SRO Imp:** 4.4 **L. Plan:** A2LP-RO-EAOP **OBJ** 39

Description: Conduct of Operations - Ability to perform specific system and integrated plant procedures during all modes of plant operation.

Question:

Given the following:

* The plant is at full power.
* Alarm 2K07 window C 1 "CIAS ACT" came in 5 minutes ago.
* Alarm "CCW DISCH FLOW LOW" is locked in.
* RCS Pressure is 2200 psia.
* Containment Pressure is 14.8 psia.

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

A. Trip the Reactor, Secure all RCPs, then isolate RCP controlled bleedoff during SPTAs.

B. Enter RCP Emergencies AOP 2203.025 and override ACW to CCW isolation valves.

C. Enter Inadvertent CIAS AOP 2203.039 and override CCW to RCP isolation valves.

D. Trip the Reactor, Secure all RCPs, then align RCP bleedoff to the Quench Tank in SPTAs.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☑

Audit Exam History

2009	☐

Answer:

C. Enter Inadvertent CIAS AOP 2203.039, and override CCW to RCP isolation valves.

Notes:

Containment Pressure is below the CIAS setpoint so this alarm has come in based on a fault. The crew should enter the inadvertent CIAS AOP and take those actions. CCW to RCPs should be restored within 10 minutes or possible seal failure and small break LOCA could occur which would complicate the inadvertent CIAS event. Distracter A would be taken if the RCP CCW could not be restored within 10 minutes. Distracters B is incorrect because the wrong AOP is used to mitigate this event and the action is not required.. Distracter D is incorrect because it has not been 10 minutes and RCP bleedoff does not require operator action to got o the Quench Tank.

References:

ACA for Annunciator 2K07 C-1, CIAS ACT, Rev. 29.
AOP 2203.039, Inadvertent CIAS, Rev 5, Entry Conditions and Steps 4 and 5
AOP TG 2203.039, Rev. 5 Step 4.
AOP 2203.025, RCP Emergencies, Entry Conditions.
Lesson Plan A2LP-RO-EAOP, Rev. 12, Objective 29: Discuss the Mitigation strategy, Entry Conditions, Instructions and Exit Conditions (as per AOP and Tech Guide) of OP 2203.039, Inadvertent CIAS.

Historical Comments:

Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank:	1705	**Rev:**	0	**Rev Date:**	5/21/2009 1:13:30	**QID #:**	96	**Author:**	Jim Wright		
Lic Level:	S	**Difficulty:**	3	**Taxonomy:**	F	**Source:**	New				
Search	1940012211	**10CFR55:**	41.10 / 43.3 / 45.13	**Safety Function**							
System Title:	Generic	**System Number**	GENERIC	**K/A**	2.2.11						
Tier:	3	**Group:**	1	**RO Imp:**	2.3	**SRO Imp:**	3.3	**L. Plan:**	A2LP-SRO-MNTC	**OBJ**	7
Description:	Equipment Control - Knowledge of the process for controlling temporary design changes.										

Question:

Given the following:

* A Hot spot formed in a pipe as a result of transferring resin from Spent Fuel Pool DI (2T-5) to the Spent Resin Storage Tank (2T-13).

* A plan has been developed to flush the hot spot by using a section of rubber hose and connecting the Reactor Makeup Water System (RMWT) and Resin Transfer Header, using water to flush the hot spot to 2T-13.

* System Engineering has determined that connecting these two systems with a rubber hose would be a Temporary Modification.

Before the hose is installed between the Reactor Makeup Water System (RMWT) and Resin Transfer Header, who must authorize installation AND what is the minimum number of check valves that must be installed in series to satisfy procedural requirements?

A. System Engineering Manager, Two Check Valves.

B. Shift Manager, Three Check Valves.

C. System Engineering Manager, Three Check Valves.

D. Shift Manager, Two Check Valves.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☑

Audit Exam History

2009	☐

Answer:

D. Shift Manager, Two Check Valves.

Notes:

A and C are incorrect because the System engineering manager cannot authorize Temporary Modification installation- Engineering is responsible to ensure that the Temporary Modification is acceptable for safe plant operation. B is incorrect because Two check valves not three are required for Mechanical Hose jumper installation.

References:

Maintenance Procedure EN-DC-136 4.9 [2] REV 3
Maintenance ProcedureEN-DC-136 5.0 [4] REV 3
Lesson Plan ASLP-SRO-MNTC Rev 4 Objective 7: Describe the operations department responsibilities associated with installation and restoration of a temporary modification package.

Historical Comments:

Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank: 1706 **Rev:** 0 **Rev Date:** 5/21/2009 1:06:16 **QID #:** 97 **Author:** Jim Wright

Lic Level: S **Difficulty:** 3 **Taxonomy:** F **Source:** New

Search 1940012243 **10CFR55:** 41.10 / 43.5 / 45.13 **Safety Function**

System Title: Generic **System Number** GENERIC **K/A** 2.2.43

Tier: 3 **Group:** 1 **RO Imp:** 3.0 **SRO Imp:** 3.3 **L. Plan:** ASLP-RO-OPSPR **OBJ** 4

Description: Equipment Control - Knowledge of the process used to track inoperable alarms.

Question:

Given the following:

* An annunciator on 2K01 has been determined to be a Nuisance Alarm and has become a distraction to the control room operating staff.

* The shift manager has given permission to pull the annunciator card per 1015.001 "Conduct of Operations"

Whose concurrence must be obtained to ensure that pulling the annunciator card has no effect on continued system operability and what type of tag is required to be installed on the pulled annunciator card stored inside the annunciator panel.

A. System Engineer (SYSE), Equipment Out of Service or Caution Tag.

B. Shift Technical Advisor (STA), Equipment out of Service or Caution Tag.

C. System Engineer (SYSE), Work Incomplete or Temporary Services and Equipment Tag.

D. Shift Technical Advisor (STA), Work Incomplete or Temporary Services and Equipment Tag.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☑

Audit Exam History

2009	☐

Answer:

D. Shift Technical Advisor (STA), Work Incomplete or Temporary Services and Equipment Tag.

Notes:

A and C are incorrect because the Shift Technical Advisor (STA) performs the system operability not the system engineer. The system engineers technical knowledge may be relied upon to make the appropriate operability call- but the final determination will be made by the STA. A and B are incorrect because there are no Equipment Out of Service Tags a Caution Tag is a specific tag, not a generic tag as called for in the procedure. According to OPS expectations, Temporary Services and Equipment (TSE) Tags should be used but the procedure still calls for Work Incomplete Tags or other generic identification tag.

References:

Admin Procedure 1015.001, REV 073, Steps 10.1.1 (B) and 10.1.4 (A)
Lesson Plan ASLP-RO-OPSPR REV 11 Objective 4.f: With respect to Annunciator Controls:
1. Describe the instructions related to the following a) Malfunctioning Alarms b) Nuisance Alarms c) Superfluous Alarms d) Annunciators associated with out of service equipment 2. Describe the process for removing annunciators from service.

Historical Comments:

Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank: 1707 **Rev:** 0 **Rev Date:** 5/20/2009 10:36:4 **QID #:** 98 **Author:** Coble

Lic Level: S **Difficulty:** 2 **Taxonomy:** F **Source:** NRC Exam Bank 425 Modified

Search 1940012306 **10CFR55:** 41.13 / 43.4 / 45.10 **Safety Function**

System Title: Generic **System Number** GENERIC **K/A** 2.3.6

Tier: 3 **Group:** 1 **RO Imp:** 2.0 **SRO Imp:** 3.8 **L. Plan:** A2LP-RO-RWST **OBJ** 6

Description: Radiological Controls - Ability to approve release permits.

Question:

Unless there is a written justification, a gas decay tank (2T18) shall be isolated for _____ days prior to release approval because this _____.

A. 30 ; allows short lived gaseous activity present in the tank to decay.

B. 30; prevents purging high activity RCS gas to the tank prior to release.

C. 60 ; allows short lived gaseous activity present in the tank to decay.

D. 60; prevents purging high activity RCS gas to the tank prior to release.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☑

Audit Exam History

2009	☐

Answer:

A. 30 ; allows short lived gaseous activity present in the tank to decay.

Notes:

Based on NRC letter 0-NRCM-90-04-19, a Gas Decay tank should be isolated for 30 days by Tagging out the isolation valves unless written justification is provided on the release permit, NOP 2104.022, Gaseous Radwaste System, Supplement 1 Section 3.1. Distracters C and D are incorrect because the time limit of 60 days is not a requirement. Distracters B and D are incorrect because this is not the correct reason for the 30 days but it is a valid reason to keep someone from inadvertently placing the tank in service.

References:

NOP 2104.022, Gaseous Radwaste System, Rev. 39, Section 3.0, Step 9.14, and Supplement 1, Gaseous Radwaste Release Permit, Step 3.1.
Lesson Plan A2LP-RO-RWST, Rev. 6, Objective 6:Describe the following tasks associated with the radioactive waste operating procedures: Gaseous Rad Waste System 2104.022 and Perform a Waste Gas Decay Tank Release.

Historical Comments:

Original question was used on the 2002 NRC Exam.

Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank:	1708	**Rev:**	0	**Rev Date:**	5/20/2009 2:31:21	**QID #:**	99	**Author:**	Coble		
Lic Level:	S	**Difficulty:**	4	**Taxonomy:**	H	**Source:**	NRC Exam Bank 277 Modified				
Search	1940012315	**10CFR55:**	41.12 / 43.4 / 45.9	**Safety Function**							
System Title:	Generic	**System Number**	GENERIC	**K/A**	2.3.15						
Tier:	3	**Group:**	1	**RO Imp:**	2.9	**SRO Imp:**	3.1	**L. Plan:**	A2LP-RO-RMON	**OBJ**	11
Description:	Radiological Controls - Knowledge of radiation monitoring systems, such as fixed radiation monitors and alarms, portable survey instruments, personnel monitoring equipment, etc.										

Question:

Given the following plant conditions:

* Plant has returned to full power after a transient.
* PZR level is 60.3% and lowering.
* RCS pressure is 2202 psia.
* One Charging Pumps, 2P-36A is running.
* Letdown flow is 68 gpm and rising.
* LETDOWN RADIATION HI/LO annunciator (2K12-A1) alarm comes in.
* Letdown Gross Activity Monitor (2RITS-4806-A) reads 2E+5 CPM and rising.
* Letdown I-131 Activity Monitor (2RITS-4806-B) reads 1E+5 CPM and rising.

Which of the following events occurred for the given indications and also list the correct implementing procedure to mitigate this event?

A. Failed Fuel; AOP 2203.020, RCS High Activity

B. RCS crud burst; AOP 2203.020, RCS High Activity

C. RCS leak; AOP 2203.016, Excess RCS Leakage

D. RCS head void; AOP 2203.016, Excess RCS leakage

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☑

Audit Exam History

2009	☐

Answer:

A. Failed Fuel; AOP 2203.020, RCS High Activity

Notes:

The indication of rising Letdown flow is normal since PZR level is higher than 60% setpoint for 100% power. PZR level is lowering back to setpoint with only one charging pump running. Therefore, and RCS leak or void should not be diagnosed. Rising activity on both the Gross and Iodine 131 monitors indicate Fuel Failure in the RCS Distracters B is incorrect because only Gross activity would rise during a crud burst. Distracters C and D are incorrect because

References:

STM 2-62, Radiation Monitoring System, Rev. 15 Section 2.2.1.
AOP 2203.020, RCS High Activity AOP, Rev. 10, Entry Conditions and Step 6, 7 and 8.
Lesson Plan A2LP-RO-RMON, Rev. 12, Objective 11: Describe the use of the Radiation Monitoring System in the Abnormal Operating Procedures.

Historical Comments:

Data for 2009 NRC RO/SRO Exam

18-Jun-09

Bank: 1709 **Rev:** 0 **Rev Date:** 5/20/2009 4:18:38 **QID #:** 100 **Author:** Coble

Lic Level: S **Difficulty:** 3 **Taxonomy:** H **Source:** NRC Exam Bank 1484 Modified

Search 1940012406 **10CFR55:** 41.10 / 43.5 / 45.13 **Safety Function**

System Title: Generic **System Number** GENERIC **K/A** 2.4.6

Tier: 3 **Group:** 1 **RO Imp:** 3.7 **SRO Imp:** 4.7 **L. Plan:** A2LP-RO-ESGTR **OBJ** 12

Description: Emergency Procedures/Plan - Knowledge of EOP mitigation strategies.

Question:

Consider the following:

* Unit 2 has tripped from full power.
* RCS pressure is 1350 psia and slowly rising
* All RCPs have been secured
* PZR Level is 62% and slowly rising
* 'A' SG Main Steam Radiation is in alarm and reads 175 mr/hr
* 'B' SG Main Steam Radiation is in alarm and reads 2500 mr/hr
* Condenser Off-Gas Radiation is alarm
* Forced flow needs to be established to mitigate this event

Assuming all RCP restart conditions are satisfied, which of the following RCPs should be started FIRST and why?

A. 2P-32C to ensure thorough mixing of the boron with the RCS during SG draining.

B. 2P-32B to prevent sending a slug of diluted water through the Reactor core.

C. 2P-32C to prevent sending a slug of diluted water through the Reactor core.

D. 2P-32B to ensure thorough mixing of the boron with the RCS during SG draining.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☑

Audit Exam History

2009	☐

Answer:

B. 2P-32B to prevent sending a slug of diluted water through the Reactor core.

Notes:

Based on the indication a SGTR has occurred in the 'B' Steam Generator (ruptured SG) and 'A' Steam Generator is considered the intact SG. A RCP in the intact (least affected) loop should be started first and flow should be allowed to stabilize for 5 minutes. Following the stabilization period the selected RCP in the ruptured loop should be enabled and started. The 5 minute time delay is necessary to allow for mixing of a possible slug of water with reduced boron concentration from the ruptured SG loop. Distracters A and C are incorrect because 2P-32C is on the ruptured loop. Distracter D is incorrect because the reason is wrong.

References:

EOP 2202.004 SGTR, Rev. 9, Step 13 (Note), Step 45 and Technical Guidance for Step 45.
STM 2-03-02 RCPs, Rev. 13 Figure on page 44.
Lesson Plan A2LP-RO-ESGTR, Rev. 5, Objective 12: Given a set of plant conditions during a SGTR, determine if a RCP can be restarted.

Historical Comments: