DRAFT WRITTEN
RO

Wednesday, January 14, 2004 @ 01:43 PM

Answer Key

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Test Name: 2004RO.TST
Test Date: Tuesday, January 13, 2004

		Question ID		Type	Pts	0	1	2	3	4	5	6	7	8	9
1:	1	SRO-201-0-2-05	005	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	2	VAPOR SPACE ACC	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	3	CONTAINMENT COOLING	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	4	SRO-201-5-1-06	006	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	5	RCP MALFUNCTIONS	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	6	LOSS OF RCS MAKEUP	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	7	CRO-113-5-5-25	025	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	8	PRESSURIZER PCS MALF	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	9	SRO-201-0-3-29	029	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	10	SRO-201-6-1-30	030	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	11	STEAM LINE RUPTURE	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	12	LOSS OF FEEDWATER	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	13	STATION BLACKOUT	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	14	LOSS OF OFFSITE	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	15	LOSS OF VITAL AC	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	16	LOSS OF DC POWER	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	17	LOSS OF SRW	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	18	AOP-7D-08	008	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	19	DROPPED CEA	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	20	LOSS OF WRNI	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	21	FUEL HANDLING ACCIDE	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	22	AREA RAD MON	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	23	CRO-202-9A-2-49	049	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	Di	LOR-114-1-03-08	008	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	25	CRO-107-1-3-55	055	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	26	EXCESS RCS LEAKAGE	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	27	SRO-201-8-1-18	018	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	28	AOP-3F-06	006	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	29	CRO-107-1-9-01	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	30	CRO-48-3-0-09	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	31	CRO-63-1-3-18	018	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	32	CRO-113-5-5-19	019	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	33	PZR QUENCH TNK	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	34	COMPONENT CLG	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	35	LOSS OF PCS	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	36	RPS MALF	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	37	RPS POWER SUPPLIES	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	38	ESFAS	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	39	CONTAINMENT COOLING	003	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	40	CONTAINMENT SPRAY	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	41	CONTAINMENT SPRAY	002	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	42	MN STM RMS	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	43	CRO-102-2-16	016	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	44	CRO-103-2-4-82	082	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	45	MAIN FEED O4	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A

Test Name: 2004RO.TST
Test Date: Tuesday, January 13, 2004

		Question ID		Type	Pts	0	1	2	3	4	5	6	7	8	9
1:	46	MFW ISOL	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	47	AFW 04	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	48	AFW XCONN	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	49	AC DISTRIBUTION	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	50	LOR-020540304-002	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	51	EDG SYS	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	52	CRO-122-1-3-07	009	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	53	CRO-113-2-5-24	024	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	54	INSTRUMENT AIR04	002	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	55	CONTAINMENT 04	012	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	56	CRO-60-1-04	004	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	57	CRO-5-2-10-06	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	58	CRO-60-1-45	045	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	59	NUCLEAR INSTRUMENTS	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	60	H2 ANALYZER	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	61	CONTAINMENT PURGE	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	62	CRO-113-4-3-06	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	63	LIQUID RADWASTE	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	64	CRO-134-1-5-45	045	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	65	FIRE SYSTEM04	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	66	SHIFT TURNOVER04	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	67	CONDITIONS/LIMITS	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	68	SYSTEM STATUS COMM	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	69	FUEL MOVES	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	70	CEA PROGRAM	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	71	CORE REACTIVITY	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	72	RADIATION CONTROL04	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	73	RADIATION RELEASE	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	74	ERPIP DEFINITIONS	003	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	75	VERIFY ALARMS	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D

Name: ______________________________

1 SRO-201-0-2-05 005/ / NEW -2/ SRO-201-0-/ 3.0/ 020590408/ 007EA1.06/ 4.4/4.5/ EOP-0, STU

U-2 is operating at 100% when a reactor trip occurs.
The RO observes the following indications on the CEA mimic:

4 CEAs do not have the amber lights energized
2 of the above CEAs have green lights energized

What must be performed when performing the Reactivity Control Safety Function?

A. Take the alternate actions to deenergize CEDM MG sets and verify all CEAs are inserted.

B. Depress the Reactor Trip pushbuttons on 2C15, verify reactor power is lowering, and verify a negative startup rate exists.

C. Verify reactor power is lowering, check that no CEA deviation alarms are present, verify a negative startup rate exists, check that RCS makeup is secured and inform CRS that Reactivity Control is complete.

✓D. Commence RCS boration to at least 2300 ppm via gravity feed or a Boric Acid pump using all available charging pumps.

A is incorrect, the reactor has tripped, de-energizing the MG sets is not required
B is incorrect, the reactor has tripped and depressing the trip buttons on 2C15 is not required.
C is incorrect, these are normal trip actions, but do not include the actions required for more than one CEA failing to insert.
D is correct per EOP-0 and bases, page13, rev 14
Basis: EOP-0 reactivity control questionReferences: EOP-0 Rev. 3KA1: KA2:

K/A mm?
Is this RPE

Given the following conditions:

RCS pressure:	1600 PSIA
PZR level:	360"
T h:	532.5°F
Tc:	532.2°F
Containment Pressure:	2.4 PSIA
Containment temp:	115°F
S/G pressures:	880/885 PSIA

EOP-0 is being implemented

What is the most likely cause of these conditions?

A. RCS cold leg break

✓B. RCS leak at the top of the PZR

C. S/G tube leak

D. Main Steam line break in containment

A is incorrect, a differnece in Tc and T h would be more evident, also, pressurizer level would not be high during EOP-0 with RCS pressure above the shutoff head of the HPSI pumps
B is correct--classic indications
C is incorrect, pressurizer level again does not support this
D is incorrect, Tc and S/G pressures don't support this

3. CONTAINMENT COOLING 001/ / NEW–2/ LOI-052-3/ 5.0/ 201.093/ 009EA1.07/ 3.7/3.9/

The CRS ordered Unit-1 manually tripped due to rapidly loweing PZR level and RCS pressure. EOP-0 is being implemented and the following conditions exist:

RCS pressure:	1900 PSIA
Tc:	532.5°F
Containment pressure	0.5 PSIA
Containment temperature	98°F

What is the status of the Containment Air Coolers? **(Assume no operator action)**

A. 4 Coolers in slow speed with maximum SRW flow

B. 4 Coolers in fast speed with normal SRW flow

C. 3 Coolers in slow speed with maximum SRW flow

✓D. 3 Coolers in fast speed with normal SRW flow

A is incorrect, but describes operation during SIAS. SIAS setpoints have not been reached.
B and C are incorrect, but could be options with manual actions by the operator
D is correct per OI-5A, normal system lineup.

4. SRO-201-5-1-06 006/ / BANK–01/ SRO-201-5-/ 1.1.3/ 033480602/ 011EK2.02/ 2.6/2.7/ EOP - EMER

Which one of the following describes the RCS inventory and core heat removal processes during a large break LOCA?

A. HPSI injection provides makeup and heat is removed via natural circulation flow to the S/Gs.

✓B. HPSI pumps, LPSI pumps and the SITs provide makeup and heat is removed via flow out the break.

C. LPSI pumps and the SITs provide makeup and heat is removed via forced flow to the S/Gs.

D. HPSI pumps and charging pumps provide makeup and heat is removed via flow out the break.

A is incorrect, for Large break LOCAs, heat removal is via flow out the break and inventory is established by SITs and LPSIs
B is correct per EOP-5 basis pages 10-11
C is incorrect, S/Gs are not providing heat removal for DBA LOCA
D is incorrect, no credit for heat removal is given to charging pumps for DBA LOCA
Basis: Core Heat RemovalReferences: EOP-5 Rev. 3 Basis DocumentKA1: 02007K3.01KA2:

Given the following conditions:

-11A RCP tripped due to a breaker fault

-EOP-0 has been completed, no alternate actions were required

How will the RCS and Steam Generators have responded?

A. 11 and 12 loop differential temperatures will be equal and 11 and 12 S/G pressures will be equal.

B. 11 loop will have an inverted differential temperature and 11 S/G pressure will be lower than 12 S/G pressure.

✓C. 12 loop differential temperature will be greater than 11 loop differential temperature and 11 and 12 S/G pressures will be equal.

D. 12 loop will have a smaller differential temperature than 11 and 12 S/G pressure will be lower than 11S/G pressure.

A is incorrect, this reflects equal flow conditions.
B is incorrect, 11 loop will still have forward flow with one RCP in operation, and S/G pressures will be equal.
C is correct, validated with simulator response. 12 loop differential temp. will be about 2°F, 11 loop differential temperature will be approximately 1°F. S/G pressures are essentially equal due to operation of the TBVs.
D is incorrect, 12 loop differential temperature will be approximately twice 11 and S/G pressures will be equal.

MOD

6. LOSS OF RCS MAKEUP 001/ / MOD--1/ SRO-201-0-/ 14.4/ 032010407/ 022 2.4.21/ 3.7/4.3/

A reactor trip has occurred and the following conditions exist:

-- Pressurizer level is 140 inches and stable
-- One Charging Pump is available
-- Pressurizer pressure is 1900 psia and rising
-- RCS Subcooling is 65°F and steady

After performing the immediate actions for PIC, the Reactor Operator reports "Pressure and Inventory Control cannot be met" to the CRS.

What is the reason for this report?

A. Letdown has been isolated.

B. RCS subcooling is not in band.

C. All Charging Pumps are not in operation.

✓D. Pressurizer level is not trending toward setpoint.

A is incorrect, letdown status is not a basis for meeting Pressure and Inventory Control
B is incorrect, Subcooling band is 30 to 140 °F.
C is incorrect, charging pump status is not a basis for Pressure and Inventory
D is correct per EOP-0.
ControlBasis: Proper Report from RO to CRSReferences: EOP-0 Rev. 3 and NO-1-201KA1: 03PA3.01KA2: 03PA3.03

DATES: Modified: Tuesday, January 13, 2004 Used: Friday, November 30, 2001 00OP.TST

ANSWERS: Single Points 1

Version Answers:

0	1	2	3	4	5	6	7	8	9
D	A	B	C	D	A	B	C	D	A

☒ Scramble Choices

Scramble Range: A - D

6. LOSS OF RCS MAKEUP 001/ / MOD--1/ SRO-201-0-/ 14.4/ 032010407/ 022 2.4.21/ 3.7/4.3/

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C is incorrect, charging pump status is not a basis for Pressure and Inventory
D is correct per EOP-0.
ControlBasis: Proper Report from RO to CRSReferences: EOP-0 Rev. 3 and NO-1-201KA1: 03PA3.01KA2: 03PA3.03

7. CRO-113-5-5-25 025/ / NEW--2/ CRO-113-5-/ 6.0/ / 026AK3.02/ 3.6/3.9/ 113 - SERV

Why does the Component Cooling system realign on a SIAS?

A. Minimize dose rates due to contamination of Component Cooling system

✓B. Provide long term cooling to containment after RAS

C. Minimize load on the Saltwater system to ensure containment cooling via Service Water

D. Provide continuous cooling to LPSI pump seals

A is incorrect, CC should not become contaminated due to a LOCA
B is correct per SD-15. The system realigns to cool containment spray which becomes the largest heat load to Component Cooling after RAS.
C is incorrect, the Saltwater system alignment ensures this happens.
D is incorrect, LPSI pumps are secured during RAS.
Basis: System Description References: 55.41.5, 41.10:

Original

1. SRO-201-0-3-15 015/ STEAM TABL/ 0/ SRO-201-0-/ 14.4/ 032010407/ 03PA3.01/ 03PA3.03/ EOP - EMER

Upon reporting the status of Reactivity Control the RO observes the following plant conditions for the Pressure and Inventory Control safety function in EOP-0:

-- Pressurizer level is 70 inches and decreasing with 3 charging pumps running
-- Letdown was isolated prior to reactor trip
-- Pressurizer pressure is 1900 psia and steady
-- RCS Subcooling is 95°F and steady

The report from the RO to the CRS regarding the status of Pressure and Inventory Control safety function should be:

A. Complete

B. Monitoring

✓C. Cannot be Met

D. Taking Alternate Actions

Basis: Proper Report from RO to CRSReferences: EOP-0 Rev. 3 and NO-1-201KA1: 03PA3.01KA2: 03PA3.03

DATES: Modified: Tuesday, November 27, 2001 Used: Friday, November 30, 2001 00OP.TST

ANSWERS: Single Points 1

Version Answers:

0	1	2	3	4	5	6	7	8	9
C	D	A	B	C	D	A	B	C	D

☒ Scramble Choices

Scramble Range: A - D

8. PRESSURIZER PCS MALF 001/ ARM/ BANK--2/ CRO-62-1-3/ 4.1/ 064.036/ 027AK3.03/ 3.7/4.1/

Unit-1 is in Mode 3 with the following conditions:
RCS pressure is 2150 PSIA and lowering
Pressurizer Spray Valves, 1-RC-100E and F are fully open
PIC-100X is indicating 2400 PSIA, controller output is 100%
PIC-100Y is indicating 2150 PSIA output is 0%

What action is required?

A. Stop 11A and 11B Reactor Coolant Pumps.

B. Energize all Pressurizer Heaters.

✓C. Place PZR PRESS CH SEL switch, 1-HS-100 in "Y".

D. Place PRESSURIZER SPRAY VALVE CONTROLLER, 1-HIC-100 in manual with a 100% output.

A is incorrect, would stop depressurization, but indications are of a failed instrument channel.
B is incorrect, with spray valves failed open, RCS would still depressurize.
C is correct, per 1C07 ARM, E-29.
D is incorrect, 100% ouput would keep spray valves open.

9. SRO-201-0-3-29 029/ / NEW--1/ SRO-201-0-/ 3.1/ 022010601/ 029EK1.03/ 3.6/3.9/ EOP - EMER

EOP-8 has been implemented because the Reactivity Safety Function was not met in EOP-0. What indications are used to verify that boration is successfully meeting the acceptance criteria?

✓A. WRNI power is less than 10^{-4}% and SUR is negative or zero

B. LRNI power is less than 10^{-4}% or SUR is negative

C. A boric acid pump is running and charging header flow is 40 GPM or greater

D. SUR is zero and the CHG HDR FLOW LO PRESS LO alam is clear

A is corrrect per EOP-8,appendix 1,rev 26.
B is incorrect, both conditions are required
C is incorrect, boration at the given rate in addition to lowering power and negative SUR indications
D is incorrect, negative SUR and boration rate of at least 40 GPM is specified.

10. SRO-201-6-1-30 030/ EOP-6 REV./ MOD--2/ SRO-201-6-/ 5.1/ 033480603/ 038EK3.01/ 4.1/4.3/ 201 - EMER

Which one of the following is the reason for equalizing the pressure on the primary and secondary sides of a ruptured Steam Generator per the applicable EOP?

A. Lowering the RCS pressure allows HPSI flow to restore Pressurizer level.

✓B. Reducing the differential pressure lowers the RCS leak rate.

C. Reducing RCS pressure and temperature aids initiation of natural circulation.

D. Equalizing RCS and S/G secondary side pressures initiates backflow to control affected S/G level.

A is a correct statement, but does is not a basis for initially lowering RCS pressure during tube leaks.
B is correct per EOP-6 Basis page 33, rev.18
C is incorrect, cooldown and depressurization are directed to lower the RCS leak rate and to allow isolating the affected S/G without lifting a S/G safety valve.
D is incorrect, level is controlled via backflow be depressurizing RCS to less than S/G pressure.
Basis: Basis for subcooling limits in EOP-6References: EOP-6 Rev. 2 Step J BasisKA1: KA2:

11. STEAM LINE RUPTURE 001/ / NEW--1/ 201-3-7/ 1.0/ 201.038/ 040AK1.07/ 3.4/4.2/

Emergency Operating Procedures provide specific guidance for feeding a dry S/G to restore RCS heat removal.

This guidance is based on ________________________________.
(Select the phrase that correctly completes the above statement)

A. minimizing S/G tube voiding, which would inhibit natural circulation

B. preventing a rapid RCS cooldown, avoiding a pressurized thermal shock to the Reactor Vessel

C. preventing uneven cooling of the RCS, which may result in a localized reactivity excursion

✓D. minimizing the probability of creating a waterhammer, and damaging S/G internals

A is incorrect, the steps to slowly introduce water into the feedring is not based on voiding.
B is incorrect, under the conditions outlined in the procedure, thermal shock is not an issue.
C is incorrect, reactivity addition is not a concern for this method of RCS heat removal.
D is correct per EOP-3 Basis ,step IV.K.2. page 37, rev.20.

mO(l)

10 SRO-201-6-1-30 030/ EOP-6 REV./ MOD--2/ SRO-201-6-/ 5.1/ 033480603/ 038EK3.01/ 4.1/4.3/ 201 - EMER

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Basis: Basis for subcooling limits in EOP-6References: EOP-6 Rev. 2 Step J
BasisKA1: KA2:

DATES: Modified: Tuesday, January 13, 2004 Used:

ANSWERS: Single Points 1

Version Answers:

0	1	2	3	4	5	6	7	8	9
B	C	D	A	B	C	D	A	B	C

☒ Scramble Choices

Scramble Range: A - D

Original

1. SRO-201-6-1-20 020/ EOP-6 REV./ 0/ SRO-201-6-/ 5.1/ 033480603/ / /201 - EMER

A S/G tube rupture has occurred on Unit-1. All RCPs have been tripped. Which one of the following is a reason for maintaining RCS subcooling as low as possible during plant cooldown and depressurization?

✓A. Reduces the differential pressure between the RCS and S/G.

B. Prevents exceeding reactor vessel PTS limits.

C. Enhances natural circulation flow.

D. Prevents drawing a bubble in the reactor vessel head.

Basis: Basis for subcooling limits in EOP-6References: EOP-6 Rev. 2 Step J BasisKA1: KA2:

DATES: Modified: Wednesday, December 12, 2001 Used:

ANSWERS: Single Points 1

Version Answers:

0	1	2	3	4	5	6	7	8	9
A	B	C	D	A	B	C	D	A	B

☒ Scramble Choices

Scramble Range: A - D

12. LOSS OF FEEDWATER 001/ / NEW--3/ 201-4-6/ 3.0/ 201.015/ 054AK1.01/ 4.1/4.3/

EOP-0 was completed and the following conditions exist:

11 S/G pressure	725 PSIA and lowering
12 S/G pressure	840 PSIA
11 S/G level	-260" and lowering
12 S/G level	- 80" and rising slowly
Tc	521°F
Pzr pressure	1830 PSIA

MSIVs and S/G Blowdown Isolation Valves are shut

Which event would cause these indications?

✓A. A Feedwater line rupture inside Containment

B. An RCS leak inside Containment

C. A Main Steam line rupture in the Turbine Building

D. A rupture of the S/G Blowdown Tank

A is correct, a feedline break downstream of the check valve will exhibit the same indications as a Main Steam line rupture inside containment.
B is incorrect, RCS leak would not cause 11 S/G level to continue to lower
C is incorrect, the MSIVs shutting would isolate this leak, Tc and 11 S/G parameters would trend to normal.
D is incorrect, shutting the Blowdown valves would isolate this leak.

1?. STATION BLACKOUT 001/ NONE/ MOD--1/ SRO-201-7-/ 9.0/ 201.077/ 055EA1.06/ 4.1/4.5/ 201 - EMER

EOP-7 (Station Blackout) has been initiated on U-1 and the CRS has directed the CRO to restore power to 14 4KV bus using the 0C Emergency Diesel Generator.

What is an indication that this action has been completed?

A. 12 Charging Pump has automatically restarted.

B. 11 and 12 Gravity Feed Valves, 1-CVC-508 and 509 MOV position indications are re-energized.

✓C. U-1 Control Room normal lighting is restored.

D. CEA mimic on 1C05 indications return.

A is incorrect, Charging Pumps will not automatically restart or cycle on due to pressurizer level deviations when energized from an EDG.
B is incorrect, these indications are powered from the MCC supplied by 11 4KV bus.
C is correct per AOP-7I.
D is incorrect, this indication is powered from the instrument bus powered from 11 4KV bus.
Basis: Restore Reactor MCCs and Instrument Buses (MCC-104 to MCC-114)References: EOP-7 Rev. 4 step R and AOP-7IKA1: ?KA2:

14. LOSS OF OFFSITE 001/ / NEW--2/ 201-0-9/ 1.8/ 202.071/ 056AA2.43/ 3.9/4.1/

Unit-1 has experienced a Loss of Offsite Power from 100% power.
11 and 14 4 KV buses have been re-energized by their associated Diesel Generators.
EOP-0 is being implemented.

What action must the CRO take for step B, "ENSURE TURBINE TRIP" that would **NOT** be expected on a reactor trip with offsite power available?

A. Depressing the Turbine TRIP button.

B. Opening 11 GEN FIELD BKR, 1-CS-41.

C. Shutting the MSIVs due to not being able to verify Turbine speed dropping.

✓D. Dispatching an operator to shut the MSR 2nd stage bypass valves.

A is incorrect, this must be performed for all turbine trips.
B is incorrect, DC power is available, the Generator Field Breaker will automatically open.
C is incorrect, Turbine speed indication is available
D is correct per EOP-0, alternate action 3.1

P100

13 STATION BLACKOUT 001/ NONE/ MOD--1/ SRO-201-7-/ 9.0/ 201.077/ 055EA1.06/ 4.1/4.5/ 201 - EMER

EOP-7 (Station Blackout) has been initiated on U-1 and the CRS has directed the CRO to restore power to 14 4KV bus using the 0C Emergency Diesel Generator.

What is an indication that this action has been completed?

A. 12 Charging Pump has automatically restarted.

B. 11 and 12 Gravity Feed Valves, 1-CVC-508 and 509 MOV position indications are re-energized.

✓C. U-1 Control Room normal lighting is restored.

D. CEA mimic on 1C05 indications return.

A is incorrect, Charging Pumps will not automatically restart or cycle on due to pressurizer level deviations when energized from an EDG.
B is incorrect, these indications are powered from the MCC supplied by 11 4KV bus.
C is correct per AOP-7I.
D is incorrect, this indication is powered from the instrument bus powered from 11 4KV bus.
Basis: Restore Reactor MCCs and Instrument Buses (MCC-104 to MCC-114)References: EOP-7 Rev. 4 step R and AOP-7IKA1: ?KA2:

DATES: Modified: Monday, October 20, 2003 Used:

ANSWERS: Single Points 1

Version Answers:

0	1	2	3	4	5	6	7	8	9
C	D	A	B	C	D	A	B	C	D

☒ Scramble Choices

Scramble Range: A - D

Original

1. SRO-201-7-1-11 011/ NONE/ 0/ SRO-201-7-/ 9.0/ 022010406/ / / 201 - EMER

EOP-7 (Station Blackout) has been initiated on U-1 and the crew has restored power to #14 4KV Vital Bus via the 1B DG. The CRS directs you to cross-tie MCC-114 to MCC-104. Which equipment will have power restored upon performing this action?

✓A. #11 Boric acid pump and #12 BAST Gravity Feed MOV (1-CVC-509).

B. Both channels of CETs and U-1 Condenser Off-Gas RMS (RI-1752).

C. U-1 Control Room lighting and LPFW Htr high level dump CVs.

D. ADV controller on 1C03 and #12 Saltwater Air Compressor.

Basis: Restore Reactor MCCs and Instrument Buses (MCC-104 to MCC-114)References: EOP-7 Rev. 4 step R and AOP-7IKA1: ?KA2:

DATES: Modified: Wednesday, October 15, 2003 Used:

ANSWERS: Single Points 1

Version Answers:

0	1	2	3	4	5	6	7	8	9
A	B	C	D	A	B	C	D	A	B

☒ Scramble Choices

Scramble Range: A - D

15. LOSS OF VITAL AC 001/ / BANK–3/ CRO-63-1-3/ 1.7A, 1.7D/ 020540103/ 057AA2.17/ 3.1/3.4/ SD 63 - ES

The inverter backup bus is powering 1Y01 when offsite power is lost.
How is 4 KV bus 11 affected?

A. 1A DG will start but not load because ESFAS logic cabinet ZA remains deenergized, maintaining a UV (load shed signal) to 4 KV bus 11 loads.

B. 4 KV bus 11 will be re-energized by manually starting and loading 0C Diesel Generator.

✓C. 1A DG will automatically start and load to energize 4KV bus 11 after the 1B DG starts and energizes 4KV bus 14.

D. 4 KV bus 11 cannot be re-energized until power is restored to 1Y01 via DC bus 11.

A is incorrect, logic cabinet ZA will be re-energized when 4 KV bus 14 is re-energized.
B is incorrect, the automatic actions associated with the 1B EDG will restore power to1Y01 which will re-energize ESFAS to start the 1A EDG and repower 11 4 KV bus.
C is correct, the inverter backup bus is powered from MCC 104 which will be re-energized by the 1B EDG.
D is incorrect,see C.
Basis: MCC that is used for backup AC power when inverter OOS
References: 55.41:7 55.43KA1: 063K2.01KA2: 013000K2.01

16. LOSS OF DC POWER 001/ / NEW–2/ 69-5-4/ 1.0/ 094.013/ 058-2.1.19/ 3.0/3.0/

A plant transient has ocurred and the following conditions exist:

--All Unit-1 annunciator lights are deenergized
--CC CNTMT RETURN, 1-CC-3833-CV has failed shut

How will SPDS indicate the cause of this event?

A. All Safety Function boxes turn red, and a "Loss of AC bus " alarm appears on the "Vital Auxiliaries" Safety Function screen.

B. The "Vital Auxiliaries" Safety Function box turns red, and the indicator for the affected AC bus on the electrical systems mimic flashes.

✓C. The "Vital Auxiliaries" Safety Function box turns yellow, and the indicator for the affected DC bus on the electrical systems mimic changes color.

D. All Safety Function boxes turn magenta and a small red box appears next to the indicator for the affected DC bus on the electrical systems mimic.

A is incorrect, indications are for a loss of 21 DC bus, listed indications are not supported by SPDS
B is incorrect, indications are for a loss of 21 DC bus, listed indications are not supported by SPDS
C is correct, per AOP-7J and SPDS alarm response manual.
D is incorrect, indications are for a loss of 21 DC bus, listed indications are not supported by SPDS

17. LOSS OF SRW 001/ / NEW--2/ SALTWTR/ 1.02F/ 202.065/ 062AK3.01/ 3.2/3.5/

2-HS-5155, 22A/22B SRW HXR EMERGENCY OUTLET VLVS handswitch is inadvertantly placed in 'OPEN'.
How are the Service Water Heat Exchangers affected?

A. 22A/22B SRW HXR emergency outlets valves open, but normal SW flow is maintained because the emergency overboard valve is normally gagged shut.

B. 22A/22B SRW heat exchangers are removed from service because the heat exchangers' SW inlet valves will also shut.

✓C. 21A/21B SRW heat exchangers lose SW flow because the emergency overboard valve automatically opens, and 22A/22B SRW heat exchangers SW outlets shift to 21 SW supply header.

D. 21A/21B SRW heat exchangers' SW inlet and outlet valves automatically shut, and 22A/22B SRW heat exchangers will be supplied by 21 SW header.

A is incorrect, emergency outlet valve automatically opens when any emergency outlet valve handswitch is in the OPEN position, the valve is not gagged.
B is incorrect, inlet valves are not affected by this H/S
C is correct per OM-49.
D is incorrect, 21 heat exchanger valves are unaffected, and 21 header will not supply 22 heat exchangers.

18. AOP-7D-08 008/ / BANK--1/ CRO-202-7D/ 4.0/ 020410301/ 065AA1.04/ 3.5/3.4/ AOP-7D, SW

What will automatically start the Saltwater Air Compressors?

A. Low Instrument Air Header pressure.

B. Shutdown Sequencer Signal (SDS).

✓C. Safety Injection Actuation Signal (SIAS).

D. Containment Isolation Signal (CIS)

C is correct per LD-58A sheet 1
Distractors do not start the Saltwater Air Compressors, but "A" would restart the IAC.
Basis: AUTO START FEATURE FOR SWACsReferences: AOP-7DKA1:
02041K4.06KA2:

19. DROPPED CEA 001/ / MOD--1/ CRO-60-1/ 11.5/ 202.008/ 003AA2.01/ 3.7/3.9/ SD 60 - CE

On a dropped CEA, what causes the plant computer to set the CEA position indication to zero?

✓A. Rod bottom reedswitch

B. Up-Down counter signal

C. CEDM breaker position

D. CEA coil power programmers

A is correct per LP and system description.
Distractors are other signals or components within the CEDS
Basis: CEA Indicator Post-trip Reset
References: 55.41:2,6 55.43KA1: 060K4.08KA2: 014000K1.01

20. LOSS OF WRNI 001/ / NEW--2/ CRO-57-1-5/ 6.1.2/ 020570201/ 032 2.2.22/ 3.4/4.1/ SD 57 - NU

Given the following conditions:
Unit-2 is on Shutdown Cooling, RCS temperature is 120°F
RCS pressure is 14.7 PSIA
The reactor vessel head is fully tensioned
Reactor Trip Circuit Breakers are open
One of two operable WRNI channels has failed low

What action is required immediately?

A. Commence boration of at least 40 GPM until RCS boron is 2300 PPM or greater.

✓B. Suspend all operations involving positive reactivity additions.

C. Commence actions to restore two WRNI channels to operable status.

D. Perform SDM verification per Surveillance requirement 3.1.1.1.

A is incorrect, SDM margin verification is not required for 4 hours, which would leak to the boration,if required.
B is correct per Technical Specifications (3.3.12 action A) referenced in ARM D-41.
C is incorrect, but is a specific requirement if 2 Channels are OOS in Mode 6.
D is incorrect. SDM margin verification is not required for 4 hours per TS 3.3.12
Basis: WR NI Requirements
References: 55.41:10 55.43:2 / Tech Spec 3.3.1.1KA1: 057K8.1KA2: K8.2,K8.4

MOD

19 A DROPPED CEA 001/ / MOD--1/ CRO-60-1/ 11.5/ 202.008/ 003AA2.01/ 3.7/3.9/ SD 60 - CE

On a dropped CEA, what causes the plant computer to set the CEA position indication to zero?

✓A. Rod bottom reedswitch

B. Up-Down counter signal

C. CEDM breaker position

D. CEA coil power programmers

A is correct per LP and system description.
Distractors are other signals or components within the CEDS
Basis: CEA Indicator Post-trip Reset
References: 55.41:2,6 55.43KA1: 060K4.08KA2: 014000K1.01

DATES: Modified: Tuesday, January 13, 2004 Used: Wednesday, May 16, 2001 01SDM.TST

ANSWERS: Single Points 1

Version Answers:

0	1	2	3	4	5	6	7	8	9
A	B	C	D	A	B	C	D	A	B

☒ Scramble Choices

Scramble Range: A - D

Original

1. CRO-60-1-19 019/ / 0/ CRO-60-1/ 11.5/ N/A/ 060K4.08/ 014000K1.0/ SD 60 - CE

Following a reactor trip, how is the plant computer CEA position indication reset?

✓A. Rod bottom signal.

B. Up-Down counter signal.

C. Reactor trip breaker position.

D. CEA coil power programmers.

Basis: CEA Indicator Post-trip ResetReferences: 55.41:2,6 55.43KA1: 060K4.08KA2: 014000K1.01

DATES: Modified: Monday, April 27, 1998 Used: Wednesday, May 16, 2001 01SDM.TST

ANSWERS: Single Points 1

Version Answers:

0	1	2	3	4	5	6	7	8	9
A	B	C	D	A	B	C	D	A	B

☒ Scramble Choices

Scramble Range: A - D

21. FUEL HANDLING ACCIDE 001//NEW--2/LOI-113-6/1.8/202.052/036AA2.02/3.4/4.1/

Which of the following would be classified as a fuel handling incident per AOP-6D?

✓A. A large object was dropped in the Spent Fuel Pool and is laying on top of a spent fuel assembly .

B. During refueling of the core, a fuel assembly was placed in an incorrect core location.

C. A new fuel assembly was dropped when being moved from the New Fuel Storage Area to the New Fuel Inspection Platform.

D. A portable light pole hanging off the refueling machine bridge was damaged when performing the refueling machine operational checks per OI-25C.

A is correct per AOP-6D, rev.15, I.B.2.
B-D are incorrect, the procedure is written to address an incident where there is a possibility of damage to an irradiated fuel assembly which could result in damage to a fuel pin.

22. AREA RAD MON 001//NEW--2/77-1-0/2.0/079.008/061 2.1.1/3.7/3.8/

"RMS PANEL 1C26" alarm at 1C18 has annunciated.
2-RI-7010, Unit-2 BAST room Area Radiation Monitor is reading off-scale, high.
No other indications of abnormal conditions are present.

What action is directed by plant procedures?

A. Contact Chemistry to obtain samples of the BASTs, VCT and RCS.

B. Recommend Radiation Safety Supervision post the area.

✓C. Obtain CRS permission to bypass the alarm to clear the alarm at 1C18.

D. Sound the emergency alarm, evacuate the immediate area and declare a Radiological Event per ERPIP 3.0.

A is incorrect, there is no direction nor need to have chemistry take samples on an Area RMS alarm.
B is incorrect, Rad Safety should be called to take surveys.
C is correct per OI-35, rev.26
D is incorrect. The indications stated are indications of an instrument failure, a Rad Event should not be declared unless actual rad levels are high.

23. CRO-202-9A-2-49 049/ NONE/ NEW--1/ CRO-202-9A/ 1.2, 1.2.1/ 022020301/ 067AK3.04/ 3.3/4.1/ AOP-9A

During a severe fire in the Control Room, (AOP-9A), why are the Fairbanks Diesel Generators shutdown?

A. To prevent overloading the Diesel Generators when equipment starts, as the sequencers may not be operable.

B. To ensure fuel is conserved for continued extended operation of the OC Diesel Generator

✓C. To protect the engine from damage due to loss of cooling

D. To ensure MCCs 104 and 114 are de-energized to keep PORVs from failing open

A is incorrect, Diesel loading is not a concern in this condition.
B is incorrect, enough fuel is available for the all diesels to operate within the bounds of this procedure.
C is correct per AOP-9A Unit 1 Bases, rev.8 page 2 of 11.
D is incorrect, but is the basis for opening the Load Center breakers for the MCCs.
Basis: AOP-9A Control Room evacuation positions
References: NO-1-200 Att. 2 41.5, 41.10

24. LOR-114-1-03-08 008/ / BANK--1/ 114-1-03/ 2.4/ 201.073/ 074EA1.16/ 4.4/4.6/ CET

On Unit-2 PAMS, what does a "?" next to a CET temperature indication signify?

✓A. The indication is outside the quality check parameters.

B. The CET is the highest reading CET in it's quadrant.

C. The CET has been "bypassed", and the value is an old, non-updated indication.

D. The indication is a calculated value, not an actual temperature measurement.

A is correct, per design documents, CCNPP-PAMS-0003-03.
B is incorrect, this would be indicated by ?? in the CET number and 0 for value on the C05 default screen.
C is incorrect, bypassed CET indications are preceded by a 'B' and have a blue background and does not revert to an old indication.
D is incorrect, the calculated value associated with the CET temperature is Tcrep.

Ref. CCNPP-PAMS-0003-03; CFR 41.7

25. CRO-107-1-3-55 055/ / BANK-1/ CRO-107-1-/ 2.5/ 202.045/ 076AK2.01/ 2.6/3.0/ PROCES RAD

Which phrase describes the relationship of RCS activity to the Process Rad Monitor? The Process Radiation Monitor:

✓A. detects increases in specific isotopes due to fuel failures

B. detects only increases in RCS activity specifically related to CRUD bursts

C. measures RCS activity changes associated with Severe Accident Mitigation scenarios

D. measures dose rates in the Letdown HX room at power due to CRUD bursts or fuel failures.

A is correct per system description #41
B is incorrect, the PRM will detect increases in RCS activity, the specific isotope (I) distinguishes fuel failures from crud burst activity
C is incorrect, letdown would be isolated in a SAM condition.
D is incorrect, the PRM does not measure dose rates.
Basis: Boron Concentration High Alarm
References: 55.41:10 55.43:5 / ARP C07 F-19KA1: 006K5.16KA2: 004000GEN8

26. EXCESS RCS LEAKAGE 001/ AOP-2A ATT/ BANK--2/ 202-2A-6/ 1.1/ 064.017/ CEA16AA1.1/ 3.4/3.6/

Using provided references, given the following Unit-2 information:

Reactor Power:	100%
Tc:	547.7°F and steady
Letdown flow:	30 GPM
Charging flow:	135 GPM
PZR level:	Lowering at 2.5 inches/minute
RCS pressure:	2210 PSIA and slowly lowering
Total CBO flow:	6 GPM

What is the approximate RCS leak rate, in GPM?

A. 135
✓B. 146
C. 152
D. 172

B is correct, 2.5 inches/minute(18.9 GPM)= 47.25 +(135-36)=146.25
References: AOP-2A attachment 1. 41.7

27. SRO-201-8-1-18 018/ / BANK--1/ SRO-201-8-/ 2.5/ 201.078/ CEE09EK3.4/ 3.3/3.9/ FUNCTIONAL

Which one of the following conditions would allow you to exit EOP-8?

A. A plant cooldown has been completed, shutdown cooling flow has been established, and Core/RCS Heat Removal and Pressure/Inventory safety function status checks for EOP-8 are met.

✓B. All the safety function acceptance criteria for success paths implemented are being met, a single event diagnosis can be made and intermediate safety function status checks for single event are being met.

C. The CRS or STA has analyzed plant conditions and has verified that steps in an optimal recovery procedure, or an Operating Procedure, will address the safety functions such that EOP-8 final acceptance criteria for all the safety functions will be met.

D. In the case of multiple events, one event has been terminated, (such as a when the affected S/G goes dry during an ESDE) and all intermediate safety function status checks for EOP-8 are being satisified.

A is incorrect,EOP-8 will direct SDC operations, all safety functions must be met for the procedure you are tansiting to, or all EOP-8 criteria are satisfied.
B is correct per EOP-8,V.B. rev.26
C and D are incorrect, conflict with EOP-8 requirements.
Basis: EOP-8 exit conditions
References: EOP-8 Rev. 3 Step F 41.5, 41.10

28. AOP-3F-06 006/ / BANK--1/ CRO-202-3F/ 10.2/ 020050427/ 003 2.1.32/ 3.4/3.8/ AOP-3F, RC

When restoring forced circulation it is necessary to verify the 4KV bus voltage greater than 4100 volts prior to starting the RCPs.
What is the basis for this requirement?

✓A. To prevent the 4KV degraded voltage relays from actuating upon RCP start.

B. To prevent tripping the oil lift pumps on low voltage when the first RCP is started.

C. Ensures that the running component cooling pump will operate within its design voltage limits.

D. Ensures that excessive starting current is not developed which could damage RCP windings.

A is correct per OI-1A Precaution L, rev.26
B is incorrect, lift pumps do not have undervoltage protection, and this is not listed as a concern.
C is incorrect, not part of the design limitations.
D is incorrect, not listed as a basis for the limit.
Basis: RCP RESTART CRITERIA/BASIS FOR ENSURING 4KV VOLTAGE > 3950 VOLTS References: AOP-3F KA1: 02005A6.10KA2: 41.10, 43.2

29. CRO-107-1-9-01 001/ / BANK–2/ CRO-107-1-/ 8.3/ 201.085/ 004K6.04/ 2.8/3.1/ CHG PUMP O

Given the following plant conditions:

-- Unit One has tripped due to a Loss of Offsite Power
-- 11 and 14 4KV busses are energized from the EDGs
-- Pzr level is 100" and slowly lowering

How does this effect charging pump operation to restore Pzr level?

A. One charging pump starts automatically, the other charging pumps must be manually started and will stop automatically when Pzr level reaches +13 inches above program.

B. All 3 charging pumps must be started manually and will receive no signals to stop on Pzr level deviations from program.

✓C. All 3 charging pumps must be started manually and the backup pumps will stop automatically when Pzr level reaches +13 inches above program.

D. One charging pump starts automatically the other charging pumps must be operated manually to control pressurizer level.

A is incorrect, none of the charging pumps will automatically start with the normal and alternate 4 KV bus feeder bkrs open.
B is incorrect, backup pumps will stop at +13" from program.
C is correct per Lesson Plan LOI-107-1 and electrical print 61075, sh23
D is incorrect, none of the charging pumps will automatically start with the normal and alternate 4 KV bus feeder bkrs open.
References: 41.7

30. CRO-48-3-0-09 001/ / BANK–1/ CRO-48-3/ 3.4/ 004.010/ 005K2.01/ 3.0/3.2/ 4 KV

Which of the following is a possible cause when the following alarm has actuated?

--On panel 1C19 **"U-1 4KV Eng SF Motor Overload"**

A. 152-1204 (11 Condensate Booster Pump breaker) tripped

B. 152-1114 (U-440-11A high side Feeder) tripped

✓C. 152-1104 (11 LPSI Pump breaker) tripped

D. 152-2107 (21 Containment Spray Pump breaker) tripped

A is incorrect, Condensate Booster pumps are not ESF loads
B is incorrect, this is a service transformer feeder breaker and does not supply an ESF motor
C is correct per 1C18 ARM M-04
D is incorrect, this is a Unit-2 load.
Basis: "U-1 4KV Eng. Sf. Fdr. Bkr Trip" Alarm on 1C19
References: 41.7

31. CRO-63-1-3-18 018/ / BANK--2/ CRO-63-1-3/ 1.7B, 1.7C/ 201.043/ 006K4.11/ 3.9/4.2/ SD 63 - ES

During recovery from a LOCA on U-2, you are directed by the U-2 CRS to reset SIAS from the control room using the implemented EOP . Containment pressure is 2.0 psig and PZR pressure is 800 psia. What sequence of actions must occur to complete this action?

✓A. Match required handswitches per the EOP attachment, block PZR pressure SIAS, and depress both SIAS channel reset pushbuttons.

B. Block Pzr pressure SIAS and depress either SIAS channel reset pushbutton.

C. Match required handswitches and depress both SIAS channel reset pushbuttons.

D. Block the Pzr pressure SIAS and depress both SIAS channel reset pushbuttons.

A is correct per EOP-5 and basis
B is incorrect, without matching handswitches, SIAS cannot be reset from the Control Room, also, both reset pushbuttons must be depressed.
C is incorrect, without blocking Pzr pressure signals, SIAS will not stay reset.
D is incorrect, without matching handswitches, SIAS cannot be reset from the Control Room.
Basis: Steps for Evolution Requirement for Resetting SIAS
References: 55.41:7,10 55.43: 5KA1: 063K4.03KA2: A4.02

32. CRO-113-5-5-19 019/ / BANK--1/ CRO-113-5-/ 12.0/ 202.067/ 008K3.01/ 3.4/3.5/ 113 - SERV

Unit 2 is in Mode 1 at 100% power when a loss of Component Cooling occurs. Which condition from this event alone would require a manual Reactor trip?

A. Main Generator gas temperature of greater than 48°C for at least 15 minutes.

✓B. RCP bleed off temperature of 200°F.

C. Component Cooling heat exchanger outlet temperature of 175°F.

D. Letdown is automatically isolated due to high temperature.

A is incorrect, this system is cooled by SRW
B is correct per 2C07 A&B ARM
C and D are incorrect, these are not trip criteria in any procedure.
Basis: Loss of CC with Unit 2 in Mode 1 at 100% Power
References: 41.4, 41.7

Unit 1 is in Mode 5, preparing for a plant heatup.
E01, QUENCH TK TEMP LVL PRESS is in alarm on 1C06.

Given the following Quench Tank parameters:

1) Pressure is 12 PSIG
2) Temperature is 105°F
3) Level is 29 inches

What action is required?

✓A. Open WGS CNTMT ISOL valves, WGS-2180, 2181-CVs and open QT VENT, 1-RC-400-CV.

B. Place PORV handswitches, 1-HS-1402 and 1-1404 in "OVERRIDE"

C. Open Quench Tank Drain, 1-RC-401-CV

D. Open Containment Nitrogen Supply Valve, 0-N_2-238.

A is correct per OI-1B and 1C06 ARM, E-01
B is incorrect, in Mode 5, no PORV leakage would go to the QT
C is incorrect, level is normal
D is incorrect, this would pressurize the QT even more.
Basis: Data on Quench Tank References: 55.41:10 55.43 / OI-1BKA1: 005K5.08KA2: 007000K1.03

mOD

33 X. PZR QUENCH TNK 001/ / MOD-2/ CRO-5-2-10/ 16.1/ 064.005/ 007A2.02/ 2.6/3.2/ SD 5 - RCS

Unit 1 is in Mode 5, preparing for a plant heatup.
E01, QUENCH TK TEMP LVL PRESS is in alarm on 1C06.

Given the following Quench Tank parameters:

1) Pressure is 12 PSIG
2) Temperature is 105°F
3) Level is 29 inches

What action is required?

✓A. Open WGS CNTMT ISOL valves, WGS-2180, 2181-CVs and open QT VENT, 1-RC-400-CV.

B. Place PORV handswitches, 1-HS-1402 and 1-1404 in "OVERRIDE"

C. Open Quench Tank Drain, 1-RC-401-CV

D. Open Containment Nitrogen Supply Valve, 0-N_2-238.

A is correct per OI-1B and 1C06 ARM, E-01
B is incorrect, in Mode 5, no PORV leakage would go to the QT
C is incorrect, level is normal
D is incorrect, this would pressurize the QT even more.
Basis: Data on Quench Tank References: 55.41:10 55.43 / OI-1BKA1:
005K5.08KA2: 007000K1.03

DATES: Modified: Tuesday, January 13, 2004 Used: Wednesday, May 16, 2001 00C06REM.TST

ANSWERS: Single Points 1

Version Answers:

0	1	2	3	4	5	6	7	8	9
A	B	C	D	A	B	C	D	A	B

☒ Scramble Choices

Scramble Range: A - D

Original

1. CRO-5-2-10-05 001/ / 0/ CRO-5-2-10/ 16.1/ 020050302/ 005K5.08/ 007000K1.0/ SD 5 - RCS

Given the following data on the Quench Tank:

1) Pressure is 4 psig
2) Temperature is 105°F
3) Level is 29 inches

Analyze the quench tank parameters to determine if any off normal conditions exist.

✓A. No concerns all parameters normal

B. Pressure is too high

C. Temperature is too high

D. Level is too high

Basis: Data on Quench TankReferences: 55.41:10 55.43 / OI-1BKA1: 005K5.08KA2: 007000K1.03

DATES: Modified: Monday, March 19, 2001 Used: Wednesday, May 16, 2001 00C06REM.TST

ANSWERS: Single Points 1

Version Answers:

0	1	2	3	4	5	6	7	8	9
A	B	C	D	A	B	C	D	A	B

☒ Scramble Choices

Scramble Range: A - D

34. COMPONENT CLG 001/ / NEW--2/ LOI-15-1-0/ 6.0/ 202.029/ 008K4.09/ 2.7/2.9/

Unit-1 was initially at 100% power when a major plant transient ocurred. The following conditions exist:

The 500 KV Red Bus was lost (P-13000-2 is de-energized)
RCS pressure is 1600 PSIA
Tc is 532.4°F
Contaiment pressure is 2.2 PSIG

No other malfunctions occurred.

How many Component Cooling Pumps would be running, assuming no operator actions?

A. 0

B. 1

✓C. 2

D. 3

A is incorrect, but would be true if only a loss of offsite power existed
B is incorrect, but reflects normal conditions with no SIAS condition present
C is correct, the SIAS will start 11 and 12 CC pumps, 1B diesel will pick up 14 4KV bus. LD-58A and 61080 sh 15
D is incorrect, 13 CC pump would only start if the pump aligned to the same electrical bus failed to start.
References: 41.7

35. LOSS OF PCS 001/ / NEW--1/ 5-2-11/ 22.0/ 201.014/ 010K6.03/ 3.2/3.6/

RCS pressure is initially 2250 PSIG.
Spray Valve Controller, 1-HIC-100 fails to a 0% output.
What is a direct result of this failure?

A. All Backup Heaters will energize if in "Auto".

B. Spray Valves 1-RC-100E and F will fully open.

C. All Backup heaters will deenergize.

✓D. Proportional heaters will receive full power

A is incorrect, Backup heater operation is controlled by PIC-100X or Y
B is incorrect, spray valves will be fully open at 100% output
C is incorrect,Backup heater operation is controlled by PIC-100X or Y
D is correct per SD-64D, and FSAR fig. 7-13
References: 41.7

36. RPS MALF 001/ / NEW--2/ 58-1-01/ 6.2,10.5/ 058.004/ 012K3.02/ 3.2/3.3/

Unit-2 is at 16% power, with the Turbine Generator having just been paralleled with the grid.
A malfunction in RPS channel B causes the Power Trip Test Interlock (PTTI) to actuate.
How is the Turbine Generator affected?

A. A turbine trip will result due to ESFAS B logic cabinet initiating a turbine trip signal.

✓B. Trip logic will be reduced to 1 out of 3, since channel B Loss of Load trip unit will actuate.

C. The Turbine Generator will not be affected since the Loss of Load Trip is disabled.

D. RPS will initiate a Turbine Trip signal, but the signal is bypassed at ESFAS due to low reactor power.

A is incorrect, only one input is satisifed, so no trip signal is generated.
B is correct, power is greater than 15%, so loss of load is enabled, and PTTI will trip channel B loss of load trip unit. FSAR chapter 7 and lesson plan LOI-058-1
C is incorrect, Loss of Load is enabled at 15% or greater.
D is incorrrect, RPS is in 1/3 logic, ESFAS signal to trip the turbine is not affected by power level.
references: 41.7

37. RPS POWER SUPPLIES 001/ / NEW--1/ 58-1-01/ 8.3/ 058.007/ 012 2.4.47/ 3.4/3.7/

Using provided references:

If 1Y03 were de-energized, which RPS matrix power supply lights at 1C15 would be extinguised?

A. 5 and 15
B. 5,9 and 7
✓C. 8,12 and 15
D. 9 and 10

C is correct per FSAR figure 7-2
All distractors are other power supplies but not affected by loss of 1Y03
References: 41.10, 43.2

38. ESFAS 001/ / NEW--3/ 201-6-7/ 2.0/ 202.120/ 013A1.01/ 4.0/4.2/

A S/G tube rupture has been diagnosed, the correct EOP has been implemented and the following conditions exist:

RCS pressure is 1280 PSIA
RCS temperature is 485°F
PZR level is 85"
11A and 12B RCPs are running
Cooldown rate is 95°F/hr, using TBVs
The affected S/G has been isolated and pressure is 700 PSIG

What action is required?

A. Secure the remaining RCPs to prevent exceeding pump curve limits.

B. Throttle HPSI flow to allow for backflow from the affected S/G as RCS depressurization continues.

✓C. Lower TBV controller output to avoid exceeding cooldown rate limits when HPSI injection begins.

D. Increase RCS depressurization using Main Spray to lower the leak rate into the affected S/G.

A is incorrect, at 485°F, pumps can be run to 850 PSIA.
B is incorrect, HPSI throttling is not permitted below 101" PZR level.
C is correct, HPSI injection will start at about 1270 PSIA and will increase RCS cooldown rate as Cooler RWT water is injected.
D is incorrect, although depressurization is a main goal of the procedure, with these conditions, the RCS cooldown rate would be exceeded if injection occurs before steaming rate is reduced. Also, with 2 RCPs running Main Spray is not effective, EOP-6 directs the use of Aux. spray if depressurization is desired.
References: EOP-6, 41.5

39. CONTAINMENT COOLING 003/ / NEW–2/ LOR-344-1/ 1.1/ 012.005/ 022K1.01/ 3.5/3.7/ TECH SPECS

Part of the 2003 modification to the LOCI sequencer advanced the start of the Service Water pumps from step 4 to step 0.
Why was this modification made?

A. Prevents overloading the Emergency Diesel Generators

B. Prevents tripping the supply breakers for the safety related 4 KV buses

C. Prevents damage to the Service Water Pump motors caused by excessively high starting currents

✓D. Prevents a rupture of the Service Water system caused by water hammer in the Containment Air Coolers

D is correct per ES199700364 and lesson plan LOR-344-1-03.
Distractors are reasons for previous changes to sequencers or for other modifications to equipment.
References: 41.2-41.9

40. CONTAINMENT SPRAY 001/ / NEW–2/ 052-3-1/ 13.0/ / 026K2.01/ 3.4/3.6/

2A Diesel Generator is being taken out of service for routine maintenance.
Which component is also potentially affected? **ASSUME NORMAL SYSTEM LINEUPS**

✓A. 21 Containment Spray Pump

B. 22 Charging Pump

C. 12 SFP Cooling Pump

D. 23 Saltwater Pump

A is correct, powered from 2A EDG fed 21 4KV bus, per OI-27C
B is incorrect, powered from 24 480 volt bus, fed by 2B EDG
C is incorrect, powered from 24 480 volt bus, fed by 2B EDG
D is incorrect, powered from 24 4KV bus, fed by 2B EDG
References: 41.7

41. CONTAINMENT SPRAY 002/ / NEW–1/ 201-5-6/ 1.2/ 201.063/ 026A2.07/ 3.6/3.9/

A LOCA has occurred, SIAS initiated and RWT level is 7 feet and lowering.

What actions are directed by the applicable EOP to prevent or mitigate cavitation of the Containment Spray Pumps?

A. Align a HPSI pump to the suction of a CS PP if discharge pressure lowers and amps fluctuate.

✓B. Verify Containment Sump level rises as RWT level lowers and, after RAS has initiated, place a second CC HX in service.

C. Prior to RAS, place both CS PPs in PULL TO LOCK. Verify sump level is greater than 28". When RAS actuates, place a second CC HX is in service.

D. When RWT level lowers to 4 feet, throttle CS PP discharge valves per EOP attachments. After RAS has initiated, verify flow less than 1300 GPM.

A is incorrect, but aligning a CS PP to the suction of a HPSI PP is directed in the EOP if a HPSI is cavitating.
B is correct per EOP 5, Rev.19 Section IV, steps P and S.
C is incorrect, but there is direction to verify the sump has at least 28" of water in it.
D is incorrect, but the procedure directs CS PPs to be placed in PTL if RWT level is 4 feet and CSAS has not initiated. It also directs throttling HPSI valves per an attachment.
References: EOP-5, 41.5, 43.5

42. MN STM RMS 001/ / NEW–2/ LOI_77-1-0/ 1,2/ 202.016/ 039A1.09/ 2.5/2.7/

With reactor power at 25%, what indication is available to the operator to monitor a S/G tube leak of 5 GPD?

A. Only S/G sample results reported by Chemistry

B. N-16 monitors and Condensor Off Gas RMS

✓C. Condenser Off Gas RMS and Main Steam Line Radiation Monitors

D. N-16 monitors only

A is incorrect, newer instrumentation has allowed CCNPP to detect S/G tube leakage on the order of a few GPD.
B is incorrect, the N-16 indication is only accurate above 50% power, note in OI-35 states that below 50%, N-16 may indicate 0.00 GPD leak rate.
C is correct, the condenser off gas RMS has a reactor power input that is used in calculating the leakrate. The main steam line RMS will indicate a difference in the affected steam header vs. non-affected header, since it indicates actual steam line radiation levels. The Recorder would also be used to show trends.
D is incorrect, the N-16 indication is only accurate above 50% power, note in OI-35 states that below 50%, N-16 may indicate 0.00 GPD leak rate.
References: 41.5

43. CRO-102-2-16 016/ / BANK--2/ CRO-102-8/ 20.0/ 093.015/ 039A4.01/ 2.9/2.8/ 102 - 1/2C

The following conditions exist on Unit 2:

Reactor/Turbine trip has just occurred
(Power prior to trip--100%)
S/G pressures are currently 850 psig

What operator action (in the Control Room) must initially be taken to prevent an overcooling of the RCS per EOP-0?

A. Press "Close Valves" button on the turbine control panel.

✓B. Press "Reset" button on the MSR control panel.

C. Shut the MSIVs.

D. Press the BFV "reset" buttons.

B is correct per EOP-0, Unit-2 basis.
Distractors are actions which are not directed by the procedures
Basis: Reactor Trip With Unit 2 at 800 MWE and MSRs in Service References: 41.7

44. CRO-103-2-4-82 082/ AOP-3G/ MOD-2/ CRO-103-2-/ 3.0/ 202.036/ 056A2.04/ 2.6/2.8/ T2G1

Unit 1 is operating at 50% power.
An electrical system malfunction occurs resulting in the loss of 12 and 13 Condensate Pumps.
What is the effect of this transient, and what action must be taken?

A. Reduced feed flow to the S/Gs and lowering levels will result. Bias feed pumps as required to maintain S/G levels.

B. Lower SGFP suction pressure will exist. Verify a Condensate Booster Pump automatically starts.

C. Reduced feed flow to the S/Gs and lowering levels will result. Trip the reactor and implement EOP-0.

✓D. Low suction pressure to the SGFPs and runout of the operating Condensate Pump will result. Reduce power to maintain condensate header flow less than 8,000 GPM.

A is incorrect, biasing feed pumps will cause additonal loss of NPSH to the SGFPs.
B is incorrect, Per AOPs-3G and 7I, a main concern is runout of the condensate pump and increased wear and cavitiation, so power must be reduced.
C is incorrect, a trip should only be required if greater than 70% per AOP-7I.
D is correct. This guidance is available in both AOP-7I and AOP-3G
References: 55.41:4 55.43.5 /

MDD

44 CRO-103-2-4-82 082/ AOP-3G/ MOD-2/ CRO-103-2-/ 3.0/ 202.036/ 056A2.04/ 2.6/2.8/ T2G1

Unit 1 is operating at 50% power.
An electrical system malfunction occurs resulting in the loss of 12 and 13 Condensate Pumps.
What is the effect of this transient, and what action must be taken?

A. Reduced feed flow to the S/Gs and lowering levels will result. Bias feed pumps as required to maintain S/G levels.

B. Lower SGFP suction pressure will exist. Verify a Condensate Booster Pump automatically starts.

C. Reduced feed flow to the S/Gs and lowering levels will result. Trip the reactor and implement EOP-0.

✓D. Low suction pressure to the SGFPs and runout of the operating Condensate Pump will result. Reduce power to maintain condensate header flow less than 8,000 GPM.

A is incorrect, biasing feed pumps will cause additonal loss of NPSH to the SGFPs.
B is incorrect, Per AOPs-3G and 7I, a main concern is runout of the condensate pump and increased wear and cavitiation, so power must be reduced.
C is incorrect, a trip should only be required if greater than 70% per AOP-7I.
D is correct. This guidance is available in both AOP-7I and AOP-3G
References: 55.41:4 55.43.5 /

DATES: Modified: Wednesday, October 29, 2003 Used: Wednesday, October 15, 2003 2002RO.TST

ANSWERS: Single

Points 1

Version Answers:

0	1	2	3	4	5	6	7	8	9
D	A	B	C	D	A	B	C	D	A

☒ Scramble Choices

Scramble Range: A - D

Original

1. CRO-103-2-4-06 007/ AOP-3G/ MOD-ANA/ CRO-103-2-/ 3.0/ 020290202/ 056A2.04/ 2.6/2.8/ T2G1

Unit 1 is operating at 100% power with condensate pumps 11, 12 and 13 running when #12 condensate pump trips.
What effect will this have on the secondary and what steps should be taken to mitigate the consequences?

A. Reduced feed flow to the S/Gs and lowering levels will result. Bias feed pumps as required to maintain S/G levels.

B. Lower feed pump suction pressure will exist. Verify a condensate booster pump automatically starts.

✓C. Lower condensate header pressure will exist. Place hotwell level control in manual and bypass condensate demineralizers and precoat filters.

D. Cavitation and increased impellar wear will occur. Reduce power to maintain condensate header flow less than 8,000 GPM.

References: 55.41:4 55.43.5 /

DATES: Modified: Wednesday, October 29, 2003 Used: Wednesday, October 15, 2003 2002RO.TST

ANSWERS: Single Points 1

Version Answers:

0	1	2	3	4	5	6	7	8	9
C	D	A	B	C	D	A	B	C	D

☒ Scramble Choices

Scramble Range: A - D

45. MAIN FEED 04 001/ NONE/ MOD–2/ LOI45B-1/ 9.0,14.0/ 202.040/ 059K4.08/ 2.5/2.7/ FRDFWCS MA

Unit-1 is at 100% power. Both feedwater flow transmitter signals from 12 S/G to DFWCS faillow (out of range).
How is 12 FRV, 1-FW-1121-CV, affected?

A. The last good feed flow input is used and 12 FRV control is shifted to the Backup CPU.

B. Both CPUs fail and 12 FRV controller is shifted to "MANUAL".

C. An "11/12 S/G FW CONTR XFER INHIBIT" alarm is received, a shift from high power to low power control mode will not occur and 12 FRV will be controlled by the Backup CPU.

✓D. Steam flow/feed flow error signal is not used and the Main CPU operates the FRV in single element control.

A is incorrect, with both signals out of range, a deviation alarm is sent, and the main CPU continues to operate the system in single element control.
B is incorrect, main continues to operate in Auto.
C is incorrect, the system would not shift to High Power Mode if in low power mode, but low power mode is unaffected.
D is correct, single element control is used with the loss of both steam flow channels or both feed flow channels.
See LOR LP 301-1-98, or ES-199602497
Basis: Failure of a Feed Flow input signal offscale LOW
References: OI-12A 41.7

mod

15 9. MAIN FEED O4 001/ NONE/ MOD–2/ LOI45B-1/ 9.0,14.0/ 202.040/ 059K4.08/ 2.5/2.7/ FRDFWCS MA

Unit-1 is at 100% power. Both feedwater flow transmitter signals from 12 S/G to DFWCS faillow (out of range).
How is 12 FRV, 1-FW-1121-CV, affected?

A. The last good feed flow input is used and 12 FRV control is shifted to the Backup CPU.

B. Both CPUs fail and 12 FRV controller is shifted to "MANUAL".

C. An "11/12 S/G FW CONTR XFER INHIBIT" alarm is received, a shift from high power to low power control mode will not occur and 12 FRV will be controlled by the Backup CPU.

✓D. Steam flow/feed flow error signal is not used and the Main CPU operates the FRV in single element control.

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B is incorrect, main continues to operate in Auto.
C is incorrect, the system would not shift to High Power Mode if in low power mode, but low power mode is unaffected.
D is correct, single element control is used with the loss of both steam flow channels or both feed flow channels.
See LOR LP 301-1-98, or ES-199602497
Basis: Failure of a Feed Flow input signal offscale LOW
References: OI-12A 41.7

DATES: Modified: Tuesday, January 13, 2004 Used: Thursday, September 27, 2001 00C03.TST

ANSWERS: Single Points 1

Version Answers:

0	1	2	3	4	5	6	7	8	9
D	A	B	C	D	A	B	C	D	A

☒ Scramble Choices

Scramble Range: A - D

Original

1. CRO-103-1-2-31 031/ NONE/ 0/ CRO-103-1-/ 1.3/ 020320307/ / / FRDFWCS MA

Failure of both feedwater flow transmitter input signals offscale **LOW** into DFWCS while in HIGH POWER mode will cause which one of the following?
(NOTE: Both CPUs are in service and operating normally)

A. The input causes a failure of the main CPU and control shifts to the backup CPU.

B. Both CPUs fail and all feed controllers transfer to manual control.

C. No effect, the main CPU retains the last good flow signal, and annunciates an "automatic transfer inhibit" alarm.

✓D. The feedwater flow signal is bypassed and the main CPU operates in single element control.

Basis: Failure of a Feed Flow input signal offscale LOWReferences: OI-12AKA1: KA2:

DATES: Modified: Wednesday, October 29, 2003 Used: Thursday, September 27, 2001 00C03.TST

ANSWERS: Single Points 1

Version Answers:

0	1	2	3	4	5	6	7	8	9
D	A	B	C	D	A	B	C	D	A

☒ Scramble Choices

Scramble Range: A - D

4 MFW ISOL 001/ / NEW–2/ 048-1-0/ 1.7.D/ 201.055/ 059A3.06/ 3.2/3.3/

Unit-2 was initially at 100% power when a major plant transient occurred. The following conditions exist:

RCS pressure is 1800 PSIA
Containment pressure is 0.4 PSIG
21 S/G pressure is 865 PSIG
22 S/G pressure is 680 PSIG

Which list correctly identifies Main Feedwater/Condensate system automatic actions?

A. Both SGFPs trip, all Condensate Pumps trip, both Heater Drain Pumps trip, both Main Feed MOVs shut and both MSIVs shut.

✓B. Both SGFPs trip, all Condensate Booster Pumps trip, both Heater Drain Pumps trip, both Main feed MOVs shut and both MSIVs shut.

C. Both SGFPs trip, all Condensate Booster Pumps trip, both Heater Drain Pumps trip, 22 Main Feed MOV shuts and 22 MSIV shuts.

D. Both SGFPs trip, all Condensate Pumps trip, all Condensate Booster Pumps trip, both Heater Drain Pumps trip, both Main Feed MOVs shut and both MSIVs shut.

A is incorrect, Condensate Pumps do not receive SGIS
B is correct per 2C03 ARM and 2-LD58A.
C is incorrect, both MSIVs and MOVs shut.
D is incorrect, Condensate Pumps do not receive SGIS.
References: 41.5, 43.5

4 . AFW 04 001//NEW--1/LOI-34-2//202.113/061K5.01/3.6/3.9/

What is the basis for the AFW flow controller automatic setpoints of 150 GPM?

A. S/G levels will be restored to EOP-1 limits within 10 minutes of AFAS actuation with MFW isolated, and AFW suction piping flow limits are not exceeded.

B. EDG ratings are not exceeded on SIAS with a Loss of Offsite Power, and S/G inventory is adequate for worst case decay heat with 2 trains of AFW operating.

✓C. AFW flow will be adequate with one AFW train to remove highest decay heat, but low enough to prevent initiating SIAS due to RCS overcooling with 2 trains operating.

D. AFW flow will be adequate to maintain S/G level in the unaffected S/G in the event of AFAS Block to the affected S/G with no operator action, yet low enough to prevent RCS cooldown to less than 525°F with one train operating.

A is incorrect, the suction header flow limit is 600 GPM , there is no requirement to meet EOP-1 condtions in 10 minutes.
B is incorrect, no EDG limit exists and 1 train of AFW is adequate.
C is correct.per SD-36A/B
D is incorrect, these criteria are not specified anywhere.
References: 41.5

48. AFW XCONN 001//MOD--2/CRO-34-2-7/9.0/201.031/061A1.03/3.1/3.6/LIMITS

A Loss of Offsite Power exists with Unit-1 previously at 100% power and Unit-2 in Mode 5. Unit-2 has been unable to restore Shutdown Cooling and is using 13 AFW Pump to restore S/G levels.
Unit-1 is using 11 AFW Pump to feed 11 and 12 S/Gs at 150 GPM per S/G.

What is the flow limit for 13 AFW pump to supply Unit-2?

A. 275 GPM

✓B. 300 GPM

C. 600 GPM

D. 900 GPM

Per OI-32A, Rev.19, Unit-1 6.3.C.1, total AFW flow should be less than 600 GPM when feeding both units from a single AFW System.
600-300 =300, so B is correct..
A is incorrect, but represents the Motor limit of 575 GPM, minus the 300 GPM to Unit-1 carried by the steam pump.
C is the total flow limit for one system.
D is the 1200 two system limit minus, 300 GPM used on Unit-1
Basis: AFW flow limitsReferences: 10CFR55.41: 7 - SD-34 - OI-32KA1: 02034K6.02KA2: 061000K4.04

MOD

18 1. AFW XCONN 001// MOD–2/ CRO-34-2-7/ 9.0/ 201.031/ 061A1.03/ 3.1/3.6/ LIMITS

A Loss of Offsite Power exists with Unit-1 previously at 100% power and Unit-2 in Mode 5. Unit-2 has been unable to restore Shutdown Cooling and is using 13 AFW Pump to restore S/G levels.
Unit-1 is using 11 AFW Pump to feed 11 and 12 S/Gs at 150 GPM per S/G.

What is the flow limit for 13 AFW pump to supply Unit-2?

A. 275 GPM

✓B. 300 GPM

C. 600 GPM

D. 900 GPM

Per OI-32A, Rev.19, Unit-1 6.3.C.1, total AFW flow should be less than 600 GPM when feeding both units from a single AFW System.
600-300 =300, so B is correct..
A is incorrect, but represents the Motor limit of 575 GPM, minus the 300 GPM to Unit-1 carried by the steam pump.
C is the total flow limit for one system.
D is the 1200 two system limit minus, 300 GPM used on Unit-1
Basis: AFW flow limitsReferences: 10CFR55.41: 7 - SD-34 - OI-32KA1: 02034K6.02KA2: 061000K4.04

DATES: Modified: Tuesday, January 13, 2004 Used: Wednesday, June 17, 1998 1C07&04.TST

ANSWERS: Single Points 1

Version Answers:

0	1	2	3	4	5	6	7	8	9
B	C	D	A	B	C	D	A	B	C

☒ Scramble Choices

Scramble Range: A - D

Orig Prt

1. CRO-34-2-3-08 008/ / 0/ CRO-34-2-7/ 9.0/ 020340201/ 02034K6.02/ 061000K4.0/ LIMITS

If 11 & 13 AFW pumps are being used to provide AFW flow to both units, total flow is limited to which value?

A. 575 gpm

✓B. 600 gpm

C. 1175 gpm

D. 1200 gpm

Basis: AFW flow limitsReferences: 10CFR55.41: 7 - SD-34 - OI-32KA1: 02034K6.02KA2: 061000K4.04

DATES: Modified: Wednesday, June 17, 1998 Used: Wednesday, June 17, 1998 1C07&04.TST

ANSWERS: Single Points 1

Version Answers:

0	1	2	3	4	5	6	7	8	9
B	C	D	A	B	C	D	A	B	C

☒ Scramble Choices

Scramble Range: A - D

49. AC DISTRIBUTION 001/ / NEW–2/ 202-7I-4/ 3.0/ 202.097/ 062A2.01/ 3.4/3.9/

Unit-1 is at 100% power when 13B 480 Volt Bus is lost.

What is the major affect to the plant, and what action must be taken?

A. Boration via the RWT from all operable Charging Pumps causes power to decrease. The Charging Pumps are placed in PTL, suction is shifted back to the VCT.

B. All Circulating Water Pumps lose excitation. The Reactor is tripped and EOP-0 is implemented

C. Feedwater Heater Level Dump Valves fail open, reactor power increases. Reactor power is reduced, the valve handswitches are matched and 1Y09 and 1Y10 are tied.

✓D. 12 and 13 Condensate Pumps' bearing temperatures rise due to loss of lube oil cooling. MCCs 106 and 116 are tied.

A is incorect, this describes a loss of MCC-104 or14A 480 Volt Bus.
B is incorrect, this describes a loss of 15 480 Volt Bus.
C is incorrect, this describes a loss of MCC-114 or 11A 480 Volt Bus.
D is correct per AOP-7I.
References: AOP-7I, 41.5, 43.5

50. LOR-020540304-002 001/ AOP-7J REV/ BANK–1/ LOR-202-7J/ 2.2/ 202.101/ 063A4.01/ 2.8/3.1/ BUS

A loss of which one of the following buses will result in a loss of all Unit-2 annunciator alarms?

✓A. 11 125 VDC bus
B. 12 125 VDC bus
C. 21 125 VDC bus
D. 22 125 VDC bus

A is correct per AOP-7J
Basis: Determine which bus was lost
References: AOP-7J Rev. 41.7

5 . EDG SYS 001/ / NEW–2/ LOI-02-1-0/ 3.0/ 002.010/ 064K1.04/ 3.6/3.9/

1A Diesel Generator is out of service for maintenance when a Loss of Offsite Power occurs.
2B Diesel Generator did not load due to a faulted 4 KV bus.

What affect does this have on the DC electrical distribution system as indicated at 1C24A?

A. 11 DC bus will be supplied only by 11 battery.

B. 21 DC bus will be supplied by 21 battery charger.

C. 12 DC bus will be supplied by 24 battery charger.

✓D. 22 DC bus will be supplied by 22 battery charger.

A is incorrect, 11 bus will have power from 23 battery charger
B is incorrect, 21 battery charger is powered from 24A 480 volt bus, which remained deenergized.
C is incorrect, 24 battery charger is powered from 24B 480 volt bus which remained deeneregized
D is correct, 22 battery charger is powered from 21B 480 volt bus, carried by 2A Diesel Generator
References: 41.2- 41.9

52. CRO-122-1-3-07 009/ / BANK–1/ LOI-77-1-0/ 1.0/ 079.008/ 073K5.01/ 2.5/3.0/

What type of radiation do the Component Cooling, Service Water and S/G Blowdown Recovery (process rad. monitors) detect?

A. Alpha

B. Beta

✓C. Gamma

D. Neutron

C is correct per SD-77.
References: 41.5

53. CRO-113-2-5-24 024/ / BANK–1/ CRO-113-2-/ 2.2/ 011.005/ 076A1.02/ 2.6/2.6/ 113 - SERV

During normal operation at 100% power, what is the largest heat load on the Service Water system?

✓A. Main Generator Hydrogen Coolers.

B. Hydrogen Seal Oil Coolers

C. Containment Air Coolers

D. 1B Diesel Generator

A is correct per AOP-7B, loss of SRW.

Basis: Largest Heat Load(s) on Service Water System During A Trip of SW
References: 41.5

54. INSTRUMENT AIR04 002/ / NEW–2/ 019-1-0/ 2.0/ 201.020/ 078K4.02/ 3.2/3.5/

After a SIAS actuation, what is the source of Instrument Air supplied to the AFW flow control valves?

A. Saltwater Air Compressors

✓B. The opposite unit's Plant Air Compressor

C. Auxiliary Feedwater system air accumulators

D. Nitrogen backup to Instrument Air

A is incorrect, a manual valve, 1-IA-728 or 2-IA-314 (or 317) must be opened. and header pressure must be less than 85 PSIG
B is correct, the PA/IA cross connect opens at 88 PSIG and will return pressure to normal.
C is incorrect. The accumulators will supply air if the header pressure is less than 85 PSIG
D is incorrect, nitrogen backup requires manual valve operation and lower instrument air header pressure.
References: SD. 41.7

55. CONTAINMENT 04 012/ / NEW--2/ 212-1-4/ 1.3/ 204.076/ 103A2.05/ 2.9/3.9/

What affect does a containment entry at power have on the Containment system, and how is this impact controlled?

✓A. Containment airlock door seals must be tested within 7 days, containment access checklists ensure testing is scheduled.

B. Containment integrity is breached, per the containment entry checklists, someone must be stationed outside the airlock door while it is open.

C. Containment atmosphere enters the Auxiliary Building unfiltered, per access procedures, a containment vent is performed prior to containment entry.

D. Containment is a Foreign Materials Exclusion boundary, an FME log (MN-1-109 att.5) is required for entry

A is correct per EN-4-105 and NO-1-104
B is incorrect, there is no requirement to have anyone at the containment door while open.
C is incorrect, there is no requirement to vent containment prior to entry.
D is incorrect, MN 1-109 does not require the log. FME concerns are adressed by NO-104 checklists.
References: EN-4-105, NO-1-104 41.5, 43.5

56. CRO-60-1-04 004/ / BANK--2/ CRO-60-1/ 10.1, 2, 1/ 055.003/ 001A4.08/ 3.7/3.4/ SD 60 - CE

Under which condition can CEAs be WITHDRAWN in the manual sequential mode? **(without using CMI bypass features)**

✓A. Tavg-Tref deviation alarm.

B. Group 5 CEAs below the PDIL.

C. 2 out of 4 TM/LP channel pretrips at RPS.

D. A misaligned CEA 7.5 inches from its group.

A is correct, per 1C05 ARM, all other conditions result in a CWP

Basis: Withdrawing of CEAs in Manual Sequential Mode References: 55.41:2,6
55.43KA1: 060K4.06KA2: K11.01

57. CRO-5-2-10-06 001/ / BANK--2/ CRO-5-2-3/ 18.1/ 078.010/ 002A1.06/ 4.0/4.0/

The reactor is at steady state conditions and turbine load has been adjusted to maintain Tc on program.

Given the following:
T cold is 538°F
T hot is 556°F

What is reactor power?

A. 18%
B. 34.5%
✓C. 37.5%
D. 40.5%

Tc @0% is 532, @100% is 548, 16/100=6/x so, x=37.5%
Or delta T at 0% is 0, delta T at 100% is 48, existing delta T is 18, 18/48=x/100=37.5
References: 41.5

Which statement satisfies the requirements for minimum operable position indication channels for a CEA?

A. CEA voltage divider reed switch position indicator channel capable of determining the absolute CEA position within ±6 inches
and
CEA pulse counting position indicator channel.

B. CEA voltage divider reed switch position indicator channel capable of determining the absolute CEA position within ±7.5 inches
or
CEA "Full Out" reed switch position indicator channel only if the CEA is fully withdrawn as verified by actuation of the applicable position indicator.

✓C. CEA voltage divider reed switch position indicator channel
and
CEA pulse counting position indicator channel in agreement within 4.5 inches.

D. CEA voltage divider reed switch position indicator channel capable of determining the absolute CEA position within ±1.75 inches of absolute position
or
CEA "Full Out" reed switch position indicator channel only if the CEA is fully withdrawn as verified by actuation of the applicable position indicator.

A is incorrect, no requirement exists for the 6" limit.
B is incorrect, 7.5 inches is the T.S. limit for deviation between CEAs within a group, and 2 position indicator channels are required.
C is correct, reflects wording in TNC 15.1.5
D is incorrect, the statement involving 1.75 inches was deleted, and 2 channels are required, not one.
Basis: CEA Position Channels References: 55.41:2,6,10 55.43:2

5 . NUCLEAR INSTRUMENTS 001/ / NEW--3/ / / 078.009/ 015A3.05/ 2.6/2.7/

Which condition would cause **audible** WRNI count rate to rise?

A. Pulling CEAs to criticality when performing the first reactor startup following a refueling outage

✓B. Reinserting a once-burned fuel assembly in a new core location

C. During RCS drain down to reduced inventory for RCP seal replacement

D. Withdrawing CEA #1 from a fuel assembly while swapping CEAs

A is incorrect, audio count rate is only available on the refueling cart, which is disconnected before startup.
B is correct, this is a positive reactivity addition, it is normal during refueling
C is incorrect, draining should add no positive activity, and audio count rate may not be available as it is only required during core alterations.
D is incorrect, **all** CEAs are not credited for refueling SDM, also, the CEA is in the center of the core, away from the excore detectors and would have no effect on count rate.
References: 41.7

60. H2 ANALYZER 001/ / NEW--1/ LOI-052-5/ 12.B/ 073.003/ 028A4.03/ 3.1/3.3/

How are the **sample locations** indicated on the Hydrogen Analyzer recorders on 1(2)C10 selected?

A. Manually at the recorder

B. Automatically or manually by the plant computer

✓C. Automatically or manually from sample panels in the Aux. Building

D. Automatically at the recorder

C is correct per SD-38B and Chemistry Procedures
References: 41.7

6: CONTAINMENT PURGE 001/ / NEW--2/ CRO-122-1/ 2.0, 3.0/ 020150208/ 029K4.03/ 3.2/3.5/

Refueling operations are in progress and Containment Purge is in operation. While taking logs in the Cable Spreading Room, the CRO notices that channel ZF of CRS is bypassed.

How does this affect Containment Purge?

A. Containment Purge will be automatically secured if any other channel of CRS actuates.

B. In the event of a valid CRS signal, one Containment Purge CV will remain open.

✓C. Containment Purge must be secured (or fuel movement suspended), per Technical Specification requirements.

D. The remaining channels of CRS must be verified operable to allow Containment Purge to remain in operation

A is incorrect, with one sensor bypassed, it requires 2 channels to trip.
B is incorrect, bypassing a sensor will not effect how the components reposition on a valid signal.
C is correct. TS 3.3.7 requires all sensors to be operable during fuel movement.
D is incorrect per TS 3.3.7
References: 55.41.7, 55.43.2. **Related to Calvert Cliffs LER involving refueling with one channel of CRS inoperable during 2001 refueling outage**

62. CRO-113-4-3-06 001/ / BANK--2/ CRO-113-4/ 3.5/ 202.057/ 033K3.03/ 3.0/3.3/

High Spent Fuel Pool temperature is corrected by what action?

A. Adjusting spent fuel pool temperature controller setpoint.

B. Throttling 11A/B SRW heat exchanger Saltwater outlet valves open.

C. Adjusting SFP CLR OUT THROTTLE valve to obtain a discharge pressure of greater than 120 psig.

✓D. Throttling open SFP CLR DISCH HDR stop valve.

A is incorrect, there is no controller for SFP cooling.
B is incorrect, no spent fuel pool cooler is cooled by 11 SRW header.
C is incorrect, but is the method for controlling SFP cooling system flowrate to prevent pump runout.
D is correct per 1C13 ARM and OI-24A
References: 41.7

63. LIQUID RADWASTE 001/ / NEW--2/ LOR-71-1-0/ / 064.041/ 068K5.04/ 3.2/3.5/

What advantage has CCNPP realized from processing liquid radwaste through the NUKEM skid over using the originally installed waste processing system?

A. Lower cost for processing liquid radwaste

✓B. Decreased amount of radioactive material released to the Chesapeake Bay

C. Smaller potentially contaminated area in the Auxiliary Building

D. Lower number of High Radiation Areas in the Auxiliary Building

A is incorrect, the system is currently an increase in cost, as new equipment is being leased
B is correct, the purpose of the skid is to lower release rates such that CCNPP is in the top quartile
C is incorrect, the skid occupies space that was previously open area, the potential for more contaminated area due to leaks is increased.
D is incorrect, this area includes a new locked high rad area, but is designed to have general area dose rates of less than 5mR/ hr.
References: 41.5

64. CRO-134-1-5-45 045/ / BANK--1/ CRO-134-1-/ 2.5.C/ 0243B0503/ 072K1.04/ 3.3/3.5/ 134 - HVAC

Control Room Vent RMS, 0-RI-5350 is in alarm.
How is the Control Room HVAC system affected?

A. Outside air dampers open to purge the Control Room, and the air conditioning unit is shutdown

✓B. Control Room ventilation is in recirculation with Post-LOCI filter fans in operation and the kitchen exhaust fan secured.

C. The Control Room HVAC shifts to winter mode of operation with Post-LOCI filter fans in operation.

D. Control Room air handling unit is secured. Only outside air dampers open.

A is incorrect, outside flow paths are secured.
B is correct per LP 134 and system description.
C is incorrect, outside air dampers remain open in winter mode.
D is incorrect, outside air dampers remain shut.
Basis: Automatic Action of The Control Room HVAC on High Rad Signal
References: 55.41:4 55.43 / SD 43BKA1: 43BK4.09KA2: 072000K4.03

65. FIRE SYSTEM04 001//BANK–1///013.024/086A3.01/2.9/3.3/

What condition will start the diesel fire pump?

A. Fire main header pressure less than 105 PSIG

B. A smoke detector or temperature detector actuation

✓C. Both electric fire pump feeder breakers being open

D. Preaction solenoid valve or sprinkler alarm check valve actuation

A is an incorrect setpoint, pressure must be less than 85 PSIG
B and D are incorrect, but will cause "FIRE PROT PANEL 1C24B" alarm
C is correct, per 1C17 ARM L-06
References; 41.7

66. SHIFT TURNOVER04 001//MOD–1/SRO-204-1-/4.0/204.043/2.1.3/3.0/3.4/204 - SHIF

Which category of deficient equipment status should be annotated on the Shift Turnover Information Sheet to communicate the status of 21 Condensate Pump which has a broken lube oil pump?

✓A. (OOS) Out Of Service

B. (I/F) Inoperable But Functional

C. (D) Degraded

D. (O) Inoperable

A is correct, although the pump could be run until bearing temperatures rise, this would not be prudent and AOP-7I directs a power reduction when power is lost to these pumps. NO-1-207 rev. 34 page 13
B is incorrect, this designation is for TS equipment only.
C is incorrect, degraded implies that the equipment can perform it's designed function.
D is incorrect, this desigination is for TS equipment only.
Basis: Complete the Shift Turnover Information Sheet References: NO-1-207 41.10

moo

66 A. SHIFT TURNOVER04 001/ / MOD--1/ SRO-204-1-/ 4.0/ 204.043/ 2.1.3/ 3.0/3.4/ 204 - SHIF

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C is incorrect, degraded implies that the equipment can perform it's designed function.
D is incorrect, this desigination is for TS equipment only.
Basis: Complete the Shift Turnover Information Sheet References: NO-1-207 41.10

DATES: Modified: Wednesday, January 14, 2004 Used:

ANSWERS: Single Points 1

Version Answers:

0	1	2	3	4	5	6	7	8	9
A	B	C	D	A	B	C	D	A	B

☒ Scramble Choices

Scramble Range: A - D

Original

1. SRO-204-1-1-00016 016/ NONE/ 0/ SRO-204-1-/ 4.0/ 032040054/ / / 204 - SHIF

Which category of deficient equipment status should be annotated on the Shift Turnover Information Sheet to communicate the statusof 21 Condensate Pump which is pumping at a reduced capacity due to impeller wear?

A. (OOS) Out Of Service
B. (I/F) Inoperable But Functional
✓C. (D) Degraded
D. (O) Operable

Basis: Complete the Shift Turnover Information SheetReferences: NO-1-207KA1: KA2:

DATES: Modified: Tuesday, March 24, 1998 Used:

ANSWERS: Single Points 1

Version Answers:

0	1	2	3	4	5	6	7	8	9
C	D	A	B	C	D	A	B	C	D

☒ Scramble Choices

Scramble Range: A - D

6· CONDITIONS/LIMITS 001/ / NEW--1/ 042-1/ 9.0/ 042.002/ 2.1.10/ 2.7/3.9/

What is the condenser differential temperature (condenser delta T) limit, as stated in the facility license?

A. The calculated flow weighted hourly average of the temperature rise across both condensers is limited to 12°F

B. The calculated flow weighted hourly average of the temperature rise across each condenser is limited to 12°F.

✓C. The calculated average of the 24 flow weighted hourly readings of both units for a calendar day is limited to 12°F.

D. The calculated average of the 24 flow weighted hourly readings of each unit for a calendar day is limited to 12°F.

A is incorrect, the limit is not an hourly average.
B is incorrect, the limit is not an hourly average, and is for both units.
C is correct per OI-14A, rev 15, precaution A.
D is incorrect, the limit is for both units, not each unit.
References: 43.1

68. SYSTEM STATUS COMM 001/ / NEW--3/ AOP-2A/ / 204.013/ 2.1.14/ 2.5/3.3/

Given Nuclear Plant Operations Section Standing Order 03-03:
A known Component Cooling system leak is causing a Unit-2 sump frequency of 3.4 hours.
Sump frequency changes to 95 minutes with a corresponding increase in unidentified RCS leak rate.

Which method of informing the GS-NPO is required per administrative procedures?

A. Voicemail

B. Alpha-page

C. Alpha-page and detailed voicemail

✓D. Talk directly

A is incorrect, this is only allowed for RCS Leakage condition 1.
B is incorrect, this is for RCS Leakage Condition 2
C is incorrect, this is the method to be used to contact **OTHER** site management.
D is correct, with containment sump frequency less than 4 hours, Condition 3 exists, per the first action, direct communication with GS-NPO and PE-PSE is required.
References: 41.10, 43.5

6 FUEL MOVES 001/ / NEW--2/ 209-0-08/ A-4/ 032.002/ 2.2.28/ 2.6/3.5/

Which condition requires that the Spent Fuel Pool Ventilation charcoal filters be placed in service?

A. Spent fuel is being loaded into an ISFSI storage cask.

B. New fuel is being loaded into the Spent Fuel Pool.

C. A dummy fuel assembly is being transferred from the Spent Fuel Pool to the Refueling Pool for RFM testing.

✓D. Refueling is in progress which does not include a complete core offload.

A is incorrect, fuel loaded into the cask has not been in a critical core within the previous 32 days.
B is incorrect, new fuel has not been irradiated
C is incorrect, the dummy is not recently irradiated fuel as defined in OI-22D (and in A, above).
D is correct, refueling involves the transport of "recently irradiated fuel"--part of a critical core within the last 32 days-- unless in an extended outage.
References: OI-22D, 41.7, 41.8, 41.10, 43.7

70. CEA PROGRAM 001/ / NEW--1/ 60-1-13/ 1.23/ 055.012/ 2.2.33/ 2.5/2.9/

Where is the regulating group CEA "All Rods Out" (ARO) position stated?

✓A. NEOP-13 (23)

B. COLR figure 3.1.6

C. System 55 (CEDS) setpoint manual

D. OI-42, CEDM System Operation

A is correct. Figure IV.B.1
B is incorrect, not in COLR
C is incorrect, setpoint manual has CEDS setpoints, but not CEA position
D is incorrect, the OI is not updated each RFO to reflect CEA ARO position.
References: 41.10, 43.6

7 CORE REACTIVITY 001// NEW--2/212-3-9/ 10.0/ 058.002/ 2.2.34/ 2.8/3.2/

What documents, used by Operations personnel to run the plant, are updated to communicate the core reactivity effect changes due to core age or fuel composition?

A. USFSAR and NFM Operator Surveillance Procedures (NEOP-301/302)

B. TRM and Offsite Dose Calculation Manual

✓C. COLR and Technical Data Book (NEOPs)

D. Calvert Cliffs Operating Manual and Technical Specification LCOs

A is incorrect, the UFSAR is not used to operate the plant, and NEOP-301/302 defines the processes which usually do not change from cycle to cycle.
B is incorrect, the TRM and ODCM are not cycle specific.
C is correct, both documents are reviewed and updated for every refueling cycle.
D is incorrect, operations procedures and the LCOs are reviewed for possible impact by refueling, but are not routinely updated due to changes in reactivity effects associated with the core.
References: 41.10, 43.6

72. RADIATION CONTROL04 001// NEW--1/ 217-30-9/ 1.7.1/ 204.139/ 2.3.10/ 2.9/3.3/

The Shift Manager has declared an Alert per ERPIP 3.0
The Operational Support Center is not yet staffed.

A plant operator is required to perform a task in the Auxiliary Building where dose rates are unknown.

What is required prior to the operator being sent to perform the task?

A. Another operator must be assigned to monitor radiation levels for the worker.

B. The Shift Manager must approve the action and the selection of personnel to perform the task.

✓C. The Shift Radiation Technician must be contacted to assess radiological conditions and preferred access and egress routes.

D. A pre-evolution brief must be held with Security, the Interim Radiation Protection Director and the CRS in attendance.

A is incorrect. An operator cannot fulfill this function per the ERPIP.
B is incorrect. There is no requirement for the SM to provide this oversight, and it is not a task for the SEC.
C is correct per ERPIP-108 and ERPIP-102 6.2.B.2.c
D is incorrect, Security and CRS attendance is not a requirement.
References: 41.10, 41.12 43.4

CCNPP NRC License Examination
March 2004 PWR Examination outline
Emergency and Abnormal Plant evolutions – Tier 1 Group 1 (**RO**/SRO)

Form ES-401-2

	E/APE #/Name/Safety Function	K 1	K 2	K 3	A 1	A 2	G	Number	K/A Topics	Imp.	RO #
1	000007/E02 Reactor Trip – Recovery /1				x			EA1.06	Verification that the control and safety rods are in after the trip SRO-201-2-05 005	4.4	1
2	000008 Pzr Vapor Space Accident /3					x		AA2.01	RCS pressure and temperature indicators and alarms VAPOR SPACE ACC 001	3.9	1
3	000009 Small Break LOCA /3				x			EA1.07	Ability to operate and monitor the Containment Cooling System CONTAINMENT COOLING 001	3.7	1
4	000011 Large Break LOCA /3		x					EK2.02	Kn[redacted]lations between Pumps and the Large Break LOCA SRO-201-5-1-06 006	2.6	1
5	000015/17 RCP Malfunctions /4	x						AK1.04	Basic steady state thermodynamic relationship between RCS loops and S/Gs resulting from unbalanced RCS flow RCP Malfunctions 001	2.9	1
6	000022 Loss of Rx Coolant Makeup /2						x	2.4.21	Knowledge of parameters and logic used to assess the status of safety functions LOSS OF RCS MU 001	3.7	1
	000025 Loss of RHR System /4								NOT SELECTED		
[illegible]	000026 Loss of Comp. Cooling Water /8			x				AK3.02	Automatic actions within the CCWS resulting from ESFAS actuation CRO-113-5-5-25 035	3.6	1
[illegible]	000027 Pzr Press. Ctrl. Sys. Malf. /3			x				AK3.03	[redacted]ed in EOP for PZR PCS malfunction PZR PRESS MALF 001	3.7	1
[illegible]	000029 ATWS /1	x						EK1.03	Effects of boron on reactivity, as it relates to an ATWS SRO-201-0-3-29 029	3.6	1
10	000038 SG Tube Rupture/3			x				EK3.01	Equalizing pressure on primary and secondary sides of ruptured S/G SRO-201-6-1-30 030	4.1	1
[illegible]	000040CE05 Steam Line Rupture /4	x						AK1.07	Effects of feedwater introduction on dry S/G Steam Line Rupture 001	3.4	1
[illegible]	000054CE06 Loss of Feedwater /4	x						AK1.01	MFW line break depressurizes the S/G (similar to steam line break) LOSS OF FEEDWATER 001	4.1	1
[illegible]	000055 Station Blackout /6				x			EA1.06	Restoration of power with one ED/G STATION BLACKOUT 001	4.1	1
15	000056 /Loss of Off Site Power /6					x		AA2.43	Occurrence of a turbine trip LOSS OF OFFSITE	3.9	1
	000057 Loss of Vital AC Instrument Bus /6					x		AA2.17	S[redacted]status, using local or remote controls LOSS OF VITAL AC 001	3.1	1
16	000058 Loss of DC Power /6						x	2.1.19	Ability to use plant computer to obtain and evaluate parametric information on system or component status LOSS OF DC POWER 001	3.0	1
17	000062 Loss of Nuclear Service Water /4			x				AK3.01	The conditions that will initiate the automatic opening and closing of the SWS isolation valves to the nuclear service water coolers LOSS OF SRW 001	3.2	1
18	000065 Loss of Instrument Air /8				x			AA1.04	[redacted]nitor Emergency air compressors as applicable to loss of instrument [redacted] AOP-7D-08 008	3.5	1
	K/A Category Totals	4	1	4	4	3	2				18

NEW

BANK

MODIFIED

Cognitive Level 2or3

Confidential

CCNPP NRC License Examination
March 2004 PWR Examination outline
Emergency and Abnormal Plant evolutions – Tier 1 Group 2 (**RO**/SRO) Form ES-401-2

	E/APE #/Name/Safety Function	K 1	K 2	K 3	A 1	A 2	G	Number	K/A Topics	Imp.	RO #
	000001 Continuous Rod Withdrawal /1										
19	000003 Dropped Control Rod /1					x		AA2.01	Dropped CEA 001 Ability to determine and interpret—Rod position indication to actual rod position	3.7	1
	000005 Inoperable/Stuck Control Rod /1										
	000024 Emergency Boration /1										
	000028 /Pzr Level Malfunction /2										
20	000032 Loss of Source Range NI /7						x	2.2.22	Knowledge of limiting conditions for operation and safety limits Loss of WRNI 001	3.4	1
	000033 Loss of Intermediate Range NI /7										
21	000036 /Fuel Handling Accident /8					x		AA2.02	Fuel Handling Accident 001 Ability to determine and interpret—occurrence of a fuel handling incident	3.4	1
	000037 SG Tube Leak /3										
	000051 Loss of Condenser vacuum /4										
	000059 Accidental Liquid RadWaste Rel. /9										
	000060 Accidental Gaseous Radwaste Rel./9										
22	000061 ARM System Alarms /7						x	2.1.1	Knowledge of conduct of operations requirements AREA RAD MON 001	3.7	1
23	000067 Plant Fire on Site /8			x				AK3.04	Actions contained in EOP for plant fire on site CRO-202-9A-2-49 049	3.3	1
	000068 Control Room Evac. /8										
	000069 Loss of CTMT Integrity /5										
24	000074 Inadequate Core Cooling /4				x			EA1.16	[redacted] r RCS in-core thermocouple indicators LOR-114-1-03-08	4.4	008
25	000076 High Reactor Coolant Activity /9		x					AK2.01	[redacted] ons between the High Reactor Coolant Activity and the [redacted] tors CRO-107-1-3-55 055	2.6	1
	CE/A11 RCS Overcooling/PTS /4										
	CE/A13 Natural Circulation /4										
26	CE/A16 /Excessive RCS Leakage /2				x			AA1.1	[redacted] RCS LEAKAGE 001 or components, functions of control and safety systems [redacted] ation, signals, interlocks failure modes, auto/man features	3.4	1
27	CE/E09 /Functional Recovery			x				EK3.4	[redacted] or SRO function within the control room team in su [redacted] e adhered to and limits are not violated SRO-201-8-7-18	3.3	1 018
	K/A Category Totals	0	1	2	2	2	2		Group Point Total		9

Plant Systems – Tier 2 Group 1 (**RO**/SRO) Form ES-401-2

	System #/Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	Number	K/A Topics	Imp.	RO #
28	003 Reactor Coolant Pump	[redacted]										x	2.1.32	Ability to explain and apply all system limits and precautions AOP-7F-06 006	3.4	1
29	004 Chemical and Volume Control	[redacted]					x						K6.04	Knowledge of the effects of loss of CVCS pumps CRD-107-1-9-2	2.8	1 001
30	005 Residual Heat Removal	[redacted]											K2.01	Knowledge of the bus power supplies to the RHR pumps [illegible]	3.0	001 1
31	006 Emergency Core Cooling	[redacted]											K4.11	Knowledge of ECCS design features/interlocks which provide for resetting SIAS CRD-063-1-3-18 018	3.9	1
32	008 Component Cooling Water System	[redacted]											K3.01	Knowledge of the effect that a loss or malfunction of the CCWS will have on loads cooled by CCWS CRD-113-5-5-19 019	3.4	1
33	007 Pressurizer Relief/Quench Tank								x				A2.02	Ability to predict the impacts of and correct, control or mitigate abnormal pressure in the PRT ~~[illegible]~~	2.6	1 PZR Quench Tnk 001
34	008 Component Cooling Water				x								K4.09	The standby feature of the CCW pumps COMPONENT CLG	2.7 001	1
35	010 Pressurizer Pressure Control						x						K6.03	Knowledge of the effect of a loss or malfunction of PZR sprays and heaters will have on RCS PCS LOSS OF PCS	3.2	001
36	012 Reactor Protection			x									K3.02	Knowledge that a loss or malfunction of the RPS will have on the Turbine/Generator RPS MALF 001	3.2	1
37	012 Reactor Protection											x	2.4.47	Ability to diagnose and recognize trends in an accurate and timely matter using reference material RPS POWER Supplies	3.4 001	1
38	013 ESFAS					[redacted]							A1.01	Ability to predict/monitor changes in RCS pressure and temperature associated with operating ESFAS ESFAS 001	4.0	1
39	022 Containment Cooling	x											K1.01	Knowledge of connections, cause effect relationship between CCS and SWS cooling system CONTAINMENT COOLING	3.5	1 003
40	026 Containment Spray	[redacted]											K2.01	Knowledge of the bus power supplies to CS pumps CONTAINMENT SPRAY	3.4	1 001
41	026 Containment Spray								x				A2.07	Ability to predict impacts of and correct, loss of spray pump suction when in recirc due to clogged screen, cavitation CONTAINMENT SPRAY	3.6	1 002
42	039 Main and Reheat Steam							x					A1.09	Ability to predict/monitor changes in Main Steam line RMS MN STM	2.5	1 RMS 001
43	039 Main and Reheat Steam	[redacted]									x		A4.01	Ability to manually operate/monitor MS supply valves CRD-103-2-16-016	2.9	1
44	056 Condensate								x				A2.04	Ability to predict impacts of loss of condensate pumps... CRD 103-2-4-82 082	2.6	1
45	059 Main Feedwater				x								K4.08	FRV operation on basis of feed/steam flow mismatch MAIN FEED 04	2.5	1 001
46	059 Main Feedwater									x			A3.06	Ability to monitor MFW isolation MFW ISOL 001	3.2	1
47	061 Auxiliary Feedwater					x							K5.01	Knowledge of the relationship between AFW flow and RCS heat transfer AFW 04 001	3.6	1
48	061 Auxiliary Feedwater							x					A1.03	Ability to predict/monitor interactions when units cross tied AFW X CONN	3.1	1 001
49	062 AC Electrical Distribution								x				A2.01	Ability to predict impacts, correct, de-energized loads that degrade or hinder operation AC DISTRIBUTION 001	3.4	1
50	063 DC Electrical Distribution	[redacted]									x		A4.01	Ability to operate or monitor breakers, fuses in the CR LOR-020540304-002 001	2.8	1

CCNPP NRC License Examination
March 2004 PWR Examination outline
Plant Systems – Tier 2 Group 1 (**RO**/SRO)

Form ES-401-2

	System #/Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	Number	K/A Topics	Imp.	RO #
51	064 Emergency Diesel Generator	x											K1.04	Knowledge of the connection, cause/effect between ED/G and DC distribution system EDG SYS 001	3.6	1
52	073 Process Radiation Monitorin[redacted]					x							K5.01	Knowledge of Radiation theory as applies to PRM CRD-122-2.5-3T 07 009	2.5	1
53	076 Service Water	[redacted]						x					A1.02	Ability to predict/monitor changes in reactor and turbine building closed cooling water temperatures CRD-113-2-5-24	2.6	1 024
54	078 Instrument Air				x								K4.02	Knowledge of design features/interlocks which provide for cross-over to other air systems Instrument Air 04 002	3.2	1
55	103 Containment								x				A2.05	Ability to predicts impacts of Emergency containment entry and control or mitigate consequences Containment	2.9	1
	K/A Category Point totals	2	2	2	4	2	2	4	5	1	2	2		Group Point Total		28

	System #/Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	Number	K/A Topics	Imp.	RO #
56	001 Control Rod Drive	[redacted]									X		A4.08	Ability to manually operate the mode select for CRDS, operation of MG sets and control panel CRD-60-1-04 004	3.7	1
57	002 Reactor Coolant	[redacted]						x					A1.06	Ability to predict/monitor reactor power associated with RCS controls CRD-52-10-06 001	[illegible]	
	011 Pressurizer Level Control															
58	014 Rod Position Indication	[redacted]											K5.01	Knowledge of operational implications of differences between RPIS and step counter CRD-60-1-45 045	2.7	1
59	015 Nuclear Instrumentation									x			A3.05	Ability to monitor recognition of audio output expected for a given plant condition NUCLEAR INSTRUMENTS 001	2.6	1
	016 Non-Nuclear Instrumentation															
	017 In-Core Temperature Monitor															
	027 Containment Iodine Removal															
60	028 H2 Recombiner and Purge Control	[redacted]									x		A4.03	Ability to manually operate/monitor H2 sampling and analysis of cntmt atmosphere including alarms and indications H2 Analyzer 001	3.1	1
61	029 Containment Purge				x								K4.03	Knowledge of the design feature/interlock providing auto isolation CONTAINMENT PURGE 001	[illegible]	
62	033 Spent Fuel Pool Cooling		[redacted]										K3.03	Knowledge that the effect of loss of cooling has on spent fuel temperature CRD-113-4-3-06 001	3.0	1
	034 Fuel Handling Equipment															
	035 Steam Generator															
	041 Steam Dump/Turbine Bypass Control															
	045 Main Turbine Generator															
	055 Condenser Air Removal															
63	068 Liquid Radwaste					x							K5.04	Knowledge of operational implications of biological hazards of radiation and resulting goal of ALARA LIQUID RADWASTE 001	3.2	1
	071 Waste Gas Disposal															
64	072 Area Radiation Monitoring	[redacted]											K1.04	Knowledge of connections and cause/effect between ARM and Control Room ventilation CRD-134-1-5-45 045	3.3	1
	075 Circulating Water															
	079 Station Air															
65	086 Fire Protection	[redacted]								x			A3.01	Ability to manually operate/monitor starting mechanisms of fire pumps FIRE SYSTEM 04 001	2.9	1
	K/A Category Point totals	1	0	1	1	2	0	1	0	2	2	0		Group Point Total		10

CCNPP NRC License Examination
March 2004 PWR Examination outline
Generic Knowledge and Abilities Outline (Tier 3)

Form ES-401-3

Category	K/A #	Topic	RO Imp.	RO #
66	2.1.3	Knowledge of shift turnover practices SHIFT TURNOVER 001	3.0	1
67	2.1.10	Knowledge of conditions and limitations in the facility license COND/LIMITS 001	2.7	1
1. Conduct of Operations 68	2.1.14	Knowledge of system status criteria which require the notification of plant personnel SYSTEM STATUS COMM 001	2.5	1
	Subtotal			3
69	2.2.28	Knowledge of new and spent fuel movement procedures FUEL MOVES 001	2.6	1
70	2.2.33	Knowledge of control rod programming CEA PROGRAM 001	2.5	1
2. Equipment Control 71	2.2.34	Knowledge of the process for determining the internal and external effects on core reactivity CORE REACTIVITY 001	2.8	1
	Subtotal			3
3. Radiation Control 72	2.3.10	Ability to perform procedures to reduce excessive levels of radiation and guard against personnel exposure RAD CONTROL 001	2.9	1
73	2.3.11	Ability to control radiation releases RADIATION RELEASE 001	2.7	1
	Subtotal			2
74	2.4.17	Knowledge of EOP terms and definitions ERPIP DEFINITIONS 003	3.1	1
4. Emergency Procedures / Plan 75	2.4.46	Ability to verify that alarms are consistent with plant conditions VERIFY Alarms 001	3.5	1
	Subtotal			2
Tier 3 Point Total				10

Name: ______________________________

1 SRO-201-0-2-05 005/ / NEW -2/ SRO-201-0-/ 3.0/ 020590408/ 007EA1.06/ 4.4/4.5/ EOP-0, STU

U-2 is operating at 100% when a reactor trip occurs.
The RO observes the following indications on the CEA mimic:

4 CEAs do not have the amber lights energized
2 of the above CEAs have green lights energized

What must be performed when performing the Reactivity Control Safety Function?

A. Take the alternate actions to deenergize CEDM MG sets and verify all CEAs are inserted.

B. Depress the Reactor Trip pushbuttons on 2C15, verify reactor power is lowering, and verify a negative startup rate exists.

C. Verify reactor power is lowering, check that no CEA deviation alarms are present, verify a negative startup rate exists, check that RCS makeup is secured and inform CRS that Reactivity Control is complete.

✓D. Commence RCS boration to at least 2300 ppm via gravity feed or a Boric Acid pump using all available charging pumps.

A is incorrect, the reactor has tripped, de-energizing the MG sets is not required
B is incorrect, the reactor has tripped and depressing the trip buttons on 2C15 is not required.
C is incorrect, these are normal trip actions, but do not include the actions required for more than one CEA failing to insert.
D is correct per EOP-0 and bases, page13, rev 14
Basis: EOP-0 reactivity control questionReferences: EOP-0 Rev. 3KA1: KA2:

Given the following conditions:

RCS pressure:	1600 PSIA
PZR level:	360"
T h:	532.5°F
Tc:	532.2°F
Containment Pressure:	2.4 PSIA
Containment temp:	115°F
S/G pressures:	880/885 PSIA

EOP-0 is being implemented

What is the most likely cause of these conditions?

A. RCS cold leg break

✓B. RCS leak at the top of the PZR

C. S/G tube leak

D. Main Steam line break in containment

A is incorrect, a differnece in Tc and T h would be more evident, also, pressurizer level would not be high during EOP-0 with RCS pressure above the shutoff head of the HPSI pumps
B is correct--classic indications
C is incorrect, pressurizer level again does not support this
D is incorrect, Tc and S/G pressures don't support this

3. CONTAINMENT COOLING 001/ / NEW--2/ LOI-052-3/ 5.0/ 201.093/ 009EA1.07/ 3.7/3.9/

The CRS ordered Unit-1 manually tripped due to rapidly loweing PZR level and RCS pressure. EOP-0 is being implemented and the following conditions exist:

RCS pressure:	1900 PSIA
Tc:	532.5°F
Containment pressure	0.5 PSIA
Containment temperature	98°F

What is the status of the Containment Air Coolers? **(Assume no operator action)**

A. 4 Coolers in slow speed with maximum SRW flow

B. 4 Coolers in fast speed with normal SRW flow

C. 3 Coolers in slow speed with maximum SRW flow

✓D. 3 Coolers in fast speed with normal SRW flow

A is incorrect, but describes operation during SIAS. SIAS setpoints have not been reached.
B and C are incorrect, but could be options with manual actions by the operator
D is correct per OI-5A, normal system lineup.

4. SRO-201-5-1-06 006/ / BANK--01/ SRO-201-5-/ 1.1.3/ 033480602/ 011EK2.02/ 2.6/2.7/ EOP - EMER

Which one of the following describes the RCS inventory and core heat removal processes during a large break LOCA?

A. HPSI injection provides makeup and heat is removed via natural circulation flow to the S/Gs.

✓B. HPSI pumps, LPSI pumps and the SITs provide makeup and heat is removed via flow out the break.

C. LPSI pumps and the SITs provide makeup and heat is removed via forced flow to the S/Gs.

D. HPSI pumps and charging pumps provide makeup and heat is removed via flow out the break.

A is incorrect, for Large break LOCAs, heat removal is via flow out the break and inventory is established by SITs and LPSIs
B is correct per EOP-5 basis pages 10-11
C is incorrect, S/Gs are not providing heat removal for DBA LOCA
D is incorrect, no credit for heat removal is given to charging pumps for DBA LOCA
Basis: Core Heat RemovalReferences: EOP-5 Rev. 3 Basis DocumentKA1: 02007K3.01KA2:

RCP MALFUNCTIONS 001//NEW–3/201-2-8/1.0/201.024/015AK1.04/2.9/3.1/

Given the following conditions:

-11A RCP tripped due to a breaker fault

-EOP-0 has been completed, no alternate actions were required

How will the RCS and Steam Generators have responded?

A. 11 and 12 loop differential temperatures will be equal and 11 and 12 S/G pressures will be equal.

B. 11 loop will have an inverted differential temperature and 11 S/G pressure will be lower than 12 S/G pressure.

✓C. 12 loop differential temperature will be greater than 11 loop differential temperature and 11 and 12 S/G pressures will be equal.

D. 12 loop will have a smaller differential temperature than 11 and 12 S/G pressure will be lower than 11S/G pressure.

A is incorrect, this reflects equal flow conditions.
B is incorrect, 11 loop will still have forward flow with one RCP in operation, and S/G pressures will be equal.
C is correct, validated with simulator response. 12 loop differential temp. will be about 2°F, 11 loop differential temperature will be approximately 1°F. S/G pressures are essentially equal due to operation of the TBVs.
D is incorrect, 12 loop differential temperature will be approximately twice 11 and S/G pressures will be equal.

6. LOSS OF RCS MAKEUP 001/ / MOD--1/ SRO-201-0-/ 14.4/ 032010407/ 022 2.4.21/ 3.7/4.3/

A reactor trip has occurred and the following conditions exist:

-- Pressurizer level is 140 inches and stable
-- One Charging Pump is available
-- Pressurizer pressure is 1900 psia and rising
-- RCS Subcooling is 65°F and steady

After performing the immediate actions for PIC, the Reactor Operator reports "Pressure and Inventory Control cannot be met" to the CRS.

What is the reason for this report?

A. Letdown has been isolated.

B. RCS subcooling is not in band.

C. All Charging Pumps are not in operation.

✓D. Pressurizer level is not trending toward setpoint.

A is incorrect, letdown status is not a basis for meeting Pressure and Inventory Control
B is incorrect, Subcooling band is 30 to 140 °F.
C is incorrect, charging pump status is not a basis for Pressure and Inventory
D is correct per EOP-0.
ControlBasis: Proper Report from RO to CRSReferences: EOP-0 Rev. 3 and NO-1-201KA1: 03PA3.01KA2: 03PA3.03

7. CRO-113-5-5-25 025/ / NEW--2/ CRO-113-5-/ 6.0/ / 026AK3.02/ 3.6/3.9/ 113 - SERV

Why does the Component Cooling system realign on a SIAS?

A. Minimize dose rates due to contamination of Component Cooling system

✓B. Provide long term cooling to containment after RAS

C. Minimize load on the Saltwater system to ensure containment cooling via Service Water

D. Provide continuous cooling to LPSI pump seals

A is incorrect, CC should not become contaminated due to a LOCA
B is correct per SD-15. The system realigns to cool containment spray which becomes the largest heat load to Component Cooling after RAS.
C is incorrect, the Saltwater system alignment ensures this happens.
D is incorrect, LPSI pumps are secured during RAS.
Basis: System Description References: 55.41.5, 41.10:

MOD

6. LOSS OF RCS MAKEUP 001/ / MOD--1/ SRO-201-0-/ 14.4/ 032010407/ 022 2.4.21/ 3.7/4.3/

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B is incorrect, Subcooling band is 30 to 140 °F.
C is incorrect, charging pump status is not a basis for Pressure and Inventory
D is correct per EOP-0.
ControlBasis: Proper Report from RO to CRSReferences: EOP-0 Rev. 3 and NO-1-201KA1: 03PA3.01KA2: 03PA3.03

DATES: Modified: Tuesday, January 13, 2004 Used: Friday, November 30, 2001 00OP.TST

ANSWERS: Single Points 1

Version Answers:

0	1	2	3	4	5	6	7	8	9
D	A	B	C	D	A	B	C	D	A

☒ Scramble Choices

Scramble Range: A - D

Original

1. SRO-201-0-3-15 015/ STEAM TABL/ 0/ SRO-201-0-/ 14.4/ 032010407/ 03PA3.01/ 03PA3.03/ EOP - EMER

Upon reporting the status of Reactivity Control the RO observes the following plant conditions for the Pressure and Inventory Control safety function in EOP-0:

-- Pressurizer level is 70 inches and decreasing with 3 charging pumps running
-- Letdown was isolated prior to reactor trip
-- Pressurizer pressure is 1900 psia and steady
-- RCS Subcooling is 95°F and steady

The report from the RO to the CRS regarding the status of Pressure and Inventory Control safety function should be:

A. Complete

B. Monitoring

✓C. Cannot be Met

D. Taking Alternate Actions

Basis: Proper Report from RO to CRSReferences: EOP-0 Rev. 3 and NO-1-201KA1: 03PA3.01KA2: 03PA3.03

DATES: Modified: Tuesday, November 27, 2001 Used: Friday, November 30, 2001 00OP.TST

ANSWERS:

Single

Points 1

Version Answers:

0	1	2	3	4	5	6	7	8	9
C	D	A	B	C	D	A	B	C	D

☒ Scramble Choices

Scramble Range: A - D

8. PRESSURIZER PCS MALF 001/ ARM/ BANK--2/ CRO-62-1-3/ 4.1/ 064.036/ 027AK3.03/ 3.7/4.1/

Unit-1 is in Mode 3 with the following conditions:
RCS pressure is 2150 PSIA and lowering
Pressurizer Spray Valves, 1-RC-100E and F are fully open
PIC-100X is indicating 2400 PSIA, controller output is 100%
PIC-100Y is indicating 2150 PSIA output is 0%

What action is required?

A. Stop 11A and 11B Reactor Coolant Pumps.

B. Energize all Pressurizer Heaters.

✓C. Place PZR PRESS CH SEL switch, 1-HS-100 in "Y".

D. Place PRESSURIZER SPRAY VALVE CONTROLLER, 1-HIC-100 in manual with a 100% output.

A is incorrect, would stop depressurization, but indications are of a failed instrument channel.
B is incorrect, with spray valves failed open, RCS would still depressurize.
C is correct, per 1C07 ARM, E-29.
D is incorrect, 100% ouput would keep spray valves open.

9. SRO-201-0-3-29 029/ / NEW--1/ SRO-201-0-/ 3.1/ 022010601/ 029EK1.03/ 3.6/3.9/ EOP - EMER

EOP-8 has been implemented because the Reactivity Safety Function was not met in EOP-0. What indications are used to verify that boration is successfully meeting the acceptance criteria?

✓A. WRNI power is less than 10^{-4}% and SUR is negative or zero

B. LRNI power is less than 10^{-4}% or SUR is negative

C. A boric acid pump is running and charging header flow is 40 GPM or greater

D. SUR is zero and the CHG HDR FLOW LO PRESS LO alam is clear

A is corrrect per EOP-8,appendix 1,rev 26.
B is incorrect, both conditions are required
C is incorrect, boration at the given rate in addition to lowering power and negative SUR indications
D is incorrect, negative SUR and boration rate of at least 40 GPM is specified.

10. SRO-201-6-1-30 030/ EOP-6 REV./ MOD--2/ SRO-201-6-/ 5.1/ 033480603/ 038EK3.01/ 4.1/4.3/ 201 - EMER

Which one of the following is the reason for equalizing the pressure on the primary and secondary sides of a ruptured Steam Generator per the applicable EOP?

A. Lowering the RCS pressure allows HPSI flow to restore Pressurizer level.

✓B. Reducing the differential pressure lowers the RCS leak rate.

C. Reducing RCS pressure and temperature aids initiation of natural circulation.

D. Equalizing RCS and S/G secondary side pressures initiates backflow to control affected S/G level.

A is a correct statement, but does is not a basis for initially lowering RCS pressure during tube leaks.
B is correct per EOP-6 Basis page 33, rev.18
C is incorrect, cooldown and depressurization are directed to lower the RCS leak rate and to allow isolating the affected S/G without lifting a S/G safety valve.
D is incorrect, level is controlled via backflow be depressurizing RCS to less than S/G pressure.
Basis: Basis for subcooling limits in EOP-6References: EOP-6 Rev. 2 Step J BasisKA1: KA2:

11. STEAM LINE RUPTURE 001/ / NEW--1/ 201-3-7/ 1.0/ 201.038/ 040AK1.07/ 3.4/4.2/

Emergency Operating Procedures provide specific guidance for feeding a dry S/G to restore RCS heat removal.

This guidance is based on ____________________________________.
(Select the phrase that correctly completes the above statement)

A. minimizing S/G tube voiding, which would inhibit natural circulation

B. preventing a rapid RCS cooldown, avoiding a pressurized thermal shock to the Reactor Vessel

C. preventing uneven cooling of the RCS, which may result in a localized reactivity excursion

✓D. minimizing the probability of creating a waterhammer, and damaging S/G internals

A is incorrect, the steps to slowly introduce water into the feedring is not based on voiding.
B is incorrect, under the conditions outlined in the procedure, thermal shock is not an issue.
C is incorrect, reactivity addition is not a concern for this method of RCS heat removal.
D is correct per EOP-3 Basis ,step IV.K.2. page 37, rev.20.

mod

10 . SRO-201-6-1-30 030/ EOP-6 REV./ MOD--2/ SRO-201-6-/ 5.1/ 033480603/ 038EK3.01/ 4.1/4.3/ 201 - EMER

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B is correct per EOP-6 Basis page 33, rev.18
C is incorrect, cooldown and depressurization are directed to lower the RCS leak rate and to allow isolating the affected S/G without lifting a S/G safety valve.
D is incorrect, level is controlled via backflow be depressurizing RCS to less than S/G pressure.
Basis: Basis for subcooling limits in EOP-6References: EOP-6 Rev. 2 Step J BasisKA1: KA2:

DATES: Modified: Tuesday, January 13, 2004 Used:

ANSWERS: Single Points 1

Version Answers:

0	1	2	3	4	5	6	7	8	9
B	C	D	A	B	C	D	A	B	C

☒ Scramble Choices

Scramble Range: A - D

Original

1. SRO-201-6-1-20 020/ EOP-6 REV./ 0/ SRO-201-6-/ 5.1/ 033480603/ / / 201 - EMER

A S/G tube rupture has occurred on Unit-1. All RCPs have been tripped. Which one of the following is a reason for maintaining RCS subcooling as low as possible during plant cooldown and depressurization?

✓A. Reduces the differential pressure between the RCS and S/G.

B. Prevents exceeding reactor vessel PTS limits.

C. Enhances natural circulation flow.

D. Prevents drawing a bubble in the reactor vessel head.

Basis: Basis for subcooling limits in EOP-6References: EOP-6 Rev. 2 Step J BasisKA1: KA2:

DATES: Modified: Wednesday, December 12, 2001 Used:

ANSWERS: Single Points 1

Version Answers:

0	1	2	3	4	5	6	7	8	9
A	B	C	D	A	B	C	D	A	B

☒ Scramble Choices

Scramble Range: A - D

12. LOSS OF FEEDWATER 001//NEW–3/201-4-6/3.0/201.015/054AK1.01/4.1/4.3/

EOP-0 was completed and the following conditions exist:

11 S/G pressure	725 PSIA and lowering
12 S/G pressure	840 PSIA
11 S/G level	-260" and lowering
12 S/G level	- 80" and rising slowly
Tc	521°F
Pzr pressure	1830 PSIA

MSIVs and S/G Blowdown Isolation Valves are shut

Which event would cause these indications?

✓A. A Feedwater line rupture inside Containment

B. An RCS leak inside Containment

C. A Main Steam line rupture in the Turbine Building

D. A rupture of the S/G Blowdown Tank

A is correct, a feedline break downstream of the check valve will exhibit the same indications as a Main Steam line rupture inside containment.
B is incorrect, RCS leak would not cause 11 S/G level to continue to lower
C is incorrect, the MSIVs shutting would isolate this leak, Tc and 11 S/G parameters would trend to normal.
D is incorrect, shutting the Blowdown valves would isolate this leak.

13. STATION BLACKOUT 001/ NONE/ MOD--1/ SRO-201-7-/ 9.0/ 201.077/ 055EA1.06/ 4.1/4.5/ 201 - EMER

EOP-7 (Station Blackout) has been initiated on U-1 and the CRS has directed the CRO to restore power to 14 4KV bus using the 0C Emergency Diesel Generator.

What is an indication that this action has been completed?

A. 12 Charging Pump has automatically restarted.

B. 11 and 12 Gravity Feed Valves, 1-CVC-508 and 509 MOV position indications are re-energized.

✓C. U-1 Control Room normal lighting is restored.

D. CEA mimic on 1C05 indications return.

A is incorrect, Charging Pumps will not automatically restart or cycle on due to pressurizer level deviations when energized from an EDG.
B is incorrect, these indications are powered from the MCC supplied by 11 4KV bus.
C is correct per AOP-7I.
D is incorrect, this indication is powered from the instrument bus powered from 11 4KV bus.
Basis: Restore Reactor MCCs and Instrument Buses (MCC-104 to MCC-114)References: EOP-7 Rev. 4 step R and AOP-7IKA1: ?KA2:

14. LOSS OF OFFSITE 001/ / NEW--2/ 201-0-9/ 1.8/ 202.071/ 056AA2.43/ 3.9/4.1/

Unit-1 has experienced a Loss of Offsite Power from 100% power.
11 and 14 4 KV buses have been re-energized by their associated Diesel Generators.
EOP-0 is being implemented.

What action must the CRO take for step B, "ENSURE TURBINE TRIP" that would **NOT** be expected on a reactor trip with offsite power available?

A. Depressing the Turbine TRIP button.

B. Opening 11 GEN FIELD BKR, 1-CS-41.

C. Shutting the MSIVs due to not being able to verify Turbine speed dropping.

✓D. Dispatching an operator to shut the MSR 2nd stage bypass valves.

A is incorrect, this must be performed for all turbine trips.
B is incorrect, DC power is available, the Generator Field Breaker will automatically open.
C is incorrect, Turbine speed indication is available
D is correct per EOP-0, alternate action 3.1

P100

13 STATION BLACKOUT 001/ NONE/ MOD--1/ SRO-201-7-/ 9.0/ 201.077/ 055EA1.06/ 4.1/4.5/ 201 - EMER

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A. 12 Charging Pump has automatically restarted.

B. 11 and 12 Gravity Feed Valves, 1-CVC-508 and 509 MOV position indications are re-energized.

✓C. U-1 Control Room normal lighting is restored.

D. CEA mimic on 1C05 indications return.

A is incorrect, Charging Pumps will not automatically restart or cycle on due to pressurizer level deviations when energized from an EDG.
B is incorrect, these indications are powered from the MCC supplied by 11 4KV bus.
C is correct per AOP-7I.
D is incorrect, this indication is powered from the instrument bus powered from 11 4KV bus.
Basis: Restore Reactor MCCs and Instrument Buses (MCC-104 to MCC-114)References: EOP-7 Rev. 4 step R and AOP-7IKA1: ?KA2:

DATES: Modified: Monday, October 20, 2003 Used:

ANSWERS: Single Points 1

Version Answers:

0	1	2	3	4	5	6	7	8	9
C	D	A	B	C	D	A	B	C	D

☒ Scramble Choices

Scramble Range: A - D

Original

1. SRO-201-7-1-11 011/ NONE/ 0/ SRO-201-7-/ 9.0/ 022010406/ / /201 - EMER

EOP-7 (Station Blackout) has been initiated on U-1 and the crew has restored power to #14 4KV Vital Bus via the 1B DG. The CRS directs you to cross-tie MCC-114 to MCC-104. Which equipment will have power restored upon performing this action?

✓A. #11 Boric acid pump and #12 BAST Gravity Feed MOV (1-CVC-509).

B. Both channels of CETs and U-1 Condenser Off-Gas RMS (RI-1752).

C. U-1 Control Room lighting and LPFW Htr high level dump CVs.

D. ADV controller on 1C03 and #12 Saltwater Air Compressor.

Basis: Restore Reactor MCCs and Instrument Buses (MCC-104 to MCC-114)References: EOP-7 Rev. 4 step R and AOP-7IKA1: ?KA2:

DATES: Modified: Wednesday, October 15, 2003 Used:

ANSWERS: Single

Points 1

Version Answers:

0	1	2	3	4	5	6	7	8	9
A	B	C	D	A	B	C	D	A	B

☒ Scramble Choices

Scramble Range: A - D

15. LOSS OF VITAL AC 001/ / BANK--3/ CRO-63-1-3/ 1.7A, 1.7D/ 020540103/ 057AA2.17/ 3.1/3.4/ SD 63 - ES

The inverter backup bus is powering 1Y01 when offsite power is lost.
How is 4 KV bus 11 affected?

A. 1A DG will start but not load because ESFAS logic cabinet ZA remains deenergized, maintaining a UV (load shed signal) to 4 KV bus 11 loads.

B. 4 KV bus 11 will be re-energized by manually starting and loading 0C Diesel Generator.

✓C. 1A DG will automatically start and load to energize 4KV bus 11 after the 1B DG starts and energizes 4KV bus 14.

D. 4 KV bus 11 cannot be re-energized until power is restored to 1Y01 via DC bus 11.

A is incorrect, logic cabinet ZA will be re-energized when 4 KV bus 14 is re-energized.
B is incorrect, the automatic actions associated with the 1B EDG will restore power to1Y01 which will re-energize ESFAS to start the 1A EDG and repower 11 4 KV bus.
C is correct, the inverter backup bus is powered from MCC 104 which will be re-energized by the 1B EDG.
D is incorrect,see C.
Basis: MCC that is used for backup AC power when inverter OOS
References: 55.41:7 55.43KA1: 063K2.01KA2: 013000K2.01

16. LOSS OF DC POWER 001/ / NEW--2/ 69-5-4/ 1.0/ 094.013/ 058-2.1.19/ 3.0/3.0/

A plant transient has ocurred and the following conditions exist:

--All Unit-1 annunciator lights are deenergized
--CC CNTMT RETURN, 1-CC-3833-CV has failed shut

How will SPDS indicate the cause of this event?

A. All Safety Function boxes turn red, and a "Loss of AC bus " alarm appears on the "Vital Auxiliaries" Safety Function screen.

B. The "Vital Auxiliaries" Safety Function box turns red, and the indicator for the affected AC bus on the electrical systems mimic flashes.

✓C. The "Vital Auxiliaries" Safety Function box turns yellow, and the indicator for the affected DC bus on the electrical systems mimic changes color.

D. All Safety Function boxes turn magenta and a small red box appears next to the indicator for the affected DC bus on the electrical systems mimic.

A is incorrect, indications are for a loss of 21 DC bus, listed indications are not supported by SPDS
B is incorrect, indications are for a loss of 21 DC bus, listed indications are not supported by SPDS
C is correct, per AOP-7J and SPDS alarm response manual.
D is incorrect, indications are for a loss of 21 DC bus, listed indications are not supported by SPDS

17. LOSS OF SRW 001/ / NEW--2/ SALTWTR/ 1.02F/ 202.065/ 062AK3.01/ 3.2/3.5/

2-HS-5155, 22A/22B SRW HXR EMERGENCY OUTLET VLVS handswitch is inadvertantly placed in 'OPEN'.
How are the Service Water Heat Exchangers affected?

A. 22A/22B SRW HXR emergency outlets valves open, but normal SW flow is maintained because the emergency overboard valve is normally gagged shut.

B. 22A/22B SRW heat exchangers are removed from service because the heat exchangers' SW inlet valves will also shut.

✓C. 21A/21B SRW heat exchangers lose SW flow because the emergency overboard valve automatically opens, and 22A/22B SRW heat exchangers SW outlets shift to 21 SW supply header.

D. 21A/21B SRW heat exchangers' SW inlet and outlet valves automatically shut, and 22A/22B SRW heat exchangers will be supplied by 21 SW header.

A is incorrect, emergency outlet valve automatically opens when any emergency outlet valve handswitch is in the OPEN position, the valve is not gagged.
B is incorrect, inlet valves are not affected by this H/S
C is correct per OM-49.
D is incorrect, 21 heat exchanger valves are unaffected, and 21 header will not supply 22 heat exchangers.

18. AOP-7D-08 008/ / BANK--1/ CRO-202-7D/ 4.0/ 020410301/ 065AA1.04/ 3.5/3.4/ AOP-7D, SW

What will automatically start the Saltwater Air Compressors?

A. Low Instrument Air Header pressure.

B. Shutdown Sequencer Signal (SDS).

✓C. Safety Injection Actuation Signal (SIAS).

D. Containment Isolation Signal (CIS)

C is correct per LD-58A sheet 1
Distractors do not start the Saltwater Air Compressors, but "A" would restart the IAC.
Basis: AUTO START FEATURE FOR SWACsReferences: AOP-7DKA1:
02041K4.06KA2:

19. DROPPED CEA 001/ / MOD--1/ CRO-60-1/ 11.5/ 202.008/ 003AA2.01/ 3.7/3.9/ SD 60 - CE

On a dropped CEA, what causes the plant computer to set the CEA position indication to zero?

✓A. Rod bottom reedswitch

B. Up-Down counter signal

C. CEDM breaker position

D. CEA coil power programmers

A is correct per LP and system description.
Distractors are other signals or components within the CEDS
Basis: CEA Indicator Post-trip Reset
References: 55.41:2,6 55.43KA1: 060K4.08KA2: 014000K1.01

20. LOSS OF WRNI 001/ / NEW--2/ CRO-57-1-5/ 6.1.2/ 020570201/ 032 2.2.22/ 3.4/4.1/ SD 57 - NU

Given the following conditions:
Unit-2 is on Shutdown Cooling, RCS temperature is 120°F
RCS pressure is 14.7 PSIA
The reactor vessel head is fully tensioned
Reactor Trip Circuit Breakers are open
One of two operable WRNI channels has failed low

What action is required immediately?

A. Commence boration of at least 40 GPM until RCS boron is 2300 PPM or greater.

✓B. Suspend all operations involving positive reactivity additions.

C. Commence actions to restore two WRNI channels to operable status.

D. Perform SDM verification per Surveillance requirement 3.1.1.1.

A is incorrect, SDM margin verification is not required for 4 hours, which would leak to the boration,if required.
B is correct per Technical Specifications (3.3.12 action A) referenced in ARM D-41.
C is incorrect, but is a specific requirement if 2 Channels are OOS in Mode 6.
D is incorrect. SDM margin verification is not required for 4 hours per TS 3.3.12
Basis: WR NI Requirements
References: 55.41:10 55.43:2 / Tech Spec 3.3.1.1KA1: 057K8.1KA2: K8.2,K8.4

Moo

19 DROPPED CEA 001/ / MOD--1/ CRO-60-1/ 11.5/ 202.008/ 003AA2.01/ 3.7/3.9/ SD 60 - CE

On a dropped CEA, what causes the plant computer to set the CEA position indication to zero?

✓A. Rod bottom reedswitch

B. Up-Down counter signal

C. CEDM breaker position

D. CEA coil power programmers

A is correct per LP and system description.
Distractors are other signals or components within the CEDS
Basis: CEA Indicator Post-trip Reset
References: 55.41:2,6 55.43KA1: 060K4.08KA2: 014000K1.01

DATES: Modified: Tuesday, January 13, 2004 Used: Wednesday, May 16, 2001 01SDM.TST

ANSWERS: Single Points 1

Version Answers:

0	1	2	3	4	5	6	7	8	9
A	B	C	D	A	B	C	D	A	B

☒ Scramble Choices

Scramble Range: A - D

Original

1. CRO-60-1-19 019/ / 0/ CRO-60-1/ 11.5/ N/A/ 060K4.08/ 014000K1.0/ SD 60 - CE

Following a reactor trip, how is the plant computer CEA position indication reset?

✓A. Rod bottom signal.

B. Up-Down counter signal.

C. Reactor trip breaker position.

D. CEA coil power programmers.

Basis: CEA Indicator Post-trip ResetReferences: 55.41:2,6 55.43KA1: 060K4.08KA2: 014000K1.01

DATES: Modified: Monday, April 27, 1998 Used: Wednesday, May 16, 2001 01SDM.TST

ANSWERS:

Single

Points 1

Version Answers:

0	1	2	3	4	5	6	7	8	9
A	B	C	D	A	B	C	D	A	B

☒ Scramble Choices

Scramble Range: A - D

21. FUEL HANDLING ACCIDE 001/ / NEW--2/ LOI-113-6/ 1.8/ 202.052/ 036AA2.02/ 3.4/4.1/

Which of the following would be classified as a fuel handling incident per AOP-6D?

✓A. A large object was dropped in the Spent Fuel Pool and is laying on top of a spent fuel assembly .

B. During refueling of the core, a fuel assembly was placed in an incorrect core location.

C. A new fuel assembly was dropped when being moved from the New Fuel Storage Area to the New Fuel Inspection Platform.

D. A portable light pole hanging off the refueling machine bridge was damaged when performing the refueling machine operational checks per OI-25C.

A is correct per AOP-6D, rev.15, I.B.2.
B-D are incorrect, the procedure is written to address an incident where there is a possibility of damage to an irradiated fuel assembly which could result in damage to a fuel pin.

22. AREA RAD MON 001/ / NEW--2/ 77-1-0/ 2.0/ 079.008/ 061 2.1.1/ 3.7/3.8/

"RMS PANEL 1C26" alarm at 1C18 has annunciated.
2-RI-7010, Unit-2 BAST room Area Radiation Monitor is reading off-scale, high.
No other indications of abnormal conditions are present.

What action is directed by plant procedures?

A. Contact Chemistry to obtain samples of the BASTs, VCT and RCS.

B. Recommend Radiation Safety Supervision post the area.

✓C. Obtain CRS permission to bypass the alarm to clear the alarm at 1C18.

D. Sound the emergency alarm, evacuate the immediate area and declare a Radiological Event per ERPIP 3.0.

A is incorrect, there is no direction nor need to have chemistry take samples on an Area RMS alarm.
B is incorrect, Rad Safety should be called to take surveys.
C is correct per OI-35, rev.26
D is incorrect. The indications stated are indications of an instrument failure, a Rad Event should not be declared unless actual rad levels are high.

23. CRO-202-9A-2-49 049/ NONE/ NEW--1/ CRO-202-9A/ 1.2, 1.2.1/ 022020301/ 067AK3.04/ 3.3/4.1/ AOP-9A

During a severe fire in the Control Room, (AOP-9A), why are the Fairbanks Diesel Generators shutdown?

A. To prevent overloading the Diesel Generators when equipment starts, as the sequencers may not be operable.

B. To ensure fuel is conserved for continued extended operation of the OC Diesel Generator

✓C. To protect the engine from damage due to loss of cooling

D. To ensure MCCs 104 and 114 are de-energized to keep PORVs from failing open

A is incorrect, Diesel loading is not a concern in this condition.
B is incorrect, enough fuel is available for the all diesels to operate within the bounds of this procedure.
C is correct per AOP-9A Unit 1 Bases, rev.8 page 2 of 11.
D is incorrect, but is the basis for opening the Load Center breakers for the MCCs.
Basis: AOP-9A Control Room evacuation positions
References: NO-1-200 Att. 2 41.5, 41.10

24. LOR-114-1-03-08 008/ / BANK--1/ 114-1-03/ 2.4/ 201.073/ 074EA1.16/ 4.4/4.6/ CET

On Unit-2 PAMS, what does a "?" next to a CET temperature indication signify?

✓A. The indication is outside the quality check parameters.

B. The CET is the highest reading CET in it's quadrant.

C. The CET has been "bypassed", and the value is an old, non-updated indication.

D. The indication is a calculated value, not an actual temperature measurement.

A is correct, per design documents, CCNPP-PAMS-0003-03.
B is incorrect, this would be indicated by ?? in the CET number and 0 for value on the C05 default screen.
C is incorrect, bypassed CET indications are preceded by a 'B' and have a blue background and does not revert to an old indication.
D is incorrect, the calculated value associated with the CET temperature is Tcrep.

Ref. CCNPP-PAMS-0003-03; CFR 41.7

25. CRO-107-1-3-55 055/ / BANK-1/ CRO-107-1-/ 2.5/ 202.045/ 076AK2.01/ 2.6/3.0/ PROCES RAD

Which phrase describes the relationship of RCS activity to the Process Rad Monitor? The Process Radiation Monitor:

✓A. detects increases in specific isotopes due to fuel failures

B. detects only increases in RCS activity specifically related to CRUD bursts

C. measures RCS activity changes associated with Severe Accident Mitigation scenarios

D. measures dose rates in the Letdown HX room at power due to CRUD bursts or fuel failures.

A is correct per system description #41
B is incorrect, the PRM will detect increases in RCS activity, the specific isotope (I) distinguishes fuel failures from crud burst activity
C is incorrect, letdown would be isolated in a SAM condition.
D is incorrect, the PRM does not measure dose rates.
Basis: Boron Concentration High Alarm
References: 55.41:10 55.43:5 / ARP C07 F-19KA1: 006K5.16KA2: 004000GEN8

26. EXCESS RCS LEAKAGE 001/ AOP-2A ATT/ BANK--2/ 202-2A-6/ 1.1/ 064.017/ CEA16AA1.1/ 3.4/3.6/

Using provided references, given the following Unit-2 information:

Reactor Power:	100%
Tc:	547.7°F and steady
Letdown flow:	30 GPM
Charging flow:	135 GPM
PZR level:	Lowering at 2.5 inches/minute
RCS pressure:	2210 PSIA and slowly lowering
Total CBO flow:	6 GPM

What is the approximate RCS leak rate, in GPM?

A. 135
✓B. 146
C. 152
D. 172

B is correct, 2.5 inches/minute(18.9 GPM)= 47.25 +(135-36)=146.25
References: AOP-2A attachment 1. 41.7

27. SRO-201-8-1-18 018/ / BANK--1/ SRO-201-8-/ 2.5/ 201.078/ CEE09EK3.4/ 3.3/3.9/ FUNCTIONAL

Which one of the following conditions would allow you to exit EOP-8?

A. A plant cooldown has been completed, shutdown cooling flow has been established, and Core/RCS Heat Removal and Pressure/Inventory safety function status checks for EOP-8 are met.

✓B. All the safety function acceptance criteria for success paths implemented are being met, a single event diagnosis can be made and intermediate safety function status checks for single event are being met.

C. The CRS or STA has analyzed plant conditions and has verified that steps in an optimal recovery procedure, or an Operating Procedure, will address the safety functions such that EOP-8 final acceptance criteria for all the safety functions will be met.

D. In the case of multiple events, one event has been terminated, (such as a when the affected S/G goes dry during an ESDE) and all intermediate safety function status checks for EOP-8 are being satisified.

A is incorrect,EOP-8 will direct SDC operations, all safety functions must be met for the procedure you are tansiting to, or all EOP-8 criteria are satisfied.
B is correct per EOP-8,V.B. rev.26
C and D are incorrect, conflict with EOP-8 requirements.
Basis: EOP-8 exit conditions
References: EOP-8 Rev. 3 Step F 41.5, 41.10

28. AOP-3F-06 006/ / BANK--1/ CRO-202-3F/ 10.2/ 020050427/ 003 2.1.32/ 3.4/3.8/ AOP-3F, RC

When restoring forced circulation it is necessary to verify the 4KV bus voltage greater than 4100 volts prior to starting the RCPs.
What is the basis for this requirement?

✓A. To prevent the 4KV degraded voltage relays from actuating upon RCP start.

B. To prevent tripping the oil lift pumps on low voltage when the first RCP is started.

C. Ensures that the running component cooling pump will operate within its design voltage limits.

D. Ensures that excessive starting current is not developed which could damage RCP windings.

A is correct per OI-1A Precaution L, rev.26
B is incorrect, lift pumps do not have undervoltage protection, and this is not listed as a concern.
C is incorrect, not part of the design limitations.
D is incorrect, not listed as a basis for the limit.
Basis: RCP RESTART CRITERIA/BASIS FOR ENSURING 4KV VOLTAGE > 3950 VOLTS References: AOP-3F KA1: 02005A6.10KA2: 41.10, 43.2

29. CRO-107-1-9-01 001/ / BANK--2/ CRO-107-1-/ 8.3/ 201.085/ 004K6.04/ 2.8/3.1/ CHG PUMP O

Given the following plant conditions:

-- Unit One has tripped due to a Loss of Offsite Power
-- 11 and 14 4KV busses are energized from the EDGs
-- Pzr level is 100" and slowly lowering

How does this effect charging pump operation to restore Pzr level?

A. One charging pump starts automatically, the other charging pumps must be manually started and will stop automatically when Pzr level reaches +13 inches above program.

B. All 3 charging pumps must be started manually and will receive no signals to stop on Pzr level deviations from program.

✓C. All 3 charging pumps must be started manually and the backup pumps will stop automatically when Pzr level reaches +13 inches above program.

D. One charging pump starts automatically the other charging pumps must be operated manually to control pressurizer level.

A is incorrect, none of the charging pumps will automatically start with the normal and alternate 4 KV bus feeder bkrs open.
B is incorrect, backup pumps will stop at +13" from program.
C is correct per Lesson Plan LOI-107-1 and electrical print 61075, sh23
D is incorrect, none of the charging pumps will automatically start with the normal and alternate 4 KV bus feeder bkrs open.
References: 41.7

30. CRO-48-3-0-09 001/ / BANK--1/ CRO-48-3/ 3.4/ 004.010/ 005K2.01/ 3.0/3.2/ 4 KV

Which of the following is a possible cause when the following alarm has actuated?

--On panel 1C19 **"U-1 4KV Eng SF Motor Overload"**

A. 152-1204 (11 Condensate Booster Pump breaker) tripped

B. 152-1114 (U-440-11A high side Feeder) tripped

✓C. 152-1104 (11 LPSI Pump breaker) tripped

D. 152-2107 (21 Containment Spray Pump breaker) tripped

A is incorrect, Condensate Booster pumps are not ESF loads
B is incorrect, this is a service transformer feeder breaker and does not supply an ESF motor
C is correct per 1C18 ARM M-04
D is incorrect, this is a Unit-2 load.
Basis: "U-1 4KV Eng. Sf. Fdr. Bkr Trip" Alarm on 1C19
References: 41.7

31. CRO-63-1-3-18 018/ / BANK--2/ CRO-63-1-3/ 1.7B, 1.7C/ 201.043/ 006K4.11/ 3.9/4.2/ SD 63 - ES

During recovery from a LOCA on U-2, you are directed by the U-2 CRS to reset SIAS from the control room using the implemented EOP . Containment pressure is 2.0 psig and PZR pressure is 800 psia. What sequence of actions must occur to complete this action?

✓A. Match required handswitches per the EOP attachment, block PZR pressure SIAS, and depress both SIAS channel reset pushbuttons.

B. Block Pzr pressure SIAS and depress either SIAS channel reset pushbutton.

C. Match required handswitches and depress both SIAS channel reset pushbuttons.

D. Block the Pzr pressure SIAS and depress both SIAS channel reset pushbuttons.

A is correct per EOP-5 and basis
B is incorrect, without matching handswitches, SIAS cannot be reset from the Control Room, also, both reset pushbuttons must be depressed.
C is incorrect, without blocking Pzr pressure signals, SIAS will not stay reset.
D is incorrect, without matching handswitches, SIAS cannot be reset from the Control Room.
Basis: Steps for Evolution Requirement for Resetting SIAS
References: 55.41:7,10 55.43: 5KA1: 063K4.03KA2: A4.02

32. CRO-113-5-5-19 019/ / BANK--1/ CRO-113-5-/ 12.0/ 202.067/ 008K3.01/ 3.4/3.5/ 113 - SERV

Unit 2 is in Mode 1 at 100% power when a loss of Component Cooling occurs. Which condition from this event alone would require a manual Reactor trip?

A. Main Generator gas temperature of greater than 48°C for at least 15 minutes.

✓B. RCP bleed off temperature of 200°F.

C. Component Cooling heat exchanger outlet temperature of 175°F.

D. Letdown is automatically isolated due to high temperature.

A is incorrect, this system is cooled by SRW
B is correct per 2C07 A&B ARM
C and D are incorrect, these are not trip criteria in any procedure.
Basis: Loss of CC with Unit 2 in Mode 1 at 100% Power
References: 41.4, 41.7

33. PZR QUENCH TNK 001// MOD-2/ CRO-5-2-10/ 16.1/ 064.005/ 007A2.02/ 2.6/3.2/ SD 5 - RCS

Unit 1 is in Mode 5, preparing for a plant heatup.
E01, QUENCH TK TEMP LVL PRESS is in alarm on 1C06.

Given the following Quench Tank parameters:

1) Pressure is 12 PSIG
2) Temperature is 105°F
3) Level is 29 inches

What action is required?

✓A. Open WGS CNTMT ISOL valves, WGS-2180, 2181-CVs and open QT VENT, 1-RC-400-CV.

B. Place PORV handswitches, 1-HS-1402 and 1-1404 in "OVERRIDE"

C. Open Quench Tank Drain, 1-RC-401-CV

D. Open Containment Nitrogen Supply Valve, 0-N_2-238.

A is correct per OI-1B and 1C06 ARM, E-01
B is incorrect, in Mode 5, no PORV leakage would go to the QT
C is incorrect, level is normal
D is incorrect, this would pressurize the QT even more.
Basis: Data on Quench Tank References: 55.41:10 55.43 / OI-1BKA1:
005K5.08KA2: 007000K1.03

mOD

33 X PZR QUENCH TNK 001/ / MOD-2/ CRO-5-2-10/ 16.1/ 064.005/ 007A2.02/ 2.6/3.2/ SD 5 - RCS

Unit 1 is in Mode 5, preparing for a plant heatup.
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Given the following Quench Tank parameters:

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What action is required?

✓A. Open WGS CNTMT ISOL valves, WGS-2180, 2181-CVs and open QT VENT, 1-RC-400-CV.

B. Place PORV handswitches, 1-HS-1402 and 1-1404 in "OVERRIDE"

C. Open Quench Tank Drain, 1-RC-401-CV

D. Open Containment Nitrogen Supply Valve, 0-N_2-238.

A is correct per OI-1B and 1C06 ARM, E-01
B is incorrect, in Mode 5, no PORV leakage would go to the QT
C is incorrect, level is normal
D is incorrect, this would pressurize the QT even more.
Basis: Data on Quench Tank References: 55.41:10 55.43 / OI-1BKA1:
005K5.08KA2: 007000K1.03

DATES: Modified: Tuesday, January 13, 2004 Used: Wednesday, May 16, 2001 00C06REM.TST

ANSWERS: Single Points 1

Version Answers:

0	1	2	3	4	5	6	7	8	9
A	B	C	D	A	B	C	D	A	B

☒ Scramble Choices

Scramble Range: A - D

Original

1. CRO-5-2-10-05 001/ / 0/ CRO-5-2-10/ 16.1/ 020050302/ 005K5.08/ 007000K1.0/ SD 5 - RCS

Given the following data on the Quench Tank:

1) Pressure is 4 psig
2) Temperature is 105°F
3) Level is 29 inches

Analyze the quench tank parameters to determine if any off normal conditions exist.

✓A. No concerns all parameters normal

B. Pressure is too high

C. Temperature is too high

D. Level is too high

Basis: Data on Quench TankReferences: 55.41:10 55.43 / OI-1BKA1: 005K5.08KA2: 007000K1.03

DATES: Modified: Monday, March 19, 2001 Used: Wednesday, May 16, 2001 00C06REM.TST

ANSWERS: Single

Points 1

Version Answers:

0	1	2	3	4	5	6	7	8	9
A	B	C	D	A	B	C	D	A	B

☒ Scramble Choices

Scramble Range: A - D

34. COMPONENT CLG 001/ / NEW--2/ LOI-15-1-0/ 6.0/ 202.029/ 008K4.09/ 2.7/2.9/

Unit-1 was initially at 100% power when a major plant transient ocurred. The following conditions exist:

The 500 KV Red Bus was lost (P-13000-2 is de-energized)
RCS pressure is 1600 PSIA
Tc is 532.4°F
Contaiment pressure is 2.2 PSIG

No other malfunctions occurred.

How many Component Cooling Pumps would be running, assuming no operator actions?

A. 0

B. 1

✓C. 2

D. 3

A is incorrect, but would be true if only a loss of offsite power existed
B is incorrect, but reflects normal conditions with no SIAS condition present
C is correct, the SIAS will start 11 and 12 CC pumps, 1B diesel will pick up 14 4KV bus. LD-58A and 61080 sh 15
D is incorrect, 13 CC pump would only start if the pump aligned to the same electrical bus failed to start.
References: 41.7

35. LOSS OF PCS 001/ / NEW--1/ 5-2-11/ 22.0/ 201.014/ 010K6.03/ 3.2/3.6/

RCS pressure is initially 2250 PSIG.
Spray Valve Controller, 1-HIC-100 fails to a 0% output.
What is a direct result of this failure?

A. All Backup Heaters will energize if in "Auto".

B. Spray Valves 1-RC-100E and F will fully open.

C. All Backup heaters will deenergize.

✓D. Proportional heaters will receive full power

A is incorrect, Backup heater operation is controlled by PIC-100X or Y
B is incorrect, spray valves will be fully open at 100% output
C is incorrect,Backup heater operation is controlled by PIC-100X or Y
D is correct per SD-64D, and FSAR fig. 7-13
References: 41.7

36. RPS MALF 001/ / NEW--2/ 58-1-01/ 6.2,10.5/ 058.004/ 012K3.02/ 3.2/3.3/

Unit-2 is at 16% power, with the Turbine Generator having just been paralleled with the grid.
A malfunction in RPS channel B causes the Power Trip Test Interlock (PTTI) to actuate.
How is the Turbine Generator affected?

A. A turbine trip will result due to ESFAS B logic cabinet initiating a turbine trip signal.

✓B. Trip logic will be reduced to 1 out of 3, since channel B Loss of Load trip unit will actuate.

C. The Turbine Generator will not be affected since the Loss of Load Trip is disabled.

D. RPS will initiate a Turbine Trip signal, but the signal is bypassed at ESFAS due to low reactor power.

A is incorrect, only one input is satisifed, so no trip signal is generated.
B is correct, power is greater than 15%, so loss of load is enabled, and PTTI will trip channel B loss of load trip unit. FSAR chapter 7 and lesson plan LOI-058-1
C is incorrect, Loss of Load is enabled at 15% or greater.
D is incorrrect, RPS is in 1/3 logic, ESFAS signal to trip the turbine is not affected by power level.
references: 41.7

37. RPS POWER SUPPLIES 001/ / NEW--1/ 58-1-01/ 8.3/ 058.007/ 012 2.4.47/ 3.4/3.7/

Using provided references:

If 1Y03 were de-energized, which RPS matrix power supply lights at 1C15 would be extinguised?

A. 5 and 15
B. 5,9 and 7
✓C. 8,12 and 15
D. 9 and 10

C is correct per FSAR figure 7-2
All distractors are other power supplies but not affected by loss of 1Y03
References: 41.10, 43.2

38. ESFAS 001/ / NEW--3/ 201-6-7/ 2.0/ 202.120/ 013A1.01/ 4.0/4.2/

A S/G tube rupture has been diagnosed, the correct EOP has been implemented and the following conditions exist:

RCS pressure is 1280 PSIA
RCS temperature is 485°F
PZR level is 85"
11A and 12B RCPs are running
Cooldown rate is 95°F/hr, using TBVs
The affected S/G has been isolated and pressure is 700 PSIG

What action is required?

A. Secure the remaining RCPs to prevent exceeding pump curve limits.

B. Throttle HPSI flow to allow for backflow from the affected S/G as RCS depressurization continues.

✓C. Lower TBV controller output to avoid exceeding cooldown rate limits when HPSI injection begins.

D. Increase RCS depressurization using Main Spray to lower the leak rate into the affected S/G.

A is incorrect, at 485°F, pumps can be run to 850 PSIA.
B is incorrect, HPSI throttling is not permitted below 101" PZR level.
C is correct, HPSI injection will start at about 1270 PSIA and will increase RCS cooldown rate as Cooler RWT water is injected.
D is incorrect, although depressurization is a main goal of the procedure, with these conditions, the RCS cooldown rate would be exceeded if injection occurs before steaming rate is reduced. Also, with 2 RCPs running Main Spray is not effective, EOP-6 directs the use of Aux. spray if depressurization is desired.
References: EOP-6, 41.5

39. CONTAINMENT COOLING 003/ / NEW--2/ LOR-344-1/ 1.1/ 012.005/ 022K1.01/ 3.5/3.7/ TECH SPECS

Part of the 2003 modification to the LOCI sequencer advanced the start of the Service Water pumps from step 4 to step 0.
Why was this modification made?

A. Prevents overloading the Emergency Diesel Generators

B. Prevents tripping the supply breakers for the safety related 4 KV buses

C. Prevents damage to the Service Water Pump motors caused by excessively high starting currents

✓D. Prevents a rupture of the Service Water system caused by water hammer in the Containment Air Coolers

D is correct per ES199700364 and lesson plan LOR-344-1-03.
Distractors are reasons for previous changes to sequencers or for other modifications to equipment.
References: 41.2-41.9

40. CONTAINMENT SPRAY 001/ / NEW--2/ 052-3-1/ 13.0/ / 026K2.01/ 3.4/3.6/

2A Diesel Generator is being taken out of service for routine maintenance.
Which component is also potentially affected? **ASSUME NORMAL SYSTEM LINEUPS**

✓A. 21 Containment Spray Pump

B. 22 Charging Pump

C. 12 SFP Cooling Pump

D. 23 Saltwater Pump

A is correct, powered from 2A EDG fed 21 4KV bus, per OI-27C
B is incorrect, powered from 24 480 volt bus, fed by 2B EDG
C is incorrect, powered from 24 480 volt bus, fed by 2B EDG
D is incorrect, powered from 24 4KV bus, fed by 2B EDG
References: 41.7

41. CONTAINMENT SPRAY 002/ / NEW--1/ 201-5-6/ 1.2/ 201.063/ 026A2.07/ 3.6/3.9/

A LOCA has occurred, SIAS initiated and RWT level is 7 feet and lowering.

What actions are directed by the applicable EOP to prevent or mitigate cavitation of the Containment Spray Pumps?

A. Align a HPSI pump to the suction of a CS PP if discharge pressure lowers and amps fluctuate.

✓B. Verify Containment Sump level rises as RWT level lowers and, after RAS has initiated, place a second CC HX in service.

C. Prior to RAS, place both CS PPs in PULL TO LOCK. Verify sump level is greater than 28". When RAS actuates, place a second CC HX is in service.

D. When RWT level lowers to 4 feet, throttle CS PP discharge valves per EOP attachments. After RAS has initiated, verify flow less than 1300 GPM.

A is incorrect, but aligning a CS PP to the suction of a HPSI PP is directed in the EOP if a HPSI is cavitating.
B is correct per EOP 5, Rev.19 Section IV, steps P and S.
C is incorrect, but there is direction to verify the sump has at least 28" of water in it.
D is incorrect, but the procedure directs CS PPs to be placed in PTL if RWT level is 4 feet and CSAS has not initiated. It also directs throttling HPSI valves per an attachment.
References: EOP-5, 41.5, 43.5

42. MN STM RMS 001/ / NEW--2/ LOI_77-1-0/ 1,2/ 202.016/ 039A1.09/ 2.5/2.7/

With reactor power at 25%, what indication is available to the operator to monitor a S/G tube leak of 5 GPD?

A. Only S/G sample results reported by Chemistry

B. N-16 monitors and Condensor Off Gas RMS

✓C. Condenser Off Gas RMS and Main Steam Line Radiation Monitors

D. N-16 monitors only

A is incorrect, newer instrumentation has allowed CCNPP to detect S/G tube leakage on the order of a few GPD.
B is incorrect, the N-16 indication is only accurate above 50% power, note in OI-35 states that below 50%, N-16 may indicate 0.00 GPD leak rate.
C is correct, the condenser off gas RMS has a reactor power input that is used in calculating the leakrate. The main steam line RMS will indicate a difference in the affected steam header vs. non-affected header, since it indicates actual steam line radiation levels. The Recorder would also be used to show trends.
D is incorrect, the N-16 indication is only accurate above 50% power, note in OI-35 states that below 50%, N-16 may indicate 0.00 GPD leak rate.
References: 41.5

43. CRO-102-2-16 016/ / BANK--2/ CRO-102-8/ 20.0/ 093.015/ 039A4.01/ 2.9/2.8/ 102 - 1/2C

The following conditions exist on Unit 2:

Reactor/Turbine trip has just occurred
(Power prior to trip--100%)
S/G pressures are currently 850 psig

What operator action (in the Control Room) must initially be taken to prevent an overcooling of the RCS per EOP-0?

A. Press "Close Valves" button on the turbine control panel.

✓B. Press "Reset" button on the MSR control panel.

C. Shut the MSIVs.

D. Press the BFV "reset" buttons.

B is correct per EOP-0, Unit-2 basis.
Distractors are actions which are not directed by the procedures
Basis: Reactor Trip With Unit 2 at 800 MWE and MSRs in Service References: 41.7

44. CRO-103-2-4-82 082/ AOP-3G/ MOD-2/ CRO-103-2-/ 3.0/ 202.036/ 056A2.04/ 2.6/2.8/ T2G1

Unit 1 is operating at 50% power.
An electrical system malfunction occurs resulting in the loss of 12 and 13 Condensate Pumps.
What is the effect of this transient, and what action must be taken?

A. Reduced feed flow to the S/Gs and lowering levels will result. Bias feed pumps as required to maintain S/G levels.

B. Lower SGFP suction pressure will exist. Verify a Condensate Booster Pump automatically starts.

C. Reduced feed flow to the S/Gs and lowering levels will result. Trip the reactor and implement EOP-0.

✓D. Low suction pressure to the SGFPs and runout of the operating Condensate Pump will result. Reduce power to maintain condensate header flow less than 8,000 GPM.

A is incorrect, biasing feed pumps will cause additonal loss of NPSH to the SGFPs.
B is incorrect, Per AOPs-3G and 7I, a main concern is runout of the condensate pump and increased wear and cavitiation, so power must be reduced.
C is incorrect, a trip should only be required if greater than 70% per AOP-7I.
D is correct. This guidance is available in both AOP-7I and AOP-3G
References: 55.41:4 55.43.5 /

MDO

44 CRO-103-2-4-82 082/ AOP-3G/ MOD-2/ CRO-103-2-/ 3.0/ 202.036/ 056A2.04/ 2.6/2.8/ T2G1

Unit 1 is operating at 50% power.
An electrical system malfunction occurs resulting in the loss of 12 and 13 Condensate Pumps.
What is the effect of this transient, and what action must be taken?

A. Reduced feed flow to the S/Gs and lowering levels will result. Bias feed pumps as required to maintain S/G levels.

B. Lower SGFP suction pressure will exist. Verify a Condensate Booster Pump automatically starts.

C. Reduced feed flow to the S/Gs and lowering levels will result. Trip the reactor and implement EOP-0.

✓D. Low suction pressure to the SGFPs and runout of the operating Condensate Pump will result. Reduce power to maintain condensate header flow less than 8,000 GPM.

A is incorrect, biasing feed pumps will cause additonal loss of NPSH to the SGFPs.
B is incorrect, Per AOPs-3G and 7I, a main concern is runout of the condensate pump and increased wear and cavitiation, so power must be reduced.
C is incorrect, a trip should only be required if greater than 70% per AOP-7I.
D is correct. This guidance is available in both AOP-7I and AOP-3G
References: 55.41:4 55.43.5 /

DATES: Modified: Wednesday, October 29, 2003 Used: Wednesday, October 15, 2003 2002RO.TST

ANSWERS: Single Points 1

Version Answers:

0	1	2	3	4	5	6	7	8	9
D	A	B	C	D	A	B	C	D	A

☒ Scramble Choices

Scramble Range: A - D

Original

1. CRO-103-2-4-06 007/ AOP-3G/ MOD-ANA/ CRO-103-2-/ 3.0/ 020290202/ 056A2.04/ 2.6/2.8/ T2G1

Unit 1 is operating at 100% power with condensate pumps 11, 12 and 13 running when #12 condensate pump trips.
What effect will this have on the secondary and what steps should be taken to mitigate the consequences?

A. Reduced feed flow to the S/Gs and lowering levels will result. Bias feed pumps as required to maintain S/G levels.

B. Lower feed pump suction pressure will exist. Verify a condensate booster pump automatically starts.

✓C. Lower condensate header pressure will exist. Place hotwell level control in manual and bypass condensate demineralizers and precoat filters.

D. Cavitation and increased impellar wear will occur. Reduce power to maintain condensate header flow less than 8,000 GPM.

References: 55.41:4 55.43.5 /

DATES: Modified: Wednesday, October 29, 2003 Used: Wednesday, October 15, 2003 2002RO.TST

ANSWERS: Single

Points 1

Version Answers:

0	1	2	3	4	5	6	7	8	9
C	D	A	B	C	D	A	B	C	D

☒ Scramble Choices

Scramble Range: A - D

45. MAIN FEED O4 001/ NONE/ MOD--2/ LOI45B-1/ 9.0,14.0/ 202.040/ 059K4.08/ 2.5/2.7/ FRDFWCS MA

Unit-1 is at 100% power. Both feedwater flow transmitter signals from 12 S/G to DFWCS faillow (out of range).
How is 12 FRV, 1-FW-1121-CV, affected?

A. The last good feed flow input is used and 12 FRV control is shifted to the Backup CPU.

B. Both CPUs fail and 12 FRV controller is shifted to "MANUAL".

C. An "11/12 S/G FW CONTR XFER INHIBIT" alarm is received, a shift from high power to low power control mode will not occur and 12 FRV will be controlled by the Backup CPU.

✓D. Steam flow/feed flow error signal is not used and the Main CPU operates the FRV in single element control.

A is incorrect, with both signals out of range, a deviation alarm is sent, and the main CPU continues to operate the system in single element control.
B is incorrect, main continues to operate in Auto.
C is incorrect, the system would not shift to High Power Mode if in low power mode, but low power mode is unaffected.
D is correct, single element control is used with the loss of both steam flow channels or both feed flow channels.
See LOR LP 301-1-98, or ES-199602497
Basis: Failure of a Feed Flow input signal offscale LOW
References: OI-12A 41.7

MOD

45 9. MAIN FEED O4 001/ NONE/ MOD--2/ LOI45B-1/ 9.0,14.0/ 202.040/ 059K4.08/ 2.5/2.7/ FRDFWCS MA

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C. An "11/12 S/G FW CONTR XFER INHIBIT" alarm is received, a shift from high power to low power control mode will not occur and 12 FRV will be controlled by the Backup CPU.

✓D. Steam flow/feed flow error signal is not used and the Main CPU operates the FRV in single element control.

A is incorrect, with both signals out of range, a deviation alarm is sent, and the main CPU continues to operate the system in single element control.
B is incorrect, main continues to operate in Auto.
C is incorrect, the system would not shift to High Power Mode if in low power mode, but low power mode is unaffected.
D is correct, single element control is used with the loss of both steam flow channels or both feed flow channels.
See LOR LP 301-1-98, or ES-199602497
Basis: Failure of a Feed Flow input signal offscale LOW
References: OI-12A 41.7

DATES: Modified: Tuesday, January 13, 2004 Used: Thursday, September 27, 2001 00C03.TST

ANSWERS: Single Points 1

Version Answers:

0	1	2	3	4	5	6	7	8	9
D	A	B	C	D	A	B	C	D	A

☒ Scramble Choices

Scramble Range: A - D

Original

1. CRO-103-1-2-31 031/ NONE/ 0/ CRO-103-1-/ 1.3/ 020320307/ / / FRDFWCS MA

Failure of both feedwater flow transmitter input signals offscale **LOW** into DFWCS while in HIGH POWER mode will cause which one of the following?
(NOTE: Both CPUs are in service and operating normally)

A. The input causes a failure of the main CPU and control shifts to the backup CPU.

B. Both CPUs fail and all feed controllers transfer to manual control.

C. No effect, the main CPU retains the last good flow signal, and annunciates an "automatic transfer inhibit" alarm.

✓D. The feedwater flow signal is bypassed and the main CPU operates in single element control.

Basis: Failure of a Feed Flow input signal offscale LOWReferences: OI-12AKA1: KA2:

DATES: Modified: Wednesday, October 29, 2003 Used: Thursday, September 27, 2001 00C03.TST

ANSWERS: Single Points 1

Version Answers:

0	1	2	3	4	5	6	7	8	9
D	A	B	C	D	A	B	C	D	A

☒ Scramble Choices

Scramble Range: A - D

4 MFW ISOL 001/ / NEW--2/ 048-1-0/ 1.7.D/ 201.055/ 059A3.06/ 3.2/3.3/

Unit-2 was initially at 100% power when a major plant transient occurred. The following conditions exist:

RCS pressure is 1800 PSIA
Containment pressure is 0.4 PSIG
21 S/G pressure is 865 PSIG
22 S/G pressure is 680 PSIG

Which list correctly identifies Main Feedwater/Condensate system automatic actions?

A. Both SGFPs trip, all Condensate Pumps trip, both Heater Drain Pumps trip, both Main Feed MOVs shut and both MSIVs shut.

✓B. Both SGFPs trip, all Condensate Booster Pumps trip, both Heater Drain Pumps trip, both Main feed MOVs shut and both MSIVs shut.

C. Both SGFPs trip, all Condensate Booster Pumps trip, both Heater Drain Pumps trip, 22 Main Feed MOV shuts and 22 MSIV shuts.

D. Both SGFPs trip, all Condensate Pumps trip, all Condensate Booster Pumps trip, both Heater Drain Pumps trip, both Main Feed MOVs shut and both MSIVs shut.

A is incorrect, Condensate Pumps do not receive SGIS
B is correct per 2C03 ARM and 2-LD58A.
C is incorrect, both MSIVs and MOVs shut.
D is incorrect, Condensate Pumps do not receive SGIS.
References: 41.5, 43.5

4?. AFW 04 001/ / NEW–1/ LOI-34-2/ / 202.113/ 061K5.01/ 3.6/3.9/

What is the basis for the AFW flow controller automatic setpoints of 150 GPM?

A. S/G levels will be restored to EOP-1 limits within 10 minutes of AFAS actuation with MFW isolated, and AFW suction piping flow limits are not exceeded.

B. EDG ratings are not exceeded on SIAS with a Loss of Offsite Power, and S/G inventory is adequate for worst case decay heat with 2 trains of AFW operating.

✓C. AFW flow will be adequate with one AFW train to remove highest decay heat, but low enough to prevent initiating SIAS due to RCS overcooling with 2 trains operating.

D. AFW flow will be adequate to maintain S/G level in the unaffected S/G in the event of AFAS Block to the affected S/G with no operator action, yet low enough to prevent RCS cooldown to less than 525°F with one train operating.

A is incorrect, the suction header flow limit is 600 GPM , there is no requirement to meet EOP-1 condtions in 10 minutes.
B is incorrect, no EDG limit exists and 1 train of AFW is adequate.
C is correct.per SD-36A/B
D is incorrect, these criteria are not specified anywhere.
References: 41.5

48. AFW XCONN 001/ / MOD–2/ CRO-34-2-7/ 9.0/ 201.031/ 061A1.03/ 3.1/3.6/ LIMITS

A Loss of Offsite Power exists with Unit-1 previously at 100% power and Unit-2 in Mode 5. Unit-2 has been unable to restore Shutdown Cooling and is using 13 AFW Pump to restore S/G levels.
Unit-1 is using 11 AFW Pump to feed 11 and 12 S/Gs at 150 GPM per S/G.

What is the flow limit for 13 AFW pump to supply Unit-2?

A. 275 GPM

✓B. 300 GPM

C. 600 GPM

D. 900 GPM

Per OI-32A, Rev.19, Unit-1 6.3.C.1, total AFW flow should be less than 600 GPM when feeding both units from a single AFW System.
600-300 =300, so B is correct..
A is incorrect, but represents the Motor limit of 575 GPM, minus the 300 GPM to Unit-1 carried by the steam pump.
C is the total flow limit for one system.
D is the 1200 two system limit minus, 300 GPM used on Unit-1
Basis: AFW flow limitsReferences: 10CFR55.41: 7 - SD-34 - OI-32KA1: 02034K6.02KA2: 061000K4.04

MOD

48 1. AFW XCONN 001/ / MOD-2/ CRO-34-2-7/ 9.0/ 201.031/ 061A1.03/ 3.1/3.6/ LIMITS

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600-300 =300, so B is correct..
A is incorrect, but represents the Motor limit of 575 GPM, minus the 300 GPM to Unit-1 carried by the steam pump.
C is the total flow limit for one system.
D is the 1200 two system limit minus, 300 GPM used on Unit-1
Basis: AFW flow limitsReferences: 10CFR55.41: 7 - SD-34 - OI-32KA1: 02034K6.02KA2: 061000K4.04

DATES: Modified: Tuesday, January 13, 2004 Used: Wednesday, June 17, 1998 1C07&04.TST

ANSWERS: Single Points 1

Version Answers:

0	1	2	3	4	5	6	7	8	9
B	C	D	A	B	C	D	A	B	C

☒ Scramble Choices

Scramble Range: A - D

Orig Ans!

1. CRO-34-2-3-08 008/ / 0/ CRO-34-2-7/ 9.0/ 020340201/ 02034K6.02/ 061000K4.0/ LIMITS

If 11 & 13 AFW pumps are being used to provide AFW flow to both units, total flow is limited to which value?

A. 575 gpm

✓B. 600 gpm

C. 1175 gpm

D. 1200 gpm

Basis: AFW flow limitsReferences: 10CFR55.41: 7 - SD-34 - OI-32KA1: 02034K6.02KA2: 061000K4.04

DATES: Modified: Wednesday, June 17, 1998 Used: Wednesday, June 17, 1998 1C07&04.TST

ANSWERS: Single Points 1

Version Answers:

0	1	2	3	4	5	6	7	8	9
B	C	D	A	B	C	D	A	B	C

☒ Scramble Choices

Scramble Range: A - D

49. AC DISTRIBUTION 001/ / NEW–2/ 202-7I-4/ 3.0/ 202.097/ 062A2.01/ 3.4/3.9/

Unit-1 is at 100% power when 13B 480 Volt Bus is lost.

What is the major affect to the plant, and what action must be taken?

A. Boration via the RWT from all operable Charging Pumps causes power to decrease. The Charging Pumps are placed in PTL, suction is shifted back to the VCT.

B. All Circulating Water Pumps lose excitation. The Reactor is tripped and EOP-0 is implemented

C. Feedwater Heater Level Dump Valves fail open, reactor power increases. Reactor power is reduced, the valve handswitches are matched and 1Y09 and 1Y10 are tied.

✓D. 12 and 13 Condensate Pumps' bearing temperatures rise due to loss of lube oil cooling. MCCs 106 and 116 are tied.

A is incorect, this describes a loss of MCC-104 or14A 480 Volt Bus.
B is incorrect, this describes a loss of 15 480 Volt Bus.
C is incorrect, this describes a loss of MCC-114 or 11A 480 Volt Bus.
D is correct per AOP-7I.
References: AOP-7I, 41.5, 43.5

50. LOR-020540304-002 001/ AOP-7J REV/ BANK–1/ LOR-202-7J/ 2.2/ 202.101/ 063A4.01/ 2.8/3.1/ BUS

A loss of which one of the following buses will result in a loss of all Unit-2 annunciator alarms?

✓A. 11 125 VDC bus
B. 12 125 VDC bus
C. 21 125 VDC bus
D. 22 125 VDC bus

A is correct per AOP-7J
Basis: Determine which bus was lost
References: AOP-7J Rev. 41.7

51. EDG SYS 001/ / NEW--2/ LOI-02-1-0/ 3.0/ 002.010/ 064K1.04/ 3.6/3.9/

1A Diesel Generator is out of service for maintenance when a Loss of Offsite Power occurs.
2B Diesel Generator did not load due to a faulted 4 KV bus.

What affect does this have on the DC electrical distribution system as indicated at 1C24A?

A. 11 DC bus will be supplied only by 11 battery.

B. 21 DC bus will be supplied by 21 battery charger.

C. 12 DC bus will be supplied by 24 battery charger.

✓D. 22 DC bus will be supplied by 22 battery charger.

A is incorrect, 11 bus will have power from 23 battery charger
B is incorrect, 21 battery charger is powered from 24A 480 volt bus, which remained deenergized.
C is incorrect, 24 battery charger is powered from 24B 480 volt bus which remained deeneregized
D is correct, 22 battery charger is powered from 21B 480 volt bus, carried by 2A Diesel Generator
References: 41.2- 41.9

52. CRO-122-1-3-07 009/ / BANK--1/ LOI-77-1-0/ 1.0/ 079.008/ 073K5.01/ 2.5/3.0/

What type of radiation do the Component Cooling, Service Water and S/G Blowdown Recovery (process rad. monitors) detect?

A. Alpha

B. Beta

✓C. Gamma

D. Neutron

C is correct per SD-77.
References: 41.5

53. CRO-113-2-5-24 024/ / BANK--1/ CRO-113-2-/ 2.2/ 011.005/ 076A1.02/ 2.6/2.6/ 113 - SERV

During normal operation at 100% power, what is the largest heat load on the Service Water system?

✓A. Main Generator Hydrogen Coolers.

B. Hydrogen Seal Oil Coolers

C. Containment Air Coolers

D. 1B Diesel Generator

A is correct per AOP-7B, loss of SRW.

Basis: Largest Heat Load(s) on Service Water System During A Trip of SW
References: 41.5

54. INSTRUMENT AIR04 002/ / NEW--2/ 019-1-0/ 2.0/ 201.020/ 078K4.02/ 3.2/3.5/

After a SIAS actuation, what is the source of Instrument Air supplied to the AFW flow control valves?

A. Saltwater Air Compressors

✓B. The opposite unit's Plant Air Compressor

C. Auxiliary Feedwater system air accumulators

D. Nitrogen backup to Instrument Air

A is incorrect, a manual valve, 1-IA-728 or 2-IA-314 (or 317) must be opened. and header pressure must be less than 85 PSIG
B is correct, the PA/IA cross connect opens at 88 PSIG and will return pressure to normal.
C is incorrect. The accumulators will supply air if the header pressure is less than 85 PSIG
D is incorrect, nitrogen backup requires manual valve operation and lower instrument air header pressure.
References: SD. 41.7

55. CONTAINMENT 04 012/ / NEW--2/ 212-1-4/ 1.3/ 204.076/ 103A2.05/ 2.9/3.9/

What affect does a containment entry at power have on the Containment system, and how is this impact controlled?

✓A. Containment airlock door seals must be tested within 7 days, containment access checklists ensure testing is scheduled.

B. Containment integrity is breached, per the containment entry checklists, someone must be stationed outside the airlock door while it is open.

C. Containment atmosphere enters the Auxiliary Building unfiltered, per access procedures, a containment vent is performed prior to containment entry.

D. Containment is a Foreign Materials Exclusion boundary, an FME log (MN-1-109 att.5) is required for entry

A is correct per EN-4-105 and NO-1-104
B is incorrect, there is no requirement to have anyone at the containment door while open.
C is incorrect, there is no requirement to vent containment prior to entry.
D is incorrect, MN 1-109 does not require the log. FME concerns are adressed by NO-104 checklists.
References: EN-4-105, NO-1-104 41.5, 43.5

56. CRO-60-1-04 004/ / BANK--2/ CRO-60-1/ 10.1, 2, 1/ 055.003/ 001A4.08/ 3.7/3.4/ SD 60 - CE

Under which condition can CEAs be WITHDRAWN in the manual sequential mode? **(without using CMI bypass features)**

✓A. Tavg-Tref deviation alarm.

B. Group 5 CEAs below the PDIL.

C. 2 out of 4 TM/LP channel pretrips at RPS.

D. A misaligned CEA 7.5 inches from its group.

A is correct, per 1C05 ARM, all other conditions result in a CWP

Basis: Withdrawing of CEAs in Manual Sequential Mode References: 55.41:2,6
55.43KA1: 060K4.06KA2: K11.01

57. CRO-5-2-10-06 001/ / BANK–2/ CRO-5-2-3/ 18.1/ 078.010/ 002A1.06/ 4.0/4.0/

The reactor is at steady state conditions and turbine load has been adjusted to maintain Tc on program.

Given the following:
T cold is 538°F
T hot is 556°F

What is reactor power?

A. 18%
B. 34.5%
C. 37.5%
D. 40.5%

Tc @0% is 532, @100% is 548, 16/100=6/x so, x=37.5%
Or delta T at 0% is 0, delta T at 100% is 48, existing delta T is 18, 18/48=x/100=37.5
References: 41.5

Which statement satisfies the requirements for minimum operable position indication channels for a CEA?

A. CEA voltage divider reed switch position indicator channel capable of determining the absolute CEA position within ±6 inches
and
CEA pulse counting position indicator channel.

B. CEA voltage divider reed switch position indicator channel capable of determining the absolute CEA position within ±7.5 inches
or
CEA "Full Out" reed switch position indicator channel only if the CEA is fully withdrawn as verified by actuation of the applicable position indicator.

✓C. CEA voltage divider reed switch position indicator channel
and
CEA pulse counting position indicator channel in agreement within 4.5 inches.

D. CEA voltage divider reed switch position indicator channel capable of determining the absolute CEA position within ±1.75 inches of absolute position
or
CEA "Full Out" reed switch position indicator channel only if the CEA is fully withdrawn as verified by actuation of the applicable position indicator.

A is incorrect, no requirement exists for the 6" limit.
B is incorrect, 7.5 inches is the T.S. limit for deviation between CEAs within a group, and 2 position indicator channels are required.
C is correct, reflects wording in TNC 15.1.5
D is incorrect, the statement involving 1.75 inches was deleted, and 2 channels are required, not one.
Basis: CEA Position Channels References: 55.41:2,6,10 55.43:2

5 . NUCLEAR INSTRUMENTS 001/ / NEW--3/ / / 078.009/ 015A3.05/ 2.6/2.7/

Which condition would cause **audible** WRNI count rate to rise?

A. Pulling CEAs to criticality when performing the first reactor startup following a refueling outage

✓B. Reinserting a once-burned fuel assembly in a new core location

C. During RCS drain down to reduced inventory for RCP seal replacement

D. Withdrawing CEA #1 from a fuel assembly while swapping CEAs

A is incorrect, audio count rate is only available on the refueling cart, which is disconnected before startup.
B is correct, this is a positive reactivity addition, it is normal during refueling
C is incorrect, draining should add no positive activity, and audio count rate may not be available as it is only required during core alterations.
D is incorrect, **all** CEAs are not credited for refueling SDM, also, the CEA is in the center of the core, away from the excore detectors and would have no effect on count rate.
References: 41.7

60. H2 ANALYZER 001/ / NEW--1/ LOI-052-5/ 12.B/ 073.003/ 028A4.03/ 3.1/3.3/

How are the **sample locations** indicated on the Hydrogen Analyzer recorders on 1(2)C10 selected?

A. Manually at the recorder

B. Automatically or manually by the plant computer

✓C. Automatically or manually from sample panels in the Aux. Building

D. Automatically at the recorder

C is correct per SD-38B and Chemistry Procedures
References: 41.7

61. CONTAINMENT PURGE 001/ / NEW--2/ CRO-122-1/ 2.0, 3.0/ 020150208/ 029K4.03/ 3.2/3.5/

Refueling operations are in progress and Containment Purge is in operation. While taking logs in the Cable Spreading Room, the CRO notices that channel ZF of CRS is bypassed.

How does this affect Containment Purge?

A. Containment Purge will be automatically secured if any other channel of CRS actuates.

B. In the event of a valid CRS signal, one Containment Purge CV will remain open.

✓C. Containment Purge must be secured (or fuel movement suspended), per Technical Specification requirements.

D. The remaining channels of CRS must be verified operable to allow Containment Purge to remain in operation

A is incorrect, with one sensor bypassed, it requires 2 channels to trip.
B is incorrect, bypassing a sensor will not effect how the components reposition on a valid signal.
C is correct. TS 3.3.7 requires all sensors to be operable during fuel movement.
D is incorrect per TS 3.3.7
References: 55.41.7, 55.43.2. **Related to Calvert Cliffs LER involving refueling with one channel of CRS inoperable during 2001 refueling outage**

62. CRO-113-4-3-06 001/ / BANK--2/ CRO-113-4/ 3.5/ 202.057/ 033K3.03/ 3.0/3.3/

High Spent Fuel Pool temperature is corrected by what action?

A. Adjusting spent fuel pool temperature controller setpoint.

B. Throttling 11A/B SRW heat exchanger Saltwater outlet valves open.

C. Adjusting SFP CLR OUT THROTTLE valve to obtain a discharge pressure of greater than 120 psig.

✓D. Throttling open SFP CLR DISCH HDR stop valve.

A is incorrect, there is no controller for SFP cooling.
B is incorrect, no spent fuel pool cooler is cooled by 11 SRW header.
C is incorrect, but is the method for controlling SFP cooling system flowrate to prevent pump runout.
D is correct per 1C13 ARM and OI-24A
References: 41.7

63. LIQUID RADWASTE 001/ / NEW--2/ LOR-71-1-0/ / 064.041/ 068K5.04/ 3.2/3.5/

What advantage has CCNPP realized from processing liquid radwaste through the NUKEM skid over using the originally installed waste processing system?

A. Lower cost for processing liquid radwaste

✓B. Decreased amount of radioactive material released to the Chesapeake Bay

C. Smaller potentially contaminated area in the Auxiliary Building

D. Lower number of High Radiation Areas in the Auxiliary Building

A is incorrect, the system is currently an increase in cost, as new equipment is being leased
B is correct, the purpose of the skid is to lower release rates such that CCNPP is in the top quartile
C is incorrect, the skid occupies space that was previously open area, the potential for more contaminated area due to leaks is increased.
D is incorrect, this area includes a new locked high rad area, but is designed to have general area dose rates of less than 5mR/ hr.
References: 41.5

64. CRO-134-1-5-45 045/ / BANK--1/ CRO-134-1-/ 2.5.C/ 0243B0503/ 072K1.04/ 3.3/3.5/ 134 - HVAC

Control Room Vent RMS, 0-RI-5350 is in alarm.
How is the Control Room HVAC system affected?

A. Outside air dampers open to purge the Control Room, and the air conditioning unit is shutdown

✓B. Control Room ventilation is in recirculation with Post-LOCI filter fans in operation and the kitchen exhaust fan secured.

C. The Control Room HVAC shifts to winter mode of operation with Post-LOCI filter fans in operation.

D. Control Room air handling unit is secured. Only outside air dampers open.

A is incorrect, outside flow paths are secured.
B is correct per LP 134 and system description.
C is incorrect, outside air dampers remain open in winter mode.
D is incorrect, outside air dampers remain shut.
Basis: Automatic Action of The Control Room HVAC on High Rad Signal
References: 55.41:4 55.43 / SD 43BKA1: 43BK4.09KA2: 072000K4.03

65. FIRE SYSTEM04 001/ / BANK--1/ / / 013.024/ 086A3.01/ 2.9/3.3/

What condition will start the diesel fire pump?

A. Fire main header pressure less than 105 PSIG

B. A smoke detector or temperature detector actuation

✓C. Both electric fire pump feeder breakers being open

D. Preaction solenoid valve or sprinkler alarm check valve actuation

A is an incorrect setpoint, pressure must be less than 85 PSIG
B and D are incorrect, but will cause "FIRE PROT PANEL 1C24B" alarm
C is correct, per 1C17 ARM L-06
References; 41.7

66. SHIFT TURNOVER04 001/ / MOD--1/ SRO-204-1-/ 4.0/ 204.043/ 2.1.3/ 3.0/3.4/ 204 - SHIF

Which category of deficient equipment status should be annotated on the Shift Turnover Information Sheet to communicate the status of 21 Condensate Pump which has a broken lube oil pump?

✓A. (OOS) Out Of Service

B. (I/F) Inoperable But Functional

C. (D) Degraded

D. (O) Inoperable

A is correct, although the pump could be run until bearing temperatures rise, this would not be prudent and AOP-71 directs a power reduction when power is lost to these pumps. NO-1-207 rev. 34 page 13
B is incorrect, this designation is for TS equipment only.
C is incorrect, degraded implies that the equipment can perform it's designed function.
D is incorrect, this desigination is for TS equipment only.
Basis: Complete the Shift Turnover Information Sheet References: NO-1-207 41.10

MOD

66 A. SHIFT TURNOVER04 001/ / MOD--1/ SRO-204-1-/ 4.0/ 204.043/ 2.1.3/ 3.0/3.4/ 204 - SHIF

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D is incorrect, this desigination is for TS equipment only.
Basis: Complete the Shift Turnover Information Sheet References: NO-1-207 41.10

DATES: Modified: Wednesday, January 14, 2004 Used:

ANSWERS:

Single

Points 1

Version Answers:

0	1	2	3	4	5	6	7	8	9
A	B	C	D	A	B	C	D	A	B

☒ Scramble Choices

Scramble Range: A - D

Original

1. SRO-204-1-1-00016 016/ NONE/ 0/ SRO-204-1-/ 4.0/ 032040054/ / / 204 - SHIF

Which category of deficient equipment status should be annotated on the Shift Turnover Information Sheet to communicate the statusof 21 Condensate Pump which is pumping at a reduced capacity due to impeller wear?

A. (OOS) Out Of Service
B. (I/F) Inoperable But Functional
✓C. (D) Degraded
D. (O) Operable

Basis: Complete the Shift Turnover Information SheetReferences: NO-1-207KA1: KA2:

DATES: Modified: Tuesday, March 24, 1998 Used:

ANSWERS: Single

Points 1

Version Answers:

0	1	2	3	4	5	6	7	8	9
C	D	A	B	C	D	A	B	C	D

☒ Scramble Choices

Scramble Range: A - D

6. CONDITIONS/LIMITS 001/ / NEW--1/ 042-1/ 9.0/ 042.002/ 2.1.10/ 2.7/3.9/

What is the condenser differential temperature (condenser delta T) limit, as stated in the facility license?

A. The calculated flow weighted hourly average of the temperature rise across both condensers is limited to 12°F

B. The calculated flow weighted hourly average of the temperature rise across each condenser is limited to 12°F.

✓C. The calculated average of the 24 flow weighted hourly readings of both units for a calendar day is limited to 12°F.

D. The calculated average of the 24 flow weighted hourly readings of each unit for a calendar day is limited to 12°F.

A is incorrect, the limit is not an hourly average.
B is incorrect, the limit is not an hourly average, and is for both units.
C is correct per OI-14A, rev 15, precaution A.
D is incorrect, the limit is for both units, not each unit.
References: 43.1

68. SYSTEM STATUS COMM 001/ / NEW--3/ AOP-2A/ / 204.013/ 2.1.14/ 2.5/3.3/

Given Nuclear Plant Operations Section Standing Order 03-03:
A known Component Cooling system leak is causing a Unit-2 sump frequency of 3.4 hours.
Sump frequency changes to 95 minutes with a corresponding increase in unidentified RCS leak rate.

Which method of informing the GS-NPO is required per administrative procedures?

A. Voicemail

B. Alpha-page

C. Alpha-page and detailed voicemail

✓D. Talk directly

A is incorrect, this is only allowed for RCS Leakage condition 1.
B is incorrect, this is for RCS Leakage Condition 2
C is incorrect, this is the method to be used to contact **OTHER** site management.
D is correct, with containment sump frequency less than 4 hours, Condition 3 exists, per the first action, direct communication with GS-NPO and PE-PSE is required.
References: 41.10, 43.5

69. FUEL MOVES 001/ / NEW--2/ 209-0-08/ A-4/ 032.002/ 2.2.28/ 2.6/3.5/

Which condition requires that the Spent Fuel Pool Ventilation charcoal filters be placed in service?

A. Spent fuel is being loaded into an ISFSI storage cask.

B. New fuel is being loaded into the Spent Fuel Pool.

C. A dummy fuel assembly is being transferred from the Spent Fuel Pool to the Refueling Pool for RFM testing.

✓D. Refueling is in progress which does not include a complete core offload.

A is incorrect, fuel loaded into the cask has not been in a critical core within the previous 32 days.
B is incorrect, new fuel has not been irradiated
C is incorrect, the dummy is not recently irradiated fuel as defined in OI-22D (and in A, above).
D is correct, refueling involves the transport of "recently irradiated fuel"--part of a critical core within the last 32 days-- unless in an extended outage.
References: OI-22D, 41.7, 41.8, 41.10, 43.7

70. CEA PROGRAM 001/ / NEW--1/ 60-1-13/ 1.23/ 055.012/ 2.2.33/ 2.5/2.9/

Where is the regulating group CEA "All Rods Out" (ARO) position stated?

✓A. NEOP-13 (23)

B. COLR figure 3.1.6

C. System 55 (CEDS) setpoint manual

D. OI-42, CEDM System Operation

A is correct. Figure IV.B.1
B is incorrect, not in COLR
C is incorrect, setpoint manual has CEDS setpoints, but not CEA position
D is incorrect, the OI is not updated each RFO to reflect CEA ARO position.
References: 41.10, 43.6

7 . CORE REACTIVITY 001/ / NEW–2/ 212-3-9/ 10.0/ 058.002/ 2.2.34/ 2.8/3.2/

What documents, used by Operations personnel to run the plant, are updated to communicate the core reactivity effect changes due to core age or fuel composition?

A. USFSAR and NFM Operator Surveillance Procedures (NEOP-301/302)

B. TRM and Offsite Dose Calculation Manual

✓C. COLR and Technical Data Book (NEOPs)

D. Calvert Cliffs Operating Manual and Technical Specification LCOs

A is incorrect, the UFSAR is not used to operate the plant, and NEOP-301/302 defines the processes which usually do not change from cycle to cycle.
B is incorrect, the TRM and ODCM are not cycle specific.
C is correct, both documents are reviewed and updated for every refueling cycle.
D is incorrect, operations procedures and the LCOs are reviewed for possible impact by refueling, but are not routinely updated due to changes in reactivity effects associated with the core.
References: 41.10, 43.6

72. RADIATION CONTROL04 001/ / NEW–1/ 217-30-9/ 1.7.1/ 204.139/ 2.3.10/ 2.9/3.3/

The Shift Manager has declared an Alert per ERPIP 3.0
The Operational Support Center is not yet staffed.

A plant operator is required to perform a task in the Auxiliary Building where dose rates are unknown.

What is required prior to the operator being sent to perform the task?

A. Another operator must be assigned to monitor radiation levels for the worker.

B. The Shift Manager must approve the action and the selection of personnel to perform the task.

✓C. The Shift Radiation Technician must be contacted to assess radiological conditions and preferred access and egress routes.

D. A pre-evolution brief must be held with Security, the Interim Radiation Protection Director and the CRS in attendance.

A is incorrect. An operator cannot fulfill this function per the ERPIP.
B is incorrect. There is no requirement for the SM to provide this oversight, and it is not a task for the SEC.
C is correct per ERPIP-108 and ERPIP-102 6.2.B.2.c
D is incorrect, Security and CRS attendance is not a requirement.
References: 41.10, 41.12 43.4

73. RADIATION RELEASE 001/ / NEW--1/ CRO-134-1-/ 2.4.F/ 093.080/ 2.3.11/ 2.7/3.2/

What operation requires an approved Discharge Permit?

✓A. Initiating S/G Blowdown to Circulating Water

B. Pumping the Containment Sump

C. Dewatering the Saltwater side of a Component Cooling Heat exchanger

D. Placing 12 RCWMT in recirculation

A is correct, per OI-8A
B is incorrect, no permits are required
C is incorrect, no permits are required.
D is incorrect, a permit is required for the release, but not for the reicirc.
References: 4.1.10, 41.12

74. ERPIP DEFINITIONS 003/ / NEW--1/ 217-30-8/ 1.16/ 204.137/ 2.4.17/ 3.1/3.8/

Per the ERPIP, what is the area that should be considered when applying the Severe Weather Conditions criteria for procedure implementation?

A. CCNPP Protected Area

B. CEG service territory within the state of Maryland

✓C. CCNPP or any of the 500 KV tie lines rights of way

D. Within the ten mile radius of CCNPP

B is correct per ERPIP 3.0, rev. 31 Attachment 20
References: 41.10

75. VERIFY ALARMS 001/ / NEW--2/ LOI201-0-9/ 1.6/ 204.138/ 2.4.46/ 3.5/3.6/

11 Saltwater pump tripped due to a motor overload
and reactor trip criteria were reached before the system could be recovered.
The RO manually tripped the reactor from 100% and all systems responded normally.

Which Control Room panel would have **no** alarms annunciated?

A. 1C18

B. 1C13

✓C. 1C08

D. 1C03

A is incorrect, U-1 ESF MOTOR OVERLOAD would be on given 11 SW pump tripped.
B is incorrect, 11 SW HDR PRESS LO at a minimum, would be on.
C is correct, any alarm on this panel indicates something more severe than an uncomplicated trip is happening and some ESFAS actuation is ocurring or required.
D is incorrect, lowering S/G levels due to the trip will cause alarms.
References: 41.5, 41.7, 43.5

DRAFT WRITTEN SRO

Test Name: 04SRO.TST
Test Date: Tuesday, January 13, 2004

		Question ID		Type	Pts	0	1	2	3	4	5	6	7	8	9
1:	1	RCP MALFUNCTIONS	002	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	2	LOSS OF RHR	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	3	PZR CONTROL MALF SRO	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	4	ATWS SRO	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	5	LOSS OF FW SRO	003	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	6	SRO-201-7-1-03	003	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	7	CRO-54-1-1-25	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	8	CRO-107-1-3-28	029	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	9	CRO-202-2A-0-04	004	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	10	CRO-202-9A-2-01	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	11	AOP-2A-03	003	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	12	SRO-201-8-1-19	019	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	13	COMP CLG SRO	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	14	CONTAINMENT CLG SRO	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	15	CRO-54-1-1-11	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	16	CONTAINMENT SRO	003	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	17	PZR LVL CONT SRO	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	18	CRO-113-6-4-20	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	19	SRO-204-1-0/3-002	002	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	20	NITE/STANDING ORDRS	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	21	CRO-212-1-1-02	003	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	22	SRO RESPONSIBILITIES	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	23	RADWORK PERMIT	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	24	EMER PRO	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	25	SRO-201-3-1-28	028	MC-SR	1	B	C	D	A	B	C	D	A	B	C

CCNPP NRC License Examination
March 2004 PWR Examination outline
Emergency and Abnormal Plant evolutions – Tier 1 Group 1 (RO/**SRO**)

Form ES-401-2

Q#	E/APE #/Name/Safety Function	K1	K2	K3	A1	A2	G	Number	K/A Topics	Imp.	SRO #
	000007/E02 Reactor Trip – Recovery /1										
	000008 Pzr Vapor Space Accident /3										
	000009 Small Break LOCA /3										
	000011 Large Break LOCA /3										
1	000015/17 RCP Malfunctions /4					x		AA2.10	When to secure RCPs on loss of cooling or seal injection RCP Malfunctions 002	3.7	1
	000022 Loss of Rx Coolant Makeup /2										
2	000025 Loss of RHR System /4						x	2.1.12	Ability to apply Technical Specifications for a system Loss of RHR 001	4.0	1
	000026 Loss of Comp. Cooling Water /8										
3	000027 Pzr Press. Ctrl. Sys. Malf. /3						x	2.4.45	Ability to prioritize and interpret the significance of each annunciator or alarm PZR CONTROL MALF SRO 001	3.6	1
4	000029 ATWS /1					x		EA2.01	Ability to determine or interpret reactor nuclear instrumentation as it applies to a ATWS ATWS SRO 001	4.7	1
	000038 SG Tube Rupture/3										
	000040CE05 Steam Line Rupture /4										
5	000054CE06 Loss of Feedwater /4					x		AA2.08	Ability to determine and interpret Steam flow-feed trend recorder ~~ATWS SRO 001~~ Loss of FW SRO 003	3.3	1
6	000055 Station Blackout /6						x	2.1.20	Ability to execute procedure steps SRO-201-7-1-03 003	4.2	1
	000056 /Loss of Off Site Power /6										
	000057 Loss of Vital AC Instrument Bus /6										
7	000058 Loss of DC Power /6					x		AA2.01	Ability to determine and interpret that a loss of dc power has occurred: verification that substitute power power sources have come on line CRO-54-1-1-25 001	4.1	1
	000062 Loss of Nuclear Service Water /4										
	000065 Loss of Instrument Air /8										
	K/A Category Totals					4	3				7

New

Bank

MOD

Cog. level 2 or 3

CCNPP NRC License Examination
March 2004 PWR Examination outline
Emergency and Abnormal Plant evolutions – Tier 1 Group 2 (RO/**SRO**) Form ES-401-2

	E/APE #/Name/Safety Function	K 1	K 2	K 3	A 1	A 2	G	Number	K/A Topics	Imp.	SRO #
	000001 Continuous Rod Withdrawal /1										
	000003 Dropped Control Rod /1										
	000005 Inoperable/Stuck Control Rod /1										
8	000024 Emergency Boration /1						x	2.2.22	Knowledge of limiting conditions for operations and safety limits CRO-107-1-3-25	4.1	0251
	000028 /Pzr Level Malfunction /2										
	000032 Loss of Source Range NI /7										
	000033 Loss of Intermediate Range NI /7										
	000036 /Fuel Handling Accident /8										
9	000037 SG Tube Leak /3						x	2.1.33	Ability to recognize indications for system operating parameters which are entry-level conditions for technical specifications CRO-202A-0-04-004	4.0	1
	000051 Loss of Condenser vacuum /4										
	000059 Accidental Liquid RadWaste Rel. /9										
	000060 Accidental Gaseous Radwaste Rel./9										
	000061 ARM System Alarms /7										
	000067 Plant Fire on Site /8										
10	000068 Control Room Evac. /8						x	2.2.25	Knowledge of bases in technical specifications for limiting conditions and safety limits SRO-202-9A-2-01 001	3.7	1
	000069 Loss of CTMT Integrity /5										
	000074 Inadequate Core Cooling /4										
	000076 High Reactor Coolant Activity /9										
	CE/A11 RCS Overcooling/PTS /4										
	CE/A13 Natural Circulation /4										
11	CE/A16 /Excessive RCS Leakage /2					x		AA2.1	Facility conditions and selection of appropriate procedures during abnormal and emergency conditions AOP-2A-03-003	3.5	1
12	CE/E09 /Functional Recovery					x		EA2.1	Facility conditions and selection of appropriate procedures during abnormal or emergency operations SRO-201-8-1-19 019	4.4	1
	K/A Category Totals					2	3		Group Point Total		5

CCNPP NRC License Examination
March 2004 PWR Examination outline
Plant Systems – Tier 2 Group 1 (RO/**SRO**)

Form ES-401-2

System #/Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	Number	K/A Topics	Imp.	SRO #
003 Reactor Coolant Pump															
004 Chemical and Volume Control															
005 Residual Heat Removal															
006 Emergency Core Cooling															
007 Pressurizer Relief/Quench Tank															
13 008 Component Cooling Water								x				A2.07	Consequences of high or low flow rate and temperature: the flow rate at which the CCW standby pump will start Comp~~...~~	2.8	CLG SRO 001
010 Pressurizer Pressure Control															
012 Reactor Protection															
013 ESFAS															
14 022 Containment Cooling								x				A2.04	Ability to predict impacts of and correct or control-Loss of service water Containment CLG SRO 001	3.2	1
026 Containment Spray															
039 Main and Reheat Steam															
056 Condensate															
059 Main Feedwater															
061 Auxiliary Feedwater															
062 AC Electrical Distribution															
15 063 DC Electrical Distribution											x	2.1.32	SRO-54-1-1-11 001 Ability to explain and apply all system limits and precautions	3.8	1
064 Emergency Diesel Generator															
073 Process Radiation Monitoring															
076 Service Water															
078 Instrument Air															
16 103 Containment											x	2.1.14	Knowledge of system status criteria which require the notification of plant personnel Containment SRO 003	3.3	1
K/A Category Point totals								2			2		Group Point Total		4

CCNPP NRC License Examination
March 2004 PWR Examination outline
Plant Systems – Tier 2 Group 2 (RO/SRO)

Form ES-401-2

System #/Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	Number	K/A Topics	Imp.	SRO #
001 Control Rod Drive															
002 Reactor Coolant															
17 011 Pressurizer Level Control								x				A2.05	Ability to predict the impacts of and correct or control-Loss of pressurizer heaters PZR LVL CONT SRO	3.7	1
014 Rod Position Indication															
015 Nuclear Instrumentation															
016 Non-Nuclear Instrumentation															
017 In-Core Temperature Monitor															
027 Containment Iodine Removal															
028 H2 Recombiner and Purge Control															
029 Containment Purge															
033 Spent Fuel Pool Cooling															
18 034 Fuel Handling Equipment											x	2.4.49	Ability to perform w/o reference to procedures actions that require immediate operation CRO-113-6-4-20 001	4.0	1
035 Steam Generator															
041 Steam Dump/Turbine Bypass Control															
045 Main Turbine Generator															
055 Condenser Air Removal															
068 Liquid Radwaste															
071 Waste Gas Disposal															
072 Area Radiation Monitoring															
075 Circulating Water															
079 Station Air															
086 Fire Protection															
K/A Category Point totals								1			1		Group Point Total		2

CCNPP NRC License Examination
March 2004 PWR Examination outline
Generic Knowledge and Abilities Outline (Tier 3)

Form ES-401-3

Category	K/A #	Topic	SRO-Only Imp.	SRO-Only #
19 20 1. Conduct of Operations	2.1.2	Knowledge of operator responsibilities during all modes of plant operation SRO-204-1-0/3-002 002	3.8	1
	2.1.15	Ability to manage short-term information such as night and standing orders NITE/STANDING ORDRS 001	3.0	1
	Subtotal			2
21 2. Equipment Control	2.2.22	Knowledge of limiting conditions for operation and safety limits SRO-213-1-1-02 003	4.1	1
	Subtotal			1
22 23 3. Radiation Control	2.3.3	Knowledge of SRO responsibilities for auxiliary systems which are outside the control room SRO Responsibilities 001	2.9	1
	2.3.7	Knowledge of the process for preparing a radiation work permit RADWORK PERMIT 001	3.3	1
	Subtotal			2
24 25 4. Emergency Procedures / Plan	2.4.4	Ability to recognize abnormal indications for system operating parameters which are entry level conditions for emergency and abnormal operating procedures EMER PRO 001	4.3	1
	2.4.18	Knowledge of the specific bases for EOPs SRO-201-3-1-28	3.6 028	1
	Subtotal			2
Tier 3 Point Total				7

Name: ______________________________

1. RCP MALFUNCTIONS 002/ / BANK--1/ CRO-63-1-3/ 1.7E/ 020630311/ 015AA2.10/ 3.7/3.7/ SD 63 - ES

U-2 is at 100% power when the "ACTUATION SYSTEM CIS TRIPPED" alarm is received on 2C08. CIS has been determined to be invalid by the crew, but all attempts to reset CIS "A" from the control room have failed.

When are the RCPs tripped?

A. Immediately after an update brief is concluded by the CRS

B. When the RO has reported that controlled bleedoff temperatures exceed 200°F, or bearing temperatures exceed 195°F

✓C. After the reactor is tripped and the RO has reported the reactivity safety function is complete

D. After an attempt has been made to reset CIS from the cable spreading room

A and B are incorrect, the reactor is first tripped manually to avoid an automatic trip.
C is correct per the Alarm Response Manual--G-06
D is incorrect, there is no requirement to attempt resetting form the ESFAS panels, and this action is not directed by a procedure.
Basis: "ACTUATION SYSTEM CIS TRIPPED" AlarmReferences: 55.41:10 55.43:5 / ARP 1C08KA1: 063A7.02KA2: 013000GEN8

2. LOSS OF RHR 001/ / NEW--2/ 052-4-0/ 7.0/ 203.011/ 025 2.1.12/ 2.9/4.0/

Per Technical Specifications, under what conditions can a spent fuel pool cooling loop replace a Shutdown Cooling loop?

✓A. The reactor head is unbolted and there is less than 23 feet of water above the fuel in the reactor vessel

B. The reactor head is unbolted and there is greater than 23 feet of water above the fuel in the reactor vessel

C. Mode 5 with the S/G tubes full

D. Mode 5 with S/G tubes drained

A is correct per TS 3.9.5, the first note.
B is incorrect, but only one loop of SDC is required.
C and D are incorrect. Per the TS, the SFP cooling loop must also be aligned for cooling the irradiated fuel and this is not possible in Mode 5.
References: 43.2, 43.5

3. PZR CONTROL MALF SRO 001/ / NEW--2/ 62-1-11/ 1/ 204.020/ 027 2.4.45/ 3.3/3.6/

Unit-1 was at 100% power when the following alarms annunciated:
PZR CH 100 PRESS
PZR CH Y LVL
ACTUATION SYS SENSOR CH ZF TRIP

1-PIC-100X indicates 2210 PSIA
1-PIC-100Y indicates 1400 PSIA
1-LI-110X indicates 208 inches
1-LI-110Y indicates 360 inches

What additional alarm would be expected with these indications?

A. PZR PRESS BLOCK A PERMITTED

B. ACTUATION SYS SIAS TRIP

✓C. CNTMT NORMAL SUMP LVL HI

D. PORV/SAFETY VLV ACOUSTIC MON

A is incorrect, indications are of a reference line leak, only one safety channel is affected, it takes 3 channels to get this alarm.
B is incorrect, the unaffected pressure instrument does not support SIAS conditions.
C is correct, with unaffected pzr level at 208 inches, a minimum of approximately 144 gallons has leaked, the sump alarms at 49 gallons.
D is incorrect. Indications are of an instrument failure, not lifting of a PORV or Safety.
References: 43.5

Unit-2 has experienced a loss of 2Y09. Reactor trip criteria was reached and the RO depressed the reactor trip buttons on 2C05.
Approximately 10 seconds later the RO reported WRNI power indications on 2C05 are reading approximately 100% power and startup rate is 0.

What is the cause of these indications?

✓A. The reactor failed to trip when the trip buttons were depressed

B. Normal reactor response immediately following a reactor trip from 100% power

C. Loss of power to NI instrumentation due to loss of 2Y09

D. An overpower condition occurred due to feedwater heater high level dump valves opening on the loss of 2Y09

N C

A is correct, SUR would be negative if CEAS inserted and an initial decrease in NI power is expected.
B is incorrect, per EOP-0.
C is incorrect, NI indications are powered from vital buses.
D is incorrect, although a high power condition may have resulted, the normal SUR and NI indications would still be evident if the reactor had tripped.
Reference: 43.5

OSS OF FW SRO 003/ / NEW--3/ 202-3G-7/ 4.0/ 202.040/ 054AA2.08/ 2.9/3.3/

A feed system malfunction has occurred and the following indications exist:
Reactor power is 100%
SGFPs speed is 4550-4650 RPM
SGFP suction pressure is 380 PSIG
11 S/G level is -2" 12 S/G level is -25"
TR1011/1111 recorder blue pen (feed flow) is slightly greater than the red pen (steam flow)
TR1021/1121 recorder red pen (steam flow) is greater than blue pen (feed flow)

What is the proper action for the CRS to direct the panel operators to perform?

A. Trip the reactor and implement EOP-0.

B. Start the standby Condensate Booster pump.

✓C. Place 12 S/G FRV controller in manual and open 12 FRV.

D. Bias SGFP speed to maintain FRV D/Ps greater than 75 PSIG.

A is incorrrect, trip criteria is not being challenged yet (-50")
B is incorrect, suction pressure is sufficient.
C is correct, given that a feed system malfunction exists (no steam leak), with feed flow less than steam flow, a FRV problem is most likely.
D is incorrect, SGFP speed is in the normal range and the pumps will respond to adjustment of the FRVs automatically.
References: 41.10, 43.5

6. SRO-201-7-1-03 003/ NONE/ BANK--2/ SRO-201-7-/ 1.0/ 201.004/ 055 2.1.20/ 4.3/4.2/ 201 - EMER

Place the following major actions of EOP-7, Station Blackout, in the order that occur within the procedure. **(First to last)**

1. Minimize 250 VDC battery discharge and restoration of forced circulation if desired.
2. Establish RCS Heat Removal and protect the condenser from overpressure.
3. Attempt to regain either an onsite or an offsite power source.
4. Evaluate the need for a plant cooldown via either forced or natural circulation.

A. 1, 2, 3, 4

B. 3, 2, 4, 1

C. 2, 1, 3, 4

✓D. 2, 3, 1, 4

D is correct per EOP-7
Basis: Major Actions of EOP-7References: EOP-7 Rev. 4 U-1 placekeeper
References: 41.10, 43.5

7. CRO-54-1-1-25 001/ / BANK–1/ CRO-54-1-1/ 10.3/ 202.101/ 058AA2.01/ 3.7/4.1/

Given an electrical system malfunction, what Control Room panel indications can be used to diagnose the status of the 125 VDC buses?

A. Reactor Protective System cabinets at 1C15

B. Steam Generator Feed Pump emergency lube oil pump lights on 1C03

C. AFW pump controls on 1C04

✓D. Containment pressure transmitter isolation valves on 1C10

A is incorrect, RPS channels are powered by Vital AC buses and have been used to give improper reports of DC bus losses in the past.
B is incorrect, these are listed indications for losses of turbine building MCCs
C is incorrect, AFW pump controls are Vital Instrument bus power supplies, and can be fed from the opposite unit.
D is correct, these indications are located close together, each is powered by a different DC bus and provide the CRS with a quick diagnostic tool for losses of DC bus reports.
References: 43.5

8. CRO-107-1-3-28 029/ / MOD–2/ CRO-107-1-/ 2.14.1/ 204.094/ 024 2.2.22/ 3.4/4.1/ BORATION

Upon a loss of MCC-114, what Technical Requirements Manual credited boration flow path would be available?

A. RWT to RWT charging pump suction valve (CVC-504) to charging pump suction

✓B. 12 BA pump to BA direct M/U valve (CVC-514) to charging pump suction

C. 12 BA pump to BA flow control valve (CVC-210Y) to VCT M/U valve (CVC-512) to VCT outlet (CVC-501) to charging pump suction

D. 11 or 12 BAST gravity drain valves (CVC-508 or 509) to charging pump suction

A is incorrect, 504 is powered from MCC 114
B is correct, all listed components are powered from MCC 104
C is incorrect, this is not a flowpath taken credit for meeting the TS.
D is incorrect, both gravity feed valves are powered from MCC114
Basis: Boration Flow Path Availability References: 55.43.5 55.45.13 KA1: 006K2.02-3KA2: 004000K2.01

mod

CRO-107-1-3-28 029/ / MOD--2/ CRO-107-1-/ 2.14.1/ 204.094/ 024 2.2.22/ 3.4/4.1/ BORATION

Upon a loss of MCC-114, what Technical Specification credited boration flow path would be available?

A. RWT to RWT charging pump suction valve (CVC-504) to charging pump suction.

✓B. 12 BA pump to BA direct M/U valve (CVC-514) to charging pump suction.

C. 12 BA pump to BA flow control valve (CVC-210Y) to VCT M/U valve (CVC-512) to VCT outlet (CVC-501) to charging pump suction.

D. 11 or 12 BAST gravity drain valves (CVC-508 or 509) to charging pump suction.

ANSWERS: Single

Points 1

Version Answers:

0	1	2	3	4	5	6	7	8	9
B	C	D	A	B	C	D	A	B	C

☒ Scramble Choices

Scramble Range: A - D

Original

CRO-107-1-3-28 028/ / 0/ CRO-107-1-/ 2.14.1/ N/A/ 006K2.02-3/ 004000K2.0/ 107 CHEMIC

Upon a loss of MCC-104, which one of the below listed boration flow paths would be available?

A. RWT to RWT charging pump suction valve (CVC-504) to 11 BAST gravity drain valve (CVC-508) to charging pump suction.

B. 12 BA pump to BA direct M/U valve (CVC-514) to charging pump suction.

C. 12 BA pump to BA flow control valve (CVC-210Y) to VCT M/U valve (CVC-512) to VCT outlet (CVC-501) to charging pump suction.

✓D. 11 or 12 BAST gravity drain valves (CVC-508 and 509) to charging pump suction.

ANSWERS: Single

Points 1

Version Answers:

0	1	2	3	4	5	6	7	8	9
D	A	B	C	D	A	B	C	D	A

☒ Scramble Choices

Scramble Range: A - D

CRO-202-2A-0-04 004/ / BANK--2/ CRO-202-2A/ 4.0/ 204.094/ 037 2.1.33/ 3.4/4.0/ AOP-2A, TS

U-1 is in Mode 1. The latest leakage reports are:

-- 0.6 gpm from Pressurizer Safety Valve leakage
-- 1.8 gpm from leakage past check valves from the RCS to the SI system
-- 0.15 gpm from primary to secondary leakage (12 S/G)
-- 4.8 gpm is total RCS leakage

Based upon these known leak rates, which of the following Technical Specification RCS leakage limits are being exceeded?

A. Pressure Boundary leakage and Identified leakage.

✓B. Primary to Secondary leakage and Unidentified leakage.

C. Identified leakage and Unidentified leakage.

D. Primary to Secondary leakage and Pressure Boundary leakage.

A is incorrect, no pressure boundary leakage is evident, identified leakage limit is 10 GPM
B is correct, primary to secondary is 216 GPD, limit is 100 GPD, and unidentified leakage is 2.25 GPM, limit is 1 GPM per 3.4.13
C is incorrect, identified limit is 10 GPM
D is incorrect, no pressure boundary leakage is evident.
Basis: RCS leak rate limits References: LCO TS 3.4.13 43.2, 43.3 KA1: 02005A8.02KA2:

10. CRO-202-9A-2-01 001/ NONE/ BANK--1/ CRO-202-9A/ 1.0/ 201.001/ 068 2.2.25/ 2.5/3.7/ AOP-9A

Fill in the blanks--
Performance of AOP-9A ensures that the plant is placed in ___ ___ within ___ hours and the RCS parameters will be maintained within those predicted for a Loss of Offsite power and the fission product boundary is not ~~e~~ffected.
a

A. Hot Standby, 24

B. Hot Shutdown, 48

✓C. Cold Shutdown, 72

D. Cold Shutdown, 96

C is correct per AOP-9A I, rev,11 Unit-1
Basis: Intent of actions for AOP-9A implementation References: AOP-9A 43.2 KA1: KA2:

11. AOP-2A-03 003/ NONE/ BANK--01/ CRO-202-2A/ 2.0/ 202.017/ CE16AA2.1/ 2.7/3.5/ AOP-2A

An RCS leak has resulted in implementing the applicable plant procedure. What direction from the CRS is provided when RCS leakage exceeds T.S. 3.4.13 LCO but is within the capacity of one charging pump? (ASSUME INITIAL ACTIONS TO LOCATE SOURCE OF LEAKAGE HAVE BEEN COMPLETED)

A. Evaluate operation of the plant with letdown isolated and align charging pumps to operate as needed to prevent exceeding a pressurizer level of 225 inches.

✓B. Commence a plant shutdown to COLD SHUTDOWN per OP-3, OP-4, and OP-5.

C. Trip the reactor and implement EOP-0 when PZR level deviates from program by 15".

D. Perform a rapid power reduction, then when Tave is less than 537°F, trip the reactor and implement EOP-0.

A is incorrect, but is close to steps in AOP-7I where letdown is lost.
B is correct per AOP-2A
C is incorrect, but similar to steps if the leak is greater than the capacity of one charging pump.
D is incorrect, but reflects actions for a S/G tube leak in excess of 1 charging pump .Basis: REQUIREMENTS TO TRIP REACTOR References: AOP-2A, 43.5 KA1: 000037EK3.07KA2:

12. SRO-201-8-1-19 019/ EOP-8 R.A./ BANK--2/ SRO-201-8-/ 2.5/ 201.006/ CE9EA2.1/ 3.2/4.4/ 201 - EMER

Using provided references:

Functional Recovery Procedure, EOP-8, has been implemented and the following plant conditions exist:

--4 CEAs indicate fully withdrawn
--SUR is 0
--All charging pumps are inoperable
--RWT is available and operable
--SIAS has actuated and 2 HPSI pumps are running
--One 500 KV bus is energized
--Both SG levels indicate at -100" and constant and AFW flow is available
--Containment pressure is 0.4 psig and lowering

Which one of the following groups of Success Paths is implemented to assess and restore safety functions?

A. VA-1, PIC-3, HR-2, CE-2, RLEC-2

B. VA-1, PIC-4, HR-3, CE-2, RLEC-1

C. VA-1, PIC-3, HR-3, CE-3, RLEC-2

✓D. VA-1, PIC-4, HR-2, CE-2, RLEC-1

A is incorrect, PIC-3 would be used if no 4 KV bus was available and SIAS had not actuated.
B is incorrect, HR-3 requires SDC initiation to satisfy heat removal.
C is incorrect-see above for PIC-3 and HR-3
D is correct per the resource assessment table.
RC-3 is used for more than one stuck CEA, SUR is not negative and CVCS not available, PIC-4 uses SIS for pressure/inventory control, S/G and HPSI are used for heat removal. Basis: Success path determination via R.A.T. EOP-8
References: EOP-8, 43.5 KA1: KA2:

13. COMP CLG SRO 001/ / NEW--2/ LOI-15-1-0/ 7.0/ 015.001/ 008A2.07/ 2.5/2.8/

13 Component Cooling Pump is to be run 24 hours for PMT after bearing replacement. What action is required and why?

A. 12 Component Cooling Heat Exchanger must be placed in service to ensure a Component Cooling loop remains in operation.

B. 13 Component Cooling Pump must be powered from 11 4KV bus to ensure both loops remain operable.

✓C. 12 Component Cooling Pump must be placed in PTL to prevent damage to a SDC Heat Exchanger due to high flow if a SIAS occurs.

D. IX BYPASS 1-CVC-520 must be placed in BYPASS to prevent a reactivity event due to lowering letdown temperature.

A is incorrect, either heat exchanger can be inservice.
B is incorrect, 11 Component Cooling Pump remains operable.
C is correct, per the note for in OI-16.
D is incorrect, procedures for shifting pumps does not require bypassing the ion exchanger. For the short period of time 2 pumps are running, temperature does not change appreciably.
Refernces: OI-16, 41.5, 43.5

14. CONTAINMENT CLG SRO 001/ / NEW--2/ 011-1-0/ 2.0, 15.0/ 032.006/ 022A2.04/ 2.9/3.2/

21B SRW Heat Exchanger is to be removed from service for cleaning today. How is the Containment Cooling System affected?

✓A. The manual SRW inlet isolation valve on 21 or 22 Containment Cooler is shut to maintain 2A Diesel Generator operable.

B. One train of Containment Cooling is declared inoperable because 2A Diesel Generator is inoperable.

C. The Containment Cooling System is degraded but remains operable and functional.

D. 21 and 22 Containment Coolers must be declared inoperable because 21 Component Cooling Heat exchanger must be taken out of service.

A is correct, per OI-29 and Technical Specification LCO 3.7.6 basis.
B is incorrect, one train of air coolers is declared inoperable, but it is because one cooler is isolated, not due to the EDG.
C is incorrect per TS.
D is incorrect, only one heat exchanger is out of service, but that makes the train out of service.
References: OI-29, 43.5

1. CRO-54-1-1-11 001/ TS 3.8.4/ BANK--02/ CRO-54-1-1/ 10.3/ 020540502/ 063 2.1.32/ 3.4/3.8/

Using provided references:

After investigating an alarm at 1C33, the CRO returns from the cable spreading room and reports that #23 Battery Charger output voltage is 120 VDC.
How is the 125 VDC system affected and what action is required?

A. One DC channel is inoperable, restore to operable status within 2 hours.

B. #23 battery charger remains operable as long as it's offsite power source remains operable, perform a breaker lineup per STP-O-90.

✓C. The battery charger is inoperable, verify an operable battery charger is suppling 11 125 VDC bus

D. The battery charger is inoperable, 11 125 VDC bus is inoperable and 1Y01 must be placed on the Inverter Backup Bus.

A is incorrect, as long as one charger is operable, the bus is operable.
B is incorrect, the chargers must maintain greater than or equal to 125V at 400 amps or greater to maintain operability.
C is correct per TS 3.8.4 basis.
D incorrect, one battery charger is available to maintain the bus operable.
References: TS LCO 3.8.4 and basis, 41.10 43.2

16. CONTAINMENT SRO 003/ / NEW--1/ 204-104-1/ 1.0/ 204.076/ 103 2.1.14/ 2.5/3.3/

Which list reperesents plant personnel that must be notified in the event of a Containment entry at power?

A. Rad Con ALARA, Nuclear Security, Outage Management

B. Nuclear Security, Nuclear Training, Operations Work Control

C. Outage Management, Instrument and Controls Maintenance Supervisor, Control Room Supervisor

✓D. Instrument and Controls Maintenance Supervisor, Rad Con ALARA, Nuclear Security

A is incorrect, Outage Management is not required to be notified.
B is incorrect, Nuclear training is not required to be notified.
C is incorrect, Outage Management is not required to be notified.
D is correct. Per NO-1-104, I&C is notified to perform airlock door testing after entry is complete, Rad Con is notified prior to entry, and Security must be notified and to verify the EAL outer hatch woodruff key is installed.
References: NO-1-104, 43.5

17. PZR LVL CONT SRO 001/ / NEW--2/ CRO-107-1-/ 8.3/ 201.085/ 011A2.05/ 3.3/3.7/

Given the following plant conditions:

-- Unit One has tripped due to a loss P-13000-1
-- 11 4KV bus is energized from 1A Diesel Generator
-- Pzr level is 100" and slowly lowering
-- RCS pressure is 1920 PSIA and slowly lowering

The RO reports that only 12 Charging Pump is running and Pressure and Inventory is being monitored for positive trends.

What alternate actions must the CRS direct or verify?

A. Verify SIAS actuation when RCS pressure reaches 1725 PSIA.

✓B. Manually start 11 and 13 charging pumps to restore pressurizer level to greater than 101"and locally reset 11 pressurizer backup heater breaker.

C. Isolate letdown, check that charging pumps automatically start to restore pressurizer level and reset pressurizer proportional heaters by momentarily placing the handswitches to OFF.

D. Verify charging pumps start automatically to restore Pressurizer level to greater than 101", verify 12 and 14 pressurizer backup heaters start to restore RCS pressure.

A is incorrect, action should be taken so that SIAS does not actuate.
B is correct, charging pumps must be manually started, and heaters must be reset, and they will not operate below 101" in the pressurizer.
C is incorrect, letdown will automatically isolate, 11 and 13 charging pumps will not automatically start, and the proportional heaters will take a long time to restore RCS pressure.
D is incorrect,11 and 13 charging pumps will not automatically start with the normal and alternate 4 KV bus feeder bkrs open and 12 and 14 heaters will not have power available.
References: EOP basis docs. 41.5, 43.5

18. CRO-113-6-4-20 001/ / BANK--1/ CRO-113-6-/ 2.0.C/ 203.011/ 034 2.4.49/ 4.0/4.0/

A core shuffle is in progress and the refueling machine is indexed over a core location with a fuel assembly grappled in the hoist box. What condition would require the Fuel Handling Supervisor to stop core alterations?

A. Count rate increases from 10 CPS to 12 CPS when the fuel bundle is inserted into the core.

✓B. Communications between fuel handling stations is lost.

C. One channel of 3 available nuclear instrumentation channels is declared out of service.

D. The personnel airlock doors are both open.

A is incorrect, a small increase in countrate may be normal, depending on age of the fuel assembly and proximity of excore NI.
B is correct, per TRM TNC 15.9.2
C is incorrect, TS LCO only requires 2 NIs operable
D is incorrect, TS LCO 3.9.3 allows both doors to be open, as long as one is capable of being shut.
References: TRM, 41.10, 43.2, 43.6

19. SRO-204-1-0/3-002 002/ / NEW--1/ 204-300/ 2.0/ 204.008/ 2.1.2/ 3.0/4.0/

Which selection is the requirement for notification of plant management in the event that a deviation to a Controlling Technical Procedure was approved by the CRS and performed? **(Assume <u>no</u> Technical Specification deviation was required)**

A. Shift Manager

✓B. Shift Manager, GS-NPO or M-NO

C. Shift Manager, GS-NPO, M-NO and NRC resident

D. Shift Manager, GS-NPO, all site managers

A is incorrect, additonal notification is required
B is correct, per NO-1-200, 5.1.C
C is incorrect, NRC resident is not part of plant staff, and is not required to be notified per RM-1-101.
D is incorrect, all site managers is not a requirement per NO-1-200.
References: NO-1-200, 43.3, 43.5

20. NITE/STANDING ORDRS 001/ / NEW--1/ / / 204.037/ 2.1.15/ 2.3/3.0/

Who has approval authority for Nuclear Plant Operations Section Standing Orders and who can cancel them?

A. Approval--GS-NPO, cancellation-- Shift Managers

B. Approval--Manager-Nuclear Operations, cancellation--Manager-Nuclear Operations

✓C. Approval --GS-NPO, cancellation--GS-NPO

D. Approval--Shift Manager, cancellation--GS-NPO

C is correct, per the forms in the NPO Section Standing Orders book.
Distractions are possible Operations Management personnel.
References: 41.10, 43.3,

21. CRO-212-1-1-02 003/ / NEW--1/ TECH.SPECS/ 25,26/ 204.094/ 2.2.22/ 3.4/4.1/

What systems/components are credited for protection of the RCS Pressure Safety Limit?

A. All systems listed in the Limiting Conditions for Operations of Technical Specifications.

B. PORVs, Steam Bypass Control System (ADVs and TBVs), Pressurizer Pressure Control system

✓C. RPS high RCS pressure trip, Pressurizer Safety Valves and main steam safety valves

D. Auxiliary Feedwater system, ESFAS system and RPS actuation of PORVs

C is correct per B 2.1.1, Applicable Safety Analyses
Distractors are systems of components not listed in TS Basis.
References: TS Safety Limits, basis, 43.1, 43.2

22. SRO RESPONSIBILITIES 001/ / NEW--2/ 048-1-0/ 1.11/ 048.007/ 2.3.3/ 1.8/2.9/

Which evolution requires direct supervision by a Senior Reactor Operator?

✓A. Bypassing an RAS sensor module

B. Discharging a RCWMT

C. Performance of any "trip sensitive" PE

D. Placing the SFP ion exchanger in service

A is correct per OI-34, 5.0.B
B is incorrect, a signed permit is required, but not direct supervision of the lineup.
C is incorrect, only requires notification and approval to perform.
D is incorrect, requires PWS supervision, which can be a non-licensed operator per NO-1-200
References: OI-34, 43.4, 43.5

23. RADWORK PERMIT 001/ / NEW--1/ / / 204.007/ 2.3.7/ 2.0/3.3/

Who is responsible for writing an SWP for an Operations evolution when the task is not covered by an exisiting permit?

A. The person who is in charge of performing the task

B. Operations ALARA Coordinator

C. Operations Work Control

✓D. An ALARA planner

D is correct per RSP-1-200
Distractors are Operations personnel or shift personnel without this responsibility or authority.
References: 41.10, 43.3, 43.4

24. EMER PRO 001/ / NEW--2/ 052-4-0/ 5.0/ 204.093/ 2.4.4/ 4.0/4.3/

Unit-2 has been stable for the past 24 hours with RCS pressure 100 PSIA.
RCS temperature is 110°F.
Containment closure deviations exist.
Pressurizer level starts rapidly lowering from 160".

What procedure provides the required actions for these conditions?

A. AOP-2A, Excessive RCS Leakage

B. EOP-5, Loss of Coolant Accident

✓C. AOP-3B, Abnormal Shutdown Cooling Conditions

D. AOP-4A, Loss of Containment Integrity/Closure

A is incorrect, this provides guidance only when RCS is at a higher pressure.
B is incorrect, EOP-5 assumes a trip and EOP-0 have been completed
C is correct. Section V is specifically for a loss of inventory.
D is incorrect. Deviations are allowed in Mode 5, there is no guidance in AOP-4A for these indications, and AOP-3B will address containment closure.
References: 43.2, 43.5

25. SRO-201-3-1-28 028/ / BANK–2/ SRO-201-3-/ 11.0/ 033480605/ 2.4.18/ 2.7/3.6/

A sustained loss of all feedwater has ocurred. What action is required, and what is the basis for the action?

A. If Steam Generator levels are less than -26 inches, Auxiliary Feedwater must be used to restore level. This protects Steam Generator internals and feedwater piping from the adverse affects of waterhammer.

✓B. Initiate Once Through Core Cooling prior to CET temperatures exceeding 560°F. This ensures RCS pressure will be low enough to allow adequate HPSI flow to cool the core.

C. Isolate the most affected Steam Generator when hot leg temperature is less than 515°F. This prevents lifting Steam Generator safety valves.

D. When each Steam Generator lowers to -350 inches, isolate the Steam Generator. This ensures adequate inventory to prevent damage to Steam Generator internals when feed is restored.

A is incorrect. this was old guidance before S/G replacement.
B is correct per EOP-3 Basis Rev. 20 for block Step J. The intent is to initiate OTCC prior to RCS reaching a condition where HPSI flow is not sufficient to provide adequate cooling.
C is incorrect. This is a correct action and basis for a S/G tube leak, but not for a loss of feedwater.
D is incorrect. The basis for isolating S/Gs is to mainatain inventory to minimize the differential pressure across the S/G tubes.
Basis: Basis for initiating once-thru cooling prior to 560 degrees References: EOP-3 and basis. 41.10, 43.5, KA1: KA2:

U.S. Nuclear Regulatory Commission
Site-Specific
SRO Written Examination

Applicant Information	
Name:	
Date: 2/27/04	Facility/Unit: CCNPP / 1 and 2
Region: I / II / III / IV	Reactor Type: W / CE / BW / GE
Start Time:	Finish Time:

Instructions

Use the answer sheets provided to document your answers. Staple this cover sheet on top of the answer sheets. To pass the examination you must achieve a final grade of at least 80.00 percent overall, with a 70.00 percent or better on the SRO-only items if given in conjunction with the RO exam; SRO-only exams given alone require an 80.00 percent to pass. You have eight hours to complete the combined examination, and three hours if you are only taking the SRO portion.

Applicant Certification

All work done on this examination is my own. I have neither given nor received aid.

____
Applicant's Signature

Results		
RO / SRO-Only / Total Examination Values	____ / ____ / ____	Points
Applicant's Scores	____ / ____ / ____	Points
Applicant's Grade	____ / ____ / ____	Percent

Name: ______________________________

1 U-2 is operating at 100% when a reactor trip occurs.
The RO observes the following indications on the CEA mimic:

4 CEAs do not have the amber lights energized
2 of the above CEAs have green lights energized

What must be performed when performing the Reactivity Control Safety Function?

A. Take the alternate actions to deenergize CEDM MG sets and verify all CEAs are inserted.

B. Depress the Reactor Trip pushbuttons on 2C15, verify reactor power is lowering, and verify a negative startup rate exists.

C. Verify reactor power is lowering, check that no CEA deviation alarms are present, verify a negative startup rate exists, check that RCS makeup is secured and inform CRS that Reactivity Control is complete.

D. Commence RCS boration to at least 2300 ppm via gravity feed or a Boric Acid pump using all available charging pumps.

2 Given the following conditions:

RCS pressure:	1600 PSIA
PZR level:	360"
T h:	532.5°F
Tc:	532.2°F
Containment Pressure:	2.4 PSIA
Containment temp:	115°F
S/G pressures:	880/885 PSIA

EOP-0 is being implemented

What is the most likely cause of these conditions?

A. RCS cold leg break

B. RCS leak at the top of the PZR

C. S/G tube leak

D. Main Steam line break in containment

The CRS ordered Unit-1 manually tripped due to rapidly loweing PZR level and RCS pressure. EOP-0 is being implemented and the following conditions exist:

RCS pressure:	1900 PSIA
Tc:	532.5°F
Containment pressure	0.5 PSIA
Containment temperature	98°F

What is the status of the Containment Air Coolers? **(Assume no operator action)**

A. 4 Coolers in slow speed with maximum SRW flow

B. 4 Coolers in fast speed with normal SRW flow

C. 3 Coolers in slow speed with maximum SRW flow

D. 3 Coolers in fast speed with normal SRW flow

4 Which one of the following describes the RCS inventory and core heat removal processes during a large break LOCA?

A. HPSI injection provides makeup and heat is removed via natural circulation flow to the S/Gs.

B. HPSI pumps, LPSI pumps and the SITs provide makeup and heat is removed via flow out the break.

C. LPSI pumps and the SITs provide makeup and heat is removed via forced flow to the S/Gs.

D. HPSI pumps and charging pumps provide makeup and heat is removed via flow out the break.

5 Given the following conditions:
-11A RCP tripped due to a breaker fault
-EOP-0 has been completed, no alternate actions were required
How will the RCS and Steam Generators have responded?

A. 11 and 12 loop differential temperatures will be equal and 11 and 12 S/G pressures will be equal.

B. 11 loop will have an inverted differential temperature and 11 S/G pressure will be lower than 12 S/G pressure.

C. 12 loop differential temperature will be greater than 11 loop differential temperature and 11 and 12 S/G pressures will be equal.

D. 12 loop will have a smaller differential temperature than 11 and 12 S/G pressure will be lower than 11S/G pressure.

A reactor trip has occurred and the following conditions exist:

-- Pressurizer level is 140 inches and stable
-- One Charging Pump is available
-- Pressurizer pressure is 1900 psia and rising
-- RCS Subcooling is 65°F and steady

After performing the immediate actions for PIC, the Reactor Operator reports "Pressure and Inventory Control cannot be met" to the CRS.

What is the reason for this report?

A. Letdown has been isolated.

B. RCS subcooling is not in band.

C. All Charging Pumps are not in operation.

D. Pressurizer level is not trending toward setpoint.

7. Why does the Component Cooling system realign on a SIAS?

A. Minimize dose rates due to contamination of Component Cooling system

B. Provide long term cooling to containment after RAS

C. Minimize load on the Saltwater system to ensure containment cooling via Service Water

D. Provide continuous cooling to LPSI pump seals

8. Unit-1 is in Mode 3 with the following conditions:
RCS pressure is 2150 PSIA and lowering
Pressurizer Spray Valves, 1-RC-100E and F are fully open
PIC-100X is indicating 2400 PSIA, controller output is 100%
PIC-100Y is indicating 2150 PSIA output is 0%

What action is required?

A. Stop 11A and 11B Reactor Coolant Pumps.

B. Energize all Pressurizer Heaters.

C. Place PZR PRESS CH SEL switch, 1-HS-100 in "Y".

D. Place PRESSURIZER SPRAY VALVE CONTROLLER, 1-HIC-100 in manual with a 100% output.

9. EOP-8 has been implemented because the Reactivity Safety Function was not met in EOP-0. What indications are used to verify that boration is successfully meeting the acceptance criteria?

A. WRNI power is less than 10^{-4}% and SUR is negative or zero

B. LRNI power is less than 10^{-4}% or SUR is negative

C. A boric acid pump is running and charging header flow is 40 GPM or greater

D. SUR is zero and the CHG HDR FLOW LO PRESS LO alam is clear

10. Which one of the following is the reason for equalizing the pressure on the primary and secondary sides of a ruptured Steam Generator per the applicable EOP?

A. Lowering the RCS pressure allows HPSI flow to restore Pressurizer level.

B. Reducing the differential pressure lowers the RCS leak rate.

C. Reducing RCS pressure and temperature aids initiation of natural circulation.

D. Equalizing RCS and S/G secondary side pressures initiates backflow to control affected S/G level.

11. Emergency Operating Procedures provide specific guidance for feeding a dry S/G to restore RCS heat removal.

This guidance is based on ______________________________.
(Select the phrase that correctly completes the above statement)

A. minimizing S/G tube voiding, which would inhibit natural circulation

B. preventing a rapid RCS cooldown, avoiding a pressurized thermal shock to the Reactor Vessel

C. preventing uneven cooling of the RCS, which may result in a localized reactivity excursion

D. minimizing the probability of creating a waterhammer, and damaging S/G internals

12. EOP-0 was completed and the following conditions exist:

11 S/G pressure	725 PSIA and lowering
12 S/G pressure	840 PSIA
11 S/G level	-260" and lowering
12 S/G level	- 80" and rising slowly
Tc	521°F
Pzr pressure	1830 PSIA

MSIVs and S/G Blowdown Isolation Valves are shut

Which event would cause these indications?

A. A Feedwater line rupture inside Containment

B. An RCS leak inside Containment

C. A Main Steam line rupture in the Turbine Building

D. A rupture of the S/G Blowdown Tank

13. EOP-7 (Station Blackout) has been initiated on U-1 and the CRS has directed the CRO to restore power to 14 4KV bus using the 0C Emergency Diesel Generator.

What is an indication that this action has been completed?

A. 12 Charging Pump has automatically restarted.

B. 11 and 12 Gravity Feed Valves, 1-CVC-508 and 509 MOV position indications are re-energized.

C. U-1 Control Room normal lighting is restored.

D. CEA mimic on 1C05 indications return.

14. Unit-1 has experienced a Loss of Offsite Power from 100% power.
11 and 14 4 KV buses have been re-energized by their associated Diesel Generators.
EOP-0 is being implemented.

What action must the CRO take for step B, "ENSURE TURBINE TRIP" that would **NOT** be expected on a reactor trip with offsite power available?

A. Depressing the Turbine TRIP button.

B. Opening 11 GEN FIELD BKR, 1-CS-41.

C. Shutting the MSIVs due to not being able to verify Turbine speed dropping.

D. Dispatching an operator to shut the MSR 2nd stage bypass valves.

15. The inverter backup bus is powering 1Y01 when offsite power is lost.
How is 4 KV bus 11 affected?

A. 1A DG will start but not load because ESFAS logic cabinet ZA remains deenergized, maintaining a UV (load shed signal) to 4 KV bus 11 loads.

B. 4 KV bus 11 will be re-energized by manually starting and loading 0C Diesel Generator.

C. 1A DG will automatically start and load to energize 4KV bus 11 after the 1B DG starts and energizes 4KV bus 14.

D. 4 KV bus 11 cannot be re-energized until power is restored to 1Y01 via DC bus 11.

16. A plant transient has ocurred and the following conditions exist:

--All Unit-1 annunciator lights are deenergized
--CC CNTMT RETURN, 1-CC-3833-CV has failed shut

How will SPDS indicate the cause of this event?

A. All Safety Function boxes turn red, and a "Loss of AC bus " alarm appears on the "Vital Auxiliaries" Safety Function screen.

B. The "Vital Auxiliaries" Safety Function box turns red, and the indicator for the affected AC bus on the electrical systems mimic flashes.

C. The "Vital Auxiliaries" Safety Function box turns yellow, and the indicator for the affected DC bus on the electrical systems mimic changes color.

D. All Safety Function boxes turn magenta and a small red box appears next to the indicator for the affected DC bus on the electrical systems mimic.

17. 2-HS-5155, 22A/22B SRW HXR EMERGENCY OUTLET VLVS handswitch is inadvertantly placed in 'OPEN'.
How are the Service Water Heat Exchangers affected?

A. 22A/22B SRW HXR emergency outlets valves open, but normal SW flow is maintained because the emergency overboard valve is normally gagged shut.

B. 22A/22B SRW heat exchangers are removed from service because the heat exchangers' SW inlet valves will also shut.

C. 21A/21B SRW heat exchangers lose SW flow because the emergency overboard valve automatically opens, and 22A/22B SRW heat exchangers SW outlets shift to 21 SW supply header.

D. 21A/21B SRW heat exchangers' SW inlet and outlet valves automatically shut, and 22A/22B SRW heat exchangers will be supplied by 21 SW header.

18. What will automatically start the Saltwater Air Compressors?

A. Low Instrument Air Header pressure.

B. Shutdown Sequencer Signal (SDS).

C. Safety Injection Actuation Signal (SIAS).

D. Containment Isolation Signal (CIS)

19. On a dropped CEA, what causes the plant computer to set the CEA position indication to zero?

A. Rod bottom reedswitch

B. Up-Down counter signal

C. CEDM breaker position

D. CEA coil power programmers

20. Given the following conditions:
Unit-2 is on Shutdown Cooling, RCS temperature is 120°F
RCS pressure is 14.7 PSIA
The reactor vessel head is fully tensioned
Reactor Trip Circuit Breakers are open
One of two operable WRNI channels has failed low

What action is required immediately?

A. Commence boration of at least 40 GPM until RCS boron is 2300 PPM or greater.

B. Suspend all operations involving positive reactivity additions.

C. Commence actions to restore two WRNI channels to operable status.

D. Perform SDM verification per Surveillance requirement 3.1.1.1.

2 Which of the following would be classified as a fuel handling incident per AOP-6D?

A. A large object was dropped in the Spent Fuel Pool and is laying on top of a spent fuel assembly .

B. During refueling of the core, a fuel assembly was placed in an incorrect core location.

C. A new fuel assembly was dropped when being moved from the New Fuel Storage Area to the New Fuel Inspection Platform.

D. A portable light pole hanging off the refueling machine bridge was damaged when performing the refueling machine operational checks per OI-25C.

22. "RMS PANEL 1C26" alarm at 1C18 has annunciated.
2-RI-7010, Unit-2 BAST room Area Radiation Monitor is reading off-scale, high.
No other indications of abnormal conditions are present.

What action is directed by plant procedures?

A. Contact Chemistry to obtain samples of the BASTs, VCT and RCS.

B. Recommend Radiation Safety Supervision post the area.

C. Obtain CRS permission to bypass the alarm to clear the alarm at 1C18.

D. Sound the emergency alarm, evacuate the immediate area and declare a Radiological Event per ERPIP 3.0.

23. During a severe fire in the Control Room, (AOP-9A), why are the Fairbanks Diesel Generators shutdown?

A. To prevent overloading the Diesel Generators when equipment starts, as the sequencers may not be operable.

B. To ensure fuel is conserved for continued extended operation of the OC Diesel Generator

C. To protect the engine from damage due to loss of cooling

D. To ensure MCCs 104 and 114 are de-energized to keep PORVs from failing open

24. On Unit-2 PAMS, what does a "?" next to a CET temperature indication signify?

A. The indication is outside the quality check parameters.

B. The CET is the highest reading CET in it's quadrant.

C. The CET has been "bypassed", and the value is an old, non-updated indication.

D. The indication is a calculated value, not an actual temperature measurement.

25. Which phrase describes the relationship of RCS activity to the Process Rad Monitor? The Process Radiation Monitor:

A. detects increases in specific isotopes due to fuel failures

B. detects only increases in RCS activity specifically related to CRUD bursts

C. measures RCS activity changes associated with Severe Accident Mitigation scenarios

D. measures dose rates in the Letdown HX room at power due to CRUD bursts or fuel failures.

26. Using provided references, given the following Unit-2 information:

Reactor Power:	100%
Tc:	547.7°F and steady
Letdown flow:	30 GPM
Charging flow:	135 GPM
PZR level:	Lowering at 2.5 inches/minute
RCS pressure:	2210 PSIA and slowly lowering
Total CBO flow:	6 GPM

What is the approximate RCS leak rate, in GPM?

A. 135
B. 146
C. 152
D. 172

27. Which one of the following conditions would allow you to exit EOP-8?

A. A plant cooldown has been completed, shutdown cooling flow has been established, and Core/RCS Heat Removal and Pressure/Inventory safety function status checks for EOP-8 are met.

B. All the safety function acceptance criteria for success paths implemented are being met, a single event diagnosis can be made and intermediate safety function status checks for single event are being met.

C. The CRS or STA has analyzed plant conditions and has verified that steps in an optimal recovery procedure, or an Operating Procedure, will address the safety functions such that EOP-8 final acceptance criteria for all the safety functions will be met.

D. In the case of multiple events, one event has been terminated, (such as a when the affected S/G goes dry during an ESDE) and all intermediate safety function status checks for EOP-8 are being satisified.

28. When restoring forced circulation it is necessary to verify the 4KV bus voltage greater than 4100 volts prior to starting the RCPs.
What is the basis for this requirement?

A. To prevent the 4KV degraded voltage relays from actuating upon RCP start.

B. To prevent tripping the oil lift pumps on low voltage when the first RCP is started.

C. Ensures that the running component cooling pump will operate within its design voltage limits.

D. Ensures that excessive starting current is not developed which could damage RCP windings.

29. Given the following plant conditions:

-- Unit One has tripped due to a Loss of Offsite Power
-- 11 and 14 4KV busses are energized from the EDGs
-- Pzr level is 100" and slowly lowering

How does this effect charging pump operation to restore Pzr level?

A. One charging pump starts automatically, the other charging pumps must be manually started and will stop automatically when Pzr level reaches +13 inches above program.

B. All 3 charging pumps must be started manually and will receive no signals to stop on Pzr level deviations from program.

C. All 3 charging pumps must be started manually and the backup pumps will stop automatically when Pzr level reaches +13 inches above program.

D. One charging pump starts automatically the other charging pumps must be operated manually to control pressurizer level.

30. Which of the following is a possible cause when the following alarm has actuated?

--On panel 1C19 **"U-1 4KV Eng SF Motor Overload"**

A. 152-1204 (11 Condensate Booster Pump breaker) tripped

B. 152-1114 (U-440-11A high side Feeder) tripped

C. 152-1104 (11 LPSI Pump breaker) tripped

D. 152-2107 (21 Containment Spray Pump breaker) tripped

31. During recovery from a LOCA on U-2, you are directed by the U-2 CRS to reset SIAS from the control room using the implemented EOP . Containment pressure is 2.0 psig and PZR pressure is 800 psia. What sequence of actions must occur to complete this action?

A. Match required handswitches per the EOP attachment, block PZR pressure SIAS, and depress both SIAS channel reset pushbuttons.

B. Block Pzr pressure SIAS and depress either SIAS channel reset pushbutton.

C. Match required handswitches and depress both SIAS channel reset pushbuttons.

D. Block the Pzr pressure SIAS and depress both SIAS channel reset pushbuttons.

32. Unit 2 is in Mode 1 at 100% power when a loss of Component Cooling occurs. Which condition from this event alone would require a manual Reactor trip?

A. Main Generator gas temperature of greater than 48°C for at least 15 minutes.

B. RCP bleed off temperature of 200°F.

C. Component Cooling heat exchanger outlet temperature of 175°F.

D. Letdown is automatically isolated due to high temperature.

33. Unit 1 is in Mode 5, preparing for a plant heatup.
E01, QUENCH TK TEMP LVL PRESS is in alarm on 1C06.

Given the following Quench Tank parameters:

1) Pressure is 12 PSIG
2) Temperature is 105°F
3) Level is 29 inches

What action is required?

A. Open WGS CNTMT ISOL valves, WGS-2180, 2181-CVs and open QT VENT, 1-RC-400-CV.

B. Place PORV handswitches, 1-HS-1402 and 1-1404 in "OVERRIDE"

C. Open Quench Tank Drain, 1-RC-401-CV

D. Open Containment Nitrogen Supply Valve, 0-N_2-238.

34. Unit-1 was initially at 100% power when a major plant transient ocurred. The following conditions exist:

The 500 KV Red Bus was lost (P-13000-2 is de-energized)
RCS pressure is 1600 PSIA
Tc is 532.4°F
Contaiment pressure is 2.2 PSIG

No other malfunctions occurred.

How many Component Cooling Pumps would be running, assuming no operator actions?

A. 0

B. 1

C. 2

D. 3

35. RCS pressure is initially 2250 PSIG.
Spray Valve Controller, 1-HIC-100 fails to a 0% output.
What is a direct result of this failure?

A. All Backup Heaters will energize if in "Auto".

B. Spray Valves 1-RC-100E and F will fully open.

C. All Backup heaters will deenergize.

D. Proportional heaters will receive full power

36. Unit-2 is at 16% power, with the Turbine Generator having just been paralleled with the grid.
A malfunction in RPS channel B causes the Power Trip Test Interlock (PTTI) to actuate.
How is the Turbine Generator affected?

A. A turbine trip will result due to ESFAS B logic cabinet initiating a turbine trip signal.

B. Trip logic will be reduced to 1 out of 3, since channel B Loss of Load trip unit will actuate.

C. The Turbine Generator will not be affected since the Loss of Load Trip is disabled.

D. RPS will initiate a Turbine Trip signal, but the signal is bypassed at ESFAS due to low reactor power.

37. Using provided references:

If 1Y03 were de-energized, which RPS matrix power supply lights at 1C15 would be extinguised?

A. 5 and 15
B. 5,9 and 7
C. 8,12 and 15
D. 9 and 10

38. A S/G tube rupture has been diagnosed, the correct EOP has been implemented and the following conditions exist:

RCS pressure is 1280 PSIA
RCS temperature is 485°F
PZR level is 85"
11A and 12B RCPs are running
Cooldown rate is 95°F/hr, using TBVs
The affected S/G has been isolated and pressure is 700 PSIG

What action is required?

A. Secure the remaining RCPs to prevent exceeding pump curve limits.

B. Throttle HPSI flow to allow for backflow from the affected S/G as RCS depressurization continues.

C. Lower TBV controller output to avoid exceeding cooldown rate limits when HPSI injection begins.

D. Increase RCS depressurization using Main Spray to lower the leak rate into the affected S/G.

39. Part of the 2003 modification to the LOCI sequencer advanced the start of the Service Water pumps from step 4 to step 0.
Why was this modification made?

A. Prevents overloading the Emergency Diesel Generators

B. Prevents tripping the supply breakers for the safety related 4 KV buses

C. Prevents damage to the Service Water Pump motors caused by excessively high starting currents

D. Prevents a rupture of the Service Water system caused by water hammer in the Containment Air Coolers

40. 2A Diesel Generator is being taken out of service for routine maintenance. Which component is also potentially affected? **ASSUME NORMAL SYSTEM LINEUPS**

A. 21 Containment Spray Pump

B. 22 Charging Pump

C. 12 SFP Cooling Pump

D. 23 Saltwater Pump

41. A LOCA has occurred, SIAS initiated and RWT level is 7 feet and lowering.

What actions are directed by the applicable EOP to prevent or mitigate cavitation of the Containment Spray Pumps?

A. Align a HPSI pump to the suction of a CS PP if discharge pressure lowers and amps fluctuate.

B. Verify Containment Sump level rises as RWT level lowers and, after RAS has initiated, place a second CC HX in service.

C. Prior to RAS, place both CS PPs in PULL TO LOCK. Verify sump level is greater than 28". When RAS actuates, place a second CC HX is in service.

D. When RWT level lowers to 4 feet, throttle CS PP discharge valves per EOP attachments. After RAS has initiated, verify flow less than 1300 GPM.

42. With reactor power at 25%, what indication is available to the operator to monitor a S/G tube leak of 5 GPD?

A. Only S/G sample results reported by Chemistry

B. N-16 monitors and Condensor Off Gas RMS

C. Condenser Off Gas RMS and Main Steam Line Radiation Monitors

D. N-16 monitors only

43. The following conditions exist on Unit 2:

Reactor/Turbine trip has just occurred
(Power prior to trip--100%)
S/G pressures are currently 850 psig

What operator action (in the Control Room) must initially be taken to prevent an overcooling of the RCS per EOP-0?

A. Press "Close Valves" button on the turbine control panel.

B. Press "Reset" button on the MSR control panel.

C. Shut the MSIVs.

D. Press the BFV "reset" buttons.

44. Unit 1 is operating at 50% power.
An electrical system malfunction occurs resulting in the loss of 12 and 13 Condensate Pumps.
What is the effect of this transient, and what action must be taken?

A. Reduced feed flow to the S/Gs and lowering levels will result. Bias feed pumps as required to maintain S/G levels.

B. Lower SGFP suction pressure will exist. Verify a Condensate Booster Pump automatically starts.

C. Reduced feed flow to the S/Gs and lowering levels will result. Trip the reactor and implement EOP-0.

D. Low suction pressure to the SGFPs and runout of the operating Condensate Pump will result. Reduce power to maintain condensate header flow less than 8,000 GPM.

45. Unit-1 is at 100% power. Both feedwater flow transmitter signals from 12 S/G to DFWCS faillow (out of range).
How is 12 FRV, 1-FW-1121-CV, affected?

A. The last good feed flow input is used and 12 FRV control is shifted to the Backup CPU.

B. Both CPUs fail and 12 FRV controller is shifted to "MANUAL".

C. An "11/12 S/G FW CONTR XFER INHIBIT" alarm is received, a shift from high power to low power control mode will not occur and 12 FRV will be controlled by the Backup CPU.

D. Steam flow/feed flow error signal is not used and the Main CPU operates the FRV in single element control.

46. Unit-2 was initially at 100% power when a major plant transient occurred. The following conditions exist:

RCS pressure is 1800 PSIA
Containment pressure is 0.4 PSIG
21 S/G pressure is 865 PSIG
22 S/G pressure is 680 PSIG

Which list correctly identifies Main Feedwater/Condensate system automatic actions?

A. Both SGFPs trip, all Condensate Pumps trip, both Heater Drain Pumps trip, both Main Feed MOVs shut and both MSIVs shut.

B. Both SGFPs trip, all Condensate Booster Pumps trip, both Heater Drain Pumps trip, both Main feed MOVs shut and both MSIVs shut.

C. Both SGFPs trip, all Condensate Booster Pumps trip, both Heater Drain Pumps trip, 22 Main Feed MOV shuts and 22 MSIV shuts.

D. Both SGFPs trip, all Condensate Pumps trip, all Condensate Booster Pumps trip, both Heater Drain Pumps trip, both Main Feed MOVs shut and both MSIVs shut.

47. What is the basis for the AFW flow controller automatic setpoints of 150 GPM?

A. S/G levels will be restored to EOP-1 limits within 10 minutes of AFAS actuation with MFW isolated, and AFW suction piping flow limits are not exceeded.

B. EDG ratings are not exceeded on SIAS with a Loss of Offsite Power, and S/G inventory is adequate for worst case decay heat with 2 trains of AFW operating.

C. AFW flow will be adequate with one AFW train to remove highest decay heat, but low enough to prevent initiating SIAS due to RCS overcooling with 2 trains operating.

D. AFW flow will be adequate to maintain S/G level in the unaffected S/G in the event of AFAS Block to the affected S/G with no operator action, yet low enough to prevent RCS cooldown to less than 525°F with one train operating.

48. A Loss of Offsite Power exists with Unit-1 previously at 100% power and Unit-2 in Mode 5. Unit-2 has been unable to restore Shutdown Cooling and is using 13 AFW Pump to restore S/G levels.
Unit-1 is using 11 AFW Pump to feed 11 and 12 S/Gs at 150 GPM per S/G.

What is the flow limit for 13 AFW pump to supply Unit-2?

A. 275 GPM

B. 300 GPM

C. 600 GPM

D. 900 GPM

49. Unit-1 is at 100% power when 13B 480 Volt Bus is lost.

What is the major affect to the plant, and what action must be taken?

A. Boration via the RWT from all operable Charging Pumps causes power to decrease. The Charging Pumps are placed in PTL, suction is shifted back to the VCT.

B. All Circulating Water Pumps lose excitation. The Reactor is tripped and EOP-0 is implemented

C. Feedwater Heater Level Dump Valves fail open, reactor power increases. Reactor power is reduced, the valve handswitches are matched and 1Y09 and 1Y10 are tied.

D. 12 and 13 Condensate Pumps' bearing temperatures rise due to loss of lube oil cooling. MCCs 106 and 116 are tied.

50. A loss of which one of the following buses will result in a loss of all Unit-2 annunciator alarms?

A. 11 125 VDC bus
B. 12 125 VDC bus
C. 21 125 VDC bus
D. 22 125 VDC bus

51. 1A Diesel Generator is out of service for maintenance when a Loss of Offsite Power occurs.
2B Diesel Generator did not load due to a faulted 4 KV bus.

What affect does this have on the DC electrical distribution system as indicated at 1C24A?

A. 11 DC bus will be supplied only by 11 battery.

B. 21 DC bus will be supplied by 21 battery charger.

C. 12 DC bus will be supplied by 24 battery charger.

D. 22 DC bus will be supplied by 22 battery charger.

52. What type of radiation do the Component Cooling, Service Water and S/G Blowdown Recovery (process rad. monitors) detect?

A. Alpha

B. Beta

C. Gamma

D. Neutron

53. During normal operation at 100% power, what is the largest heat load on the Service Water system?

A. Main Generator Hydrogen Coolers.

B. Hydrogen Seal Oil Coolers

C. Containment Air Coolers

D. 1B Diesel Generator

54. After a SIAS actuation, what is the source of Instrument Air supplied to the AFW flow control valves?

A. Saltwater Air Compressors

B. The opposite unit's Plant Air Compressor

C. Auxiliary Feedwater system air accumulators

D. Nitrogen backup to Instrument Air

55. What affect does a containment entry at power have on the Containment system, and how is this impact controlled?

A. Containment airlock door seals must be tested within 7 days, containment access checklists ensure testing is scheduled.

B. Containment integrity is breached, per the containment entry checklists, someone must be stationed outside the airlock door while it is open.

C. Containment atmosphere enters the Auxiliary Building unfiltered, per access procedures, a containment vent is performed prior to containment entry.

D. Containment is a Foreign Materials Exclusion boundary, an FME log (MN-1-109 att.5) is required for entry

56. Under which condition can CEAs be WITHDRAWN in the manual sequential mode? **(without using CMI bypass features)**

A. Tavg-Tref deviation alarm.

B. Group 5 CEAs below the PDIL.

C. 2 out of 4 TM/LP channel pretrips at RPS.

D. A misaligned CEA 7.5 inches from its group.

57. The reactor is at steady state conditions and turbine load has been adjusted to maintain Tc on program.

Given the following:
T cold is 538°F
T hot is 556°F

What is reactor power?

A. 18%
B. 34.5%
C. 37.5%
D. 40.5%

58. Which statement satisfies the requirements for minimum operable position indication channels for a CEA?

A. CEA voltage divider reed switch position indicator channel capable of determining the absolute CEA position within ±6 inches
and
CEA pulse counting position indicator channel.

B. CEA voltage divider reed switch position indicator channel capable of determining the absolute CEA position within ±7.5 inches
or
CEA "Full Out" reed switch position indicator channel only if the CEA is fully withdrawn as verified by actuation of the applicable position indicator.

C. CEA voltage divider reed switch position indicator channel
and
CEA pulse counting position indicator channel in agreement within 4.5 inches.

D. CEA voltage divider reed switch position indicator channel capable of determining the absolute CEA position within ±1.75 inches of absolute position
or
CEA "Full Out" reed switch position indicator channel only if the CEA is fully withdrawn as verified by actuation of the applicable position indicator.

59. Which condition would cause **audible** WRNI count rate to rise?

A. Pulling CEAs to criticality when performing the first reactor startup following a refueling outage

B. Reinserting a once-burned fuel assembly in a new core location

C. During RCS drain down to reduced inventory for RCP seal replacement

D. Withdrawing CEA #1 from a fuel assembly while swapping CEAs

60. How are the **sample locations** indicated on the Hydrogen Analyzer recorders on 1(2)C10 selected?

A. Manually at the recorder

B. Automatically or manually by the plant computer

C. Automatically or manually from sample panels in the Aux. Building

D. Automatically at the recorder

61. Refueling operations are in progress and Containment Purge is in operation. While taking logs in the Cable Spreading Room, the CRO notices that channel ZF of CRS is bypassed.
How does this affect Containment Purge?

A. Containment Purge will be automatically secured if any other channel of CRS actuates.

B. In the event of a valid CRS signal, one Containment Purge CV will remain open.

C. Containment Purge must be secured (or fuel movement suspended), per Technical Specification requirements.

D. The remaining channels of CRS must be verified operable to allow Containment Purge to remain in operation

62. High Spent Fuel Pool temperature is corrected by what action?

A. Adjusting spent fuel pool temperature controller setpoint.

B. Throttling 11A/B SRW heat exchanger Saltwater outlet valves open.

C. Adjusting SFP CLR OUT THROTTLE valve to obtain a discharge pressure of greater than 120 psig.

D. Throttling open SFP CLR DISCH HDR stop valve.

63. What advantage has CCNPP realized from processing liquid radwaste through the NUKEM skid over using the originally installed waste processing system?

A. Lower cost for processing liquid radwaste

B. Decreased amount of radioactive material released to the Chesapeake Bay

C. Smaller potentially contaminated area in the Auxiliary Building

D. Lower number of High Radiation Areas in the Auxiliary Building

6. Control Room Vent RMS, 0-RI-5350 is in alarm.
How is the Control Room HVAC system affected?

A. Outside air dampers open to purge the Control Room, and the air conditioning unit is shutdown

B. Control Room ventilation is in recirculation with Post-LOCI filter fans in operation and the kitchen exhaust fan secured.

C. The Control Room HVAC shifts to winter mode of operation with Post-LOCI filter fans in operation.

D. Control Room air handling unit is secured. Only outside air dampers open.

65. What condition will start the diesel fire pump?

A. Fire main header pressure less than 105 PSIG

B. A smoke detector or temperature detector actuation

C. Both electric fire pump feeder breakers being open

D. Preaction solenoid valve or sprinkler alarm check valve actuation

66. Which category of deficient equipment status should be annotated on the Shift Turnover Information Sheet to communicate the status of 21 Condensate Pump which has a broken lube oil pump?

A. (OOS) Out Of Service

B. (I/F) Inoperable But Functional

C. (D) Degraded

D. (O) Inoperable

67. What is the condenser differential temperature (condenser delta T) limit, as stated in the facility license?

A. The calculated flow weighted hourly average of the temperature rise across both condensers is limited to 12°F

B. The calculated flow weighted hourly average of the temperature rise across each condenser is limited to 12°F.

C. The calculated average of the 24 flow weighted hourly readings of both units for a calendar day is limited to 12°F.

D. The calculated average of the 24 flow weighted hourly readings of each unit for a calendar day is limited to 12°F.

6. Given Nuclear Plant Operations Section Standing Order 03-03:
A known Component Cooling system leak is causing a Unit-2 sump frequency of 3.4 hours.
Sump frequency changes to 95 minutes with a corresponding increase in unidentified RCS leak rate.

Which method of informing the GS-NPO is required per administrative procedures?

A. Voicemail

B. Alpha-page

C. Alpha-page and detailed voicemail

D. Talk directly

69. Which condition requires that the Spent Fuel Pool Ventilation charcoal filters be placed in service?

A. Spent fuel is being loaded into an ISFSI storage cask.

B. New fuel is being loaded into the Spent Fuel Pool.

C. A dummy fuel assembly is being transferred from the Spent Fuel Pool to the Refueling Pool for RFM testing.

D. Refueling is in progress which does not include a complete core offload.

70. Where is the regulating group CEA "All Rods Out" (ARO) position stated?

A. NEOP-13 (23)

B. COLR figure 3.1.6

C. System 55 (CEDS) setpoint manual

D. OI-42, CEDM System Operation

71. What documents, used by Operations personnel to run the plant, are updated to communicate the core reactivity effect changes due to core age or fuel composition?

A. USFSAR and NFM Operator Surveillance Procedures (NEOP-301/302)

B. TRM and Offsite Dose Calculation Manual

C. COLR and Technical Data Book (NEOPs)

D. Calvert Cliffs Operating Manual and Technical Specification LCOs

7 The Shift Manager has declared an Alert per ERPIP 3.0
The Operational Support Center is not yet staffed.

A plant operator is required to perform a task in the Auxiliary Building where dose rates are unknown.

What is required prior to the operator being sent to perform the task?

A. Another operator must be assigned to monitor radiation levels for the worker.

B. The Shift Manager must approve the action and the selection of personnel to perform the task.

C. The Shift Radiation Technician must be contacted to assess radiological conditions and preferred access and egress routes.

D. A pre-evolution brief must be held with Security, the Interim Radiation Protection Director and the CRS in attendance.

73. What operation requires an approved Discharge Permit?

A. Initiating S/G Blowdown to Circulating Water

B. Pumping the Containment Sump

C. Dewatering the Saltwater side of a Component Cooling Heat exchanger

D. Placing 12 RCWMT in recirculation

74. Per the ERPIP, what is the area that should be considered when applying the Severe Weather Conditions criteria for procedure implementation?

A. CCNPP Protected Area

B. CEG service territory within the state of Maryland

C. CCNPP or any of the 500 KV tie lines rights of way

D. Within the ten mile radius of CCNPP

75. 11 Saltwater pump tripped due to a motor overload
and reactor trip criteria were reached before the system could be recovered.
The RO manually tripped the reactor from 100% and all systems responded normally.

Which Control Room panel would have **no** alarms annunciated?

A. 1C18

B. 1C13

C. 1C08

D. 1C03

Nuclear Plant Operations Section Standing Orders			
Number: 03-03, Rev. 0	Effective Date/Time: 08-01-2003 / 1200	Expiration Date/Time:	

Title: RCS Leakage

Purpose:

This Standing Order is intended to provide basic guidance for Operations to ensure consistent response at varying levels of unidentified RCS leakage. This Standing Order is not intended to change any responses or actions dictated by the CCOM, the Tech Specs, or any other Operational guidance.

Definitions:

Unidentified RCS Leakage – Leakage from the RCS that has not been determined to be from a specific source. For example, if total RCS leakage has been *determined to be 0.6 GPM, but 0.4 GPM has been determined to be from 12* Charging Pump primary packing leakage, then the unidentified RCS leakage, as referred to in this Standing Order, would be 0.2 GPM.

Considerations:

- Historical baseline RCS leakage for both units has typically been in the range of 0.1 GPM to 0.15 GPM following a refueling outage. This value tends to increase over the fuel cycle due to minor degradations of RCS sealing interfaces (e.g., packing, etc…). Larger leakrates are typically seen very near the end of a fuel cycle (during times of increased CVCS diversion) due to inaccuracies in the diversion integrator.
- Calculated leakrate values will be greatly impacted by non-steady-state operation. Consideration of minor changes in RCS leakrates should be given only when the RCS has been in steady-state conditions.
- The sensitivity of the Containment Gaseous and Particulate detectors is based on a source term with 1%-failed fuel. Therefore, these detectors will be essentially blind to leakage within the range of this Standing Order.
- The values presented in this Standing Order are to be considered general guidance. Plant conditions may dictate that actions be taken prior to these values being reached.
- Any actions taken to attempt to identify sources of unidentified RCS leakage should be documented in the CRO logs (e.g., "*Quantified charging pump primary leakage per OI-2A. No primary leakage detected.*") This will ensure efficiency in *the search, should it go over several shifts.*
- Small changes in RCS leakage may need to be trended over several shifts before actions to find leakage need to be taken.
- Single evolutions that cause the planned loss of RCS inventory (but are not "leakage") should be annotated in the CRO logs. Examples include large quantities of charging pump venting (such as restoring from maintenance), large diversion activities (such as rinsing a CVCS IX), etc…

Guidance

I. RCS Leakage Condition 1

Definition:

A) Unidentified RCS leakage >0.2 GPM

B) Unexplained increase of 0.1 GPM

Actions:

___ Notify the GS-NPO (voicemail).

___ *Evaluate Charging Pumps for increased primary packing leakage.*

___ Consider performing the Miscellaneous portions of STP O-27 (e.g., RCDT leakage).

___ Consider performing the Leak Identification attachment of AOP-2A.

___ If potential leak sources are addressed, start a Supplemental STP-O-27 to verify the effect.

II. RCS Leakage Condition 2

Definition:

A) Unidentified RCS leakage >0.4 GPM

B) Unexplained increase of 0.3 GPM

C) Unexplained Containment Sump Frequency of <8 Hours concurrent with increased RCS Leakage.

> **NOTE**
> A leakrate of 0.1 GPM into a completely empty containment 49-gallon (44-gallon) sump will cause the alarm to come in every 8.2 hours (7.3 hours).

Actions:

___ Initiate an Issue Report per QL-2-100.

___ Notify the GS-NPO and PE-PSE (alpha-page).

___ Leave detailed Voicemail for Site Managers per the Notification Matrix.

___ Perform the Miscellaneous portions of STP O-27.

___ Perform the Leak Identification attachment of AOP-2A.

___ If the increased RCS leakrate is indicated in the Containment:

- Begin planning a Containment entry while carrying out other actions. After planning is complete, the decision to make the entry will be made by the GS-NPO.
- Request Chemistry obtain a fresh sample of the 12/22 ECCS pump room sump for Boric Acid and hydrazine content. Chemistry should grab the sample while the containment sump is being drained.
- Evaluate SRW and CC system leakrates for changes.
- Request Health Physics obtain a sample of the Containment atmosphere for indications of RCS leakage.

___ If potential leak sources are addressed, start a Supplemental STP-O-27 to verify the effect.

III. RCS Leakage Condition 3

Definition:

A. Unidentified RCS leakage >0.5 GPM with all potential corrective actions taken.

B. Unexplained Containment Sump Frequency of <4 hours concurrent with increased RCS leakage.

Actions:

____ Alert Site Management with alpha-page and detailed voicemail per Notification Matrix. Ensure you talk directly to the GS-NPO and PE-PSE.

____ Begin planning a controlled unit shutdown. Activate the Forced Outage Protocol Checklist per OAP 01-03.

NOTE:
A leakrate of 0.2 GPM into a completely empty containment 49-gallon (44-gallon) sump will cause the alarm to come in every 4.1 hours (3.6 hours).

____ If the increased RCS leakage is indicated in the containment:

- Implement the Rapid Containment Entry procedure. Consideration for personnel safety must be applied. If the RCS leakrate is degrading a containment entry may no be advisable.

____ Review RCS Leakage Condition 2 checklist for appropriate actions.

Approved by: GS-NPO	Original signed by J. K. Mills	08/01/03
	Printed Name and Signature	Date
Canceled by: GS-NPO		
	Printed Name and Signature	Date

ATTACHMENT (1)
Page 2 of 2

ESTIMATE GROSS LEAK RATE

Calculate Leak Rate:

m. PZR Level

(a. _______ - d. _______) x k. _______ gallons/inch = m. _______ gallons

n. RCS Temperature

(b. _______ - e. _______) x l. _______ gallons/° F = n. _______ gallons

o. RCS change

(m. _______ - n. _______) ÷ (f. _______ - c. _______) = o. _______ gpm

p. Calculate Leak Rate

o. _______ + h. _______ - i. _______ - j. _______ = p. _______ gpm

p. _______ gpm = Leak Rate

R21

Name: ______________________________

1. RCP MALFUNCTIONS 002// BANK--1/ CRO-63-1-3/ 1.7E/ 020630311/ 015AA2.10/ 3.7/3.7/ SD 63 - ES

U-2 is at 100% power when the "ACTUATION SYSTEM CIS TRIPPED" alarm is received on 2C08. CIS has been determined to be invalid by the crew, but all attempts to reset CIS "A" from the control room have failed.

When are the RCPs tripped?

A. Immediately after an update brief is concluded by the CRS

B. When the RO has reported that controlled bleedoff temperatures exceed 200°F, or bearing temperatures exceed 195°F

✓C. After the reactor is tripped and the RO has reported the reactivity safety function is complete

D. After an attempt has been made to reset CIS from the cable spreading room

A and B are incorrect, the reactor is first tripped manually to avoid an automatic trip.
C is correct per the Alarm Response Manual--G-06
D is incorrect, there is no requirement to attempt resetting form the ESFAS panels, and this action is not directed by a procedure.
Basis: "ACTUATION SYSTEM CIS TRIPPED" AlarmReferences: 55.41:10 55.43:5 / ARP 1C08KA1: 063A7.02KA2: 013000GEN8

2. LOSS OF RHR 001// NEW--2/ 052-4-0/ 7.0/ 203.011/ 025 2.1.12/ 2.9/4.0/

Per Technical Specifications, under what conditions can a spent fuel pool cooling loop replace a Shutdown Cooling loop?

✓A. The reactor head is unbolted and there is less than 23 feet of water above the fuel in the reactor vessel

B. The reactor head is unbolted and there is greater than 23 feet of water above the fuel in the reactor vessel

C. Mode 5 with the S/G tubes full

D. Mode 5 with S/G tubes drained

A is correct per TS 3.9.5, the first note.
B is incorrect, but only one loop of SDC is required.
C and D are incorrect. Per the TS, the SFP cooling loop must also be aligned for cooling the irradiated fuel and this is not possible in Mode 5.
References: 43.2, 43.5

3. PZR CONTROL MALF SRO 001/ / NEW--2/ 62-1-11/ 1/ 204.020/ 027 2.4.45/ 3.3/3.6/

Unit-1 was at 100% power when the following alarms annunciated:
PZR CH 100 PRESS
PZR CH Y LVL
ACTUATION SYS SENSOR CH ZF TRIP

1-PIC-100X indicates 2210 PSIA
1-PIC-100Y indicates 1400 PSIA
1-LI-110X indicates 208 inches
1-LI-110Y indicates 360 inches

What additional alarm would be expected with these indications?

A. PZR PRESS BLOCK A PERMITTED

B. ACTUATION SYS SIAS TRIP

✓C. CNTMT NORMAL SUMP LVL HI

D. PORV/SAFETY VLV ACOUSTIC MON

A is incorrect, indications are of a reference line leak, only one safety channel is affected, it takes 3 channels to get this alarm.
B is incorrect, the unaffected pressure instrument does not support SIAS conditions.
C is correct, with unaffected pzr level at 208 inches, a minimum of approximately 144 gallons has leaked, the sump alarms at 49 gallons.
D is incorrect. Indications are of an instrument failure, not lifting of a PORV or Safety.
References: 43.5

Unit-2 has experienced a loss of 2Y09. Reactor trip criteria was reached and the RO depressed the reactor trip buttons on 2C05.
Approximately 10 seconds later the RO reported WRNI power indications on 2C05 are reading approximately 100% power and startup rate is 0.

What is the cause of these indications?

✓A. The reactor failed to trip when the trip buttons were depressed

B. Normal reactor response immediately following a reactor trip from 100% power

C. Loss of power to NI instrumentation due to loss of 2Y09

D. An overpower condition occurred due to feedwater heater high level dump valves opening on the loss of 2Y09

A is correct, SUR would be negative if CEAS inserted and an initial decrease in NI power is expected.
B is incorrect, per EOP-0.
C is incorrect, NI indications are powered from vital buses.
D is incorrect, although a high power condition may have resulted, the normal SUR and NI indications would still be evident if the reactor had tripped.
Reference: 43.5

5. LOSS OF FW SRO 003/ / NEW--3/ 202-3G-7/ 4.0/ 202.040/ 054AA2.08/ 2.9/3.3/

A feed system malfunction has occurred and the following indications exist:
Reactor power is 100%
SGFPs speed is 4550-4650 RPM
SGFP suction pressure is 380 PSIG
11 S/G level is -2" 12 S/G level is -25"
TR1011/1111 recorder blue pen (feed flow) is slightly greater than the red pen (steam flow)
TR1021/1121 recorder red pen (steam flow) is greater than blue pen (feed flow)

What is the proper action for the CRS to direct the panel operators to perform?

A. Trip the reactor and implement EOP-0.

B. Start the standby Condensate Booster pump.

✓C. Place 12 S/G FRV controller in manual and open 12 FRV.

D. Bias SGFP speed to maintain FRV D/Ps greater than 75 PSIG.

A is incorrrect, trip criteria is not being challenged yet (-50")
B is incorrect, suction pressure is sufficient.
C is correct, given that a feed system malfunction exists (no steam leak), with feed flow less than steam flow, a FRV problem is most likely.
D is incorrect, SGFP speed is in the normal range and the pumps will respond to adjustment of the FRVs automatically.
References: 41.10, 43.5

6. SRO-201-7-1-03 003/ NONE/ BANK--2/ SRO-201-7-/ 1.0/ 201.004/ 055 2.1.20/ 4.3/4.2/ 201 - EMER

Place the following major actions of EOP-7, Station Blackout, in the order that occur within the procedure. **(First to last)**

1. Minimize 250 VDC battery discharge and restoration of forced circulation if desired.
2. Establish RCS Heat Removal and protect the condenser from overpressure.
3. Attempt to regain either an onsite or an offsite power source.
4. Evaluate the need for a plant cooldown via either forced or natural circulation.

A. 1, 2, 3, 4

B. 3, 2, 4, 1

C. 2, 1, 3, 4

✓D. 2, 3, 1, 4

D is correct per EOP-7
Basis: Major Actions of EOP-7References: EOP-7 Rev. 4 U-1 placekeeper
References: 41.10, 43.5

7. CRO-54-1-1-25 001/ / BANK--1/ CRO-54-1-1/ 10.3/ 202.101/ 058AA2.01/ 3.7/4.1/

Given an electrical system malfunction, what Control Room panel indications can be used to diagnose the status of the 125 VDC buses?

A. Reactor Protective System cabinets at 1C15

B. Steam Generator Feed Pump emergency lube oil pump lights on 1C03

C. AFW pump controls on 1C04

✓D. Containment pressure transmitter isolation valves on 1C10

A is incorrect, RPS channels are powered by Vital AC buses and have been used to give improper reports of DC bus losses in the past.
B is incorrect, these are listed indications for losses of turbine building MCCs
C is incorrect, AFW pump controls are Vital Instrument bus power supplies, and can be fed from the opposite unit.
D is correct, these indications are located close together, each is powered by a different DC bus and provide the CRS with a quick diagnostic tool for losses of DC bus reports.
References: 43.5

8. CRO-107-1-3-28 029/ / MOD--2/ CRO-107-1-/ 2.14.1/ 204.094/ 024 2.2.22/ 3.4/4.1/ BORATION

Upon a loss of MCC-114, what Technical Requirements Manual credited boration flow path would be available?

A. RWT to RWT charging pump suction valve (CVC-504) to charging pump suction

✓B. 12 BA pump to BA direct M/U valve (CVC-514) to charging pump suction

C. 12 BA pump to BA flow control valve (CVC-210Y) to VCT M/U valve (CVC-512) to VCT outlet (CVC-501) to charging pump suction

D. 11 or 12 BAST gravity drain valves (CVC-508 or 509) to charging pump suction

A is incorrect, 504 is powered from MCC 114
B is correct, all listed components are powered from MCC 104
C is incorrect, this is not a flowpath taken credit for meeting the TS.
D is incorrect, both gravity feed valves are powered from MCC114
Basis: Boration Flow Path Availability References: 55.43.5 55.45.13 KA1: 006K2.02-3KA2: 004000K2.01

mod

CRO-107-1-3-28 029/ / MOD--2/ CRO-107-1-/ 2.14.1/ 204.094/ 024 2.2.22/ 3.4/4.1/ BORATION

Upon a loss of MCC-114, what Technical Specification credited boration flow path would be available?

A. RWT to RWT charging pump suction valve (CVC-504) to charging pump suction.

✓B. 12 BA pump to BA direct M/U valve (CVC-514) to charging pump suction.

C. 12 BA pump to BA flow control valve (CVC-210Y) to VCT M/U valve (CVC-512) to VCT outlet (CVC-501) to charging pump suction.

D. 11 or 12 BAST gravity drain valves (CVC-508 or 509) to charging pump suction.

ANSWERS:

Single

Points 1

Version Answers:

0	1	2	3	4	5	6	7	8	9
B	C	D	A	B	C	D	A	B	C

☒ Scramble Choices

Scramble Range: A - D

Original

CRO-107-1-3-28 028/ / 0/ CRO-107-1-/ 2.14.1/ N/A/ 006K2.02-3/ 004000K2.0/ 107 CHEMIC

Upon a loss of MCC-104, which one of the below listed boration flow paths would be available?

A. RWT to RWT charging pump suction valve (CVC-504) to 11 BAST gravity drain valve (CVC-508) to charging pump suction.

B. 12 BA pump to BA direct M/U valve (CVC-514) to charging pump suction.

C. 12 BA pump to BA flow control valve (CVC-210Y) to VCT M/U valve (CVC-512) to VCT outlet (CVC-501) to charging pump suction.

✓D. 11 or 12 BAST gravity drain valves (CVC-508 and 509) to charging pump suction.

ANSWERS:

Single

Points 1

Version Answers:

0	1	2	3	4	5	6	7	8	9
D	A	B	C	D	A	B	C	D	A

☒ Scramble Choices

Scramble Range: A - D

9. CRO-202-2A-0-04 004/ / BANK--2/ CRO-202-2A/ 4.0/ 204.094/ 037 2.1.33/ 3.4/4.0/ AOP-2A, TS

U-1 is in Mode 1. The latest leakage reports are:

- -- 0.6 gpm from Pressurizer Safety Valve leakage
- -- 1.8 gpm from leakage past check valves from the RCS to the SI system
- -- 0.15 gpm from primary to secondary leakage (12 S/G)
- -- 4.8 gpm is total RCS leakage

Based upon these known leak rates, which of the following Technical Specification RCS leakage limits are being exceeded?

A. Pressure Boundary leakage and Identified leakage.

✓B. Primary to Secondary leakage and Unidentified leakage.

C. Identified leakage and Unidentified leakage.

D. Primary to Secondary leakage and Pressure Boundary leakage.

A is incorrect, no pressure boundary leakage is evident, identified leakage limit is 10 GPM
B is correct, primary to secondary is 216 GPD, limit is 100 GPD, and unidentified leakage is 2.25 GPM, limit is 1 GPM per 3.4.13
C is incorrect, identified limit is 10 GPM
D is incorrect, no pressure boundary leakage is evident.
Basis: RCS leak rate limits References: LCO TS 3.4.13 43.2, 43.3 KA1: 02005A8.02KA2:

10. CRO-202-9A-2-01 001/ NONE/ BANK--1/ CRO-202-9A/ 1.0/ 201.001/ 068 2.2.25/ 2.5/3.7/ AOP-9A

Fill in the blanks--
Performance of AOP-9A ensures that the plant is placed in ___ ___ within ___ hours and the RCS parameters will be maintained within those predicted for a Loss of Offsite power and the fission product boundary is not effected.

A. Hot Standby, 24

B. Hot Shutdown, 48

✓C. Cold Shutdown, 72

D. Cold Shutdown, 96

C is correct per AOP-9A I, rev,11 Unit-1
Basis: Intent of actions for AOP-9A implementation References: AOP-9A 43.2 KA1: KA2:

11. AOP-2A-03 003/ NONE/ BANK--01/ CRO-202-2A/ 2.0/ 202.017/ CE16AA2.1/ 2.7/3.5/ AOP-2A

An RCS leak has resulted in implementing the applicable plant procedure. What direction from the CRS is provided when RCS leakage exceeds T.S. 3.4.13 LCO but is within the capacity of one charging pump? (ASSUME INITIAL ACTIONS TO LOCATE SOURCE OF LEAKAGE HAVE BEEN COMPLETED)

A. Evaluate operation of the plant with letdown isolated and align charging pumps to operate as needed to prevent exceeding a pressurizer level of 225 inches.

✓B. Commence a plant shutdown to COLD SHUTDOWN per OP-3, OP-4, and OP-5.

C. Trip the reactor and implement EOP-0 when PZR level deviates from program by 15".

D. Perform a rapid power reduction, when Tave is less than 537°F, trip the reactor and implement EOP-0.

A is incorrect, but is close to steps in AOP-7I where letdown is lost.
B is correct per AOP-2A
C is incorrect, but similar to steps if the leak is greater than the capacity of one charging pump.
D is incorrect, but reflects actions for a S/G tube leak in excess of 1 charging pump
.Basis: REQUIREMENTS TO TRIP REACTOR References: AOP-2A, 43.5 KA1: 000037EK3.07KA2:

12. SRO-201-8-1-19 019/ EOP-8 R.A./ BANK--2/ SRO-201-8-/ 2.5/ 201.006/ CE9EA2.1/ 3.2/4.4/ 201 - EMER

Using provided references:

Functional Recovery Procedure, EOP-8, has been implemented and the following plant conditions exist:

--4 CEAs indicate fully withdrawn
--SUR is 0
--All charging pumps are inoperable
--RWT is available and operable
--SIAS has actuated and 2 HPSI pumps are running
--One 500 KV bus is energized
--Both SG levels indicate at -100" and constant and AFW flow is available
--Containment pressure is 0.4 psig and lowering

Which one of the following groups of Success Paths is implemented to assess and restore safety functions?

A. VA-1, PIC-3, HR-2, CE-2, RLEC-2

B. VA-1, PIC-4, HR-3, CE-2, RLEC-1

C. VA-1, PIC-3, HR-3, CE-3, RLEC-2

✓D. VA-1, PIC-4, HR-2, CE-2, RLEC-1

A is incorrect, PIC-3 would be used if no 4 KV bus was available and SIAS had not actuated.
B is incorrect, HR-3 requires SDC initiation to satisfy heat removal.
C is incorrect-see above for PIC-3 and HR-3
D is correct per the resource assessment table.
RC-3 is used for more than one stuck CEA, SUR is not negative and CVCS not available, PIC-4 uses SIS for pressure/inventory control, S/G and HPSI are used for heat removal. Basis: Success path determination via R.A.T. EOP-8
References: EOP-8, 43.5 KA1: KA2:

13. COMP CLG SRO 001/ / NEW--2/ LOI-15-1-0/ 7.0/ 015.001/ 008A2.07/ 2.5/2.8/

13 Component Cooling Pump is to be run 24 hours for PMT after bearing replacement. What action is required and why?

A. 12 Component Cooling Heat Exchanger must be placed in service to ensure a Component Cooling loop remains in operation.

B. 13 Component Cooling Pump must be powered from 11 4KV bus to ensure both loops remain operable.

✓C. 12 Component Cooling Pump must be placed in PTL to prevent damage to a SDC Heat Exchanger due to high flow if a SIAS occurs.

D. IX BYPASS 1-CVC-520 must be placed in BYPASS to prevent a reactivity event due to lowering letdown temperature.

A is incorrect, either heat exchanger can be inservice.
B is incorrect, 11 Component Cooling Pump remains operable.
C is correct, per the note for in OI-16.
D is incorrect, procedures for shifting pumps does not require bypassing the ion exchanger. For the short period of time 2 pumps are running, temperature does not change appreciably.
Refernces: OI-16, 41.5, 43.5

14. CONTAINMENT CLG SRO 001/ / NEW--2/ 011-1-0/ 2.0, 15.0/ 032.006/ 022A2.04/ 2.9/3.2/

21B SRW Heat Exchanger is to be removed from service for cleaning today. How is the Containment Cooling System affected?

✓A. The manual SRW inlet isolation valve on 21 or 22 Containment Cooler is shut to maintain 2A Diesel Generator operable.

B. One train of Containment Cooling is declared inoperable because 2A Diesel Generator is inoperable.

C. The Containment Cooling System is degraded but remains operable and functional.

D. 21 and 22 Containment Coolers must be declared inoperable because 21 Component Cooling Heat exchanger must be taken out of service.

A is correct, per OI-29 and Technical Specification LCO 3.7.6 basis.
B is incorrect, one train of air coolers is declared inoperable, but it is because one cooler is isolated, not due to the EDG.
C is incorrect per TS.
D is incorrect, only one heat exchanger is out of service, but that makes the train out of service.
References: OI-29, 43.5

15. CRO-54-1-1-11 001/TS 3.8.4/ BANK--02/ CRO-54-1-1/ 10.3/ 020540502/ 063 2.1.32/ 3.4/3.8/

Using provided references:

After investigating an alarm at 1C33, the CRO returns from the cable spreading room and reports that #23 Battery Charger output voltage is 120 VDC.
How is the 125 VDC system affected and what action is required?

A. One DC channel is inoperable, restore to operable status within 2 hours.

B. #23 battery charger remains operable as long as it's offsite power source remains operable, perform a breaker lineup per STP-O-90.

✓C. The battery charger is inoperable, verify an operable battery charger is suppling 11 125 VDC bus

D. The battery charger is inoperable, 11 125 VDC bus is inoperable and 1Y01 must be placed on the Inverter Backup Bus.

A is incorrect, as long as one charger is operable, the bus is operable.
B is incorrect, the chargers must maintain greater than or equal to 125V at 400 amps or greater to maintain operability.
C is correct per TS 3.8.4 basis.
D incorrect, one battery charger is available to maintain the bus operable.
References: TS LCO 3.8.4 and basis, 41.10 43.2

16. CONTAINMENT SRO 003/ / NEW--1/ 204-104-1/ 1.0/ 204.076/ 103 2.1.14/ 2.5/3.3/

Which list reperesents plant personnel that must be notified in the event of a Containment entry at power?

A. Rad Con ALARA, Nuclear Security, Outage Management

B. Nuclear Security, Nuclear Training, Operations Work Control

C. Outage Management, Instrument and Controls Maintenance Supervisor, Control Room Supervisor

✓D. Instrument and Controls Maintenance Supervisor, Rad Con ALARA, Nuclear Security

A is incorrect, Outage Management is not required to be notified.
B is incorrect, Nuclear training is not required to be notified.
C is incorrect, Outage Management is not required to be notified.
D is correct. Per NO-1-104, I&C is notified to perform airlock door testing after entry is complete, Rad Con is notified prior to entry, and Security must be notified and to verify the EAL outer hatch woodruff key is installed.
References: NO-1-104, 43.5

17. PZR LVL CONT SRO 001/ / NEW--2/ CRO-107-1-/ 8.3/ 201.085/ 011A2.05/ 3.3/3.7/

Given the following plant conditions:

-- Unit One has tripped due to a loss P-13000-1
-- 11 4KV bus is energized from 1A Diesel Generator
-- Pzr level is 100" and slowly lowering
-- RCS pressure is 1920 PSIA and slowly lowering

The RO reports that only 12 Charging Pump is running and Pressure and Inventory is being monitored for positive trends.

What alternate actions must the CRS direct or verify?

A. Verify SIAS actuation when RCS pressure reaches 1725 PSIA.

✓B. Manually start 11 and 13 charging pumps to restore pressurizer level to greater than 101"and locally reset 11 pressurizer backup heater breaker.

C. Isolate letdown, check that charging pumps automatically start to restore pressurizer level and reset pressurizer proportional heaters by momentarily placing the handswitches to OFF.

D. Verify charging pumps start automatically to restore Pressurizer level to greater than 101", verify 12 and 14 pressurizer backup heaters start to restore RCS pressure.

A is incorrect, action should be taken so that SIAS does not actuate.
B is correct, charging pumps must be manually started, and heaters must be reset, and they will not operate below 101" in the pressurizer.
C is incorrect, letdown will automatically isolate, 11 and 13 charging pumps will not automatically start, and the proportional heaters will take a long time to restore RCS pressure.
D is incorrect,11 and 13 charging pumps will not automatically start with the normal and alternate 4 KV bus feeder bkrs open and 12 and 14 heaters will not have power available.
References: EOP basis docs. 41.5, 43.5

18 CRO-113-6-4-20 001/ / BANK--1/ CRO-113-6-/ 2.0.C/ 203.011/ 034 2.4.49/ 4.0/4.0/

A core shuffle is in progress and the refueling machine is indexed over a core location with a fuel assembly grappled in the hoist box. What condition would require the Fuel Handling Supervisor to stop core alterations?

A. Count rate increases from 10 CPS to 12 CPS when the fuel bundle is inserted into the core.

✓B. Communications between fuel handling stations is lost.

C. One channel of 3 available nuclear instrumentation channels is declared out of service.

D. The personnel airlock doors are both open.

A is incorrect, a small increase in countrate may be normal, depending on age of the fuel assembly and proximity of excore NI.
B is correct, per TRM TNC 15.9.2
C is incorrect, TS LCO only requires 2 NIs operable
D is incorrect, TS LCO 3.9.3 allows both doors to be open, as long as one is capable of being shut.
References: TRM, 41.10, 43.2, 43.6

19. SRO-204-1-0/3-002 002/ / NEW--1/ 204-300/ 2.0/ 204.008/ 2.1.2/ 3.0/4.0/

Which selection is the requirement for notification of plant management in the event that a deviation to a Controlling Technical Procedure was approved by the CRS and performed? **(Assume no Technical Specification deviation was required)**

A. Shift Manager

✓B. Shift Manager, GS-NPO or M-NO

C. Shift Manager, GS-NPO, M-NO and NRC resident

D. Shift Manager, GS-NPO, all site managers

A is incorrect, additonal notification is required
B is correct, per NO-1-200, 5.1.C
C is incorrect, NRC resident is not part of plant staff, and is not required to be notified per RM-1-101.
D is incorrect, all site managers is not a requirement per NO-1-200.
References: NO-1-200, 43.3, 43.5

20. NITE/STANDING ORDRS 001/ / NEW--1/ / / 204.037/ 2.1.15/ 2.3/3.0/

Who has approval authority for Nuclear Plant Operations Section Standing Orders and who can cancel them?

A. Approval--GS-NPO, cancellation-- Shift Managers

B. Approval--Manager-Nuclear Operations, cancellation--Manager-Nuclear Operations

✓C. Approval --GS-NPO, cancellation--GS-NPO

D. Approval--Shift Manager, cancellation--GS-NPO

C is correct, per the forms in the NPO Section Standing Orders book.
Distractions are possible Operations Management personnel.
References: 41.10, 43.3,

21. CRO-212-1-1-02 003/ / NEW--1/ TECH.SPECS/ 25,26/ 204.094/ 2.2.22/ 3.4/4.1/

What systems/components are credited for protection of the RCS Pressure Safety Limit?

A. All systems listed in the Limiting Conditions for Operations of Technical Specifications.

B. PORVs, Steam Bypass Control System (ADVs and TBVs), Pressurizer Pressure Control system

✓C. RPS high RCS pressure trip, Pressurizer Safety Valves and main steam safety valves

D. Auxiliary Feedwater system, ESFAS system and RPS actuation of PORVs

C is correct per B 2.1.1, Applicable Safety Analyses
Distractors are systems of components not listed in TS Basis.
References: TS Safety Limits, basis, 43.1, 43.2

22. SRO RESPONSIBILITIES 001/ / NEW--2/ 048-1-0/ 1.11/ 048.007/ 2.3.3/ 1.8/2.9/

Which evolution requires direct supervision by a Senior Reactor Operator?

✓A. Bypassing an RAS sensor module

B. Discharging a RCWMT

C. Performance of any "trip sensitive" PE

D. Placing the SFP ion exchanger in service

A is correct per OI-34, 5.0.B
B is incorrect, a signed permit is required, but not direct supervision of the lineup.
C is incorrect, only requires notification and approval to perform.
D is incorrect, requires PWS supervision, which can be a non-licensed operator per NO-1-200
References: OI-34, 43.4, 43.5

23. RADWORK PERMIT 001/ / NEW--1/ / / 204.007/ 2.3.7/ 2.0/3.3/

Who is responsible for writing an SWP for an Operations evolution when the task is not covered by an exisiting permit?

A. The person who is in charge of performing the task

B. Operations ALARA Coordinator

C. Operations Work Control

✓D. An ALARA planner

D is correct per RSP-1-200
Distractors are Operations personnel or shift personnel without this responsibility or authority.
References: 41.10, 43.3, 43.4

24. EMER PRO 001/ / NEW--2/ 052-4-0/ 5.0/ 204.093/ 2.4.4/ 4.0/4.3/

Unit-2 has been stable for the past 24 hours with RCS pressure 100 PSIA.
RCS temperature is 110°F.
Containment closure deviations exist.
Pressurizer level starts rapidly lowering from 160".

What procedure provides the required actions for these conditions?

A. AOP-2A, Excessive RCS Leakage

B. EOP-5, Loss of Coolant Accident

✓C. AOP-3B, Abnormal Shutdown Cooling Conditions

D. AOP-4A, Loss of Containment Integrity/Closure

A is incorrect, this provides guidance only when RCS is at a higher pressure.
B is incorrect, EOP-5 assumes a trip and EOP-0 have been completed
C is correct. Section V is specifically for a loss of inventory.
D is incorrect. Deviations are allowed in Mode 5, there is no guidance in AOP-4A for these indications, and AOP-3B will address containment closure.
References: 43.2, 43.5

25. SRO-201-3-1-28 028/ / BANK--2/ SRO-201-3-/ 11.0/ 033480605/ 2.4.18/ 2.7/3.6/

A sustained loss of all feedwater has ocurred. What action is required, and what is the basis for the action?

A. If Steam Generator levels are less than -26 inches, Auxiliary Feedwater must be used to restore level. This protects Steam Generator internals and feedwater piping from the adverse affects of waterhammer.

✓B. Initiate Once Through Core Cooling prior to CET temperatures exceeding 560°F. This ensures RCS pressure will be low enough to allow adequate HPSI flow to cool the core.

C. Isolate the most affected Steam Generator when hot leg temperature is less than 515°F. This prevents lifting Steam Generator safety valves.

D. When each Steam Generator lowers to -350 inches, isolate the Steam Generator. This ensures adequate inventory to prevent damage to Steam Generator internals when feed is restored.

A is incorrect. this was old guidance before S/G replacement.
B is correct per EOP-3 Basis Rev. 20 for block Step J. The intent is to initiate OTCC prior to RCS reaching a condition where HPSI flow is not sufficient to provide adequate cooling.
C is incorrect. This is a correct action and basis for a S/G tube leak, but not for a loss of feedwater.
D is incorrect. The basis for isolating S/Gs is to mainatain inventory to minimize the differential pressure across the S/G tubes.
Basis: Basis for initiating once-thru cooling prior to 560 degrees References: EOP-3 and basis. 41.10, 43.5, KA1: KA2:

U.S. Nuclear Regulatory Commission
Site-Specific
SRO Written Examination

Applicant Information

Name:	
Date: 2/27/04	Facility/Unit: CCNPP / 1 and 2
Region: I / II / III / IV	Reactor Type: W / CE / BW / GE
Start Time:	Finish Time:

Instructions

Use the answer sheets provided to document your answers. Staple this cover sheet on top of the answer sheets. To pass the examination you must achieve a final grade of at least 80.00 percent overall, with a 70.00 percent or better on the SRO-only items if given in conjunction with the RO exam; SRO-only exams given alone require an 80.00 percent to pass. You have eight hours to complete the combined examination, and three hours if you are only taking the SRO portion.

Applicant Certification

All work done on this examination is my own. I have neither given nor received aid.

____
Applicant's Signature

Results

RO / SRO-Only / Total Examination Values	_____ / _____ / _____	Points
Applicant's Scores	_____ / _____ / _____	Points
Applicant's Grade	_____ / _____ / _____	Percent

Name: ______________________________

1. U-2 is at 100% power when the "ACTUATION SYSTEM CIS TRIPPED" alarm is received on 2C08. CIS has been determined to be invalid by the crew, but all attempts to reset CIS "A" from the control room have failed.

When are the RCPs tripped?

A. Immediately after an update brief is concluded by the CRS

B. When the RO has reported that controlled bleedoff temperatures exceed 200°F, or bearing temperatures exceed 195°F

C. After the reactor is tripped and the RO has reported the reactivity safety function is complete

D. After an attempt has been made to reset CIS from the cable spreading room

2. Per Technical Specifications, under what conditions can a spent fuel pool cooling loop replace a Shutdown Cooling loop?

A. The reactor head is unbolted and there is less than 23 feet of water above the fuel in the reactor vessel

B. The reactor head is unbolted and there is greater than 23 feet of water above the fuel in the reactor vessel

C. Mode 5 with the S/G tubes full

D. Mode 5 with S/G tubes drained

3 Unit-1 was at 100% power when the following alarms annunciated:
PZR CH 100 PRESS
PZR CH Y LVL
ACTUATION SYS SENSOR CH ZF TRIP

1-PIC-100X indicates 2210 PSIA
1-PIC-100Y indicates 1400 PSIA
1-LI-110X indicates 208 inches
1-LI-110Y indicates 360 inches

What additional alarm would be expected with these indications?

A. PZR PRESS BLOCK A PERMITTED

B. ACTUATION SYS SIAS TRIP

C. CNTMT NORMAL SUMP LVL HI

D. PORV/SAFETY VLV ACOUSTIC MON

4 Unit-2 has experienced a loss of 2Y09. Reactor trip criteria was reached and the RO depressed the reactor trip buttons on 2C05.
Approximately 10 seconds later the RO reported WRNI power indications on 2C05 are reading approximately 100% power and startup rate is 0.

What is the cause of these indications?

A. The reactor failed to trip when the trip buttons were depressed

B. Normal reactor response immediately following a reactor trip from 100% power

C. Loss of power to NI instrumentation due to loss of 2Y09

D. An overpower condition occurred due to feedwater heater high level dump valves opening on the loss of 2Y09

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.4 DC Sources-Operating

BASES

BACKGROUND

The station DC sources provide the AC emergency power system with control power. It also provides both motive and control power to selected safety related equipment and preferred AC vital bus power (via inverters). As required by Reference 1, Appendix 1C, Criterion 39, the DC electrical power sources are designed to have sufficient independence, redundancy, and testability to perform their safety functions, assuming a single failure. The DC sources also conform to the recommendations of References 2 and 3.

The 125 VDC electrical power sources consist of four independent and redundant safety related Class 1E DC channels. Each channel consists of one 125 VDC battery, the associated battery charger for each battery, and all the associated control equipment and interconnecting cabling.

During normal operation, the 125 VDC load is powered from the battery chargers with the batteries floating on the system. In cases where momentary loads are greater than the charger capability, or a loss of normal power to the battery charger, the DC load is automatically powered from the station batteries.

The DC channels provide the control power for its associated Class 1E AC power load group, 4.16 kV switchgear, and 480 V load centers. The DC channels also provide a DC source to the inverters, which in turn power the AC vital buses.

The DC sources are described in more detail in the Bases for LCO 3.8.9 and for LCO 3.8.10.

Each battery has adequate storage capacity to carry the required load continuously for at least 2 hours and to carry load duty cycle as discussed in Reference 1, Chapter 8.

Each 125 VDC battery is separately housed in a ventilated room apart from its charger and distribution centers. Each channel is separated physically and electrically from the other channel to ensure that a single failure in one channel does not cause a failure in a redundant channel. There is

BASES

no sharing between redundant Class 1E channels, such as batteries, battery chargers, or distribution panels.

The batteries for DC channels are sized to produce required capacity at 80% of nameplate rating, corresponding to warranted capacity at end of life cycles and the 100% design demand. Battery size is based on 125% of required capacity. An average voltage of 2.13 V per cell, corresponds to a total minimum voltage output of 125 V per battery (128 V for the reserve battery) as discussed in Reference 1, Chapter 8. The criteria for sizing large lead storage batteries are defined in Reference 4.

Each DC channel has ample power output capacity for the steady state operation of connected loads required during normal operation, while at the same time maintaining its battery bank fully charged. Each battery charger also has sufficient capacity to restore the battery from the design minimum charge to 95% of its fully charged state within 24 hours while supplying normal steady state loads discussed in Reference 1, Chapter 8.

APPLICABLE SAFETY ANALYSES

The initial conditions of DBA and transient analyses in Reference 1, Chapters 6 and 14, assume that ESF systems are OPERABLE. The DC channels provide a normal and emergency DC sources for the DGs, emergency auxiliaries, and control and switching during all MODEs of operation.

The OPERABILITY of the DC sources is consistent with the initial assumptions of the accident analyses and is based upon meeting the design basis of the unit. This includes maintaining the DC sources OPERABLE during accident conditions in the event of:

a. An assumed loss of all offsite AC power or all onsite AC power; and

b. A worst case single failure.

The DC sources satisfy 10 CFR 50.36(c)(2)(ii), Criterion 3.

LCO

The DC channels, each channel consisting of one battery, one battery charger, and the corresponding control equipment and interconnecting cabling supplying power to the associated

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bus, are required to be OPERABLE to ensure the availability of the required power to shut down the reactor and maintain it in a safe condition after an AOO or a postulated DBA. Loss of any DC channel does not prevent the minimum safety function from being performed (Reference 1, Chapter 8).

An OPERABLE DC channel requires the battery and one OPERABLE charger to be operating and connected to the associated DC bus(es).

A battery charger is considered OPERABLE as long as it is receiving power from its normal offsite source and can be connected to a DG within 2 hours following an event.

APPLICABILITY

The DC sources are required to be OPERABLE in MODEs 1, 2, 3, and 4 to ensure safe unit operation and to ensure that:

a. Acceptable fuel design limits and reactor coolant pressure boundary limits are not exceeded as a result of AOOs or abnormal transients; and

b. Adequate core cooling is provided, and containment integrity and other vital functions are maintained in the event of a postulated DBA.

The DC sources requirement for MODEs 5 and 6 are addressed in the Bases for LCO 3.8.5.

ACTIONS

<u>A.1</u>

Required Action A.1 requires the inoperable battery to be replaced by the reserve battery within four hours when one DC channel is inoperable due to an inoperable battery and the reserve battery is available. The reserve battery is a qualified battery that can replace and perform the required function of any inoperable battery. The four hour Completion Time is acceptable based on the capability of the reserve battery and the time it takes to replace the inoperable battery with the reserve battery while minimizing the time in this degraded condition.

<u>B.1</u>

Condition B represents one channel with a loss of ability to completely respond to an event, and a potential loss of ability to remain energized during normal operation. Therefore, it is imperative that the operator's attention focus on stabilizing the unit, minimizing the potential for complete loss of DC power to the affected channel. The 2 hour limit is consistent with the allowed time for an inoperable DC channel.

If one of the required DC channels is inoperable for reasons other than Condition A (e.g., inoperable battery, inoperable battery charger(s), or inoperable battery charger and associated inoperable battery), the remaining DC channels have the capacity to support a safe shutdown and to mitigate an accident condition. Since a subsequent worst case single failure would, however, result in the further loss of the 125 VDC channels with attendant loss of ESF functions, continued power operation should not exceed 2 hours. The 2 hour Completion Time is based on Reference 5 and reflects a reasonable time to assess unit status as a function of the inoperable DC channel and, if the DC channel is not restored to OPERABLE status, to prepare to effect an orderly and safe unit shutdown.

C.1 and C.2

If the inoperable DC channel cannot be restored to OPERABLE status within the required Completion Time, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to at least MODE 3 within 6 hours and to MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems. The Completion Time to bring the unit to MODE 5 is consistent with the time required in Reference 5.

SURVEILLANCE REQUIREMENTS

SR 3.8.4.1

Verifying battery terminal voltage while on float charge helps to ensure the effectiveness of the charging system and the ability of the batteries to perform their intended function. Float charge is the condition in which the charger is supplying connected loads and the continuous charge required to overcome the internal losses of a battery and maintain the battery in a fully charged state. The voltage requirements are based on the nominal design voltage of the battery (2.13 V per cell average) and are consistent with Reference 6 and the initial state of charge conditions assumed in the battery sizing calculations. The 7 day Frequency is conservative when compared with manufacturer recommendations and Reference 6.

SR 3.8.4.2

Visual inspection to detect corrosion of the battery cells and connections, or measurement of the resistance of each cell to cell and terminal connection, provides an indication of physical damage or abnormal deterioration that could potentially degrade battery performance.

The limits established for this SR must be no more than 20% above the resistance as measured during installation or not above the ceiling value established by the manufacturer.

The SR Frequency for these inspections, which can detect conditions that can cause power losses due to resistance heating, is 92 days. This Frequency is considered acceptable based on operating experience related to detecting corrosion trends.

SR 3.8.4.3

Visual inspection of the battery cells, cell plates, and battery racks provides an indication of physical damage or abnormal deterioration that could potentially degrade battery performance.

The presence of physical damage or deterioration does not necessarily represent a failure of this SR, provided an evaluation determines that the physical damage or deterioration does not affect the OPERABILITY of the battery (its ability to perform its design function).

The 18 month Frequency is based on engineering judgment. Operating experience has shown that these components usually pass the SR when performed at the 18 month Frequency.

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Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

SR 3.8.4.4 and SR 3.8.4.5

Visual inspection and resistance measurements of cell to cell and terminal connections provide an indication of physical damage or abnormal deterioration that could indicate degraded battery condition. The anti-corrosion material is used to help ensure good electrical connections and to reduce terminal deterioration. The visual inspection for corrosion is not intended to require removal of and inspection under each terminal connection. The removal of visible corrosion is a preventive maintenance SR. The presence of visible corrosion does not necessarily represent a failure of this SR provided visible corrosion is removed during performance of SR 3.8.4.4.

The connection resistance limits for SR 3.8.4.5 shall be no more than 20% above the resistance as measured during installation, or not above the ceiling value established by the manufacturer.

The 18 month Frequency for these SRs is based on engineering judgment. Operating experience has shown that these components usually pass the SRs when performed at the 18 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

SR 3.8.4.6

This SR requires that each battery charger be capable of supplying 400 amps and 125 V for ≥ 30 minutes. These requirements are based on the output rating of the chargers (Reference 1, Chapter 8). According to Reference 7, the battery charger supply is required to be based on the largest combined demands of the various steady state loads and the charging capacity to restore the battery from the design minimum charge state to the fully charged state, irrespective of the status of the unit during these demand occurrences. The minimum required amperes and duration ensures that these requirements can be satisfied. The test is performed while supplying normal DC loads or an equivalent or greater dummy load.

The SR Frequency is acceptable, given the unit conditions required to perform the test and the other administrative controls existing to ensure adequate charger performance during these 24 month intervals. In addition, this Frequency is intended to be consistent with expected fuel cycle lengths.

SR 3.8.4.7

A battery service test is a special test of battery capability, as found and with the associated battery charger disconnected, to satisfy the design requirements (battery duty cycle) of the DC source. The test duration must be ≥ 2 hours and battery terminal voltage must be maintained ≥ 105 volts during the test. The discharge rate and test length should correspond to the design accident load (duty) cycle requirements as specified in Reference 1, Chapter 8. A dummy load simulating the emergency loads of the design duty cycle may be used in lieu of the actual emergency loads.

The SR Frequency of 24 months is consistent with expected fuel cycle lengths.

This SR is modified by a Note. The Note allows the performance of a modified performance discharge test in lieu of a service test. This substitution is acceptable because a modified performance discharge test represents a more severe test of battery capacity than SR 3.8.4.7.

SR 3.8.4.8

A battery performance discharge test is a test of constant current capacity of a battery after having been in service, to detect any change in the capacity determined by the acceptance test. The test is intended to determine overall battery degradation due to age and usage.

A battery modified performance discharge test is a simulated duty cycle consisting of just two rates; the one minute rate published for the battery or the largest current load of the duty cycle, followed by the test rate employed for the performance discharge test, both of which envelope the duty cycle of the service test. Since the ampere-hours removed by a rated one minute discharge represents a very small portion of the battery capacity, the test rate can be changed to that for the performance test without compromising the results of the performance discharge test. The battery terminal voltage for the modified performance discharge test should remain above the minimum battery terminal voltage specified in the battery performance discharge test for the duration of time equal to that of the performance discharge test.

A modified performance discharge test is a test of the battery capacity and its ability to provide a high rate, short duration load (usually the highest rate of the duty cycle). This will often confirm the battery's ability to meet the critical period of the load duty cycle, in addition to determining its percentage of rated capacity. Initial conditions for the modified performance discharge test should be identical to those specified for a service test. Either the battery performance discharge test or the modified performance discharge test is acceptable for satisfying SR 3.8.4.8; however, only the modified performance discharge test may be used to satisfy SR 3.8.4.8 while satisfying the requirements of SR 3.8.4.7 at the same time.

The acceptance criteria for this SR are consistent with References 6 and 4. These references recommend that the battery be replaced if its capacity is below 80% of the manufacturer rating. A capacity of 80% shows that the battery rate of deterioration is increasing, even if there is ample capacity to meet the load requirements.

The SR Frequency for this test is normally 60 months. If the battery shows degradation, or if the battery has reached 85% of its expected life and capacity is < 100% of the manufacturer's rating, the SR Frequency is reduced to 12 months. However, if the battery shows no degradation but has reached 85% of its expected life, the SR Frequency is only reduced to 24 months for batteries that retain capacity ≥ 100% of the manufacturer's rating. Degradation is indicated, according to Reference 6, when the battery capacity drops by more than 10% relative to its capacity on

BASES

the previous performance test or when it is ≥ 10% below the manufacturer's rating. These Frequencies are consistent with the recommendations in Reference 6.

REFERENCES

1. UFSAR
2. Safety Guide 6, Revision 0, "Assumptions Used for Evaluating the Potential Radiological Consequences of a Steam Line Break Accident for Boiling Water Reactors," March 1971
3. IEEE Standard -308-1978, "IEEE Standard Criteria for Class 1E Power Systems for Nuclear Power Generating Stations"
4. IEEE Standard -485-1983, "Recommended Practice for Sizing Large Lead Storage Batteries for Generating Stations and Substations (ANSI)," June 1983
5. Regulatory Guide 1.93, "Availability of Electric Power Sources," December 1974
6. IEEE Standard -450-1995, "IEEE Recommended Practice for Maintenance, Testing, and Replacement of Vented Lead-Acid Batteries for Stationary Applications," May 1995
7. Regulatory Guide 1.32, Revision 2, "Criteria for Safety-Related Electric Power Systems for Nuclear Power Plants," February 1977

VI. RESOURCE ASSESSMENT TABLE

REACTIVITY CONTROL SUCCESS PATH	SAFETY FUNCTION SUCCESS PATH DETERMINATION RESOURCE CONDITIONS	 ACCEPTANCE CRITERIA
RC-1: CEA Insertion	a. CEAs are able to be inserted, and SUR is negative **OR** b. A loss of **ALL** Vital 4KV Buses may have occurred	1. **NO** more than ONE CEA **NOT** fully inserted, WRNI power is lowering, **OR** 2. WRNI power below 10^{-4}% and SUR is negative or zero
RC-2: Boration Using CVCS	a. Charging pump is available for boron addition b. Boric acid source is available: • BAST • RWT c. Charging path is available via normal flow path or SIS flow path	1. Boration rate greater than or equal to 40 GPM, WRNI power is lowering, and SUR is negative **OR** 2. WRNI power below 10^{-4}% and SUR is negative or zero
RC-3: Boration Using SIS	a. HPSI pump is available for boron addition b. RWT is available as boric acid source c. A flow path is available	1. Boration rate greater than or equal to 40 GPM, WRNI power is lowering, and SUR is negative **OR** 2. WRNI power below 10^{-4}% and SUR is negative or zero

VI. RESOURCE ASSESSMENT TABLE

VITAL AUXILIARIES SUCCESS PATH	SAFETY FUNCTION SUCCESS PATH DETERMINATION	
	RESOURCE CONDITIONS	**ACCEPTANCE CRITERIA**
VA-1: 500KV Offsite Power	a. At least ONE 500KV Bus is available	1. At least ONE 4KV vital bus is energized 2. 11, 12, 21 and 22 125V DC Buses, **ALL** greater than 105 volts 3. At least THREE 120V AC Vital Buses are energized: • 11 • 12 • 13 • 14 4. **EITHER** 1Y09 or 1Y10 is energized
VA-2: Diesel Generators	a. 1A, 1B OR 0C Diesel Generator is available	1. At least ONE 4KV vital bus is energized 2. 11, 12, 21 and 22 125V DC Buses, **ALL** greater than 105 volts 3. At least THREE 120V AC Vital Buses are energized: • 11 • 12 • 13 • 14 4. **EITHER** 1Y09 or 1Y10 is energized

(continue)

VI. RESOURCE ASSESSMENT TABLE

VITAL AUXILIARIES (continued) SUCCESS PATH	SAFETY FUNCTION SUCCESS PATH DETERMINATION	
	RESOURCE CONDITIONS	**ACCEPTANCE CRITERIA**
VA-3: SMECO	a. SMECO Power Supply System is available	1. At least ONE 4KV vital bus is energized 2. 11, 12, 21 and 22 125V DC Buses, **ALL** greater than 105 volts 3. At least THREE 120V AC Vital Buses are energized: • 11 • 12 • 13 • 14 4. **EITHER** 1Y09 or 1Y10 is energized

VI. RESOURCE ASSESSMENT TABLE

RCS PRESSURE AND INVENTORY CONTROL SUCCESS PATH	SAFETY FUNCTION SUCCESS PATH DETERMINATION RESOURCE CONDITIONS	 ACCEPTANCE CRITERIA
PIC-1: CVCS	a. Charging pump is available b. Charging path is available via normal flow path or SIS flow path c. A charging source is available: • VCT • BAST • RWT d. A method of pressurizer pressure control is available: • Pressurizer heaters • Main Spray • Aux Spray • Controlled Steaming e. SIAS has **NOT** actuated **OR** has been reset	1. Pressurizer pressure less than the upper limits of Att. (1) 2. Pressurizer level greater than 30 inches 3. RCS subcooling is between 25°F and 140°F based on CET temperatures 4. RVLMS indicates level above the top of the hot leg
PIC-2: PORVs or Pressurizer Vent	a. PORV or Pressurizer Vent required to reduce pressure b. PORV or Pressurizer Vent available to control pressure c. Charging and letdown and/or SIS is available to control pressurizer level d. Once-Through-Cooling is **NOT** in progress (continue)	1. Pressurizer pressure less than 2400 PSIA 2. Pressurizer pressure less than the upper limits of Att. (1) 3. RCS subcooling is between 25°F and 140°F based on CET temperatures 4. Pressurizer level greater than 30 inches {90} 5. RVLMS indicates level above the top of the hot leg

VI. RESOURCE ASSESSMENT TABLE

RCS PRESSURE AND INVENTORY CONTROL (continued) SUCCESS PATH	SAFETY FUNCTION SUCCESS PATH DETERMINATION	
	RESOURCE CONDITIONS	**ACCEPTANCE CRITERIA**
PIC-3: Loss Of Vital AC	a. A loss of **ALL** 4KV Vital Buses has occurred b. SIAS has **NOT** actuated **OR** has been reset	1. Pressurizer pressure less than the upper limits of Att. (1) 2. RCS subcooling greater than 25°F based on CET temperatures (1) **OR** CET temperatures less than 50°F superheated (1) 3. RVLMS indicates the core is covered
PIC-4: SIS	a. SIAS has actuated **OR** SIS is able to be used to supply RCS makeup	1. **IF** RAS has **NOT** occurred, **AND** pressurizer pressure is greater than 1270 PSIA, **THEN** at least ONE Charging Pump operating 2. HPSI and LPSI Pumps are injecting water into the RCS **PER** Atts. (10) and (11) (2) (3) 3. RVLMS indicates the core is covered

(1) Refer to Attachment (12) to read CETs while vital AC buses are de-energized.
(2) Limits in Attachments (10) and (11) are not required to be met if SIS throttle criteria are met.
(3) LPSI Pumps are **NOT** required post-RAS.

VI. RESOURCE ASSESSMENT TABLE

CORE AND RCS HEAT REMOVAL SUCCESS PATH	SAFETY FUNCTION SUCCESS PATH DETERMINATION: RESOURCE CONDITIONS	ACCEPTANCE CRITERIA
HR-1: S/G Heat Sink With **NO** SIS Operation	a. At least ONE S/G level greater than (-)350 inches b. Feedwater is available: • Main Feedwater • AFW • Booster Pump Injection c. SIAS has **NOT** actuated **OR** has been reset d. SIS operation **NOT** required	1. At least ONE S/G has level between (-)24 inches and (+)30 inches **OR** S/G level is being restored by feedwater flow 2. **IF** RCPs are operating, **THEN** T_{HOT} minus T_{COLD} is less than 10°F 3. **IF** RCPs are **NOT** operating, **THEN** T_{HOT} minus T_{COLD} is less than 50°F 4. RCS subcooling greater than 25°F based on CET temperatures (1) 5. RVLMS indicates level above the top of the hot leg

(1) Refer to Attachment (12) to read CETs while vital AC buses are de-energized.

(continue)

VI. RESOURCE ASSESSMENT TABLE

CORE AND RCS HEAT REMOVAL (continued) SUCCESS PATH	SAFETY FUNCTION SUCCESS PATH DETERMINATION: RESOURCE CONDITIONS	ACCEPTANCE CRITERIA
HR-2: SG Heat Sink With SIS Operation	a. At least ONE S/G level greater than (-)350 inches b. Feedwater is available: • Main Feedwater • AFW • Booster Pump Injection c. SIAS has actuated or SIS operation required	1. At least ONE S/G has level between 0 inches and (+)38 inches **OR** S/G level is being restored by feedwater flow 2. CET temperatures less than 50°F superheated (1) 3. **IF** RAS has **NOT** occurred, **AND** pressurizer pressure is greater than 1270 PSIA, **THEN** at least ONE Charging Pump operating 4. HPSI and LPSI Pumps are injecting water into the RCS **PER** Atts. (10) and (11) (2) (3)

(1) Refer to Attachment (12) to read CETs while vital AC buses are de-energized.
(2) Limits in Attachments (10) and (11) are not required to be met if SIS throttle criteria are met.
(3) LPSI Pumps are **NOT** required post-RAS.

(continue)

VI. RESOURCE ASSESSMENT TABLE

CORE AND RCS HEAT REMOVAL (continued) **SUCCESS PATH**	**SAFETY FUNCTION SUCCESS PATH DETERMINATION** **RESOURCE CONDITIONS**	 **ACCEPTANCE CRITERIA**
HR-3: Shutdown Cooling System	a. CET temperatures less than 300° F b. Radiation levels are low enough to allow valve repositioning	1. CET temperatures less than 300°F and less than 50°F superheated (1) 2. HPSI Pumps are injecting water into the RCS **PER** Att. (10) (2) 3. Pressurizer pressure less than 270 PSIA {245} 4. RVLMS indicates the core is covered
HR-4: Once-Through-Cooling	a. HPSI pumps are available b. BOTH PORVs are available c. Flow path is available d. RWT is available as a makeup source	1. CET temperatures less than 50°F superheated (1) 2. **IF** RAS has **NOT** occurred, **AND** HPSI throttle criteria are **NOT** met, **THEN ALL** available Charging Pumps operating 3. HPSI and LPSI Pumps are injecting water into the RCS **PER** Atts. (10) and (11) (2) (3) 4. Pressurizer pressure less than 1270 PSIA, **OR** is lowering

(1) Refer to Attachment (12) to read CETs while vital AC buses are de-energized.
(2) Limits in Attachments (10) and (11) are not required to be met if SIS throttle criteria are met.
(3) LPSI Pumps are **NOT** required post-RAS.

VI. RESOURCE ASSESSMENT TABLE

CONTAINMENT ENVIRONMENT SUCCESS PATH	SAFETY FUNCTION SUCCESS PATH DETERMINATION: RESOURCE CONDITIONS	ACCEPTANCE CRITERIA
CE-1: **NO** CIS	a. Containment pressure less than 2.8 PSIG	1. Containment pressure less than 2.8 PSIG
	b. CIS has **NOT** actuated **OR** has been reset	2. Containment temperature less than 220°F (1)
	c. Containment radiation alarms are clear with **NO** unexplained rise (2)	3. Containment radiation alarms are clear with **NO** unexplained rise (2)

(1) **NOT** available if 1Y10 is de-energized.
(2) **NOT** applicable if OOS due to loss of power.

(continue)

VI. RESOURCE ASSESSMENT TABLE

CONTAINMENT ENVIRONMENT (continued) SUCCESS PATH	SAFETY FUNCTION SUCCESS PATH DETERMINATION	
	RESOURCE CONDITIONS	**ACCEPTANCE CRITERIA**
CE-2: Containment Isolation	a. Containment pressure less than 4.25 PSIG b. CSAS has **NOT** actuated **OR** has been reset	1. Containment pressure less than 4.25 PSIG 2. **ALL** available Containment Air Coolers are operating with maximum SRW flow 3. **ALL** containment penetrations required to be shut have an isolation valve shut 4. Hydrogen concentration less than 0.5% **(1)** **OR** **ALL** available hydrogen recombiners are energized with Hydrogen concentration less than 4.0% **(1)** **OR** Hydrogen purge operation per Tech Support recommendation **(1)**

(1) Hydrogen concentration acceptance criteria may be omitted until Chemistry has been able to place hydrogen monitors in service.

(continue)

VI. RESOURCE ASSESSMENT TABLE

CONTAINMENT ENVIRONMENT (continued) **SUCCESS PATH**	**SAFETY FUNCTION SUCCESS PATH DETERMINATION** **RESOURCE CONDITIONS**	**ACCEPTANCE CRITERIA**
CE-3: Containment Spray	a. Containment pressure greater than 4.25 PSIG	1. Containment pressure less than 50 PSIG 2. **ALL** available Containment Air Coolers are operating with maximum SRW flow 3. Containment spray flow is greater than 1350 GPM per pump, if operating 4. **ALL** containment penetrations required to be shut have an isolation valve shut 5. Hydrogen concentration less than 0.5% **(1)** **OR** **ALL** available hydrogen recombiners are energized with Hydrogen concentration less than 4.0% **(1)** **OR** Hydrogen purge operation per Tech Support recommendation **(1)**

(1) Hydrogen concentration acceptance criteria may be omitted until Chemistry has been able to place hydrogen monitors in service.

VI. RESOURCE ASSESSMENT TABLE

RADIATION LEVELS EXTERNAL TO CONTAINMENT SUCCESS PATH	SAFETY FUNCTION SUCCESS PATH DETERMINATION RESOURCE CONDITIONS	 ACCEPTANCE CRITERIA
RLEC-1:Normal Levels	a. Normal Radiation levels exist outside of containment b. Containment pressure less than 2.8 PSIG c. A loss of **ALL** Vital 4KV Buses may have occurred	1. Noble Gas Monitor (1-RIC-5415) alarm clear with **NO** unexplained rise 2. Condenser Off-Gas RMS (1-RI-1752) alarm clear with **NO** unexplained rise (1) 3. S/G B/D RMS (1-RI-4014) alarm clear with **NO** unexplained rise (1) 4. Main Vent Gaseous RMS (1-RI-5415) alarm clear with **NO** unexplained rise (1)

(1) **NOT** applicable if OOS due to loss of power.

(continue)

VI. RESOURCE ASSESSMENT TABLE

RADIATION LEVELS EXTERNAL TO CONTAINMENT (continued) SUCCESS PATH	SAFETY FUNCTION SUCCESS PATH DETERMINATION RESOURCE CONDITIONS	ACCEPTANCE CRITERIA
RLEC-2: Containment Isolated	a. Radiation detected outside containment **OR** Containment pressure greater than 2.8 PSIG	1. **ALL** of the following alarms are clear with **NO** unexplained rise: • Noble Gas Monitor (1-RIC-5415) • Condenser Off-Gas RMS (1-RI-1752) • S/G B/D RMS (1-RI-4014) • Main Vent Gaseous RMS (1-RI-5415) **OR** 2. **ALL** containment penetrations required to be shut have an isolation valve shut **IF** a tube rupture is identified in a S/G, • **ALL** release paths from the affected S/G to the environment are isolated • Affected S/G pressure less than 920 PSIA

5. A feed system malfunction has occurred and the following indications exist:
Reactor power is 100%
SGFPs speed is 4550-4650 RPM
SGFP suction pressure is 380 PSIG
11 S/G level is -2" 12 S/G level is -25"
TR1011/1111 recorder blue pen (feed flow) is slightly greater than the red pen (steam flow)
TR1021/1121 recorder red pen (steam flow) is greater than blue pen (feed flow)

What is the proper action for the CRS to direct the panel operators to perform?

A. Trip the reactor and implement EOP-0.

B. Start the standby Condensate Booster pump.

C. Place 12 S/G FRV controller in manual and open 12 FRV.

D. Bias SGFP speed to maintain FRV D/Ps greater than 75 PSIG.

6. Place the following major actions of EOP-7, Station Blackout, in the order that occur within the procedure. **(First to last)**

1. Minimize 250 VDC battery discharge and restoration of forced circulation if desired.
2. Establish RCS Heat Removal and protect the condenser from overpressure.
3. Attempt to regain either an onsite or an offsite power source.
4. Evaluate the need for a plant cooldown via either forced or natural circulation.

A. 1, 2, 3, 4

B. 3, 2, 4, 1

C. 2, 1, 3, 4

D. 2, 3, 1, 4

7. Given an electrical system malfunction, what Control Room panel indications can be used to diagnose the status of the 125 VDC buses?

A. Reactor Protective System cabinets at 1C15

B. Steam Generator Feed Pump emergency lube oil pump lights on 1C03

C. AFW pump controls on 1C04

D. Containment pressure transmitter isolation valves on 1C10

8. Upon a loss of MCC-114, what Technical Requirements Manual credited boration flow path would be available?

A. RWT to RWT charging pump suction valve (CVC-504) to charging pump suction

B. 12 BA pump to BA direct M/U valve (CVC-514) to charging pump suction

C. 12 BA pump to BA flow control valve (CVC-210Y) to VCT M/U valve (CVC-512) to VCT outlet (CVC-501) to charging pump suction

D. 11 or 12 BAST gravity drain valves (CVC-508 or 509) to charging pump suction

9. U-1 is in Mode 1. The latest leakage reports are:

- -- 0.6 gpm from Pressurizer Safety Valve leakage
- -- 1.8 gpm from leakage past check valves from the RCS to the SI system
- -- 0.15 gpm from primary to secondary leakage (12 S/G)
- -- 4.8 gpm is total RCS leakage

Based upon these known leak rates, which of the following Technical Specification RCS leakage limits are being exceeded?

A. Pressure Boundary leakage and Identified leakage.

B. Primary to Secondary leakage and Unidentified leakage.

C. Identified leakage and Unidentified leakage.

D. Primary to Secondary leakage and Pressure Boundary leakage.

10. Fill in the blanks--
Performance of AOP-9A ensures that the plant is placed in ___ ___ within ___ hours and the RCS parameters will be maintained within those predicted for a Loss of Offsite power and the fission product boundary is not effected.

A. Hot Standby, 24

B. Hot Shutdown, 48

C. Cold Shutdown, 72

D. Cold Shutdown, 96

11. An RCS leak has resulted in implementing the applicable plant procedure. What direction from the CRS is provided when RCS leakage exceeds T.S. 3.4.13 LCO but is within the capacity of one charging pump? (ASSUME INITIAL ACTIONS TO LOCATE SOURCE OF LEAKAGE HAVE BEEN COMPLETED)

A. Evaluate operation of the plant with letdown isolated and align charging pumps to operate as needed to prevent exceeding a pressurizer level of 225 inches.

B. Commence a plant shutdown to COLD SHUTDOWN per OP-3, OP-4, and OP-5.

C. Trip the reactor and implement EOP-0 when PZR level deviates from program by 15".

D. Perform a rapid power reduction, when Tave is less than 537°F, trip the reactor and implement EOP-0.

12. Using provided references:

Functional Recovery Procedure, EOP-8, has been implemented and the following plant conditions exist:

--4 CEAs indicate fully withdrawn
--SUR is 0
--All charging pumps are inoperable
--RWT is available and operable
--SIAS has actuated and 2 HPSI pumps are running
--One 500 KV bus is energized
--Both SG levels indicate at -100" and constant and AFW flow is available
--Containment pressure is 0.4 psig and lowering

Which one of the following groups of Success Paths is implemented to assess and restore safety functions?

A. VA-1, PIC-3, HR-2, CE-2, RLEC-2

B. VA-1, PIC-4, HR-3, CE-2, RLEC-1

C. VA-1, PIC-3, HR-3, CE-3, RLEC-2

D. VA-1, PIC-4, HR-2, CE-2, RLEC-1

13. 13 Component Cooling Pump is to be run 24 hours for PMT after bearing replacement. What action is required and why?

A. 12 Component Cooling Heat Exchanger must be placed in service to ensure a Component Cooling loop remains in operation.

B. 13 Component Cooling Pump must be powered from 11 4KV bus to ensure both loops remain operable.

C. 12 Component Cooling Pump must be placed in PTL to prevent damage to a SDC Heat Exchanger due to high flow if a SIAS occurs.

D. IX BYPASS 1-CVC-520 must be placed in BYPASS to prevent a reactivity event due to lowering letdown temperature.

14. 21B SRW Heat Exchanger is to be removed from service for cleaning today. How is the Containment Cooling System affected?

A. The manual SRW inlet isolation valve on 21 or 22 Containment Cooler is shut to maintain 2A Diesel Generator operable.

B. One train of Containment Cooling is declared inoperable because 2A Diesel Generator is inoperable.

C. The Containment Cooling System is degraded but remains operable and functional.

D. 21 and 22 Containment Coolers must be declared inoperable because 21 Component Cooling Heat exchanger must be taken out of service.

15. Using provided references:

After investigating an alarm at 1C33, the CRO returns from the cable spreading room and reports that #23 Battery Charger output voltage is 120 VDC.
How is the 125 VDC system affected and what action is required?

A. One DC channel is inoperable, restore to operable status within 2 hours.

B. #23 battery charger remains operable as long as it's offsite power source remains operable, perform a breaker lineup per STP-O-90.

C. The battery charger is inoperable, verify an operable battery charger is suppling 11 125 VDC bus

D. The battery charger is inoperable, 11 125 VDC bus is inoperable and 1Y01 must be placed on the Inverter Backup Bus.

16. Which list reperesents plant personnel that must be notified in the event of a Containment entry at power?

A. Rad Con ALARA, Nuclear Security, Outage Management

B. Nuclear Security, Nuclear Training, Operations Work Control

C. Outage Management, Instrument and Controls Maintenance Supervisor, Control Room Supervisor

D. Instrument and Controls Maintenance Supervisor, Rad Con ALARA, Nuclear Security

17. Given the following plant conditions:

-- Unit One has tripped due to a loss P-13000-1
-- 11 4KV bus is energized from 1A Diesel Generator
-- Pzr level is 100" and slowly lowering
-- RCS pressure is 1920 PSIA and slowly lowering

The RO reports that only 12 Charging Pump is running and Pressure and Inventory is being monitored for positive trends.

What alternate actions must the CRS direct or verify?

A. Verify SIAS actuation when RCS pressure reaches 1725 PSIA.

B. Manually start 11 and 13 charging pumps to restore pressurizer level to greater than 101"and locally reset 11 pressurizer backup heater breaker.

C. Isolate letdown, check that charging pumps automatically start to restore pressurizer level and reset pressurizer proportional heaters by momentarily placing the handswitches to OFF.

D. Verify charging pumps start automatically to restore Pressurizer level to greater than 101", verify 12 and 14 pressurizer backup heaters start to restore RCS pressure.

18. A core shuffle is in progress and the refueling machine is indexed over a core location with a fuel assembly grappled in the hoist box. What condition would require the Fuel Handling Supervisor to stop core alterations?

A. Count rate increases from 10 CPS to 12 CPS when the fuel bundle is inserted into the core.

B. Communications between fuel handling stations is lost.

C. One channel of 3 available nuclear instrumentation channels is declared out of service.

D. The personnel airlock doors are both open.

19. Which selection is the requirement for notification of plant management in the event that a deviation to a Controlling Technical Procedure was approved by the CRS and performed? **(Assume no Technical Specification deviation was required)**

A. Shift Manager

B. Shift Manager, GS-NPO or M-NO

C. Shift Manager, GS-NPO, M-NO and NRC resident

D. Shift Manager, GS-NPO, all site managers

20. Who has approval authority for Nuclear Plant Operations Section Standing Orders and who can cancel them?

A. Approval--GS-NPO, cancellation-- Shift Managers

B. Approval--Manager-Nuclear Operations, cancellation--Manager-Nuclear Operations

C. Approval --GS-NPO, cancellation--GS-NPO

D. Approval--Shift Manager, cancellation--GS-NPO

21. What systems/components are credited for protection of the RCS Pressure Safety Limit?

A. All systems listed in the Limiting Conditions for Operations of Technical Specifications.

B. PORVs, Steam Bypass Control System (ADVs and TBVs), Pressurizer Pressure Control system

C. RPS high RCS pressure trip, Pressurizer Safety Valves and main steam safety valves

D. Auxiliary Feedwater system, ESFAS system and RPS actuation of PORVs

22. Which evolution requires direct supervision by a Senior Reactor Operator?

A. Bypassing an RAS sensor module

B. Discharging a RCWMT

C. Performance of any "trip sensitive" PE

D. Placing the SFP ion exchanger in service

23. Who is responsible for writing an SWP for an Operations evolution when the task is not covered by an exisiting permit?

A. The person who is in charge of performing the task

B. Operations ALARA Coordinator

C. Operations Work Control

D. An ALARA planner

24. Unit-2 has been stable for the past 24 hours with RCS pressure 100 PSIA.
RCS temperature is 110°F.
Containment closure deviations exist.
Pressurizer level starts rapidly lowering from 160".

What procedure provides the required actions for these conditions?

A. AOP-2A, Excessive RCS Leakage

B. EOP-5, Loss of Coolant Accident

C. AOP-3B, Abnormal Shutdown Cooling Conditions

D. AOP-4A, Loss of Containment Integrity/Closure

23 A sustained loss of all feedwater has ocurred. What action is required, and what is the basis for the action?

A. If Steam Generator levels are less than -26 inches, Auxiliary Feedwater must be used to restore level. This protects Steam Generator internals and feedwater piping from the adverse affects of waterhammer.

B. Initiate Once Through Core Cooling prior to CET temperatures exceeding 560°F. This ensures RCS pressure will be low enough to allow adequate HPSI flow to cool the core.

C. Isolate the most affected Steam Generator when hot leg temperature is less than 515°F. This prevents lifting Steam Generator safety valves.

D. When each Steam Generator lowers to -350 inches, isolate the Steam Generator. This ensures adequate inventory to prevent damage to Steam Generator internals when feed is restored.