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December 21, 2010

Mr. Gabriel Apger, Chief Examiner
U.S. Nuclear Regulatory Commission
612 E. Lamar Blvd., Suite 400
Arlington, TX 76011- 4125

Subject: Initial Examination – Exam Material Submittal for ANO, Unit 2 (CE)
Docket No. 50-368
License No. NPF-6

Dear Mr. Apger,

Included are the Examination Materials (updated with comments) for the Arkansas Nuclear One, Unit 2 (ANO-2) Initial Examination scheduled for January 28, 2011. I have included all requested forms per NUREG-1021, Revision 9 Supplement 1 for the ANO-2 Initial Examination.

These materials shall be withheld from public disclosure until the examination is complete. We request that the written exam be withheld from public disclosure for two years following completion of the exam.

Please call me at (479) 858-6879 if you have any questions.

Exam: Jan 2011
Release: Jan 2013

Sincerely,

Sherrie Cotton

Clay Simpson

Sherrie Cotton
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Clay M. Simpson
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Attachments

cc w/o attachment: K. Jones
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ANO-DCC

ANO UNIT 2 - 2011 RO AND SRO EXAM ANSWER KEY

QUESTION: 1 QID: 1710

A. Close both Main Steam Isolation Valves (MSIV's) to prevent the main turbine from overspeeding.

QUESTION: 2 QID: 1711

A. >60%; controlling letdown flow at 128 gpm.

QUESTION: 3 QID: 1712

A. Small Break LOCA; MTS is not satisfied

QUESTION: 4 QID: 1713

C. 3 minutes, Local Engine Control switch to "Lockout" position.

QUESTION: 5 QID: 1714

A. Lower seal only

QUESTION: 6 QID: 1715

C. Automatic isolation of Letdown to protect the Regenerative Heat Exchanger.

QUESTION: 7 QID: 1716

D. Leave "A" LPSI running and throttle SDC FCV 2CV-5091 to stop vortexing at the pump suction.

QUESTION: 8 QID: 1717

D. Position the Pressurizer Pressure Control selector switch 2HS4626 to the 'B' position, Pressurizer Proportional heaters are FULL ON.

QUESTION: 9 QID: 1718

B. These conditions would cause the 'A' and 'B' CEA MG Set DSS output contactors to open and ALL rod bottom lights would be illuminated on 2C03.

QUESTION: 10 QID: 1719

B. Perform RCS cooldown to less than 535°F Thot.

QUESTION: 11 QID: 1720

A. Closed; CSAS.

QUESTION: 12 QID: 1721

A. "A" Steam Generator; Q CST.

QUESTION: 13 QID: 1722

B. Natural Circulation IS NOT established due to CET and T-hot delta T greater than 10°F.

QUESTION: 14 QID: 1723

A. 1 Pump, Loop 1 Service Water.

QUESTION: 15 QID: 1724

B. Breakers 2 and 6.

QUESTION: 16 QID: 1725

A. Take pilot cell readings for battery bank 2D12 within 1 hour to verify operability.

QUESTION: 17 QID: 1726

C. The valves will be CLOSED and can be overridden and opened, and a subsequent RAS will cause them to close;
Service water pump discharge pressure will be HIGHER than it was at 100% power.

QUESTION: 18 QID: 1727

B. Upstream ADVs fail Open; Downstream ADVs fail Closed.

QUESTION: 19 QID: 1728

D. Reactor startup MAY NOTcontinue, conservatively place the reactor in a safe condition.

QUESTION: 20 QID: 1729

B. Radwaste Area Discharge Radiation Monitor 2VEF-8A/B (2RITS-8542).

QUESTION: 21 QID: 1730

B. "Waste Gas Decay Tanks Discharge Isolation" 2CV-2428 automatically closes,
The ventilation lineup is not affected. .

QUESTION: 22 QID: 1731

C. Isolate letdown flow by closing 2CV-4820-2 Letdown isolation valve.

QUESTION: 23 QID: 1732

C. CRS will open Reactor Trip Circuit Breakers 1 through 8 locally.

QUESTION: 24 QID: 1733

C. 2.14 gpm

QUESTION: 25 QID: 1734

B. RCS pressure is 1200 psia; RCS Hot Leg and average CET Temperature are 582 °F;
RVLMS LEVEL 7 and below indicates wet.

QUESTION: 26 QID: 1735

B. minimize the cooldown of the RCS.

QUESTION: 27 QID: 1736

A. Pressurizer level rises when charging flow is directed through auxiliary spray.

QUESTION: 28 QID: 1737

B. RCP Motor Stator Winding Temperature alarm.

QUESTION: 29 QID: 1738

D. Both BAM pumps are running and Emergency borate valve (2CV-4916-2) is open supplying borated water to the charging pump suction for RCS makeup.

QUESTION: 30 QID: 1739

B. Charging Pumps A and B start, heaters cutout, letdown flow lowers.

QUESTION: 31 QID: 1740

C. To ensure that Containment Spray pump suction piping does not become overpressurized.

QUESTION: 32 QID: 1741

A. "A" High Pressure Injection Pump AND "A" Low Pressure Injection Pump will be damaged due to loss of suction.

QUESTION: 33 QID: 1742

D. RCS High Point Vents, Reactor Drain Tank.

QUESTION: 34 QID: 1743

D. 40% and 50%; the 2VEF-8A/B Suction.

QUESTION: 35 QID: 1744

D. 2P-33C Running, 2P-33B auto started and running.

QUESTION: 36 QID: 1745

B. The secondary steam is superheated, the primary steam is saturated.

QUESTION: 37 QID: 1746

B. Low DNBR

QUESTION: 38 QID: 1747

D. Chill Water supply and return valves (2CV-3852-1 and 2CV-3851-1) are OPEN.
Service Water supply and return valves (2CV-1511-1 and 2CV-1519-1) are OPEN
Bypass Damper 2UCD-8203-1 is CLOSED/RESET.

QUESTION: 39 QID: 1748

A. Verify all containment cooling fans running and service water inlet and outlet valves open to the coolers.

QUESTION: 40 QID: 1749

B. 6%; EOP Exhibit 2, HPSI Flow Curve

QUESTION: 41 QID: 1750

A. Containment Spray termination criteria IS satisfied and the CSAS should be RESET and Spray pumps secured.

QUESTION: 42 QID: 1751

B. RCS temperature will LOWER; Reactor power will RISE.

QUESTION: 43 QID: 1752

D. Both MFW pumps tripped.

QUESTION: 44 QID: 1753

D. Main Feedwater Pumps at turning gear speed, Main Feed Regulating Valves Closed, Main Feed Regulating Bypass valves at approximately 19% open.

QUESTION: 45 QID: 1754

C. must be manually started and both SGs must be manually fed.

QUESTION: 46 QID: 1755

D. 15, 80

QUESTION: 47 QID: 1756

C. discharged; locked

QUESTION: 48 QID: 1757

C. The battery AMP's will rise steadily until the design battery capacity is exhausted.

QUESTION: 49 QID: 1758

A. Breakers will remain in their "as is" condition and operation would only be possible by local manual means.

QUESTION: 50 QID: 1759

C. Vital 480 VAC

QUESTION: 51 QID: 1760

B. Fuel cladding damage; RCS crud burst

QUESTION: 52 QID: 1761

D. ECP Contained water volume of 70 acre feet: ECP top temperature 101°F; ECP bottom temperature 100°F.

QUESTION: 53 QID: 1762

C. non-vital 480; vital 4160

QUESTION: 54 QID: 1763

C. Main Steam Isolation Valves.

QUESTION: 55 QID: 1764

D. Reduce Containment pressure to ensure a cushion exists for potential loss of Main Chill water per 2104.033.

QUESTION: 56 QID: 1765

D. 2B7 and 2B8.

QUESTION: 57 QID: 1766

D. 2P-1A will be tripped; 2P-1B will be running

QUESTION: 58 QID: 1767

D. 2RE-8233 closes the Containment Purge supply and exhaust isolation valves.

QUESTION: 59 QID: 1768

C. To prevent damage to the fuel assemblies being moved.

QUESTION: 60 QID: 1769

B. Turbine Bypass Valve 2CV-303.

QUESTION: 61 QID: 1770

D. Reactor power will lower and RCS pressure will rise.

QUESTION: 62 QID: 1771

C. High Steam Generator Water Level.

QUESTION: 63 QID: 1772

A. 2C14; 2C14

QUESTION: 64 QID: 1773

C. Emergency Recirc Fan (VSF-9) starts, normal supply fans (VSF-8A&B) stop.

QUESTION: 65 QID: 1774

A. Motor Driven Fire Pump P-6A; Trip the plant and evacuate the Control Room.

QUESTION: 66 QID: 1775

D. Raise Turbine load without securing dilution because raising Turbine load in conjunction with RCS dilution is considered one method of positive reactivity addition.

QUESTION: 67 QID: 1776

B. Sound the Containment Evacuation alarm on 2C22, evacuate the Containment, set Containment closure within 30 minutes and secure the Containment Purge system.

QUESTION: 68 QID: 1777

A. Integrated Emergency Diesel Generator/Engineering Safety Features Test; Anyone.

QUESTION: 69 QID: 1778

A. The pump power supply is isolated first, then the pump discharge valve is closed before the suction valve. This is to prevent pump suction over pressurization if back leakage exists.

QUESTION: 70 QID: 1779

B. Unidentified Leakage

QUESTION: 71 QID: 1780

D. Administrative 6 hours; Federal 26 hours.

QUESTION: 72 QID: 1781

C. the current calendar year; the duration of the job or activity

QUESTION: 73 QID: 1782

C. Locked High Radiation Area; Continuous Radiation Protection coverage and door locked Closed.

QUESTION: 74 QID: 1783

D. Impacted Steam Generator

QUESTION: 75 QID: 1784

A. Reactor Operator Two (RO-2) should locally start Charging Pump 2P36A at 2B52; defeats all the trips for 2P36A.

QUESTION: 76 QID: 1785

D. RCP Seal Cooler, Excess RCS Leakage AOP 2203.016, Complete a plant shutdown and isolate the affected RCP seal cooler heat exchanger.

QUESTION: 77 QID: 1786

D. Prior to the test, a dedicated operator should be stationed at the 2P4B Handswitch in case of loss of offsite power; After the test Loop 2 Service Water is inoperable.

QUESTION: 78 QID: 1787

A. Loss of Turbine Load Abnormal Operating Procedure 2203.024.

QUESTION: 79 QID: 1788

B. Continue the cooldown and refer to TS 3.3.3.6 Post-Accident Instrumentation.

QUESTION: 80 QID: 1789

D. 2202.009, Functional Recovery EOP; EFW is NOT feeding either SG.

QUESTION: 81 QID: 1790

B. 2202.006, Loss of Feedwater; T.S. 3.0.3, LCO 3/4 Applicability.

QUESTION: 82 QID: 1791

C. Enter AOP 2203.028, PZR Systems Malfunction, Trip the Reactor, Commence adding 2750 gallons of makeup to the RCS to maintain PZR level, then GO to SPTAs EOP 2202.001.

QUESTION: 83 QID: 1792

A. One Unit 2 SFP area radiation monitor operable and the Unit 1 SFP area ventilation unit is operable and in operation.

QUESTION: 84 QID: 1793

C. Trip the Reactor, verify Main Turbine tripped, and go to Standard Post Trip Actions.

QUESTION: 85 QID: 1794

C. Site Area Emergency; 3.4

QUESTION: 86 QID: 1795

C. Enter the Functional Recovery EOP and locally shutdown the PMS Inverter 2Y25.

QUESTION: 87 QID: 1796

B. Complete SPTAs, enter LOCA Recovery EOP and use Standard Att.11, Degraded Power.

QUESTION: 88 QID: 1797

A. Lower plant power below 100% immediately based on ACA guidance for 2K10 A2.

QUESTION: 89 QID: 1798

B. 2DG1 is operable and generate a condition report/WR to calibrate the volt meter.

QUESTION: 90 QID: 1799

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

QUESTION: 91 QID: 1800

A. "A" SG is the ruptured SG and "B" SG is the intact SG; SG Tube Rupture EOP 2202.004.

QUESTION: 92 QID: 1801

A. Power Operation NOP 2102.004; two; of a concern with damage to condenser tubes

QUESTION: 93 QID: 1802

A. The release CAN proceed as long as an independent verification of the discharge path valve lineup and an independent sample of 2T-18A activity is analyzed first.

QUESTION: 94 QID: 1803

D. 15%; 10%

QUESTION: 95 QID: 1804

A. SDC system pressure boundary limits; reactor coolant pump NPSH

QUESTION: 96 QID: 1805

D. OSC Director;
ensuring safety functions are maintained using 2202.008 Station Blackout EOP.

QUESTION: 97 QID: 1806

D. The last set of three studs are tensioned during the final pass and verified.

QUESTION: 98 QID: 1807

C. The job is performed by 3 operators for 1 hour each on the job at the hot spot and a 4th operator reading instructions in the general room area for 1 hour.

QUESTION: 99 QID: 1808

B. 10 to 38; partially uncovered to cool the steam space of the 'A" SG.

QUESTION: 100 QID: 1809

B. Alert; Shelter all personnel in the CSB or LLRWB.

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank: 1710 **Rev:** 1 **Rev Date:** 12/17/2010 3:58:2 **QID #:** 1 **Author:** Jim Wright

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

Search 000007K103 **10CFR55:** 41.10 **Safety Function** 1

System Title: Reactor Trip - Stabilization **System Number** 007 **K/A** EK1.03

Tier: 1 **Group:** 1 **RO Imp:** 3.7 **SRO Imp:** 4.0 **L. Plan:** A2LP-RO-ESPTA **OBJ** 9

Description: Knowledge of the operational implications of the following concepts as they apply to the reactor trip: - Reasons for closing the main turbine governor valve and the main turbine stop valve after a reactor trip

Question:

The reactor trips from 100% power due to a Loss of Offsite Power. The control room operators immediately observe the following:

* Main generator output breakers are open.
* #3 Main Turbine stop valve is fully open.
* #3 Main Turbine Control valve is 50% open.
* Annunciator 2K02B-14 in alarm.
* The Steam Dump Bypa S) is functioning as designed.

This question was revised prior to exam administration. See next page.

What action is required to l d what is the reason for this action?

A. Close both Main Steam Isolation Valves to prevent the main turbine from overspeeding.

B. Close both Main Steam Bypass Valves to prevent exceeding the design flow of SDBCS.

C. Locally close all SDBCS valves to prevent exceeding the design flow of SDBCS.

D. Locally close 2CV-0400 and 2CV-0460 to prevent the main turbine from overspeeding.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☑	☑

Audit Exam History

2011	☐

Answer:

A. Close both Main Steam Isolation Valves (MSIV's) to prevent the main turbine from overspeeding.

Notes:

"A" is the correct answer because MSIV's will remain open for at least 30 minutes after a loss of offsite power. With a loss of offsite power the turbine generator will no longer be slowed down by the grid and will overspeed.

"B" "C" and "D" are incorrect because SDBCS capacity is not a concern because the condenser interlock and the loss of instrument air will close all SDBCS valves. Closing 2CV-0400 and 2CV-0460 will reduce overall steam flow and cooldown, but does nothing to reduce steam flow thru the turbine. The Main Steam Bypass valves are normally closed at 100% power therefore they would not perform this action.

References:

OP 2203.012B Change 33 Annunciator 2K02 Corrective Actions Page 87 .
OP-2107.001 Change 80 Electrical System Operations Exhibit C-1 and C-2 pages 68 and 69 .
CEN 152 Rev 5 Standard Post Trip Action Basis.
EOP Tech Guide Rev. 11 Standard post Trip Actions Page 10 of 41.
OP 2202.001 Standard Post Trip Actions Rev 11 Page 4 of 17.
STM 2-15 Rev 13 Steam Generators and Main Steam System page 27-29 and 32.

Historical Comments:

Data for 2011 NRC RO/SRO Exam

24-Jan-11

Bank: 1710 **Rev:** 2 **Rev Date:** 12/17/2010 3:58:2 **QID #:** 1 **Author:** Jim Wright

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

Search 000007K103 **10CFR55:** 41.10 **Safety Function** 1

System Title: Reactor Trip - Stabilization **System Number** 007 **K/A** EK1.03

Tier: 1 **Group:** 1 **RO Imp:** 3.7 **SRO Imp:** 4.0 **L. Plan:** A2LP-RO-ESPTA **OBJ** 9

Description: Knowledge of the operational implications of the following concepts as they apply to the reactor trip: - Reasons for closing the main turbine governor valve and the main turbine stop valve after a reactor trip

Question:

The reactor trips from 100% power due to a Loss of Offsite Power. The control room operators immediately observe the following:

* Main generator output breakers are open.
* #3 Main Turbine stop valve is fully open.
* #3 Main Turbine Control valve is 50% open.
* Annunciator 2K02B-14 "Condenser Interlock" is in alarm.
* The Steam Dump Bypass Control System (SDBCS) is functioning as designed.

What action is required to be performed in SPTA's and what is the reason for this action?

A. Close both Main Steam Isolation Valves to prevent the main turbine from overspeeding.

B. Locally close all SDBCS valves to prevent exceeding the design flow of SDBCS.

C. Close both Main Steam Isolation Valves to prevent exceeding the design flow of SDBCS.

D. Locally close all SDBCS valves to prevent the main turbine from overspeeding.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☑	☑

Audit Exam History

2011	☐

Answer:

A. Close both Main Steam Isolation Valves to prevent the main turbine from overspeeding.

Notes:

"A" is the correct answer because MSIV's will remain open for at least 30 minutes after a loss of offsite power. With a loss of offsite power the turbine generator will no longer be slowed down by the grid and will overspeed.

"B" "C" and "D" are incorrect because SDBCS capacity is not a concern because the condenser interlock and the loss of instrument air will close all SDBCS valves. Closing the MSIV's is not performed to prevent exceeding the design flow of SDBCS.

References:

OP 2203.012B Change 33 Annunciator 2K02 Corrective Actions Page 87 .
OP-2107.001 Change 80 Electrical System Operations Exhibit C-1 and C-2 pages 68 and 69 .
CEN 152 Rev 5 Standard Post Trip Action Basis.
EOP Tech Guide Rev. 11 Standard post Trip Actions Page 10 of 41.
OP 2202.001 Standard Post Trip Actions Rev 11 Page 4 of 17.
STM 2-15 Rev 13 Steam Generators and Main Steam System page 27-29 and 32.

Historical Comments:

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank:	1711	**Rev:**	0	**Rev Date:**	9/1/2010 3:40:47	**QID #:**	2	**Author:**	Jim Wright
Lic Level:	R	**Difficulty:**	3	**Taxonomy:**	H	**Source:**	NEW		
Search	000008K203	**10CFR55:**	41.7	**Safety Function**	3				
System Title:	Pressurizer (PZR) Vapor Space Accident (Relief	**System Number**	008	**K/A**	AK2.03				
Tier:	1	**Group:**	1	**RO Imp:**	2.5	**SRO Imp:**	2.4	**L. Plan:**	A2LP-RO-RVMS	**OBJ**	8
Description:	Knowledge of the interrelations between the Pressurizer Vapor Space Accident and the following: - Controllers and positioners								

Question:

Consider the following:

* Unit 2 is at full power.
* 2K10-A4 "Pressurizer Relief Valve Open" is in alarm .
* Pressurizer Code safety audio monitor on 2C-336-1 for 2PSV-4633 indicates elevated flow noise.
* 2K10-B4 " PZR RELIEF TAILPIPE TEMP HI" is in alarm .
* Quench Tank 2T-42 level is off scale high.
* Containment Temperature and humidity are rising.
* Containment building pressure is 15.6 psia and rising.
* RCS pressure is 2100 psia and lowering.

Given these conditions, the indicated pressurizer level would be _____ and the pressurizer level control system would be _____.

A. >60%; controlling letdown flow at 128 gpm.

B. >60%; controlling letdown flow at 28 gpm.

C. <60%; controlling letdown flow at 28 gpm.

D. <60%: controlling letdown flow at 128 gpm.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☑	☑

Audit Exam History

2011	☐

Answer:

A. >60%; controlling letdown flow at 128 gpm.

Notes:

"A" is the correct answer because with a PORV stuck open on the pressurizer level should be artificially elevated to saturated conditions in the PZR. Pressurizer level control system will see a high level and the controller will call for maximum letdown flow which is 128 gpm. "C" and "D" are incorrect because pressurizer level will not lower with a steam space leak even though RCS inventory is lost due to saturated system effects. "B" is incorrect because PZR level controller signal will be putting out 100% demand signal which corresponds to 128 gpm letdown not 28 gpm which corresponds to 16.6% demand minimum letdown flow)

References:

STM 2-12-1 Rev 1 Relief Valve Monitoring System pages 2,8,9,13.
OP 2203.012J Change 36 Annunciator 2K10-A4/B4 Annunciator Corrective Action Page 37- 39.
STM 2-04 Rev 28 Chemical and Volume Control Page 54
STM 2-03-1 Rev 14 Pressurizer Pressure and Level Control Pages 19-20
STM 2-64 Rev 9 Reactor Regulating System, page 6.

Historical Comments:

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank: 1712 **Rev:** 1 **Rev Date:** 12/17/2010 4:00:4 **QID #:** 3 **Author:** Jim Wright

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

Search 000009K102 **10CFR55:** 41.5 **Safety Function** 3

System Title: Small Break LOCA **System Number** 009 **K/A** EK1.02

Tier: 1 **Group:** 1 **RO Imp:** 3.5 **SRO Imp:** 4.2 **L. Plan:** A2LP-RO-ELOCA **OBJ** 4

Description: Knowledge of the operational implications of the following concepts as they apply to the small break LOCA: - Use of steam tables

Question:

Given the following plant conditions:

* Five (5) minutes post trip from full power.
* RCS pressure is 1260 psia and stable.
* Pressurizer Level is 9% and rising slowly.
* "A" and "B" S/G are 960 psia and stable.
* Quench Tank Pressure, Temperature and Level are normal.
* Containment Low Range Radiation Monitors read 850 to 900 mr/hr.
* Containment High Range Area Radiation Monitors read 1.1 R/hr and 1.0 R/hr.
* Containment Pressure is 19 psia.
* Containment Temperature is 245 degrees F.
* RCS Cold Leg Temperature is 545 degrees F.
* RCS Hot Leg Temperature is 548 degrees F.

Determine the event in progress for the given conditions and RCS Margin to Saturation per SPTA's:

A. Small Break LOCA; MTS is not satisfied.

B. Excess Steam Demand Event; MTS is not satisfied.

C. Small Break LOCA; MTS is satisfied.

D. Excess Steam Demand Event; MTS is satisfied.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☑	☑

Audit Exam History

2011	☐

Answer:

A. Small Break LOCA; MTS is not satisfied

Notes:

"A" is correct because conditions for a Small Break LOCA exist i.e. margin to saturation lowering loss of inventory in the RCS and containment radiation levels rising for both the high and low range radiation monitors. Margin to sat calculated is 25.47 degrees and the limit is greater than 30 degrees. Distracter "C" is plausible if Margin to saturation is calculated incorrectly. Distracters "B" and "D" are plausible because of the reduced steam header pressure and containment high range radiation monitor readings will rise in a steam line break inside containment do to temperature induced effects.

References:

OP 2202.003 Loss of Coolant Accident Rev 11 Page 1 of 67
OP 2202.001 Standard Post Trip Actions Rev 11 Page 6 of 17
OP 2202.010 Standard Attachments Rev 15 Pages 4 and 152

Historical Comments:

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank:	1713	**Rev:**	1	**Rev Date:**	12/17/2010 4:01:1	**QID #:**	4	**Author:**	Jim Wright
Lic Level:	R	**Difficulty:**	2	**Taxonomy:**	H	**Source:**	NEW		
Search	0000112420	**10CFR55:**	41.10	**Safety Function**	3				
System Title:	Large Break LOCA			**System Number**	011	**K/A**	2.4.20		
Tier:	1	**Group:**	1	**RO Imp:**	3.8	**SRO Imp:**	4.3	**L. Plan:**	A2LP-RO-ELOCA	**OBJ**	6
Description:	Emergency Procedures/Plan - Knowledge of operational implications of EOP warnings, cautions, and notes.								

Question:

The following plant conditions exist:

* A large break LOCA has occurred on Unit 2.
* EOP 2202.003, Loss of Coolant Accident is being implemented.
* SIAS has actuated and 2DG1 is running loaded with its output breaker closed.
* Annunciator 2K08-D1 "2DG1 Potential Engine Failure" is in alarm.
* 2DG1 Service Water Outlet Valve 2CV-1503-1 is closed and cannot be opened.

The maximum time that 2DG1 may be run before damage may occur is ____, and it must be secured by placing the ____.

A. 3 minutes, Control Room Handswitch in "Pull to Lock" position.

B. 10 minutes, Local Engine Control switch to "Lockout" position.

C. 3 minutes, Local Engine Control switch to "Lockout" position.

D. 10 minutes, Control Room handswitch in "Pull to Lock" position.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☑	☑

Audit Exam History

2011	☐

Answer:

C. 3 minutes, Local Engine Control switch to "Lockout" position.

Notes:

The answer is a step in the EOP to ensure compliance with the operating procedure caution.

"C" is the correct answer because the D/G must be secured within 3 minutes and this can only be performed from the local engine control switch because of SIAS signal being present.

"A" is incorrect but plausible because the EDG is normally secured from the Control room handswitch but it is disabled during an SIAS.

"B" and "D" are plausible because a 10 minute for operating the EDG unloaded does exist in the normal operating procedure to prevent oil buildup in the exhaust manifold.

References:

OP 2104.036 Change 75 Emergency Diesel Generator Operations system description on page 4 and limit and precaution 5.9.
OP 2202.003 Rev 11 Loss of Coolant Accident caution after step 9, page 4 of 67.
OP 2203.012H Change 32 Annunciator 2K08 Corrective Action 2K08-D1 Potential Engine Failure page 6 of 45.
OP 2203.012U Change 19 Annunciator 2E12 Corrective Action Annunciator 2K-126 Service Water Pressure

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Lo, page 7 of 33 .
STM 2-42 Rev 33 Section 3.5.8 Emergency Diesel Generator Coolers, page 36.
Tech Guide AOP 2203.022 Loss of Service Water Rev 11 step 6, page 7.

Historical Comments:

Bank:	1714	**Rev:**	1	**Rev Date:**	12/17/2010 4:01:2	**QID #:**	5	**Author:**	Jim Wright		
Lic Level:	R	**Difficulty:**	3	**Taxonomy:**	H	**Source:**	Modified IH bank OpsUnit2-10087a				
Search	000015K210	**10CFR55:**	41.3			**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% power with the following data being observed on "B" Reactor Coolant Pump (RCP):

* Vapor Seal Pressure - 60 psia
* Upper Seal Pressure - 1200 psia
* Middle Seal Pressure - 2200 psia

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

A. Lower seal only

B. Lower and Middle seals

C. Middle seal only.

D. Lower and Upper seals

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☑	☑

Audit Exam History

2011	☐

Answer:

A. Lower seal only

Notes:

B is incorrect because 1 seals has failed - lower.
C is incorrect because the middle seal has not failed.
D is incorrect because the upper seal has not failed.

References:

OP 2203.025 Rev. 13 RCP Emergencies, Step 5, Attachment B and Attachment D, pages 10,20 and 22

Historical Comments:

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank:	1715	**Rev:**	1	**Rev Date:**	12/17/2010 4:01:4	**QID #:**	6	**Author:**	Jim Wright		
Lic Level:	R	**Difficulty:**	3	**Taxonomy:**	H	**Source:**	NEW				
Search	000022K304	**10CFR55:**	41.5	**Safety Function**	2						
System Title:	Loss of Reactor Coolant Makeup			**System Number**	022	**K/A**	AK3.04				
Tier:	1	**Group:**	1	**RO Imp:**	3.2	**SRO Imp:**	3.4	**L. Plan:**	A2LP-RO-CVCS	**OBJ**	4
Description:	Knowledge of the reasons for the following responses as they apply to the Loss of Reactor Coolant Pump Makeup: - Isolating letdown										

Question:

Given:

* Unit 2 is at 100% power.
* 2P36C Charging Pump is OOS for maintenance.
* 2P36B Charging Pump is in "AUTO".
* 2P36A Charging Pump is running and trips on low oil pressure.

If no operator action is taken, which of the following describes the final state of letdown?

A. Normal letdown flow will be automatically restored after 2P-36A starts.

B. Automatic isolation of Letdown to protect the RCS Charging header inlet nozzles.

C. Automatic isolation of Letdown to protect the Regenerative Heat Exchanger.

D. Letdown flow will be at minimum flow (28 gpm) due to 2P-36A trip.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☑	☑

Audit Exam History

2011	☐

Answer:

C. Automatic isolation of Letdown to protect the Regenerative Heat Exchanger.

Notes:

C. is the correct because the standby pump will not auto start until a PZR level deviation and letdown flow will isolate at 470 degrees without charging available. The subsequent high Letdown temperature would damage the regenerative heat exchanger if flow is allowed to continue.

Distracter A is incorrect because the flow controller will go to minimum but then Letdown Isolation Valve 2CV-4820-2 will close isolating letdown on a high temperature.
Distracter B is incorrect because the RHX is protected from high temperatures and the charging flow will be lost in this scenario.
Distracter D is incorrect because the flow controller will go to minimum not maximum but then Letdown Isolation Valve 2CV-4820-2 will close isolating letdown on a high temperature.

References:

STM 2-04 Rev 27 page 4 section 2.1.2 and page 24.

Historical Comments:

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank:	1716	**Rev:**	1	**Rev Date:**	12/17/2010 4:01:5	**QID #:**	7	**Author:**	Jim Wright
Lic Level:	R	**Difficulty:**	3	**Taxonomy:**	H	**Source:**	NEW		
Search	000025K303	**10CFR55:**	41.8	**Safety Function**	4				
System Title:	Loss of Residual Heat Removal System (RHRS)	**System Number**	025	**K/A**	AK3.03				
Tier:	1	**Group:**	1	**RO Imp:**	3.9	**SRO Imp:**	4.1	**L. Plan:**	A2LP-RO-SDC	**OBJ**	4
Description:	Knowledge of the reasons for the following responses as they apply to the Loss of Residual Heat Removal System: - Immediate actions contained in EOP for Loss of RHRS								

Question:

Given the following:

* RCS level is currently 25 inches from the bottom of the hot leg.
* LPSI pump "A" is in service providing SDC flow.
* LPSI pump "B" is in standby.
* LPSI pump amperage and flow rate start to oscillate.
* Instrument air header pressure is 98 psig.
* No operator actions have been taken.
* AOP 2203.029 Loss of Shutdown Cooling AOP has been entered.

Which of the following describes the action(s) required to mitigate this event in accordance with OP 2203.029?

A. Start "B" LPSI Pump to raise total system flow and reduce amperage on the "A" LPSI pump.

B. Stop "A" LPSI Pump then start the "B" LPSI to restore total system flow back to normal.

C. Leave "A" LPSI running and close 3 LPSI Injection MOV's to lower Net Positive Suction Head.

D. Leave "A" LPSI running and throttle SDC FCV 2CV-5091 to stop vortexing at the pump suction.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☑	☑

Audit Exam History

2011	☐

Answer:

D. Leave "A" LPSI running and throttle SDC FCV 2CV-5091 to stop vortexing at the pump suction.

Notes:

"D" is the correct answer, with instrument air available closing 2CV-5091 will stop vortexing by reducing flow at low RCS levels.

"A" answer is plausible but incorrect because amperage reduction on the "A" pump will occur but the additional flow will induce more vortexing.
"B" is plausible but will not change system conditions and will only jeopardize the good standby pump. The symptoms are do to system conditions not pump conditions.
"C" is plausible because Net Positive suction will be affected but not lowered as stated in the question

References:

OP-2203.029 Loss of Shutdown Cooling Rev 14, Page 8 Step 11.
Technical Guideline OP 2203.029 Loss of Shutdown Cooling Rev 14 page 13, Step 11.

Historical Comments:

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank: 1717 **Rev:** 1 **Rev Date:** 12/17/2010 4:02:4 **QID #:** 8 **Author:** Jim Wright

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

Search 000027A104 **10CFR55:** 41.7 **Safety Function** 3

System Title: Pressurizer Pressure Control (PZR PCS) Malfun **System Number** 027 **K/A** AA1.04

Tier: 1 **Group:** 1 **RO Imp:** 3.9 **SRO Imp:** 3.6 **L. Plan:** A2LP-RO-PZR **OBJ** 3

Description: Ability to operate and/or monitor the following as they apply to the Pressurizer Pressure Control Malfunctions: - Pressure recovery, using emergency-only heaters

Question:

The plant is at 100% power with the following conditions:

* Pressurizer Pressure Controller 2PIC-4626A is selected in AUTO with a setpoint of 2200 psia.
* The following alarm is received: 2K10 E6 "CNTRL CH 1 PRESSURE HI/LO".
* Pressurizer Pressure Control Channel 2PT-4626A is failed low and is reading "0" psia.
* Pressurizer Pressure Control Channel 2PT-4626B is reading "2200" psia.
* Pressurizer level is verified to be 60%.
* AOP 2203.028 PZR SYSTEM MALFUNCTION has been entered.

What action(s) are required to be taken for the above conditions, and what is the status of the Pressurizer Proportional Heaters BEFORE actions are taken?

A. Manually control PZR heaters and close spray valves to restore RCS pressure, Pressurizer Proportional heaters are FULL ON.

B. Manually control PZR heaters and open spray valves to restore RCS pressure, Pressurizer Proportional heaters are FULL OFF.

C. Position the Pressurizer Pressure Control selector switch 2HS4626 to the 'B' position, Pressurizer Proportional heaters are FULL OFF.

D. Position the Pressurizer Pressure Control selector switch 2HS4626 to the 'B' position, Pressurizer Proportional heaters are FULL ON.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☑	☑

Audit Exam History

2011	☐

Answer:

D. Position the Pressurizer Pressure Control selector switch 2HS4626 to the 'B' position, Pressurizer Proportional heaters are FULL ON.

Notes:

"D" is the correct answer because the AOP directs to select the unaffected channel and PZR proportional heaters will be full on at 25 psia below setpoint due to "A" control channel failure.

"A" and "B" are plausible but incorrect because the AOP will direct these actions but only if both control channels are failed.

"C" is plausible because the first half of the answer is a correct action but the heater will be full on not off.

References:

STM 2-03-1 Rev 14 Page 28
OP-2203.012J Annunciator 2K10 corrective action Change 36 Page 61
AOP OP-2203.028 PZR Systems Malfunction Rev 10 page 6 and 7
A2LP-RO-PZR.ppt page 38

Historical Comments:

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank:	1718	**Rev:**	0	**Rev Date:**	9/16/2010 2:54:11	**QID #:**	9	**Author:**	Jim Wright		
Lic Level:	R	**Difficulty:**	3	**Taxonomy:**	H	**Source:**	Modified NRC Exam Bank #1495				
Search	000029A208	**10CFR55:**	41.6	**Safety Function**	1						
System Title:	Anticipated Transient Without Scram (ATWS)	**System Number**	029	**K/A**	EA2.08						
Tier:	1	**Group:**	1	**RO Imp:**	3.4	**SRO Imp:**	3.5	**L. Plan:**	A2LP-RO-DSS	**OBJ**	5
Description:	Ability to determine and interpret the following as they apply to a ATWS: - Rod bank step counters and RPI										

Question:

Consider the following:

* Unit 2 is at full power operation.
* The Unit 2 Main Turbine Trips on low lube oil pressure.
* Reactor Protection System FAILS to trip the reactor.
* The following indications are on 2C-409 Diverse Scram Signal (DSS) Panel.
* The 'A' channel pressurizer pressure transmitter (2PT-4600-1) for DSS reads 2447 psia.
* The 'B' channel pressurizer pressure transmitter (2PT-4600-2) for DSS reads 2451 psia.
* The 'C' channel pressurizer pressure transmitter (2PT-4600-3) for DSS reads 2449 psia.
* The 'D' channel pressurizer pressure transmitter (2PT-4600-4) for DSS reads 2452 psia.
* Assume that all other plant components and their systems function as designed.

How would these conditions affect Unit 2?

A. These conditions would cause only the 'A' CEA MG Set DSS output contactor to open and ALL rod bottom lights would be illuminated on 2C03.

B. These conditions would cause the 'A' and 'B' CEA MG Set DSS output contactors to open and ALL rod bottom lights would be illuminated on 2C03.

C. These conditions would not cause MG Set DSS output contactors to open and NO rod bottom lights would be illuminated on 2C03.

D. These conditions would cause only the 'B' CEA MG Set DSS output contactor to open and only 50% of the rod bottom lights would be illuminated on 2C03.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☑	☑

Audit Exam History

2011	☐

Answer:

B. These conditions would cause the 'A' and 'B' CEA MG Set DSS output contactors to open and ALL rod bottom lights would be illuminated on 2C03.

Notes:

"B" is the correct answer because the DSS system uses a 2 out of 4 logic which will open a contactor on the output of the MG sets and cause all rod to drop to the bottom of the core illuminating dropped rod contacts on 2C03.

The DSS trip path logic comparators for channels 1 and 3 send a signal to DSS contactor #1 for MG set #1 and logic comparators for channels 2 and 4 send a signal to DSS contactor #2 for MG set #2. With a trip signal from channel 2 and 4 only . This makes answer "A" and "D" a plausible choice. Answer "C" could be chosen if confusion regarding "ANY 2 OUT OF 4 CHANNELS >2450 psia" vice two specific channels >2450 psia.

References:

STM 2-63-1 REV 1 Page 3,4,17,18 and 19.
STM 2-02 Rev 20 page 23 and 29.

Historical Comments:

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank:	1719	**Rev:**	1	**Rev Date:**	12/17/2010 4:03:1	**QID #:**	10	**Author:**	Jim Wright		
Lic Level:	R	**Difficulty:**	3	**Taxonomy:**	H	**Source:**	NEW				
Search	0000382447	**10CFR55:**	41.11	**Safety Function**	3						
System Title:	Steam Generator Tube Rupture (SGTR)			**System Number**	038	**K/A**	2.4.47				
Tier:	1	**Group:**	1	**RO Imp:**	4.2	**SRO Imp:**	4.2	**L. Plan:**	A2LP-RO-ESGTR	**OBJ**	2
Description:	Emergency Procedures/Plan - Ability to diagnose and recognize trends in an accurate and timely manner utilizing the appropriate control room reference material.										

Question:

Unit 2 was manually tripped from 21% power due to Steam generator tube leakage greater than Tech Spec limits and the following conditions exist:

* RCS pressure is 1975 psia and slowly rising.
* PZR level is 35% and slowly rising.
* 2RE-5854 "A" S/G blowdown radmonitor reads = 400 cpm.
* 2RE-5864 "B" S/G blowdown radmonitor reads = 35 cpm.
* RCS TAVE= 545 degrees.
* Current tube leakage is 10 GPM and steady.

Based on the above condition, what actions should be performed to mitigate this event upon the completion of SPTA's?

A. Isolate the steam supply to 2P-7A from the "B" S/G.

B. Perform RCS cooldown to less than 535°F Thot.

C. Isolate the feedwater supply to the "B" S/G.

D. Perform RCS cooldown to less than 535°F Tcold.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☑	☑

Audit Exam History

2011	☐

Answer:

B. Perform RCS cooldown to less than 535°F Thot.

Notes:

"B" is the correct answer because neither an SIAS, Loop or leakage > 44 gpm have occurred therefore Primary to secondary leakage is the event in progress and cooldown to less than 535 °F is an appropriate action for this event.

"A" is incorrect but plausible because the "B" generator is not leaking but all other actions in the answer are correct.

"C" and "D" are plausible if it is not recognized that an SIAS, Loop or leakage > 44 gpm don't exist and "B" S/G is not the leaking generator.

References:

OP-2203.038 Rev 12 pages 1,5,6,11,12,28.
OP-2202.004 Rev 10 pages 9,13.
OP-2202.010 Rev 15 page 152.
STM 2-62 Rev 17 pages 30,31,33-34.

Historical Comments:

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank: 1720 **Rev:** 0 **Rev Date:** 9/23/2010 11:19:5 **QID #:** 11 **Author:** Jim Wright

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

Search 000040K201 **10CFR55:** 41.7 **Safety Function** 4

System Title: Steam Line Rupture **System Number** 040 **K/A** AK2.01

Tier: 1 **Group:** 1 **RO Imp:** 2.6 **SRO Imp:** 2.5 **L. Plan:** A2LP-RO-FWCD **OBJ** 11

Description: Knowledge of the interrelations between the Steam Line Rupture and the following: - Valves

Question:

Given the following:

* Unit 2 has experienced a Steam Line Rupture inside containment.
* MSIS,CSAS,SIAS,EFAS,CIAS,CCAS have all actuated.

Which one of the following list the correct status of the Main Feedwater Isolation Valves (2CV-1023-2,1073-2,1024-1,1074-1) and the signal that placed them in the current position?

A. Closed; CSAS..

B. Open; MSIS.

C. Closed; SIAS

D. Open; EFAS.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☑	☑

Audit Exam History

2011	☐

Answer:

A. Closed; CSAS.

Notes:

"A" is correct because the feedwater block valve receive a closed signal on CSAS due to ANO Unit 2 power uprate/S/G replacement with larger generators. The CSAS signal closes the Main Feedwater Isolation Valves to limit containment pressure rise cause by feedwater flow to the affected S/G.

"B" ,"C" and "D" are plausible because the valves do get an ESFAS signal during a steam line break but the candidate must know which direction the valves travel and which ESFAS signal.

References:

STM 2-19 Rev 12 Page 11 Section 2.7

Historical Comments:

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank:	1721	**Rev:**	0	**Rev Date:**	9/28/2010 9:31:55	**QID #:**	12	**Author:**	Jim Wright		
Lic Level:	R	**Difficulty:**	3	**Taxonomy:**	H	**Source:**	NEW				
Search	000054A103	**10CFR55:**	41.7	**Safety Function**	4						
System Title:	Loss of Main Feedwater (MFW)	**System Number**	054	**K/A**	AA1.03						
Tier:	1	**Group:**	1	**RO Imp:**	3.5	**SRO Imp:**	3.7	**L. Plan:**	A2LP-RO-EFW	**OBJ**	8
Description:	Ability to operate and/or monitor the following as they apply to the Loss of Main Feedwater (MFW): - AFW auxiliaries, including oil cooling water supply										

Question:

The plant trips and the following conditions exist:

* Offsite Power is NOT available.
* 4160V ESF Bus 2A3 is locked-out due to a fire.
* 4160V ESF Bus 2A4 is being supplied by 2DG2.
* Steam Generator "A" level is 20% (lowering).
* Steam Generator "B" level is 25% (lowering).
* Emergency feedwater suction pressure is 25 psig.

Which Steam Generator is being supplied feedwater and what source of water is supplying EFW Pump bearing cooling water?

A. "A" Steam Generator; Q CST.

B. "B" Steam Generator; Q CST.

C. "A" Steam Generator; Service water.

D. "B" Steam Generator; Service water.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☑	☑

Audit Exam History

2011	☐

Answer:

A. "A" Steam Generator; Q CST.

Notes:

"A" is the correct answer because "A" Steam Generator is less than 22.2% and the normal suction source to EFW would be aligned because suction pressure is greater than 5 psig. The suction source aligned to the pump is the source of water to the bearing oil cooler.

"B" "C" and "D" are plausible because EFW has the ability to feed the "B" generator but the setpoint is too high and service water is an available suction source but not aligned at this time.

References:

STM 2-19-2 Rev 30 Pages 7,14,15,17
OP 2106.006 Change 76 page 11.

Historical Comments:

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank:	1722	**Rev:**	0	**Rev Date:**	9/28/2010 4:07:28	**QID #:**	13	**Author:**	Jim Wright		
Lic Level:	R	**Difficulty:**	3	**Taxonomy:**	H	**Source:**	Modified NRC Exam bank #517				
Search	000055K102	**10CFR55:**	41.14	**Safety Function**	6						
System Title:	Loss of Offsite and Onsite Power (Station Black	**System Number**	055	**K/A**	EK1.02						
Tier:	1	**Group:**	1	**RO Imp:**	4.1	**SRO Imp:**	4.4	**L. Plan:**	A2LP-RO-ESBO	**OBJ**	5
Description:	Knowledge of the operational implications of the following concepts as they apply to the Station Blackout: - Natural circulation cooling										

Question:

Given the following:

* The Plant has tripped due to a Station Blackout 15 minutes ago.
* SPTAs are complete and the Station Blackout EOP 2202.008 has been entered.
* RCS hot leg temperature 561°F and lowering.
* RCS cold leg temperature 515°F and constant.
* RCS Average CET temperature 572°F and lowering.
* PZR pressure 1600 psia and steady.

What is the status of natural circulation conditions?

A. Natural Circulation IS established due to RCS margin to saturation greater than 30°F.

B. Natural Circulation IS NOT established due to CET and T-hot delta T greater than 10°F.

C. Natural Circulation IS established due to loop delta T less than 50°F.

D. Natural Circulation IS NOT established due to cold leg temperature constant.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☑	☑

Audit Exam History

2011	☐

Answer:

B. Natural Circulation IS NOT established due to CET and T-hot delta T greater than 10°F.

Notes:

Natural Circulation is verified met by looking at the parameters listed in the Station Blackout EOP section 1 step 13. All of the 4 criteria must be met to ensure single phase natural circulation.

Distracter A and C are incorrect because it does meet one of the criteria for the given conditions but ALL of the 4 criteria in the EOP step must be met.

Distracter D is incorrect because one of the criteria is T-cold constant or lowering which is the case in the distracter but the distracter says "Natural Circulation is NOT established".

References:

OP-2202.008 Rev 9 , Station Blackout EOP, Section 1 Step 13, page 15 of 73.
Tech Guide OP 2202.008 Rev 8, Station Blackout TG, Section 1 Step 13, page 19 of 100.

Historical Comments:

Original QID #517 was used on the 2005 NRC Exam

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank:	1723	**Rev:**	1	**Rev Date:**	12/17/2010 4:05:0	**QID #:**	14	**Author:**	Jim Wright
Lic Level:	R	**Difficulty:**	3	**Taxonomy:**	F	**Source:**	NEW		
Search	000056A107	**10CFR55:**	41.7	**Safety Function**	6				
System Title:	Loss of Offsite Power	**System Number**	056	**K/A**	AA1.07				
Tier:	1	**Group:**	1	**RO Imp:**	3.2	**SRO Imp:**	3.2	**L. Plan:**	A2LP-RO-SWACW	**OBJ**	5
Description:	Ability to operate and/or monitor the following as they apply to the Loss of Offsite Power: - Service water pump								

Question:

Given the following:

* All 3 Service Water Pumps are running with 2P-4B aligned to Loop 2.
* Unit 2 Reactor trips due to a Loss of Offsite Power.
* All non-Vital and Vital AC buses deenergize.
* 2DG1 starts and energizes its associated vital 4160V bus.
* 2DG2 fails to start and cannot be started locally.
* All associated equipment operates as designed.
* Assume no operator actions.

How many Service Water Pumps are running and what loads are being supplied?

A. 1 Pump, Loop 1 Service Water.

B. 2 Pumps, Loop 1 Service Water.

C. 2 Pumps, Loop 1 Service Water and ACW.

D. 1 Pump, Loop 1 Service Water and ACW.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☑	☑

Audit Exam History

2011	☐

Answer:

A. 1 Pump, Loop 1 Service Water.

Notes:

"A" is correct based on not having any ESFAS actuations and only 1 service water pump aligned to the Red train - "A" service water pump will auto start when #1DG ties on to the 2A3 bus according to the stem "A" pump is only aligned to loop 1 service water.

"B" ,"C" and "D" are incorrect because specify the wrong number of pumps running or the answer specifies that ACW will also be supplied. ACW is aligned to Loop 2, not Loop 1.

References:

STM 2-42 Rev 33 pages 22 and 23

Historical Comments:

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank:	1724	**Rev:**	0	**Rev Date:**	9/28/2010 11:30:0	**QID #:**	15	**Author:**	Jim Wright		
Lic Level:	R	**Difficulty:**	2	**Taxonomy:**	F	**Source:**	Modified NRC Exam Bank #655				
Search	000057A218	**10CFR55:**	41.6	**Safety Function**	6						
System Title:	Loss of Vital AC Electrical Instrument Bus	**System Number**	057	**K/A**	AA2.18						
Tier:	1	**Group:**	1	**RO Imp:**	3.1	**SRO Imp:**	3.1	**L. Plan:**	A2LP-RO-RPS	**OBJ**	6
Description:	Ability to determine and interpret the following as they apply to the Loss of Vital AC Instrument Bus: - The indicator, valve, breaker, or damper position which will occur on a loss of power										

Question:

Which of the following Reactor Trip Circuit Breakers would indicate open on a loss of 120V Vital AC bus 2RS-2?

A. Breakers 1 and 5.

B. Breakers 2 and 6.

C. Breakers 3 and 7.

D. Breakers 4 and 8.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☑	☑

Audit Exam History

2011	☐

Answer:

B. Breakers 2 and 6.

Notes:

"B" is the correct answer because deenergizing 2RS-2 will deenergize K-2 relay opening TCB 2 and 6.

"A" ,"C", and "D" are plausible but incorrect because they are TCB's but are the incorrect combination because they are deenergized by K1, K3, and K4.

References:

STM-2-63, Rev 10, Section 5.0, (Reactor Protection System) pages 37-40 and 55.

Historical Comments:

Original QID 655 was used on the 2006 NRC Exam

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank: 1725 **Rev:** 1 **Rev Date:** 12/17/2010 4:10:5 **QID #:** 16 **Author:** Jim Wright

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

Search 0000582212 **10CFR55:** 41.8 **Safety Function** 6

System Title: Loss of DC Power **System Number** 058 **K/A** 2.2.12

Tier: 1 **Group:** 1 **RO Imp:** 3.7 **SRO Imp:** 4.1 **L. Plan:** A2LP-RO-ED125 **OBJ** 9

Description: Equipment Control - Knowledge of surveillance procedures.

Question:

Consider the following:

* Unit 2 is at 100% power.
* Annunciator 2K01- E11 "BUS 2D02 CHARGER TROUBLE" is in alarm.
* The Inside AO reports the DC output breaker (B302) is open on the in-service battery charger 2D32A.
* Assume no other operator action is taken.

Which of the following is the required action to take with respect to Unit 2 Technical Specifications?

A. Take pilot cell readings for battery bank 2D12 within 1 hour to verify operability.

B. Restore a battery charger to 2D12 within 1 hour or be in Hot Standby within 1 hour.

C. No Technical Specification actions are required for the above listed conditions.

D. Immediately reduce load on 2D12 because battery charger 2D32A is not available.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☑	☑

Audit Exam History

2011	☐

Answer:

A. Take pilot cell readings for battery bank 2D12 within 1 hour to verify operability.

Notes:

"A" is correct per Tech Specs. The station is required to verify pilot cell reading within 1 hour to determine battery operability.

"B","C" and "D" are plausible but incorrect because the battery is still operable with the battery charger disconnected from it as long as pilot cell values are in spec. Tech specs require the action of taking pilot cell data within 1 hour to prove continued operability.

References:

OP-2203.012A Change 38 Page 103-104 Annunciator 2K01 Corrective Action for 2K01-E11.
STM 2-35-2 Rev 16 Pages 9 and 23.
ANO Unit 2 Tech Specifications 3.8.2.3 Action "b".

Historical Comments:

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank:	1726	**Rev:**	1	**Rev Date:**	12/17/2010 4:11:5	**QID #:**	17	**Author:**	Jim Wright
Lic Level:	R	**Difficulty:**	2	**Taxonomy:**	H	**Source:**	NEW		
Search	000062K304	**10CFR55:**	41.7	**Safety Function**	4				
System Title:	Loss of Nuclear Service Water	**System Number**	062	**K/A**	AK3.04				
Tier:	1	**Group:**	1	**RO Imp:**	3.5	**SRO Imp:**	3.7	**L. Plan:**	A2LP-RO-SWACW	**OBJ**	11

Description: Knowledge of the reasons for the following responses as they apply to the Loss of Nuclear Service Water: - Effect on the nuclear service water discharge flow header of a loss of CCW

Question:

The following plant conditions exist:

* The plant has just tripped due to a 550 gpm RCS leak inside containment.
* SIAS, CIAS, CCAS,MSIS,CSAS have actuated.
* No Operator actions have been taken.

What is the response of the Service Water supply valves to the Component Cooling Water System (2CV-1530-1 and 2CV-1531-2) to the above stated conditions and what is the effect on the Service Water Pump discharge pressure?

A. The valves will be OPEN and a subsequent RAS will cause them to close;
Service water pump discharge pressure will be LOWER than it was at 100% power.

B. The valves will be OPEN and a subsequent RAS will have no effect on them;
Service water pump discharge pressure will be LOWER than it was at 100% power.

C. The valves will be CLOSED and can be overridden and opened, and a subsequent RAS will cause them to close;
Service water pump discharge pressure will be HIGHER than it was at 100% power.

D. The valves will be CLOSED and can be overridden and opened, and a subsequent RAS will have no effect on them;
Service water pump discharge pressure will be HIGHER than it was at 100% power.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☑	☑

Audit Exam History

2011	☐

Answer:

C. The valves will be CLOSED and can be overridden and opened, and a subsequent RAS will cause them to close;
Service water pump discharge pressure will be HIGHER than it was at 100% power.

Notes:

"C" is the correct answer with a SIAS signal present these valves will close and increase service water system pressure.

"A" "B" are plausible if it is overlooked that a SIAS has occurred and the valve go closed/service water pump discharge pressure will actually be higher than it was at 100% power but lower than it should be with SIAS actuated.

"D" is the correct valve position but incorrect response/service water system response is correct.

References:

STM 2-42 Rev 33 pages 37,38 and 62

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Historical Comments:

Bank:	1727	**Rev:**	1	**Rev Date:**	12/17/2010 4:12:1	**QID #:**	18	**Author:**	Jim Wright		
Lic Level:	R	**Difficulty:**	2	**Taxonomy:**	F	**Source:**	NRC EXAM bank #540				
Search	000065A208	**10CFR55:**	41.8	**Safety Function**	8						
System Title:	Loss of Instrument Air			**System Number**	065	**K/A**	AA2.08				
Tier:	1	**Group:**	1	**RO Imp:**	2.9	**SRO Imp:**	3.3	**L. Plan:**	A2LP-RO-EAOP	**OBJ**	16
Description:	Ability to determine and interpret the following as they apply to the Loss of Instrument Air: - Failure modes of air-operated equipment										

Question:

Given the following conditions:

* The plant is experiencing a loss of Instrument air pressure.

If Instrument air pressure continues to lower, what would be the final status of the Main Steam Atmospheric Dump Valves (ADVs) upstream and downstream of the Main Steam Isolation Valves (MSIVs)?

A. Upstream and Downstream ADVs would fail Closed.

B. Upstream ADVs fail Open; Downstream ADVs fail Closed.

C. Upstream and Downstream ADVs would fail Open.

D. Upstream ADVs fail Closed; Downstream ADVs fail Open.

QID use History

	RO	SRO
2003	☐	☐
2005	☑	☑
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☑	☑

Audit Exam History

2011	☐

Answer:

B. Upstream ADVs fail Open; Downstream ADVs fail Closed.

Notes:

Distracter A and D are incorrect because the Upstream ADVs fail Open.

Distracter C is incorrect because the Downstream ADV fails Closed.

References:

AOP 2203.021 Change 13 , Loss of Instrument Air, Attachment A System Valve Positions and Attachment D, Critical Component Information, pages 17 and 36.

Historical Comments:

QID 540 was used on the 2005 NRC Exam

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank:	1728	**Rev:**	1	**Rev Date:**	12/17/2010 4:12:3	**QID #:**	19	**Author:**	Jim Wright		
Lic Level:	R	**Difficulty:**	2	**Taxonomy:**	F	**Source:**	Modified NRC EXAM BANK #121				
Search	000032K301	**10CFR55:**	41.10	**Safety Function**	7						
System Title:	Loss of Source Range Nuclear Instrumentation			**System Number**	032	**K/A**	AK3.01				
Tier:	1	**Group:**	2	**RO Imp:**	3.2	**SRO Imp:**	3.6	**L. Plan:**	A2LP-RO-NIMAL	**OBJ**	3
Description:	Knowledge of the reasons for the following responses as they apply to the Loss of Source Range Nuclear Instrumentation: - Startup termination on source-range loss										

Question:

Given the following:

* Unit 2 is in Mode 2.
* Reactor Startup is in progress.
* Annunciator 2K10-K4 "STARTUP CHANNEL 1 TROUBLE" comes in alarm.
* Annunciator 2K10-K5 "STARTUP CHANNEL 2 TROUBLE" comes in alarm.
* The Control Room Supervisor declares Startup Channel #1 and Channel #2 Source Range Monitors inoperable.
* The Reactor Engineer reports that 1/M plot data can no longer be obtained due to loss of Source Range Monitor data.

Which of the following describes the required action per OP 2102.016 Reactor Startup?

A. Reactor startup MAY continue provided boron samples are taken every 15 minutes.

B. Reactor plant startup MAY continue without the optional 1/M plot data.

C. Reactor startup MAY NOT continue because all log channel power has been lost.

D. Reactor startup MAY NOT continue, conservatively place the reactor in a safe condition.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☑	☑

Audit Exam History

2011	☐

Answer:

D. Reactor startup MAY NOTcontinue, conservatively place the reactor in a safe condition.

Notes:

"D" is correct based on guidance given in OP 2102.016 prejob brief and Limits and precaution 5.9 that states if unexpected conditions arise the reactor should be place in a safe condition.

"A","B" "C" are plausible but incorrect monitoring boron concentration is not a requirement if the start up channels are lost. All log channel power indication has not been lost the safety channels are still available. The procedure also gives no guidance to continue if 1/M plot data cannot be obtained therefore the operator should not continue.

References:

Tech Spec 3.9.2
OP 2203.012J, Rev 36, 2K10-K4, (Annunciator 2K10 Corrective Actions) page 47 and 54.
OP 2102.016 Rev 15 pages 5,7,22,23,24

Historical Comments:

Original QID 121 was used on the 1998 NRC Exam

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank:	1729	**Rev:**	0	**Rev Date:**	10/1/2010 9:56:42	**QID #:**	20	**Author:**	Jim Wright		
Lic Level:	R	**Difficulty:**	2	**Taxonomy:**	H	**Source:**	NEW				
Search	000037A105	**10CFR55:**	41.13	**Safety Function**	3						
System Title:	Steam Generator (S/G) Tube Leak			**System Number**	037	**K/A**	AA1.05				
Tier:	1	**Group:**	2	**RO Imp:**	3.3	**SRO Imp:**	3.5	**L. Plan:**	A2LP-RO-RMON	**OBJ**	20

Description: Ability to operate and/or monitor the following as they apply to the Steam Generator Tube Leak: - Radiation monitor for auxiliary building exhaust processes

Question:

Given the following:

* Unit 2 has tripped from 100% power.
* Condenser Off-Gas Radiation monitor is in alarm.
* The CRS has diagnosed SGTR Optimal Recovery EOP.
* Annunciator 2K11-D10 "Process Gas Radiation HI/LO" comes in.
* Assume all radiation/process monitors are in operation.

Which one of the following radiation monitors could be alarming based on the above conditions?

A. Containment Purge Discharge Radiation Monitor 2VEF-15 (2RITS-8233).

B. Radwaste Area Discharge Radiation Monitor 2VEF-8A/B (2RITS-8542).

C. Fuel Handling Area Discharge Radiation Monitor 2VEF-14A/B (2RITS-8540).

D. Penetration Room Exhaust Discharge Radiation Monitor 2VEF-38A (2RITS-8845-1).

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☑	☑

Audit Exam History

2011	☐

Answer:

B. Radwaste Area Discharge Radiation Monitor 2VEF-8A/B (2RITS-8542).

Notes:

"B" is the correct answer because it is in the direct flow path of the condenser vacuum exhaust and would be expected to trend up and/or alarm during a SGTR.

"A", "C" and "D" are all radiation monitors that feed Annunciator 2K11-D10 Process Gas Radiation HI/LO alarm

References:

OP 2203.012K Annunciator 2K11 Corrective Action Change 37 Page 96 and 105.
OP-2104.035 Ventilation System Operation Change 30 step 7.4.2.
M-2262 Sheet 3 Rev 42.
M-2204 Sheet 5 Rev 13.

Historical Comments:

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank:	1730	**Rev:**	1	**Rev Date:**	12/17/2010 4:13:2	**QID #:**	21	**Author:**	Jim Wright
Lic Level:	R	**Difficulty:**	3	**Taxonomy:**	F	**Source:**	New		
Search	000060A205	**10CFR55:**	41.11	**Safety Function**	9				
System Title:	Accidental Gaseous Radwaste Release			**System Number**	060	**K/A**	AA2.05		
Tier:	1	**Group:**	2	**RO Imp:**	3.7	**SRO Imp:**	4.2	**L. Plan:**	A2LP-RO-RWST	**OBJ**	4.c.8

Description: Ability to determine and interpret the following as they apply to the Accidental Gaseous Radwaste Release: - That the automatic safety actions have occurred as a result of a high ARM system signal

Question:

Given the following:

* The plant is in Mode 4.
* Waste gas compressor 2C-75A is operating with its suction aligned to the Volume Control Tank.
* The Waste Control Operator inadvertently aligns 2C-75A discharge to 2T-18B resulting in an accidental gaseous radwaste release.
* A gaseous radwaste release from Gas Decay Tank 2T-18B is in progress
* Annunciator 2K11 D10 "Gaseous Radwaste System Trouble" is in alarm.
* Annunciator 2K16 B7 "Gaseous Radwaste Discharge Radiation High" is in alarm.
* 2RITS-2429 "Gaseous Radwaste Discharge Rad Monitor" is in High alarm on 2C25.

Which of the following automatic actions occur as a result of 2RITS-2429 "Gaseous Radwaste Discharge Rad Monitor alarm?

A. The running 2VEF-8 "Auxiliary Building Radwaste Exhaust Fan" stops and "Waste Gas Decay Tanks Discharge Isolation" 2CV-2428 closes.

B. "Waste Gas Decay Tanks Discharge Isolation" 2CV-2428 automatically closes, The ventilation lineup is not affected.

C. The standby 2VEF-8 "Auxiliary Building Radwaste Exhaust Fan" starts and "Waste Gas Decay Tank Discharge Isolation" 2CV-2428 closes.

D. The running 2VEF-8 "Auxiliary Building Radwaste Exhaust Fan" and 2VSF-7A/B "Auxiliary Building Supply Fans" stop.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☑	☑

Audit Exam History

2011	☐

Answer:

B. "Waste Gas Decay Tanks Discharge Isolation" 2CV-2428 automatically closes, The ventilation lineup is not affected. .

Notes:

2CV-2428 is the release path isolation and is interlocked to close if 2RITS-2429 "Gaseous Radwaste Discharge Rad Monitor" is in High alarm. No ventilation lineup changes occur as a result of a high radiation alarm. 2VEF-8A fans are interlocked with 2CV-2428 causing it to closed if they are stopped. 2VEF -8A/B are interlocked such that if the running fans stops, 2CV-2428 will receive a closed signal. The 2VSF 7 A/B fans receive no signals from 2RITS-2429.

References:

STM 2-54,Rev 8 Gaseous Radwaste System, Section 2.8 ,page 6 and 12
OP-2203.012K Rev 37 2K11-D10 /F9 Annunciator corrective actions, pages 91 and 105.
OP-2203.012P Rev 13 2K16-B7 Annunciator corrective actions, pages 9.

Data for 2011 NRC RO/SRO Exam

21-Dec-10

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 2011 NRC RO/SRO Exam

21-Dec-10

Bank:	1731	**Rev:**	1	**Rev Date:**	12/17/2010 4:14:4	**QID #:**	22	**Author:**	Jim Wright
Lic Level:	R	**Difficulty:**	3	**Taxonomy:**	H	**Source:**	NEW		
Search	0000612120	**10CFR55:**	41.10	**Safety Function**	7				
System Title:	Area Radiation Monitoring (ARM) System Alar	**System Number**	061	**K/A**	2.1.20				
Tier:	1	**Group:**	2	**RO Imp:**	4.6	**SRO Imp:**	4.6	**L. Plan:**	A2LP-RO-EAOP	**OBJ**	11
Description:	Conduct of Operations - Ability to interpret and execute procedure steps.								

Question:

Given the following:

* Unit 2 is at full power.
* Annunciator 2K11-B10 "Area Radiation HI/LO" is in alarm.
* 2RITS-8902 on elevation 335' "2F3A/B LETDOWN FILTER AREA" is in alarm on 2C25.
* VCT level is lowering.
* Charging header flow = 44gpm.
* "VCT 2T4 LEVEL HI/LO" annunciator (2K12-H5) is in alarm.
* The online 2T20 tank level is rising.
* Pressurizer level is 60% and stable.

Based on the above indications, what is the required action per AOP 2203.016, Excess RCS Leakage?

A. Isolate letdown flow by closing 2CV-4810/2CV-4811 backpressure control valves.

B. Secure all charging pumps to allow letdown flow to refill VCT to normal.

C. Isolate letdown flow by closing 2CV-4820-2 Letdown isolation valve.

D Secure all Charging pumps and close pump manual suction and discharge valves.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☑	☑

Audit Exam History

2011	☐

Answer:

C. Isolate letdown flow by closing 2CV-4820-2 Letdown isolation valve.

Notes:

"C" is correct based on the AOP actions for a leak in CVCS. The AOP directs the operator to isolate letdown flow by using 2CV-4820-2 if the leak is in CVCS. The operator should be able to determine the location of the leak by a combination of the radiation alarm, PZR level response, VCT level response, charging header flow and 2T20 tank level rising.

"A" "B" are plausible because they will result in restoration of VCT level but not isolation of the leak in both cases."D" are actions specified in the loss of charging AOP and are plausible if it is not recognized where the leak is located in the system.

References:

AOP 2203.012K Change 37 Page 98 and 99 Annunciator Corrective Action 2K11-B10.
AOP 2203.036 Loss of Charging Rev 9 pages 1-5.
AOP 2203.016, Excess RCS Leakage, Rev 15 Pages 1,5, and 9
STM 2-52 Rev 14 page 8
STM 2-04 Rev 28 page 62.

Historical Comments:

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank:	1732	**Rev:**	0	**Rev Date:**	10/4/2010 10:01:3	**QID #:**	23	**Author:**	Jim Wright		
Lic Level:	R	**Difficulty:**	3	**Taxonomy:**	F	**Source:**	NEW				
Search	000068K202	**10CFR55:**	41.7	**Safety Function**	8						
System Title:	Control Room Evacuation			**System Number**	068	**K/A**	AK2.02				
Tier:	1	**Group:**	2	**RO Imp:**	3.7	**SRO Imp:**	3.9	**L. Plan:**	A2LP-RO-EAOP	**OBJ**	23
Description:	Knowledge of the interrelations between the Control Room Evacuation and the following: - Reactor trip system										

Question:

Given the following:

* A compressed gas cylinder has ruptured inside the Unit 2 Control Room.
* The Control Room Supervisor has entered AOP 2203.030 Remote Shutdown and directed all control room personnel to evacuate due to breathing hazards and low visibility.
* The control room is evacuated with Unit 2 reactor at 100% power.

Which of the following describes the preferred method per AOP 2203.030 Remote Shutdown of ensuring the Unit 2 reactor is tripped after the control room is evacuated?

A. Waste Control Operator will open Load Center 2B7 and 2B8 feeder breakers.

B. Auxiliary Operator will open the MG Set output breakers locally.

C. CRS will open Reactor Trip Circuit Breakers 1 through 8 locally.

D. CBOT dons an SCBA, returns to the control room and trips the reactor.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☑	☑

Audit Exam History

2011	☐

Answer:

C. CRS will open Reactor Trip Circuit Breakers 1 through 8 locally.

Notes:

"C" The CRS opening the Trip circuit breakers is the only procedurally approved method of the four choices for tripping the reactor. The other 3 methods will trip the reactor but are not addressed in OP 2203.030 Remote Shutdown.

References:

AOP 2203.030 Rev 12, Remote Shutdown Section 1 and 3 pages 1-3 and 6.

Historical Comments:

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank:	1733	**Rev:**	0	**Rev Date:**	10/5/2010 10:00:0	**QID #:**	24	**Author:**	Jim Wright		
Lic Level:		**Difficulty:**	4	**Taxonomy:**	H	**Source:**	Modified INPO Exam Bank				
Search	000069K101	**10CFR55:**	41.14	**Safety Function**	5						
System Title:	Loss of Containment Integrity			**System Number**	069	**K/A**	AK1.01				
Tier:	1	**Group:**	2	**RO Imp:**	2.6	**SRO Imp:**	3.1	**L. Plan:**	A2LP-RO-TM006	**OBJ**	7

Description: Knowledge of the operational implications of the following concepts as they apply to Loss of Containment Integrity: - Effect of pressure on leak rate

Question:

Given the Following:

* Unit 2 has experienced a LOCA event inside containment.
* The pressure inside containment caused a piping failure outside containment in the "A" ESF room that cannot be isolated.
* Containment Pressure was 35 psig when the leak was discovered and the leakrate estimated to be 4 gpm.

What will the leakrate be if containment pressure is lowered to 10 psig?

A. 1.14 gpm

B. 2.00 gpm

C. 2.14 gpm

D. 2.83 gpm

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☑	☑

Audit Exam History

2011	☐

Answer:

C. 2.14 gpm

Notes:

The leakrate is proportional to the square root of differential pressure . The candidate has to remember this fact in order to correctly derive the answer.

The correct answer is 4 gpm times the square root of 10 divided by 35 = 2.14 gpm

The other answers are a result of using a strait ratio or incorrect unit use.

References:

PWR Thermodynamics Chapter 6 Fluid Statics and Dynamics Rev 2. Page 6 and 27

Historical Comments:

Palisades 2/28/06 Exam

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank:	1734	**Rev:**	0	**Rev Date:**	10/5/2010 4:02:15	**QID #:**	25	**Author:**	Jim Wright		
Lic Level:	R	**Difficulty:**	2	**Taxonomy:**	F	**Source:**	NEW				
Search	000074A115	**10CFR55:**	41.5	**Safety Function**	4						
System Title:	Inadequate Core Cooling			**System Number**	074	**K/A**	EA1.15				
Tier:	1	**Group:**	2	**RO Imp:**	3.9	**SRO Imp:**	4.1	**L. Plan:**	A2LP-RO-ELOCA	**OBJ**	17
Description:	Ability to operate and/or monitor the following as they apply to an Inadequate Core Cooling: - Hot-leg and cold-leg temperature recorders										

Question:

Which of the following sets of conditions indicates inadequate core cooling?

A. RCS pressure is 1100 psia; RCS Hot Leg and average CET Temperature are 532 °F; RVLMS LEVEL 2 and below indicates wet.

B. RCS pressure is 1200 psia; RCS Hot Leg and average CET Temperature are 582 °F; RVLMS LEVEL 7 and below indicates wet.

C. RCS pressure is 1350 psia; RCS Hot Leg and average CET Temperature are 577 °F; RVLMS LEVEL 3 and below indicates wet.

D. RCS pressure is 1450 psia; RCS Hot Leg and average CET Temperature are 590 °F; RVLMS LEVEL 6 and below indicates wet.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☑	☑

Audit Exam History

2011	☐

Answer:

B. RCS pressure is 1200 psia; RCS Hot Leg and average CET Temperature are 582 °F; RVLMS LEVEL 7 and below indicates wet.

Notes:

"B" is correct because based on the indications given the core is experiencing 14.81 degrees of superheat and water level in the core is below RVLMS LEVEL 6 therefore the core is uncovered.

"A" "C" and "D" are plausible because the temperatures and levels do not correspond to superheated conditions or core uncovery. The Steam tables need to be used to derive the correct answer without reference to the EOP.

References:

OP 2202.003 Loss of Coolant Accident Rev 11 Page 55 #5.
Tech Guide Loss of Coolant Accident Rev 11 Page 129 #5.

Historical Comments:

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank: 1735 **Rev:** 1 **Rev Date:** 12/17/2010 4:15:5 **QID #:** 26 **Author:** Jim Wright

Lic Level: R **Difficulty:** 2 **Taxonomy:** F **Source:** NRC Exam bank #639

Search 00CA112101 **10CFR55:** 41.10 **Safety Function** 4

System Title: RCS Overcooling **System Number** A11 **K/A** 2.1.1

Tier: 1 **Group:** 2 **RO Imp:** 3.8 **SRO Imp:** 4.2 **L. Plan:** A2LP-RO-EAOP **OBJ** 8

Description: Conduct of Operations - Knowledge of conduct of operations requirements.

Question:

Unit 2 is in Mode 3 with a cooldown in progress for refueling with the following conditions:

* SG pressures 860 psia controlled by SDBCS in manual for cooldown.
* SG 'B' main steam safety 2PSV-1052 is leaking.
* 2PSV-1052 now opens and will NOT re-seat.
* RCS Overcooling AOP is entered.

Manually closing the Main Steam Isolation Valves will _____.

A. isolate the lifted main steam safety valve

B. minimize the cooldown of the RCS

C. isolate EFW steam supply from the affected SG

D. prevent an uncontrolled cooldown of the RCS

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☑	☑
2008	☐	☐
2009	☐	☐
2011	☑	☑

Audit Exam History

2011	☐

Answer:

B. minimize the cooldown of the RCS.

Notes:

The cooldown will be limited/minimized by closing Main Steam Isolation Valves due to only cooling down from one SG verses both.

A. The MSSVs are upstream of the MSIVs and will not be isolated.
C. EFW steam supply valve are upstream of the MSIV's and are not affected by their closure.
D. An RCS cooldown will commence because the MSSVs are upstream of the MSIVs.

References:

AOP 2203.011 and Tech Guide Rev 4 step 9.
STM 2-15 Rev 13 page 46.

Historical Comments:

QID 639 was used on the 2006 NRC Exam

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank: 1736 **Rev:** 1 **Rev Date:** 12/17/2010 4:16:0 **QID #:** 27 **Author:** Bill Coble

Lic Level: R **Difficulty:** 3 **Taxonomy:** H **Source:** NRC Exam Bank #342

Search 00CA13K102 **10CFR55:** 41.14 **Safety Function** 4

System Title: Natural Circulation Operations **System Number** A13 **K/A** EK1.2

Tier: 1 **Group:** 2 **RO Imp:** 3.2 **SRO Imp:** 3.5 **L. Plan:** A2LP-RO-EAOP **OBJ** 9

Description: Knowledge of the operational implications of the following concepts as they apply to the (Natural Circulation Operations): - Normal, abnormal and emergency operating procedures associated with (Natural Circulation Operations)

Question:

During a natural circulation cooldown, which of the following pressurizer level responses would indicate the presence of a void in the reactor vessel upper head?

A. Pressurizer level rises when charging flow is directed through auxiliary spray.

B. Pressurizer level lowers when charging flow is directed through auxiliary spray.

C. Pressurizer level rises when charging flow is directed into the cold legs.

D. Pressurizer level lowers when there is an increase in the cooldown rate.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☑	☑

Audit Exam History

2011	☐

Answer:

A. Pressurizer level rises when charging flow is directed through auxiliary spray.

Notes:

Answer A is correct because a lowering of pressure in the pressurizer would cause expansion of the bubble in the head forcing water up into the pressurizer - just the opposite of answer B. Answer C is wrong because a level increase should be expected with charging going to the loops. Answer D is wrong because a cooldown should contract the RCS and lower Pressurizer level.

References:

OP 2203.013, Natural Circulation Operations, Change 13, Step 32
AOP 2203.013, Technical Guide, Revision 13, Step 32

Historical Comments:

QID 342 was used on the 2002 NRC Exam

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank: 1737 **Rev:** 1 **Rev Date:** 12/17/2010 4:17:2 **QID #:** 28 **Author:** Jim Wright

Lic Level: R **Difficulty:** 2 **Taxonomy:** F **Source:** Modified NRC Bank #301

Search 003000A203 **10CFR55:** 41.5 **Safety Function** 4

System Title: Reactor Coolant Pump System (RCPS) **System Number** 003 **K/A** A2.03

Tier: 2 **Group:** 1 **RO Imp:** 2.7 **SRO Imp:** 3.1 **L. Plan:** A2LP-RO-RCS **OBJ** 8

Description: Ability to (a) predict the impacts of the following malfunctions or operations on the RCPS and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: - Problems associated with RCP motors, including faulty motors and current, and winding and bearing temperature problems

Question:

Given the following:

* Unit 2 is at 100%
* All systems are in the normal full power lineup.

Which of the following Reactor Coolant Pump (RCP) malfunction indications would allow the affected RCP(s) to remain running per OP 2203.025 RCP Emergencies, rather than requiring an immediate reactor trip and the affected RCP(s) being secured?
(Assume any temperature and pressure trends are stable)

A. Loss of RCP CCW flow for greater than 10 minutes.

B. RCP Motor Stator Winding Temperature alarm.

C. Three stages failed on any of the four RCP's.

D. RCP Vapor Seal pressure greater than 1500 psia.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☑	☑

Audit Exam History

2011	☐

Answer:

B. RCP Motor Stator Winding Temperature alarm.

Notes:

"B" is the correct answer because with a stable trend RCP Motor Stator Winding Temperature alarm is not trip criteria.
Answers "A" ,"C" and "D" are trip criteria for the RCP's per the RCP emergencies AOP

References:

OP-2203.025 Rev 13 Att."D" and page 20.

Historical Comments:

Original QID 301 was used on the 2000 NRC Exam

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank:	1738	**Rev:**	0	**Rev Date:**	10/7/2010 3:48:54	**QID #:**	29	**Author:**	Jim Wright		
Lic Level:	R	**Difficulty:**	3	**Taxonomy:**	H	**Source:**	NEW				
Search	0040002128	**10CFR55:**	41.7	**Safety Function**	1						
System Title:	Chemical and Volume Control System (CVCS)	**System Number**	004	**K/A**	2.1.28						
Tier:	2	**Group:**	1	**RO Imp:**	4.1	**SRO Imp:**	4.1	**L. Plan:**	A2LP-RO-CVCS	**OBJ**	6
Description:	Conduct of Operations - Knowledge of the purpose and function of major system components and controls.										

Question:

Given the following:

* Unit 2 Reactor has been manually tripped due to an RCS leak inside containment.
* 480V ESF Bus 2B5 sustains a lockout due to an electrical ground when the reactor is tripped.
* SIAS,CCAS,CIAS have all actuated during SPTA's.
* No operator actions have been taken.

Based on the above conditions, what is the status of the Chemical and Volume Control System (CVCS) and why?

A. BAM tank gravity feed valves are open (2CV-4920-1 and 2CV-4921-1) to supply borated water to the charging pump suction for VCT makeup.

B. RWT to the charging pump suction valve (2CV-4950-2) is open to supply borated water to the charging pump suction for RCS makeup.

C. BAM tank gravity feed valves, RWT to the charging pump suction and all BAM pumps are aligned to the charging pump suction for VCT makeup.

D. Both BAM pumps are running and Emergency borate valve (2CV-4916-2) is open supplying borated water to the charging pump suction for RCS makeup.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☑	☑

Audit Exam History

2011	☐

Answer:

D. Both BAM pumps are running and Emergency borate valve (2CV-4916-2) is open supplying borated water to the charging pump suction for RCS makeup.

Notes:

"D" is the correct answer because the BAM pump are the only available automatically aligned boration source due to the loss of power.

"A", "B" and "C" are plausible because these are all available boration methods but they are incorrect because they either do not automatically align (2CV-4950-2) or power has been lost (2CV-4920-1 and 2CV-4921-1) or a combination of both. VCT makeup will not occur because Letdown will isolate on SIAS (2CV-4820-2). Loss of 2B5 will deenergize 2B52 (2CV-4920-1 and 2CV-4921-1).

References:

STM 2-04 Rev 28 Page 1 drawing,4,22 and 32.
Op-2107.002 Change 27 page 17.

Historical Comments:

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank: 1739 **Rev:** 0 **Rev Date:** 10/10/2010 6:16:5 **QID #:** 30 **Author:** Jim Wright

Lic Level: R **Difficulty:** 3 **Taxonomy:** H **Source:** Modified NRC Bank #1506

Search 004000K305 **10CFR55:** 41.7 **Safety Function** 1

System Title: Chemical and Volume Control System (CVCS) **System Number** 004 **K/A** K3.05

Tier: 2 **Group:** 1 **RO Imp:** 3.8 **SRO Imp:** 4.2 **L. Plan:** A2LP-RO-PZR **OBJ** 5

Description: Knowledge of the effect that a loss or malfunction of the CVCS will have on the following: - PZR LCS

Question:

Given the following plant conditions:

* The plant is at full power.
* Pressurizer Level Control System master controller is in AUTO REMOTE.
* Pressurizer Level Control 2HS-4628 is selected to Channel "B".
* Pressurizer Heater Low Level Cutout 2HS-4642 is selected to Both "A & B".
* Charging Pump Selector Switch 2HS-4868 is in "A & B".
* Pressurizer Variable leg 2LT-4627-2 develops a large leak.
* No operator action is taken.

WHICH ONE of the following describes the response of the Pressurizer Level Control System?

A. Charging Pumps A and B start, heaters energize, letdown flow rises.

B. Charging Pumps A and B start, heaters cutout, letdown flow lowers.

C. Charging Pumps B and C get a stop signal, heaters energize, letdown flow rises.

D. Charging Pumps A, B, and C get a stop signal, heaters cutout, letdown flow lowers.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☑	☑

Audit Exam History

2011	☐

Answer:

B. Charging Pumps A and B start, heaters cutout, letdown flow lowers.

Notes:

The Variable leg leak will cause a low indicated level input to the Pressurizer Level controller and associated bistables to cause level to indicate less than 29%. This will in turn send a start signal to the backup charging pumps in this case pumps A and B (the lead pump C will continue to run), a signal to deenergize all pressurizer heaters and force the Letdown Flow Controller to minimum output.

References:

STM 2-3-1,Rev 14 Pressurizer Pressure and Level Control, Sections 3.2
2103.005, Step 6.6 (Pressurizer Operations)

Historical Comments:

Original QID 1506 was used on the 2008 NRC Exam

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank: 1740 **Rev:** 1 **Rev Date:** 12/17/2010 4:18:2 **QID #:** 31 **Author:** Jim Wright

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

Search 005000K306 **10CFR55:** 41.5 **Safety Function** 4

System Title: Residual Heat Removal System (RHRS) **System Number** 005 **K/A** K3.06

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

Description: Knowledge of the effect that a loss or malfunction of the RHRS will have on the following: - CSS

Question:

The Loss of Shutdown Cooling AOP OP-2203.029 gives guidance to use a Containment Spray Pump per OP 2104.004 if both LPSI pumps are not available. OP 2104.004 prohibits use of the Containment Spray Pumps for Shutdown Cooling unless RCS suction pressure is < 50 psig.

What is the purpose of this pressure limitation?

A. To ensure insoluble gases do not collect in the Containment Spray discharge piping.

B. To ensure that cavitation does not occur in the Containment Spray pump casing.

C. To ensure that Containment Spray pump suction piping does not become overpressurized.

D. To ensure adequate D/P is developed across the pump for proper system flowrates.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☑	☑

Audit Exam History

2011	☐

Answer:

C. To ensure that Containment Spray pump suction piping does not become overpressurized.

Notes:

C is the correct answer to prevent overpressurizing the pump suction piping.

"A" and "B" would be true if the pressure in the system was increased. Voiding is more likely to occur at low pressures.

"D" is incorrect because the system pressure is felt on the suction and discharge equally therefore has no effect.

References:

STM 2-14 Rev 9 page 12 2.2.2.1
OP-2203.029 Rev 14 Page 16 Step 19.
OP 2104.004 Change 43 page 23 step 11.2

Historical Comments:

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank: 1741 **Rev:** 0 **Rev Date:** 10/12/2010 10:37: **QID #:** 32 **Author:** Jim Wright

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

Search 006000K610 **10CFR55:** 41.8 **Safety Function** 2

System Title: Emergency Core Cooling System (ECCS) **System Number** 006 **K/A** K6.10

Tier: 2 **Group:** 1 **RO Imp:** 2.6 **SRO Imp:** 2.8 **L. Plan:** A2LP-RO-ECCS **OBJ** 6

Description: Knowledge of the effect of a loss or malfunction of the following will have on the ECCS: - Valves

Question:

Given the following:

* Unit 2 reactor has tripped.
* Containment pressure has risen from 14.1 psia to 19.2 psia.
* RCS pressure has lowered to 1592 psia.
* RWT level is 89% and lowering.
* RWT Outlet Valve 2CV-5630-1 closes due to a hot short.

What effect will this have on the ECCS with no operator action?

A. "A" High Pressure Injection Pump AND "A" Low Pressure Injection Pump will be damaged due to loss of suction.

B. "B" High Pressure Injection Pump AND "B" Low Pressure Injection Pump will be damaged due to loss of suction.

C. "A" High Pressure Injection Pump AND "A" Reactor Building Spray Pump will be damaged due to loss of suction.

D. "C" High Pressure Injection Pump AND "B" Reactor Building Spray Pump will be damaged due to loss of suction.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☑	☑

Audit Exam History

2011	☐

Answer:

A. "A" High Pressure Injection Pump AND "A" Low Pressure Injection Pump will be damaged due to loss of suction.

Notes:

A. Is the correct answer. 2CV-5630-1 is ES actuated open to provide suction to the Green Train ECCS components
B. Is incorrect, these are the Green Train ECCS Components and would not be effected by 2CV-5630-1.
C. Is incorrect, because SIAS does not cause the Reactor Building Spray Pumps to start.
D. Is incorrect, because SIAS does not cause the Reactor Building Spray Pumps to start.

References:

STM 2-05 Rev 22 pages 20,21,22,50,66 and 76.
STM 2-08 Rev 21 pages 4,8,9,16,25 and 41.

Historical Comments:

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank:	1742	**Rev:**	1	**Rev Date:**	12/17/2010 4:19:2	**QID #:**	33	**Author:**	Jim Wright		
Lic Level:	R	**Difficulty:**	3	**Taxonomy:**	F	**Source:**	NEW				
Search	007000A202	**10CFR55:**	41.3	**Safety Function**	5						
System Title:	Pressurizer Relief Tank/Quench Tank System (	**System Number**	007	**K/A**	A2.02						
Tier:	2	**Group:**	1	**RO Imp:**	2.6	**SRO Imp:**	3.2	**L. Plan:**	A2LP-RO-RCS	**OBJ**	25

Description: Ability to (a) predict the impacts of the following malfunctions or operations on the PRTS and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: - Abnormal pressure in the PRT

Question:

Given the following:

* The plant is at full power.
* Annunciator 2K10-D4 "Quench Tank Pressure HI" comes in.

Which of the following is a possible source of inleakage to the Quench Tank and where is the Quench Tank vented to clear the alarm ?

A. Reactor Head Gasket Leak off, Containment Sump.

B. Reactor Loop Drains, Reactor Drain Tank.

C. Pressurizer Spray Valve Stem leakoff, Containment Sump.

D. RCS High Point Vents, Reactor Drain Tank.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☑	☑

Audit Exam History

2011	☐

Answer:

D. RCS High Point Vents, Reactor Drain Tank.

Notes:

"D" is the correct answer the RCS high point vents discharge into the quench tank and the quench tank is vented to the Reactor Drain Tank

"A" "B" and "C" are incorrect but plausible drain /vent paths but they go to the RDT not the quench tank. The quench tank vent path contains a moisture trap that goes to the containment sump and the sump is vented to atmosphere.

References:

OP 2203.012J Change 36 page 41 Annunciator Corrective Action.
STM 2-52 Rev 14 page 13 and 44.
STM 2-03 Rev 19 page 23
OP 2103.007 Change 20 Page 6 Step 7.4

Historical Comments:

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank:	1743	**Rev:**	0	**Rev Date:**	10/13/2010 12:48:	**QID #:**	34	**Author:**	Jim Wright		
Lic Level:	R	**Difficulty:**	3	**Taxonomy:**	F	**Source:**	NRC Exam Bank #0311				
Search	008000A402	**10CFR55:**	41.10	**Safety Function**	8						
System Title:	Component Cooling Water System (CCWS)			**System Number**	008	**K/A**	A4.02				
Tier:	2	**Group:**	1	**RO Imp:**	2.5	**SRO Imp:**	2.5	**L. Plan:**	A2LP-RO-EAOP	**OBJ**	11

Description: Ability to manually operate and/or monitor in the control room: - Filling and draining operations of the CCWS including the proper venting of the components

Question:

Consider the following conditions.

* The plant is at 100% power.
* Component Cooling Water (CCW) Surge Tank levels are slowly rising.
* Chemistry samples of CCW indicate short lived radionuclides.
* The CRS has entered the appropriate AOP.

Given these conditions, the CCW Surge Tank levels should be maintained between _____ and the CCW Surge Tank vents should be aligned to _____.

A. 25% and 35%; atmosphere.

B. 40% and 50%; atmosphere.

C. 25% and 35%; the 2VEF-8A/B Suction.

D. 40% and 50%; the 2VEF-8A/B Suction.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☑	☑

Audit Exam History

2011	☐

Answer:

D. 40% and 50%; the 2VEF-8A/B Suction.

Notes:

The guidance found in the RCS Leakage AOP, Attachment A has the Surge Tank vent swapped to the 2VEF-8A/B Suction and level maintained between 40 and 50%. Thus D is the correct answer. The 25 - 35% range is within the makeup valve opening setpoints of 25 - 45%.

References:

OP 2203.016 Rev 15, Excess RCS Leakage - Attachment A
STM 2-43, Rev 13 (Component Cooling Water), 2.8.1

Historical Comments:

QID 311 was used on the 2002 NRC Exam

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank:	1744	**Rev:**	0	**Rev Date:**	10/13/2010 3:08:5	**QID #:**	35	**Author:**	Jim Wright		
Lic Level:	R	**Difficulty:**	2	**Taxonomy:**	H	**Source:**	Modified IH Bank ANO-OPS2-7000				
Search	008000K409	**10CFR55:**	41.7	**Safety Function**	8						
System Title:	Component Cooling Water System (CCWS)	**System Number**	008	**K/A**	K4.09						
Tier:	2	**Group:**	1	**RO Imp:**	2.7	**SRO Imp:**	2.9	**L. Plan:**	A2LP-RO-CCW	**OBJ**	2
Description:	Knowledge of CCWS design feature(s) and/or interlock(s) which provide for the following: - The "standby" feature for the CCW pumps										

Question:

Consider the following conditions:

* 2P-33A Component Cooling Water Pump is in Normal-After-Stop (Standby).
* 2P-33B Component Cooling Water Pump is in Normal-After-Stop (Standby).
* 2P-33C Component Cooling Water Pump is in Normal-After-Start supplying the system (Loops are cross-tied).

The following now occurs:

* A pipe break downstream of 2P-33C has caused pump discharge pressure to drop and remain at 50 psig.

Given the above conditions, what is the correct final system condition?

A. 2P-33C Tripped, 2P-33B auto started and running.

B 2P-33C Tripped, 2P-33A auto started and running.

C. 2P-33C Running, 2P-33A auto started and running.

D. 2P-33C Running, 2P-33B auto started and running.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☑	☑

Audit Exam History

2011	☐

Answer:

D. 2P-33C Running, 2P-33B auto started and running.

Notes:

"D" is correct - 2P-33C will not trip on low pressure and 2P-33B will auto start.

"A" is incorrect because 2P-33C will not trip. "B" and "C" are incorrect because 2P-33A does not receive an auto start.

References:

STM 2-43 Rev 13 page 3

Historical Comments:

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank:	1745	**Rev:**	1	**Rev Date:**	12/17/2010 4:29:5	**QID #:**	36	**Author:**	Jim Wright		
Lic Level:	R	**Difficulty:**	3	**Taxonomy:**	H	**Source:**	NRC Exam Bank #196				
Search	010000K502	**10CFR55:**	41.14			**Safety Function**	3				
System Title:	Pressurizer Pressure Control System (PZR PCS)					**System Number**	010	**K/A**	K5.02		
Tier:	2	**Group:**	1	**RO Imp:**	2.6	**SRO Imp:**	3.0	**L. Plan:**	ASLP-RO-TM004	**OBJ**	22
Description:	Knowledge of the operational implications of the following concepts as they apply to the PZR PCS: - Constant enthalpy expansion through a valve										

Question:

Given the following conditions:

* Unit 2 operating at full power.
* A steam leak develops on the "A" Main Steam line outside containment.
* A one (1) gpm RCS leak develops upstream of the Pressurizer High Point vent valve.
* Containment pressure is at atmospheric.

Which of the following statements correctly describes the condition of the steam exiting each leak?

A. The primary side steam is saturated, the secondary steam is saturated.

B. The secondary steam is superheated, the primary steam is saturated.

C. The primary steam is superheated, the secondary steam is superheated.

D. The secondary steam is saturated, the primary steam is superheated.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☑	☑

Audit Exam History

2011	☐

Answer:

B. The secondary steam is superheated, the primary steam is saturated.

Notes:

The examinee will be required to know both primary and secondary temperatures and pressures. Using the steam tables, determine the condition of the leaking fluid.

References:

Steam Tables/ Mollier Diagram. Figure A-1

Historical Comments:

QID 196 was used on the 2000 NRC Exam

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank:	1746	**Rev:**	0	**Rev Date:**	10/14/2010 3:36:1	**QID #:**	37	**Author:**	Jim Wright		
Lic Level:	R	**Difficulty:**	3	**Taxonomy:**	F	**Source:**	Modified NRC Exam Bank #1525				
Search	012000K501	**10CFR55:**	41.2	**Safety Function**	7						
System Title:	Reactor Protection System			**System Number**	012	**K/A**	K5.01				
Tier:	2	**Group:**	1	**RO Imp:**	3.3	**SRO Imp:**	3.8	**L. Plan:**	A2LP-RO-RPS	**OBJ**	11
Description:	Knowledge of the operational implications of the following concepts as they apply to the RPS: - DNB										

Question:

Which one of the following RPS trips will protect the fuel cladding by ensuring that the cladding heat transfer coefficient is large enough so that the maximum clad surface temperature is only slightly greater than the coolant saturation temperature during power operations?

A. Low Pressurizer Pressure

B. Low DNBR

C. High LPD

D. High Log Power

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☑	☑

Audit Exam History

2011	☐

Answer:

B. Low DNBR

Notes:

"B" is the correct answer based on Tech Spec Bases definition.

"A","C", and "D" are all plausible answers because they are related to power which effects fuel temperature and pressure which effects boiling. All are also Reactor trips.

References:

STM 2-63 Rev. 10 Page 23, 4.3.4 and Page 47, 7.1.1
Tech Spec. Bases 2.1.1

Historical Comments:

Original QID 1525 was used on the 2008 NRC Exam

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank:	1747	**Rev:**	1	**Rev Date:**	12/17/2010 4:20:1	**QID #:**	38	**Author:**	Jim Wright		
Lic Level:	R	**Difficulty:**	3	**Taxonomy:**	H	**Source:**	NEW				
Search	013000A202	**10CFR55:**	41.9	**Safety Function**	2						
System Title:	Engineered Safety Features Actuation System (	**System Number**	013	**K/A**	A2.02						
Tier:	2	**Group:**	1	**RO Imp:**	4.3	**SRO Imp:**	4.5	**L. Plan:**	A2LP-RO-CVENT	**OBJ**	4

Description: Ability to (a) predict the impacts of the following malfunctions or operations on the ESFAS and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: - Excess steam demand

Question:

Given the following:

* The plant was tripped due to an Excess Steam Demand.
* MSIS is the only actuation in.
* The CRS has directed the CBOT to perform OP 2202.010 Attachment 4 "MSIS Verification".
* Post cooldown temperature and pressure are being maintained.
* RCS pressure is 1725 psia
* Containment pressure is 14.8 psia.
* Containment temperature is 120°F.

Based on the above conditions, what is the status of 2VSF-1A Containment Cooler discovered while performing OP 2202.010 Attachment 4?

A. Chill Water supply and return valves (2CV-3852-1 and 2CV-3851-1) are CLOSED.
Service Water supply and return valves (2CV-1511-1 and 2CV-1519-1) are CLOSED.
Bypass Damper 2UCD-8203-1 is CLOSED/RESET.

B. Chill Water supply and return valves (2CV-3852-1 and 2CV-3851-1) are OPEN.
Service Water supply and return valves (2CV-1511-1 and 2CV-1519-1) are CLOSED.
Bypass Damper 2UCD-8203-1 is OPEN/DROPPED.

C. Chill Water supply and return valves (2CV-3852-1 and 2CV-3851-1) are OPEN.
Service Water supply and return valves (2CV-1511-1 and 2CV-1519-1) are OPEN.
Bypass Damper 2UCD-8203-1 is OPEN/DROPPED.

D. Chill Water supply and return valves (2CV-3852-1 and 2CV-3851-1) are OPEN.
Service Water supply and return valves (2CV-1511-1 and 2CV-1519-1) are OPEN.
Bypass Damper 2UCD-8203-1 is CLOSED/RESET.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☑	☑

Audit Exam History

2011	☐

Answer:

D. Chill Water supply and return valves (2CV-3852-1 and 2CV-3851-1) are OPEN.
Service Water supply and return valves (2CV-1511-1 and 2CV-1519-1) are OPEN
Bypass Damper 2UCD-8203-1 is CLOSED/RESET.

Notes:

"D" is correct because based on having only an MSIS and no CIAS or CCAS. The fans are running in the normal mode with Service Water aligned.

"A","B" and "C" are plausible because all these component receive an ESFAS signal to reposition but based on only having an MSIS the bypass damper will be closed and the normal chillwater supply will be open

References:

STM 2-09 Rev 16 Pages 7,9,10,11,12,13,14,51,52, and 53.
EOP 2202.005 Rev 10 Step 14 contingency, page 9.
EOP 2202.010 Rev 15 "MSIS Verification", page 12 and 13.

Historical Comments:

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank:	1748	**Rev:**	0	**Rev Date:**	10/15/2010 1:00:5	**QID #:**	39	**Author:**	Jim Wright		
Lic Level:	R	**Difficulty:**	2	**Taxonomy:**	F	**Source:**	NEW				
Search	022000A104	**10CFR55:**	41.10	**Safety Function**	5						
System Title:	Containment Cooling System (CCS)			**System Number**	022	**K/A**	A1.04				
Tier:	2	**Group:**	1	**RO Imp:**	3.2	**SRO Imp:**	3.3	**L. Plan:**	A2LP-RO-EAOP	**OBJ**	29
Description:	Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the CCS controls including: - Cooling water flow										

Question:

Given the following:

* An inadvertent CIAS actuation has occurred on Unit 2.
* The CRS has entered AOP 2203.039 "Inadvertent CIAS".
* CIAS has not been reset.
* Containment temperature and pressure are rising.

What are the correct action(s) to take per AOP-2203.039 based on the above conditions?

A. Verify all containment cooling fans running and service water inlet and outlet valves open to the coolers.

B. Verify all CEDM cooling fans running and service water inlet and outlet valves open to the coolers.

C. Verify all containment cooling fans running and main chill water inlet and outlet valves open to the coolers.

D. Verify all CEDM cooling fans running and main chill water inlet and outlet valves open to the coolers.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☑	☑

Audit Exam History

2011	☐

Answer:

A. Verify all containment cooling fans running and service water inlet and outlet valves open to the coolers.

Notes:

"A" is correct because without CIAS being reset service water is the only cooling water source. The AOP directs aligning and verifying service water is aligned.

"B" "C" and "D" are plausible but incorrect. The CEDM coolers would provide some cooling to the Reactor head general area but have little effect on containment atmosphere. Chill water to both the containment coolers and the CEDM coolers will be isolated on the CIAS and not available. Service water is not supplied to the CEDM coolers only to the containment coolers.

References:

OP-2203.039 Rev 5 Page 16 Step 10
STM 2-09 Rev 16 page 25 6.3

Historical Comments:

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank:	1749	**Rev:**	1	**Rev Date:**	12/17/2010 4:20:4	**QID #:**	40	**Author:**	Coble		
Lic Level:	R	**Difficulty:**	2	**Taxonomy:**	F	**Source:**	Modified NRC Bank #610				
Search	026000K408	**10CFR55:**	41.8	**Safety Function**	5						
System Title:	Containment Spray System (CSS)			**System Number**	026	**K/A**	K4.08				
Tier:	2	**Group:**	1	**RO Imp:**	4.1	**SRO Imp:**	4.3	**L. Plan:**	A2LP-RO-SPRAY	**OBJ**	4

Description: Knowledge of CSS design feature(s) and/or interlock(s) which provide for the following: - Automatic swapover to containment sump suction for recirculation phase after LOCA (RWST low-low level alarm)

Question:

During a large break LOCA a Recirculation Actuation Signal will occur when 2 out of 4 channels of RWT level reach the RAS setpoint of _____ , and when this occurs adequate core heat removal should be verified using _____ .

A. 40%; EOP Exhibit 3, LPSI Flow Curve

B. 6%; EOP Exhibit 2, HPSI Flow Curve

C. 40%; EOP Exhibit 2, HPSI Flow Curve

D. 6%; EOP Exhibit 3, LPSI Flow Curve

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☑	☑

Audit Exam History

2011	☐

Answer:

B. 6%; EOP Exhibit 2, HPSI Flow Curve

Notes:

Core cooling is being provided by the HPSI pumps taking a suction on the Containment Sump and Injecting into the core. Exhibit 2 shows the expected flow for given RCS pressure that is required for Inventory/Heat Removal. Distracter A is incorrect because the CS system provides the cooling for the Containment Sump but does not provide flow to cool the core. Also the CSAS verification attachment only checks valve/component positions. Distracter C is incorrect because the SIAS verification attachments only checks valve/component positions. Distracter D is incorrect because the LPSI pumps trip with a RAS therefore LPSI flow should be zero.

References:

EOP 2202.010, Standard Attachments, Revision 15, Exhibit 2 and 3, and Attachments 2 (page 1 of 6) and Attachment 41.

Historical Comments:

Original Question 610 was used on the 2006 NRC Exam

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank: 1750 **Rev:** 0 **Rev Date:** 10/1/2010 11:45:3 **QID #:** 41 **Author:** Coble

Lic Level: R **Difficulty:** 3 **Taxonomy:** H **Source:** Modified NRC Bank #529

Search 0260002411 **10CFR55:** 41.10 **Safety Function** 5

System Title: Containment Spray System (CSS) **System Number** 026 **K/A** 2.4.11

Tier: 2 **Group:** 1 **RO Imp:** 4.0 **SRO Imp:** 4.2 **L. Plan:** A2LP-RO-SPRAY **OBJ** 8

Description: Emergency Procedures/Plan - Knowledge of abnormal condition procedures.

Question:

Given the following:

* The plant was tripped due to an Excess Steam Demand (ESD) inside Containment
* SPTAs are complete and the ESD EOP 2202.005 has been entered.
* Post cooldown temperature and pressure are being maintained.
* HPSI Termination Criteria has been met and HPSI flow has been secured.
* All available Containment Cooling Fans are running in the Emergency Mode.
* Containment pressure peaked at 28 psia and has lowered to 21.5 psia.
* Containment temperature peaked at 165°F and has lowered to 121°F.

Which of the following is TRUE concerning the Containment Spray system?

A. Containment Spray termination criteria IS satisfied and the CSAS should be RESET and Spray pumps secured.

B. Containment Spray termination criteria IS NOT satisfied until the TSC determines the system is not required for Containment Iodine Removal.

C. Containment Spray termination criteria IS satisfied but one train should be left in service for decay heat removal after a RAS.

D. Containment Spray termination criteria IS NOT satisfied until Containment Pressure and Temperature are back within Mode 3 TS limits.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☑	☑

Audit Exam History

2011	☐

Answer:

A. Containment Spray termination criteria IS satisfied and the CSAS should be RESET and Spray pumps secured.

Notes:

During a LOCA continued CNTMT Spray operation may be desirable to reduce offsite doses from airborne iodine activity in Containment. The TSC will perform dose assessment around the site and give the control room notice when Containment Spray is no longer needed for Iodine removal. However, during an ESD event the iodine concentration is not a concern so as long as all the termination criteria is met, CSAS should be terminated and RESET if all the criteria is met. Distracter B and C are incorrect because the termination criteria listed is for a LOCA only. Distracter D is incorrect because the termination criteria for Containment temperature and pressure are met in the ESD EOP well above the TS LCO limits.

References:

EOP 2202.005, ESD, Revision 10, Step 32.
EOP 2202.003, LOCA, Revision 11, Step 17 and the note above step 17.
T.S. 3.6.1.4 Internal Pressure and Air Temperature, Amendment 225.

Historical Comments:

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Original Question 529 was used on the 2005 NRC exam

Bank: 1751 **Rev:** 0 **Rev Date:** 10/1/2010 1:12:16 **QID #:** 42 **Author:** Coble

Lic Level: R **Difficulty:** 3 **Taxonomy:** H **Source:** Modified NRC Bank #1529

Search 039000K104 **10CFR55:** 41.1 **Safety Function** 4

System Title: Main and Reheat Steam System (MRSS) **System Number** 039 **K/A** K1.04

Tier: 2 **Group:** 1 **RO Imp:** 3.1 **SRO Imp:** 3.1 **L. Plan:** **OBJ**

Description: Knowledge of the physical connections and/or cause-effect relationships between the MRSS and the following systems: - RCS temperature monitoring and control

Question:

Given the following:

* The plant is at full power in the middle of an operating cycle.
* The Extraction Steam flow to the #1 FW HTR 2E-1A is lost.

What effect will this have on the RCS?

A. RCS temperature will LOWER; Reactor power will LOWER.

B. RCS temperature will LOWER; Reactor power will RISE.

C. RCS temperature will RISE; Reactor power will RISE.

D. RCS temperature will RISE; Reactor power will LOWER.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☑	☑

Audit Exam History

2011	☐

Answer:

B. RCS temperature will LOWER; Reactor power will RISE.

Notes:

The loss of reheating steam to the #1 FW heaters will lower Feedwater temperature entering the SG which will lower RCS average temperature which will cause an out surge from the pressurizer causing a drop in level. The lower temperature will induce positive reactivity in the core with a negative MTC thus causing Reactor power to rise. This question is also tied to GFES Reactor Theory Chapter 8 Reactor Operational Physics, Objective 21. Distracter A and D are incorrect because Reactor power will rise. Distracter C and D are incorrect because RCS temperature will lower.

References:

STM 2-17, Extraction Steam, Revision 11, Section 3.1.3.2 and drawing of the Extraction to #1 FW heaters along with the High Pressure Feedwater System.

Historical Comments:

Original Question 1529 was used on the 2008 NRC exam

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank: 1752 **Rev:** 0 **Rev Date:** 10/1/2010 2:01:24 **QID #:** 43 **Author:** Coble

Lic Level: R **Difficulty:** 3 **Taxonomy:** H **Source:** Modified IH Bank OpsUnit2-10490a

Search 059000A304 **10CFR55:** 41.4 **Safety Function** 4

System Title: Main Feedwater (MFW) System **System Number** 059 **K/A** A3.04

Tier: 2 **Group:** 1 **RO Imp:** 2.5 **SRO Imp:** 2.6 **L. Plan:** A2LP-RO-FWCD **OBJ** 15

Description: Ability to monitor automatic operation of the MFW System, including: - Turbine driven feed pump

Question:

Consider the following:

* The plant was tripped from 100% power due to a high energy release inside Containment.
* RCS pressure is 1700 psia and lowering.
* Containment Building pressure peaked at 28 psia and is slowly lowering.
* Both SG pressures are 1000 psia and steady.
* The FW Pump Preferred Trip Selector Switch is selected to "B" MFW Pump 2P-1B

Assuming no operator action, which one of the following represents the current status of the Main Feedwater Pumps?

A. MFW Pump 2P-1A running at minimum speed; MFW Pump 2P-1B tripped.

B. MFW Pump 2P-1B running at minimum speed; MFW Pump 2P-1A tripped.

C. Both MFW Pumps running.

D. Both MFW pumps tripped.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☑	☑

Audit Exam History

2011	☐

Answer:

D. Both MFW pumps tripped.

Notes:

The preferred pump selector switch will trip the pump selected on a turbine trip which is tripped on a reactor trip and send the other MFW pump to minimum speed. However, a CSAS signal will trip both MFW pump when Containment Pressure goes above 23.3 psia to limit energy addition to the Containment should A Steam Line break be in progress. Distracter A, B and C are incorrect because Both MFW pumps will be tripped.

References:

STM 2-19, MFW System, Revision 12, Section 8.7.
STM 2-19-1, MFW Pump and Turbine Control, Revision 19, Section 1.6.1.4

Historical Comments:

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank:	1753	**Rev:**	1	**Rev Date:**	12/17/2010 4:21:4	**QID #:**	44	**Author:**	Coble
Lic Level:	R	**Difficulty:**	3	**Taxonomy:**	H	**Source:**	Modified NRC Exam Bank #359		
Search	059000A107	**10CFR55:**	41.4	**Safety Function**	4				
System Title:	Main Feedwater (MFW) System			**System Number**	059	**K/A**	A1.07		
Tier:	2	**Group:**	1	**RO Imp:**	2.5	**SRO Imp:**	2.6	**L. Plan:**	A2LP-RO-FWCS	**OBJ**	11

Description: Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the MFW System controls including: - Feed Pump speed, including normal control speed for ICS

Question:

Given the following conditions:

* A reactor trip was automatically initiated concurrent with a MSIS.
* Both SG levels are 23% Narrow Range and slowly restoring.
* RCS T-ave is 520°F.

The correct status of the following Main Feedwater System components would be: (REFERENCE PROVIDED)

A. Running Main Feedwater Pump at 3150 rpm, Main Feed Regulating Valves Open, Main Feed Regulating Bypass valves at approximately 50% open.

B. Running Main Feedwater Pump at 3150 rpm, Main Feed Regulating Valves Closed, Main Feed Regulating Bypass valves at approximately 19% open.

C. Main Feedwater Pumps at turning gear speed, Main Feed Regulating Valves Open, Main Feed Regulating Bypass valves at approximately 50% open.

D. Main Feedwater Pumps at turning gear speed, Main Feed Regulating Valves Closed, Main Feed Regulating Bypass valves at approximately 19% open.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☑	☑

Audit Exam History

2011	☐

Answer:

D. Main Feedwater Pumps at turning gear speed, Main Feed Regulating Valves Closed, Main Feed Regulating Bypass valves at approximately 19% open.

Notes:

The Main Feedwater Pumps will go to minimum speed of 3150 rpm on a reactor trip based on a RTO signal to the FWICS; however in this case both MSIVs should be closed due to an MSIS on Low SG pressure signal so no steam is available to the MFW turbine therefore they will slow down and go on the turning gear. This makes answers A and B wrong. The MFRV always closes on a trip due to RTO. The MFRV Bypass valve modulates based on a T-ave of 548.24 at ~19% open position to a T-ave of 552 at 50% open. With the given conditions, T-ave should place the bypass reg. valves at approximately 34 % open. This is based on a calculation of 4.12% flow demand at 550 degrees F T-ave. Therefore Distracter C is wrong.

Provide OP 2202.010, Standard Attachments, Exhibit 7 as a reference.

References:

STM 2-69, Feedwater Control System, Revision 11, Section 3.3.
STM 2-19, Main Feedwater System, Revision 12, Section 8.7.
STM 2-63, Reactor Protection System, Revision 10, Section 4.3.9.
OP 2202.010, Standard Attachments, Revision 15, Exhibit 7

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Historical Comments:

Question 359 was used on the 2002 NRC Exam

Bank: 1754 **Rev:** 1 **Rev Date:** 12/17/2010 4:22:0 **QID #:** 45 **Author:** Coble

Lic Level: R **Difficulty:** 3 **Taxonomy:** H **Source:** Modified IH Bank OPS2-12966

Search 061000A301 **10CFR55:** 41.8 **Safety Function** 4

System Title: Auxiliary / Emergency Feedwater (AFW) Syste **System Number** 061 **K/A** A3.01

Tier: 2 **Group:** 1 **RO Imp:** 4.2 **SRO Imp:** 4.2 **L. Plan:** A2LP-RO-EFW **OBJ** 10

Description: Ability to monitor automatic operation of the AFW System, including: - AFW startup and flows

Question:

Given the following at full power:

* Emergency Feedwater (EFW) Pump 2P7A is out of service for maintenance.
* A Loss of Offsite Power occurs.
* Emergency Diesel Generator, 2DG1, trips on low lube oil pressure during start.
* Steam Generator Pressures are 1080 psia and stable.
* During SPTAs, the AAC Diesel generator is started and aligned to ESF Bus 2A3.
* Both Steam Generator levels have lowered from 70% and have just reached 28%.

Based on the conditions AT THIS TIME, to raise S/G level EFW Pump 2P-7B _____.

A. would automatically start and both SGs will be automatically fed.

B. would automatically start and both SGs must be manually fed.

C. must be manually started and both SGs must be manually fed.

D. must be manually started and both SGs will be automatically fed.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☑	☑

Audit Exam History

2011	☐

Answer:

C. must be manually started and both SGs must be manually fed.

Notes:

The Motor Driven EFW pump must see the normal feeder breaker power from offsite or emergency feeder breaker power from the EDG to receive an automatic start. Thus for the given conditions, 2P7B must be manually started. The EFW feed valves will not automatically open above the EFAS-1/EFAS-2 setpoint of 22.2% level so they will have to be manually opened to established feed flow for RCS decay heat removal. Distracter A and B are incorrect because the pumps must be manually started. Distracters A and D are incorrect because the valves must be manually opened.

References:

STM 2-19-2, EFW, Revision 30, Section 2.1.2.
NOP 2104.037, AACDG Operations, Change 019, Attachment E, Step 6.0.

Historical Comments:

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank:	1755	**Rev:**	1	**Rev Date:**	12/17/2010 4:22:2	**QID #:**	46	**Author:**	Coble
Lic Level:	R	**Difficulty:**	3	**Taxonomy:**	H	**Source:**	Modified IH Bank OPSUNIT2-03932a		
Search	061000K602	**10CFR55:**	41.8	**Safety Function**	4				
System Title:	Auxiliary / Emergency Feedwater (AFW) Syste	**System Number**	061	**K/A**	K6.02				
Tier:	2	**Group:**	1	**RO Imp:**	2.6	**SRO Imp:**	2.7	**L. Plan:**	A2LP-RO-DEFAS	**OBJ**	980
Description:	Knowledge of the effect of a loss or malfunction of the following will have on the AFW System components: - Pumps								

Question:

Given the following at full power:

* The Main Turbine trips.
* Offsite power fails to energize electrical buses 2A1 or 2A2.
* The Reactor trips due to a Diverse Scram Signal (DSS).
* Both Steam Generator levels are 20% Narrow Range and lowering.
* Steam Generator Pressures are 1080 psia and stable.
* EFAS 1 and EFAS 2 have not automatically actuated.
* No operator action is taken.

Based on the above conditions, the Emergency Feedwater Pumps will initially receive a backup signal to automatically start at _____% Narrow Range Steam Generator Level and raise Steam Generator levels to a maximum of _____%.

A. 10, 25

B. 10; 80

C. 15; 25

D. 15, 80

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☑	☑

Audit Exam History

2011	☐

Answer:

D. 15, 80

Notes:

A Diversified Emergency Feed Actuation Signal (DEFAS) (Backup to EFAS) will be generated if a valid Diversified Scram Signal (DSS) at 2450 psia has been generate with no MSIS or EFAS and SG Narrow Range (NR) level drops to 15%. Once a DEFAS signal has been generated, the SGs will be fed up to 80% NR instead of the normal EFAS reset level of 25%. Distracter A and B are incorrect because the DEFAS signal comes in at 15% instead of 10%. Distracters A and C are incorrect because the level will rise to 80% after a DEFAS has been generated.

References:

STM 2-70-1, DEFAS, Revision 6, Section 2.2

Historical Comments:

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank:	1756	**Rev:**	0	**Rev Date:**	10/15/2010 9:33:5	**QID #:**	47	**Author:**	Coble		
Lic Level:	R	**Difficulty:**	2	**Taxonomy:**	F	**Source:**	IH Exam Bank OPS2-3655				
Search	062000A402	**10CFR55:**	41.8	**Safety Function**	6						
System Title:	A.C. Electrical Distribution System	**System Number**	062	**K/A**	A4.02						
Tier:	2	**Group:**	1	**RO Imp:**	2.5	**SRO Imp:**	2.8	**L. Plan:**	A2LP-RO-ECCS	**OBJ**	10
Description:	Ability to manually operate and/or monitor in the control room: - Remote racking in and out of breakers										

Question:

Given the following at full power:

* Tags have been cleared on the "C" HPSI Pump, 2P89C, Breaker 2A407.
* The breaker has been racked up with the following indications on 2C-16:

  Green light is ON
  White light is OFF
  Red Light is OFF
  Amber light is ON

Based on these indications, the 2P-89C Green Train Breaker, 2A407, closing springs are _____ and the Kirk Key lock is _____.

A. charged; locked

B. charged; unlocked

C. discharged; locked

D. discharged; unlocked

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☑	☑

Audit Exam History

2011	☐

Answer:

C. discharged; locked

Notes:

Four indicating lights are located directly above the handswitch for 2P-89C. The GREEN light indicates the pump power supply breaker is open. The RED light indicates the pump power supply breaker is closed. The WHITE light indicates the closing spring for the pump controller breaker is charged. The AMBER light on 2C16 indicate that the breakers is LOCKED OUT by the Kirk Key for train separation as 2P-89C is the swing HPSI Pump. Distracters A and B are incorrect because the Springs are discharged. Distracters B and D are incorrect because the Kirk Key is locked.

References:

STM 2-05, ECCS, Revision 22, Section 3.6

Historical Comments:

Has never been used on an ANO-Unit 2 NRC Exam.

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank:	1757	**Rev:**	0	**Rev Date:**	10/13/2010 4:05:3	**QID #:**	48	**Author:**	Coble		
Lic Level:	R	**Difficulty:**	2	**Taxonomy:**	F	**Source:**	ANO Unit 1 NRC Exam Bank #496				
Search	062000K303	**10CFR55:**	41.5	**Safety Function**	6						
System Title:	A.C. Electrical Distribution System			**System Number**	062	**K/A**	K3.03				
Tier:	2	**Group:**	1	**RO Imp:**	3.7	**SRO Imp:**	3.9	**L. Plan:**	ASLP-RO-CMP05	**OBJ**	3
Description:	Knowledge of the effect that a loss or malfunction of the A.C. Distribution System will have on the following: - DC system										

Question:

Unit 2 has been in a station blackout for 1.5 hours with battery bank 2D12 supplying bus 2D02 with power for the entire time.

If the loads on bus 2D02 do NOT change, which one of the following statements describe the battery's discharge rate (expressed as AMP's) as the battery is expended?

A. The battery AMP's will be fairly constant until the design battery capacity is exhausted.

B. The battery AMP's will drop steadily until the design battery capacity is exhausted.

C. The battery AMP's will rise steadily until the design battery capacity is exhausted.

D. The battery AMP's will drop based on the square of the change in resistance until the design battery capacity is exhausted.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☑	☑

Audit Exam History

2011	☐

Answer:

C. The battery AMP's will rise steadily until the design battery capacity is exhausted.

Notes:

P= IE; As the battery discharges under a constant load, battery voltage will drop and current (battery amperage) will rise. Distracters A, B and D are incorrect because the Amps will rise over time as the voltage drop with a constant load.

References:

GFES PWR Components Chapter 5 Motors and Generators, Revision 2, Applying Ohm's Law.

Historical Comments:

Question 496 was used on the 2003 Unit 1 NRC Exam

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank: 1758 **Rev:** 0 **Rev Date:** 10/14/2010 3:08:2 **QID #:** 49 **Author:** Coble

Lic Level: R **Difficulty:** 2 **Taxonomy:** F **Source:** NRC Exam Bank #94

Search 063000K402 **10CFR55:** 41.7 **Safety Function** 6

System Title: D.C. Electrical Distribution System **System Number** 063 **K/A** K4.02

Tier: 2 **Group:** 1 **RO Imp:** 2.9 **SRO Imp:** 3.2 **L. Plan:** A2LP-RO-ED125 **OBJ** 1

Description: Knowledge of D.C. Electrical System design feature(s) and/or interlock(s) which provide for the following: - Breaker interlocks, permissives, bypasses and cross-ties

Question:

Which of the following describes 4160V breaker operation if DC control power is lost?

A. Breakers will remain in their "as is" condition and operation would only be possible by local manual means.

B. Automatic breaker trips would remain operational but remote operation of breakers would not be possible.

C. Breakers would remain remotely operable but automatic trip functions would become inoperable.

D. Breakers would trip open and operation would not be possible by local means.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☑	☑

Audit Exam History

2011	☐

Answer:

A. Breakers will remain in their "as is" condition and operation would only be possible by local manual means.

Notes:

125 VDC power provides the motive power for remote breaker operations and permissives, and breaker bypass interlocks. This would prevent any remote manual operations and automatic breaker cycles. Thus Distracters B and C are incorrect. Distracter D is incorrect because tripping the breaker open would require 125 VDC power.

References:

STM 2.32-2, High Voltage Electrical Distribution, Revision 23, Section 6.2.2

Historical Comments:

Question 94 was used on the 1998 NRC Exam

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank: 1759 **Rev:** 0 **Rev Date:** 9/30/2010 4:10:43 **QID #:** 50 **Author:** Coble

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

Search 064000K202 **10CFR55:** 41.7 **Safety Function** 6

System Title: Emergency Diesel Generator (ED/G) System **System Number** 064 **K/A** K2.02

Tier: 2 **Group:** 1 **RO Imp:** 2.8 **SRO Imp:** 3.1 **L. Plan:** A2LP-AO-EDG **OBJ** 2.b.13

Description: Knowledge of bus power supplies to the following: - Fuel oil pumps

Question:

The power supply to the Emergency Diesel Generator Fuel Oil Transfer Pumps 2P-16A and 2P-16B are:

A. Vital 120 VAC

B. Non-Vital 120 VAC

C. Vital 480 VAC

D. Non Vital 480 VAC

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☑	☑

Audit Exam History

2011	☐

Answer:

C. Vital 480 VAC

Notes:

The fuel oil transfer pumps are 480 VAC motors powered from Vital 480 VAC MCC Buses 2B53 AND 2B63.

References:

STM 2-31, Emergency Diesel Generators, Revision 28, Section 2.3.4.

Historical Comments:

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank: 1760 **Rev:** 1 **Rev Date:** 12/17/2010 4:23:0 **QID #:** 51 **Author:** Coble

Lic Level: R **Difficulty:** 2 **Taxonomy:** F **Source:** NRC Exam Bank #383

Search 073000K101 **10CFR55:** 41.11 **Safety Function** 7

System Title: Process Radiation Monitoring (PRM) System **System Number** 073 **K/A** K1.01

Tier: 2 **Group:** 1 **RO Imp:** 3.6 **SRO Imp:** 3.9 **L. Plan:** A2LP-RO-RMON **OBJ** 19

Description: Knowledge of the physical connections and/or cause-effect relationships between the PRM System and the following systems: - Those systems served by PRMs.

Question:

Given the following plant conditions:

* Plant has returned to 100% power from 70% power after recovery of a dropped CEA.
* Annunciator 2K12-A1, LETDOWN RADIATION HI/LO has actuated.
* CBOT is directed to monitor RCS Gross and Iodine activities on Letdown Radmonitor Recorder, 2RR-4806, on 2C-14.

If RCS Iodine 131 Activity has caused the alarm, then _____ should be suspected but if RCS Gross Activity has caused the alarm, then _____ should be suspected.

A. RCS crud burst; Letdown filter damage

B. Fuel cladding damage; RCS crud burst

C. Letdown filter damage; Fuel cladding damage

D. RCS crud burst; Fuel cladding damage

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☑	☑
2008	☐	☐
2009	☐	☐
2011	☑	☑

Audit Exam History

2011	☐

Answer:

B. Fuel cladding damage; RCS crud burst

Notes:

A rise in the radioactivity of RCS could be caused by crud released in the RCS or failure of the fuel cladding of the Reactor fuel assemblies. The Gross gamma indication is read out on 2RITS-4806A while the specific activity level can be read on 2RITS-4806B. The specific activity monitor 2RITS-4806B monitors the Letdown fluid for the presence of Iodine-131. Iodine-131 is a fission product that is released with relative ease from defective fuel assemblies. A rise in the gross activity only would be an indication of a crud burst. The differential pressure across the Letdown radiation monitors is driven by the pressure drop across the Letdown filter. The only way Letdown filter damage could cause a rise in RCS activity is if it as located upstream of the radiation monitor. As such they are in parallel to the radiation monitors thus answers A and C are wrong. D is wrong because it is the reverse of the correct answer B.

References:

STM 2-04, CVCS, Revision 28, Section 2.1.13 ,page 13.
STM 2-62, Radiation Monitoring System, Revision 17, Section 2.2.1,pages 13-14.
OP-2203.020, High RCS Activity, Revision 10, Steps 6 and 7,page 4.

Historical Comments:

Question 383 was used on the Unit 2 2006 NRC Exam

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank: 1761 **Rev:** 1 **Rev Date:** 12/17/2010 4:23:1 **QID #:** 52 **Author:** Wright

Lic Level: R **Difficulty:** 3 **Taxonomy:** F **Source:** NEW

Search 0760002222 **10CFR55:** 41.8 **Safety Function** 4

System Title: Service Water System (SWS) **System Number** 076 **K/A** 2.2.22

Tier: 2 **Group:** 1 **RO Imp:** 4.0 **SRO Imp:** 4.7 **L. Plan:** A2LP-RO-SWACW **OBJ** 12

Description: Equipment Control - Knowledge of limiting conditions for operations and safety limits.

Question:

Which set of conditions would require entry into the Technical Specifications Limiting Condition for Operation for the Emergency Cooling Pond?

A. ECP Contained water volume of 71 acre feet; ECP top temperature 102°F; ECP bottom temperature 96°F.

B. ECP Contained water volume of 70 acre feet; ECP top temperature 102°F; ECP bottom temperature 97°F.

C. ECP Contained water volume of 71 acre feet; ECP top temperature 101°F; ECP bottom temperature 98°F.

D. ECP Contained water volume of 70 acre feet; ECP top temperature 101°F; ECP bottom temperature 100°F.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☑	☑

Audit Exam History

2011	☐

Answer:

D. ECP Contained water volume of 70 acre feet: ECP top temperature 101°F; ECP bottom temperature 100°F.

Notes:

The level in the ECP is greater than or equal to the T.S. minimum of 70 acre feet for the ECP operability. The average ECP temperature is required to be equal to 100 degrees or less and is determined by adding the top and bottom temperatures and dividing by 2. "D" is the correct answer because the average = 100.5 °F.

References:

Technical Specification 3.7.4.1 and its associated bases, Amendment 271.
STM 2-42, Service Water and Auxiliary Cooling Water Systems, Revision 33, Section 2.8.2,pages 12-13.
Unit 2 Outside Auxiliary Operator Rounds OPS-B31 Pages 41 and 42.

Historical Comments:

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank:	1762	**Rev:**	0	**Rev Date:**	9/30/2010 4:42:52	**QID #:**	53	**Author:**	Coble		
Lic Level:	R	**Difficulty:**	2	**Taxonomy:**	F	**Source:**	NEW				
Search	076000K204	**10CFR55:**	41.7	**Safety Function**	4						
System Title:	Service Water System (SWS)	**System Number**	076	**K/A**	K2.04						
Tier:	2	**Group:**	1	**RO Imp:**	2.5	**SRO Imp:**	2.6	**L. Plan:**	A2LP-RO-CVENT	**OBJ**	3
Description:	Knowledge of bus power supplies to the following: - Reactor building closed cooling water										

Question:

The plant was operating at full power when the following event occurs:

* Containment Pressure rises to 19.3 psia from 14.1 psia.
* RCS pressure drops to 1575 psia from 2200 psia.

Prior to the event, the pump(s) providing cooling water flow to the Containment fan coolers was powered from _____ VAC and after the event, the pump(s) providing cooling water flow to the Containment fan coolers is being powered from _____ VAC.

A. vital 480 ; non-vital 480

B. non-vital 4160; vital 4160

C. non-vital 480; vital 4160

D. vital 480 vital; non-vital 4160

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☑	☑

Audit Exam History

2011	☐

Answer:

C. non-vital 480; vital 4160

Notes:

The Containment Coolers are normally supplied by the Main Chilled Water System. During accident conditions, Service Water is automatically aligned to the Service Water Containment Cooling coils in 2VCC-2A, B, C, & D. The Main Chill water pumps are powered from non-vital 480 VAC bus 2B12 and 2B22. The Service Water pumps are powered form vital 4160 VAC bus 2A3 and 2A4. Thus the answer is C and the other distracter combinations are incorrect.

References:

STM 2-42, Service Water and Auxiliary Cooling Water Systems, Revision 33, Section 3.5.4 and 3.1,pages 21 and 32.
STM 2-45, Main Chill water System, Revision 16, Section 2.4.1,page 20.

Historical Comments:

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank:	1763	**Rev:**	1	**Rev Date:**	12/17/2010 4:23:4	**QID #:**	54	**Author:**	Coble		
Lic Level:	R	**Difficulty:**	2	**Taxonomy:**	F	**Source:**	NEW				
Search	078000K105	**10CFR55:**	41.4	**Safety Function**	8						
System Title:	Instrument Air System (IAS)	**System Number**	078	**K/A**	K1.05						
Tier:	2	**Group:**	1	**RO Imp:**	3.4	**SRO Imp:**	3.5	**L. Plan:**	A2LP-RO-EAOP	**OBJ**	16

Description: Knowledge of the physical connections and/or cause-effect relationships between the IAS and the following systems: - MSIV air

Question:

Which one of the following components would fail closed when their source of Instrument Air (IA) is lost?

A. Shutdown Cooling System Flow Control Valve.

B. Main Feedwater Regulating Valves.

C. Main Steam Isolation Valves.

D. Cooling Tower Basin Level Control Valve.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☑	☑

Audit Exam History

2011	☐

Answer:

C. Main Steam Isolation Valves.

Notes:

Motive force to open the MSIVs is IA and the valves fail closed when IA is lost. Distracter A is incorrect because the Upstream Atmosphere Dump Valves fail open on a loss of IA. Distracter B is incorrect because the Main Feedwater Regulating Valves fail AS IS on a loss of IA. Distracter D is incorrect because the Cooling Tower Basin Level Control Valve fails AS IS on a loss of IA.

References:

AOP 2203.021, Loss of IA AOP, Revision 13, Attachment A Pages 3, 5, 6 and 14 of 19.

Historical Comments:

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank:	1764	**Rev:**	1	**Rev Date:**	12/17/2010 4:24:0	**QID #:**	55	**Author:**	Coble
Lic Level:	R	**Difficulty:**	3	**Taxonomy:**	H	**Source:**	NEW		
Search	103000A101	**10CFR55:**	41.5	**Safety Function**	5				
System Title:	Containment System			**System Number**	103	**K/A**	A1.01		
Tier:	2	**Group:**	1	**RO Imp:**	3.7	**SRO Imp:**	4.1	**L. Plan:**	A2LP-RO-CVENT	**OBJ**	16

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

Question:

Given the following at full power:

* A small steam leak inside Containment has caused temperature and pressure to rise during the last 5 hours.
* A team is being assembled to repair the leak.
* Three (3) out of four (4) Containment Fan Coolers are running.
* The Containment parameters have stabilized as follows:
  * Average Containment temperature has risen to 114.99°F.
  * Average Containment pressure has risen to 14.87 psia.

At this time, what action, if any, should be taken per 2104.033 or Tech Specs? (REFERENCE PROVIDED)

A. Restore Containment pressure to within Tech Spec limits within 1 hour or be in Hot Standby in the next 6 hours.

B. Reduce Containment temperature to < 110°F to ensure proper Oxygen levels for Containment Entry per 2104.033 "Containment Atmosphere Control".

C. No action should be taken, all Containment limits are met for pressure, and temperature.

D. Reduce Containment pressure to ensure a cushion exists for potential loss of Main Chill water per 2104.033 "Containment Atmosphere Control".

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☑	☑

Audit Exam History

2011	☐

Answer:

D. Reduce Containment pressure to ensure a cushion exists for potential loss of Main Chill water per 2104.033.

Notes:

Average CNTMT pressure should be maintained between 13.9 and 14.2 psia to ensure cushion exists for potential loss of chill water. Maintaining negative pressure in building is necessary to enable fresh air to be drawn into building. Fresh airflow into building required to maintain oxygen levels above minimum required for human occupancy. Distracter A is incorrect because no TS limits have been exceeded. Distracter B is incorrect because the temperature is not out of the limit range and lowering temperature to 110°F will have little effect on Oxygen levels. Distracter C is incorrect because Limit and Precaution 5.6 in NOP 2104.033, Containment Atmosphere Control, is not met.

Need to provide Plant Computer print out of Containment Pressure and Temperature 2104.033 SUPP 4 with parameters listed in the stem.

References:

OP 2104.033, Containment Atmosphere Control, Change 062, Step 5.6,page 5.
Plant Computer print out of Containment Pressure and Temperature 2104.033 SUPP 4.
T.S. 3.6.1.4 Internal Pressure and Air Temperature, Amendment 225, Figure 3.6-1

Historical Comments:

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank: 1765 **Rev:** 0 **Rev Date:** 9/29/2010 7:46:23 **QID #:** 56 **Author:** Coble

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

Search 001000K205 **10CFR55:** 41.6 **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:

The CEDM Motor Generator sets are powered from Electrical Buses

A. 2B1 and 2B2.

B. 2B3 and 2B4.

C. 2B5 and 2B6.

D. 2B7 and 2B8.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☑	☑

Audit Exam History

2011	☐

Answer:

D. 2B7 and 2B8.

Notes:

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, B, and C are incorrect because they will not de-energize the CEA Drives to cause a Scram.

References:

STM 2-02, CEDMCS, Revision 20, Figures on page 82 and 83.
OP 2202.001, SPTAs, Revision 11, 3.A.2 ,page 3.

Historical Comments:

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank:	1766	**Rev:**	1	**Rev Date:**	12/17/2010 4:24:3	**QID #:**	57	**Author:**	Coble		
Lic Level:	R	**Difficulty:**	4	**Taxonomy:**	H	**Source:**	Modified NRC Exam Bank #1530				
Search	0160002431	**10CFR55:**	41.4			**Safety Function**	7				
System Title:	Non-Nuclear Instrumentation System (NNIS)					**System Number**	016	**K/A**	2.4.31		
Tier:	2	**Group:**	2	**RO Imp:**	4.2	**SRO Imp:**	4.1	**L. Plan:**	A2LP-RO-MFPTC	**OBJ**	24

Description: Emergency Procedures/Plan - Knowledge of annunciator alarms, indications, or response procedures.

Question:

With Unit-2 at full power, a plant transient produces the following feedwater system indications:

* 2K03-B9 "PUMP DISCH PRESS HI" is in fast flash for feedwater pump 2P-1A
* 2K03-B12 "PUMP DISCH PRESS HI" is in fast flash for feedwater pump 2P-1B
* Feedwater heater 2E-1A outlet pressure is observed at 1285 psig
* Feedwater heater 2E-1B outlet pressure is observed at 1278 psig

As the transient continues, the following condition is observed:

* 2K03-B12 "PUMP DISCH PRESS HI" clears and goes to slow flash
* Feedwater Pump 2P-1A discharge pressure is reading 1282 psig
* Feedwater Pump 2P-1B discharge pressure is reading 1245 psig

10 seconds later:

* Feedwater heater 2E-1A outlet pressure reads 1305 psig
* Feedwater heater 2E-1B outlet pressure reads 1290 psig

What will be the resulting status of the feedwater pumps?

A. 2P-1A will be running; 2P-1B will be tripped

B. 2P-1A will be tripped; 2P-1B will be tripped

C. 2P-1A will be running; 2P-1B will be running

D. 2P-1A will be tripped; 2P-1B will be running

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☑	☑

Audit Exam History

2011	☐

Answer:

D. 2P-1A will be tripped; 2P-1B will be running

Notes:

FW Pump 2P-1A trips at > 1300 psig at EITHER 2E-1A or 2E-1B outlet in conjunction with 2P-1A high discharge pressure of greater than 1250 psig. Distracter A is incorrect because 2P-1B alarm went below it setpoint (slow flash) and should not be tripped but 2P-1A should be tripped. Distracter B is incorrect because 2P-1B should not be tripped. Distracter C is incorrect because 2P-1A should not be running.

References:

STM 2-19, Main Feedwater System, Revision 12, Section 3.2, pages 15-17.
NOP 2106.007, MFW Pump and FWCS Operation, Change 046, Step 6.1 - 11th bullet, page 10.
ACA 2203.012C, ACA for 2K03, Change 026, 2K03-B9 and 2K03-B12, pages 85 and 116.

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Historical Comments:

Original question 1530 was used on the 2008 NRC Exam.

Bank: 1767 **Rev:** 0 **Rev Date:** 9/29/2010 9:54:24 **QID #:** 58 **Author:** Coble

Lic Level: R **Difficulty:** 2 **Taxonomy:** F **Source:** IH Exam Bank ANO-OPS2-39

Search 029000A102 **10CFR55:** 41.9 **Safety Function** 8

System Title: Containment Purge System (CPS) **System Number** 029 **K/A** A1.02

Tier: 2 **Group:** 2 **RO Imp:** 3.4 **SRO Imp:** 3.4 **L. Plan:** A2LP-RO-CVENT **OBJ** 13

Description: Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the Containment Purge System controls including: - Radiation levels

Question:

Given the following:

* The plant is in cold shutdown (Mode 5) with the Containment Purge System in operation.
* The operation of the Containment Purge system is being monitored using 2RE-9820, Containment Purge SPING #5 Radiation Monitor, and 2RE-8233, Containment Purge Exhaust Radiation Monitor.

If Containment radiation levels were to rise above setpoint, which one of the following actions would occur?

A. 2RE-9820 stops the Containment Purge supply and exhaust fans.

B. 2RE-9820 closes the Containment Purge supply and exhaust isolation valves.

C. 2RE-8233 stops the Containment Purge supply and exhaust fans.

D. 2RE-8233 closes the Containment Purge supply and exhaust isolation valves.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☑	☑

Audit Exam History

2011	☐

Answer:

D. 2RE-8233 closes the Containment Purge supply and exhaust isolation valves.

Notes:

The 2RE-9820 SPING 5 monitors the purge exhaust flow for activity to predict off site dose during emergencies but does not provide any interlocks to the purge components. 2RE-8233 will isolate the purge system on a high radiation signal. Another pressure switch in the purge system senses pipe pressure and will secure the supply and exhaust fans after the isolations close. Distracters A and B are incorrect because this monitor does not send any interlock signals to the Purge components. Distracter C is incorrect because the radiation monitor does not send the signal to secure the supply and exhaust fans, only to close the isolations.

References:

NOP 2104.033, Containment Atmosphere Control, Change 62, Supplement 1, Containment Purge Gaseous Release Permit, Steps 3.0, and 4.7,pages 46-48..
STM 2-09, Containment Cooling and Purge System, Revision 16, Sections 7.6 and 7.7, page 41.

Historical Comments:

Has never been used on an ANO-Unit 2 NRC Exam.

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank:	1768	**Rev:**	0	**Rev Date:**	9/29/2010 10:50:4	**QID #:**	59	**Author:**	Coble		
Lic Level:	R	**Difficulty:**	2	**Taxonomy:**	F	**Source:**	IH Exam Bank OPS2-10930				
Search	034000K402	**10CFR55:**	41.2	**Safety Function**	8						
System Title:	Fuel Handling Equipment System (FHES)	**System Number**	034	**K/A**	K4.02						
Tier:	2	**Group:**	2	**RO Imp:**	2.5	**SRO Imp:**	3.3	**L. Plan:**	A2LP-RO-FH	**OBJ**	2.1
Description:	Knowledge of Fuel Handling System design feature(s) and/or interlock(s) which provide for the following: - Fuel movement										

Question:

Which one of the following is the purpose of the overload and underload trip setpoints on the Main Refueling Machine Hoist?

A. To keep the cable properly seated on the cable drum.

B. To prevent burning up the hoist motor.

C. To prevent damage to the fuel assemblies being moved.

D. To prevent damage to the hoist breaks.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☑	☑

Audit Exam History

2011	☐

Answer:

C. To prevent damage to the fuel assemblies being moved.

Notes:

The fuel being raised or lowered could come in contact with a mechanical component and the overloads protect the hoist cable from exceeding its design limits and potentially dropping a fuel assembly. Underloads could cause the cable on the hoist to come loose and allow the grapple on the fuel assembly to be disengaged and potentially drop a fuel assembly. Distracter A is incorrect because there is spring tension on the cable drum to retrieve the cable on a fuel lift but could potentially come off the cable drum during an underload if the spring is worn or not functioning. Distracter Band D are potential failures if the overload and underload interlocks do not function but the main reason for the over and under load interlocks is to protect the fuel assemblies from damage.

References:

STM 2-51-1, Main Refueling Bridge and Reactor Building Fuel Handling Equipment, Revision 8, Sections 1.2 and 2.2.6, pages 2-3 and 18-19.

Historical Comments:

Has never been used on an ANO-Unit 2 NRC Exam.

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank:	1769	**Rev:**	1	**Rev Date:**	12/17/2010 4:25:3	**QID #:**	60	**Author:**	Coble		
Lic Level:	R	**Difficulty:**	3	**Taxonomy:**	F	**Source:**	NEW				
Search	035000K602	**10CFR55:**	41.1	**Safety Function**	4						
System Title:	Steam Generator System (S/GS)			**System Number**	035	**K/A**	K6.02				
Tier:	2	**Group:**	2	**RO Imp:**	3.1	**SRO Imp:**	3.5	**L. Plan:**	A2LP-RO-SDBCS	**OBJ**	1
Description:	Knowledge of the effect of a loss or malfunction of the following will have on the S/GS: - Secondary PORV										

Question:

Given the following:

* Power ascension is in progress following a reactor trip at 275 EFPD.
* Power has been stabilized at 80% power to calibrate Nuclear Instruments.
* 1 hour after stabilization, plant power starts rising with no operator action.
* Plant power stabilizes at 85% power with no operator action.

Which one of the following valves, if it failed full open, would cause this increase in power?

A. Turbine Bypass Valve 2CV-306.

B. Turbine Bypass Valve 2CV-303.

C. Downstream Atmosphere Dump Valve 2CV-301.

D. Upstream Atmosphere Dump Valve 2CV-1001.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☑	☑

Audit Exam History

2011	☐

Answer:

B. Turbine Bypass Valve 2CV-303.

Notes:

2CV-303 is the only steam dump with a capacity of 5% steam flow. The rest have a capacity of 11.5 % steam flow. The mechanism that cause positive reactivity to be added to the core causing the power rise is a negative Moderator Temperature Coefficient. The lowering SG pressure in a saturated system lowers the overall SG temperature and lowers RCS Tave which will add the positive reactivity. Distracter A is incorrect because of the capacity of 2CV-306 is 11.5% and the SG pressure will lower. Distracter C is incorrect because of the capacity of 2CV-301 is 11.5%. Distracter D is incorrect because of the capacity of 2CV-1001 is 11.5%; however it is normally isolated so it is really 0% capacity and the SG pressure will lower.

References:

NOP-2105.008, Steam Dump and Bypass Control System Operations, Change 22, Section 3.0,page 2.

Historical Comments:

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank:	1770	**Rev:**	1	**Rev Date:**	12/17/2010 4:26:0	**QID #:**	61	**Author:**	Coble		
Lic Level:	R	**Difficulty:**	3	**Taxonomy:**	H	**Source:**	NEW				
Search	041000K302	**10CFR55:**	41.5	**Safety Function**	4						
System Title:	Steam Dump System (SDS) and Turbine Bypass	**System Number**	041	**K/A**	K3.02						
Tier:	2	**Group:**	2	**RO Imp:**	3.8	**SRO Imp:**	3.9	**L. Plan:**	A2LP-RO-SDBCS	**OBJ**	5
Description:	Knowledge of the effect that a loss or malfunction of the SDS will have on the following: - RCS										

Question:

Given the following:

* The Main Turbine trips from 50% power during power ascension with MOL core conditions..
* The Steam Dump and Bypass Control System responds to maintain Reactor power at 50% and 1000 psia SG pressure.
* 10 minutes later Condenser vacuum has trended from 2.0 inches HgA to 6.0 inches HgA and is degrading.

What effect will this have on Reactor power and the RCS?

A. Reactor power will rise and RCS pressure will lower.

B. Reactor power will lower and RCS pressure will lower.

C. Reactor power will rise and RCS pressure will rise.

D. Reactor power will lower and RCS pressure will rise.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☑	☑

Audit Exam History

2011	☐

Answer:

D. Reactor power will lower and RCS pressure will rise.

Notes:

Condenser vacuum rising above 5.75 inches HgA will cause the condenser Steam Dumps 2CV-0302, 0303, and 0306 to close causing a loss of steam flow thus a loss of reactor power due to a negative MTC. The loss of heat removal will cause a rise in RCS pressure and an insurge to the PZR causing level to rise. Distracters A, B, C are incorrect because they have a combination of parameters that will not occur in this scenario.

References:

NOP-2105.008, Steam Dump and Bypass Control System Operations, Change 22, Section 3.0 and Step 6.2, pages 2,3 and 5.

Historical Comments:

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank:	1771	**Rev:**	1	**Rev Date:**	12/17/2010 4:26:3	**QID #:**	62	**Author:**	Coble		
Lic Level:	R	**Difficulty:**	2	**Taxonomy:**	F	**Source:**	NEW				
Search	045000K118	**10CFR55:**	41.4	**Safety Function**	4						
System Title:	Main Turbine Generator (MT/G) System			**System Number**	045	**K/A**	K1.18				
Tier:	2	**Group:**	2	**RO Imp:**	3.6	**SRO Imp:**	3.7	**L. Plan:**	A2LP-RO-RPS	**OBJ**	11
Description:	Knowledge of the physical connections and/or cause-effect relationships between the MT/G System and the following systems: - RPS										

Question:

Which one of the following RPS trips is designed to prevent damage to the Main Turbine ?

A. Low Steam Generator Pressure.

B. Low Steam Generator Water Level.

C. High Steam Generator Water Level.

D. High Linear Power Level.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☑	☑

Audit Exam History

2011	☐

Answer:

C. High Steam Generator Water Level.

Notes:

Distracter A is incorrect because Low Steam Generator Pressure protects the reactor form overcooling. Distracter B is incorrect because Low Steam Generator Water Level protects the reactor from a loss of heat sink. Distracter D is incorrect because High Linear Power Level protects the fuel in the core. Answer C is correct because High Steam Generator Water Level could cause moisture carryover to the Main Turbine and cause blading damage.

References:

STM 2-63, RPS, Revision 10, Section 7.1.1 and 7.1.2, pages47-48.
TRM 2.2.1, Reactor Trip Setpoints, Revision 14.

Historical Comments:

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank: 1772 **Rev:** 0 **Rev Date:** 9/29/2010 3:59:17 **QID #:** 63 **Author:** Coble

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

Search 068000A402 **10CFR55:** 41.13 **Safety Function** 9

System Title: Liquid Radwaste System (LRS) **System Number** 068 **K/A** A4.02

Tier: 2 **Group:** 2 **RO Imp:** 3.2 **SRO Imp:** 3.1 **L. Plan:** A2LP-RO-RWST **OBJ** 6.b.3

Description: Ability to manually operate and/or monitor in the control room: - Remote radwaste release

Question:

With a Boric Acid Condensate Tank, 2T-69, release in progress, the discharge flow rate can be monitored on a recorder on _____ in the control room and the effluent activity level can be monitored on a recorder on _____ in the control room.

A. 2C14; 2C14

B. 2C14; 2C33

C. 2C25; 2C25

D. 2C33; 2C14

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☑	☑

Audit Exam History

2011	☐

Answer:

A. 2C14; 2C14

Notes:

Both of these indications are on the same dual pen recorder on 2C14. 2C14 is right next to 2C33 which has a lot of miscellaneous recorders on the panel. The activity of the release can also be read out on 2C25 but not recorded. Flow cannot be read out on 2C25 or 2C33 so distracters C and D are incorrect. Activity cannot be read out on 2C33 so distracter B is incorrect.

References:

NOP-2104.014, LRW and BMS Operations, Change 50, Supplement 3 step 11,page 135.

Historical Comments:

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank:	1773	**Rev:**	0	**Rev Date:**	9/30/2010 8:23:31	**QID #:**	64	**Author:**	Coble		
Lic Level:	R	**Difficulty:**	2	**Taxonomy:**	F	**Source:**	ANO Unit 1 NRC Bank #0153				
Search	072000A301	**10CFR55:**	41.11	**Safety Function**	7						
System Title:	Area Radiation Monitoring (ARM) System	**System Number**	072	**K/A**	A3.01						
Tier:	2	**Group:**	2	**RO Imp:**	2.9	**SRO Imp:**	3.1	**L. Plan:**	A2LP-RO-CRVNT	**OBJ**	11
Description:	Ability to monitor automatic operation of the ARM system, including: - Changes in ventilation alignment										

Question:

A high rad alarm on 2RITS-8001A, Unit 1 Control Room area radiation monitor, will cause all CR normal ventilation isolation dampers to close and:

A. Both emergency Recirc Fans (VSF-9 and 2VSF-9) start, normal supply fans (2VSF-8A/B) stop.

B. Emergency Recirc Fans (VSF-9 and 2VSF-9) start, normal exhaust fans (2VEF-43A/B) stop

C. Emergency Recirc Fan (VSF-9) starts, normal supply fans (VSF-8A&B) stop.

D. Emergency Recirc Fan (2VSF-9) starts, all normal supply fans (VSF-8A&B, 2VSF-8A/B) stop.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☑	☑

Audit Exam History

2011	☐

Answer:

C. Emergency Recirc Fan (VSF-9) starts, normal supply fans (VSF-8A&B) stop.

Notes:

"A" is incorrect, 2RITS-8001A will not cause 2VSF-9 to start and 2VSF-8A/B to stop.
"B" is incorrect, 2RITS-8001A will not cause 2VSF-9 to start.
"C" is correct, 2RITS-8001A will cause VSF-9 to start
"D" is incorrect, 2RITS-8001A will not cause 2VSF-9 to start and 2VSF-8A/B to stop but will stop VSF-8A&B

References:

STM 2-47-3, Control Room Ventilation, Revision 21, Section 3.4.2.1. and 3.4.2.2, pages 34-36.
NOP 2104.007, Control Room Emergency Air Conditioning and Ventilation, Change 049, Supplement 3 Page 126 of 171.

Historical Comments:

Original question 0153 was used in a Unit 1 RO re-take Exam for Jon Gray.

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank:	1774	**Rev:**	0	**Rev Date:**	9/23/2010 4:22:46	**QID #:**	65	**Author:**	Coble		
Lic Level:	R	**Difficulty:**	3	**Taxonomy:**	H	**Source:**	NEW				
Search	086000A202	**10CFR55:**	41.4	**Safety Function**	8						
System Title:	Fire Protection System (FPS)	**System Number**	086	**K/A**	A2.02						
Tier:	2	**Group:**	2	**RO Imp:**	3.0	**SRO Imp:**	3.3	**L. Plan:**	A2LP-RO-FPROT	**OBJ**	3

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

Question:

Given the following:

* Annunciator 2K11 A-9 "FIRE ALARM" comes in.
* Annunciator 2K11 B-9 "FIRE WATER FLOW" comes in.
* Fire protection header pressure dropped from an initial pressure of 145 psig.
* Header pressure dropped to 105 psig and then rose and stabilized at 130 psig.
* 2C343 indicates a fire in the Cable Spreading Room.
* Local reports determine that the fire is fully developed and severe.

Based on the above conditions, which one of the following lists the correct Fire Protection pump that should be running and correct action to take?

A. Motor Driven Fire Pump P-6A; Trip the plant and evacuate the Control Room.

B. Motor Driven Fire Pump P-6A; Commence a rapid plant shutdown in the Control Room.

C. Diesel Driven Fire Pump P-6B; Trip the plant and evacuate the Control Room.

D. Diesel Driven Fire Pump P-6B; Commence a rapid plant shutdown in the Control Room.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☑	☑

Audit Exam History

2011	☐

Answer:

A. Motor Driven Fire Pump P-6A; Trip the plant and evacuate the Control Room.

Notes:

The Motor driven Fire pump will start when header pressure drops to less than 110 psig but the diesel driven fire water pump will not start until header pressure drops below 90 psig. A fire in the cable spreading room requires a control room evacuation after tripping the plant IAW the Alternate Shutdown procedure. The cable spreading room is just below the control room floor. There are several other safety related areas that should a fire develop and become severe, then a rapid plant shutdown would be required. Distracters C and D are incorrect because the Diesel driven Fire Pump would not start. Distracters B and D are incorrect because the control room would be evacuated.

References:

STM 2-60, Fire Protection System, Revision 9, Section 2.2. and 2.3, pages 2-3.
AOP 2203.014, Alternate Shutdown, Revision 23, Entry Conditions and Steps 1, 7 and 8, pages 1-2.
AOP 2203.034, Fire OR Explosion, Revision 11, Step 11, page 6 .

Historical Comments:

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank:	1775	**Rev:**	0	**Rev Date:**	9/23/2010 9:00:10	**QID #:**	66	**Author:**	Coble		
Lic Level:	R	**Difficulty:**	2	**Taxonomy:**	F	**Source:**	NEW				
Search	1940012143	**10CFR55:**	41.1	**Safety Function**							
System Title:	Generic			**System Number**	GENERIC	**K/A**	2.1.43				
Tier:	3	**Group:**	1	**RO Imp:**	4.1	**SRO Imp:**	4.3	**L. Plan:**	ASLP-RO-REACT	**OBJ**	2

Description: Conduct of Operations - Ability to use procedures to determine the effects on reactivity of plant changes, such as reactor coolant system temperature, secondary plant, fuel depletion, etc.

Question:

Given the following:

* A plant power ascension is being performed after a plant trip five days ago.
* Core life is at 426 EFPD and plant power is at 65%.
* A continuous 10 gpm dilution is in progress to raise RCS temperature.
* The Main Turbine is on the Load Limit Pot.
* Main Turbine load needs to be raised to maintain TREF at RCS TAVE.

Which of the following is correct action to take to raise turbine load?

A. Secure dilution of the RCS, raise Turbine load, then recommence dilution to prevent adding positive reactivity to the core by two methods at once.

B. Raise Turbine load, secure dilution of the RCS until the effects of the turbine adjustment have been seen on core reactivity then recommence dilution.

C. Raise Turbine load without securing dilution because raising Turbine load is a negative reactivity addition method which is allowed with a positive reactivity addition.

D. Raise Turbine load without securing dilution because raising Turbine load in conjunction with RCS dilution is considered one method of positive reactivity addition.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☑	☑

Audit Exam History

2011	☐

Answer:

D. Raise Turbine load without securing dilution because raising Turbine load in conjunction with RCS dilution is considered one method of positive reactivity addition.

Notes:

Per COPD001, Operations Standards and Expectations, Step 5.4.1 D, raising turbine load and dilution are considered one method of positive reactivity addition thus distracter A is incorrect. Securing the dilution would be considered at beginning of life with a high fuel worth, but not at end of life conditions thus Distracter B is incorrect. Diluting the RCS overcomes the negative reactivity due to the power defect. Raising turbine load will tend to lower RCS temperature thus adding positive reactivity thus Distracter C is incorrect.. This site guidance is allowed per the reactivity plan used for the power ascension.

References:

EN-OP-115, Conduct of Operations, Revision 009, Step 5.4 [7], page 25.
COPD001, Operations Standards and Expectations, Change 047, Step 5.4.1 D, page 23.

Historical Comments:

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank:	1776	**Rev:**	0	**Rev Date:**	9/23/2010 9:38:05	**QID #:**	67	**Author:**	COBLE
Lic Level:	RS	**Difficulty:**	3	**Taxonomy:**	H	**Source:**	NRC Exam Bank #496		
Search	1940012144	**10CFR55:**	41.9	**Safety Function**					
System Title:	Generic			**System Number**	GENERIC	**K/A**	2.1.44		
Tier:	3	**Group:**	1	**RO Imp:**	3.9	**SRO Imp:**	3.8	**L. Plan:**	A2LP-RO-EAOP	**OBJ**	22

Description: Knowledge of RO duties in the control room during fuel handling, such as responding to alarms from the fuel handling area, communication with the fuel storage facility, systems operated from the control room in support of fueling operations, and supporting instrumentation.

Question:

The following plant conditions exist.

* Mode 6 with core reload in progress.
* The Containment Purge system is in service.
* The running SDC Pump trips.
* SDC Flow HI/LO on 2K07-A7 is in alarm.
* All attempts to restore SDC flow have failed.
* The Lower Mode Functional Recovery procedure is entered.

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

A. Sound the Containment Evacuation alarm on 2C14, evacuate the Containment, set Containment closure within 30 minutes and start all Containment cooling fans.

B. Sound the Containment Evacuation alarm on 2C22, evacuate the Containment, set Containment closure within 30 minutes and secure the Containment Purge system.

C. Sound the Containment Evacuation alarm on 2C14, evacuate the Containment, set Containment closure within 45 minutes and secure the Containment Purge system..

D. Sound the Containment Evacuation alarm on 2C22, evacuate the Containment, set Containment closure within 45 minutes and start all Containment Cooling fans.

QID use History

	RO	SRO
2003	☐	☐
2005	☑	☑
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☑	☑

Audit Exam History

2011	☐

Answer:

B. Sound the Containment Evacuation alarm on 2C22, evacuate the Containment, set Containment closure within 30 minutes and secure the Containment Purge system.

Notes:

Distracter A is incorrect because the evacuation alarm is activated on the wrong panel and the Purge System should be secured.

Distracter C is incorrect because the evacuation alarm is activated on the wrong panel and containment closure should be set in 30 minutes.

Distracter D is incorrect because containment closure should be set in 30 minutes and the Purge System should be secured.

References:

AOP 2203.029, Loss of SDC, Revision 14, Steps 3, and 19.G, pages 3 and 16.
NOP 1015.008, Unit 2 SDC Control, Change 31, Attachment F, page 57-58.
EOP 2202.011, Lower Mode Functional Recovery,Rev6, Step 3.A,page 3.

EOP 2202.010, EOP Standard Attachment 32, Revision 15, Steps 5. B, E, and F, page 101.

Historical Comments:

Question 496 was used on the 2005 NRC Exam

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Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank: 1777 **Rev:** 1 **Rev Date:** 12/17/2010 4:27:1 **QID #:** 68 **Author:** Coble

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

Search 1940012207 **10CFR55:** 41.10 **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** 14

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

Question:

Which one of the following evolutions REQUIRES an Infrequently Performed Test or Evolution (IPTE) brief prior to conducting the evolution, and who has the authority to stop the evolution if a problem occurs during the evolution? (SLM = Senior Line Manager)

A. Integrated Emergency Diesel Generator/Engineering Safety Features Test; Anyone.

B. Starting the first RCP following a fill and vent of the Reactor Coolant System: SLM only.

C. Full flow testing of the High and Low Pressure Safety Injection systems; Anyone.

D. Initial PURGE of the Containment atmosphere when starting a refueling outage; SLM only.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☑	☑

Audit Exam History

2011	☐

Answer:

A. Integrated Emergency Diesel Generator/Engineering Safety Features Test; Anyone.

Notes:

All four of these evolutions are performed at 18 month intervals but Distracters B, C and D are evolutions that have been screened and are included in procedures that do not require an IPTE brief prior to the evolution therefore they are incorrect. Answer A is one of the required IPTEs listed in the IPTE procedure EN-OP-116 for PWR Units. Also the IPTE procedure EN-OP-116 Step 5.3.1. the briefer should discuss conditions that warrant stopping the IPTE. This authority to stop work lies with everyone who sees an issue especially if there is a safety or radiological concern, or plant equipment damage is imminent.

References:

EN-OP-116, IPTE Procedure, Revision 6, Attachment 9.1, Identified IPTEs, Sheet 2 of 2, PWR Units, second bullet, pages 13,18 and 19 .
OP 2305.001, Integrated ESF Test, Change 21, Cover Page requires an IPTE.

Historical Comments:

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank: 1778 **Rev:** 1 **Rev Date:** 12/17/2010 4:27:3 **QID #:** 69 **Author:** Hatman

Lic Level: R **Difficulty:** 2 **Taxonomy:** F **Source:** NRC Exam Bank #047

Search 1940012213 **10CFR55:** 41.10 **Safety Function**

System Title: Generic **System Number** GENERIC **K/A** 2.2.13

Tier: 3 **Group:** 1 **RO Imp:** 4.1 **SRO Imp:** 4.3 **L. Plan:** ELP-OPS-PTAT **OBJ** 2

Description: Equipment Control - Knowledge of tagging and clearance procedures.

Question:

Which of the following describes the required order for isolation and tag out of a centrifugal pump, and the reason for this order?

A. The pump power supply is isolated first, then the pump discharge valve is closed before the suction valve. This is to prevent pump suction over pressurization if back leakage exists.

B. The pump power supply is isolated first, then the pump suction valve is closed before the discharge valve. This is to maintain lubrication of the pump seals.

C. The pump suction and discharge valves are closed first, in any order, and then the pump power supply is isolated. This is to prevent pump flow with the valves closed.

D. The pump power supply is isolated first, and then the suction and discharge valves are closed in any order. This will prevent the pump from starting during isolation.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☑	☑

Audit Exam History

2011	☐

Answer:

A. The pump power supply is isolated first, then the pump discharge valve is closed before the suction valve. This is to prevent pump suction over pressurization if back leakage exists.

Notes:

There is normally a design pressure change from the suction side of a pump and the discharge side of the pump. Closing the suction first would allow system pressure from another running pump to be felt on the suction and could cause over pressurization of the suction to the pump. Distracter B is incorrect because the suction valve is closed before the discharge. Distracter C is incorrect because the pump is isolated prior to isolating the power supply which would potentially allow the pump to start after it is isolated damaging the pump. Distracter D is incorrect because the suction could potentially be closed first.

References:

EN-OP-102, Protective and Caution Tagging, Attachment 9.2, General tag out Standards, step 7.2, page 65.

Historical Comments:

Original Question 047 was developed and used on the 1998 NRC Exam

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank:	1779	**Rev:**	0	**Rev Date:**	9/23/2010 2:41:11	**QID #:**	70	**Author:**	Coble		
Lic Level:	R	**Difficulty:**	3	**Taxonomy:**	H	**Source:**	NEW				
Search	1940012238	**10CFR55:**	41.5	**Safety Function**							
System Title:	Generic			**System Number**	GENERIC	**K/A**	2.2.38				
Tier:	3	**Group:**	1	**RO Imp:**	3.6	**SRO Imp:**	4.5	**L. Plan:**	A2LP-RO-TS	**OBJ**	4
Description:	Equipment Control - Knowledge of conditions and limitations in the facility license.										

Question:

Consider the following RCS leakrate data at full power:

* Total RCS leakrate is 6.9 gpm.
* Leakage into the Quench Tank is 3.2 gpm.
* Leakage into the RDT is 1.3 gpm.
* 'A' SG tube leakage is 0.08 gpm. (115.2 gpd)
* 'B' SG tube leakage is 0.03 gpm. (43.2 gpd)
* No other RCS leakage exist.
* RCS zinc Injection skid is secured.

(Note: gpd = gallons per day)

Which one of the following allowed Technical Specification RCS leakage limits has been exceeded?

A. Identified Leakage

B. Unidentified Leakage

C. 'A' Steam Generator Leakage

D. Total Steam Generator Leakage

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☑	☑

Audit Exam History

2011	☐

Answer:

B. Unidentified Leakage

Notes:

The correct answer is 6.9- (3.2 +1.3 +.08 +.03) = 2.29 gpm which exceeds the allowed 1 gpm unidentified leak rate. Distracter A is incorrect because all the identified leak rates add up to 4.61 gpm which is less than the allowed 10 gpm but could be > 10 gpm if all the leak rates were added to the total RCS leak rate. Distracter C is incorrect because the leak is 115.2 GPD which is less than the allowed 150 GPD through any one SG. Distracter D is incorrect because there is no allowed Total SG leakage TS limit, only 150 GPD through any one SG; however the total SG leakage is > 150 GPD ((158.4 gpm).

References:

T.S 3.4.6.2, RCS Operational Leakage, Amendment #280, LCO b, c, and d.
T.S Definition 1.14, Identified Leakage, and 1.15 Unidentified leakage.

Historical Comments:

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank: 1780 **Rev:** 1 **Rev Date:** 12/17/2010 4:28:1 **QID #:** 71 **Author:** Jim Wright

Lic Level: R **Difficulty:** 3 **Taxonomy:** H **Source:** Modified NRC Exam Bank #1558

Search 1940012304 **10CFR55:** 41.12 **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** 15

Description: Radiological Controls - Knowledge of radiation exposure limits under normal or emergency conditions.

Question:

Given the following:

* A Waste Control Operator is required to do a surveillance test in an area where the radiation level is 150 mrem/hour.
* The operator's current Total Effective Dose Equivalent (TEDE) is 1100 mrem for the year.

What is the maximum time he can work in this area and not exceed his Routine Administrative TEDE Dose Control annual limit; AND with the proper approvals, how long could he stay and not exceed his Federal TEDE Dose annual Limit?

A. Administrative 6 hours; Federal 13 hours.

B. Administrative 3 hours; Federal 26 hours.

C. Administrative 3 hours; Federal 13 hours.

D. Administrative 6 hours; Federal 26 hours.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☑	☑

Audit Exam History

2011	☐

Answer:

D. Administrative 6 hours; Federal 26 hours.

Notes:

His Admin DCL is 2 Rem/Year so he can received 900 mrem which would give him 6 hours to work before exceeding Admin DCL. His Federal DCL is 5000 with proper approvals which would allow him to work 26 hours in the radiation area.

References:

EN-RP-201, Steps 5.3 [1], [2], [3] and 5.4 (Exposure Limits and Controls) pages 8-12

Historical Comments:

Question 1558 was Used on the 2008 Unit 2 NRC Exam

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank:	1781	**Rev:**	0	**Rev Date:**	9/23/2010 4:50:09	**QID #:**	72	**Author:**	Coble		
Lic Level:	R	**Difficulty:**	2	**Taxonomy:**	F	**Source:**	NEW				
Search	1940012307	**10CFR55:**	41.12	**Safety Function**							
System Title:	Generic	**System Number**	GENERIC	**K/A**	2.3.7						
Tier:	3	**Group:**	1	**RO Imp:**	3.5	**SRO Imp:**	3.6	**L. Plan:**	ASLP-RO-RADP	**OBJ**	4
Description:	Radiological Controls - Ability to comply with radiation work permit requirements during normal or abnormal conditions.										

Question:

A General RWP is normally good for _____ and a Specific RWP is normally good for _____.

A. one year from the date of issue; one calendar quarter

B. one year from the date of issue; the duration of the job or activity

C. the current calendar year; the duration of the job or activity

D. the current calendar year; one calendar quarter

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☑	☑

Audit Exam History

2011	☐

Answer:

C. the current calendar year; the duration of the job or activity

Notes:

Answer C is correct. Distracter A is incorrect on both parts. Distracter B is incorrect on the first part. Distracter D is incorrect on the second part.

References:

EN-RP-105, RWPs, Revision 9, 3.0 [23] and [24],page 6.

Historical Comments:

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank: 1782 **Rev:** 0 **Rev Date:** 11/23/2010 11:59: **QID #:** 73 **Author:** Coble

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

Search 1940012313 **10CFR55:** 41.12 **Safety Function**

System Title: Generic **System Number** GENERIC **K/A** 2.3.13

Tier: 3 **Group:** 1 **RO Imp:** 3.4 **SRO Imp:** 3.8 **L. Plan:** ASLP-RO-RADP **OBJ** 7

Description: Radiological Controls - Knowledge of radiological safety procedures pertaining to licensed operator duties, such as response to radiation monitor alarms, containment entry requirements, fuel handling responsibilities, access to locked high-radiation areas, aligning filters, etc.

Question:

Given the following:

* Shutdown Cooling has been placed in service following a hydrogen peroxide addition to the RCS going into a refueling outage.
* General area dose rates in the Lower South Piping Penetration Room (LSPPR) are 1300 mr/hour.
* The CRS has sent the CBOT down to assist the WCO to troubleshoot the SDC Flow Control Valve 2CV-5091 due to oscillating SDC flow.

Which one of the following list the correct Radiation Protection posting that should be placed in front of the LSPPR door and the correct access requirements to the LSPPR for the above stated conditions?

A. High Radiation Area; Continuous Radiation Protection coverage and door barricaded with a rope stanchion.

B. High Radiation Area; Periodic Radiation Protection coverage and door locked Closed.

C. Locked High Radiation Area; Continuous Radiation Protection coverage and door locked Closed.

D. Locked High Radiation Area; Periodic Radiation Protection coverage and door barricaded with a rope stanchion.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☑	☑

Audit Exam History

2011	☐

Answer:

C. Locked High Radiation Area; Continuous Radiation Protection coverage and door locked Closed.

Notes:

The dose rates for the general area exceed the definition of a Locked High Radiation Area and should be posted as such. Access requirement for areas > 1 Rem/Hr require continuous RP coverage and a locked barricade to prevent inadvertent entry into the area. Distracters A and B are incorrect because the area is above a high radiation area. Distracter D is incorrect because the door is not locked and the RP coverage is not continuous.

References:

EN-RP-108, RP Posting, Rev. 9, Definitions 13 and 15.
EN-RP-101, Access Control for Radiologically Controlled Areas, Rev. 5 Step 5.5 [6] and [10].

Historical Comments:

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank: 1783 **Rev:** 0 **Rev Date:** 9/28/2010 3:52:58 **QID #:** 74 **Author:** Coble

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

Search 1940012417 **10CFR55:** 41.10 **Safety Function**

System Title: Generic **System Number** GENERIC **K/A** 2.4.17

Tier: 3 **Group:** 1 **RO Imp:** 3.9 **SRO Imp:** 4.3 **L. Plan:** A2LP-RO-ESPTA **OBJ** 3

Description: Emergency Procedures/Plan - Knowledge of EOP terms and definitions.

Question:

During the implementation of the Loss of Feedwater Emergency Operating Procedure, which one of the following terms would describe a steam generator whose level has dropped below the feed ring and needs a slow refill to avoid water hammer?

A. Affected Steam Generator.

B. Jeopardized Steam Generator

C. Challenged Steam Generator

D. Impacted Steam Generator

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☑	☑

Audit Exam History

2011	☐

Answer:

D. Impacted Steam Generator

Notes:

Distracters A, B, and C are incorrect because they do not describe the stem above but are all terms used in the EOPs. Answer D is correct because there is a specific definition of the stem description above.

References:

NOP 1015.021, ANO-2 EOP/AOP Users Guide, Change 008, Steps, 4.39.1, 4.39.4, 4.39.11, and 4.39.13, pages 10 and 12.

Historical Comments:

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank:	1784	**Rev:**	0	**Rev Date:**	9/28/2010 4:21:25	**QID #:**	75	**Author:**	Coble
Lic Level:	R	**Difficulty:**	3	**Taxonomy:**	H	**Source:**	NEW		
Search	1940012434	**10CFR55:**	41.10	**Safety Function**					
System Title:	Generic			**System Number**	GENERIC	**K/A**	2.4.34		
Tier:	3	**Group:**	1	**RO Imp:**	4.2	**SRO Imp:**	4.1	**L. Plan:**	A2LP-RO-EAOP	**OBJ**	10

Description: Emergency Procedures/Plan - Knowledge of RO tasks performed outside the main control room during an emergency and the resultant operational effects.

Question:

Given the following:

* The Alternate Shutdown AOP 2203.014 is being implemented.
* The Control Room has been evacuated.
* Follow up actions are in progress.
* Pressurizer level is 20% and lowering.
* RCS pressure is 1790 psia and lowering.

Based on these conditions, which one of the following actions should be taken and what affect will this have on the applicable system?

A. Reactor Operator Two (RO-2) should locally start Charging Pump 2P36A at 2B52; defeats all the automatic starts and stops for 2P36A.

B. The Emergency Operator (EO) should locally start Charging Pump 2P36B at 2B62; defeats the low oil pressure trip for 2P36B.

C. Reactor Operator One (RO-1) should locally energize PZR heaters in the Lower South Electrical Penetration Room (LSEPR); defeats the low level cutout of the PZR heaters.

D. The Control Room Supervisor (CRS) should locally energize PZR heaters in the Upper South Electrical Penetration Room (USEPR); defeats the high pressure cutout of the PZR heaters.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☑	☑

Audit Exam History

2011	☐

Answer:

A. Reactor Operator Two (RO-2) should locally start Charging Pump 2P36A at 2B52; defeats all the trips for 2P36A.

Notes:

The Reactor Operators (RO-1 and RO-2) are dispatched to the inside of the Aux Building (Controlled Access Part) during an Alternate Shutdown (Location of 2B52 and 2B62). All of the CRS and EO actions are completed outside Controlled Access which is where the LSEPR is located. The RO-2 is the actual RO that will start and stop charging pumps as needed to restore RCS inventory. Distracter B is incorrect because the RO-2 performs this function and the charging pumps only have an alarm on low lube oil pressure - no trip. Distracters C and D are incorrect because the proportional heaters will not energize due to the low level heater cutout in effect due to the low level in the PZR to prevent heater burnout.

References:

AOP 2203.014, Alternate Shutdown, Revision 23, Section 2 Step 15 A&B, page 7.
AOP 2203.014, Alternate Shutdown, Revision 23, Section 6 Step 14, page 27.
STM 2-04, CVCS, Revision 28, Section 2.2.3 - Bottom of page 24.

Historical Comments:

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank:	1785	**Rev:**	0	**Rev Date:**	9/17/2010 12:06:4	**QID #:**	76	**Author:**	Coble		
Lic Level:	S	**Difficulty:**	3	**Taxonomy:**	H	**Source:**	NEW				
Search	000026A201	**10CFR55:**	43.5	**Safety Function**	8						
System Title:	Loss of Component Cooling Water (CCW)	**System Number**	026	**K/A**	AA2.01						
Tier:	1	**Group:**	1	**RO Imp:**	2.9	**SRO Imp:**	3.5	**L. Plan:**	A2LP-RO-EAOP	**OBJ**	11
Description:	Ability to determine and interpret the following as they apply to the Loss of Component Cooling Water: - Location of a leak in the CCWS										

Question:

Consider the following conditions.

* The plant is at 100% power.
* Component Cooling Water (CCW) Surge Tank levels are slowly rising.
* The Loop II CCW Radiation Monitor alarm comes in.
* Chemistry samples of Loop II CCW indicate short lived radionuclides.

Which of the following would be the correct location of the leak, the correct implementing procedure, and the correct action to take?

A. RCP Seal Cooler, RCP Emergencies AOP 2203.025, Remain at 100% power and isolate the affected RCP seal cooler heat exchanger.

B. RCP Motor Cooler, Excess RCS Leakage AOP 2203.016, Remain at 100% power and isolate the affected RCP motor cooler heat exchanger.

C. RCP Motor Cooler, RCP Emergencies AOP 2203.025, Complete a plant shutdown and isolate the affected RCP motor cooler heat exchanger.

D. RCP Seal Cooler, Excess RCS Leakage AOP 2203.016, Complete a plant shutdown and isolate the affected RCP seal cooler heat exchanger.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☐	☑

Audit Exam History

2011	☐

Answer:

D. RCP Seal Cooler, Excess RCS Leakage AOP 2203.016, Complete a plant shutdown and isolate the affected RCP seal cooler heat exchanger.

Notes:

Distracter A is a source of RCS fluid into the CCW system but the guidance for isolating the Seal leak is found in the Excess RCS leakage AOP and the plant cannot run without 4 RCPs and must be shutdown. Distracter B is possible if the candidate fails to remember that there is no RCS fluid interface with the motor cooler and the plant cannot run without 4 RCPs and must be shutdown. Distracter C is cooled by CCW but CCW cools the air entering the RCP motor not RCS fluid and the RCP Emergency AOP does not contain guidance for isolating the motor cooler.

References:

AOP 2203.016, Excess RCS Leakage, Revision 15, Entry Step 7, Step 12 F. and Attachment A Steps 1 through 9, pages 1,6,8,23-26.
AOP 2203.002, SFP Emergencies, Revision 4, Entry Conditions and step 6, pages 1 and 7.
AOP 2203.025, RCP Emergencies, Revision 13, Entry Conditions, page 1.
AOP 2203.036, Loss of Charging, Revision 9, Entry Conditions, page 1.

Historical Comments:

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank:	1786	**Rev:**	1	**Rev Date:**	12/13/2010 5:39:4	**QID #:**	77	**Author:**	Coble
Lic Level:	S	**Difficulty:**	3	**Taxonomy:**	H	**Source:**	NEW		
Search	0000622221	**10CFR55:**	43.2	**Safety Function**	4				
System Title:	Loss of Nuclear Service Water			**System Number**	062	**K/A**	2.2.21		
Tier:	1	**Group:**	1	**RO Imp:**	2.9	**SRO Imp:**	4.1	**L. Plan:**	A2LP-RO-SWACW	**OBJ**	12
Description:	Equipment Control - Knowledge of pre- and post-maintenance operability requirements.								

Question:

Given the following at full power:

* Service Water Pump 2P4B has completed a motor replacement outage.
* The pump is coupled up and ready for an operability test.
* 2P4B has been started and aligned to Loop 2 and ACW.
* 2P4C has been secured and the handswitch is in Normal After Stop.
* 2P4B Service Water Strainer DP is reading 11 psid on PD-1432.
* Loop 2 Service Water flow is reading 2040 gpm on 2FI-1402.
* ACW flow is reading 6020 gpm on 2FI-1601.

Based on this, which of the following describes the requirements to test an inoperable service water pump and the status of operability of Loop 2 Service Water? (REFERENCE PROVIDED)

A. Prior to the test, the CBOT should be stationed at the 2P4B Handswitch in case of loss of offsite power; After the test Loop 2 Service Water is inoperable.

B. Prior to the test, a dedicated operator should be stationed at the 2P4B Handswitch in case of loss of offsite power; After the test Loop 2 Service Water is operable.

C. Prior to the test, the CBOT should be stationed at the 2P4B Handswitch in case of loss of offsite power; After the test Loop 2 of Service Water is operable.

D. Prior to the test, a dedicated operator should be stationed at the 2P4B Handswitch in case of loss of offsite power; After the test Loop 2 of Service Water is inoperable.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☐	☑

Audit Exam History

2011	☐

Answer:

D. Prior to the test, a dedicated operator should be stationed at the 2P4B Handswitch in case of loss of offsite power; After the test Loop 2 Service Water is inoperable.

Notes:

A dedicated operator with no concurrent duties should be stationed at the 2P4B handswitch during the test so that on a Loss of Offsite power, the operator can place the inoperable pump in Pull to Lock so the operable pump logic is made up to automatically start. Based on Table 2 of Form 2104.029 A, the minimum operable loop two SW flow for 11 psid on the suction strainer is 8080 gpm. Based on the indications in the stem only 8060 gpm of flow is indicated at 11 psid on the suction strainer so the loop 2 is inoperable and the Loss of Service Water AOP should be referred to. .

Provide Form 2104.029A as a reference.

References:

NOP 2104.029, Service Water System Operations, Change 80, Step 12.3 and Form 2104.029 A, pages 30,216 and 217.

Historical Comments:

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank:	1787	**Rev:**	0	**Rev Date:**	12/14/2010 1:44:4	**QID #:**	78	**Author:**	Coble		
Lic Level:	S	**Difficulty:**	3	**Taxonomy:**	H	**Source:**	NEW				
Search	000077A203	**10CFR55:**	43.5	**Safety Function**	6						
System Title:	Generator Voltage and Electric Grid Disturbanc	**System Number**	077	**K/A**	AA2.03						
Tier:	1	**Group:**	1	**RO Imp:**	3.5	**SRO Imp:**	3.6	**L. Plan:**	A2LP-RO-MGEN	**OBJ**	8

Description: Ability to determine and interpret the following as they apply to Generator Voltage and Electric Grid Disturbances: - Generator current outside the capability curve.

Question:

Consider the following at full power:

* Severe Thunderstorms are resulting in changing Main Generator parameters.
* Investigation finds the Main Generator output current exceeding the capability curve.

* Annunciator 2K02 B-4 "STATOR WATER TEMPERATURE HI" comes in.
* Stator Cooling outlet temperature on 2TS-9779 is reading 175°F (79.4°C)
* Annunciator 2K02 A-4 "GEN PROT CIRCUIT ENERGIZED" comes in.

Which one of the following procedures contains the mitigating actions for these conditions?

A. Loss of Turbine Load Abnormal Operating Procedure 2203.024.

B. Annunciator 2K02 Corrective Action Response Procedure 2203.012B.

C. Generator Stator Cooling Water Normal Operating Procedure 2106.004.

D. Natural Emergencies Abnormal Operating Procedure 2203.008.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☐	☑

Audit Exam History

2011	☐

Answer:

A. Loss of Turbine Load Abnormal Operating Procedure 2203.024.

Notes:

The Generator Protective Circuit alarm will come in with > 7807 amps on the Main Generator which is well within the capability curve but to get the alarm, the Stator Water temperature has to be above 77.5°C. These condition will cause a rapid Main Generator runback relay to energize and Turbine load will be lost.
The ACA for the Generator Protective Circuit alarm sends the SRO to the Loss of Turbine Load AOP to mitigate this condition by emergency borating and inserting CEAs to prevent a Reactor trip on high pressure. Distracter B is incorrect because the ACA only give the cause of the alarm and then directs the SRO to the Loss of Turbine Load AOP. Distracter C is incorrect because the temperature is high due to the high current on the Main Generator. Distracter C is plausible because the normal operating procedure would be applicable if the SCW Temperature control valve was malfunctioning. Distracter D is incorrect because there are no mitigating actions for the runback in this procedure but is plausible because there are mitigating actions for the severe thunderstorms in this AOP.

References:

NOP 2106.009, Turbine Generator Operations, Change 059, Exhibit 2
ACA 2203.012 B, Change 33, Annunciator 2K02 B-4 "STATOR WATER TEMPERATURE HI"
ACA 2203.012 B, Change 33, Annunciator 2K02 A-4 "GEN PROT CIRCUIT ENERGIZED"
Loss of Turbine Load Abnormal Operating Procedure 2203.024, Rev. 8, Entry Conditions and Step 6.

Historical Comments:

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank: 1788 **Rev:** 0 **Rev Date:** 9/20/2010 4:05:47 **QID #:** 79 **Author:** Simpson

Lic Level: S **Difficulty:** 2 **Taxonomy:** F **Source:** NRC Exam Bank #625

Search 00CE022119 **10CFR55:** 43.2 **Safety Function** 3

System Title: Reactor Trip Recovery **System Number** E02 **K/A** 2.1.19

Tier: 1 **Group:** 1 **RO Imp:** 3.9 **SRO Imp:** 3.8 **L. Plan:** A2LP-RO-MTS **OBJ** 6

Description: Conduct of Operations - Ability to use plant computers to evaluate system or component status.

Question:

Consider the following:

* Reactor Trip Recovery EOP, 2202.002 is being implemented following an unplanned trip from 100%
* A plant cooldown is in progress
* 2K10 E-2, CHANNEL 1 MARG TO SAT LO alarms
* Margin to SAT chart recorder 2XR-4612 is NOT updating
* SPDS indication for margin to saturation on the SFD screen is 47°F
* Channel 1 Margin to Sat Calculator locally indicates a flashing 28°F
* Channel 2 Margin to Sat Calculator locally indicates a steady 50°F

Which of the following actions should be taken for these indications?

A. Secure RCPs and enter 2203.013 Natural Circulation Operation.

B. Continue the cooldown and refer to TS 3.3.3.6 Post-Accident Instrumentation.

C. Rediagnose using 2202.010 Exhibit 8 Diagnostic Actions.

D. Restore saturation margin until all indicators are above 30 °F.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☑
2008	☐	☐
2009	☐	☐
2011	☐	☑

Audit Exam History

2011	☐

Answer:

B. Continue the cooldown and refer to TS 3.3.3.6 Post-Accident Instrumentation.

Notes:

The flashing readout on the local indicator means the calculator is malfunctioning. Adequate MTS can be verified by using the SPDS computer point when in the EOP. 30 °F is required to maintain safety function. Since >30 °F can be validated then no other actions are required. If a valid low MTS was in , the RCPs should be tripped due to a loss of NPSH. There are no abnormal conditions and all Safety Function Status Checks (SFSCs) are met so no rediagnoses is called for but SFSC would not be met if actual MTS was less than 30°F. Restoration above 30°F MTS is not required because it is not actually below 30°F. T.S. 3.3.3.6 requires 1 channel of MTS to be operable so the TS should be referred to and not entered.

References:

ACA 2203.012J for 2K10 E-2, Change 36, pages 21-22.
EOP 2202.002, Reactor Trip Recovery, Revision 8, SFSCs 3 and 5, page 13.
T.S. 3.3.3.6, Table 3.3-10, Instrument 10, Amendment #255/281.

Historical Comments:

Question 625 was used on the 2006 NRC Exam

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank:	1789	**Rev:**	0	**Rev Date:**	9/20/2010 2:44:54	**QID #:**	80	**Author:**	Coble		
Lic Level:	S	**Difficulty:**	4	**Taxonomy:**	H	**Source:**	Modified NRC Exam Bank #284				
Search	00CE05A202	**10CFR55:**	43.5	**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-EFRP	**OBJ**	1

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:

Given the following plant conditions:

* Five (5) minutes post trip from full power.
* 'B' Main Steam Line Rad Monitor reads 100 mr/hr.
* 'A' Steam Generator Pressure is 690 psia and lowering.
* 'B' Steam Generator Pressure is 880 psia and rising.
* RCS Pressure is 1680 psia and lowering.
* Pressurizer Level is 15% and lowering.
* Containment Pressure is 22 psia and rising.
* Steam Generator 'A' level was 70% NR and is now 19.8% NR and lowering.
* Steam Generator 'B' level was 70% NR, lowered to 27% NR and is now 31.8% NR and rising.
* No operator action has been taken.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☐	☑

Which of the following list the correct procedure to be entered following SPTAs and the status of EFW for the given conditions?

Audit Exam History

2011	☐

A. 2202.009, Functional Recovery EOP; EFW is feeding 'A' SG only.

B. 2202.005, Excess Steam Demand EOP; EFW is feeding 'A' SG only.

C. 2202.005, Excess Steam Demand EOP; EFW is NOT feeding either SG.

D. 2202.009, Functional Recovery EOP; EFW is NOT feeding either SG.

Answer:

D. 2202.009, Functional Recovery EOP; EFW is NOT feeding either SG.

Notes:

There are indications of an Excess Steam Demand along with a SGTR. The Optimum Recovery EOPs are written to deal with one event along with a loss of power. Therefore neither the Excess Steam Demand EOP nor the Steam Generator Tube Rupture EOP will deal with two events and should NOT be entered. In this case, a MSIS was actuated at 750 psia in the 'A' SG. To address this event and maintain the safety functions within the limitations in the facility's license and amendments, the Functional Recovery procedure has to be implemented. EFAS actuated when the 'A' SG level went below 22.2% NR but since it is the broke SG and has the lowest pressure, EFW will not automatically feed the 'A' SG. Since SG 'B' level never went below 22.2%, EFW will not automatically feed the 'B' SG.

References:

EOP 2202.009, Functional Recovery, Revision 11, Entry Conditions page 1.
NOP 1015.021, ANO-2 EOP/AOP Users Guide, Change 008, step 5.1.8, page 16.
AOP 2203.011, RCS Overcooling, Revision 4, Entry Conditions, page 1.

STM 2-19-2, EFW System, Revision 30, Section 2.3.3.1, page 21-22.

Historical Comments:

Original question 284 was used on the 2000 NRC exam

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank:	1790	**Rev:**	1	**Rev Date:**	12/13/2010 5:40:5	**QID #:**	81	**Author:**	Coble		
Lic Level:	S	**Difficulty:**	3	**Taxonomy:**	H	**Source:**	Modified NRC Exam Bank #335				
Search	00CE062242	**10CFR55:**	43.2	**Safety Function**	4						
System Title:	Loss of Feedwater			**System Number**	E06	**K/A**	2.2.42				
Tier:	1	**Group:**	1	**RO Imp:**	3.9	**SRO Imp:**	4.6	**L. Plan:**	A2LP-RO-ELOSF	**OBJ**	1

Description: Equipment Control - Ability to recognize system parameters that are entry-level conditions for Technical Specifications.

Question:

Given the following plant conditions at full power:

* Emergency Diesel Generator 2DG1 is out of service for maintenance.
* An Inadvertent Containment Spray Actuation Signal (CSAS) has occurred.
* An electrical bus 2A1 lockout alarm actuates on the plant trip.
* 2P-7A, Emergency Feedwater Pump 'A' overspeeds and trips when starting.
* All other equipment operates as designed and no other abnormal conditions exist.

After completion of the Standard Post Trip Actions (SPTA's), which of the following implementing procedures should be diagnosed, and what is the correct Technical Specification that should be implemented?

A. 2202.006, Loss of Feedwater; T.S. 3.7.1.2 Emergency Feedwater System.

B. 2202.006, Loss of Feedwater; T.S. 3.0.3, LCO 3/4 Applicability.

C. 2202.010, Functional Recovery; T.S. 3.7.1.2 Emergency Feedwater System.

D. 2202.010, Functional Recovery; T.S. 3.0.3, LCO 3/4 Applicability.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☐	☑

Audit Exam History

2011	☐

Answer:

B. 2202.006, Loss of Feedwater; T.S. 3.0.3, LCO 3/4 Applicability.

Notes:

The entry conditions are met for a Loss of Main Feedwater EOP because: 1) the CSAS tripped the MFW pumps and closed the MFW Block and Main Steam Isolation valves. 2) The B EFW pump and AFW pump 2P75 are not available due to the loss of their power supply bus 2A1 and the 2DG1 and 3) the A EFW pump is not available due to an overspeed condition. The functional recovery procedure should not be diagnosed because there is only one event occurring for the given conditions above and the loss of power can be restored using the Loss of Feedwater EOP. T.S 3.0.3 should be implemented because there are no EFW pumps available to feed the Steam Generators. The EFW T.S 3.7.1.2 applied until 2P7A oversped and tripped. Both Containment Spray pumps will be placed in Pull to Lock in SPTAs which again would be T.S. 3.0.3 instead of T.S. 3.6.1.2. The MSIV T.S. does not apply because the MSIV are closed in their ESF position.

References:

EOP 2202.006, Loss of Feedwater, Revision 9, Entry Conditions, page 1.
T.S. 3.7.1.2, EFW System.
T.S. 3.0.3.
T.S. 3.6.2.1, Containment Spray System
T.S. 3.7.1.5, MSIVs.

Historical Comments:

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Original Question 335 was used on the 2002 NRC Exam.

Bank: 1791 **Rev:** 0 **Rev Date:** 11/30/2010 1:40:3 **QID #:** 82 **Author:** Coble

Lic Level: S **Difficulty:** 3 **Taxonomy:** H **Source:** NEW

Search 0000282420 **10CFR55:** 43.5 **Safety Function** 2

System Title: Pressurizer (PZR) Level Control Malfunction **System Number** 028 **K/A** 2.4.20

Tier: 1 **Group:** 2 **RO Imp:** 3.8 **SRO Imp:** 4.3 **L. Plan:** A2LP-RO-EAOP **OBJ** 21

Description: Emergency Procedures/Plan - Knowledge of operational implications of EOP warnings, cautions, and notes.

Question:

Given the following at 100% power:

* Annunciator 2K10-G6/G7 "CNTRL CH 1/2 Level LO" comes in.
* The ATC reports that PZR Level Indication 2LI 4627-1, 2LI 4627-2, and 2LI 4625 are all failed LOW.
* Troubleshooting by I&C determines that none of the indications can be restored.
* No other PZR level indication are available on SPDS, PMS or on 2C80.

Which one of the following actions should be taken?

A. Enter AOP 2203.028, PZR Systems Malfunction, Commence a plant down power and add 77.5 gallons of makeup to the RCS for every one degree reduction in Tave.

B. Trip the Reactor, Enter SPTAs EOP 2202.001, Verify three charging pumps are continuously operating with Letdown isolated, and cool the plant down to SDC entry conditions.

C. Enter AOP 2203.028, PZR Systems Malfunction, Trip the Reactor, Commence adding 2750 gallons of makeup to the RCS to maintain PZR level, then GO to SPTAs EOP 2202.001.

D. Enter AOP 2203.028, PZR Systems Malfunction, place Letdown in manual control and match Charging and Letdown flows while maintaining 100% stable power.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☐	☑

Audit Exam History

2011	☐

Answer:

C. Enter AOP 2203.028, PZR Systems Malfunction, Trip the Reactor, Commence adding 2750 gallons of makeup to the RCS to maintain PZR level, then GO to SPTAs EOP 2202.001.

Notes:

As directed by AOP 2203.028, Answer C is the correct sequence to take. Distracter A is incorrect because there are no indications of PZR level and the Reactor should be tripped instead of shutdown but is plausible because the addition rate would maintain PZR level. Distracter B is incorrect as this would maintain RCS inventory but would tend to overfill the PZR and could cause RCS solid conditions. Distracter D is incorrect because there are no available PZR indications but would be correct if at least 1 PZR level indication could be read.

References:

AOP 2203.028, PZR Systems Malfunction, Rev. 10, Entry Conditions.
AOP 2203.028, PZR Systems Malfunction, Rev. 10, Step 7.G
AOP 2203.028, PZR Systems Malfunction Technical Guide, Rev. 10, Step 7.
STM 2-03, RCS, Rev. 19, Figure on page 52, Simplified PZR Level Transmitters.

Historical Comments:

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank:	1792	**Rev:**	1	**Rev Date:**	12/13/2010 5:41:2	**QID #:**	83	**Author:**	Coble
Lic Level:	S	**Difficulty:**	2	**Taxonomy:**	F	**Source:**	NEW		
Search	000036A201	**10CFR55:**	43.7	**Safety Function**	8				
System Title:	Fuel Handling Incidents			**System Number**	036	**K/A**	AA2.01		
Tier:	1	**Group:**	2	**RO Imp:**	3.2	**SRO Imp:**	3.9	**L. Plan:**	A2LP-RO-FH	**OBJ**	5

Description: Ability to determine and interpret the following as they apply to the Fuel Handling Incidents: - ARM system indications

Question:

Which one of the following would satisfy the MINIMUM initial condition requirements for radiation monitoring in the SFP area should a fuel handling event occur while performing a core offload?

A. One Unit 2 SFP area radiation monitor operable and the Unit 1 SFP area ventilation unit is operable and in operation.

B. Two Unit 2 SFP area radiation monitors operable with both Unit 1 and Unit 2 area ventilation units operable and in service.

C. All Three Unit 2 SFP area radiation monitors operable and the Unit 2 SFP area ventilation unit is operable and in operation.

D. No Unit 2 SFP area radiation monitors operable with both Unit 1 and Unit 2 area ventilation units operable and in service.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☐	☑

Audit Exam History

2011	☐

Answer:

A. One Unit 2 SFP area radiation monitor operable and the Unit 1 SFP area ventilation unit is operable and in operation.

Notes:

At least one SFP area radiation monitor has to be operable and either the Unit 1 or Unit 2 Ventilation unit has to be operable and in operation to meet the minimum requirement listed in the distracters. Distracter B, C and D are incorrect because only one ARM and only one ventilation unit is required to meet the minimum requirements.

References:

T.S 3.3.3.1 Amendment 255 Table 3.3-6 Item 1.a.
TRM 3.9.1 Revision 27.
OP 2502.001, Refueling Shuffle, Change 041, Step 7.1.2.F and 7.1.2.H, pages 9-11.

Historical Comments:

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank:	1793	**Rev:**	0	**Rev Date:**	9/17/2010 9:05:48	**QID #:**	84	**Author:**	Coble		
Lic Level:	S	**Difficulty:**	3	**Taxonomy:**	F	**Source:**	Modified IH Bank OPSUNIT2 10860				
Search	000051A202	**10CFR55:**	43.5	**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:

Given the following:

* The plant is at 100% power when the 'B' Circ Water Pump Trips
* The breaker for the B' Circ Water Pump Discharge Valve, 2CV-1215 trips open as the valve begins to close.
* Condenser Vacuum is reading 6.6 inches of HG Absolute and rising rapidly.

Which of the following list the correct actions to take for these conditions?

A. Enter Loss of Condenser Vacuum AOP and commence Emergency Boration to lower power.

B. Trip the Main Turbine and go to Loss of Turbine Load AOP to stabilize Rx Power with ADVs.

C. Trip the Reactor, verify Main Turbine tripped, and go to Standard Post Trip Actions.

D. Enter Loss of Condenser Vacuum AOP, manually close 2CV-1215 and restore vacuum.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☐	☑

Audit Exam History

2011	☐

Answer:

C. Trip the Reactor, verify Main Turbine tripped, and go to Standard Post Trip Actions.

Notes:

Distracter A is a procedurally directed step (6) in the Loss of Condenser Vacuum AOP but it assumes the CW discharge valve on the pump that tripped went fully closed. If the valve does not close fully then the flow from the 'A' CW pump can be short-cycled causing a rapid loss of Condenser Vacuum (Step 4 of the Loss of Condenser Vacuum AOP). Distracter 2 is also a step in the Loss of Condenser Vacuum AOP (Step 5) but based on plant power and ADV capacity, reactor power cannot be stabilized before tripping on High RCS pressure. Distracter D is incorrect as it would take to long for an operator to reach the discharge isolation at the cooling tower and manually close the valve but would be plausible for a slowly rising vacuum..

References:

AOP 2203.019, Loss of Condenser Vacuum AOP, Revision 9, Entry Conditions, Steps 4, 5 and 6 , pages 1-4. Technical guide OP 2203.019 for step 4, page 7.

Historical Comments:

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank:	1794	**Rev:**	0	**Rev Date:**	9/17/2010 10:33:3	**QID #:**	85	**Author:**	Coble		
Lic Level:	S	**Difficulty:**	4	**Taxonomy:**	H	**Source:**	NEW				
Search	0000762447	**10CFR55:**	43.4	**Safety Function**	9						
System Title:	High Reactor Coolant Activity			**System Number**	076	**K/A**	2.4.47				
Tier:	1	**Group:**	2	**RO Imp:**	4.2	**SRO Imp:**	4.2	**L. Plan:**	ASLP-RO-EPLAN	**OBJ**	6

Description: Emergency Procedures/Plan - Ability to diagnose and recognize trends in an accurate and timely manner utilizing the appropriate control room reference material.

Question:

Consider the following:

* Unit 2 has been at full power for 100 days.
* A reactor trip is initiated due to a 200 gpm Steam Generator Tube Rupture.
* Coincident with the reactor trip is a total loss of off-site power.
* A cooldown is in progress to isolate the ruptured Steam Generator.
* Time is 20 minutes post trip.
* RCS pressure is 1400 psia and steady.
* RCS Temperature is 548 degrees F and lowering
* A current RCS sample reveals 47 µCi/gm of I-131 activity.
* Dose Rate on RCS sample line 2TCD-19 indicates 400 mr/hr at 30 cm.
* Low range containment radiation monitors are reading 10 R/hr.
* High range containment radiation monitors are reading 12 R/hr.
* Dose rate projection for the site boundary is unavailable at this time.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☐	☑

Audit Exam History

2011	☐

Given these conditions the Shift Manager should declare a(n) _____ based on EAL _____. (REFERENCE PROVIDED)

A. Notice Of Unusual Event; 1.1

B. Alert; 3.3

C. Site Area Emergency; 3.4

D. General Emergency; 1.5

Answer:

C. Site Area Emergency; 3.4

Notes:

Distracter A would apply since RCS activity is greater than 37.8 µCi/gm I-131 but is incorrect since there is a SGTR with a steam release in progress (only way to cooldown without a condenser). Distracter B would also apply but with RCS activity than 37.8 µCi/gm I-131, EAL 3.4 would be the correct Eplan call. Distracter D is incorrect because the dose rate on 2TCD-19 are below the 1% failed fuel readings per 1903.010 Attachment 8 and there are no indications of inadequate core cooling.

Provide OP 1903.010, EAL Classification, Unit 2 EALs with index and Unit 2 Attachments as a reference.

References:

OP 1903.010, EAL Classification, Change 043, EALs 1.1, 3.3, 1.3, 3.4 and Attachment 8, pages 76,78,88,89,and 132.

Historical Comments:

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank:	1795	**Rev:**	1	**Rev Date:**	12/13/2010 6:20:5	**QID #:**	86	**Author:**	Coble		
Lic Level:	S	**Difficulty:**	2	**Taxonomy:**	F	**Source:**	NEW				
Search	012000A207	**10CFR55:**	43.5	**Safety Function**	7						
System Title:	Reactor Protection System			**System Number**	012	**K/A**	A2.07				
Tier:	2	**Group:**	1	**RO Imp:**	3.2	**SRO Imp:**	3.7	**L. Plan:**	A2LP-RO-ESPTA	**OBJ**	17

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: - Loss of dc control power.

Question:

Given the following:

* The plant is at 100% Power.
* Annunciator "2K01 A-10 CONT CENTER 2D01 UNDERVOLT" comes in.
* Voltage for 2D01 on SPDS point E2D01 indicates zero (0) voltage.
* The Reactor trips.
* During SPTAs the voltage for 2D02 on SPDS point E2D02 goes to zero (0).

Which one of the following actions would be correct after completion of SPTAs?

A. Enter Loss of 125 VDC AOP and locally shutdown the PMS Inverter 2Y25.

B. Enter Loss of SPDS AOP and locally restart the SPDS Inverter 2Y26.

C. Enter the Functional Recovery EOP and locally shutdown the PMS Inverter 2Y25.

D. Enter the Station Blackout EOP and locally start the Alternate AC Diesel Generator.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☐	☑

Audit Exam History

2011	☐

Answer:

C. Enter the Functional Recovery EOP and locally shutdown the PMS Inverter 2Y25.

Notes:

On a loss off both 125 VDC vital buses 2D01 and 2D02, RPS may open all the Reactor Trip Circuit Breakers and trip the reactor. On a loss of a single 125 VDC bus, the Reactor may or may not trip and the correct action to take is to enter Loss of 125 VDC and take the action associated with the loss of the one bus that lost voltage. In this case the reactor tripped and SPTAs should be completed. Then based on the Diagnostic flow chart, the functional recovery procedure should be entered based on loss of both Vital DC buses. Distracters A and B are incorrect because the reactor tripped and the AOP is no longer applicable.
Distracter D is incorrect because the wrong EOP is diagnosed but could be picked if the candidate realizes both safety bus voltages will also be zero since no EDG will start and Offsite power will not transfer power to the safety buses on a loss of vital DC.

References:

ACA 2K01 A-10 and A-11 for "2K01 A-10 CONT CENTER 2D01/02 UNDERVOLT" Change 038, page 79 and 98..
STM 2-32-5, 125 VDC, Rev. 16, Section 2.7.2, page 15.
Loss of 125 VDC AOP 2203.037, Revision 6, Step 2, page 3.
Technical Guideline Loss of 125 VDC AOP 2203.037, Revision 6, Step 2, page 5.
EOP Standard Attachments EOP 2202.010, Revision 15, Exhibit 8, page 152.
EOP 2202009_R11 Functional Recovery MVDC-1 Step 1 - 4 and Standard Attachment 40

Historical Comments:

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank:	1796	**Rev:**	0	**Rev Date:**	9/14/2010 2:27:29	**QID #:**	87	**Author:**	Coble		
Lic Level:	S	**Difficulty:**	3	**Taxonomy:**	H	**Source:**	NEW				
Search	013000A201	**10CFR55:**	43.5	**Safety Function**	2						
System Title:	Engineered Safety Features Actuation System (	**System Number**	013	**K/A**	A2.01						
Tier:	2	**Group:**	1	**RO Imp:**	4.6	**SRO Imp:**	4.8	**L. Plan:**	A2LP-RO-ELOCA	**OBJ**	6

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

Question:

Given the following:

* The Green Train Emergency Diesel 2DG2 is OOS for planned maintenance
* The plant is at full power when a 200 gpm LOCA develops.
* The plant is manually tripped.
* Electrical Bus 2A2 fails to transfer to its offsite power source during the trip.
* Annunciator 2K01 B-8 "SU 2 LO Relay Trip" Alarm comes in.
* All other plant equipment operate as designed.

Which of the following would be the correct action to take to restore power to the Green Train ESF equipment?

A. During SPTAs, start the Alternate AC Diesel Generator (AACG) and tie to Bus 2A4.

B. Complete SPTAs, enter LOCA Recovery EOP and use Standard Att.11, Degraded Power.

C. Complete SPTAs, enter LOOP Recovery EOP and use Standard Att.11, Degraded Power.

D. During SPTAs, manually align Bus 2A2 to SU #2 Transformer and tie to Bus 2A4.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☐	☑

Audit Exam History

2011	☐

Answer:

B. Complete SPTAs, enter LOCA Recovery EOP and use Standard Att.11, Degraded Power.

Notes:

The RCS inventory safety function can be handled by one train (Red Train) of ESF equipment so there is no urgency to restore the Green train of ESF equipment in SPTAs. Distracter A is incorrect because SPTAs provide direction to start the AACG only if neither Emergency DG is available. In this case the Red Train 2DG1 is available. Distracter C is incorrect because there is no Loss of Offsite power and each specific recovery EOP has direction to restore power to a faulted bus. Distracter D is incorrect because the SPTA procedure has no guidance for this action and the LO Relay will prevent a manual transfer. Answer B is correct because step 19 of the LOCA recovery procedure Section 1 is a floating step and can be used anytime after completing SPTAs and entering the LOCA Recovery EOP to restore power to a faulted bus so this is the correct action to take.

References:

EOP 2202.001, SPTAs, Revision 11, Step 4.F, page 5.
EOP 2202.003 Section 1, Revision 11, Floating Step 19, page 12.
Admin Procedure 1015.021, ANO-2 EOP/AOP User Guide, Change 08, Step 5.1/5.1.2, page 14.

Historical Comments:

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank:	1797	**Rev:**	1	**Rev Date:**	12/13/2010 5:42:1	**QID #:**	88	**Author:**	Coble		
Lic Level:	S	**Difficulty:**	3	**Taxonomy:**	H	**Source:**	Modified NRC Exam Bank #1566				
Search	0390002449	**10CFR55:**	43.2	**Safety Function**	4						
System Title:	Main and Reheat Steam System (MRSS)			**System Number**	039	**K/A**	2.4.49				
Tier:	2	**Group:**	1	**RO Imp:**	4.6	**SRO Imp:**	4.4	**L. Plan:**	A2LP-RO-COLSS	**OBJ**	17
Description:	Emergency Procedures/Plan - Ability to perform without reference to procedures those actions that require immediate operation of system components and controls.										

Question:

Consider the following at full power:

* Main Turbine load is 1044 MWe initially
* Annunciator 2K10 A2 "COLSS POWER MARGIN EXCEEDED" comes in.
* Investigation reveals the Main Turbine load has dropped 16 MWe and is currently 1028 MWe and stable.
* Plant power has risen to 101.5% power.

Based on these conditions, which of the following is the correct action to take?

A. Lower plant power below 100% immediately based on ACA guidance for 2K10 A2.

B. Lower plant power below 100% within 10 minutes based on ACA guidance for 2K10 A2.

C. Enter Loss of Turbine Load AOP and restore Main Turbine load to 1044 MWe.

D. Immediately trip the Reactor and enter Standard Post Trip Actions EOP.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☐	☑

Audit Exam History

2011	☐

Answer:

A. Lower plant power below 100% immediately based on ACA guidance for 2K10 A2.

Notes:

Answer A is the correct action to take based on a steam leak at power to reduce turbine load below 100% if plant power exceeds 101%. The ACA directs this action but should be a known immediate action to the SRO who should direct this action prior to referring to the ACA. If it is > 100% but less than 101%, then a ten minute time frame applies. Distracter B is incorrect because plant power exceeded 101% Power. If greater than 101%, the action must be taken immediately. If the steam leak is large enough to cause a loss of > 50 MWe load to be removed from the main turbine, then this is trip criteria in the annunciator corrective action and SPTAs will be the guiding document. Distracter D is incorrect because there has only been a loss of 21 Mwe. A Loss of Turbine Load AOP is plausible because the turbine is loosing load but Distracter C is incorrect because this AOP is for a Loss of Load and a loss in reactor power (rise in RCS temperature) and raising turbine load would raise Reactor power.

References:

EOP 2203.012J, Annunciator Corrective Action (ACA) for alarm 2K10 A2, Change 036, Step 2.2, page 17.
AOP 2203.024, Loss of Turbine Load, Revision 8, Entry Conditions, page 1.

Historical Comments:

The original question 1566 was used on the 2008 NRC exam

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank:	1798	**Rev:**	1	**Rev Date:**	12/13/2010 5:42:2	**QID #:**	89	**Author:**	Coble
Lic Level:	S	**Difficulty:**	3	**Taxonomy:**	H	**Source:**	NEW		
Search	064000A207	**10CFR55:**	43.1	**Safety Function**	6				
System Title:	Emergency Diesel Generator (ED/G) System			**System Number**	064	**K/A**	A2.07		
Tier:	2	**Group:**	1	**RO Imp:**	2.5	**SRO Imp:**	2.7	**L. Plan:**	A2LP-RO-EDG	**OBJ**	7

Description: Ability to (a) predict the impacts of the following malfunctions or operations on the ED/G System and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: - Consequences of operating under/over excited.

Question:

Given the following at 100% power:

* A monthly slow start surveillance of Emergency Diesel 2DG1 is in progress using Supplement 1A of OP 2104.036, EDG Operations.
* When the diesel is started and its output breaker closed, its initial indication of reactive load is reading a negative (-10) KVAR.
* 2DG1 is now loaded to 1400 KW using the Governor Control Switch (CS-4)
* Now, all parameters associated with the surveillance meet their acceptance criteria.

Based on the acceptance criteria of Supplement 1A and the results of this surveillance, which one of the following is correct? (REFERENCE PROVIDED)

A. Declare 2DG1 inoperable, Refer to T.S. 3.8.1.1, and generate a condition report/WR.

B. 2DG1 is operable and generate a condition report/WR to calibrate the volt meter.

C. Declare 2DG1 inoperable, verify LCO Tracking Record and condition report/WR initiated.

D. 2DG1 is operable and generate a condition report/WR to repair the governor controller.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☐	☑

Audit Exam History

2011	☐

Answer:

B. 2DG1 is operable and generate a condition report/WR to calibrate the volt meter.

Notes:

If the initial generator KVAR response is Negative and not Neutral/Positive, then Negative would be circled in step 3.9 of NOP 2104.036, Supplement 1A. Then in the acceptance criteria of this supplement step 5.6 would be answered as NO. The answer is found in step 5.9 of the acceptance criteria but must have knowledge that VARs are adjusted with the voltage regulator when tied to a grid. The distracters are found in step 5.7 and 6.4 of Supplement 1A of NOP 2104.036.

Provide NOP 2104.036, EDG Operations, Supplement 1A Steps 3, 4, 5, and 6 as a reference.

References:

NOP 2104.036, EDG Operations, Change 075, Supplement 1A Steps 3.9, 5.6, 5.9 and 6.4, Pages 105-111 and 116-118.

Historical Comments:

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank:	1799	**Rev:**	1	**Rev Date:**	12/13/2010 5:34:1	**QID #:**	90	**Author:**	Coble		
Lic Level:	S	**Difficulty:**	2	**Taxonomy:**	F	**Source:**	NRC Exam Bank #1689				
Search	0780002404	**10CFR55:**	43.5	**Safety Function**	8						
System Title:	Instrument Air System (IAS)	**System Number**	078	**K/A**	2.4.4						
Tier:	2	**Group:**	1	**RO Imp:**	4.5	**SRO Imp:**	4.7	**L. Plan:**	A2LP-RO-EAOP	**OBJ**	16

Description: Emergency Procedures/Plan - Ability to recognize abnormal indications for system operating parameters that are entry-level conditions for emergency and abnormal operating procedures.

Question:

Given the following plant conditions:

* Unit 2 at 100% power
* Annunciator 2K12 A-8 " INSTR AIR PRESS HI/LO" alarms
* 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	☐	☑
2011	☐	☑

Audit Exam History

2011	☐

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, 4, and 5.

Historical Comments:

Original question 1689 was used on the 2009 NRC exam.

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Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank:	1800	**Rev:**	0	**Rev Date:**	9/8/2010 9:48:13	**QID #:**	91	**Author:**	Coble
Lic Level:	S	**Difficulty:**	3	**Taxonomy:**	H	**Source:**	NEW		
Search	0550002145	**10CFR55:**	43.5	**Safety Function**	4				
System Title:	Condenser Air Removal System (CARS)			**System Number**	055	**K/A**	2.1.45		
Tier:	2	**Group:**	2	**RO Imp:**	4.3	**SRO Imp:**	4.3	**L. Plan:**	A2LP-RO-ESGTR	**OBJ**	2

Description: Conduct of Operations - Ability to identify and interpret diverse indications to validate the response of another indication.

Question:

The following plant conditions exist at 15% power during a plant startup:

* Annunciator 2K11 A-10, "SEC SYS RADIATION HI" comes in.
* Condenser Offgas Radiation Monitor, 2RE-0645, has a high alarm.
* "A" Steam Generator N-16 monitor indicates 3.2 gpd and rising.
* "B" Steam Generator N-16 monitor indicates 300 gpd and rising.
* Ten minutes later, the RCS leakrate is 50 gpm.
* "A" Main Steam radiation monitor = 50 mR/hr and rising.
* "B" Main Steam radiation monitor = 10 mR/hr and rising.
* The plant is manually tripped.
* Standard Post Trip Actions (SPTA's) are completed.

What is the status of "A" and "B" Steam Generators in the above stated conditions and which procedure should be implemented after SPTAs?

A. "A" SG is the ruptured SG and "B" SG is the intact SG; SG Tube Rupture EOP 2202.004.

B. "A" SG is the intact SG and "B" SG is the ruptured SG; SG Tube Rupture EOP 2202.004.

C. "A" SG is the intact SG and "B" SG is the leaking SG; Primary to Secondary Leakage AOP 2203.038.

D. "A" SG is the leaking SG and "B" SG is the intact SG; Primary to Secondary Leakage AOP 2203.038.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☐	☑

Audit Exam History

2011	☐

Answer:

A. "A" SG is the ruptured SG and "B" SG is the intact SG; SG Tube Rupture EOP 2202.004.

Notes:

In the ANO-2 EOP/AOP User guide, the words "Leaking SG" are used to define the SG primary to secondary leakage within the limits of OP 2203.038, Primary to Secondary Leakage. The words "Intact SG" are used to describe the SG with no tube leakage or the least affected by leakage. The words " ruptured SG are used to describe the SG with tube leakage in excess of the limits of OP 2203.038, Primary to Secondary Leakage, which is 44 gpm (See step 13 of AOP 2208.038) Also the N-16 SG activity monitors are not accurate below 20% power and thus should not be used to diagnose SG leakage rates for the given conditions.

Distracter B is incorrect because the A SG is ruptured and B SG is the intact SG.
Distracter C is incorrect because the A SG is ruptured and the wrong procedure is implemented.
Distracter D is incorrect because the leakage is > 44 gpm (ruptured) which is considered ruptured not leaking and the wrong procedure is implemented.

References:

OP 1015.021 ANO-2 EOP/AOP User Guide (Change 008) steps 4.39.12, 4.39.14, and 4.39.17, page 12.
AOP 2203.038, Primary to Secondary Leakage (Revision 12), Entry Conditions, Steps 12 and 13 along with the technical guide for these steps, pages 1,5,13,14.
EOP 2202.004, Steam Generator Tube Rupture (Revision 10), Entry Conditions, Step 14 along with the technical guide for this step, pages 1,12,and 29.
STM 2-62, Radiation Monitoring System, Rev. 17, Section 2.3.3 and 2.3.4, pages 32-36.

Historical Comments:

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank:	1801	**Rev:**	0	**Rev Date:**	9/13/2010 11:24:3	**QID #:**	92	**Author:**	Coble		
Lic Level:	S	**Difficulty:**	2	**Taxonomy:**	F	**Source:**	Modified IH Bank ANO-OPS2-12313				
Search	056000A205	**10CFR55:**	43.5	**Safety Function**	4						
System Title:	Condensate System			**System Number**	056	**K/A**	A2.05				
Tier:	2	**Group:**	2	**RO Imp:**	2.1	**SRO Imp:**	2.5	**L. Plan:**	A2LP-RO-CWS	**OBJ**	7

Description: Ability to (a) predict the impacts of the following malfunctions or operations on the Condensate System and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: - Condenser tube leak

Question:

Consider the following:

* Unit 2 is at full power when a significant condenser tube leak occurs.
* The leak is determined to be in the 'B' North tube bundle.

To isolate this leak, plant power should be reduced using _____ and _____ of the Steam Dump Bypass Control System Valves need (s) to be DISABLED because _____. (REFERENCE PROVIDED)

A. Power Operation NOP 2102.004; two; of a concern with damage to condenser tubes

B. Loss of Turbine Load AOP 2203.024; two; of a concern with the vacuum pumps tripping

C. Loss of Turbine Load AOP 2203.024; one; of a concern with the vacuum pumps tripping

D. Power Operation NOP 2102.004; one; of a concern with damage to condenser tubes

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☐	☑

Audit Exam History

2011	☐

Answer:

A. Power Operation NOP 2102.004; two; of a concern with damage to condenser tubes

Notes:

Steam exhausting on the dry condenser tubes can cause thermally induced stresses therefore steam dumps that can exhaust on the dry tubes are disabled prior to isolating the waterbox. The suction isolations to the condenser vacuum pumps are also closed when isolating waterboxes to prevent overloading and tripping the vacuum pumps. Distracters C and D are incorrect because two Steam Dumps need to be disabled. Distracters B and C are incorrect because they have the wrong reason for disabling the steam dumps.

Provide OP 2104.008, CW System Operations, Section 5.0 (limits and Precautions) as a reference.

References:

STM 2-40-1, CW System, Rev. 27, Figure on page 77
NOP 2104.008, CW System Operations, (Change 049) Step 5.11and Step 16.1.2 (Step 5.11 needs to be provided as a reference). pages 7 and 31

Historical Comments:

Has never been used on an ANO-Unit 2 NRC Exam.

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank:	1802	**Rev:**	1	**Rev Date:**	12/13/2010 5:49:5	**QID #:**	93	**Author:**	Coble		
Lic Level:	S	**Difficulty:**	2	**Taxonomy:**	F	**Source:**	NRC Exam Bank #0536				
Search	071000A205	**10CFR55:**	43.4	**Safety Function**	9						
System Title:	Waste Gas Disposal System (WGDS)			**System Number**	071	**K/A**	A2.05				
Tier:	2	**Group:**	2	**RO Imp:**	2.5	**SRO Imp:**	2.6	**L. Plan:**	A2LP-RO-RWST	**OBJ**	9

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: - Power failure to the ARM and PRM Systems

Question:

Given the following:

* The plant is at full power at the end of a cycle preparing to shutdown in 1 week.
* A Unit 2 Gaseous Release Permit has been issued for Gas Decay Tank (GDT) 2T-18A.
* The power supply on the GDT Vent Line Radiation Monitor 2RITS-2429 has failed.
* The Shift Manager has declared 2RITS-2429 inoperable.

Which of the following statements is TRUE concerning the release of 2T-18A?

A. The release CAN proceed as long as an independent verification of the discharge path valve lineup and an independent sample of 2T-18A activity is analyzed first.

B. The release CAN proceed as planned as long as the Auxiliary Building Exhaust Dose Assessment SPING 6 is operable to monitor the activity being released.

C. The release CANNOT proceed until 2RITS-2429 has been returned to Operable status in accordance with ODCM L2.2.1 requirements.

D. The release CANNOT proceed because the discharge flow path cannot be aligned with with no power available to 2RITS-2429.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☑
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☐	☑

Audit Exam History

2011	☐

Answer:

A. The release CAN proceed as long as an independent verification of the discharge path valve lineup and an independent sample of 2T-18A activity is analyzed first.

Notes:

Distracter B is incorrect because the SPING does not automatically shutoff the release on high activity and this is not allowed without independent samples and lineup.

Distracter C is incorrect because the release can still be completed with independent samples and lineup.

Distracter D is incorrect because the interlock to isolate the discharge flow path will only occur on a high radiation signal or the rad monitor failing high.

References:

NOP 2104.022, Rev 39 Supplement 1, Unit 2 Gaseous Release Permit, Step 3.16, page 53.
ODCM Rev 17 L.2.2.1 Pages 64,65,68.

Historical Comments:

Changed to Bank question vice modified due to NRC feedback. Question 536 was used on the 2005 ANO Unit 2

Data for 2011 NRC RO/SRO Exam

21-Dec-10

SRO Exam

Bank: 1803 **Rev:** 1 **Rev Date:** 12/13/2010 5:49:3 **QID #:** 94 **Author:** Coble

Lic Level: S **Difficulty:** 3 **Taxonomy:** H **Source:** NEW

Search 1940012123 **10CFR55:** 43.6 **Safety Function** 4

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-OPROC **OBJ** 3

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 has been shutdown from a 100 day run at 100% power.
* The forced shutdown has lasted 30 days.
* The reactor is critical and power ascension has begun.
* Reactor Engineering has determined that Conditioned Power is 100%.
* The ASI/ESI difference is 0.015.

During the up power the maximum permissible power ascension rate is _____%/hour prior to 50% power followed by a maximum of _____%/hour prior to 100% power. (REFERENCE PROVIDED)

A. 10%; 3%

B. 15%; 3%

C. 10%; 15%

D. 15%; 10%

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☐	☑

Audit Exam History

2011	☐

Answer:

D. 15%; 10%

Notes:

The power ascension limits are provided to prevent exceeding fuel differential temperature stresses as the fuel heats up on a power ascension. If the reactor has been operated at power for > 72 cumulative hours in the last 30 days at power, then the power ascension limit is 15%/hour at less than 50% power and per table A-1 of step 4.2.3. If raising power from a refueling outage or above conditioned power, then power ascension limits are 3% per hour. Distracters A, B and C are incorrect because they contain the incorrect combination of ascension limits.

Provide NOP 2102.004 Change 047, Power Operations, Attachment A Step 4.0 as a reference.

References:

NOP 2102.004 Change 048, Power Operations, Attachment A Step 4.2, pages 52-54.

Historical Comments:

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank: 1804 **Rev:** 1 **Rev Date:** 12/13/2010 5:51:1 **QID #:** 95 **Author:** Coble

Lic Level: S **Difficulty:** 3 **Taxonomy:** F **Source:** NRC Exam Bank #0454

Search 1940012132 **10CFR55:** 43.2 **Safety Function** 3

System Title: Generic **System Number** GENERIC **K/A** 2.1.32

Tier: 3 **Group:** 1 **RO Imp:** 3.8 **SRO Imp:** 4.0 **L. Plan:** A2LP-RO-SDC **OBJ** 1

Description: Conduct of Operations - Ability to explain and apply system limits and precautions.

Question:

Consider the following:

* Unit 2 is being cooled down in preparation for a refueling outage.
* Shutdown cooling is in service.
* 'A' and 'D' reactor coolant pumps are running.
* The upper limit for RCS pressure is 300 psia.
* The lower limit for RCS pressure is 260 psia.

The upper RCS pressure limit is based on _____ and the lower RCS pressure limit is based on _____.

A. SDC system pressure boundary limits; reactor coolant pump NPSH

B. SDC system pressure boundary limits; limiting the downward thrust on the RCPs

C. tripping of the running SDC pump; reactor coolant pump NPSH

D. tripping of the running SDC pump; limiting the downward thrust on the RCPs

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☑
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☐	☑

Audit Exam History

2011	☐

Answer:

A. SDC system pressure boundary limits; reactor coolant pump NPSH

Notes:

The operational limits of the shutdown cooling system are 300 psia and 300°F per OP 1015.016 page 3 of 4. RCP operating limits are based on minimum pressure requirements for the seals, hydrostatic bearings and NPSH, whichever is most limiting for the given RCS temperature per OP 1015.016 page 3 of 4.

References:

STM 2-14 Rev 9, Shutdown Cooling System, Section 1.2, page 4.
STM 2-03-2, Rev 14 RCP System, Section 1.8.1.2, page 16.
NOP 1015.016 H Rev 33, RCS Pressure Vs. Temperature, Pages 3 of 4 and 4 of 4 Step 1.1, page 8-9.

Historical Comments:

Changed to Bank question vice modified due to NRC feedback. Question 454 was used on the 2005 NRC Exam

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank:	1805	**Rev:**	0	**Rev Date:**	9/21/2010 3:30:16	**QID #:**	96	**Author:**	Simpson		
Lic Level:	S	**Difficulty:**	3	**Taxonomy:**	H	**Source:**	NRC Exam Bank #0626				
Search	1940012220	**10CFR55:**	43.1	**Safety Function**	6						
System Title:	Generic			**System Number**	GENERIC	**K/A**	2.2.20				
Tier:	3	**Group:**	1	**RO Imp:**	2.6	**SRO Imp:**	3.8	**L. Plan:**	ASCBT-EP-A0011	**OBJ**	3
Description:	Equipment Control - Knowledge of the process for managing troubleshooting activities.										

Question:

Consider the following:

* 2DG2 out of service for governor repairs.
* Severe weather causes loss of offsite power and plant trip from 100% power.
* 2K08-H3, 2A3 L.O. RELAY FAILURE alarm is in due to a bus fault.
* The AACG is unavailable due to wind damage to the radiator.
* Station Blackout EOP, 2202.008, is being implemented.
* SAE Emergency Class has been declared due to Blackout lasting more than 15 minutes.
* ERO is fully staffed and Emergency Direction and Control has been shifted to the EOF.

Electricians troubleshooting 2A3 to estimate recovery time are required to report status to the _____ , while the Shift Manager is responsible for _____.

A. Work Week Manager;
developing the 2DG2 recovery plan using 2202.008 Station Blackout EOP.

B. EOF Director;
assigning local operator support for recovery of 2A3 using 1903.033 Protective Action Guidelines for Rescue/Repair and Damage Control Teams.

C. TSC Director;
developing an alternate cooling method for running the AACG 1903.033 Protective Action Guidelines for Rescue/Repair and Damage Control Teams.

D. OSC Director;
ensuring safety functions are maintained using 2202.008 Station Blackout EOP.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☑
2008	☐	☐
2009	☐	☐
2011	☐	☑

Audit Exam History

2011	☐

Answer:

D. OSC Director;
ensuring safety functions are maintained using 2202.008 Station Blackout EOP.

Notes:

Distracter A is incorrect because the OSC coordinates activities of the maintenance teams and the shift manager is responsible for implementing the 2DG2 recovery plan.
Distracter B is incorrect because the SM will provide support on request, but primary responsibility is to implement the EOP and maintain safety functions until vital power to at least one bus is restored
Distracter C is incorrect because the TSC has the responsibility to develop alternate success paths for restoring power.

References:

NOP 1903.033, Protective Action Guidelines for Rescue/Repair and Damage Control Teams, Change 021, Steps 4.1, 5.2, 5.4 and 5.8, pages 3-4.

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Historical Comments:

Original question 626 was used on the ANO 2 2006 NRC Exam

Bank: 1806 **Rev:** 0 **Rev Date:** 9/2/2010 9:32:20 **QID #:** 97 **Author:** Coble

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

Search 1940012235 **10CFR55:** 43.7 **Safety Function** 4

System Title: Generic **System Number** GENERIC **K/A** 2.2.35

Tier: 3 **Group:** 1 **RO Imp:** 3.6 **SRO Imp:** 4.5 **L. Plan:** A2LP-RO-TS **OBJ** 1

Description: Equipment Control - Ability to determine Technical Specification Mode of Operation.

Question:

Given the following:

* Core on load has been completed during a refueling outage.
* Preparations are underway to tension the head bolts on the vessel head.

Technical Specification Mode 5 should be entered when _____.

A. The first set of three studs are tensioned during the first pass and verified.

B. The last set of three studs are tensioned during the first pass and verified.

C. The first set of three studs are tensioned during the final pass and verified.

D. The last set of three studs are tensioned during the final pass and verified.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☐	☑

Audit Exam History

2011	☐

Answer:

D. The last set of three studs are tensioned during the final pass and verified.

Notes:

The plant enters Mode 6 when the first stud is detensioned and re-enters Mode 5 when the last stud is fully tensioned and verified using stud elongation rod measurements. Tensioning is done in two passes to prevent overloading any one stud or tool. A third adjustment pass may be needed if stud elongation measurements are out of tolerance. Distracters A, B, and C are incorrect because the vessel head is not fully tensioned until the last set of studs are tensioned and verified during the final pass.

References:

T.S Table 1.1 Operational Modes Amendment No. 60.
Refueling Procedure 2504.008, Reactor Vessel Head Stud Installation and Tensioning, Change 19, Steps 3.0, on page 2 and Attachment 1.

Historical Comments:

Has never been used on an ANO-Unit 2 NRC Exam.

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank:	1807	**Rev:**	0	**Rev Date:**	9/2/2010 1:55:24	**QID #:**	98	**Author:**	Coble		
Lic Level:	S	**Difficulty:**	3	**Taxonomy:**	H	**Source:**	Millstone 2005 NRC Exam #80				
Search	1940012314	**10CFR55:**	43.4	**Safety Function**	9						
System Title:	Generic	**System Number**	GENERIC	**K/A**	2.3.14						
Tier:	3	**Group:**	1	**RO Imp:**	3.4	**SRO Imp:**	3.8	**L. Plan:**	ASLP-RO-RADP	**OBJ**	1

Description: Radiological Controls - Knowledge of radiation or contamination hazards that may arise during normal, abnormal, or emergency conditions or activities.

Question:

The following conditions exist for a job to be performed on a system:

* The general area radiation levels are 10 mrem/hr.
* The hot spot in the room is a pipe elbow that has radiation levels of 100 mrem/hr.
* The job will be performed near the hot spot area.

Which ONE (1) of the following results in the LEAST amount of personnel exposure?

A. The job is performed by 2 operators for 3 hours each on the job at the hot spot.

B. The job is performed by 2 operators for 2 hours each on the job at the hot spot and a 3rd operator reading instructions in the general room area for 2 hours.

C. The job is performed by 3 operators for 1 hour each on the job at the hot spot and a 4th operator reading instructions in the general room area for 1 hour.

D. 2 Health Physics technicians require 1.5 hours to install and remove 1 tenth thickness of lead shielding on the hot spot. The job is performed with the shielding in place by 2 operators for 3 hours each.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☐	☑

Audit Exam History

2011	☐

Answer:

C. The job is performed by 3 operators for 1 hour each on the job at the hot spot and a 4th operator reading instructions in the general room area for 1 hour.

Notes:

Distracter A is incorrect because total dose for this plan equals 600 mrem The lowest dose of any choice provided is 310 mrem. VALID DISTRACTOR This choice involves the fewest number of personnel

Distracter (B) is incorrect because total dose for this plan equals 420 mrem The lowest dose of any choice provided is 310 mrem. VALID DISTRACTOR This choice requires less time to complete the job than the 2 other choices

Answer (C) - is correct because this choice results in the lowest total dose of 310 mrem

Distracter D is incorrect because total dose for this plan equals 360 mrem The lowest dose of any choice provided is 310 mrem. VALID DISTRACTOR This choice installs shielding to reduce the dose to the workers

References:

EN-RP-110 Rev 7, ALARA program. Step 4.0 [9] and [10] pages 8-9.

Historical Comments:

Has never been used on an ANO-Unit 2 NRC Exam.

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank: 1808 **Rev:** 0 **Rev Date:** 9/2/2010 1:55:24 **QID #:** 99 **Author:** Coble

Lic Level: S **Difficulty:** 3 **Taxonomy:** F **Source:** Modified IH Exam Bank OPS2-11534

Search 1940012418 **10CFR55:** 43.1 **Safety Function** 4

System Title: Generic **System Number** GENERIC **K/A** 2.4.18

Tier: 3 **Group:** 1 **RO Imp:** 3.3 **SRO Imp:** 4.0 **L. Plan:** A2LP-RO-ESGTR **OBJ** 9

Description: Emergency Procedures/Plan - Knowledge of the specific bases for EOPs.

Question:

Given the following:

* Unit 2 has tripped from full power due to a Steam Generator Tube Rupture.
* 'A' Steam Generator has been diagnosed as the ruptured SG.
* SG 'A' has been isolated.
* RCPs 2P-32A and 2P-32D are running.
* Cooldown and depressurization of the 'A' SG has commenced.
* All other system and components function as designed.

During this time, the level in the ruptured SG should be maintained between _____% and the basis for this level is to ensure SG tubes are _____.

A. 10 to 38; covered to prevent release of gaseous activity from the RCS.

B. 10 to 38; partially uncovered to cool the steam space of the 'A" SG.

C. 20 to 45; covered to prevent release of gaseous activity from the RCS.

D. 20 to 45; partially uncovered to cool the steam space of the 'A" SG.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☐	☑

Audit Exam History

2011	☐

Answer:

B. 10 to 38; partially uncovered to cool the steam space of the 'A" SG.

Notes:

Step 35 of the SGTR EOP has a step to maintain SG level 45 to 90% to limit any radioactive release. The basis for the 45% is to keep the SG tubes covered. However in Step 49 of the SGTR EOP, the process of cooling down the isolated SG begins and level is lowered to 10 to 38% to allow uncovering of the SG tubes thus transferring latent heat of the hot steam to the cooler RCS. C and D are incorrect because they list the wrong level to maintain. A and C are incorrect because they list the wrong basis.

References:

EOP 2202.004, SGTR EOP, Revision 10, Steps 35 and 49, pages 22,29.
TG 2202.004, SGTR EOP Tech Guide, Revision 10, Step 35 and 49, pages 52 and 70.

Historical Comments:

Data for 2011 NRC RO/SRO Exam

21-Dec-10

Bank: 1809 **Rev:** 1 **Rev Date:** 12/13/2010 11:04: **QID #:** 100 **Author:** Coble

Lic Level: S **Difficulty:** 3 **Taxonomy:** H **Source:** NEW

Search 1940012428 **10CFR55:** 43.5 **Safety Function**

System Title: Generic **System Number** GENERIC **K/A** 2.4.28

Tier: 3 **Group:** 1 **RO Imp:** 3.2 **SRO Imp:** 4.1 **L. Plan:** A2LP-RO-EAOP **OBJ** 33

Description: Emergency Procedures/Plan - Knowledge of procedures relating to a security event (non-safeguards information).

Question:

Given the following:

* Both Units are operating at full power.
* The NRC notifies the Shift Manager that an airliner attack has been validated and airliner arrival is expected in 20 minutes.

Which of the following is the correct Emergency Action Level (EAL) to implement and actions to take? (REFERENCE PROVIDED)

A. Notice of Unusual Event (NUE); Shelter all personnel in the CSB or LLRWB.

B. Alert; Shelter all personnel in the CSB or LLRWB.

C. Notice of Unusual Event (NUE); Evacuate all non essential site personnel.

D. Alert; Evacuate all non essential site personnel.

QID use History

	RO	SRO
2003	☐	☐
2005	☐	☐
2006	☐	☐
2008	☐	☐
2009	☐	☐
2011	☐	☑

Audit Exam History

2011	☐

Answer:

B. Alert; Shelter all personnel in the CSB or LLRWB.

Notes:

Distracters C and D are incorrect because the procedure requires sheltering of personnel on such short notice in the Central Support Building or Low Level Rad Waste Building. Evacuations are the correct action if at least 30 minutes are available prior to the plane arrival time. Distracters A, C, and D are incorrect because they list the wrong implementing Emergency Action Level.

References:

OP 1903.010, EAL Classification, Change 43, EALs 7.1, 7.2, 7.3, 7.4, pages 112-115.

Historical Comments: