

Final Submittal
(Blue Paper)

CATAWBA DECEMBER 2005 EXAM

05000413/2005301 & 05000414/2005301

DECEMBER 5 - 8, 2005
DECEMBER 14, 2005 (WRITTEN)

COMBINED RO/SRO WRITTEN EXAM
WITH KAS, ANSWERS, REFERENCES,
AND ANALYSIS

Question: 05-01

- 1 Pt(s) Assuming all plant systems respond as designed, which one set of signals provides a correct list of additional functions caused by a reactor trip?
- A. Main feedwater isolation valves receive a close signal
 Atmospheric dump valves receive a block signal
 Main turbine receives a trip signal
 - B. Main feedwater isolation valves receive a close signal
 Atmospheric dump valves receive a block signal
 Main feedwater pumps receive a trip signal
 - C. Main feedwater isolation valves receive a close signal
 Main turbine receives a trip signal
 Main feedwater pumps receive a trip signal
 - D. Atmospheric dump valves receive a block signal
 Main turbine receives a trip signal
 Main feedwater pumps receive a trip signal

Question: 05-01

Answer: A

LEVEL:	RO / SRO
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K/A	EPE007	Title	Reactor Trip
	G2.1.27	Description	Knowledge of system purpose and or function. (CFR: 41.7)
		Importance	2.8/2.9

SOURCE	NEW
LEVEL of KNOWLEDGE	Memory
Lesson	OP-CN-CF-CF rev 035 page 25 of 32
Objectives	8
REFERENCE S	Lesson plan information (See Below)
Author	RJK
Time	7/1/2005 3:59 PM 42 minutes

Distracter Analysis: All the functions are true in each answer except for feedpump trip. Feedpumps get a signal to runback to minimum speed on a reactor trip.

The following get a P4 signal

- Turbine Trip
- **Feedwater Isolation less than Low Tave(564°F)**
- Arm condenser dumps and blocks atmospheric
- Allow a block of the Safety Injection Signal after time delay
- **Run back the CF pumps on reactor trip**

- A. Correct -
- B. Incorrect -
- C. Incorrect -
- D. Incorrect

Question: 05-02

1 Pt(s)

Given the following:

- Indicated pressurizer level rapidly increases to 100%
- Containment pressure and humidity are increasing
- Pressurizer pressure is slowly decreasing

Which ONE of the following events is the cause for these indications?

- A. Pressurizer level transmitter diaphragm rupture
- B. Pressurizer surge line break
- C. Pressurizer impulse line break
- D. Pressurizer reference leg break

Question: 05-02

Answer: D

LEVEL: RO

K/A	APE008	Title	Pressurizer Vapor Space Accident
	AK2.02	Description	Knowledge of the interrelations between the Pressurizer Vapor Space: (CFR 41.7 / 45.7) Sensors and detectors
		Importance	2.7/2.7

SOURCE	NEW
LEVEL of KNOWLEDGE	Analysis
Lesson	OP-CN-PS-ILE rev 23 page 17 of 24
Objectives	6
REFERENCES	Lesson plan
Author	RJK
Time	7/5/2005 12:52 PM 93 minutes

Distracter Analysis: When the steam space is ruptured, the effect on the transmitter level is described below, Indicated level increases above actual. If you include the other parameters that accompany a break in the NCS/PRZ then you have a analysis/diagnostic determination per the K/A.

- A. **Incorrect:** This causes equalization with an indicated level increasing to 100% but does not cause the containment conditions listed.
- B. **Incorrect:** Level would be lower. If the leak grows, eventually there would be a rapid level decrease, but as a leak grows, it may act like level on "impulse side".
- C. **Incorrect:** This causes a low level only but this can easily be confused with reference leg failures.
- D. **Correct:**

Page 17 of 24 Mechanical Faults

Break in reference Leg
Removes high pressure reference side of transmitter. Results in indicated level to read high. Results in the indicated level being higher than actual level.

Break on PZR line to transmitter [low pressure (impulse) side]

Allows actual level pressure to be removed from diaphragm.
Reference leg pressure to be removed from diaphragm. (delta P Maximum)
Results in indicated level to decrease to zero.

Question: 05-03

1 Pt(s)

Which one the following design features ensures that primary coolant leakage is isolated or contained during a small break LOCA?

- A. High flow from the reactor coolant pump seal leakoffs closes the seal return isolation valves.
- B. High flow from the reactor coolant pump thermal barrier closes the outlet isolation valve.
- C. 1EMF-46A/B (Train A/B KC System Rad Monitor) Trip 2 automatically closes the KC surge tank vent isolation valves.
- D. High flow from the seal return heat exchanger closes the seal return isolation valves.

Question: 05-03

Answer: B

LEVEL: RO/SRO

K/A	EPE009	Title	Small Break LOCA
	EK3.15	Description	Knowledge of the reasons for the following responses as they apply to the small break LOCA: (CFR 41.5 / 41.10 / 45.6 / 45.13) Closing of RCP thermal barrier outlet valves
		Importance	3.2/3.2

SOURCE	NEW
LEVEL of KNOWLEDGE	Memory
Lesson	OP-CN-PSS-KC rev 51
Objectives	15
REFERENCES	Lesson plan page 12
Author	RJK
Time	7/5/2005 3:07 PM 6 minutes plus 44 from original.

Distracter Analysis: The KC outlet valves from the thermal barrier heat exchanger will automatically close when a high flow condition occurs. No other signal directly isolates this water flow.

- A. Incorrect:** There are no auto actions for this, but these valves do close on a LOCA.
- B. Correct:**
- C. Incorrect:** This used to be a design feature but was deleted via mod. It is plausible because many plants still have this feature and a seal water HX leak would cause this indication.
- D. Incorrect:** High flow does not close these valves, but these valves do close automatically on a LOCA (St).

Outlet valve auto closed @ 60 gpm after 30 seconds. (30 sec. time delay - Prevents Valve from Closing on Surge, From Pump)

Question: 05-04

1 Pt(s)

At what point, during a large LOCA, is sufficient core cooling by natural circulation lost?

- A. As soon as water level in the reactor vessel decreases to less than 100%
- B. As soon as water level in the pressurizer decreases to less than 0%
- C. As soon as saturated conditions are reached in the reactor coolant loops
- D. As soon as steam voiding occurs in the steam generator tubes

Question: 05-04

Answer: D

LEVEL: RO/SRO

K/A	EPE011	Title	Large Break LOCA
	EK1.01	Description	Knowledge of the operational implications of the following concepts as they apply to the Large Break LOCA: (CFR 41.8 / 41.10 / 45.3) Natural circulation and cooling, including reflux boiling.
		Importance	4.1/4.4

SOURCE	NEW
LEVEL of KNOWLEDGE	Memory
Lesson	OP-CN-THF-HT rev
Objectives	17
REFERENCES	Lesson plan pages 10 and 11
Author	RJK
Time	7/6/2005 10:00 AM 63 minutes

Distracter Analysis:

- A. **Incorrect:** Vessel level by itself would not necessary impede NC flow. The heat source is already lower than the heat sink. Steaming would still occur. But a low vessel level is one indication used for determining if there is adequate core cooling.
- B. **Incorrect:** PZR level by itself would not necessary impede NC flow. The heat source is already lower than the heat sink. Steaming would still occur.
- C. **Incorrect:** Saturated conditions in the loops will not impede NC heat transfer. Procedures assume a problem with core cooling when subcooling is lost and this may be viewed as a loss of cooling.
- D. **Correct:** When the tubes void, this is a condition were reflux boiling would begin. This is not sufficient for adequate long term heat removal.

HT lesson plan pages 10 and 11

Detriments to Natural Circulation (Obj. #17)

1. Loss of heat sink
 - Loss of S/G feed
 - Loss of steam release capability
2. Overfeeding S/G
 - Feeding S/G too fast Causes cold slug in Th side of U-tubes which reduces flow.
3. Gases in NC legs or S/G tubes
 - Blocks flow path
4. Voiding in NC legs (two phase flow)
 - This will occur when the liquid in the loops reaches saturation.
 - When saturation is reached, the amount of energy transferred to each lbm of liquid will increase. As this occurs the density of the liquid will decrease and result in a higher delta P causing flow rate to increase.
 - This mode of natural circulation is sufficient to ensure heat removal.
 - If severe voiding occurs, the S/G tubes will void and the heat removal will be by re-flux cooling. Steam rises up the hot leg is condensed in the S/G tubes and falls back down the hot leg to the core.

Question: 05-05

1 Pt(s)

Given the following conditions:

- Unit 2 is at 10% power
- 2A reactor coolant pump motor bearing temperature is 200°F and slowly increasing

What is the correct course of action per AP/2/A/5500/008 (Malfunction of Reactor Coolant Pump)?

- A. 2A NCP trip criteria are not currently met. Monitor 2A NCP and if pump trip criteria are exceeded, trip the reactor, and then trip 2A NCP.
- B. Trip 2A NCP, then shutdown the reactor to Mode 3.
- C. Trip the reactor, verify reactor power less than 5%, then trip 2A NCP.
- D. Reduce reactor power to less than 5% (without tripping the reactor), then trip 2A NCP.

Question: 05-05

Answer: C

LEVEL:	RO
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K/A	APE015	Title	Reactor Coolant Pump (RCP) Malfunctions
	AA1.20	Description	Ability to operate and / or monitor the following as they apply to the Reactor Coolant Pump Malfunctions(Loss of RC Flow) (CFR 41.7 / 45.5 / 45.6) RCP bearing temperature indicators
		Importance	2.7/2.7

SOURCE	NEW
LEVEL of KNOWLEDGE	Comprehension
Lesson	OP-CN-PS-NCP
Objectives	12
REFERENCES	AP/2/A/5500/008 revision 13
Author	RJK
Time	7/6/2005 10:43 AM 72 minutes

Distracter Analysis:

- A. **Incorrect:** This temperature is above the trip criteria, but an operator may think they have not yet reached a shutdown condition.
- B. **Incorrect:** This is not allowed at CNS, the reactor must first be tripped. Since no automatic trip exists an operator may shutdown the pump first.
- C. **Correct:**
- D. **Incorrect:** This is not allowed at CNS, the reactor must first be tripped. But it is a recent NEW requirement prior to tripping any NCP.

Question: 05-06

1 Pt(s) Given the following initial conditions:

- 1NV-294 (NV Pmps A&B Disch Flow Ctrl) in MANUAL
- 1NV-309 (Seal Water Injection Flow) in MANUAL
- pressurizer pressure is 2235 psig
- total seal water flow is 32 gpm
- charging line flow is 89 gpm

If pressurizer pressure is increased to 2300 psig, which one of the following sets of system parameter changes is correct?

- A. Charging line flow decreases and total seal water flow decreases
- B. Charging line flow decreases and total seal water flow remains the same
- C. Charging pump discharge header pressure increases and total seal water flow increases
- D. Charging pump discharge header pressure increases and total seal water flow remains the same

Question: 05-06

Answer: A

LEVEL: RO/SRO

K/A	APE022	Title	Loss of Reactor Coolant Makeup
	AK1.02	Description	Knowledge of the operational implications of the following concepts as they apply to Loss of Reactor Coolant Pump Makeup: (CFR 41.8 / 41.10 / 45.3) Relationship of charging flow to pressure differential between charging and RCS
		Importance	2.7/3.1

SOURCE	NEW
LEVEL of KNOWLEDGE	Analysis
Lesson	OP-CN-THF-FF rev 07
Objectives	12, 13, 14, 15
REFERENCES	Lesson plan: centrifugal pump laws. Pages 9 & 16
Author	RJK
Time	8/15/2005 3:50 PM 9 minutes

Distracter Analysis: Centrifugal pump laws require that the discharge header pressure increases and flow decreases as system pressure increases. Therefore charging line flow and total seal flow will decrease while charging line discharge pressure increases.

- A. **Correct:**
- B. **Incorrect:** total seal flow decreases because 1NV-309 is in manual.
- C. **Incorrect:** total seal flow decreases. May think higher discharge pressure = more seal flow.
- D. **Incorrect:** total seal water flow decreases because 1NV-309 is in manual.

Question: 05-07

1 Pt(s)

Given the following:

- Unit 1 experienced a safety Injection due to a LOCA coincident with a loss of offsite power (LOOP)
- 1AD-09 D/8, FWST 2/4 LO LEVEL alarm is LIT
- 1AD-07 F/8, KC TRAIN B TWO PUMP RUNOUT is LIT
- EP/1/A/5000/ES-1.3, Transfer to Cold Leg Recirculation, is in progress

Which one of the following could have caused the "B" train KC pump runout condition?

- A. "B" train auxiliary building KC non-essential header isolation valves failed to close
- B. KC reactor building non-essential header break inside containment
- C. "A" and "B" train ND heat exchanger inlet valves failed open
- D. 1A1 and 1A2 KC pumps failed to restart following the LOOP

Question: 05-07

Answer: A

LEVEL:	RO/SRO
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K/A	APE026	Title	Loss of Component Cooling Water (CCW)
	AK3.04	Description	Knowledge of the reasons for the following responses as they apply to the Loss of Component Cooling Water: (CFR 41.5,41.10 / 45.6 / 45.13) Effect on the CCW flow header of a loss of CCW
		Importance	3.5/3.7

SOURCE	NEW
LEVEL of KNOWLEDGE	Comprehension
Lesson	OP-CN-PSS-KC rev 51
Objectives	17
REFERENCES	OP/1/A/6100/010J Lesson plan page 9
Author	RJK
Time	7/7/2005 12:40 PM 75 minutes

Distracter Analysis: When FWST level reaches 37% coincident with a Ss signal the following automatic actions occur in the KC system: ND heat exchanger inlet isolation valves OPEN, Reactor Building NON-Essential header valves CLOSE, Auxiliary building NON-essential header isolation valves CLOSE.

- A. **Correct:** .
- B. **Incorrect:** This flowpath is isolated based on Ss with Lo FWST level
- C. **Incorrect:** This is normal for both trains but a high flow condition may be assumed if these valves open.
- D. **Incorrect:** KC trains separate on this condition, so B train pumps will not runout.

Question: 05-08

1 Pt(s) Unit 1 is operating at 100% power with the following conditions:

- Channel III pressurizer pressure has failed low
- "Pzr Press Ctrl Select" switch is in the "1-2" position

How will a failure of the pressurizer pressure master to 100% demand affect pressurizer pressure?

- A. Pressurizer heaters will energize. No PORVs will open. Pressure will increase to the reactor trip setpoint.
- B. Pressurizer heaters will energize. 1NC-32B (Pzr PORV) and 1NC-36B (Pzr PORV) will cycle to maintain pressure between 2315 and 2335 psig.
- C. Pressurizer sprays will open. 1NC-34A (Pzr PORV) will open and remain open. Pressure will decrease to the reactor trip setpoint.
- D. Pressurizer sprays will open. 1NC-34A will open and reclose at 2185 psig. Pressure will decrease to the reactor trip setpoint.

Question: 05-08

Answer: A

LEVEL:	RO
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K/A	APE027	Title	Pressurizer Pressure Control System (PZR PCS) Malfunction
	AK2.03	Description	Knowledge of the interrelations between the Pressurizer Pressure Control Malfunctions and the following: (CFR 41.7 / 45.7) Controllers and positioners
		Importance	2.6/2.8

SOURCE	NEW
LEVEL of KNOWLEDGE	Application
Lesson	OP-CN-PS-IPE rev 27
Objectives	8 and 10
REFERENCES	Lesson plan information 25 and 26 and drawing below.
Author	RJK
Time	7/7/2005 1:40 PM 71 minutes plus 98 from original.

Distracter Analysis:

The pressure master controls all heaters, pressurizer spray and PORV 1NC-34A.

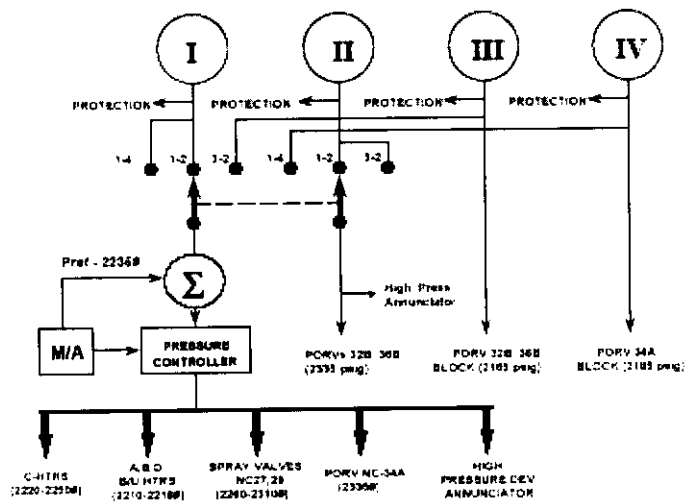
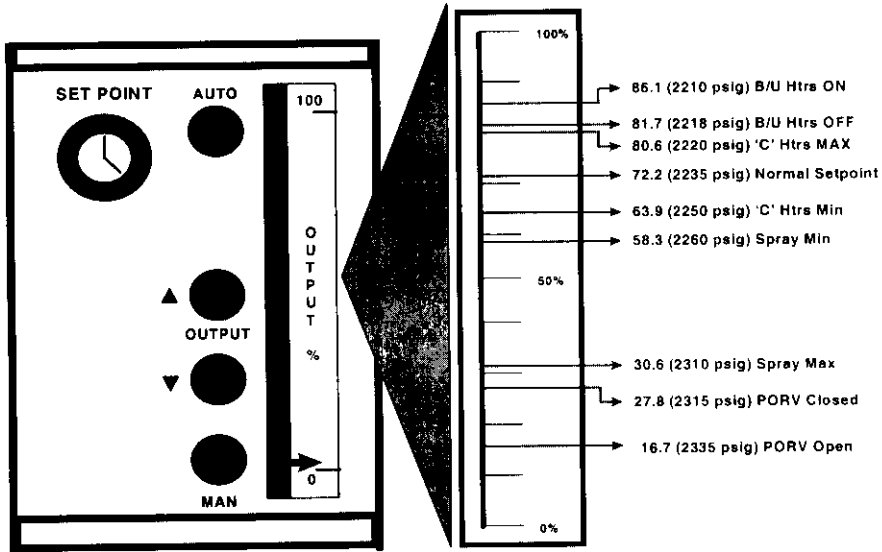
There are two "maximum" conditions of the controller:

1. At an indicated demand of 0%, the pressure master is responding in a way to reduce pressurizer pressure. Heaters are off, sprays are opened and PORV 1NC-34A is opened.
2. At an indicated demand of 100%, the pressure master is responding in a way to increase pressurizer pressure.

With all heaters "ON", pressure will increase to the cycle at the PZR PORV lift setpoint of 2335 using PORVs: NC32/36. Without operator action this will go on and on. However, with Channel 3 PZR pressure already failed low, NC32/36 are blocked, therefore no PORVs are available.

- A. **Correct:**
- B. **Incorrect:** Channel 3 PZR pressure is blocking PORVs NC32/36.
- C. **Incorrect:** Sprays are closed at 100% demand.
- D. **Incorrect:** Sprays are closed at 100% demand.

PZR PRESSURE MASTER



Question: 05-09

1 Pt(s) Unit 2 has initiated bleed and feed per EP/2/A/5000/FR-H.1, Response to Loss of Heat Sink. Current S/G conditions are as follows:

<u>S/G</u>	<u>pressure (psig)</u>	<u>WR level</u>
2A	200, decreasing	2%, decreasing
2B	700, stable	10%, decreasing
2C	700, stable	7%, decreasing
2D	1000, increasing	31%, increasing

Once a source of feedwater is available, which one of these is the most desirable steam generator to establish feedwater flow to?

- A. 2A
- B. 2B
- C. 2C
- D. 2D

Question: 05-09

Answer: B

LEVEL:	RO/SRO
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K/A	APE05 4	Title	Loss of Main Feedwater (MFW)
	AK1.02	Description	Knowledge of the operational implications of the following concepts as they apply to Loss of Main Feedwater (MFW): (CFR 41.8 / 41.10 / 45.3) Effects of feedwater introduction on dry S/G
		Importance	3.6/4.2

SOURCE	NEW
LEVEL of KNOWLEDGE	application
Lesson	OP-CN-EP-FRH
Objectives	2 and 3
REFERENCE S	WOG Background for FR-H see attached statements.
Author	RJK
Time	7/7/2005 2:40 PM 72 minutes

Distracter Analysis: It is most desirable to choose a S/G that is neither faulted or ruptured. Among intact S/Gs the one with the highest level is used first.

- A. **Incorrect:** This S/G is faulted based on indications provided.
- B. **Correct:**
- C. **Incorrect:** This S/G appears to be intact, however, it is not the highest level.
- D. **Incorrect:** This S/G is ruptured based on indications provided.

FR-H.1 Background

Re-establishment of feed flow to a S/G may result in thermal or mechanical shocks to the S/G tubes that could result in tube leakage or tube rupture. If feed flow is re-established to a faulted steam generator and tube leakage resulted, control of the leakage would not be possible until the steam generator secondary boundary was restored. Flow restoration to a nonfaulted S/G will provide an effective and controllable secondary heat sink.

Question: 05-10

1 Pt(s) A caution statement in EP/1/A/5000/E-3, Steam Generator Tube Rupture, states that "Safety Injection must be terminated when termination criteria is met to prevent _____".

- A. over-filling the pressurizer
- B. over-filling the ruptured steam generator(s)
- C. over-cooling the reactor coolant system
- D. over-pressurizing the ruptured steam generator(s)

Question: 05-10

Answer: B

LEVEL:	RO/SRO
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K/A	EPE038	Title	Steam Generator Tube Rupture
	EK3.09	Description	Knowledge of the reasons for the following responses as they apply to the SGTR: (CFR 41.5 / 41.10 / 45.6 / 45.13) Criteria for securing/throttling ECCS
		Importance	4.1/4.5

SOURCE	NEW
LEVEL of KNOWLEDGE	Memory
Lesson	OP-CN-EP-E4
Objectives	13
REFERENCES	WOG Background for E-3 procedure
Author	RJK
Time	7/8/2005 12:12 PM 25 minutes

Distracter Analysis:

- A. **Incorrect:** Not a priority in tube ruptures, but is an issue with SLB induced safety injections. To depressurize the NC system we use 76% PZR level. The purpose of SI termination in Background document step 23 is to establish inventory control in subsequent steps. There is a potential for overfilling the PZR if SI is not terminated when required.
- B. **Correct:**
- C. **Incorrect:** Cooldown/ depressurization has been completed. Continued SI will cause additional cooldown.
- D. **Incorrect:** This would only occur AFTER the S/G level is increased to the relief valves. Though pressures would increase with NC hot water.

Question: 05-11

- 1 Pt(s) What is the minimum length of time that each vital instrument and control system battery is designed to carry its own loads and the loads of the other train related vital bus?
- A. 1 hours
 - B. 2 hours
 - C. 4 hours
 - D. 8 hours

Question: 05-11

Answer: B

LEVEL:	RO/SRO
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K/A	EPE055	Title	Station blackout
	EK3.01	Description	Knowledge of the reasons for the following responses as they apply to the Station Blackout: (CFR 41.5 / 41.10 / 45.6 / 45.13) Length of time for which battery capacity is designed
		Importance	2.7/3.4

SOURCE	NEW
LEVEL of KNOWLEDGE	Memory
Lesson	OP-CN-EL-EPL
Objectives	21
REFERENCES	Lesson plan pages 6 and 7
Author	RJK
Time	7/8/2005 12:39 PM 23 minutes

Distracter Analysis: Stated capacity per lesson plan information

- A. **Incorrect** 1 hour is for SSF batteries
- B. **Correct:**
- C. **Incorrect:**
- D. **Incorrect:** 8 hours is the time it takes to recharge a battery.

Question: 05-12

1 Pt(s) Unit 1 is at 50% power with the following events:

- AC power instrument bus 1ERPA is de-energized
- Pressurizer level control system input is swapped to channel 3-2
- Operators have implemented AP/1/A/5500/029, Loss of Vital or Aux Control Power

While 1ERPA is de-energized, how is pressurizer level being controlled?

- A. 1NV-294 (NV Pmps A&B Disch Flow Ctrl) in automatic with normal letdown
- B. 1NV-294 (NV Pmps A&B Disch Flow Ctrl) in automatic with excess letdown
- C. 1NV-294 (NV Pmps A&B Disch Flow Ctrl) in manual with excess letdown
- D. 1NV-294 (NV Pmps A&B Disch Flow Ctrl) in manual with normal letdown

Question: 05-12

Answer: C

LEVEL:	RO/SRO
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K/A	APE057	Title	Loss of Vital AC Instrument Buss
	AA1.02	Description	Ability to operate and / or monitor the following as they apply to the Loss of Vital AC Instrument Bus: (CFR 41.7 / 45.5 / 45.6) Manual control of PZR level
		Importance	3.8/3.7

SOURCE	NEW
LEVEL of KNOWLEDGE	Comprehension
Lesson	OP-CN-IC-ILE
Objectives	6
REFERENCES	AP/1/A/5500/029 steps 6 and 9 Revision 13
Author	RJK
Time	7/8/2005 1:26 PM 5 minutes plus 60 from original

Distracter Analysis: Letdown isolated on the level channel loss. When channel is selected to the 3-2 position letdown can be restored. But the procedure directs an immediate level control with manual charging and excess letdown. NV-309 would be unaffected by this and remain in automatic.

- A. **Incorrect:** This was the initial lineup. But after the channel swap, an operator may think that all systems can be restored.
- B. **Incorrect:** This could not work due to the low flow of excess letdown, but this is the letdown option until the channel of vital is restored.
- C. **Correct:**
- D. **Incorrect:** Normal letdown is not used per the actions of AP/29.

Question: 05-13

1 Pt(s)

Unit 2 battery charger 2ECD has failed and buss 2EDD is being supplied by battery 2EBD. Which of the following statements indicates the minimum voltage at which the battery must be removed from service and the reason for removal?

- A. 120 volts; to prevent damage to fed equipment
- B. 115 volts; to prevent damage to fed equipment
- C. 110 volts; to prevent cell reversal
- D. 105 volts; to prevent cell reversal

Question: 05-13

Answer: D

LEVEL: RO/SRO

K/A	APE058	Title	Loss of DC Power
	AA2.02	Description	Ability to determine and interpret the following as they apply to the Loss of DC Power: (CFR: 43.5 / 45.13) 125V dc bus voltage, low/critical low, alarm
		Importance	3.3/3.6

SOURCE	NEW
LEVEL of KNOWLEDGE	Memory
Lesson	OP-CN-EL-EPL
Objectives	21
REFERENCES	Lesson plan information
Author	RJK
Time	7/8/2005 2:22 PM 28 minutes

Distracter Analysis:

- A. **Incorrect:** This would be acceptable until voltage decreases to 105 volts.
- B. **Incorrect:** This would be acceptable until voltage decreases to 105 volts.
- C. **Incorrect:** This is above the required voltage, but is the reason to remove the cell from service.
- D. **Correct:** At 105 volts the battery must be removed to prevent damaging other cells.

Question: 05-14

1 Pt(s)

Initial Conditions:

- Unit 1 and Unit 2 are operating at 100% power.
- 1A RN pump is in service.
- B train KC is in service.

Current Conditions:

- 1A RN pump tripped.
- 1B RN pump was started by the crew per AP/0/A/5500/020 (Loss of Nuclear Service Water).
- The OSM has directed that Unit 2 be removed from the RN System technical specification LCO due to upcoming scheduled work.
- Alignments are being made per OP/0/A/6400/006C, Enclosure 4.12A (Alignment for Single Pump Flow Balance Due to One Train A RN Pump and/or Its Associated D/G Inoperable).

Once alignments are made per OP/0/A/6400/006C, and the RN technical specification LCO no longer applies to Unit 2, which one of the following is still aligned to RN on Unit 1?

- A. 1A NS heat exchanger
- B. 1A train CA
- C. 1A KC heat exchanger
- D. The RN non-essential header

Question: 05-14

Answer: C

LEVEL: RO/SRO

K/A	APE062	Title	Loss of Nuclear Service Water
	G2.1.27	Description	Knowledge of system purpose and or function. (CFR: 41.7)
		Importance	2.8/2.9

SOURCE	NEW
LEVEL of KNOWLEDGE	Comprehension
Lesson	OP-CN-PSS-RN rev 54
Objectives	14
REFERENCES	RN OP 4.12A page 2&3
Author	JKS
Time	7/8/2005 3:24 PM 57 minutes+ 91 minutes

Distracter Analysis:

- A. **Incorrect:** This is isolated by the enclosure.
- B. **Incorrect:** This is isolated by the enclosure.
- C. **Correct:**
- D. **Incorrect** This is isolated by the enclosure.

Question: 05-15

1 Pt(s)

Given the following conditions:

- Unit 1 tripped during a loss of instrument air (VI) at 1600 hrs
- Unit 1 is being stabilized in hot standby

Based on these conditions, which one of the following evolutions could NOT be performed at 1615 hrs?

- A. Manually increasing S/G level using a CA flow control valve
- B. Manually controlling T-Avg by cycling the S/G PORVs
- C. Manually decreasing pressurizer pressure using pressurizer PORV
- D. Manually increasing pressurizer level using 1NV-294 (NV Pmps A & B Disch Flow Ctrl)

Question: 05-15

Answer: D

LEVEL:	RO/SRO
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K/A	APE065	Title	Loss of Instrument Air
	AA2.07	Description	Ability to determine and interpret the following as they apply to the Loss of Instrument Air: (CFR: 41.10 / 43.5 / 45.13) Whether backup nitrogen supply is controlling valve position
		Importance	2.8/3.2

SOURCE	NEW
LEVEL of KNOWLEDGE	Memory
Lesson	OP-CN-STM-SM
Objectives	6
REFERENCES	AP/0/A/5500/022 rev 23
Author	RJK
Time	7/12/2005 9:55 AM 35 minutes

Distracter Analysis:

- A. **Incorrect:** This system does use a backup air tank system.
- B. **Incorrect:** N2 backup via bottles
- C. **Incorrect:** The NC system does employ nitrogen for the PZR PORVs when they are in the LTOP mode of operation from the Cold Leg Accumulators.
- D. **Correct:**

Question: 05-16

1 Pt(s) A loss of coolant accident outside containment has occurred on the residual heat removal system injection header.

The crew is performing Step 3 of EP/1/A/5000/ECA-1.2, LOCA Outside Containment, which states:

“Verify leak path is isolated as follows:”

Which ONE of the following indications is used to identify that the leak has been successfully isolated?

- A. ND Pump discharge pressure decreasing
- B. Pressurizer level increasing
- C. ND/NS room sump levels decreasing
- D. Reactor coolant pressure increasing

Question: 05-16

Answer: D

LEVEL:	RO/SRO
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K/A	W04	Title	LOCA Outside Containment
	EK2.2	Description	Knowledge of the interrelations between the (LOCA Outside Containment) and the following: (CFR: 41.7 / 45.7) Facilities heat removal systems, including primary coolant, emergency coolant, the decay heat removal systems, and relations between the proper operation of these systems to the operation of the facility.
		Importance	3.8/4.0

SOURCE	BANK (South Texas Initial Exam Bank)
LEVEL of KNOWLEDGE	Memory
Lesson	OP-CN-EP-EP2
Objectives	20
REFERENCE S	EP/1/A/5000/ECA-1.2 rev 2
Author	RJK
Time	7/12/2005 10:48 AM 61 minutes

Distracter Analysis: ECA-1.1 looks for the pressure increase as the crews isolate each train of ND.

- A. **Incorrect:** If the leak is in ND, then decreasing pressure may equate to leak isolation because the relief valve would close on the system and the pressure would decrease.
- B. **Incorrect:** Pressurizer level increasing is a later issue for SI termination. It is not reasonable to assume that level would already be on scale.
- C. **Incorrect:** This might be true if the leak is contained and the sumps are pumped down but is not the indication that the procedure keys off of.
- D. **Correct:**

Question: 05-17

1 Pt(s) Given the following:

- EP/1/A/5000/ECA-1.1, Loss of Emergency Coolant Recirculation, has just been implemented
- Refueling Water Storage Tank (FWST) level is 4.5%

Which of the following procedure actions is performed first while attempting to restore recirculation?

- A. Initiate makeup to the FWST.
- B. Start one reactor coolant pump.
- C. Makeup to the NC system from the standby makeup pump.
- D. Secure all ECCS and NS pumps taking a suction from the FWST.

Question: 05-17

Answer: D

LEVEL:	RO/SRO
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K/A	WE11	Title	Loss of Emergency Coolant Recirculation
	EA2.2	Description	Ability to determine and interpret the following as they apply to the (Loss of Emergency Coolant Recirculation) (CFR: 41.7 / 43.5 / 45.13) Adherence to appropriate procedures and operation within the limitations in the facilities license and amendments.
		Importance	3.4/4.2

SOURCE	NEW
LEVEL of KNOWLEDGE	Memory
Lesson	OP-CN-EP-EP2
Objectives	20
REFERENCES	EP/1/A/5000/ECA-1.1
Author	RJK
Time	7/12/2005 12:39 PM 59 minutes

Distracter Analysis: All these actions are done, but are not done first. Based on stem conditions, Enclosure 1 applies which required all pumps taking a suction from the FWST to be secured. This is also a step in the body of the procedure.

- A. Incorrect:
- B. Incorrect:
- C. Incorrect:
- D. Correct:

Question: 05-18

1 Pt(s)

Given the following:

- Containment pressure is 4 psig
- All steam generator pressures are 150 psig
- EP/1/A/5000/ECA-2.1, Uncontrolled Depressurization of All Steam Generators, is in effect
- The OATC has been instructed to begin dumping steam using S/G PORVs to stabilize Thots

Which of the following lists the minimum actions required to allow the S/G PORVs to be manually positioned?

- A. Depress the "S/G PORV CTRL MODE" "MANUAL" pushbutton
- B. Depress the "SM PORV TRN A(B) RESET" pushbuttons
Depress the "S/G PORV CTRL MODE" "MANUAL" pushbutton
- C. Depress the "SM ISOL TRN A(B) RESET" pushbuttons
Depress the "SM PORV TRN A(B) RESET" pushbuttons
Depress the "S/G PORV CTRL MODE" "MANUAL" pushbutton
- D. Depress the "ECCS TRN A" "RESET" pushbutton
Depress the "SM ISOL TRN A(B) RESET" pushbuttons
Depress the "SM PORV TRN A(B) RESET" pushbuttons
Depress the "S/G PORV CTRL MODE" "MANUAL" pushbutton

Question: 05-18

Answer: A

LEVEL:	RO/SRO
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K/A	WE12	Title	Uncontrolled Depressurization of all Steam Generators
	EA1.1	Description	Ability to operate and / or monitor the following as they apply to the (Uncontrolled Depressurization of all Steam Generators) (CFR: 41.7 / 45.5 / 45.6) Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features
		Importance	3.8/3.8

SOURCE	NEW
LEVEL of KNOWLEDGE	Application
Lesson	OP-CN-STM-SM
Objectives	6
REFERENCES	Lesson plan information PAGE 11
Author	RJK
Time	7/12/2005 1:30 PM 63 minutes

Distracter Analysis:

- A. **Correct**
- B. **Incorrect:** The additional reset is not required for the potentiometers to work
- C. **Incorrect:** Other steps are required if PORVs are to be allowed to operate in AUTO
- D. **Incorrect:** ECCS has not connection to the SM PORVs, Additional actions are only required if PORVs are to be allowed to operate in AUTO.

Question: 05-19

1 Pt(s)

Given the following conditions and sequence of events:

- The crew is responding to a continuous rod withdrawal per AP/1/A/5500/015 Case 2, Continuous Rod Motion
- Control rods have been placed in manual and rod motion has stopped
- Boron is being added with 1A boric acid transfer pump to return Tavg to Tref
- 1ETA experiences a loss of power
- The blackout sequencer re-energized 1ETA

Which choice states the minimum action(s), if any, required to be completed before the operator can secure the 1A boric acid transfer pump using its control switch?

- A. Reset the 1A diesel generator sequencer and then reset the 1A boric acid transfer pump
- B. Reset the 1A diesel generator sequencer
- C. Reset the 1A boric acid transfer pump
- D. No additional actions are required

Question: 05-19

Answer: A

LEVEL: RO/SRO

K/A	APE001	Title	Continuous Rod Withdrawal
	AA1.03	Description	Ability to operate and / or monitor the following as they apply to the Continuous Rod Withdrawal: (CFR 41.7 / 45.5 / 45.6) Boric acid pump control switch
		Importance	3.4/3.2

SOURCE	NEW
LEVEL of KNOWLEDGE	Application
Lesson	OP-CN-PS-NV
Objectives	17, 19
REFERENCES	Lesson plan information (see below)
Author	RJK
Time	7/12/2005 2:34 PM 34 minutes

Distracter Analysis:

- A. **Correct:** First the sequencer is RESET and THEN the transfer pumps RESET pushbutton is reset.
- B. **Incorrect:** This is correct for any sequencer load to establish control board switch control by the operator but the BA transfer pump has an additional reset requirement.
- C. **Incorrect:** This is correct to regain control of the pump if the sequencer is reset.
- D. **Incorrect:** Two resets are required.

Question: 05-20

1 Pt(s)

Given the following conditions:

- Unit 1 at 45% power
- Loop "A" That fails high

Assuming no operator action, which one of the following statements correctly explains the initial effect of this That failure?

- A. Loop "A" OTDT setpoint increases
- B. Control rods step inward at a constant 48 steps per minute
- C. Charging flow increases
- D. Pressurizer level increases to the Hi level alarm setpoint

Question: 05-20

Answer: C

LEVEL:	RO/SRO
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K/A	APE028	Title	Pressurizer (PZR) Level Control Malfunction
	AA1.02	Description	Ability to operate and / or monitor the following as they apply to the Pressurizer Level Control Malfunctions: (CFR 41.7 / 45.5 / 45.6) CVCS
		Importance	3.4/3.4

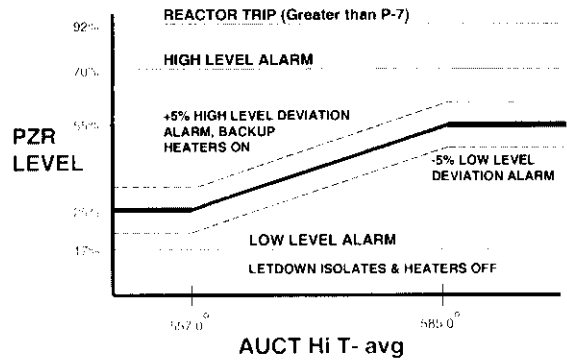
SOURCE	CNS exam bank
LEVEL of KNOWLEDGE	Application
Lesson	OP-CN-PS-ILE
Objectives	6
REFERENCES	Lesson plan information, page 6 and 17
Author	RJK
Time	7/13/2005 12:51 PM 43 minutes

Distracter Analysis:

At 50 % power PZR level will be about 40%. T-Hot failing hot (650 F.) will cause T-Avg to read approximately 604 degrees at this power level $((650-557)/2+557)$. If T-AVE fails to high, the Auctioneered T-Avg becomes that loop: PZR level would then just bring level to its 100% programmed level and stabilize (55%).

- A. **Incorrect:** OTDT setpoint will decrease.
- B. **Incorrect:** Control banks insert but at 72 steps per minute. The mismatch is greater than 5 degrees where rod speed peaks at 72 SPM.
- C. **Correct:**
- D. **Incorrect:** If an operator assumes that pressurizer level setpoint is linear and disregards the normal 100% value of 55% being the maximum level allows by program, he may think that the trend line will continue linearly. This would equate to a PZR level of ~75% at 604 F (~1% level setpoint per degree F but only in the normal band)
This exceeds the high level setpoint (70%)

PZR LEVEL PROGRAM AND SETPOINTS (U1)



Question: 05-21

1 Pt(s)

Spent fuel assemblies are being shuffled in the Spent Fuel building when the following two (2) alarms are received simultaneously:

- 1RAD-2 A/2, 1EMF36 UNIT VENT GAS HI RAD is LIT
- 1RAD-2 F/5, CABINET 3-4 TROUBLE is LIT

The operator notes the following:

- 1EMF36 Operate and Trip 2 lights are LIT, the Trip 1 light is DARK
- All 1EMF42 (FUEL BLDG VENT MONITOR) module indications are DARK
- 1RAD-2 B/1, 1EMF42 FUEL BLDG VENT HI RAD is DARK
- ABUXF-1A and ABUXF-1B have tripped

Based on the EMF indications of panel 1RAD-2, which one of the following is the highest priority alarm response procedure action to take?

- A. Review and then verify automatic actions of 1RAD-2 A/2 for the 1EMF36 Trip 2 alarm even though spent fuel building ventilation is already in the required condition to allow fuel handling activities.
- B. Review automatic actions of 1RAD-2 B/1 for a 1EMF42 Trip 2. Take no action since spent fuel building ventilation would already be in the required condition to allow fuel handling activities.
- C. Review the probable cause guidance of 1RAD-2 F/5 for the failure of 1EMF42.
- D. Review the probable cause guidance of 1RAD-2 F/5 because both EMFs have malfunctions and no automatic actions have occurred.

Question: 05-21

Answer: A

LEVEL: RO/SRO

K/A	APE037	Title	Fuel Handling Accident
	G2.4.31	Description	Knowledge of annunciators alarms and indications, and use of the response instructions (CFR: 41.10 /45.3)
		Importance	3.3/3.4

SOURCE	NEW
LEVEL of KNOWLEDGE	Analysis
Lesson	OP-CN-FH-VF
Objectives	12
REFERENCES	OP/1/B/6100/010Y rev 038 and lesson plan information
Author	RJK
Time	7/13/2005 1:33 PM 6 minutes

Distracter Analysis:

- A. **Correct:** The EMF operate light being lit and the Trip 2 light being lit would be a condition where the Trip1 light may just be burned out. The display should be checked then the annunciator response used to verify any automatic action has occurred. This would be required even though the VF system is already in filtered exhaust mode to allow the movement of spent fuel. 1EMF36 trip 2 causes ABUXFs to trip (unit related)
- B. **Incorrect:** Both EMFs were checked to verify their conditions. To review and then do nothing for the automatic action of a failed EMF would not be the FIRST action an operator would take.
- C. **Incorrect:** While this may be a follow-up at some point, there exists a valid alarm condition on EMF36 and choice "A" should be performed first.
- D. **Incorrect:** The indications provided only verify that EMF42 has a malfunction. The operator should not assume the indication of EMF36 is also associated with a failure. The OPERATE light being lit and Trip 2 being LIT would be a conditions where the Trip 1 light may just be burned out.

Question: 05-22

1 Pt(s)

Initial Conditions:

- Unit 1 is operating at 100% power
- EMF 71 (Steam Generator A Leakage) indicates 18 gpd
- Secondary Chemistry confirms the leak on 1A S/G
- EMF 33 (Condenser Air Ejector Exhaust) reads 210 CPM
- Charging system mismatch reads 12 gpm

Current Conditions:

- Unit 1 is in Mode 2 at 4% power
- Steam generator leakage has increased to 4 gpm

Per NSD 513 (Primary to Secondary Leak Monitoring Program) which one detection method is preferred:

1. At 100% power
2. In Mode 2 at 4% power

- A. 1. EMF 33
2. Secondary system sampling
- B. 1. EMF 33
2. EMF 71
- C. 1. EMF 71
2. EMF 33
- D. 1. Secondary system sampling
2. EMF 33

Question: 05-22

Answer: A

LEVEL:	RO/SRO
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K/A	APE037	Title	Steam Generator Tube Leak
	AA2.05	Description	Ability to determine and interpret the following as they apply to the Steam Generator Tube Leak: (CFR: 41.10 / 43.5 / 45.13) Past history of leakage with current problem
		Importance	2.8/3.3

SOURCE	NEW
LEVEL of KNOWLEDGE	Memory
Lesson	OP-CN-STM-SG
Objectives	24
REFERENCES	Lesson plan information page 32
Author	RJK
Time	7/13/2005 3:13 PM 12 minutes plus 34 minutes.

Distracter Analysis: At 100% power, EMF 33 is used, in Mode 2, secondary sampling is used (tritium)

- A. **Correct:**
- B. **Incorrect:** N-16 monitors not accurate below 40%, but EMF-33 is preferred at 100%.
- C. **Incorrect:** N-16 monitors accurate above 40% power, but EMF-33 is preferred. EMF33 is not preferred in Mode 2.
- D. **Incorrect:** This is reversed from correct answer.

Question: 05-23

1 Pt(s)

Area radiation monitors functions are limited to detecting which of the following type events?

- A. High radiation detected during a normal waste gas release, seal water heat exchanger tube leak, waste gas storage tank rupture
- B. High radiation detected during a normal waste gas release, waste gas storage tank rupture, fuel handling accident
- C. Seal water heat exchanger tube leak, high radiation at solid waste processing, radiation in reactor coolant filters
- D. Fuel handling accident, high radiation at solid waste processing, radiation in reactor coolant filters

Question: 05-23

Answer: D

LEVEL:	RO/SRO
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K/A	APE061	Title	Area Radiation Monitoring (ARM) System Alarms
	AK1.01	Description	Knowledge of the operational implications of the following concepts as they apply to Area Radiation Monitoring (ARM) System Alarms: CFR (41.8 / 41.10 / 45.3) Detector limitations
		Importance	2.5/2.9

SOURCE	Modified (South Texas HLP bank)		
LEVEL of KNOWLEDGE	Memory		
Lesson	BNT - CP02R rev 6 pg 23/30 and EMF annunciator responses		
Objectives	10		
REFERENCES	Lesson plan information		
Author	RJK		
Time	7/13/2005 3:38 PM	4 minutes plus 23 minutes	

Distracter Analysis:

- Hi rad during a waste release is EMF50 which is process.
- Sealwater HX leak is EMF46 A/B which is process
- WG storage tank rupture is EMF 41 and/or EMF 35,36,37 which are process
- Waste process area is EMF23 which is an area
- Fuel handling accidents are EMF 38, 39,40 or EMF 17 in containment which are process and area respectively AND EMF 42 (VF) and EMF15 in the SFP which are process and area respectively
- NC filter monitoring is with EMF18 or 19 which are area monitors

- A. All process monitors
- B. Mix of process and area
- C. Mix of process and area
- D. Correct:

Question: 05-24

1 Pt(s)

Select the statement that represents a loss of containment integrity?

- A. Both lower personnel airlock doors closed with all seals deflated
- B. Annulus doors blocked open for maintenance work
- C. Submarine hatch is found open
- D. Engineering discovery of major divider barrier seal degradation

Question: 05-24

Answer: A

LEVEL: RO/SRO

K/A	APE069	Title	Loss of Containment Integrity
	AK2.03	Description	Knowledge of the interrelations between the Loss of Containment Integrity and the following: (CFR 41.7 / 45.7) Personnel access hatch and emergency access hatch
		Importance	2.8/2.9

SOURCE	New
LEVEL of KNOWLEDGE	Memory
Lesson	OP-CN-CNT-CNT
Objectives	26
REFERENCES	T.S. 3.6.2 and bases Lesson plan information
Author	RJK
Time	7/18/2005 9:39 AM 89 minutes

Distracter Analysis: One door and one seal is the minimum required for CONTAINMENT INTEGRITY as far as acting a barrier to the release of radioactivity. Per T.S. and the Containment DBD, one door and one seal is integrity.

- A. Correct.
- B. Incorrect: This affects VE and reactor building integrity.
- C. Incorrect: This makes the divider barrier inoperable, not integrity issue.
- D. Incorrect: This is divider barrier, not containment.

Lesson plan: D.3.d) It should be noted that only one of the four seals is required to maintain containment integrity.

Question: 05-25

1 Pt(s)

Given the following:

- Unit 1 LOCA in progress
- All S/G pressures are 1000 psig
- The crew has implemented EP/1/A/5000/FR-C.1 (Response to Inadequate Core Cooling)

Which of the following statements explains the relationship between primary system temperature and steam generator pressure, and what affect does depressurizing S/Gs have on Thot temperatures?

- A. Reactor coolant hot leg temperatures in the S/Gs are approximately the same as CET temperatures.
Depressurizing the S/G's would not decrease the Thot temperatures.
- B. Reactor coolant hot leg temperatures in the S/Gs are approximately the same as CET temperatures.
Depressurizing the S/Gs would decrease Thot temperatures.
- C. Reactor coolant hot leg temperatures in the S/Gs are approximately at the saturation temperature for S/G pressure.
Depressurizing the S/Gs would not decrease the Thot temperatures.
- D. Reactor coolant hot leg temperatures in the S/Gs are approximately at the saturation temperature for S/G pressure.
Depressurizing the S/Gs would decrease Thot temperatures.

Question: 05-25

Answer: D

LEVEL:	RO/SRO
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K/A	EPE074	Title	Inadequate Core Cooling
	EA2.04	Description	Ability to determine or interpret the following as they apply to a Inadequate Core Cooling: (CFR 41.10 / 43.5 / 45.13) Relationship between RCS temperature and main steam pressure
		Importance	3.7/4.2

SOURCE	NEW
LEVEL of KNOWLEDGE	Analysis
Lesson	OP-CN-EP-FRC
Objectives	3
REFERENCES	EP/FR-C.1
Author	RJK
Time	November 10, 2005

Distracter Analysis:

- A. **Incorrect:** First part is false even during inadequate core cooling; there exists a small amount of reflux cooling. To assume that CETS and T-HOTS inside the S/G are the same would not be correct. Second part is false: Dumping steam is the FIRST choice per FR-C.1 and WOULD benefit to the primary when the S/G pressure is decrease.
- B. **Incorrect:** First part is false, even during inadequate core cooling; there exists a small amount of reflux cooling. To assume that CETS and T-HOTS inside the S/G are the same would not be correct. Second part is true; dumping steam is the FIRST choice per FR-C.1 and would benefit to the primary when the S/G pressure is decrease.
- C. **Incorrect:** First part is true, even during inadequate core cooling; there exists a small amount of reflux cooling. Second part is true; dumping steam is the FIRST choice per FR-C.1 and WOULD benefit to the primary when the S/G pressure is decrease
- D. **Correct:**

Question: 05-26

- 1 Pt(s) The required actions for a high reactor coolant activity event to limit site boundary dose is based on a _____.
- A. Main Steam Line Break
 - B. Steam Generator Tube Rupture
 - C. Small Break LOCA
 - D. Loss of Containment Integrity

Question: 05-26

Answer: B

LEVEL:	RO/SRO
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K/A	APE076	Title	High Reactor Coolant Activity
	G2.2.22	Description	Knowledge of limiting conditions for operations and safety limits. (CFR: 43.2 / 45.2)
		Importance	3.4/4.1

SOURCE	NEW
LEVEL of KNOWLEDGE	Memory
Lesson	OP-CN-PS-NC
Objectives	10
REFERENCES	Tech Spec bases 3.4.16
Author	RJK
Time	7/18/2005 12:10 PM 36 minutes

Distracter Analysis: See bases for T.S. 3.4.16

- A. **Incorrect:** since this accident dumps steam to the environment, even a small leak in one S/G would contribute to offsite dose.
- B. **Correct:**
- C. **Incorrect:** This accident breaches the reactor coolant boundary and pressurizes containment. There is a small allowable leakage allowed in containment that is filtered and would still contribute to some low level of off site dose.
- D. **Incorrect:** While a loss of containment integrity would be an issue coincident with another accident, containment atmosphere is not necessarily contaminated and therefore would not contribute to offsite dose.

TS 3.4.16 bases:

The RCS specific activity LCO limits the allowable concentration level of radionuclides in the reactor coolant. The LCO limits are established to minimize the offsite radioactivity dose consequences in the event of a steam generator tube rupture (SGTR) accident.

Question: 05-27

1 Pt(s)

Conditions at 1400 hrs:

- Unit 1 safety injection occurred due to a LOCA
- Reactor coolant (NC) system pressure is 915 psig
- NC Tcold temperatures are 535 °F
- Core Exit Thermocouples (CET) are 565 °F
- Crew has implemented EP/1/A/5000/FR-C.2, Response to Degraded Core Cooling
- The OSM has directed a cooldown to allow ND to be placed in service

Assuming temperatures have been stable since 1300 hrs, what is the maximum cooldown rate allowed per EP/1/A/5000/FR-C.2, and what is the lowest temperature that could be attained by 1600 hrs using that rate?

- A. Cooldown at 80 °F/hr to 375 °F on NC Tcolds
- B. Cooldown at 80 °F/hr to 405 °F on CETs
- C. Cooldown at 100 °F/hr to 335 °F on NC Tcolds
- D. Cooldown at 100 °F/hr to 365 °F on CETs

Question: 05-27

Answer: C

LEVEL:	RO/SRO
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K/A	E07	Title	Saturated Core Cooling
	EK3.4	Description	Knowledge of the reasons for the following responses as they apply to the (Saturated Core Cooling) (CFR: 41.5 / 41.10, 45.6, 45.13) RO or SRO function within the control room team as appropriate to the assigned position, in such a way that procedures are adhered to and the limitations in the facilities license and amendments are not violated.
		Importance	3.3/3.6

SOURCE	NEW
LEVEL of KNOWLEDGE	Comprehension
Lesson	EP-CN-EP-CSF rev 16
Objectives	1
REFERENCES	TS 3.4.3 EP/1/A/5000/FR-C.2
Author	RJK
Time	7/18/2005 1:45 PM 138 minutes

Distracter Analysis: 80 /hr is plausible because if the normal cooldown limit in OPs. This procedure allows 100/hr. (TS 3.4.3 limit) The reference temperature to use is the Tcold, NOT Core exit temperature.

- A. **Incorrect:** Wrong rate, right reference temperature.
- B. **Incorrect:** Wrong rate, wrong reference temperature.
- C. **Correct:**
- D. **Incorrect:** Right rate used, but wrong reference temperature.

Question: 05-28

1 Pt(s)

Why are the reactor coolant pumps (NCP) shutdown on a high-high containment pressure condition?

- A. Cooling water flow is isolated to the upper containment air handling units.
- B. Cooling water flow is isolated to the NCP seals.
- C. NCP seal water return path from containment is isolated.
- D. Cooling water flow is isolated to the NCP motor oil coolers.

Question: 05-28

Answer: D

LEVEL: RO/SRO

K/A	SYS003	Title	Reactor Coolant Pump
	K1.01	Description	Knowledge of the physical connections and/or cause-effect relationships between the RCPS and the following systems: (CFR: 41.2 to 41.9 / 45.7 to 45.8) RCP lube oil
		Importance	2.6/2.8

SOURCE	CNS exam bank (NCP-053-D)		
LEVEL of KNOWLEDGE	Memory		
Lesson	OP-CN-PS-NCP		
Objectives	4 and 12		
REFERENCES	NCP lesson plan EP/1/A/5000/E-0		
Author	RJK		
Time	7/18/2005 2:17 PM	36 minutes	

Distracter Analysis:

- A. **Incorrect:** Upper containment air handling units do not cool the NCPs. But RN is isolated to containment on SP signal.
- B. **Incorrect:** While true, the continued flow from the NV pumps keep the seals working correctly and cooled. Operator may think that this would cause overheating.
- C. **Incorrect:** While true, this does nothing since the seal leakoff flow goes to the PRT thru a relief valve.
- D. **Correct:**

Question: 05-29

1 Pt(s) Given the following plant conditions:

- Unit 1 is in Mode 3 at 400 °F
- Plant cooldown in progress to Mode 4
- Normal pressurizer spray is not available
- The crew has aligned auxiliary spray from the chemical and volume control system to cooldown the pressurizer

Which of the following is a caution expressed in OP/1/A/6200/001, Chemical and Volume Control System, related to this alignment?

- A. Potential for flashing the letdown line
- B. Isolating the charging flow path
- C. Inferior pressure control compared to normal spray
- D. Over cooling the pressurizer spray nozzle

Question: 05-29

Answer: D

LEVEL:	RO/SRO
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K/A	SYS004	Title	Chemical and Volume Control
	K5.11	Description	Knowledge of the operational implications of the following concepts as they apply to the CVCS: (CFR: 41.5/45.7) Thermal stress, brittle fracture, pressurized thermal shock
		Importance	3.6/3.9

SOURCE	New
LEVEL of KNOWLEDGE	memory
Lesson	OP-CN-PS-NV
Objectives	9
REFERENCES	OP/1/A/6200/001 Enclosure 4.15 caution
Author	RJK
Time	7/18/2005 2:46 PM 34 minutes

Distracter Analysis: there are specific cautions that the cold water from the NV system will cause thermal stresses on the spray line. It should only normally be used when less than 240 degrees.

- A. **Incorrect:** When NV aux spray is aligned, the normal charging path is isolated and NV flow aligned to the spray nozzle. The operator controls the flowrate and could decrease flow to the point where letdown line flashing may become an issue. But this concern is not addressed in this procedure.
- B. **Incorrect:** This is the only way to align the aux spray header.
- C. **Incorrect:** This provides throttle capability similar to the spray valves.
- D. **Correct:**

Question: 05-30

1 Pt(s) Given the following conditions:

- Both trains of residual heat removal (ND) are in service
- ND heat exchanger outlet valves are full open
- ND train flows are 3300 gpm each
- Train "B" ND heat exchanger outlet valve is manually closed

Which one of the following would represent the final stabilized total system flow and inlet temperature for Train "A" ND heat exchanger?

	<u>Total System Flow</u>	Train "A" ND heat exchanger <u>Inlet Temperature</u>
A.	DECREASE	INCREASE
B.	REMAIN THE SAME	INCREASE
C.	REMAIN THE SAME	REMAIN THE SAME
D.	DECREASE	REMAIN THE SAME

Question: 05-30

Answer: B

LEVEL:	RO/SRO
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K/A	SYS005	Title	Residual Heat Removal
	K6.03	Description	Knowledge of the effect of a loss or malfunction on the following will have on the RHRS: (CFR: 41.7 / 45.7) RHR heat exchanger
		Importance	2.5/2.6

SOURCE	BANK (South Texas HLP Bank)		
LEVEL of KNOWLEDGE	Application		
Lesson	OP-CN-PS-ND rev 031		
Objectives	3 & 7		
REFERENCES	Lesson plan page 11		
Author	RJK		
Time	7/18/2005 3:56 PM	55 minutes	

Distracter Analysis: The outlet valve fails closed and shifts all the cooling over to "A" train. As the NC system heats up, the inlet temperature should increase. The bypass valve will compensate to maintain flow in that loop at setpoint. Total flow is basically unaffected.

- A. **Incorrect:** Total flow remains constant. May think flow shifts to "A" train.
- B. **Correct:**
- C. **Incorrect:** Inlet temperature increases. May think that more flow through heat exchanger maintains temperature.
- D. **Incorrect:** Both incorrect. But may think that these would be the result for two trains in operation.

ND lesson plan page 11
ND flow through the tube side
ND Hx Outlet valves (ND-26, 60) (Obj. #3)
Air operated butterfly valves
Control flow through the Hx to maintain desired cooldown rate.
Fail open during S_g to ensure heat removal capability is maintained.

ND Hx bypass valves (ND-27, 61) (Obj. #3)
Air operated butterfly valves
Used in conjunction with ND-26, 60 to maintain train flow at approximately 3300 gpm based on potentiometer setting.

Question: 05-31

1 Pt(s)

Unit 1 is in Mode 1 with the following cold leg accumulator conditions:

CLA	1A	1B	1C	1D
Indicated Pressure (psig)	605	625	640	580
Indicated Level (%)	72	82	92	84

Based on the above accumulator parameters, how many CLAs are operable, and is Tech Spec 3.0.3 entered?

References Provided

- A. Three CLAs are operable.
Enter Tech Spec 3.0.3.
- B. Three CLAs are operable.
Do not enter Tech Spec 3.0.3.
- C. Two CLAs are operable.
Enter Tech Spec 3.0.3.
- D. Two CLAs are operable.
Do not enter Tech Spec 3.0.3.

Question: 05-31

Answer: C

LEVEL:	RO/SRO
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K/A	SYS006	Title	Emergency Core Cooling
	K6.02	Description	Knowledge of the effect of a loss or malfunction on the following will have on the ECCS: (CFR: 41.7 / 45.7) Core flood tanks (accumulators)
		Importance	3.4/3.9

SOURCE	New
LEVEL of KNOWLEDGE	Application/Comprehension
Lesson	OP-CN-ECCS-CLA rev 021
Objectives	1 & 2
REFERENCES	TS 3.5.1 and TS 3.0.3
Author	RJK
Time	12/8/2005

Distracter Analysis: According to the design of this system, 3 CLAs are needed with one CLAs being wasted out the break and it will still function in conjunction with the ECCS systems to partially cover the core.

Tech Spec 3.5.1 requires

Pressure is ≥ 585 psig and ≤ 678 psig.
Level is ≥ 7630 gallons and ≤ 8079 gallons.

Tech Spec 3.03 requires

Mode 3 in 7 hours
Mode 4 in 13 hours.

A is inoperable based on level. D is inoperable on pressure.

- A. **Incorrect:** Per the Tech Spec and CLA level sheet, 1A and 1D are inoperable. The TS action is correct for 2 CLAs out of spec per 3.5.1
- B. **Incorrect:** Per the Tech Spec and CLA level sheet, 1A and 1D are inoperable. The tech spec is right if only one is inoperable
- C. **Correct:**
- D. **Incorrect:** Right number of accumulators inoperable, but you would be in 3.0.3.

Question: 05-32

1 Pt(s) Given the following Pressure Relief Tank (PRT) parameters:

	<u>0800 hrs</u>	<u>0810 hrs</u>
Temperature	71.8 °F	72.1 °F
Pressure	3.0 psig	3.9 psig
Level	72.5 %	72.9 %

Which one of the following valves passing full flow for 10 minutes would account for the 0810 values in the PRT?

- A. Letdown orifice line relief valve
- B. Pressurizer PORV
- C. Reactor coolant pump seal return line relief valve
- D. Residual heat removal pump suction line relief valve

Question: 05-32

Answer: C

LEVEL: RO/SRO

K/A	SYS007	Title	Pressurizer Relief Tank
	A3.01	Description	Ability to monitor automatic operation of the PRTS, including: (CFR: 41.7 / 45.5) Components which discharge to the PRT
		Importance	2.7/2.9

SOURCE	NEW
LEVEL of KNOWLEDGE	Analysis
Lesson	OP-CN-PS-NC OP-CN-PS-NV
Objectives	9 7
REFERENCES	Simulator parameters 10 minute test. AP/1/A/5500/010 Enclosure 13
Author	RJK
Time	

Distracter Analysis: Based on the contents of the system providing input to the PRT:

- A. **Incorrect:** Due to the temperatures at this point, causes excessive pressure and temperatures increases: 14.9 psig and 87.8°F.
- B. **Incorrect:** The PORV showed the largest increase after only 5 minutes.
- C. **Correct:** Since these lines carry a small amount of water (~1-3 gpm per pump).
- D. **Incorrect:** This source is a massive amount of water and causes a large pressure and level increase: 28.3 psig and 86.4%

IC set #1 for 10 minutes:	Temperature	Level	Pressure
0800 Initial conditions	71.8°F	72.5%	3.0 psig
ND suction relief	73.7°F	86.4%	28.3 psig
L/D relief	87.8°F	78.7%	14.5 psig
Seal return relief	72.1°F	72.9%	3.9 psig
PORV	212 °F	84 %	55 psig (after only 5 minutes)

Clearly a small increase from only one source.

Question: 05-33

1 Pt(s) Given the following conditions and sequence of events:

- Unit 1 is at 100 %
- Alternate cooling is aligned to 1A charging pump (NV)
- A safety injection occurs

Which system provided cooling to the 1A NV pump before the safety injection and what action is required (if any) after the safety injection to maintain cooling to 1A NV pump?

- A. Drinking water (YD)
Maintain cooling from drinking water
- B. Drinking water
Realign cooling from component cooling (KC)
- C. Nuclear service water (RN)
Realign cooling from component cooling
- D. Nuclear service water
Maintain cooling from nuclear service water

Question: 05-33

Answer: B

LEVEL:	RO/SRO
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K/A	SYS008	Title	Component Cooling Water
	G2.1.27	Description	Knowledge of system purpose and or function. (CFR: 41.7)
		Importance	2.8/2.9

SOURCE	NEW
LEVEL of KNOWLEDGE	Memory
Lesson	OP-CN-PSS-KC rev 50
Objectives	7 and 14
REFERENCES	Lesson plan information see below
Author	RJK
Time	8/15/2005 12:03 PM 64 minutes

Distracter Analysis:

- A. **Incorrect:** While the drinking water is used as alternate, when the safety injection occurs, operator must restore KC to the charging pumps.
- B. **Correct:**
- C. **Incorrect:** Do not use RN as a backup source. RN is used in the KC surge tank.
- D. **Incorrect:** Do not use RN for any cooling but it is a source used in the KC surge tank.

Lesson plan page 15 rev 50

4. NV Pump Alternate Cooling on a total loss of KC:

- a) If Safety Injection has not actuated on either unit and both trains of KC have been lost, then alternate cooling from the YD System can be aligned to both units "A" NV Pump.
- b) If a NV Pump is aligned for alternate cooling and a Safety Injection occurs on either unit, then that NV Pump must be realigned to its normal cooling source (KC).

Question: 05-34

1 Pt(s)

Given the following conditions:

- Unit 1 in Mode 4 cooling down to Mode 5
- Pressurizer level is 85%
- Pressurizer heater groups 1A and 1D are in MANUAL and ON
- Reactor coolant pumps (NCP) 1A and 1B are running
- An electrical fault results in the loss of 1TA and 1ETA

Five minutes later it is reported the pressurizer outflow cannot be verified.

Which of the following actions will reinitiate and then maintain a continuous pressurizer outflow?

- A. Energize pressurizer heater group 1B and close the spray valve for 1A NCP
- B. Start NCP 1D
- C. Increase the spray valve open position for NCP 1B
- D. Adjust charging and letdown to decrease pressurizer level to 80%

Question: 05-34

Answer: A

LEVEL: RO/SRO

K/A	SYS010	Title	Pressurizer Pressure Control
	A2.01	Description	Ability to (a) predict the impacts of the following malfunctions or operations on the PZR PCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: (CFR: 41.5 / 43.5 / 45.3 / 45.13) Heater failures
		Importance	3.3/3.6

SOURCE	NEW
LEVEL of KNOWLEDGE	Analysis
Lesson	OP-CN-IC-IPE
Objectives	18
REFERENCES	OP/1/A/6100/002 Controlling Procedure for Unit Shutdown: limit and precautions and references in Encl. 4.1. rev 155 Lesson plan page 27
Author	RJK
Time	7/19/2005 3:14 PM

Distracter Analysis:

- A. **Correct:** 1A heaters were lost on the power failure. Extra heaters capacity must be used per the operating procedures. When a NCP is shutdown its spray valve must then be closed to ensure the remaining NCP spray flow is not diverted back into the shutdown pumps spray line.
- B. **Incorrect:** Neither of these pumps would be used to generate spray flow but by procedure they could be started for other reasons as long as they promote good mixing for even cooling.
- C. **Incorrect:** This would only act to reduce pressurizer pressure. The outflow is more a factor of the heater capacity.
- D. **Incorrect:** As level is decreased, you would see the effects in the PZR surge line, but once level reaches 80%, and NV readjusted to maintain 80%, surge line flow from the level decrease would cease. This would not create a continuous outflow required by the operating procedure.

OP/1/A/6100/002 Limits and Precaution

2.25 Maintain an outflow on the PZR to minimize PZR stratification. PZR outflow may be confirmed by the following:

- Extra heater capacity energized.
- NC, NV or ND PZR spray indicated by valve positive demand
- PZR surge line temperature and PZR water space temperatures are approximately equal.
- PZR spray valve for idle NC Pumps closed

Enclosure 4.1

NOTE: PZR outflow shall be maintained until the PZR bubble is collapsed.

- 2.17 Energize PZR heaters as necessary to achieve an outflow from the PZR.
- 2.18 Ensure PZR outflow as follows:
 - Extra PZR heater capacity is energized.
 - NC, NV or ND PZR spray is indicated by valve positive demand.
 - PZR surge line temperatures and PZR water space temperatures are approximately equal
 - PZR spray valve for idle NC Pumps closed.

Question: 05-35

1 Pt(s)

Initial Conditions:

- Unit 1 was operating at 65% power.
- NI44 was removed from service per procedure and all appropriate bistables have been tripped.

Current Conditions:

- Water level in the exterior doghouse is 14"
- Operators attempted to manually trip the reactor but neither reactor trip breaker (RTB) opened.
- It has just been reported that all S/G NR levels are offscale low.
- Operators are manually inserting control rods.
- Operable NIs indicate ~46% power.

What is the condition of the main turbine and the reason for that condition?

- A. Turbine is online and must be manually tripped. Both RTBs are still closed.
- B. Turbine automatically tripped. Current S/G levels generated an automatic reactor trip signal.
- C. Turbine is online and must be manually tripped. 3 of 4 P9 bistables are not met.
- D. Turbine automatically tripped. AMSAC protection actuated.

Question: 05-35

Answer: D

LEVEL:	RO/SRO
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K/A	SYS012	Title	Reactor Protection
	K3.02	Description	Knowledge of the effect that a loss or malfunction of the RPS will have on the following: (CFR: 41.7 / 45.6) T/G
		Importance	3.2/3.3

SOURCE	NEW
LEVEL of KNOWLEDGE	Analysis
Lesson	OP-CN-IC-IPX, OP-CN-CF-CF
Objectives	9
REFERENCES	Lesson plan listing
Author	JKS
Time	7/19/2005 3:40 PM 22 minutes

Distracter Analysis:

- A. **Incorrect:** RTBs open generate a P4 signal which results in a turbine trip. This is a true statement, but the turbine WILL trip.
- B. **Incorrect:** This is a true statement, but the turbine relies on the P4 signal which is not there. Student may think that the reactor trip SIGNAL causes the T/G to trip.
- C. **Incorrect:** This would be a correct statement related to P9, however the logic is backwards. P9 is for turbine trip causes reactor trip. The turbine WILL trip.
- D. **Correct:** AMSAC protection will initiate a turbine trip on loss of both CF pumps.

IPX lesson plan page 18

P-4	A or B Reactor Trip	<ul style="list-style-type: none"> • Turbine Trip • Feedwater Isolation less than Low T_{ave}(564°F) • Arms condenser dumps • Allows block of Safety Injection Signal after time delay • Runs back CF pumps on reactor trip
-----	---------------------	--

Question: 05-36

1 Pt(s)

Initial Conditions:

- Unit 1 was performing a heatup following a refueling outage
- NC Temperature was 400 °F
- NC pressure was 1600 psig
- "A" and "B" shutdown banks were withdrawn
- Containment Pressure Channel II failed high

Current Conditions:

- 1ERPD has lost power
- Containment pressure channels read:
 - Channel I: 0 psig
 - Channel II: +5 psig
 - Channel III: 0 psig
 - Channel IV: -5 psig

Which of the following statements explains the impact on the Engineered Safeguards Features (ESF) system and expected operator actions?

- A. Only Train "A" safety injection actuation logic was satisfied.
Implement EP/1/A/5000/E-0, Reactor Trip or Safety Injection.
- B. Only Train "A" safety injection actuation logic was satisfied.
Implement AP/1/A/5500/005, Reactor Trip or Inadvertent S/I Below P-11.
- C. Train "A" and "B" safety injection actuation logic were satisfied.
Implement EP/1/A/5000/E-0, Reactor Trip or Safety Injection.
- D. Train "A" and "B" safety injection actuation logic were satisfied.
Implement AP/1/A/5500/005, Reactor Trip or Inadvertent S/I Below P-11.

Question: 05-36

Answer: D

LEVEL: RO/SRO

K/A	SYS01 3	Title	Engineered Safety Features Actuation
	A2.04	Description	Ability to (a) predict the impacts of the following malfunctions or operations on the ESFAS; and (b) based Ability on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations; (CFR: 41.5 / 43.5 / 45.3 / 45.13) Loss of instrument bus
		Importance	3.6/4.2

SOURCE	NEW
LEVEL of KNOWLEDGE	Analysis
Lesson	OP-CN-ECCS-ISE
Objectives	2 & 3
REFERENCES	AP/1/A/5500/029 Enclosure 17 (1ERPD load list) rev 013
Author	RJK
Time	7/22/2005 1:39 PM 3 minutes plus 40 minutes

Distracter Analysis:

- A. **Incorrect:** Bistables for channels 2&4 are actuated and SSPS receives the input.
- B. **Incorrect:** Bistables for channels 2&4 are actuated and SSPS receives the input.
- C. **Incorrect:** Since both trains of input bay receive any signal from the process cabinets, and operator may assume that 2 pressure channels would satisfy both SSPS output bays. E-0 is not used in Mode 4, AP-05 does have you transfer to E-0 only on valid indication of high containment pressure ie greater than 200 degrees in the NC system.
- D. **Correct:** Bistables for channels 2&4 are actuated and SSPS receives the input. Because the actuations were made in Mode 4, AP-05 is the correct mitigation procedure path.

ESFAS information due to power failure: AP-29 Enclosure 17

1. Reactor Protection System and SSPS: — • All Channel IV bistables (except for "CONT HI-HI PRESS") - LIT — • All Channel IV control board meters - FAILED — • SSPS Train B Output Slave Relays will lose ability to generate any Train B ESF or RPS actuations (Train B General Warning)
--

Question: 05-37

1 Pt(s)

Given the following:

- Unit 1 is shutdown and being cooled down for an outage
- Primary temperature is 257 °F
- Upper containment temperature is 80 °F
- Lower containment temperature is 102 °F
- Control Rod Drive Mechanism fans are shutdown

Assuming no operator action, which one of the following explains the effect on containment cooling system operation as containment temperature continues to decrease?

- A. Chilled water flow control is automatically bypassed to prevent containment temperature from decreasing to less than 60 °F.
- B. Reduced heat load in containment will trip the containment chillers on low chilled water flow.
- C. Reduced heat load in containment will over pressurize the chilled water piping and trip the chilled water pumps.
- D. Chilled water flow control is automatically selected to "MAX COOL" to provide an additional heat load on the containment chillers.

Question: 05-37

Answer: B

LEVEL:	RO/SRO
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K/A	SYS022	Title	Containment Cooling
	A1.04	Description	Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the CCS controls including: (CFR: 41.5 / 45.5) Cooling water flow
		Importance	3.2/3.3

SOURCE	NEW
LEVEL of KNOWLEDGE	Comprehension
Lesson	OP-CN-CNT-VV rev 18
Objectives	13
REFERENCE S	Lesson plan information
Author	RJK
Time	7/22/2005 2:14 PM 41 minutes

Distracter Analysis:

- A. Incorrect:** The bypass action of the flow control valve is used if fans are in high speed or CNT pressure reaches 0.5 psig. But it does occur and may confuse the unsure.
- B. Correct:** At 100 degrees, the LCVU valves go closed. The chill water flow reduction causes the chillers to trip.
- C. Incorrect:** The over pressure part is true, but there are no trips for a chilled water pump.
- D. Incorrect:** This would be the correct answer IF THE OPERATOR performed the step.

VV lesson plan page 8

- 4. LCVU operation during periods of low containment heat load (Obj. # 13)
 - a) During periods when the Control Rod Drive Mechanism Fans are secured the amount of YV flow through the LCVUs is reduced as the control valves modulate closed due to low fan inlet air temperature.
 - b) Flow reductions can cause the YV chillers to trip on low chill water flow.
 - c) Flow reductions can also cause the pressure in the YV piping to increase to the point of relief valve actuation.
 - d) Enhancements were made to OP/1(2)/A/6450/001 (Containment Ventilation Systems) to direct the operator to place additional LCVUs in service or shift the LCVUs to MAX COOL to prevent the YV chillers from tripping.

Question: 05-38

1 Pt(s) Prior to which of the following actions should an operator reduce ice condenser glycol expansion tank level?

- A. Reducing the number of glycol chillers from 3 to 2
- B. Aligning the ice condenser air handling units for defrost
- C. Closing the glycol containment isolation valves
- D. Reducing the number of glycol chillers from 2 to 1

Question: 05-38

Answer: C

LEVEL: RO/SRO

K/A	SYS025	Title	Ice Condenser
	G2.1.32	Description	Ability to explain and apply all system limits and precautions (CFR: 41.10 / 43.2 / 45.12)
		Importance	3.4/3.8

SOURCE	NEW
LEVEL of KNOWLEDGE	Memory
Lesson	OP-CN-CNT-NF
Objectives	4
REFERENCES	OP/0/A/6200/008 Limits and Precaution 2.5 rev 047
Author	RJK
Time	7/22/2005 3:02 PM 68 minutes

Distracter Analysis: Expansion tank is located in containment. If the headers are isolated, the temperature increase will result in spillage of glycol to the ice condenser floor areas.

- A. **Incorrect:** May think there is some required balance which could be implied by L&P 2.3.
- B. **Incorrect:** If the system is aligned for defrost. The temperatures must increase in order to achieve a melting of the panels. One could assume that when this is planned, the increased temperatures would generate the same type of expansion problems seen when the glycol headers are isolated.
- C. **Correct:**
- D. **Incorrect:** May think there is some required balance which could be implied by L&P 2.3.

OP/0/A/6200/008 Limits and Precautions

2.3 NF glycol chillers/pumps duties are as follows:

- If 1 or 2 chillers are in service, 1 pump is required.
- If 3 chillers are in service, 2 pumps are required.
- If 4 chillers are in service, 3 pumps are required.

2.4 When gate valves in glycol service have been closed, briefly loosen the bonnet plug before opening to relieve pressure across the valve which could prevent it from opening.

2.5 When isolating a portion of the NF System for any reason, always allow for expansion of the cold glycol to ambient temperatures. If containment isolation valves are to be closed, consider reducing glycol expansion tank level.

Question: 05-39

1 Pt(s)

A LOCA has occurred on Unit 1. Given the following:

- Containment pressure peaked at 4.6 psig, decreased to 0.2 psig and then slowly increased to 0.5 psig
- The following signals have been reset:
 - Phase "A" containment isolation signal
 - Both trains of ECCS
 - Both D/G load sequencers
 - NS Train "A"

Which one of the following describes the current status of the containment spray (NS) system?

	<u>1A Train NS</u>	<u>1B Train NS</u>
A.	ON	ON
B.	ON	OFF
C.	OFF	ON
D.	OFF	OFF

Question: 05-39

Answer: D

LEVEL:	RO/SRO
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K/A	SYS026	Title	Containment Spray
	A3.01	Description	Ability to monitor automatic operation of the CSS, including: (CFR: 41.7 / 45.5) Pump starts and correct MOV positioning
		Importance	4.3/4.5

SOURCE	CNS BANK (NS-028-D)
LEVEL of KNOWLEDGE	Application
Lesson	OP-CN-ECCS-NS rev 32
Objectives	6
REFERENCES	Lesson plan information
Author	RJK
Time	8/15/2005 10:26 AM 34 minutes

Distracter Analysis:

CPCS permissives are applied to the containment spray pumps to turn them on and off.
CPCS permissives are applied to the containment spray header isolation valves so they can open and close.

- A. **Incorrect:** This system was modified just this year with new setpoints. An operator could use the previous setpoints.
- B. **Incorrect:** Operator thinks "A" train is still running.
- C. **Incorrect:** This would be true with older setpoints.
- D. **Correct:** See setpoint discussion below.

Lesson plan page 10

C. Start Signals (Obj #6)

1. A "High-High Containment Pressure" condition exists when 2/4 containment pressure transmitters reach 3.0 psig or greater and is known as a "Sp" signal. This condition generates a Containment Spray initiation "NS/VX Init" signal. When the "NS/VX Init" signal is combined with a CPCS signal that is 0.9 psid or greater, the NS and VX systems are actuated.
2. An operator can manually initiate spray with the "Phase B, NS/VX, Cont Vent Isol" pushbutton.
3. Remember that the above start signals are dependent on the CPCS permissive. If any transmitter pressure decreases to less than 0.35 psid, the associated component will no longer function. The pumps shutdown and the spray header valves will close and in the VX system, the air return fans will shutdown.

Prior to the system mod completed in spring 2005, these setpoints were employed:
ON permissive 0.4 psig increasing.
OFF block 0.3 psig decreasing.

Question: 05-40

1 Pt(s)

Given the following events:

- Unit 1 is at operating 50%
- Cycle burnup is 5 EFPD
- Control rods are in manual
- Turbine control is "MW OUT" and "1st STG OUT"
- One moisture separator reheater relief valve fails open

One minute later, how have turbine load and core reactivity been affected?

- A. Megawatt electric (MWe) has decreased
Positive reactivity has been added
- B. MWe has increased
Negative reactivity has been added
- C. MWe has increased
Positive reactivity has been added
- D. MWe has decreased
Negative reactivity has been added

Question: 05-40

Answer: A

LEVEL:	RO/SRO
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K/A	SYS039	Title	Main and Reheat Steam
	K5.08	Description	Knowledge of the operational implications of the following concepts as they apply to the MRSS: (CFR: 41.5 / 45.7) Effect of steam removal on reactivity
		Importance	3.6/3.6

SOURCE	NEW
LEVEL of KNOWLEDGE	Analysis
Lesson	BNT-RT08, Reactor Operational Physics rev 5
Objectives	23
REFERENCES	Lesson plan information.
Author	RJK
Time	7/25/2005 9:47 AM 29 minutes

Distracter Analysis:

Steam flow from the failed relief valve will cause turbine load to decrease. Initially NC temperature decreases and the -MTC causes a +reactivity addition. Power increases as temperature changes until an equilibrium condition is reached. Note that the turbine and Rod control system do nothing in response to this transient. It is only a function of the -MTC

- A. **Correct:**
- B. **Incorrect:**
- C. **Incorrect:**
- D. **Incorrect:**

Question: 05-41

1 Pt(s)

Given the following conditions:

- Unit 1 is at 95% power
- AP/1/A/5500/006, Loss of S/G Feedwater Case III, DFCS Not In Auto, is in effect
- 1CF-37 (S/G 1B CF Ctrl) feedwater regulating valve in automatic
- 1CF-39 (S/G 1B CF Byp Ctrl) feedwater regulating bypass valve in manual
- 1B steam generator level is 63% and slowly increasing

Select the correct statements that return 1B steam generator level control to automatic and results in a bumpless transfer.

- A. Decrease 1CF-39 by 5% and ensure 1CF-37 opens.
Depress manual for 1CF-37.
Depress automatic for 1CF-37 and 1CF-39.
- B. Ensure 1CF-37 demand is 100%.
Stabilize S/G level within 2% of setpoint.
Depress manual for 1CF-37.
Depress automatic for 1CF-37 and 1CF-39.
- C. Manually open 1CF-39 to 100%.
Stabilize S/G level within 2% of setpoint.
Depress manual for 1CF-37 and 1CF-39.
Depress automatic for 1CF-37 and 1CF-39.
- D. Increase 1CF-39 by 5% and ensure 1CF-37 closes.
Depress manual for 1CF-37 and 1CF-39.
Depress automatic for 1CF-37 and 1CF-39.

Question: 05-41

Answer: C

LEVEL:	RO/SRO
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K/A	SYS059	Title	Main Feedwater
	A4.08	Description	Ability to manually operate and monitor in the control room: (CFR: 41.7 / 45.5 to 45.8) Feed regulating valve controller
		Importance	3.0/2.9

SOURCE	NEW
LEVEL of KNOWLEDGE	Application
Lesson	OP-CN-CF-IFE
Objectives	9
REFERENCES	AP/1/A/5500/006 Case 3 rev 34
Author	RJK
Time	7/25/2005 10:50 AM 52 minutes

Distracter Analysis: Based on ensuring that there is no transient when the valves are returned to automatic. It is required that levels be within 2% and that the bypass be fully open.

- A. **Incorrect:** the desired effect would be to ensure the other valve responds in automatic to the operators moving the other valve.
- B. **Incorrect:** Cannot set CF-37 to 100% without increasing S/G levels. Used a similar set of instruction based on the correct set of actions.
- C. **Correct:**
- D. **Incorrect:** Same as choice "A" but changed requirement.

AP-06 step 9

a. Verify 1CF-37 (S/G 1B CF Ctrl) – IN AUTOMATIC.

AP-06 step 10

10. Ensure feed reg bypass valves in automatic and DFCS tracking logic reset as follows:

- IF** 1CF-39 (S/G 1B CF Byp Ctrl) has been in manual at any time during this event, **THEN** perform the following for S/G 1B:
 - a. **IF** reactor power greater than 90%,
THEN ensure 1CF-39 (S/G 1B CF Byp Ctrl) demand - AT 100%.
 - b. **IF** reactor power less than or equal to 90%, **THEN** ensure 1CF-39 (S/G 1B CF Byp Ctrl) demand – AT SETPOINT DETERMINED BY PLANT ENGINEERING.
 - c. Ensure S/G 1B N/R level – WITHIN 2% OF S/G N/R LEVEL SETPOINT.
 - d. Ensure S/G 1B N/R level - STABLE.
 - e. Place 1CF-37 (S/G 1B CF Ctrl) in manual.
 - f. Momentarily depress 1CF-39 (S/G 1B CF Byp Ctrl) "MAN" pushbutton.
 - g. Place 1CF-39 in automatic.
 - h. Place 1CF-37 in automatic.

Question: 05-42

1 Pt(s) Unit 1 is being transferred to the Standby Shutdown Facility (SSF).

Following a transfer to the SSF, which one of the following valves receives power from 600VAC bus 1EMXS?

- A. CAPT #1 Trip And Throttle Valve
- B. 1CA-188 (S/G 1D CA Nozz Tempering Isol)
- C. 1CA-48 (CA Pmp #1 Flow to S/G 1C)
- D. 1CA-50A (CA Pmp #1 Disch to S/G 1C Isol)

Question: 05-42

Answer: D

LEVEL:	RO/SRO
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K/A	SYS061	Title	Auxiliary Feedwater
	K2.01	Description	Knowledge of bus power supplies to the following: (CFR: 41.7) AFW system MOVs
		Importance	3.2/3.3

SOURCE	NEW
LEVEL of KNOWLEDGE	Memory
Lesson	OP-CN-CF-CA
Objectives	
REFERENCES	OP/0/A/6100/013
Author	RJK
Time	

Distracter Analysis:

- A. **Incorrect:** Valve is transferred from 1EDE to the SSF DC power system.
- B. **Incorrect:** 1CA-188 is a solenoid operated valve from 1EPA
- C. **Incorrect:** 1CA-48 is an air operated valve
- D. **Correct:** Located on 1EMXS which is realigned to SLXG during SSF operations. SLXG is a 600 VAC system

**OP/0/A/6100/013 Standby Shutdown Facility Operations
Enclosure 4.6 page 3 of 3.**

NOTE: The following valve opens when 1(2)EMXS is swapped to SMXG.
--

1(2) CA-50A (CA Pmp 1(2) Disch to S/G 1(2)C Isol)

Question: 05-43

1 Pt(s) Given the following conditions and sequence of events:

0900 1B diesel generator breaker is closed and load is increased.

0910 1B diesel generator is operating in parallel per PT/1/A/4350/002B, Diesel Generator 1B Operability Test with the following readings:

- 4000 Volts
- 950 amps
- 5749 kilowatts (KW)
- 2900 kilovars (KVAR)
- Power Factor 0.95 lagging

0920 Main generator voltage is reduced from 21.7 kilovolts to 21.5 kilovolts per dispatcher request.

0955 1B D/G load is reduced to 1000 KW in preparation for shutdown.

1015 1B D/G is shutdown per the PT.

Assuming no D/G parameters were adjusted by the operator between 0910 and 0955, was the D/G KW limit exceeded (other than any momentary transients) and what was the resulting D/G test classified?

- A. D/G KW limit was exceeded; test is an INVALID FAILURE
- B. D/G KW limit was exceeded; test is an INVALID TEST
- C. D/G KW limit was not exceeded; test is a VALID SUCCESS
- D. D/G KW limit was not exceeded; test is an INVALID TEST

Question: 05-43

Answer: D

LEVEL:	RO/SRO
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K/A	SYS062	Title	AC Electrical Distribution
	A1.01	Description	Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the ac distribution system controls including: (CFR: 41.5 / 45.5) Significance of D/G load limits
		Importance	3.4/3.8

SOURCE	NEW
LEVEL of KNOWLEDGE	Analysis
Lesson	OP-CN-DG-DG3 rev 44 BNT-CP05 (Motors and Generators)
Objectives	DG3 Obj13 CP05 Obj 29 & 30
REFERENCES	Lesson plan information, OMP 2-28
Author	RJK
Time	7/25/2005 12:21 PM 46 minutes

Distracter Analysis:

As the main generator voltage is decreased, the 4160 volt busses are held up by diesel generator voltage.

KVARs for the D/G increase and the system transfers reactive load to the D/G and amps increase. KW is a function of governor setting and does not change, KW remains the same.

Since no load limits were exceeded the test is NOT a failure, however, the test did not run for > 1 hour therefore it is an invalid test.

- A. Incorrect:
- B. Incorrect:
- C. Incorrect:
- D. Correct:

Lesson plan info.

When in parallel with another source: (Obj #12)

Voltage is controlled by other power source. Adjusting voltage setting affects P.F. and KVAR Load. (Voltage Control)

Frequency is controlled by other power source. Adjusting speed control affects KW Load.

Question: 05-44

1 Pt(s) Given the following conditions:

- Unit 2 is in Mode 6
- Core defueling is in progress
- One assembly is currently in the mast above the core
- Crews in the spent fuel pool (SFP) area are moving the most recently transferred assembly to its storage location
- 2B D/G and “B” main power are de-energized for outage related work
- 2EDE has been declared inoperable

Which one of the following action(s) is required per technical specifications?

- A. Immediately suspend core alterations and movement of irradiated fuel in the SFP area.
- B. Immediately suspend core alterations. Movement of irradiated fuel in the SFP area may continue.
- C. Within 1 hour, initiate actions to restore 2EDE to operable.
- D. Within 1 hour, initiate actions to restore affected busses for Low Temperature Overpressure Protection (LTOP) features.

Question: 05-44

Answer: A

LEVEL:	RO/SRO
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K/A	SYS063	Title	DC Electrical Distribution
	G2.1.33	Description	Ability to recognize indications for system operating parameters which are entry-level conditions for technical specifications. (CFR: 43.2 / 43.3 / 45.3)
		Importance	3.4/4.0

SOURCE	Bank question EPL-078D		
LEVEL of KNOWLEDGE	Memory		
Lesson	OP-CN-EL-EPL		
Objectives	22		
REFERENCES	Tech Spec 3.8.4		
Author	RJK		
Time	7/25/2005 3:07 PM	65 minutes	

Distracter Analysis:

- A. Correct:**
- B. Incorrect:** All movements are suspended not just core alts.
- C. Incorrect:** This is the other low power DC power spec and is not applicable for EDE, but this is an actual action.
- D. Incorrect:** This is the other low power DC power spec and is not applicable for EDE, but this is an actual action.

Question: 05-45

1 Pt(s) What is the power supply for 1A D/G fuel oil booster pump?

A. 120V AC

B. 125V DC

C. 208V AC

D. 250V DC

Question: 05-45

Answer: B

LEVEL:	RO/SRO
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K/A	SYS064	Title	Diesel Generator
	K2.02	Description	Knowledge of bus power supplies to the following: (CFR: 41.7) Fuel oil pumps
		Importance	2.8/3.1

SOURCE	NEW
LEVEL of KNOWLEDGE	Memory
Lesson	OP-CN-DG-DG1 rev 28
Objectives	13
REFERENCES	Lesson plan information below
Author	RJK
Time	7/25/2005 3:28 PM 13 minutes

Distracter Analysis: This is the only DC electrically driven pump for the d/g and is used during maintenance periods. It is 125VDC.

- A. **Incorrect:** This is approximate voltage but wrong type
- B. **Correct:**
- C. **Incorrect:** This is switchyard aux power voltage, (wrong type power too)
- D. **Incorrect:** Wrong voltage. DC there are pumps that use 250VDC Wrong voltage and type power.

Lesson plan page 13

2.1B.1.g 125VDC Distribution Center DGDA(B) – sub-loads include:

- DC Fuel Oil Booster Pump

Question: 05-46

1 Pt(s)

Initial Conditions:

- A Unit 1 containment air release (VQ) is in progress
- 1EMF39 (Containment Gas) Trip 2 setpoint is set to 1300 counts per minute (cpm) per the gas waste release permit
- 1EMF36 (Unit Vent Gas) is operable
- A small reactor coolant leak develops around an instrument line
- 1EMF39 countrate is 1000 cpm and increasing

Current Conditions:

- 1RAD-1 D/4, 1EMF-38/39/40 Containment Loss of Flow alarm is LIT

Which one of the following describes the response to this situation?

- A. 1EMF39 can no longer monitor containment atmosphere. The VQ release will continue indefinitely without manual operator action.
- B. 1EMF39 loss of flow alarm actuates a containment ventilation isolation (Sh) signal. The Sh signal stops the VQ release.
- C. 1EMF36 will detect the activity released and actuates a containment ventilation isolation (Sh) signal. The Sh signal stops the VQ release.
- D. 1EMF36 will detect the activity released and stops the VQ release.

Question: 05-46

Answer: D

LEVEL:	RO/SRO
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K/A	SYS073	Title	Process Radiation Monitoring
	K1.01	Description	Knowledge of the physical connections and/or cause- effect relationships between the PRM system and the following systems: (CFR: 41.2 to 41.9 / 45.7 to 45.8) Those systems served by PRMs
		Importance	3.6/3.9

SOURCE	NEW
LEVEL of KNOWLEDGE	Comprehension
Lesson	OP-CN-CNT-VQ rev 21
Objectives	16
REFERENCES	Lesson plan information
Author	RJK
Time	

Distracter Analysis:

- A. **Incorrect:** This is a required action if 1EMF36 were inoperable. The VQ release will be stopped by EMF 36
- B. **Incorrect:** As the controlling EMF, the trip setpoints would generate a "Sh" containment ventilation isolation if the sample flow was not lost.
- C. **Incorrect:** 1EMF36 generates a direct closure of VQ-10 which stops the release not a Sh signal.
- D. **Correct:** EMF36 would be a backup monitor and stop the VQ by directly closing VQ-10

See annunciator response procedures:

OP/1/B/6100/010 X page 4 of 37 (EMF39 Trip 2)
OP/1/B/6100/010 X page 26 of 37 (EMF 39 loss of flow)

OP/1/B/6100/010 Y page 5 of 37 (EMF36 trip 2)

Question: 05-47

1 Pt(s)

Initial Conditions:

- Both Units operating at 100%
- 1B RN pump is in service

Current conditions:

- Unit 1 experienced a LOCA
- Unit 1 containment pressure is 4.2 psig
- Unit 2 is operating at 100%
- An emergency low pit level alarm is received on the "B" train RN pit

What capability provided by the RN system is lost based on the current plant conditions?

- VA (Auxiliary Building Ventilation) and VF (Spent Fuel Pool Ventilation) supply unit cooling water on both units.
- VA (Auxiliary Building Ventilation) and VF (Spent Fuel Pool Ventilation) supply unit cooling water on Unit 1 only.
- Makeup to NW (Containment Valve Injection) on Unit 1 only.
- Makeup to the spent fuel pool on both units.

Question: 05-47

Answer: B

LEVEL:	RO/SRO
--------	--------

K/A	SYS076	Title	Service Water
	K4.01	Description	Knowledge of SWS design feature(s) and/or interlock(s) which provide for the following: (CFR: 41/7) Conditions initiating automatic closure of closed cooling water auxiliary building header supply and return valves
		Importance	2.5/2.9

SOURCE	NEW
LEVEL of KNOWLEDGE	Comprehension
Lesson	OP-CN-PSS-RN rev 56
Objectives	9 & 11
REFERENCES	Lesson plan page 38/39
Author	JKS
Time	7/26/2005 8:36 AM 7 minutes +68

Distracter Analysis: Based on the events, the unit 1 non-essential header isolates, but only one of 2 valves closes on the Unit 2 non-essential header.

- A. **Incorrect:** Only Unit 1 is affected.
- B. **Correct:**
- C. **Incorrect:** This is not isolated on an Sp or emergency low pit level. This is plausible if students do not know where this taps off the RN system.
- D. **Incorrect:** This is not isolated on an Sp or emergency low pit level. This is plausible if students do not know where this taps off the RN system.

RN lesson plan page 38/39

- a) Starts train related pumps
- b) Supplies cooling water to affected D/G
- 2. Emergency Low Pit Level
 - a) Swaps suction and discharge to the SNSWP
 - b) Starts all 4 pumps
 - c) Closes supply crossover valve on opposite train for both units.
- 3. Safety Injection
 - a) Starts all 4 pumps
 - b) Isolates RN to VA AHUs
 - c) Full flow to unit related KC hxs.
- 4. Sp signal
 - a) Isolates non-essential header
 - b) Separates RN trains
 - c) Closes containment isolations (YV/RN)

Question: 05-48

- 1 Pt(s) VI system pressure has decreased to 78 psig. What is the status of the VI supply to VS valve (1VI-500) and the VS auto backup supply to VI valve (1VS-78)?
- A. 1VI-500 open, 1VS-78 open
 - B. 1VI-500 open, 1VS-78 closed
 - C. 1VI-500 closed, 1VS-78 open
 - D. 1VI-500 closed, 1VS-78 closed

Question: 05-48

Answer: D

LEVEL:	RO/SRO
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K/A	SYS078	Title	Instrument Air
	K4.02	Description	Knowledge of IAS design feature(s) and/or interlock(s) which provide for the following: (CFR: 41.7) Cross-over to other air systems
		Importance	3.2/3.5

SOURCE	NEW
LEVEL of KNOWLEDGE	Memory
Lesson	OP-CN-SS-VI rev 33
Objectives	8
REFERENCES	Lesson plan information
Author	RJK
Time	7/26/2005 9:13 AM 46 minutes

Distracter Analysis: Normally VI is tied to supply VS. 1VI-500 closes on decreasing pressure at 80 psig to isolate VI from the VS system. When pressure decreases to 76 psig, 1VS-78 opens to attempt to supply VI from VS since isolating the systems did not correct the pressure problem. At 78 psig, both valves are closed.

- A. Incorrect:
- B. Incorrect:
- C. Incorrect:
- D. Correct:

- b) During a Loss of Offsite Power event, power to the CENTAC computer will be lost.
 - 1) E & F VI Compressors' breakers will receive a restart permissive signal from the Sequencer with load group 13
 - 2) If the CENTAC computer which is powered from Retail Power (standard wall outlet) remains de-energized, E & F Instrument Air Compressors will not automatically restart on Low VI System pressure, therefore must be manually restarted.
- ∴ Loss of VI to Primary PORVs
 - a) Pressure regulating valves supply primary PORVs 1(2)NC-34A, 1(2)NC-32B, and 1(2)NC-36B
 - b) Nitrogen can be supplied to 1(2)NC-34A and 1(2)NC-32B from Cold Leg Accumulators A and B.
 - c) The probabilistic risk assessment states the need to have two motive forces for Pressurizer PORVs in case NCS feed and bleed is needed, so the N₂ supply was added. If no N₂ is available and a major accident occurs in conjunction with a loss of VI to containment then there may be no means to control the heat buildup in the reactor and consequently core damage

VI lesson plan page: 24

Question: 05-49

1 Pt(s)

Unit 2 was operating at 100% power with a containment air release (VQ) is in progress. Given the following:

- A LOCA occurs
- "B" Train safety injection failed to actuate and was performed manually when it was recognized by the crew
- The following indications are noted for:
 - Containment pressure
 - 2EMF-37 (Unit Vent Monitor)
 - E/S Load Sequencers status lights

Time	0200	0201	0202	0203
Containment pressure (psig)	1.2	2.5	2.8	3.1
2EMF-37 Trip 1 Light	LIT	LIT	LIT	LIT
2EMF-37 Trip 2 Light	DARK	LIT	LIT	LIT
E/S LOAD SEQ ACTUATED TRAIN "A" status light	LIT	LIT	LIT	LIT
E/S LOAD SEQ ACTUATED TRAIN "B" status light	DARK	DARK	LIT	LIT

Based on the above indications and conditions, what is the earliest time that an operator can be assured that 2VQ-3B (VQ Fan Suct From Cont Isol) has received a close signal?

- A. 0200
- B. 0201
- C. 0202
- D. 0203

LEVEL:	RO/SRO
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K/A	SYS103	Title	Containment
	A3.01	Description	Ability to monitor automatic operation of the containment system, including: (CFR: 41.7 / 45.5) Containment isolation
		Importance	3.9/4.2

SOURCE	New
LEVEL of KNOWLEDGE	Application
Lesson	OP-CN-ECCS-ISE rev 040
Objectives	21
REFERENCES	Lesson plan information attached
Author	JEG
Time	7/26/2005 10:02 AM 19 minutes

Distracter Analysis: A manual St or Sp generates a train related Sh signal. Automatic St or Sp signals do not cause Sh. Student must know the initiation signals for St, Sp, Sh and signals that terminate a VQ release.

- A. Incorrect:** 1.2 psig in containment gives a Safety injection, the St initiates Phase A (St) and Containment ventilation (Sh) signal. The Sh signal would normally close this valve, however, with the failure of the B train Ss to actuate, no St or Sh signal is generated on B train, so the valve does not get a close signal from Sh.
- B. Incorrect:** 2EMF-37 trip 2 (Unit Vent) closes 2VQ-10 air release flow control valve. This valve is in the flowpath for a VQ release but is not the cont isolation valve.
- C. Correct:**
- D. Incorrect:** Phase B setpoint has been reached. This isolates some additional containment isolation valves not closed by the Phase A but VQ-3B is not one of those.

D. Containment Ventilation Isolation (S_H)

1. 4 Signals can actuate an S_H .
 - a) Manual "Phase A" (S_T): Train A (B) S_T will actuate train A (B) S_H .
 - b) Manual "Phase B, NS-VX Initiate, Cont Vent Isol": Train A (B) (Phase B, NS-VX Initiate, Cont Vent Isol) will actuate train A (B) S_H . This is a single pushbutton that actuates three functions.
 - c) S_S Signal: Train A (B) S_S will actuate Train A (B) S_H .
 - d) EMF 38 L, 39 L, 40 TRIP 2: High Containment Particulate, Gas, or Iodine will actuate BOTH Trains of S_H .
2. S_H will shutdown and will isolate VP and isolate VQ Containment Isolation valves.

Question: 05-50

1 Pt(s) Given the following electrical loads:

- 1A reactor coolant pump (NCP)
- 1B condenser circulating water pump (RC)
- 1C hotwell pump (HWP)
- 1ATD transformer

Voltage decreases to 50% of normal on "A" main bus line and "A" main bus line is no longer synchronized with the "B" main bus line.

Which one of these breakers tripped when the electrical transient occurred?

- A. 1A reactor coolant pump safety breaker
- B. 1B circulating cooling water pump breaker
- C. 1C hotwell pump breaker
- D. 1ATD transformer feeder breaker

Question: 05-50

Answer: A

LEVEL:	RO/SRO
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K/A	SYS062	Title	AC Electrical Distribution
	K3.01	Description	Knowledge of the effect that a loss or malfunction of the ac distribution system will have on the following: (CFR: 41.7 / 45.6) Major system loads
		Importance	3.5/3.9

SOURCE	NEW
LEVEL of KNOWLEDGE	Application
Lesson	OP-CN-EL-EPB rev 0
Objectives	4
REFERENCES	Lesson plan information page 14
Author	RJK
Time	7/26/2005 11:16 AM 98 minutes

Distracter Analysis:

SEE ATTACHED 6.9 KV system load list.

- A. Correct:** 1A & 1C NCP is on "A" main buss line. 2/4 busses experienced the power loss and the reactor coolant pump buss monitoring system trips all 4 NCPs. The NCP safety breaker trips but its associated 6.9 KV breaker will not open. "Safety" must be included in the breaker name to correctly designate the breaker in question.
- B. Incorrect:** 1B RC is from 1T2A but does not have an Undervoltage or underfrequency trip. The motor will lose power but restart after the slow transfer (1 second) because the breaker stays closed.
- C. Incorrect:** 1C HWP is from 1T1A but does not have an Undervoltage or underfrequency trip. The motor will lose power but restart after the slow transfer (1 second) because the breaker stays.
- D. Incorrect:** 1ATD is from TD short side and powered from "B" buss line transformer 1T1B and not affected

Lesson Plan EPB Page 14

8. Transfer can occur automatically or manually. (OBJ. #4)

a) Auto Transfer

- 1) Mode select switch in "Auto"
- 2) Auto transfer initiated by a Zone Lockout or 75% UV on the incoming line (No fault on affected bus).
- 3) If in synch, a fast transfer will occur. The incoming breaker opens before the tie breaker closes, but the transfer occurs within a few cycles with no loss of load.
- 4) If not in sync a slow transfer will occur. The transfer is delayed to allow voltage to decay to a point that synchronization is not a concern (25% voltage). This will take approximately one second and a loss of load will occur.

Reactor Coolant Pump lesson plan pages 20-22 for NCP breaker actions.

Question: 05-51

1 Pt(s) Unit 1 tripped from 100% power with the following conditions:

- “B” Reactor trip breaker did not open
- EP/1/A/5000/ES-0.1 (Reactor Trip Response) in progress
- Enclosure 2 (NC Temperature Control) is in effect
- S/G PORVs are cycling in automatic
- “% STM DUMP DEMAND” indicates 0 %
- “STM DUMP CTRL” indicates 0%
- Main steam header pressure indicates 0 psig
- All MSIVs are open

Which of the following describes:

1. Which steam dump controller is in control initially?
 2. How will temperature control be accomplished after the steam dump control switch has been swapped to pressure control mode?
- A. 1. The load rejection controller is in control.
2. Verify steam dumps automatically stabilize T-avg at 557°F.
- B. 1. The load rejection controller is in control.
2. Manually operate steam dumps to stabilize T-avg at 557°F.
- C. 1. The plant trip controller is in control.
2. Manually operate steam dumps to stabilize T-avg at 557°F.
- D. 1. The plant trip controller is in control.
2. Verify steam dumps automatically stabilize T-avg at 557°F.

Question: 05-51

Answer: B

LEVEL: RO/SRO

K/A	SYS039	Title	Main and Reheat Steam
	A2.04	Description	Ability to (a) predict the impacts of the following malfunctions or operations on the MRSS; and (b) based on predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: (CFR: 41.5 / 43.5 / 45.3 / 45.13) Malfunctioning steam dump
		Importance	3.4/3.7

SOURCE	NEW
LEVEL of KNOWLEDGE	Analysis
Lesson	OP-CN-STM-IDE
Objectives	9 & 10
REFERENCES	EP/1/A/5000/ES-0.1 rev 21
Author	RJK
Time	7/27/2005 12:56 PM 129 minutes

Distracter Analysis: % STM DUMP DEMAND reading 0 indicates that the Tavg controller has failed. STM DUMP CTRL reading 0 indicates that the steam pressure controller will not work in automatic. The only way to control steam dumps in Pressure Mode in MANUAL. Plant trip controller and load reject controller control are based on P4B being instated or not. Load reject controller has a 3 degree dead band.

- A. **INCORRECT** - Controller is correct. Only manual control is available.
- B. **CORRECT**
- C. **INCORRECT** – Only manual is correct, but this is the wrong controller due to P4B not being instated.
- D. **INCORRECT** – Only manual control is available and this is the wrong controller.

Question: 05-52

1 Pt(s) PT/1/A/4400/003B, Component Cooling (KC) Train 1B Performance Test is in progress. Given the following sequence of events:

1. 1KC-12 (KC Pump 1B1 Disch) is throttled such that it is ~10% open
2. 1B1 KC pump is started
3. 1KC-12 is throttled to achieve a flowrate of 3906 gpm

What problem is prevented by throttling the discharge valve to 10% open prior to starting the 1B1 KC pump in this procedure, and how will indicated amps change as 1KC-12 is throttled to achieve 3906 gpm flow?

- A. Prevents pump starting in a deadhead condition.
Amps will increase as 1KC-12 is throttled.
- B. Prevents pump starting in a deadhead condition.
Amps will decrease as 1KC-12 is throttled.
- C. Prevents pump starting in a runout condition.
Amps will increase as 1KC-12 is throttled.
- D. Prevents pump starting in a runout condition.
Amps will decrease as 1KC-12 is throttled.

Question: 05-52

Answer: C

LEVEL: RO

K/A	SYS008	Title	Component Cooling Water
	A4.06	Description	Ability to manually operate and/or monitor in the control room: (CFR: 41.7 / 45.5) Remote operation of hand-operated throttle valves to regulate CCW flow rate
		Importance	2.5/2.5

SOURCE	NEW
LEVEL of KNOWLEDGE	Application
Lesson	BNT-CP04 rev 4
Objectives	15 & 16
REFERENCES	PT/1/A/4400/003B rev 66
Author	JKS
Time	7/27/2005 2:14 PM 42 minutes

Distracter Analysis: To achieve 3906 gpm, valve will be throttled further open. Pump amps are initially low during the start by throttling this valve. When the valve is further opened, the power required to increase flow and pressure will also increase. The purpose of throttling the valve is to prevent runout conditions during a pump start.

- A. Incorrect:
- B. Incorrect:
- C. Correct:
- D. Incorrect:

Question: 05-53

1 Pt(s)

Initial Conditions:

- 2A diesel load sequencer in "TEST"
- 1B nuclear service water (RN) pump running
- All other systems in normal alignment

Current Conditions:

- "B" RN pit level emergency low level reached

Based on current plant conditions, what is the status of the RN pumps?

- A. 1B is running
1A, 2A, and 2B are off
- B. 1B and 2B are running
1A and 2A are off
- C. 1A, 1B, and 2B are running
2A is off
- D. 1A, 1B, 2A, and 2B are all running

Question: 05-53

Answer: C

LEVEL: RO/SRO

K/A	SYS076	Title	Nuclear Service Water
	K4.02	Description	Knowledge of SWS design feature(s) and/or interlock(s) which provide for the following: (CFR: 41/7) Automatic start features associated with SWS pump controls
		Importance	2.9/3.2

SOURCE	NEW
LEVEL of KNOWLEDGE	Memory
Lesson	OP-CN-PSS-RN rev 056
Objectives	11
REFERENCES	Lesson plan summary
Author	RJK
Time	7/27/2005 2:55 PM 22 minutes

Distracter Analysis With 2A sequencer in test, that pump will not start for the listed conditions. All remaining pumps start based on the emrg lo pit level.

- A. Incorrect:
- B. Incorrect:
- C. Correct:
- D. Incorrect:

Question: 05-54

1 Pt(s) Given the following control room indications:

- 1AD-8, A/7 VI LO PRESS alarm is LIT
- 0VIP5260 (VI&VS AIR PRESS) indicates 0 psig

Based on these indications, what are the positions of 1CF-37 (S/G 1B CF Ctrl) and 1RN-351 (KC HX 1B Outlet Throttle Valve)?

- A. 1CF-37 is open, 1RN-351 is open
- B. 1CF-37 is open, 1RN-351 is closed
- C. 1CF-37 is closed, 1RN-351 is open
- D. 1CF-37 is closed, 1RN-351 is closed

Question: 05-54

Answer: C

LEVEL: RO/SRO

K/A	SYS078	Title	Instrument Air
	A4.01	Description	Ability to manually operate and/or monitor in the control room: (CFR: 41.7 / 45.5 to 45.8) Pressure gauges
		Importance	3.1/3.1

SOURCE	NEW
LEVEL of KNOWLEDGE	Application
Lesson	OP-CN-SS-VI rev 33
Objectives	28
REFERENCES	Lesson plan setpoints. AP/22 rev 23 statements attached
Author	RJK
Time	7/27/2005 4:01 PM 111 minutes

Distracter Analysis: These are air operated valves. 1CF-37 fails closed and 1RN-351 fails open on loss of VI.

- A. Incorrect:
- B. Incorrect:
- C. Correct:
- D. Incorrect:

Question: 05-55

1 Pt(s)

Given the following:

- Unit 1 experienced a reactor trip from 100% power.
- The crew is currently taking actions in EP/1/A/5000/ES-0.1, Reactor Trip Response.
- Steam generator levels are being maintained at 39% using 1A and 1B CA pumps.
- Both trains of auxiliary feedwater (CA) are reset.
- 1AD-5, H/4 "CACST LO LEVEL" has just alarmed.

Based on the given conditions, what is the current status of the 1A and 1B CA Pumps and the suction source?

- A. Pumps running taking suction from the UST.
- B. Pumps running taking suction from the Hotwell.
- C. Pumps running taking suction from the RN system.
- D. Pumps tripped, a suction source must be manually aligned.

Question: 05-55

Answer: A

LEVEL:	RO/SRO
---------------	--------

K/A	SYS61	Title	Auxiliary/Emergency Feedwater (AFW) System
	A1.04	Description	Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the AFW controls including: AFW source tank level
		Importance	RO 3.9, SRO 3.9

SOURCE	OP-CN-CF-CA
LEVEL of KNOWLEDGE	Analysis
Lesson	OP-CN-CF-CA rev 048
Objectives	2
REFERENCES	Lesson plan information AP/1/A/5500/006 rev 35
Author	JKS
Time	17 October 2005

Distracter Analysis: The CACST, UST and hotwell are all aligned using check valve arrangements such that the source with the highest pressure automatically provides the suction to the CA pumps. Once these sources are depleted, RN supplies the suction. If CA has been RESET (this resets the autostart signal), and the pumps receive a low suction pressure signal they will trip after 5 seconds and NOT swap to RN. If RESET has not been done, then they automatically swap to RN on low suction pressure (ie. Other three sources depleted). RC is another available source to the CAPT.

- A. **Correct**
- B. **Incorrect:** This source is used after the UST is depleted and would be correct if the UST were also empty.
- C. **Incorrect:** This source is used after the UST and Hotwell are depleted and would automatically transfer except that after CA RESET, this feature is blocked.
- D. **Incorrect:** This is a true statement at a future time for the motor driven pumps (after the UST and Hotwell are depleted). The CAPT does receive an autoswap to the RC system.

Question: 05-56

1 Pt(s)

Given the following:

- The Spent Fuel Pool (SFP) Crane is parked over the New Fuel Elevator
- 1EMF-15 (Spent Fuel Pool Building Refueling Bridge Monitor) is de-energized
- A 300 pound test canister is located in the New Fuel Elevator
- The New Fuel Elevator is in the down position with power available
- Normal Radiation levels exist in the Spent Fuel Pool Building

Which one of the following correctly describes the New Fuel Elevator response if an operator attempts to raise it to the full up position?

- A. The No-Load light will be DARK and the New Fuel Elevator will raise.
- B. The No-Load light will be LIT and the New Fuel Elevator will raise.
- C. The New Fuel Elevator will raise if the SFP crane is moved to the other end of the pool. 1EMF-15 losing power has no effect on New Fuel Elevator movement.
- D. The New Fuel Elevator will raise if the SFP crane is moved to the other end of the pool and 1EMF-15 regains power and is clear of any alarm condition.

Question: 05-56

Answer: D

LEVEL:	RO/SRO
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K/A	SYS034	Title	Fuel Handling Equipment
	K6.02	Description	Knowledge of the effect of a loss or malfunction on the following will have on the Fuel Handling System: (CFR: 41.7 / 45.7) Radiation monitoring systems
		Importance	2.6/3.3

SOURCE	BANK (CNS exam bank FHS-059-D) (2001 NRC Exam)
LEVEL of KNOWLEDGE	Comprehension
Lesson	OP-CN-FH-FHS rev 25
Objectives	8
REFERENCES	Lesson plan information
Author	RJK
Time	7/27/2005 5:45 PM 31 minutes

Distracter Analysis: Load light will be lit/dark based on load being less/greater than 330 lbs. SFP crane must not be over the NFE to allow the NFE to raise. Also, 1EMF-15 must have power and not be in alarm to allow the NFE to raise.

- A. Incorrect:
- B. Incorrect:
- C. Incorrect:
- D. **Correct:** See lesson plan information.

Lesson plan page 18

- 1. New Fuel Elevator (Obj. #8)
 - d) Will not go up with high radiation alarm on EMF-15 or loss of power to EMF-15 (Spent Fuel Pool Building Refueling Bridge Monitor).
 - e) Will not go up with loss of power to SFP crane or crane over the elevator.

Question: 05-57

1 Pt(s) Given the following conditions:

- Unit 1 is in Mode 3
- Auxiliary feedwater (CA) pumps are maintaining steam generators levels
- Condensate (CM) and main feedwater (CF) systems are in high pressure cleanup alignment with 1A Hotwell and 1A Condensate Booster pumps in service
- Steam generators are at no load level and 550 psig
- The CF system is aligned to the CA nozzle

The OATC inadvertently depresses the "CF NOZZL" pushbutton on the "S/G 1A NOZZLE SEL" switch.

Which one of the following correctly describes the CA and CM/CF system alignments to S/G 1A?

- A. CA pump discharge flow remains aligned to the CA nozzle only. CM/CF system flow can be established to S/G 1A by throttling open the "CF BYP CTRL" valve.
- B. CA pump discharge flow remains aligned to the CA nozzle only. CM/CF system flow can not be established to S/G 1A without a main feedwater pump in service.
- C. CA pump discharge flow is now aligned to both the CA and CF nozzles. CM/CF system flow can be established to S/G 1A by throttling open the "CF BYP CTRL" valve.
- D. CA pump discharge flow is now aligned to both the CA and CF nozzles. CM/CF system flow can not be established to S/G 1A without a main feedwater pump in service.

Question: 05-57

Answer: A

LEVEL:	RO/SRO
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K/A	SYS035	Title	Steam Generator
	K1.01	Description	Knowledge of the physical connections and/or cause-effect relationships between the S/GS and the following systems: (CFR: 41.2 to 41.9 / 45.7 to 45.8) MFW/AFW systems
		Importance	4.2/4.5

SOURCE	NEW
LEVEL of KNOWLEDGE	Comprehension
Lesson	OP-CN-CF-CF revision 35
Objectives	4
REFERENCES	Lesson plan information
Author	RJK
Time	11/7/2005 8:49 AM

Distracter Analysis:

1. The CA flowpath is safety related and contains a dedicated flowpath to the steam generator.
The CA flow cannot travel to the main CF nozzle due to a check valve.
The CF NOZZLE pushbutton has no impact on CA system operation.
2. The high pressure cleanup path of the CM and CF systems does not include the CF connections to the S/G.
CF system connections to the S/G are aligned to the CA nozzle with the CF containment isolation valves closed.
3. When the CF NOZZLE button is depressed, the CF alignment is opened to the main (CF) nozzle. There is sufficient pressure from the high pressure cleanup pumps to feed a S/G at the low pressure.
4. 550 psig was used because it is the pressure a S/G is depressurized to in order to establish flow from the CM/CF system in the FR-H.1 emergency procedures.

- A. Correct for reasons 1 & 3**
- B. Incorrect for reasons 1 & 4**
- C. Incorrect for reasons 1 & 3**
- D. Incorrect for reasons 1 & 4**

See CF lesson plan page 30 of 32 for CF/CA system drawing.

Question: 05-58

1 Pt(s)

Initial Conditions:

- Unit 1 is at 53% power
- 3 RC pumps are in operation
- Both CF pumps are in operation

Current Conditions:

- Main condenser vacuum is 19.7" and slowly decreasing
- 1A CF pump condenser vacuum is 16.5" and slowly decreasing
- 1B CF pump condenser vacuum is 17.5" and slowly decreasing

What equipment failure accounted for the current condition, and what is the current status of the main turbine and the CF pumps?

- A. Steam supply valve to the air ejectors (1SA-24) failed closed.
The main turbine continues to run; both CF pumps continue to run.
- B. One RC pump has tripped.
The main turbine continues to run; both CF pumps continue to run.
- C. Steam supply valve to the air ejectors (1SA-24) failed closed.
The main turbine is tripped; 1A CF pump tripped and 1B CF pump continues to run.
- D. One RC pump has tripped.
The main turbine is tripped; 1A CF pump tripped and 1B CF pump continues to run.

Question: 05-58

Answer: C

LEVEL:	RO/SRO
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K/A	SYS055	Title	Condenser Air Removal
	K3.01	Description	Knowledge of the effect that a loss or malfunction of the CARS will have on the following: (CFR: 41.7 / 45.6) Main condenser
		Importance	2.5/2.7

SOURCE	NEW
LEVEL of KNOWLEDGE	Application
Lesson	
Objectives	8D
REFERENCES	TH05 page 21 REFERENCE PROVIDED Steam Table Mollier Diagram
Author	RJK
Time	7/28/2005 12:16 PM 50 minutes

Distracter Analysis: A loss of air ejectors will cause air leaking into the condensers to accumulate and continuously reduce vacuum. Running on 2 RC pumps might reduce vacuum slightly, but it is due to the higher RC inlet temperatures affecting condenser pressure. The unit could run indefinitely with 2 RC pumps at this power level, however, efficiency would be lower. The CF pumps trip setpoint for vacuum is 16.9" and the main turbine trip setpoint is 21.8".

- A. Incorrect: |
- B. Incorrect:
- C. Correct:
- D. Incorrect:

Question: 05-59

1 Pt(s)

Which of the following automatic actions are designed to prevent contaminated liquids from reaching Lake Wylie?

- A. Liquid releases from the monitor tank building are terminated on low or loss of RL flow.
- B. Auxiliary Building Floor Drain Tank discharge is directed to the monitor tank building on 1EMF-52 (Clean Area Floor Drain Monitor) Trip 2.
- C. Turbine building sump pump flows are directed to the monitor tank building on 1EMF-31 (Turbine Building Sump) Trip 2.
- D. Liquid releases from the auxiliary building are terminated on low or loss of RN flow.

Question: 05-59

Answer: A

LEVEL: RO/SRO

K/A	SYS068	Title	Liquid Radwaste System
	K4.01	Description	Knowledge of design feature(s) and/or interlock(s) which provide for the following: (CFR: 41.7) Safety and environmental precautions for handling hot, acidic, and radioactive liquids
		Importance	3.4/4.1

SOURCE	NEW
LEVEL of KNOWLEDGE	Memory
Lesson	OP-CN-WE-WL rev 15
Objectives	3
REFERENCES	WL lesson plan page 16
Author	RJK
Time	8/15/2005 9:50 AM 85 minutes

Distracter Analysis:

- A. Correct:** Release flow is diluted with the RL flow in the service building. On low flow in the RL system, 1WL-X28 trips closed.
- B. Incorrect:** This EMF directs flow to the ND/NS Sump, not the monitor tank building (partially correct).
- C. Incorrect:** This EMF terminates all sump pump actions. Operators actually manually align the flow to either the FDT system or the monitor tank building, but it not an automatic action.
- D. Incorrect:** Aux building releases are diluted with RN flow which in turn is diluted into the RL flow. There are only terminations on RL flow but an operator may not remember the difference.

Question: 05-60

1 Pt(s) Given the following information related to Waste Gas (WG) Decay Tank "C":

- H2 concentration is 4.7%
- O2 concentration is 4.2%

Which of the following action(s) (if any) is required to be performed per station Selected License Commitments (SLCs)?

- A. Immediately suspend all additions to the WG decay tanks and reduce only H2 concentration to less than 4% by volume.
- B. Immediately suspend all additions to the WG decay tanks and reduce only O2 concentration to less than 4% by volume.
- C. Immediately reduce only H2 concentration to less than 4% by volume.
- D. No action required. H2 and O2 concentrations are within limits.

Question: 05-60

Answer: B

LEVEL:	RO/SRO
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K/A	SYS071	Title	Waste Gas Disposal
	K5.04	Description	Knowledge of the operational implication of the following concepts as they apply to the Waste Gas Disposal System: (CFR: 41.5 / 45.7) Relationship of hydrogen/oxygen concentrations to flammability
		Importance	2.5/3.1

SOURCE	NEW
LEVEL of KNOWLEDGE	Memory
Lesson	OP-CN-WE-WG rev 10
Objectives	6
REFERENCES	SLC-16.11-18
Author	RJK
Time	7/28/2005 2:33 PM 79 minutes

Distracter Analysis:

- A. **Incorrect:** O2 must be reduced not H2.
- B. **Correct:** Per the SLC, ALL additions must be stopped. Second portion is an immediate action of the SLC.
- C. **Incorrect:** O2 concentrations must be reduced, not H2.
- D. **Incorrect:** Per the SLC, both concentrations are greater than the limit.

SLC16.11-18 Immediate LCOs:

B. Concentration of oxygen in the WASTE GAS HOLDUP SYSTEM > 4% by volume and hydrogen concentration > 4% by volume.	B.1 Suspend all additions of waste gases to the system.	Immediately
	AND	
	B.2 Reduce the concentration of oxygen to ≤ 4% by volume.	Immediately
	AND	
	B.3 Reduce oxygen concentration to within limits.	48 hours

Question: 05-61

1 Pt(s)

Given the following:

- Both trains of SSPS are in "TEST"
- VP (Containment Purge) is in operation
- A spent fuel assembly has just been dropped in the refueling canal as it was being moved towards the transfer car
- Bubbles are noted breaking the surface

What effect will this accident have on 1EMF-17 (REACTOR BLDG REFUEL BRIDGE) and 1EMF-39L (CONTAINMENT GAS HI RAD), and what effect will this have on VP operation?

- A. 1EMF-17 and 1EMF-39L will alarm.
VP continues to operate.
- B. 1EMF-17 will alarm, 1EMF-39L will not alarm.
VP secures.
- C. 1EMF-17 will alarm, 1EMF-39L will not alarm.
VP continues to operate.
- D. 1EMF-17 and 1EMF-39L will alarm.
VP secures.

Question: 05-61

Answer: D

LEVEL:	RO/SRO
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K/A	SYS072	Title	Area Radiation Monitoring
	A1.01	Description	Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the ARM system controls including: (CFR: 41.5 / 45.5) Radiation levels
		Importance	3.4/3.6

SOURCE	New
LEVEL of KNOWLEDGE	Comprehension
Lesson	CNT lesson, FHS lesson
Objectives	CP02R 3 and 9
REFERENCES	
Author	JKS
Time	7/28/2005 4:27 PM 60 minutes

Distracter Analysis: 1EMF39 and 1EMF17 will alarm for this accident. With both trains of SSPS in test, Sh from 1EMF-39 does not actuate, but both EMFs cause a containment evacuation alarm. Students may think that all EMF functions of EMF 39 are blocked when SSPS is in test. VP gets a direct signal on EMF 39 and SSPS in test does not affect it.

- A. **Incorrect:** VP does isolate.
- B. **Incorrect:** both EMFs will alarm, VP does secure.
- C. **Incorrect:** both EMFs will alarm VP secures.
- D. **Correct:**

Question: 05-62

1 Pt(s)

Unit 1 was operating at 100%. Given the following events and conditions:

- A tornado completely destroys the switchyard
- 1A and 1B D/Gs failed to start due to fouled fuel oil
- The crew has implemented EP/1/A/5000/ECA-0.0, Loss of All AC power
- Controls have been transferred to the SSF
- UST level is 3%
- CACST level is 1%

What are the minimum actions required to maintain a suction source for the turbine driven auxiliary feedwater pump (CAPT)?

- A. None, condenser circulating water was automatically aligned when low suction pressure was reached.
- B. Defeat the low suction pressure trip, break vacuum, and manually align suction from the condenser hotwell.
- C. Locally open nuclear service water assured supply valves.
- D. None, condenser circulating water was automatically aligned when controls were transferred to the SSF.

Question: 05-62

Answer: A

LEVEL:	RO/SRO
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K/A	SYS075	Title	Recirculating Water
	K4.01	Description	Knowledge of circulating water system design feature(s) and interlock(s) which provide for the following: (CFR: 41.7) Heat sink
		Importance	2.5/2.8

SOURCE	NEW
LEVEL of KNOWLEDGE	Comprehension
Lesson	OP-CN-CF-CA rev 048
Objectives	2
REFERENCES	Lesson plan information page 15, AP/06 rev 35
Author	RJK
Time	09/15/2005

Distracter Analysis: Upon a transfer to the SSF the control of 1(2)CA-174 and 175 are transferred to the SSF, however, positioning is controlled by suction pressure. The valves receive DC power from the SSF D/G and distribution system. Therefore no actions are required.

- A. Correct:**
- B. Incorrect:** These are actions that are taken in AP/06 to align the hotwell to CA suction.
- C. Incorrect:** The valves could be opened to supply RN since Unit 2 D/Gs are assumed to power some RN. But they are not the minimum actions necessary.
- D. Incorrect:** - Some alignments take place during transfer to the SSF but not these valves, however they are controlled from this location following the swap.

Question: 05-63

1 Pt(s) Given the following conditions:

- Fire protection system malfunctions have allowed a fire, which started in Unit 1 cable room, to spread to the Unit 2 cable room and control room
- Crews are transferring control to the Safe Shutdown Facility (SSF)

Which one of the following evolutions can be performed using controls available within the SSF once control function is transferred to the SSF?

- A. Energize 1EMXA from the SSF diesel generator.
- B. Increase pressurizer pressure with "D" pressurizer heater sub-banks.
- C. Throttle auxiliary feedwater flow to B Steam Generator using its flow control valve.
- D. Decrease pressurizer level using the reactor coolant pump seal return header.

Question: 05-63

Answer: B

LEVEL:	RO/SRO
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K/A	SYS086	Title	Fire Protection
	K3.01	Description	Knowledge of the effect that a loss or malfunction of the Fire Protection System will have on the following: (CFR: 41.7 / 45.6) Shutdown capability with redundant equipment
		Importance	2.7/3.2

SOURCE	NEW
LEVEL of KNOWLEDGE	Memory
Lesson	OP-CN-CP-AD rev 28
Objectives	2
REFERENCES	Lesson plan information pages 9 and 13
Author	RJK
Time	8/12/2005 4:28 PM 9 minutes

Distracter Analysis:

- A. **Incorrect:** 1EMXA is the location where the operators transfer EMXS to the SSF power system.
- B. **Correct:**
- C. **Incorrect:** CA flow can be on/off with the turbine driven CA pump, but throttling CA flow must be done manually locally at the valve.
- D. **Incorrect:** This would lower level if there was a way to control the isolation valves.

Question: 05-64

1 Pt(s)

Initial Conditions:

- Unit 1 reactor coolant system cooldown and depressurization was in progress
- Letdown was isolated

Current Conditions:

- 1NV-37A (Pressurizer Aux Spray) is failed open
- The crew is responding per EP/1/A/5000/FR-I.1, Response to High Pressurizer Level

Which of the following actions completes the isolation of the auxiliary spray flow in accordance with EP/1/A/5000/FR-I.1 and how will this isolation impact pressurizer level and NCP seal injection flow?

- A. Throttle 1NV-294 (NV PMPS 1A & 1B Discharge Control) to 47 gpm
Pressurizer level increases
NCP's lose seal injection flow
- B. Close 1NV-312A and 1NV-314B (Charging Line Containment Isolations)
Pressurizer level increases
NCP's continue to receive seal injection flow
- C. Close 1NV-312A and 1NV-314B (Charging Line Containment Isolations)
Pressurizer level decreases
NCP's lose seal injection flow
- D. Throttle 1NV-294 (NV PMPS 1A & 1B Discharge Control) to 32 gpm
Pressurizer level decreases
NCP's continue to receive seal injection flow

Question: 05-64

Answer: B

LEVEL:	RO/SRO
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K/A	SYS011	Title	Pressurizer Level Control
	A2.12	Description	Ability to (a) predict the impacts of the following malfunctions or operations on the PZR LCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: (CFR: 41.5/43.5/45.3/45.13) Operation of auxiliary spray
		Importance	3.3/3.3

SOURCE	NEW
LEVEL of KNOWLEDGE	Analysis
Lesson	OP-CN-PS-NV rev 44
Objectives	9
REFERENCES	EP/1/A/5000/FR-I.1 rev 11
Author	RJK
Time	8/12/2005 4:09 PM 60 minutes

Distracter Analysis: The level control is lost when charging header is isolated. Continued seal injection flow will increase PZR level when the only letdown is from seal leakoff. Until excess letdown is aligned there is only a level increase in the PZR. The NCP seals are still receiving 8 gpm each from 1NV-294 in manual at 32 gpm.

- A. **Incorrect:** This will not isolate the spray flow. The NV-294, in auto, will reduce charging line flow to 47 gpm. An operator knowing this might reduce flow in the same way manually in order to respond to the event.
- B. **Correct:**
- C. **Incorrect:** This will isolate the spray but the pressurizer level will INCREASE and not decrease due to continued seal injection flows and no letdown.
- D. **Incorrect:** This will not isolate spray flow. The operator may think that the 32 gpm will stop the flow and keep the seal flow.

FR-I.1 step 11 b RNO page 15

2) **IF** 1NV-37A cannot be closed, **THEN:**

- a) Isolate letdown.
- b) Manually throttle charging flow to establish 8 GPM seal water flow to each NC pump with an open seal injection flowpath.
- c) Close the following valves:
 - 1NV-312A (Chrg Line Cont Isol)
 - 1NV-314B (Chrg Line Cont Isol).
- d) Establish excess letdown.
REFER TO Enclosure 2
(Establishing Excess Letdown).

Question: 05-65

- 1 Pt(s) A condensate system (CM) startup is in progress per OP/1/A/6250/001, Condensate and Feedwater. 1CM-887 (CM Slow Fill Isol Valve) is opened until the "CM SYS FILL LEVEL HI" status light on 1SI-17 is lit. What is the significance of this indication and how was the fill accomplished?
- A. CM has been filled between the hotwell and the inlet of the main feed pumps. Fill was completed using gravity; no hotwell pump was necessary.
 - B. CM has been filled between the hotwell and the inlet of the main feed pumps. Fill was completed using gravity and a hotwell pump.
 - C. CM has been filled between the hotwell and the inlet of the upper surge tank dome. Fill was completed using gravity; no hotwell pump was necessary.
 - D. CM has been filled between the hotwell and the inlet of the upper surge tank dome. Fill was completed using gravity and a hotwell pump.

Question: 05-65

Answer: D

LEVEL:	RO/SRO
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K/A	SYS056	Title	Condensate
	G2.1.23	Description	Ability to perform specific system and integrated plant procedures during all modes of plant operation (CFR: 45.2 / 45.6)
		Importance	3.9/4.0

SOURCE	NEW
LEVEL of KNOWLEDGE	Memory
Lesson	OP-CN-CF-CM
Objectives	5
REFERENCES	CM lesson plan pgs 20-21 rev 33
Author	RJK
Time	8/2/2005 10:41 AM 64 minutes

Distracter Analysis:

Various portions of the CM/CF system are filled following outages. The piping between the hotwell and the CF pump suction is filled using gravity. Then a pump is started to fill the remaining piping up to the UST dome.

- A. **Incorrect:** This doesn't cause the light to be lit.
- B. **Incorrect:** This doesn't cause the light to be lit and pumps are not used
- C. **Incorrect:** The piping is filled using a combination of hotwell pump and gravity.
- D. **Correct:**

Question: 05-66

1 Pt(s)

An operator is responding to an emergency situation. Which of the following correctly states the minimum actions required by the operator prior to using an operating procedure which contains signoffs and is normally stored in a location outside the control room in accordance with OMP 1-4 (Use of Procedures)?

- A. The operator is required to verify the field copy against the control room CONTROL COPY prior to use.
- B. The operator is required to make a working copy from the field copy prior to use. The operator must also ensure that the CONTROL COPY stamp from the field copy is displayed on the working copy.
- C. The operator is required to make a working copy from the field copy prior to use. The operator must also ensure that the CONTROL COPY stamp from the field copy is not displayed on the working copy.
- D. The operator is permitted to use the field copy which is a CONTROL COPY.

Question: 05-66

Answer: D

LEVEL:	RO/SRO
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K/A	Generic	Title	Conduct of Operations
	2.1.21	Description	Ability to obtain and verify controlled procedure copy (CFR: 45.10 / 45.13)
		Importance	3.1/3.2

SOURCE	NEW
LEVEL of KNOWLEDGE	Memory
Lesson	OP-CN-ADM-OP rev 20
Objectives	10, 18
REFERENCES	OMP 1-4 rev 72
Author	RJK
Time	8/2/2005 12:18 PM 35 minutes

Distracter Analysis:

- A. Incorrect:** That is the controlled copy, no verification is required. Though an operator may think there is an additional copy in the control room.
- B. Incorrect:** The intention of placing the procedures locally is so there is no need to do anything prior to use, no copy is required. But this is the method from using a control copy from the control room i.e. makes a working copy.
- C. Incorrect:** This is something you would have no way of knowing. But these local procedures are verified monthly per the PT.
- D. Correct:**

OMP 1-4 quote: page 3

“Control copies in locations other than the control room are used to respond to an emergency or to respond to local annunciator alarms and are not required to be re-verified prior to use.”

Question: 05-67

- 1 Pt(s) In accordance with NSD 509 (Communications Standards), under which of the following conditions can the Control Room Supervisor waive the requirement to announce alarms to the control room team?
- A. The same annunciator(s) repeatedly alarming during surveillance testing.
 - B. Expected annunciators during the immediate actions of a safety injection emergency.
 - C. Status of a local annunciator panel alarm reported to the control room.
 - D. Priority and non-priority OAC alarms.

Question: 05-67

Answer: A

LEVEL:	RO/SRO
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K/A	Generic	Title	Conduct of Operations
	2.1.14	Description	Knowledge of system status criteria which require the notification of plant personnel. (CFR: 43.5 / 45.12)
		Importance	2.5/3.3

SOURCE	NEW
LEVEL of KNOWLEDGE	Memory
Lesson	OP-CN-ADM-NSO1 rev 11
Objectives	12
REFERENCES	NSD 509 rev 4 pages 3 and 4
Author	RJK
Time	8/2/2005 1:11 PM 45 minutes

Distracter Analysis:

- A. **Correct:** CRS is authorized to waive the requirement.
- B. **Incorrect:** These alarms must be announced and discussed ASAP after the immediate actions are completed. A operator may think that this could be waived due to the emergency to allow for crew concentration on the accident.
- C. **Incorrect:** This must be treated as any unexpected alarm. The operator will converse with the operator and could think this is all that is required.
- D. **Incorrect:** The priority alarms are the same as any unexpected annunciator. But an operator may think that all the OAC device is a monitor for his/her use only.

Question: 05-68

1 Pt(s)

Given the following:

- Unit 1 is in Mode 3.
- Reactor coolant system (NCS) pressure is 2750 psig.

What is the required Tech Spec action for this condition?

- A. Reduce NCS pressure to less than 2485 psig within 5 minutes.
- B. Reduce NCS pressure to less than 2735 psig within 5 minutes.
- C. Reduce NCS pressure to less than 2485 within 1 hour.
- D. Restore NCS pressure to less than 2735 within 1 hour.

Question: 05-68

Answer: B

LEVEL:	RO/SRO
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K/A	Generic	Title	Conduct of Operations
	2.1.33	Description	Ability to recognize indications for system operating parameters which are entry-level conditions for technical specifications. (CFR: 43.2 / 43.3 / 45.3)
		Importance	3.4/4.0

SOURCE	NEW
LEVEL of KNOWLEDGE	Memory
Lesson	
Objectives	
REFERENCES	REFERENCE T.S. 2.0 safety limits.
Author	JKS
Time	11/8/2005 1:23 PM

Distracter Analysis:

The actual requirements is within 5 minutes in MODE 3,4,5 and within 1 hour in Modes 1, 2. 2485 is the highest "normal" type setpoint (lift setpoint of the safety reliefs)

- A. **Incorrect:** Right action time, wrong pressure
- B. **Correct**
- C. **Incorrect:** wrong pressure , and wrong time frame this would be ok for mode 1 or 2.
- D. **Incorrect:** right pressure wrong time frame (see above)

Question: 05-69

1 Pt(s)

Given the following:

- Unit 1 and 2 are operating at 100%
- One single steam generator tube fully shears on each unit
- The crews are responding per EP/1(2)/A/5000/E-3, Steam Generator Tube Rupture, preparing to perform the initial reactor coolant system cooldown to the required core exit thermocouple temperature using steam dumps.

Based on the differences between Unit 1 and Unit 2 steam generator design, which unit would have a lower leakage rate and which unit would reach the target temperature first?

(Assume identical cores and steam dump performance.)

- A. Unit 1 would have less leakage and Unit 1 would reach required core exit temperature first.
- B. Unit 1 would have less leakage and Unit 2 would reach required core exit temperature first.
- C. Unit 2 would have less leakage and Unit 1 would reach required core exit temperature first.
- D. Unit 2 would have less leakage and Unit 2 would reach required core exit temperature first.

Question: 05-69

Answer: A

LEVEL: RO/SRO

K/A	Generic	Title	Equipment Control
	2.2.3	Description	(multi-unit) Knowledge of the design, procedural, and operational differences between units. (CFR: 41 / 43 / 45)
		Importance	3.1/3.3

SOURCE	NEW
LEVEL of KNOWLEDGE	Analysis
Lesson	OP-CN-STM-SG rev 32 pg 35
Objectives	10
REFERENCES	Lesson plan
Author	RJK
Time	8/3/2005 10:33 AM 23 minutes

Distracter Analysis: Unit 1 has smaller tubes and larger surface area, therefore the leakage would be less and assuming dumps are fully opened for the initial NC cooldown, Unit 1 would cooldown faster.

- A. Correct:
- B. Incorrect:
- C. Incorrect:
- D. Incorrect:

Question: 05-70

1 Pt(s) The following conditions exist on Unit 1:

- MODE 3 at normal operating temperature and pressure, preparing for a reactor startup
- The reactor coolant system (NC) has been diluted to the estimated critical boron concentration
- 1KC-132 (Letdn Hx Oilt Temp Ctrl) control is in MANUAL
- All other controls are in AUTOMATIC and functioning NORMALLY
- Letdown flow is decreased from 100 gpm to 50 gpm

Assuming NO other manipulations, over the next hour, Source Range counts will?

- A. INCREASE due to warmer NC water exiting the letdown heat exchanger
- B. INCREASE due to cooler NC water exiting the letdown heat exchanger
- C. DECREASE due to warmer NC water exiting the letdown heat exchanger
- D. DECREASE due to cooler NC water exiting the letdown heat exchanger

Question: 05-70

Answer: B

LEVEL:	RO/SRO
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K/A	Generic	Title	Equipment Control
	2.2.1	Description	Ability to perform pre-startup procedures for the facility, including operating those controls associated with plant equipment that could affect reactivity. (CFR: 45.1)
		Importance	3.7/3.6

SOURCE	BANK: Turkey point 2005 SRO exam #77
LEVEL of KNOWLEDGE	Comprehension
Lesson	OP-CN-PS-NV lesson
Objectives	
REFERENCES	
Author	RJK
Time	

DISTRACTORS:

- A. Incorrect:** Reducing RCS letdown flow will result in more heat being removed by CCW in the non-regenerative heat exchanger. Letdown outlet temperature will drop.
- B. Correct:** A decrease in letdown temperature will result in a reduction in boron concentration at the demineralizer outlet due to increased boron ion exchange by the anion resin at lower temperatures. Positive reactivity would be added due to reduced RCS boron concentration. In November of 1996 at Turnkey Point, reactor power increased .3% over a 30 minute period as a result of lowering non-regenerative heat exchanger outlet temperature.
- C. Incorrect:** RCS letdown flow exiting the regenerative heat exchanger will become cooler.
- D. Incorrect:** Counts would increase because RCS boron concentration would decrease. See B above.

Question: 05-71

1 Pt(s)

Given the following:

- Unit 1 is operating at 100%
- The feedwater temperature input to the thermal power best estimate (TPBE) was incorrectly calibrated to 7°F less than actual feedwater temperature
- Calibration of the power range nuclear instruments (NIs) are being performed

How will TPBE power compare to actual thermal power and how will adjustment of the NIs be affected using the calculated value of TPBE?

- A. TPBE is lower than actual power.
NI adjustment will be less conservative.
- B. TPBE is higher than actual power.
NI adjustment will be less conservative.
- C. TPBE is lower than actual power.
NI adjustment will be more conservative.
- D. TPBE is higher than actual power.
NI adjustment will be more conservative.

Question: 05-71

Answer: D

LEVEL:	RO/SRO
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K/A	Generic	Title	Equipment control
	2.2.34	Description	Knowledge of the process for determining the internal and external effects on core reactivity. (CFR: 43.6)
		Importance	2.8/3.2

SOURCE	Bank
LEVEL of KNOWLEDGE	Comprehension
Lesson	TPBE
Objectives	3
REFERENCES	
Author	JKS
Time	

Distracter Analysis: Due to FFW temperature being 7 degrees higher than indicated/calibrated, TPBE calculation will indicate higher than actual thermal power. This will cause NI calibration to result in setpoints that are more conservative (i.e. closer to the trip setpoint).

- A. Incorrect
- B. Incorrect
- C. Incorrect:
- D. Correct:

Question: 05-72

1 Pt(s)

A Duke Energy radiation worker current year Total Effective Dose Equivalent (TEDE) is 1500 mrem. If he is expected to receive 100 mrem per hour during a repair job, how many hours, if any, can he work before reaching the Dose Report EXCLUDE limit? (Assume any appropriate dose extensions have been approved to reach this limit.)

- A. None, the worker has already exceeded the EXCLUDE limit.
- B. 1 hour
- C. 3 hours
- D. 5 hours

Question: 05-72

Answer: C

LEVEL: RO/SRO

K/A	Generic	Title	Radiation Control
	2.3.1	Description	Knowledge of 10 CFR: 20 and related facility radiation control requirements (CFR: 41.12 / 43.4 / 45.9 / 45.10)
		Importance	2.6/3.0

SOURCE	NEW
LEVEL of KNOWLEDGE	Memory
Lesson	OP-CN-RAD-HP rev 20
Objectives	2
REFERENCES	Duke GET study material for Radiation worker training
Author	RJK
Time	8/3/2005 12:57 PM 19 minutes

Distracter Analysis: The EXCLUDE LIMIT IS at 90% of the admin limit (2000) which is 1800.

- A. **Incorrect:** He has not exceeded any limit but in the past, a limit of 500 was administratively used.
- B. **Incorrect:** This is the ALERT limit 80% of admin limit
- C. **Correct:** $1500 + (100 \times 3) = 1800$
- D. **Incorrect:** This is the duke admin limit.

Conditions of Exposure	NRC(10CFR20) Limits	DE Basic Administrative Control	DE Maximum Administrative Control
Adult Total Effective Dose Equivalent (TEDE)	5.0 rem/year	2.0 rem/year	5.0 rem/year

Question: 05-73

1 Pt(s)

The initial flush of penetration M-347 (Letdown Line Penetration) is being performed per OP/1/A/6200/001, Chemical and Volume Control System, in preparation for type "C" leak rate testing of the penetration.

What is the purpose of the flush, and what group determines termination criteria?

- A. The flush reduces local dose rates for the penetration testing.
RP ALARA group determines termination criteria based on dose reduction.
- B. The flush reduces local dose rates for the penetration testing.
Radwaste Chemistry determines termination criteria based on storage capacity.
- C. The flush ensures penetration valve seating surfaces are clear of debris.
Valve engineer determines termination criteria based on adequate sealing.
- D. The flush ensures penetration valve seating surfaces are clear of debris.
Radwaste Chemistry determines termination criteria based on storage capacity.

Question: 05-73

Answer: A

LEVEL:	RO/SRO
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K/A	Generic	Title	Radiation Control
	2.3.10	Description	Ability to perform procedures to reduce excessive levels of radiation and guard against personnel exposure. (CFR: 43.4 / 45.10)
		Importance	2.9/3.3

SOURCE	BANK (GET CBP questions)
LEVEL of KNOWLEDGE	Memory
Lesson	OP-CN-RAD-HP rev 20
Objectives	10
REFERENCES	GET exam bank
Author	RJK
Time	8/3/2005 1:26 PM 19 minutes

Distracter Analysis: Flush is for dose rate reduction. RP ALARA group determines termination criteria. Radwaste is contacted because they will see the additional input into radwaste. May think that chemistry terminates based on volume of water or OTG does (they run the penetration test)

- A. Correct:
- B. Incorrect:
- C. Incorrect:
- D. Incorrect:

NOTE:

1. Performance of this enclosure should be coordinated with the draining of penetration M-347 per OP/1/A/6200-020 (Unit 1 Venting and Draining Procedure For Type "C" Leak Rate Tests). Flushing of the letdown line should occur prior to the penetration being drained.
2. Steps 2.1 through 2.8 may be performed in any order.

- ____ 2.1 Notify Radwaste Chemistry that the Letdown line and the Regenerative Heat Exchanger are to be flushed and drained to the Containment Floor & Equipment sump.
Person notified _____
- ____ 2.2 Notify RP ALARA group to establish flush termination criteria.
Person notified _____
- 2.24 Perform one of the following as directed by Radiation Protection:
 - ____ • **IF** previous flushing was adequate to reduce area dose rates, proceed to Step 2.38.
 - ____ • **IF** previous flushing was **NOT** adequate to reduce area dose rates, proceed to the following step.

Question: 05-74

- 1 Pt(s) Unit 1 is in Mode 3 when an active fire occurs located in an area designated "SSF Dedicated Fire Area" per AP/0/A/5500/045, Plant Fire. How are standby shutdown facility (SSF) controls utilized, and what effect, if any, will this have on operation of the BB (Steam Generator Blowdown) system?
- A. Full transfer to the SSF.
No effect, the BB system will continue to operate.
 - B. Partial transfer to the SSF.
The BB system will be secured.
 - C. Full transfer to the SSF.
The BB system will be secured.
 - D. Partial transfer to the SSF.
No effect, the BB system will continue to operate.

Question: 05-74

Answer: B

LEVEL:	RO/SRO
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K/A	Generic	Title	Emergency Procedures/Plan
	2.4.27	Description	Knowledge of fire in the plant procedure. (CFR: 41.10 / 43.5 / 45.13)
		Importance	3.0/3.5

SOURCE	NEW
LEVEL of KNOWLEDGE	Memory
Lesson	OP-CN-EI-AP45
Objectives	4 & 5
REFERENCES	AP/0/A/5500/045 rev 001
Author	RJK
Time	8/3/2005 2:01 PM 36 minutes

Distracter Analysis: Per the AP, the initial action in response to the active fire in a Unit 1 dedicated SSF area is to dispatch an operator for the Time Critical act of partially transferring to the SSF controls. **The BB inside containment isolation valves will close on swap of 1EMXS.**

- A. **Incorrect:** Only on a loss of control room, BB will isolate
- B. **Correct:**
- C. **Incorrect:** Only on a loss of control room
- D. **Incorrect:** BB will isolate.

Question: 05-75

1 Pt(s)

Given the following events:

- Unit 2 Alert declared
- Emergency Notification Sheet signed and handed to you for transmittal

Which of the following is a complete list of agencies required to be contacted within 15 minutes of the declaration of the Alert?

- A. State and county warning points
- B. State warning points and NRC Operations Center
- C. County warning points and NRC Operations Center
- D. State and county warning points and the NRC Operations Center

Question: 05-75

Answer: A

LEVEL:	RO/SRO
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K/A	Generic	Title	Emergency Procedures/Plan
	2.4.39	Description	Knowledge of the RO's responsibilities in emergency plan implementation. (CFR: 45.11)
		Importance	3.3/3.1

SOURCE	NEW
LEVEL of KNOWLEDGE	Memory
Lesson	
Objectives	
REFERENCES	RP/0/A/5000/06A rev19
Author	RJK
Time	8/4/2005 8:42 AM 56 minutes

Distracter Analysis: 15 minute notifications do not include NRC, but are the state and county warning points.

- A. Correct:
- B. Incorrect:
- C. Incorrect:
- D. Incorrect:

Question: 05-76

1 Pt(s) The first charging pump (NV) is shutdown during safety injection termination per EP/1/A/5000/ES-1.1, Safety Injection Termination, following a LOCA. The following parameter trends are noted:

- Subcooling is +4 °F and decreasing
- Pressurizer level is 25% and decreasing
- NC pressure is 1680 psig and decreasing

Which of the following describes parameter(s) that were affected by the charging pump shutdown and what procedure will be used to complete the safety injection termination?

- A. Lower injection flow is causing pressure to decrease. Go to EP/1/A/5000/ES-1.2, Post LOCA Cooldown and Depressurization.
- B. Lower injection flow is causing pressure to decrease. Continue in EP/1/A/5000/ES-1.1, SI Termination.
- C. Lower injection flow is causing temperature to increase. Go to EP/1/A/5000/ES-1.2, Post LOCA Cooldown and Depressurization.
- D. Lower injection flow is causing temperature to increase. Continue in EP/1/A/5000/ES-1.1, SI Termination.

LEVEL: SRO

K/A	EPE009	Title	Small Break LOCA
	G.2.4.6	Description	Knowledge symptom base EOP mitigation strategies (CFR: 41.10 / 43.5 / 45.13)
		Importance	3.1/4.0

SOURCE	New
LEVEL of KNOWLEDGE	Analysis
Lesson	OP-CN-EP-EP2
Objectives	10
REFERENCES	EP/1/A/5000/ES-1.1 rev 20
Author	RJK
Time	6/23/2005 8:10 AM 80 minutes

Distracter Analysis:

- A. **Correct:** If pressure continues to decrease, the crew must transfer to ES-1.2 and conduct a cooldown and continue to terminate.
- B. **Incorrect:** Pressure will stabilize at some point, but since it is decreasing now, the RNO requires a transfer to the ES-1.2 procedure.
- C. **Incorrect:** A small break LOCA will not affect temperatures at a scale enough to cause an increase. Also, E-0 Enclosure 4 is in effect and the OATC is to control temperatures. Again an operator might think that a cooldown is a good answer to maintaining desirable conditions.
- D. **Incorrect:** A small break LOCA will not affect temperatures at a scale enough to cause an increase. Also, E-0 Enclosure 4 is in effect and the OATC is to control temperatures.

CNS EP/1/A/5000/ES-1.1	SAFETY INJECTION TERMINATION	PAGE NO. 3 of 63 Revision 20
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ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

<p>___ 6. Verify NC pressure - STABLE OR INCREASING.</p>	<p>Perform the following:</p> <ul style="list-style-type: none"> ___ a. Ensure Pzr spray valves - CLOSED. ___ b. IE NC pressure continues to decrease. THEN GO TO EP/1/A/5000/ES-1.2 (Post LOCA Cooldown And Depressurization).
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Question: 05-77

1 Pt(s) Initial conditions at 1300 hrs:

- Unit 1 was at 100% power
- Pressurizer level was at program level
- 1NV-312A (Chrg Line Cont Isol) spuriously closed and could not be reopened
- Operators have taken the following actions per AP/1/A/5500/012, Loss of Charging or Letdown, Case I, Loss of Charging:
 - Secured letdown
 - Total charging flow has been reduced to 32 gpm
- Excess letdown can not be established

At approximately what time will the pressurizer become inoperable per Tech Spec 3.4.9, Pressurizer, and what is the basis for this LCO?

Reference provided

- A. Pressurizer will be inoperable at approximately 1434 hrs.
Minimize the consequences of potential overpressure transients.
- B. Pressurizer will be inoperable at approximately 1651 hrs.
Minimize the consequences of potential overpressure transients.
- C. Pressurizer will be inoperable at approximately 1434 hrs.
Minimize the containment pressure spike on a LOCA.
- D. Pressurizer will be inoperable at approximately 1651 hrs.
Minimize the containment pressure spike on a LOCA.

Question: 05-77

Answer: B

LEVEL: SRO

K/A	APE022	Title	Loss of Reactor Coolant Makeup
	AA2.04	Description	Ability to determine and interpret the following as they apply to the Loss of Reactor Coolant Makeup: (CFR: 43.5 / 45.13) How long PZR level can be maintained within limits
		Importance	2.9/3.8

SOURCE	NEW
LEVEL of KNOWLEDGE	analysis
Lesson	OP-CN-PS-ILE rev 23
Objective(s)	9
REFERENCES	TS 3.4.9 and basis; PZR level to gallons graph (REF PROVIDED)
Author	RJK
Time	29 minutes plus 2 hours

Distracter Analysis: With charging flow at 32 gpm and no letdown, a net of 20 gpm is being added to the NC system. Based on this and a conversion of ~125gallons/% level in the PZR, level will reach the hi level setpoint of 70% at 1434 hrs (T+94 minutes). This is plausible since it is an alarm setpoint associated with abnormally high pressurizer level. The actual inoperability level is 92% which will occur at ~1651 hrs (T+231 minutes). The basis of the LCO is to minimize the consequences of overpressure transients. Minimizing the containment pressure spike on a LOCA is plausible because the additional water volume will cause a higher pressure spike theoretically, however, that is not the basis for this LCO and the additional water volume will not cause containment pressure to approach its design basis value of 15 psig.

- A. **Incorrect:** wrong time, right reason
- B. **Correct:**
- C. **Incorrect:** wrong time, wrong reason
- D. **Incorrect:** right time, wrong reason.

Question: 05-78

1 Pt(s)

Given the following conditions:

- Unit 1 in Mode 6
- Refueling cavity is filled to 23 feet.
- Core reload is in progress
- NC temperature is 145°F
- 1A residual heat removal (ND) train is in operation

A leak has been reported on the 1A ND pump motor cooler. To repair the leak, cooling flow to the motor cooler must be isolated. Maintenance estimates it will take 40 minutes to complete repairs.

What is the basis for having one ND loop in operation in this condition and how does this affect the ability to continue core reload?

- A. Provides an indication of reactor coolant temperature.
Core reload must be stopped.
- B. Ensures that a core K_{eff} of less than or equal to 0.95 is maintained during fuel handling operations.
Core reload must be stopped.
- C. Provide an indication of reactor coolant temperature.
Core reload may continue provided no operations are permitted that would dilute the refueling cavity boron concentration.
- D. Ensures that a core K_{eff} of less than or equal to 0.95 is maintained during fuel handling operations.
Core reload may continue provided no operations are permitted that would dilute the refueling cavity boron concentration.

LEVEL:	SRO
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K/A	APE025	Title	Loss of RHR System
	G2.2.25	Description	Knowledge of bases in technical specifications for limiting conditions for operations and safety limits. (CFR 43.2)
		Importance	2.5/3.7

SOURCE	NEW
LEVEL of KNOWLEDGE	Comprehension
Lesson	OP-CN-PS-ND
Objectives	11
REFERENCES	T.S. 3.9.4 and Bases
Author	RJK
Time	12/8/2005 5:17:46 PM 122 minutes

Distracter Analysis: Because the pump is stated as inoperable, core loading must stop. If the pump were not inoperable, core loading is allowed to continue without ND for up to one hour provided no change in [B]. This allows loading near the edges of the core where flow may interfere with setting fuel assemblies. The indication of temperature is one of the bases for this LCO. Maintaining core $K_{eff} \leq 0.95$ is the bases of LCO 3.9.1 which is boron concentration during refueling operations. The confusion is that the ND bases is for MIXING of the borated water to prevent potential criticality.

- A. Correct:
- B. Incorrect:
- C. Incorrect
- D. Incorrect:

TS 3.9.4 Bases

The LCO is modified by a Note that allows the required operating RHR loop to be removed from service for up to 1 hour per 8 hour period, provided no operations are permitted that would dilute the RCS boron concentration with coolant at boron concentrations less than required to meet the minimum boron concentration of LCO 3.9.1. Boron concentration reduction with coolant at boron concentrations less than required to assure the minimum required RCS boron concentration is maintained is prohibited because uniform concentration distribution cannot be ensured without forced circulation. This permits operations such as core mapping or alterations in the vicinity of the reactor vessel hot leg nozzles and RCS to RHR isolation valve testing. During this 1 hour period, decay heat is removed by natural convection to the large mass of water in the refueling cavity

Question: 05-79

1 Pt(s)

Given the following unit status:

- Unit 1 is operating at 100% with 1A RN pump in service
- Unit 2 is shutdown in Mode 5

The following alarms and indications are noted:

- 1AD-12, A/1 "RN PUMP A FLOW HI/LO"
- 1AD-12, A/2 "RN ESSENTIAL HDR A PRESSURE - LO"
- 1AD-12, A/5 "RN ESSENTIAL HDR B PRESSURE - LO"
- 1AD-12, B/1 "RN PUMP INTAKE PIT A LEVEL-LO"
- 1AD-12, B/2 "RN PIT A SCREEN HI D/P"
- RN pit "A" level is decreasing

Which of the following describes the impact to the nuclear service water (RN) system, and the implications related to Tech Spec 3.7.8 (Nuclear Service Water System) for this condition?

- A. Train "A" intake screens are clogged; direct the crew to swap to the pond and start a "B" train RN pump.
Enter Unit 1 and Unit 2 into a 72 hour action per Tech Spec 3.7.8.
- B. Train "A" intake screens are clogged; direct the crew to swap to the pond and start a "B" train RN pump.
Enter Unit 1 into a 72 action per Tech Spec 3.7.8.
Unit 2 is not in a 72 hour action per Tech Spec 3.7.8.
- C. 1A RN pump has tripped; direct the crew to start a "B" train RN pump without swapping to the pond.
Enter Unit 1 into a 72 action per Tech Spec 3.7.8.
Unit 2 is not in a 72 hour action per Tech Spec 3.7.8.
- D. 1A RN pump has tripped; direct the crew to start a "B" train RN pump without swapping to the pond.
Enter Unit 1 and Unit 2 into a 72 hour action per Tech Spec 3.7.8.

Question: 05-79

Answer: B

LEVEL:	SRO
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K/A	APE062	Title	Loss of Nuclear Service Water
	G2.4.6	Description	Knowledge of symptom based EOP mitigation strategies. (CFR 43.5)
		Importance	3.1/4.0

SOURCE	NEW
LEVEL of KNOWLEDGE	Comprehension
Lesson	OP-CN-PSS-RN
Objectives	11 & 17
REFERENCES	AP/0/A/5500/020 rev 35 page 10
Author	RJK
Time	

Distracter Analysis:

The symptoms are based on clogged screen and addressed by AP/20. Until alignments are made, Unit 1 is in TS 3.0.3. SRO ONLY because it has a TECH SPEC APPLICATION.

- A. Incorrect:** The actions to swap to the pond are correct. Starting an additional "A" train pump would enhance flow but the procedure requires that the "IDLE" pump on the opposite train be started.
This is the normal action after alignments are made (72 hours)
- B. Correct:**
- C. Incorrect:** Of the listed annunciators, the majority of alarms would be expected during the loss of the only ruining pump and starting the 2A pump would restore proper flow.
This is the normal action after alignments are made (72 hours)
- D. Incorrect:** Of the listed annunciators, the majority of alarms would be expected during the loss of the only ruining pump and starting any other pump would restore proper flow.
TS ACTIONS ARE CORRECT.

Question: 05-80

1 Pt(s) Given the following timeline:

At 1500 hrs:

- CA pump 1B was tagged for maintenance
- Reactor tripped from 100% power when a fault occurred on the main steam equalization header
- 1B and 1C MSIVs did not close
- The CAPT tripped on mechanical overspeed
- Crews were dispatched to the CAPT

At 1545 hrs:

- CA pump 1A tripped on overcurrent
- Crew entered EP/1/A/5000/FR-H.1, Response to Loss of Secondary Heat Sink
- SG parameters are as follows:
 - 1A 800 psig 55% WR level
 - 1B 0 psig 0% WR level
 - 1C 0 psig 0% WR level
 - 1D 780 psig 27% WR level
- All attempts to establish CA flow to at least one S/G have failed
- The crew has secured all NC pumps
- Maintenance has just called to report that the CAPT T&T valve has been reset

Which one of the following is the next course of action to be taken to mitigate the current conditions per EP/1/A/5000/FR-H.1?

- A. Initiate feed flow using the CAPT
- B. Initiate feed flow using a main feedwater pump
- C. Initiate bleed and feed of the NC system
- D. Initiate feed flow using condensate booster pumps

Question: 05-80

Answer: B

LEVEL:	SRO
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K/A	WE05	Title	Loss of Secondary Heat Sink
	EA2.2	Description	Ability to determine and interpret the following as they apply to the (Loss of Secondary Heat Sink) (CFR: 43.5 / 45.13) Adherence to appropriate procedures and operation within the limitations in the facilities license and amendments
		Importance	3.7/4.3

SOURCE	NEW
LEVEL of KNOWLEDGE	Analysis
Lesson	OP-CN-EP-FRH
Objectives	3
REFERENCES	EP/1/A/5000/FR-H.1 rev 025
Author	RJK
Time	7/1/2005 12:54 PM 102 minutes

Distracter Analysis:

- A. **Incorrect:** Would be the correct answer if B or C were pressurized, but with 0 psig, not available option.
- B. **Correct:**
- C. **Incorrect** Feed and bleed criteria are not met.
- D. **Incorrect:** This would be a correct option if the CFPs did not work.

Question: 05-81

1 Pt(s)

Initial Conditions:

- Reactor power 54%
- Turbine load is 586 MW
- Control Bank D group demand position is 168 steps
- OAC indicates all rods properly aligned
- Rod control is in Auto

Conditions 1 minute later:

- Reactor power 57%
- Turbine load is 591 MW
- Control Bank D group demand position is 186 steps
- OAC indicates all Bank D control rods at 186 steps except for H8 which indicates 180 steps
- Rod control is in Manual

Conditions 3 minutes later:

- Operators inserted rods for temperature control.
- Control Bank D group demand position is 180 steps
- OAC indicates all Bank D control rods at 180 steps except for H8 which indicates 174 steps

Based on the timeline and available indications, what was the initial failure, and what is the status of control rods related to Tech Spec operability?

- A. A steam leak has occurred, enter AP/1/A/5500/028, Steam Leak. Control rods are operable per Tech Specs.
- B. Channel I impulse pressure has failed high, enter AP/1/A/5500/015, Case II, Continuous Rod Movement. Control rods are operable per Tech Specs.
- C. A steam leak has occurred, enter AP/1/A/5500/028, Steam Leak. Control rods are not operable per Tech Specs.
- D. Channel I impulse pressure has failed high, enter AP/1/A/5500/015, Case II, Continuous Rod Movement. Control rods are not operable per Tech Specs.

Question: 05-81

Answer: B

LEVEL:	SRO
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K/A	APE001	Title	Continuous Rod Withdrawal
	AA2.05	Description	Ability to determine and interpret the following as they apply to the Continuous Rod Withdrawal: (CFR: 43.5 / 45.13) Uncontrolled rod withdrawal, from available indications
		Importance	4.4/4.6

SOURCE	NEW
LEVEL of KNOWLEDGE	Application
Lesson	OP-CN-IC-IRX
Objectives	5
REFERENCES	AP/1/A/5500/015 rev 010
Author	RJK
Time	11/9/2005 9:21 AM

Distracter Analysis: Because MW is increasing, it is not a steam leak, and CRDs are within 12 steps of their group.

- A. **Incorrect:** Wrong diagnosis, rods are operable.
- B. **Correct:**
- C. **Incorrect:** Wrong diagnosis, rods are operable.
- D. **Incorrect:** This is the correct diagnosis, but rods ARE operable.

Question: 05-82

1 Pt(s)

Given the following conditions:

- The refueling crew is setting an irradiated fuel assembly next to a new fuel assembly
- When it is halfway inserted, it drops into the core
- 1RAD-2, D-2 "1EMF-17 REACTOR BLDG REFUEL BRIDGE" alarms and count rates are increasing
- The RO notes that source range count rates have increased

Based on these conditions what procedure actions must be completed first per AP/1/A/5500/025, Damaged Spent Fuel, to ensure station personnel are protected.

- A. Refueling SRO ensures the containment evacuation alarm has sounded and then orders the refueling bridge to the deep end of the refueling cavity.
- B. Control room supervisor (CRS) orders the containment air release (VQ) and containment purge (VP) systems to be shutdown and then ensures the containment closure coordinator performs his actions to isolate containment.
- C. Refueling SRO orders the dropped fuel assembly to be relatched and moved to the deep end of the refueling cavity.
- D. CRS ensures the containment evacuation alarm has sounded and then orders all fuel assemblies to be placed in a safe position.

LEVEL:	SRO
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K/A	APE036	Title	Fuel Handling Accidents
	G2.4.4	Description	Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures. (CFR: 41.10 / 43.2 / 45.6)
		Importance	4.0/4.3

SOURCE	NEW
LEVEL of KNOWLEDGE	Memory
Lesson	OP-CN-FH-FHS
Objectives	2
REFERENCES	AP/1/A/5500/025 rev 015 NSD 304 rev 013
Author	RJK
Time	12/8/2005

Distracter Analysis: NSD 304 controls the Rx Engineer and FH SRO roles during fueling handling in Choices A and C.

- A. **Incorrect:** The refueling SRO duties are limited to verifying the actions of the reactor engineering procedures and fuel handling crew actions of moving fuel. While moving the bridge to the deep end places the bridge operates further away from the reactor core, the only procedure direction given would be made by the CRS.
- B. **Incorrect:** PER AP/25 Case I: The actions to shutdown VQ and VP must be completed **AFTER** the containment building is closed up. IF VP were shutdown **BEFORE** containment penetrations were closed, then any airborne activity would be released. Example: the personnel airlocks can be open with restriction per OP/0/A/5100/014 Penetration control for Modes 5 and 6.
- C. **Incorrect:** The refueling SRO duties are limited to verifying the actions of the reactor engineering procedures and fuel handling crew actions of moving fuel. Only the reactor engineer can determine the location of a fuel assembly. The FH SRO will only agree/disagree with the reactor engineer's decision.
- D. **Correct:** PER AP/25 Case I (Damaged Spent Fuel in the Reactor Building) In order to ensure the maximum protection of personnel, the fuel assemblies are placed in a safe condition. The containment evacuation is then ordered fro everyone.

Question: 05-83

1 Pt(s)

Per Selected License Commitments, which one of the following is the basis for limiting the curie content of the Waste Gas (WG) storage tanks?

- A. Limits the whole body exposure to any member of the public at the nearest site boundary in the event of an accidental release of the contents of one waste gas decay tank.
- B. Limits the whole body exposure of employees within the site boundary and any member of the public at the nearest site boundary in the event of an accidental release of the contents of all waste gas decay tanks.
- C. Limits the whole body exposure to any member of the public at the nearest site boundary in the event of an accidental release of the contents of all waste gas decay tanks.
- D. Limits the whole body exposure of employees within the site boundary and any member of the public at the nearest site boundary in the event of an accidental release of the contents of one waste gas decay tanks.

Question: 05-83

Answer: A

LEVEL:	SRO
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K/A	APE060	Title	Accidental Gaseous Radwaste Release
	G2.2.25	Description	Knowledge of bases in technical specifications for limiting conditions for operations and safety limits. (CFR: 43.2)
		Importance	2.5/3.7

SOURCE	NEW
LEVEL of KNOWLEDGE	Memory
Lesson	OP-CN-WE-WG
Objectives	3 and 6
REFERENCES	SLC 16.11-19 Bases
Author	RJK
Time	7/1/2005 1:22 PM 73 minutes

Distractors: To answer correctly, students must know that the curie limit is to protect a member of the public during the accidental release of one tank. SLCs are treated similarly to Tech Specs.

- A. **Correct:** See SLC bases.
- B. **Incorrect:** Doesn't protect all employees, only one tank, not all.
- C. **Incorrect:** Only one tank, not all.
- D. **Incorrect:** Doesn't protect employees.

SLC 1.11-19 Bases: (Limits on Tank Curie Content) Immediate LCO Bases: uncontrolled release of the tank's contents, the resulting whole body exposure to a MEMBER OF THE PUBLIC at the nearest SITE BOUNDARY will not exceed 0.5 rem

Question: 05-84

1 Pt(s)

Initial Conditions:

- Reactor coolant pump (NCP) seal leak off indications:
 - 1A NCP is 4.6 gpm
 - 1B NCP is 4.8 gpm
 - 1C NCP is 4.9 gpm
 - 1D NCP is 5.2 gpm
- NC leakage calculation shows 0.5 gpm unidentified leakage

Current Conditions:

- The VCT relief valve fails open and does not reseal

What effect will this have on NCP seal leakoff, and what action is required?

- A. NCP seal leakoff flow will increase.
Notify Security within 15 minutes that the SSF is degraded.
- B. NCP seal leakoff flow will decrease.
Immediately declare the standby makeup pump inoperable and if the standby makeup pump is not restored within 7 days, declare the SSF inoperable.
- C. NCP seal leakoff flow will increase.
Immediately declare the standby makeup pump inoperable and if the standby makeup pump is not restored within 7 days, declare the SSF inoperable.
- D. NCP seal leakoff flow will decrease.
Notify Security within 15 minutes that the SSF is degraded.

Question: 05-84

Answer: A

LEVEL:	SRO
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K/A	SYS003	Title	Reactor Coolant Pump
	A2.05	Description	Ability to (a) predict the impacts of the following malfunctions or operations on the RCPS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: (CFR: 41.5 / 43.5/ 45.3 / 45/13) Effects of VCT pressure on RCP seal leakoff flows
		Importance	2.5/2.8

SOURCE	New
LEVEL of KNOWLEDGE	Memory
Lesson	OP-CN-PS-NCP
Objectives	3
REFERENCES	SLC 16.7-9
Author	RJK
Time	

Distracter Analysis:

SRO ONLY because RO job function is not to determine who needs to be notified based on Tech Spec/SLC entries. The SRO function is to enter this into the TSAIL computer which is where the prompt is provided to notify Security. TSAIL entry is part of an SRO T&Q Guide associated with the Work Control Center.

The tank has a hydrogen pressure regulator to maintain overpressure. If pressure decreases, NCP seal leakoff increases.

- A. **Correct:**
- B. **Incorrect: Leakoff will increase** SSF is inoperable based on the STDBY M/U pump, not after 7 days.
- C. **Incorrect:** First part is true SSF is inoperable based on the STDBY M/U pump, not after 7 days.
- D. **Incorrect: Leakoff will increase** second part is true

Question: 05-85

1 Pt(s)

Given the following conditions:

- All efforts to open 1NI-185A (ND Pump 1A Cont Sump Suct) and 1NI-184B (ND Pump 1B Cont Sump Suct) have failed
- The crew has implemented EP/1/A/5000/ECA-1.1, Loss of Emergency Coolant Recirculation
- Refueling Water Storage Tank (FWST) level is 9%
- Containment pressure is 8 psig
- 1A and 1B containment spray (NS) pumps are running

Based on the current conditions:

1. How are NS pumps operated at this point per EP/1/A/5000/ECA-1.1?
 2. What is the basis for operating NS pumps in this manner?
-
- A.
 1. Shutdown both NS pumps.
 2. To prevent pump cavitation.
 - B.
 1. Secure one NS pump. Continue operating one NS pump aligned to the FWST.
 2. To conserve FWST inventory.
 - C.
 1. Shutdown both NS pumps.
 2. To conserve FWST inventory.
 - D.
 1. Secure one NS pump. Continue operating one NS pump aligned to the FWST.
 2. To prevent pump cavitation.

Question: 05-85

Answer: C

LEVEL:	SRO
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K/A	SYS026	Title	Containment Spray
	A2.02	Description	Ability to (a) predict the impacts of the following malfunctions or operations on the CSS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: (CFR: 41.5 / 43.5 / 45.3 / 45.13) Failure of automatic recirculation transfer
		Importance	4.2/4.4

SOURCE	NEW
LEVEL of KNOWLEDGE	Memory
Lesson	OP-CN-EP-CSF
Objectives	1
REFERENCES	EP/1/A/5000/FR-Z.1 rev 010 EP/1/A/ECA-1.1 rev 26
Author	RJK
Time	11/10/05

Distracter Analysis:

Based on current conditions: ECA-1.1 (Loss of Emergency Coolant Recirculation) is the controlling procedure.

In both procedures, NS pumps would not be operated until CNT pressure reaches 10 psig. The reason is to conserve FWST inventory. Pump cavitation is not assumed to occur until level is <5% power.

- A. **Incorrect:** Right NS pump configuration. Wrong basis.
- B. **Incorrect:** Wrong NS pump configuration. Right basis.
- C. **Correct:**
- D. **Incorrect:** Wrong NS pump configuration, wrong basis.

Question: 05-86

1 Pt(s) Unit 1 is in Mode 5 following refueling. All S/Gs were drained and have just been refilled with condensate water per Chemistry request.

The following conditions existed during the filling operation and have been verified to be the current conditions:

Primary conditions:

- 1A ND Hx inlet temperature 185 °F
- 1B ND Hx inlet temperature 185 °F
- NC pressure 218 psig

Secondary conditions:

- S/G 1A CF inlet temperature 71 °F
- S/G 1B CF inlet temperature 72 °F
- S/G 1C CF inlet temperature 68 °F
- S/G 1D CF inlet temperature 71 °F
- All S/Gs pressures are 0 psig.

Based on the reported conditions, what is the action required by Selected License Commitments and the basis for that action?

- A. Reduce NC pressure to less than or equal to 200 psig within 30 minutes.
To prevent a NC cooldown and subsequent reduction in shutdown margin.
- B. Increase 1C S/G secondary temperature to greater than 70 °F within 1 hour.
To prevent a NC cooldown and subsequent reduction in shutdown margin.
- C. Reduce NC pressure to less than or equal to 200 psig within 30 minutes.
To prevent a challenge to steam generator nil ductility temperature limits.
- D. Increase 1C S/G secondary temperature to greater than 70 °F within 1 hour.
To prevent a challenge to steam generator nil ductility temperature limits.

Question: 05-86

Answer: C

LEVEL:	SRO
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K/A	SYS035	Title	Steam Generator
	G2.1.33	Description	Ability to recognize indications for system operating parameters which are entry-level conditions for technical specifications. (CFR: 43.2 / 43.3 / 45.3)
		Importance	3.4/4.0

SOURCE	NEW
LEVEL of KNOWLEDGE	Memory
Lesson	OP-CN-CF-SG
Objectives	25
REFERENCES	SLC 16.5-7
Author	RJK
Time	6/24/2005 11:42 AM 57 minutes

Distracter Analysis:

- A. **Incorrect:** This is not a correct basis although under other shutdown conditions, primary cooldown could lead to inadvertent criticality (the basis of boron concentration - mode 5) correct action,
- B. **Incorrect:** Temperature increase over 1 hour will not meet the action. And wrong basis.
- C. **Correct:** .
- D. **Incorrect:** Temperature increase over 1 hour will not meet the action, correct basis.

Question: 05-87

1 Pt(s)

Initial conditions:

- Unit 1 is operating at 10-8 amps taking critical data
- One atmospheric steam dump opens
- Crew is performing AP/1/A/5500/028, Secondary Steam Leak

What action is taken per AP/1/A/5500/028 to attempt to close the dump valve, and what design bases consideration (per Tech Spec 3.4.2, RCS Minimum Temperature for Criticality) is assured if this action is successful?

- A. Take "A" and "B" "STEAM DUMP INTLK BYP" switches to "OFF/RESET"
Steam generators are above their nil ductility reference temperature.
- B. Dispatch operator to close the atmospheric dump valve isolation locally.
MTC will be in the range of slightly positive to negative.
- C. Take "A" and "B" "STEAM DUMP INTLK BYP" switches to "OFF/RESET"
The pressurizer is within its normal startup and operating range.
- D. Dispatch operator to close the atmospheric dump valve isolation locally.
Proper indication and response of the excore detectors when the reactor is critical.

LEVEL:	SRO
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K/A	SYS041	Title	Steam Dump/Turbine Bypass Control
	A2.02	Description	Ability to (a) predict the impacts of the following malfunctions or operations on the SDS; and (b) based on those predictions or mitigate the consequences of those malfunctions or operations: (CFR: 41.5/43.5/45.3/45.13) Steam valve stuck open
		Importance	3.6/3.9

SOURCE	NEW
LEVEL of KNOWLEDGE	Analysis
Lesson	OP-CN-STM-IDE
Objectives	2,3,4
REFERENCES	AP/1/A/5500/028 rev 04 SLC 16.5-7, TS 3.4.2 Verified on simulator (see below)
Author	RJK
Time	7/1/2005 1:56 PM 144 minutes

Distracter Analysis:

Atmospheric dumps have manual isolation valves available on the control boards. The procedure does not address sending operators out to locally close an isolation valve. The second parts of each answer are correct except for A which is semi correct (its nil ductility temperature of the Rx vessel, not the S/G)

- A. Incorrect First part is correct. Second part is incorrect.
- B. Incorrect: First part is incorrect. Second part is correct.
- C. Correct:
- D. Incorrect: First part is incorrect. Second part is correct.

Question: 05-88

1 Pt(s)

A blended makeup was completed at 0800, and due to problems with the makeup system, an insufficient amount of boron was added.

Given the following two sets of Thermal Power Best Estimate OAC readings:

	0800	0830
RX POWER LEVEL (OAC display)		
BEST EST	100.17%	101.35%
SECONDARY	100.17%	101.35%
PRIMARY	99.22%	99.35%
15 MINUTE	99.90%	100.45%
1 HOUR	99.89%	100.01%
12 HOUR	99.90%	99.97%

Based on the changes in OAC power readings, is the plant power condition acceptable at 0830 and what action (if any) is required?

- A. The 0830 power reading increases are acceptable.
No action is required due to the 12 HOUR power reading is less than 100%.
- B. The 0830 power reading increases are acceptable.
No action is required due to the PRIMARY power reading is less than 100%.
- C. The 0830 power readings are unacceptable.
Power shall be reduced due to the 1 HOUR power reading being greater than SOMP 01-02 (Reactivity Management) limits.
- D. The 0830 power readings are unacceptable.
Power shall be reduced due to the 15 MINUTE power reading being greater than SOMP 01-02 (Reactivity Management) limits.

Question: 05-88

Answer: D

LEVEL:	SRO
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K/A	GENERIC	Title	
	G2.1.7	Description	Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation (CFR: 43.5 / 45.12 / 45.13)
		Importance	3.7/4.4

SOURCE	NEW
LEVEL of KNOWLEDGE	Comprehension / Application
Lesson	OP-CN-CP-TPBE rev 008
Objectives	4
REFERENCES	SOMP-01-02 rev 000
Author	RJK
Time	12/8/2005

Distracter Analysis: All requirements are obtained from the REACTIVITY MANAGEMENT document SOMP-10-02.

- A. **Incorrect:** BEST EST and 15 MINUTE readings require action.
TRUE: the 12 HOUR is less than 100%
- B. **Incorrect:** Calculations from the Primary BEST EST are no longer used above 50% power.
These comments about SECONDARY would not be considered.
- C. **Incorrect:** Partially correct: BEST EST is only an evaluation BUT 15 MINUTE is a requirement.
- D. **Correct: A power reduction is required due to 15 MINUTE**

OP-CN-CP-TPBE lesson plan page 16 of 19 rev 008 (Break points for Unit 1)

Question: 05-89

1 Pt(s) Unit 1 was operating at 100% power.

Given the following:

0900 The unit was stabilized at 58% by the crew following a trip of 1A CF pump.

1300 Chemistry just reported that Dose equivalent I-131 was 175 $\mu\text{Ci/gm}$ based on a sample taken 1 hour ago.

Which ONE of the following describes the operator actions that will comply with the requirements of Technical Specifications and what limit forms the basis for this LCO?

Reference Provided

- A. Restore dose equivalent I-131 to within limits within 48 hours or be in Mode 3 with T_{avg} less than 500 °F within the following 6 hours.
Prevents exceeding the whole body exposure limits of any member of the public at the nearest site boundary during an accident.
- B. Restore dose equivalent I-131 to within limits within 48 hours or be in Mode 3 with T_{avg} less than 500 °F within the following 6 hours.
Prevents exceeding the whole body exposure limits of employees within the site boundary.
- C. Be in Mode 3 with T_{avg} less than 500 °F within 6 hours.
Prevents exceeding the whole body exposure limits of any member of the public at the nearest site boundary during an accident.
- D. Be in Mode 3 with T_{avg} less than 500 °F within 6 hours.
Prevents exceeding the whole body exposure limits of employees within the site boundary.

Question: 05-89

Answer: C

LEVEL:	SRO
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K/A	GENERIC	Title	
	G2.1.34	Description	Ability to maintain primary and secondary plant chemistry within allowable limits (CFR: 41.10 / 43.5 / 45.12)
		Importance	2.3/2.9

SOURCE	NEW
LEVEL of KNOWLEDGE	Application
Lesson	OP-CN-CH-PC
Objectives	17
REFERENCES	TS 3.4.16 PROVIDED
Author	RJK
Time	7/1/2005 2:36 PM 51 minutes

Distracter Analysis:

- A. Incorrect:** When above the limit, Action C is immediately entered.
- B. Incorrect:** When above the limit, Action C is immediately entered.
- C. Correct:**
- D. Incorrect:** Student may think that reducing power to put I-131 in the acceptable range is all that needs to be done. Action A would still apply.

Question: 05-90

1 Pt(s)

Given the following information:

- Unit 2 is shutdown for a refueling outage
- Repair work on 2A safety injection pump was completed and a retest scheduled on dayshift
- The red tags were lifted on dayshift for the retest
- Delays in the schedule have caused the retest to be rescheduled for nightshift
- The red tags remain lifted

Which of the following statements lists the person (by title) who shall coordinate the completion of the retest and how the lifted red tags are controlled while the plant transitions to nightshift?

- A. Maintenance Work Group supervisor.
No additional actions are required for the lifted tags.
- B. Work Control Center SRO.
No additional actions are required for the lifted tags.
- C. Outage Primary Execution Group supervisor.
Lifted tags are required to be voided and new tags placed until the schedule allows the test to begin.
- D. Unit 2 Supervisor (SRO).
Lifted tags are required to be voided and new tags placed until the schedule allows the test to begin.

Question: 05-90

Answer: B

LEVEL:	SRO
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K/A	GENERIC	Title	
	G2.2.20	Description	Knowledge of the process for managing troubleshooting activities. (CFR: 43.5 / 45.13)
		Importance	2.2/3.3

SOURCE	NEW
LEVEL of KNOWLEDGE	MEMORY
Lesson	OP-CN-ADM-NS-02
Objectives	10
REFERENCES	OMP 2-18 rev 065 page 5 of 18
Author	RJK
Time	

Distracter Analysis:

- A. Incorrect: False:** the MNT supervisor could be involved in the plan for the retest, but the WCC SRO is responsible for coordinating the retest. The MNT group CAN lift tags on valve MOV breakers for retest but not pumps.
False: The crews are not required to re-verify already approved lifted tags.
- B. Correct:** WCC SRO is responsible for coordinating the retest. The lifted tags are allowed until the test is performed.
- C. Incorrect: True:** Outage Control Group are the only one allowed to void tags.
False: The lifted tags are allowed until the test is performed.
- D. Incorrect: True,** the Unit 2 supervisor can be used to coordinate the retest.
False: The lifted tags are allowed until the test is performed.

Question: 05-91

1 Pt(s) A compensatory action has been used for the past 3 days to maintain proper refrigerant levels due to a refrigerant leak on Control Room "A" chiller. Maintenance now has a plan to repair the leak.

Given the following sequence of events:

- Control room chiller "A" is shutdown and red tagged for the leak repair.
- Control room chiller "A" is re-energized/realigned in preparation for retesting.
- Control room chiller "A" is retested and no refrigerant leaks are found.

Which of the following statements describe the first time the chiller is required to be declared inoperable and when the chiller can be declared operable?

- A. When the refrigerant leak was initially discovered 3 days ago.
When the chiller is re-energized/realigned.
- B. When the refrigerant leak was initially discovered 3 days ago.
When the chiller is retested and no leaks found.
- C. When the chiller is shutdown and red tagged.
When the chiller is re-energized/realigned.
- D. When the chiller is shutdown and red tagged.
When the chiller is retested and no leaks found.

Question: 05-91

Answer: D

LEVEL:	SRO
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K/A	GENERIC	Title	
	G2.2.21	Description	Knowledge of pre- and post-maintenance operability requirements (CFR: 43.2)
		Importance	2.3/3.5

SOURCE	NEW
LEVEL of KNOWLEDGE	Memory
Lesson	OP-CN-ADM-TS
Objectives	4
REFERENCES	NSD -203 appendix F example 23.
Author	RJK
Time	29 minutes add 60 minutes from original replaced question.

Distracter Analysis:

- A. **Incorrect:** The initial leak is not a requirement for inoperability, and the compaction ensures operable but degraded. And an operator might think it can be cleared as soon the leak is repaired.
- B. **Incorrect:** The initial leak is not a requirement for inoperability, and the compaction ensures operable but degraded. But an operator might think it cannot do the short term requirements either.
- C. **Incorrect:** Without the testing we will not declare a component operable, but the operator may think that the leak repair and realignment is sufficient.
- D. **Correct: See below.**

NSD 203 appendix F

As an example of an effect on mission-time, the design basis of McGuire's Control Room Area Chilled Water System (CRACWS) is to maintain the control room temperature for thirty days of continuous occupancy following a design basis accident. Should one train of CRACWS develop a refrigerant leak or other condition that would prevent it from performing its safety function for thirty days following a postulated accident, then that train is inoperable. It does not matter if the train is currently operating and maintaining control room temperature within acceptable limits. If a compensatory action can be implemented to replenish refrigerant during the thirty day period (refer to 203.7.3 and/or guidance in this appendix on pre-approved compensatory measures), then the CRACWS train can be declared Operable But Degraded/Nonconforming

Question: 05-92

1 Pt(s)

Given the following:

- A LOCA has occurred in Unit 2
- The TSC has been fully staffed and activated
- An individual is needed for lifesaving activities during which 20 Rem of TEDE exposure is expected to be received

Which one of the following is correct concerning this lifesaving activity?

- A. The individual is required to be a volunteer and the TSC Emergency Coordinator is required to approve the exposure.
- B. The individual is required to be a volunteer and the Operations Shift Manager is required to approve the exposure.
- C. The individual is not required to be a volunteer and the TSC Emergency Coordinator is required to approve the exposure.
- D. The individual is not required to be a volunteer and the Operations Shift Manager is required to approve the exposure.

Question: 05-92

Answer: C

LEVEL:	SRO
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K/A	GENERIC	Title	
	G2.3.4	Description	Knowledge of radiation exposure limits and contamination control, including permissible levels in excess of those authorized (CFR: 43.4 / 45.10) Radiation hazards that may arise during abnormal situations, including maintenance activities and various contamination conditions.
		Importance	2.5/3.1

SOURCE	NEW
LEVEL of KNOWLEDGE	Memory
Lesson	OP-CN-RAD-HP rev 20
Objectives	17
REFERENCES	HP lesson plan page 11
Author	RJK
Time	8/17/2005 10:52 AM 71 minutes plus 27 minutes.

Distracter Analysis: The PSE dose does not add to your occupational dose. PSE annual is limited to 5 REM. Lifetime PSE dose is limited to 25 annual or 25 REM

- A. **Incorrect:** Not required to be a volunteer
- B. **Incorrect:** Not required to be a volunteer, wrong person.
- C. **Correct:**
- D. **Incorrect:** Wrong person.

Question: 05-93

1 Pt(s) Given the following events and conditions:

- An ALERT was declared 10 minutes ago due to a steam generator tube rupture.
- 1EMF-33 (Condenser Air Ejector Exhaust) counts are increasing.
- TSC and OSC are not yet activated.

Which one of the following tasks is required to be performed by shift radiation protection technicians prior to TSC activation per RP/0/A/5000/003 (Alert)?

- A. Determine that a release has occurred and the significance of the release.
- B. Perform off-site dose assessment.
- C. Contact state, local or federal authorities concerning the release.
- D. Grant permission for any needed planned emergency exposures.

Question: 05-93

Answer: B

LEVEL:	SRO
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K/A	GENERIC	Title	
	G2.4.36	Description	Knowledge of chemistry / health physics tasks during emergency operations (CFR: 43.5)
		Importance	2.0/2.8

SOURCE	New
LEVEL of KNOWLEDGE	Memory
Lesson	OP-CN-EP-SEP
Objectives	20
REFERENCES	RP/0/A/5000/003 rev 040
Author	RJK
Time	6/27/2005 2:01 PM 47 minutes

Distracter Analysis: Per RP/06A if EMF-33 or alternate means indicate S/G tube leakage, a release is in progress.

- A. **Incorrect:** This is partially correct. The OSM determines if a release is occurring, but RP determines the significance of the release.
- B. **Correct:**
- C. **Incorrect:** This is performed by the control room before the TSC is manned by contacting the environmental management group.
- D. **Incorrect:** Only the RP manager is used for this purpose, but someone may think that prior to manning the ERO, an RP tech could be consulted.

RP / 03 immediate actions

_____ 2.4 **IF** there is an indication of a radioactive release **AND** the TSC is not activated, contact RP shift to perform off-site dose assessment per HP/0/B/1009/026.

Question: 05-94

1 Pt(s)

Which one of the following sets of critical safety functions (CSFs):

- is listed in the correct order per the CSF status trees from highest to lowest priority

AND

- forms the bases for protection of the reactor coolant system (NC) pressure boundary?

- A. 1. NC Integrity 2. Core Cooling 3. Heat Sink
- B. 1. Core Cooling 2. Heat Sink 3. NC Integrity
- C. 1. Heat Sink 2. NC Integrity 3. NC Inventory
- D. 1. NC Integrity 2. NC Inventory 3. Heat Sink

Question: 05-94

Answer: C

LEVEL:	SRO
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K/A	GENERIC	Title	
	G2.4.22	Description	Knowledge of the bases for prioritizing safety functions during abnormal/emergency operations (CFR: 43.5 / 45.12)
		Importance	3.0/4.0

SOURCE	NEW
LEVEL of KNOWLEDGE	Comprehension
Lesson	OP-CN-EP-CSF
Objectives	2
REFERENCES	Lesson plan information page 10
Author	RJK
Time	7/1/2005 3:17 PM 64 minutes

Distracter Analysis:

- A. **Incorrect:** Wrong order , wrong functions. But an operator might think that NC may be damaged due to lack of adequate cooling.
- B. **Incorrect:** Right order, wrong functions. But an operator might think that NC may be damaged due to lack of adequate cooling.
- C. **Correct:**
- D. **Incorrect:** Wrong order, but the right functions.

Question: 05-95

1 Pt(s) Given the following conditions:

- Unit 1 tripped from 100% power due to a complete loss of offsite power
- The transient caused a LOCA
- 1A D/G output breaker 86D relay actuated
- 1ETB undervoltage status lights are DARK

2 minutes later the RO reports the following indications on 1A and 1B NI pump E30 pushbuttons:

- 1A NI pump "ON" and "OFF" lights are DARK
- 1B NI pump "ON" and "OFF" lights are DARK
- 1A and 1B D/G load sequencer "RESET" lights are DARK
- ECCS train "A" and "B" "RESET" lights are DARK

1 hour later, the following conditions exist:

- 1A D/G load sequencer "RESET" light is DARK
- 1B D/G load sequencer "RESET" light is LIT
- ECCS train "A" and "B" "RESET" lights are LIT
- Pressurizer level is 40%
- NC pressure is stable
- All NC Thots are 340°F
- Subcooling is 12°F
- The SRO is at Step 19 of EP/1/A/5000/ES-1.2, Post LOCA Cooldown and Depressurization.

Reference provided

Which one of the following component manipulations is performed next in EP/1/A/5000/ES-1.2?

- A. Stop one NV pump
- B. Stop one NI pump
- C. Start one ND pump
- D. Isolate cold leg accumulators

Question: 05-95

Answer: B

LEVEL:	SRO
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K/A	APE056	Title	Loss of Offsite Power
	AA2.03	Description	Ability to determine and interpret the following as they apply to the Loss of Offsite Power: (CFR: 43.5 / 45.13) Operations status of safety injection pump.
		Importance	3.8/3.9

SOURCE	NEW
LEVEL of KNOWLEDGE	Analysis
Lesson	OP-CN-ECCS-NI
Objectives	
REFERENCES	EP/1/A/5000/ES-1.2 PROVIDED (pages 17-19, and 32-33)
Author	JKS
Time	8/17/2005 9:41 AM 61 minutes

Distracter Analysis: 1A NV pump and 1A NI pump is off because 1ETA has no power due to the 86D relay. 1B NI and NV pumps are running. Normally, when the D/G sequencer actuates, both the on and off lights on NI pumps are dark until the sequencer is reset (this is different than most sequencer controlled equipment). Therefore based on board E30 indication alone, it is plausible that 1A NI is running since no flow or amp indication is given.

- A. **Incorrect:** This would be correct if both NV pumps are on and both NI pumps are on.
- B. **Correct:**
- C. **Incorrect:** This would be correct if determined subcooling was less than required based on pump status assumed. IF BOTH ND pumps are off, one is started. 1B ND pump should be running.
- D. **Incorrect:**

Question: 05-96

1 Pt(s)

Given the following conditions:

- EP/2/A/5000/FR-C.2 (Response to Degraded Core Cooling) is in progress
- Reactor coolant pumps (NCP) 2A and 2C are in service
- Reactor vessel dynamic D/P is 3% less than required
- The crew has just completed depressurizing the S/Gs to 110 psig

What is the mitigation strategy in accordance with EP/1/A/5000/FR-C.2?

- A. Shutdown all NCPs. Depressurize the NC system by depressurizing the steam generators to atmospheric pressure.
- B. Shutdown all NCPs. Do not depressurize the steam generators further.
- C. Continue to run both NCPs. Depressurize the NC system by depressurizing the steam generators to atmospheric pressure.
- D. Continue to run both NCPs. Do not depressurize the steam generators further.

Question: 05-96

Answer: A

LEVEL:	SRO
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K/A	WE06	Title	
	EA2.2	Description	Ability to determine and interpret the following as they apply to the (Degraded Core Cooling) (CFR: 43.5 / 45.13) Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments.
		Importance	3.5/4.1

SOURCE	New
LEVEL of KNOWLEDGE	Comprehension
Lesson	OP-CN-EP-FRC
Objectives	2
REFERENCES	EP/2/A/5000/ FR-C.2 (Response to Degraded Core Cooling) revision 15 And background document
Author	RJK
Time	6/30/2005 2:40 PM 146 minutes

Distracter Analysis:

- A. Correct:** Pumps must be shutdown due to loss of Seal D/P when S/Gs are depressurized to atmospheric pressure.
- B. Incorrect:** S/Gs ARE further depressurized.
- C. Incorrect:** At this point, the only viable effort left is the continue blow down of the S/G to lower NC pressure and increase SI flow. You cannot operate a NCP with low Seal D/P as you depressurize the NC system. An operator may think a cooldown leaving pumps on to sacrifice is acceptable.
- D. Incorrect: Pumps are shutdown.**

Question: 05-97

1 Pt(s) Given the following conditions:

- Unit 1 is at 8% power
- Pressurizer pressure Channel III fails high
- Crew is performing actions per AP/1/A/5500/011, Pressurizer Pressure Anomalies
- The following associated channel bistables have been placed in the trip condition:
 - PZR LO PRESSURE REACTOR TRIP
 - PZR HI PRESSURE REACTOR TRIP
 - PZR LO PRESSURE S/I

What additional associated reactor protection channel bistable is required to be placed in the trip condition, and what is the basis of tripping this bistable?

- A. OP Delta T bistable
To minimize the potential to violate DNB limits
- B. OT Delta T bistable
To minimize a challenge to the pressurizer safeties
- C. OT Delta T bistable
To minimize the potential to violate DNB limits
- D. OP Delta T bistable
To minimize a challenge to the pressurizer safeties

Question: 05-97

Answer: C

LEVEL:	RO/SRO
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K/A	SYS012	Title	Reactor Protection
	A2.1.20	Description	Ability to execute procedure steps. (CFR: 41.10 / 43.5 / 45.12)
		Importance	4.3/4.2

SOURCE	NEW
LEVEL of KNOWLEDGE	Memory
Lesson	OP-CN-IC-ENB
Objectives	11 and 12
REFERENCES	AP/1/A/5500/016 rev 20
Author	RJK
Time	7/11/2005 9:49 AM 71 minutes

Distracter Analysis: PZR pressure is related to the OTDT setpoint and the basis for this bistable is to minimize the potential for violating DNB limits.

- A. **Incorrect:** wrong bistable, correct basis .
- B. **Incorrect:** right bistable, wrong reason
- C. **Correct:**
- D. **Incorrect:** wrong bistable, wrong reason

AP-16 Case 4 Immediate action

C. Operator Actions

① Verify all rod motion - STOPPED.

— IF unwarranted rod motion is occurring,
THEN place "CRD BANK SELECT" to
manual.

Question: 05-98

1 Pt(s)

Initial conditions:

- Unit 1 is operating at 100% power.
- 1B diesel generator (D/G) is running at 5750 KW for a periodic test
- 1A ND pump has been tagged to repair an emergent oil leak
- A LOCA and loss of offsite power occurs

One minute later the following conditions are noted:

- 1B NV Pump has the following indications:
 - No running amps are indicated
 - Both the "ON" and "OFF" light on the E30 pushbutton are DARK
- 1A NI Pump has the following indications:
 - No running amps are indicated
 - Both the "ON" and "OFF" light on the E30 pushbutton are DARK

Assuming all equipment not specifically addressed operated normally:

1. What is the current status of the ECCS system related to its design basis per Technical Specification 3.5.2 (ECCS - Operating)?
 2. When EP/1/A/5000/E-0, Reactor Trip or Safety Injection, is exited, what train(s) of ECCS and D/G load sequencers must be RESET?
- A. 1. There are enough ECCS pumps running to meet ECCS design criteria.
2. Both "A" and "B" trains must be RESET.
- B. 1. There are enough ECCS pumps running to meet ECCS design criteria.
2. Only "B" train must be RESET.
- C. 1. There are not enough ECCS pumps running to meet ECCS design criteria.
2. Both "A" and "B" trains must be RESET.
- D. 1. There are not enough ECCS pumps running to meet ECCS design criteria.
2. Only "B" train must be RESET.

Question: 05-98

Answer: A

LEVEL:	RO/SRO
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K/A	SYS064	Title	Emergency Diesel Generators
	A.2.16	Description	Ability to (a) predict the impacts of the following malfunctions or operations on the ED/G system; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: (CFR: 41.5 / 43.5 / 45.3 / 45.13) Loss of offsite power during full-load testing of ED/G
		Importance	3.3/3.7

SOURCE	NEW
LEVEL of KNOWLEDGE	Comprehension
Lesson	OP-CN-DG-EQB rev 028
Objectives	10
REFERENCES	Lesson plan pages 9 and 10
Author	RJK
Time	7/11/2005 1:59 PM 140 minutes

Distracter Analysis: Based on the conditions one minute later, both DGs should be running with LOCA loads. The D/G breaker will trip on overcurrent in this situation, and the LOCA will override the blackout and LOCA loads will sequence on. Since B D/G is running already, students may think that the B train sequencer wont work correctly or will only load blackout loads. In that case, the 1B ND pump would not be running (or NI) since these are LOCA-only loads. They should reset to attempt to restart the 1B NV pump as well.

Based on the conditions specified, 1A NV pump, 1A and 1B NI pumps and 1B ND pump would be running. Based on Tech Spec bases for ECCS operation, only one complete train is required meaning one of each TYPE of pump, not necessarily on the same train.

The 1B NV pump being off would cause the crew to attempt to reset ECCS and D/G load sequencer to attempt to start it, but they would not attempt to reset A train since the only pump not running is out for maintenance.

- A. **Correct:** .
- B. **Incorrect:** Both train would be reset
- C. **Incorrect:** Enough pumps are running
- D. **Incorrect:** Enough pumps are running, butboth trains are reset.

Question: 05-99

1 Pt(s)

Initial conditions:

- Unit 1 had a complete loss of switchyard
- The crew was performing steps in EP/1/A/5000/ES-0.2, Natural Circulation Cooldown
- Station management recommended a rapid cooldown due to secondary inventory concerns
- The crew transitioned to EP/1/A/5000/ES-0.3, Natural Circulation Cooldown with Steam Void in the Vessel

Current conditions:

- During the cooldown, a steam bubble formed in the reactor vessel
- Reactor vessel Upper Range (UR) level is 92%.
- The STA notes a YELLOW path on NC INVENTORY and confers with the OSM regarding the need to transition to EP/1/A/5000/FR-I.3, Response to Voids in Reactor Vessel.

Which one of the following is the correct action to control void growth such that natural circulation is not interrupted, and which procedure will be used to accomplish this?

- A. Open reactor vessel head vents per EP/1/A/5000/FR-I.3.
- B. Open reactor vessel head vents per EP/1/A/5000/ES-0.3.
- C. Energize pressurizer heaters per EP/1/A/5000/FR-I.3.
- D. Energize pressurizer heaters per EP/1/A/5000/ES-0.3.

LEVEL:	RO/SRO
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K/A	SYS002	Title	Reactor Coolant system
	Generic 2.1.23	Description	Ability to perform specific system and integrated plant procedures during all modes of plant operation (CFR: 45.2 / 45.6)
		Importance	3.9/4.0

SOURCE	NEW
LEVEL of KNOWLEDGE	Memory
Lesson	
Objectives	11
REFERENCES	EP/1/A/5000/ES-0.3 Natural Circulation Cooldown with Steam Voids in Vessel, LP OP-CN-EP-EP1, ES-0.3 basis document
Author	JEG
Time	11/22/2005 0700 AM 33 minutes

Distracter Analysis: ES-0.3 is implemented if the 50 °F/hr cooldown of ES-0.2 limit is not fast enough. ES-0.3 is designed to perform a plant cooldown on natural circulation, assuming that a void will develop in the reactor vessel head region. The operator monitors the void growth and the procedure requires that level in RV head be maintained greater than 73% UR level. The void level is controlled by the use of pressurizer heaters, (to control subcooling), and charging and letdown. FR-I.3 is entered from a yellow path on CSF status trees when Reactor vessel upper range level is not greater than 95%. This sends the crew to FR-I.3. This procedure is primarily for venting a hard bubble in the PZR, not collapsing a steam void. A transition to FR-I.3 is not necessarily incorrect, however, the first step will direct the crew back to ES0.3. Therefore, for the current conditions, NO actions are performed in FR-I.3 even if a transition occurs. ES 0.3 is used to maintain level greater than 73% to prevent a loss of natural circulation by increasing pressure (using PZR heaters).

- A. Incorrect:** No actions are taken in FR-I.3 for this condition, however, this IS an action in FR-I.3 to vent a non-condensable bubble.
- B. Incorrect:** This is the correct procedure to be in, however, this procedure does not vent the head, this is the action taken in FR-I.3 is the bubble is non-condensable gas.
- C. Incorrect:** No actions are taken in FR-I.3, this action is not in FR-I.3 but is an action that is used to control void formation in other procedures and is the correct ACTION in this condition.
- D. Correct:**

Question: 05-100

1 Pt(s)

Given the following leakage results from one hour ago:

- Current Identified leakage = 1.40 gpm
- Current Unidentified leakage = 0.73 gpm

Five minutes ago additional leakage is quantified as follows:

- One Pzr PORV leaking = 0.30 gpm

Which one of the following correctly describes the NC system operational leakage type and the required technical specification action on the leakage?

- A. The PORV leakage is identified. A tech spec shutdown is required.
- B. The PORV leakage is unidentified. A tech spec shutdown is required.
- C. The PORV leakage is identified. No tech spec shutdown is required.
- D. The PORV leakage is unidentified. No tech spec shutdown is required.

Question: 05-100

Answer: C

LEVEL:	RO/SRO
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K/A	SYS007	Title	Pressurizer Relief Tank
	G2.1.28	Description	Knowledge of the purpose and function of major system components and controls. (CFR 41.7)
		Importance	3.2/3.3

SOURCE	BANK CNS exam bank
LEVEL of KNOWLEDGE	Memory
Lesson	OP-CN-PS-NC
Objectives	10
REFERENCES	TECH SPEC's 3.4.11, 3.4.13
Author	RJK
Time	7/11/2005 3:45 PM 5 minutes plus 40 minutes

Distracter Analysis: Per Tech Spec, the PRT is a tank to quantify leakage, this leakage is considered identified. The leakage is less than the T.S. limit of 10 gpm and no shutdown is required.

- A. **Incorrect:** The leakage is identified but the leakage is less than T.S. and the PORV can be isolated to stop the leak.
- B. **Incorrect:** The leakage is identified but the leakage is less than T.S. and the PORV can be isolated to stop the leak.
- C. **Correct:**
- D. **Incorrect:** The leakage is identified. If the operator thinks the leakage is unidentified, then leakage is greater than T.S and a shutdown is required.