## FINAL SUBMITTAL

HARRIS EXAM 50-400/2004-301

FEBRUARY 23 - 27, 2004 & MARCH 4, 2004 (WRITTEN)

# FINAL RO WRITTEN EXAMINATION

U.S. Nuclear Regulatory Commission Site-Specific RO Written Examination					
Applicant	nformation				
Name:					
Date: 03/04/04	Facility/Unit: Harris				
Region: II	Reactor Type: Westinghouse				
Start Time: 0800	Finish Time:				
Use the answer sheets provided to document your answers. Staple this cover sheet on top of the answer sheets. To pass <b>the</b> examination you must achieve a final grade of at least 80.00 percent. Examination papers will be collected six hours after the examination starts.					
All work done on this examination <b>is</b> my own.	I have neither given nor received aid. Applicant's Signature				
Results					
Examination Value	Points				
Applicant's Score	Points				
Applicant's Grade	Percent				

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Following a Reactor Trip, the RCS temperature is being controlled by the Steam Dump Control System at 557°F.

Given the following range of instruments. if the Unit-SCO directs that Steam Dump Control System be placed in the Steam Pressure mode, what approximate setpoint is required to maintain the RCS temperature at  $480^{\circ}$ F?

- Steam header pressure full range: 0-1300 psig
  - Steam generator pressure full range: 0-1300 psig
- Turbine main steam pressure full range: 0-1500 psig

a. 37%

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**b.** 42%

c. 58%

d. 63%

ANSWER

b. 42%

<b>QUESTION NUMBER:</b>	1	TIER/GROUP:		1/1	
		KA IMPORTANCE:	RO	3.7	SRO
		10CFR55 CONTENT:	41(b)	7	43(b)

KA: 000007EA1.10

Ability to operate and monitor the following as they apply to a reactor trip: S/G pressure

#### **OBJECTIVE:** SDCS-3.0-4

Explain how the steam dump valves are automatically modulated in the *steam* pressure control mode, including control alignments, setpoint determination and adjustment, and the normal setpoint at power

DEVI	ELOPMEXT REFERENCES: Steam Tables OP-126 pg, 8
REFI	ERENCES SUPPLIED TO APPLICANT: Steam Tables
QUE	STIONSOURCE: NEW X SIGNIFICANTLY MODIFIED DIRECT
	BANK NUMBER FOR SIGNIFICANTLY MODIFIED / DIRECT: SDCS-R4 004
	NRC EXAM HISTORY. None
DIST	RACTOR JUSTIFICACTION (CORRECT ANSWER X'd):
a.	Plausible if the incorrect instrument is used to determine the range of the instrument (551/1500)
X b.	The equivalent steam pressure for the required RCS temperature is approximately 551 psig. This calculates to be a setpoint of $42\%$ (551 / 1300).
C.	Plausible if the correct instrument <b>is</b> used to determine <i>the</i> range of the instrument, <b>but</b> the calculation is performed incorrectly (1300 - 551 / 1300).
d.	Plausible if the incorrect instrument is used to determine the range of the instrument and the calculation is performed incorrectly (1500 - 551 / 1500).
DIFF	ICULTY ANALYSIS: COMPREHENSIVE / ANALYSIS KNOWLEDGE / RECALL DIFFICULTY RATING: 3

**EXPLANATION:** 

Must determine required stem pressure for RCS temperature and then calculate setpoint

Given the following conditions:

- The plant is operating at 95% power during a power ramp.
- The Reactor Operator attempts to perform a normal dilution for temperature control in accordance with OP-107, "Chemical and Volume Control System."
- 1CS-151, RMW TO BORIC ACID BLENDER FCV-114B, fails to open.

Which of the foilowing actions should he taken?

- a. Continue in OP-107, "Chemical and Volume Control System." and perform an Alternate Dilution
- b. Increase turbine load per GP-005, "Power Operation," to adjust RCS temperature
- c. Go to AOP-003, "Malfunction of Reactor Makeup Control," and perform an Alternate Dilution
- d. Go to AOP-003. "Malfunction of Reactor Makeup Control," and perform **a** local Manual Dilution

#### **ANSWER:**

d. Go to AOP-003, "Malfunction of Reactor Makeup Control," and perform a local Manual Dilution

<b>QUESTION NUMBER</b> 2	TIER/GROUP:		1/1	
	KA IMPORTANCE:	RO	4.0	SRO
	10CFR55 CONTENT:	41(b)	10	43(b)
<b>KA:</b> 000022G2.4.4				
Ability to recognize abnorm conditions for emergency ar	al indications for system op ad abnormal operating proce	erating p edures. (I	aramete Loss of H	rs which are entry-level Reactor Coolant Makeup)
<b>OBJECTIVE:</b> AOP-3.3-R1				
IDENTIFY symptoms that r	equire entry into AOP-003,	Malfunc	tion of l	Reactor Makeup Control
				-
<b>DEVELOPMENT REFEREN</b>	CES: AOP-003, pg 12-1	3, 25-26		
<b>REFERENCES SUPPLIED T</b>	<b>O APPLICANT</b> None	;		
QUESTION SOURCE:	NEW SIGNIFICA	NTLY 1	MODIF	IED DIRECT
BANK NUMBER F	OR SIGNIFICANTLY M	ODIFIE	D/DIR	ECT: AOP-3.3-R1 1
	NR	C EXAN	AHIST	ORY None
DISTRACTOR JUSTIFICAC	TION (CORRECT ANSV	VER X'd	):	
a. Plausible since alternate	dilution is a viable method	of dilutin	g the R	CS, but with 1CS-151 failed
closed, alternate dilution	will not function either.			
<b>b.</b> Plausible since adjusting	turbine load will result in a	change i	in RCS t	emperature, but temperature is
Plausible since alternate	dilution is a viable method	of dilutin	othe K(	CS but with 1CS-151 failed
closed, alternate dilution	will not function either.	or unutil	g the ite	co, out with roo 101 failed
<b>X</b> d. With $1CS-151$ closed, th	e only option available to d	ilute is to	perforn	n a local manual dilution.
DIFFICULTY ANALYSIS:				
X COMPREHENSIVE/ A	NALYSIS	KNOWI	EDGE	/ RECALL
DIFFICIJLTY RATING	: 3			

**EXPLANATION:** Analysis of the effect of a failure on the ability of the RMU system

Given the following conditions:

- The plant is operating at 50% power.
- PT-457, Channel III Pressurizer Pressure, has failed and all associated bistables are in *the* tripped condition.
- Power is subsequently lost to UPS Bus IDP-1A-S1.

Which of the following describes the effect of this loss of power on the Phase A Containment Isolation valves?

- a. NO Phase A Containment Isolation valves will close
- b. ONLY Train A Phase A Containment Isolation valves will close
- c. ONLY 'Train B Phase A Containment Isolation valves will close
- d. All Phase A Containment Isolation valves will close

#### **ANSWER:**

c. ONLY Train B Phase A Containment Isolation valves will close



QUESTION NUMBER: 3	<b>TIEWGROUP:</b>		2/1	
	KAIMPORTANCE:	RO	4.3	SRO
	10CFR55 CONTENT:	<b>41(b)</b>	7	43(b)

KA: 013K3.03

Knowledge of the effect that a loss or malfunction of the ESFAS will have on the following: Containment

**OBJECTIVE:** FSFAS- 3.0-4

PREDICT how loss of any of the four instrument buses Will affect the ESFAS output functions *a* each SSPS train

D	EVF	ELOPMENT REFERENCES:	AOF	P-024 pg 22	
			SD-	103 pg9, 11, 13	
R	EFE	CRENCES SUPPLIED TO API	PLICA	NT: None	
Q	UES	STION SOURCE: NEW		SIGNIFICANTLY MODIFIED	DIRECT
		RANK NIJMBER FOR SI	GNIF	ICANTLY MODIFIED / DIRECT:	ESFAS-3.0-R4 001
				<b>NRC EXAM HISTORY:</b>	None
D	IST	RACTOR JUSTIFICACTION	(COF	RRECT ANSWER X'd):	
	a.	Plausible since Train SA slave	elays	will not actuate, but Train SB relays wi	ll still actuate
	b.	Plausible since one train of Pha	se A w	vill not actuate, but the train that will no	t actuate is Train SA
X	C.	A loss of Bus IDP-1A-S1 under resulting in an SI and Phase A s and are energized to actuate, so	these ignal. Train	conditions will result in a 2/3 signal to Train SA slave relays, however, are po SA slaves will not perform their function	both trains of ESFAS, owered from IDP-1 <b>A-SI</b> on.
	d.	Plausible since SI and Phase A relays will not actuate due to no	signals t havii	s will be generated on both trains of ES ng power.	FAS, but Train SA slave
<b>D</b>					

#### **DIFFICULTY ANALYSIS:**

**COMPREHENSIVE/ ANALYSIS** 



**DIFFICULTY RATING:** 3

**EXPLANATION:** 

Analyze the effect of a loss of power on the actuation **signals and** determine which power supplies power which output relays

Given the following conditions:

- The unit is operating at **30%** power.
- A dropped Control Rank 'C' rod has just been re-aligned.
- While attempting to operate the ROD CONTROL ALARM RESET, the operator inadvertently operates the ROD CONTROL STAKT-UP RESET.

Which of the following describes the effect of operating the incorrect reset?

- **a.** All Control Hank 'C' rods drop into the core, causing an automatic reactor trip
- b. All rods, including Control Bank and Shutdown Bank rods, drop into the core, causing an automatic reactor trip
- c. All rods remain in their current position and there is **NO** effect on the Rod Control System circuitry
- d. All rods remain in their current position, but the Rod Control System circuitry indicates all rods arc fully inserted

#### **ANSWER:**

d. All rods remain in their current position, hut the Rod Control System circuitry indicates all rods are fully inserted

<b>QUESTION NUMBER:</b>	4	TIER/GROUP:		1/2	
		KAIMPORTANCE:	RO	3.6	SRO
		10CFR55 CONTENT:	41(b)	7	43(b)

KA: 000003AA1.02

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Ability to operate and / or monitor the following as they apply to the Dropped Control Rod: Controls and components necessary to recover rod

#### **OBJECTIVE:** RODCS-3.0-R7

DISCUSS the effects of manipulating each of the following rod control-related switches

- ROD CONTROL START-UP RESET switch
- ROD CONTROL ALARM RESET switch

#### DEVELOPMENT REFERENCES: AOP-001, pg 11

RODCS-3.0, pg 69

**REFERENCES SUPPLIED TO APPLICANT:** None

QUESTION SOURCE: NEW X SIGNIFICANTLY MODIFIED BANK NIJMBER FOR SIGNIFICANTLY MODIFIED/DIRECT: DIRECT RODCS-3.0-R7 001

NRC EXAM HISTORY. None

#### DISTRACTOR JUSTIFICACTION (CORRECTANSWER X'd):

- **a.** Plausible since improper operation of correct switch could result in rods dropping into core, but operated switch only resets starting points for rod control circuitry.
- **b.** Plausible since improper operation of correct switch could result in rods dropping into core, but operated switch only resets starting points for rod control circuitry.
- E. Plausible if misconception that effect is nothing if performed at power since switch is normally only operated prior to withdrawing any rods, but operated switch resets starting points for rod control circuitry.
- **X d.** Operating switch at power does not affect actual rod position, but resets rod control **such** that circuitry senses rods are at "full inserted" position.

#### **DIFFICIJLTY ANALYSIS:**

COMPREHENSIVE / ANALYSIS



DIFFICULTY RATING: 3

**EXPLANATION:** Knowledge of the function of rod control system controis

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Given the following conditions:

- A large steam break has occurred inside Containment.
- During the performance of PATH-1, the crew determined Containment pressure to he 18 psig and they verified proper operation of the Containment Spray System.
- A transition has just been mads to EPP-014. "Faulted Steam Generator Isolation."
- Containment pressure is now 22 psig.

Which of the following actions should be taken regarding the increase in Containment pressure'?

- a. Continue to monitor Containment pressure and transition to FRP-J.1, "Response to High Containment Pressure," if it exceeds 45 psig
- b. Continue to monitor Containment pressure and transition to FRP-J.1, "Response to High Containment Pressure," if it remains above 10 psig for more than 1 hour
- c. Transition to FRP-J.1, "Response to High Containment Pressure," to allow verification of proper operation of the Containment Fan Cooler fans
- d. Transition to E'RP-J.1, "Response to High Containment Pressure," to allow verification **of** proper operation of the Emergency Service Water Booster Pumps

#### **ANSWER:**

a. Continue to monitor Containment pressure and transition to FRP-J.1, "Response to High Containment Pressure," if it exceeds 45 psig

<b>QUESTION NUMBER:</b>	5	<b>TIER/GROUP:</b>		1/2	
		KA IMPORTANCE:	RO	3.3	SRO
		10CFR55 CONTENT:	41(b)	7	43(b)

#### **KA:** WE14EA1.2

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Ability to operate and / or monitor the following as they apply to the (High Containment Pressure) Operating behavior characteristics of the facility

#### **OBJECTIVE:** 3.13-4

Given the following EOP steps, notes, and cautions. DESCRIBE the associated basis

• CSF decision points

DEVELOPMENT REFERENCES:	CSFST-Containment FRP-J,1 BD-3,13-HO, pg <b>5-6</b>	
<b>REFERENCES SUPPLIED TO APP</b>	LICANT: None	
QUESTION SOURCE: X NEW	SIGNIFICANTLY MODIFIED	DIRECT
BANK NUMBER FOR SI	<b>GNIFICANTLY MODIFIED / DIRECT:</b>	New
	NRC EXAM HISTORY:	None
UISTRACTOR JUSTIFICACTION	(CORRECT ANSWER X'd):	

- **X** a. Provided containment pressure is between 10 and 45 psig and at least one spray pump has been verified operating and providing flow, a transition *is* not required to FRP-J.1 per the CSFST as this is only a yellow path.
  - **b.** Plausible since two containment spray pumps should reduce containment pressure **and** the liner acts as a gas membrane to maintain leakage within limits for up to 24 hours at nearly design pressure, but a transition would not be required unless containment pressure were to exceed 45 psig.
  - **c.** Plausible since the containment fan coolers assist the containment spray system in reducing containment pressure, but these conditions result in a yellow path only, allowing the crew to focus on more time critical tasks, such as isolating **a** faulted SG.
  - **d.** Plausible since the ESW booster pumps are checked **in** FRP-J.1 to ensure radiological releases are minimized, **but** these conditions result in a yellow path only, allowing the crew to focus on more time critical tasks, such as isolating a faulted SG.

#### DIFFICULTY ANALYSIS:

X COMPREHENSIV	E/ANALYSIS KNOWLEDGE/RECALL
<b>DIFFICULTY RAT</b>	ING: 3
<b>EXPLANATION:</b>	Comprehension of the priority of actions to be taken regarding containment
	pressure

Given the following conditions:

- FRP-H.1, "Response to a Loss of Secondary Heat Sink," is being implemented.
- RCS bleed and feed has been initiated when Auxiliary Feedwater (AFW) capability is restored.
- All SGs are completely dry and depressurized.

Which of the foilowing describes the strategy used to re-establish feed under these conditions?

- a. Feed ONLY one (1) SG to ensure KCS cooldown rates are established within 'Technical Specification limits
- b. Feed ONLY one (1) SG to limit the possibility of a SG tube rupture to a single SG
- c. Feed ALL SGs to establish subcooling conditions in the RCS as soon as possible
- d. Feed ALL SGs to allow termination of RCS bleed and feed as soon as possible

#### **ANSWER:**

b. Feed ONLY one (1) SG to limit the possibility of a SG tube rupture to a single SG

<b>QUESTION NUMBER</b>	6	TIER/GROUP:		1/1	
		KA IMPORTANCE:	RO	3.6	SRO
		10CFR55 CONTENT:	<b>41(b)</b>	8/10	43(b)

KA: 000054AK1.02

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Knowledge of the operational implications of the following concepts as they apply to Loss of Main Feedwater (MFW): Effects of feedwater introduction on dry S/G  $\,$ 

#### **OBJECTIVE:** 3.11-4

Given the following EOP steps, notes, and cautions, DESCRIBE the associated basis

• Feed restoration

DEVELOPMENT REFERENCES:	FRP-13.1, <b>pg</b> 47 LP-3.11, <b>pg</b> 12	
<b>REFERENCES SUPPLIED TO APP</b>	PLICANT: None	
QIJESTION SOURCE: X NEW	SIGNIFICANTLY MODIFIED	DIRECT
BANK NUMBER FOR SIG	GNIFICANTLY MODIFIED / DIRECT:	New
	NRC EXAM HISTORY:	None
<b>DISTRACTOR JUSTIFICACTION</b>	(CORKECT ANSWER X'd):	

- **a.** Piausihle since feed is established to only one dry SG, but the reason is to **ensure** any subsequent failures due to thermal shock are limited to a single SG.
- **X** b. Flow should only be established to one dry SG so that if excess thermal shock causes failure, the failure is limited to one SG.
  - c. Plausible since RCS subcooling is a desirable condition to achieve, but only one SG at a time is fed.
  - **d.** Plausible since terminating RCS bleed and feed *is* a desirable condition to achieve, but only one SG **at** a time is fed.

#### **UIFFICCLTY ANALYSIS:**

**COMPREHENSIVE/ ANALYSIS** 



**DIFFICULTY RATING:** 3

**EXPLANATION:** Knowledge of the requirements for feeding a dry SG and the reasons for these actions

Given the following conditions:

- The unit is at 100% power.
- The running CSIP trips at 0930.
- AOP-018, "Reactor Coolant Pump Abnormal Conditions," actions have been completed and the standby CSIP is started at 0933.

Which of the following actions should be taken to establish seal cooling to the RCPs in accordance with AOP-018?

- a. Adjust HC-186.1, RCP SEAL WTR INJ FLOW, to establish 8 to 13 gprn seal injection flow
- b. Adjust HC-186.1, RCP SEAL WTR INJ FLOW, to establish a 1°F per minute cooldown rate of the seals until 8 to 13 gpm seal injection flow is established
- c. Locally adjust 1CS-340 / 381 i422, RCP A / B / C SEAL INJ MANUAL ISOL, to establish 8 to 13 gprn seal injection flow
- d. Locally adjust 1CS-340 / 381 i422. RCP A i B / C SEAL INJ MANUAL ISOL, to establish a 1°F per minute cooldown rate of the seals until 8 to 13 gpm seal injection flow is established

#### ANSWER

a. Adjust HC-186.1, RCP **SEAL** WTR INJ FLOW. to establish 8 to 13 gpm seal injection flow

<b>QUESTION NUMBER:</b>	7	<b>TIEWGROUP:</b>		2/1	
		<b>MAIMPORTANCE:</b>	RO	3.3	SRO
		10CFR55 CONTENT:	<b>41(b)</b>	7	<b>43(b)</b>

KA: 003A4.01

VALUE AND ADDRESS OF

Ability to manually operate and/or monitor in the control room: Seal injection

#### **OBJECTIVE:** AOP-3.18-3

Given a set of plant conditions and a copy of AOP-018, DETERMINE the appropriate response

## DEVELOPMENT REFERENCES: AOP-018, p 38

#### **REFERENCES SUPPLIED TO APPLICANT:** None

QUESTION SOURCE: NEW SIGNIFICANTLY MODIFIED RANK NUMBER FOR SIGNIFICANTLY MODIFIED / DIRECT:

	DIRECT
Ha	ris I.OCT B04 073

NRC EXAM HISTORY: None

#### DISTRACTOR JUSTIFICACTION (CORRECT ANSWER X'd):

- **X a.** With **seal** injection **flow** lost for less than 5 minutes, seal injection can be established by adjusting HC-186.1 without concern for damage to the seals.
  - b. Plausible since this action would he taken if seal injection flow was lost **for** more than 5 minutes, but it is not necessary to consider the cooldown rate if lost for less than 5 minutes.
  - c. Piausihle since these actions would be taken if the cause of the **loss** of seal injection flow was other than a tripped CSIP and the flow was lost for less than 5 minutes, but with the loss of the CSIP as the cause, €<:-186.1 is used.
  - **d.** Plausible since these actions would be taken if the cause of the **loss** of seal injection flow was other than a hipped CSIP and the flow was lost for **more** than 5 minutes, but with the loss of the CSIP as the cause, HC-186.1 **is** used.

#### **DIPFICULTY ANALYSIS:**

X COMPREHENSIVE/ ANALYSIS



DIFFICULTY RATING: 3

**EXPLANATION:** Comprehension of the effect of a short term loss of seal injection flow to the RCPs

EPP-008, "SI Termination," directs resetting SI.

Which of the following describes the effect of operating only **ONE** (1) of the two (2) Si RESET switches at this step instead of both!

- a. Bypass Permissive Light Panel light 4-1, **SI** ACTUATE, would blink due to only one train of SSPS having an SI signal
  - Bypass Permissive Light Panel light 5-1, SIRESET AUTO SIBLOCKED, would blink due to only one train of SSPS having SI reset
- b. Bypass Permissive Light Panel light 4-1, SI ACTUATE, would extinguish due to neither train of SSPS having an SI signal
  - Bypass --- Permissive Light Panel light 5-1, SI RESET --- AUTO SI BLOCKED, would light due to both trains of SSPS having SI reset
- c. Bypass Permissive Light Panel light 4-1, SI ACTUATE, would blink due to only one train of SSPS having an SI signal
  - Bypass Permissive Light Panel light 5-1, SI RESEI AUTO SI BLOCKED, would light due to both trains of **SSPS** having auto SI blocked
- d. Bypass Permissive Light Panel light 4-1, SI ACTUATE, would extinguish due to neither train of SSPS having an SI signal
  - Bypass Permissive Light Panel light 5-1, SIRESET AUTO SIBLOCKED, would light due to both trains of SSPS having auto SI blocked

#### **ANSWER:**

- a. Bypass Permissive Light Panel light 4-1, SI ACTUATE, would blink due to only one train of SSPS having an SI signal
  - Bypass Permissive Light Panel light 5-1. SI RESET AUTO SI BLOCKED. would blink due to only one train of SSPS having SI reset

# QUESTION NUMBER: 8 TIER/GROUP: 2/1 KA IMPORTANCE: RO 3.9 SRO 10CFR55 CONTENT: 41(b) 7 43(b)

#### **KA:** 006K4.11

Knowledge of ECCS design feature(s) and/or interlock(s) which provide for the following: Reset of SIS

#### **OBJECTIVE::** SIS-3.0-R4

DETERMINE SIS status front the following

Bypass-Permissive Light Box

#### DEVELOPMENT REFERENCES: SD-103 pg 13

Functional Diagrams Safeguard Actuation Signals Sheet 8 EOP17-21 Handout SOER 94-1 Related Industry Events

#### **REFERENCES SUPPLIED TO APPLICANT:** None

QIJESTIONSOURCE: NEW X SIGNIFICANTLY MODIFIED

DIRECT

: INPO 1073 : None

#### BANK NUMBER FOR SIGNIFICANTLY MODIFIED / DIRECT: NRC EXAM HISTORY:

#### DISTRACTOR JUSTIFICACTION (CORRECT ANSWER X'd):

- X a. Operating only one switch only resets SI in a single train of SSPS. This would result in a disparity between the two trains of SSPS for both the reset and the actuation signals so both lights would blink.
  - **b.** Plausible since the SI Actuation switch only requires **a** single switch to actuate SI, but the reset switches are train-related.
  - **c.** Plausible since only train of SI would be reset so window 4-1 would he responding correctly, but window 5-1 would also be blinking due to the disparity between trains.
  - **d.** Plausible since the SI Actuation switch only requires a single switch to actuate **SI**, hut the reset switches are train-related.

#### **DIFFICULTY ANALYSIS:**

<b>COMPREHENSIVE / ANALYSIS</b>
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#### **DIFFICULTY RATING:** 3

**EXPLANATION:** Comprehend the effect of only operating a single train switch on SSPS and how the indications would be affected

Given the following conditions:

- The unit *is* at 100% power. .
- Power has been lost to IDP-1A-SIII. Instrument Bus III. and actions are being taken in accordance with AOP-024, "Loss of Uninterruptible Power Supply." PT-953, Containment Pressure Channel IV, then fails high.
- .

Which of the following describes the effect on the Safety Injection (SI) and Containment Spray Actuation Signal (CSAS) systems?

- Neither an SI nor a CSAS would occur a.
- An SI would occur; a CSAS would NOT occur b.
- An SI would NOT occur; a CSAS would occur c.
- d. Both an SI and a CSAS would occur

#### **ANSWER:**

b. An SI would occur; a CSAS would NOT occur

<b>QUESTION NUMBER:</b>	9	<b>TIEWGROUP:</b>		<b>2</b> /1	
		KA IMPORTANCE:	RO	2.7	SRO
		10CFR55 CONTENT:	41(b)	7	43(b)

#### **KA:** 013K6.01

Knowledge of the *effect* of a loss or malfunction on the following will have on the ESFAS: Sensors and detectors

#### OBJECTIVE: CSS-R1

Given a set of plant conditions or the status of each bistable light box, DETERMINE which of the following ESFAS signals are active

- Safety injection (SI)
- Containnient Spray Actuation

#### DEVELOPMENT REFERENCES: SD-103, pg 11, 64, 68

#### **REFERENCES SUPPLIED TO APPLICANT:** None

QUESTION SOURCE: NEW SIGNIFICANTLY MODIFIED

BANK NUMBER FOR SIGNIFICANTLY MODIFIED / DIRECT:

× DIRECT

Harris LOCT 139

NRC EXAM HISTORY: None

#### DISTRACTOR JUSTIFICACTION (CORRECT ANSWER X'd):

- a. Plausible since CSAS is energized to actuate and 1 channel is in a deenergized condition *so* CSAS will not occur. but the 2 failed channels will cause an SI actuation.
- **X** b. An SI actuation (deenergized to actuate) will occur, but a CSAS (energized to actuate) will not occur unless another energized channel senses a high pressure condition.
  - **c.** Plausible since one of the two signals is energized to actuate and the other is deenergized to actuate, but SI is deenergize to actuate and CSAS is energized to actuate.
  - **d.** I'lausible since the 2 failed channels will cause an **SI** actuation, hut CSAS is energized to actuate and 1 channel is in a deenergized condition so **CSAS** will not occur.

#### **DIFFICULTY ANALYSIS:**

X COMPREHENSIVE/ANALYSIS

**KNOWLEDGE / RECALL** 

**DIFFICULTY RATING:** 3

**EXPLANATION:** Comprehension of the effect of multiple failed channels on ESFAS signals

Given the following conditions:

- The plant is operating at **43%** power.
- 120VAC Vital Bus IDP-1B-SII deenergizes.

Outward rod motion is inhibited by  $\dots$ 

- a. C-4,  $OP\Delta T$  rod stop.
- b. C-3, OTAT rod stop
- c. C-2, Power Range rod stop.
- d. C-1,Intermediate Range rod stop.

#### **ANSWER:**

c. C-2, Power Range rod stop.

<b>QUESTION NIJMB</b>	ER: 10	TIER/GROUP:		2/2	
		KAIMPORTANCE:	RO	3.7	SRO
		10CFR55 CONTENT:	<b>41(b)</b>	7	43(b)
KA: 001 K4.07					
Knowledge of Cl	RDS desig	gn feature(s) and/or interlock	(s) which	n provide	e for the following: Rod stops
<b>OBJECTIVE:</b> NI	S-3.0-9				
DISCUSS the op	eration of	the following NI trip-related	function	ns:	
b. <b>SR</b> , IR and PR	(low) trip	blocks			
DEVELOPMENT	(EFERE)	NCES: OP-105 pg 20 AOP-024 pg 6			
<b>REFERENCES SU</b>	PLIED	TO APPLICANT: None	e		
<b>OUESTION SOUR</b>	CE:	NEW SIGNIFICA	NTLY	MODIF	IED DIRECT
BANK NI	IMBER I	FOR SIGNIFICANTLY M	ODIFIE	D/DIR	ECT. NIS-R6 003
		NR	C EXA	M HIST	ORY: None
DISTRACTOR JUS	STIFICA	CTION (CORRECT ANS)	WER X'd	):	
<b>a.</b> Plausible sinc	e causes r	od stop, but coincidence is 2	/4 instea	d of 1/4.	
		1,			
b. Plausible since	e causes r	od stop, but coincidence is 2	/4 instea	d of 114.	
<b>X</b> e. PR rod stop is	1/4 coinc	cidence. With S2-SB deencr	gized, Pl	X N-42 is	s tripped.
d. Plausible since	this causes	s a rod stop, and coincidence is	1/2, <b>but</b> II	R <i>rod</i> stoj	<b>is blocked</b> above <b>P-I</b> 0 by manual
DIFFICULTV ANA	. Must nav	2/4 PK below P-10 to reset.			
		ANALVEIS	KNOWI	FDCF	PECALI
				LEDGE.	RECALL
DIFFICULTY	( KATIN	G: 3			

**EXPLANATION:** Analyze effect of loss of power on NIS and rod control and determine effect of single channel tripped

CONTRACTOR OF A DESCRIPTION OF A DESCRIP

The basis for the operation of the Electric Hydrogen Recombiners is to minimize hydrogen concentration build up in Containment following a LOCA due to the ...

- a. Arc-water reaction and release of hydrogen from the PRT.
- b. corrosion of metals in Containment and release of hydrogen from the RCDT.
- c. release of hydrogen from the PKT and the radiolytic decomposition of water.
- d. radiolytic decomposition of water **and** the corrosion of metals in Containment.

#### ANSWER

d. radiolytic decomposition of water and the corrosion of metals in Containment.

QUESTION NUMBER	11	TIER/GROUP:		2/2		
		K h IMPORTANCE:	RO	3.4	SRO	
		10CFR55 CONTENT:	41(b)	None	43(b)	2

**Kh:** 028G2.2.22

Knowledge of limiting conditions for operations and safety limits. (Hydrogen Recombiner and **Purge** Control)

#### **OBJECTIVE:** HR-3.0-1

**STATE** the purpose and function of the Hydrogen Recombiner System, including the following components:

• Electric hydrogen recombiner

DEVELOPMENT REFERENCES:	TS 3.6.4.2 Basis SD-125 pg 21 LP-HR-3.0 pg 5	
<b>REFERENCES SUPPLIED TO APP</b>	LICANT: None	
QUESTION SOURCE: NEW	SIGNIFICANTLY MODIFIED	X DIRECT
BANK NUMBER FOR SI	GXIFICANTLY MODIFIED / DIRECT:	<b>HR</b> 01
	NRC EXAM HISTORY:	None

#### DISTRACTOR JUSTIFICACTION (CORRECT ANSWER X'd):

- **a.** Plausible since Electric Hydrogen Recombiners are designed to remove hydrogen in containment following a LOCA due to generation from the zirc-water reaction, hut not due to release from the PRT.
- **b.** Plausible since Electric Hydrogen Recombiners are designed to remove hydrogen in containment following a LOCA due to generation from the corrosion of metals in containment, but not due to release from the RCDT.
- **c.** Plausible since Electric Hydrogen Recombiners are designed to remove hydrogen in containment foilowing a LOCA due to generation from the radiolytic decomposition of water, hut not due to release from the PRT.
- X d. The Electric Hydrogen Recombiners are designed to remove hydrogen in containment following a LOCA due to generation from the zirc-water reaction, radiolytic decomposition of water, and corrosion of metals in containment.

#### **DIFFICULTY ANALYSIS:**

COMPREHENSIVE/ ANALYSIS



**DIFFICULTY RATING:** 3

**EXPLANATION:** Knowledge of Tech Spec basis for hydrogen recombiners

<u>م و کار در دارد.</u>

EPP-001, "Loss of AC Power to 1A-SA and 1B-SB Buses," is being performed. Concurrent to thr loss of power, a small break LOCA occurred.

The crew has completed the following actions when off-site power is restored to **6.9** KV Bus 1A-SA:

- e Sequencers have been de-energized
- e Safeguards pumps autostarts have been disabled
- RCP seals have been isolated
- MSIVs and FWIVs have been closed
- e Depressurization of SGs to 180 psig has commenced

Which of the following actions is the FIRST to be taken following the restoration of offsite power'?

- a. Start an ESW pump
- b. Start a CSIP
- c. Stabilize SG pressures
- d. Initiate SI

#### **ANSWER:**

c. Stabilize SG pressures

DIRECT

<b>QUESTION NUMBER:</b>	12	TIER/GROUP:		1/1	
		KA IMPORTANCE:	no	4.3	SRO
		10CFR55 CONTENT:	41(b)	7	43(b)

KA: 000055EA1.07

> Ability to operate and monitor the following as they apply to a Station Blackout: Restoration of power from offsite

#### **OBJECTIVE:** 3.7-5

Given a title of a continuous action step from a foldout and a list of plant conditions, DETERMINE if implementation is required

### DEVELOPMENT REFERENCES: EPP-001 pg 35, 38

**REFERENCES SUPPLED TO APPLICANT:** None

**QUESTION SOURCE:** SIGNIFICANTLY MODIFIED X NEW New

RANK NUMBER FOR SIGNIFICANTLY MODIFIED / DIRECT:

**NRC EXAM HISTORY** None

#### DISTRACTOR JUSTIFICACTION (CORRECT ANSWER X'd):

- a. Plausible since if the power source was an EDG instead of offsite power, it would be important to provide cooling flow to the EDG.
- Plausible since a small break LOCA exists and RCS inventory is being lost, but the first action is to b. stabilize SG pressure.
- X c. Upon restoration of power to at least one bus, the first action taken is to stabilize SG pressures.
  - d. Plausible since a small break LOCA exists and RCS inventory is being lost, but the first action is to stabilize SG pressure.

#### **DIFFICIJLTY ANALYSIS:**

**COMPREHENSIVE / ANALYSIS** 



DIFFICULTY RATING: - 3

**EXPLANATION:** 

Knowledge of required actions when power is restored following a loss of all AC power

#### **QUESTION:** I3

While performing an Operating Procedure, the Reactor Operator comes to a step which states:

"Request Chemistry to sample the RHT for boron concentration."

The Reactor Operator believes the step is **NOT** essential to achieving the purpose for which the procedure is being used and that the omission of the step does **NOT** violate the precautions and limitations of the Operating Procedure.

Which of the following is the **MINIMUM** requirement(s) that must be met to allow marking the step "N/A"?

- a. Step must be initialed by the Reactor Operator prior to performance
- b. *o* Step must be initialed by the Reactor Operator prior to performance
  - A written explanation of why the step is N/A must be provided in the Comments section of the procedure
- c. Step must be initialed by the SCO prior to performance
- d. Step must be initialed by the SCO prior to performance
  - A written explanation of why the step is N/A must be provided in the Comments section of the procedure

#### **ANSWER:**

- d. Step must be initialed by the SCO prior to performance
  - A written explanation of why the step is N/A must be provided in the Comments section of the procedure

<b>QUESTION NUMBER</b>	13	TIEWGROUP:		3		
		KAIMPORTANCE:	RO	3.9	SRO	
		10CFR55 CONTENT:	<b>41(b)</b>	None	43(b)	Xone

#### KA: 2.1.23

Ability to perform specific system and integrated plant procedures during all modes of piant operation

#### **OBJECTIVE:** PP-2.0-2

DISCUSS the requirements in PRO-NGGC-0200 concerning the following:

• Procedure user's responsibilities

DEVELOPMENT REFERENCES: PRO-NGGC-0200 pg 11-12	
<b>REFERENCES SUPPLIED TO APPLICANT:</b> None	
QUESTION SOURCE: X NEW SIGNIFICANTLY MOD	DIFIED DIRECT
BANK NUMBER FOH SIGNIFICANTLY MODIFIED/D	<b>IRECT:</b> New
NRC EXAM HIS	STORY: None

#### DISTRACTOR JUSTIFICACTION (CORRECT ANSWER X'd):

- **a.** Plausible since the RO discovered the cause for marking the step N/A, but a supervisor must initial the step prior to performance and a written explanation must **be** provided in the Comments section.
- **b.** Plausible since a written explanation must he provided in the Comments section, but a supervisor **must** initial the step prior to performance.
- **c.** Plausible since a supervisor *must* initial the step prior to performance, but a written explanation must he provided in the Comments section.
- X d. The step is initialed by the responsible supervisor prior to performance and a written explanation is provided in the Comments section.

#### **DIFFICULTY ANALYSIS:**

COMPREHENSIVE / ANALYSIS



**DIFFICULTY RATING:** 2

**EXPLANATION:** Knowledge of use of N/A during procedure usage

A new Progress Energy employee was working at another nuclear utility for the first six (6) months of this year. His occupational total effective dose equivalent (TEDE) at the other utility has been documented as being 500 mRem for this year.

What is maximum additional TEDE that he can receive during the remaining six (6) months of the year as a Progress Energy employee without exceeding his Annual Administrative Dose Limit, assuming no extensions are approved'?

- a. 1500 mRem
- b. 2000 mRem
- **c.** 3500 mRem
- d. 4500 mRem

#### **ANSWER:**

b. 2000 mRem

<b>QIJESTION NUMBER:</b>	14	TIEWGROUP:		3	
		KA IMPORTANCE:	RO	2.5	SRO
		10CFR55 CONTENT:	<b>41(b)</b>	12	<b>43(</b> b)

KA: 2.3.2

Knowledge of facility ALARA program

**OBJECTIVE:** RP-3.5-14

State the 10CFR20 and corporate occupational dose limits for individuals

D	EVE	ELOPMENT REFE	RENCES: N	IGG	M-PM-002, pg 11				
R	EFE	RENCES SUPPLIE	ED TO APPLI	[CA	NT: None		_		
Q	UES	STIQN SOURCE:	NEW		SIGNIFICANTLY MODIFIED		DIRECT		
		BANK NIJMBI	ER FOR SIGN	IFI	CANTLY MODIFIED / DIRECT:	PP-	3.7-R1 002		
					NRC EXAM HISTORY:	No	ne		
D	[ST]	RACTOR JUSTIFI	CACTION (C	OR	RECT ANSWER X'd):				
	a.	Plausible since the annual Progress Energy dose limit is 2 Rem and he has already received 500 mRem this year, but occupational dose from another utility is not considered in the 2 Rem limitation unless he would exceed 4 Rem combined for the 2 utilities.							
X	b.	Personnel annual Pr Progress Energy occ	ogress Energy cupational dose	TEI e for	DE shall not exceed 2 Rem and 4 Rem the current <b>year</b> is determined.	total	dose <b>if</b> non-		
	E.	Plausible since he is 500 mRem, but the	s permitted to r more limiting	ecei is th	ve a total of 4 Rem between the 2 utilit e 2 Rem Progress Energy dose.	ies a	nd he already h	as	

**d.** Plansible since 500 mRem and 4500 mRem **would** equal the employee's legal limit of 5000 mRem, but this is greater than the administrative limit of 2000 mRem.

#### **DIFFICULTY ANALYSIS:**

	COMPR
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DIFFICULTY RATING: 2

**EXPLANATION:** Knowledge of administrative dose limits

Given the following conditions:

- A small break LOCA has occurred.
- Containment pressure is **3.8** psig and increasing.
- Containment temperature is 137 °F and increasing.

The expected Containment Cooling Fan alignment will be one (1) fan in each Containment Fan Cooler Unit running in ...

- a. high speed with the post-accident dampers slut.
- b. high speed with the post-accident dampers open.
- c. low speed with the post-accident dampers shut.
- d. low speed with the post-accident dampers open.

#### ANSWER

d. low speed with the post-accident danipers open.

<b>QUESTION NUMBER</b>	15	<b>TIENGROUP:</b>		2'1	
		KA IMPORTANCE:	RO	3.2	SRO
		10CFR55 CONTENT:	<b>41(b)</b>	7	43(b)

#### KA: 022G2.1.28

Knowledge.of the purpose and function of major system components and controls. (Containment Cooling)

#### **OBJECTIVE:** CCS-3.0-R2

PREDICT the response(s) of the Containment Cooling Snhsystems to the following signals SI ٠

#### **DEVELOPMENT REFERENCES:** SD-169, p 14 **REFERENCES SUPPLIED TO APPLICANT:** None

**QUESTION SOURCE:** NEW **X SIGNIFICANTLY MODIFIED** 

BANK NUMBER FOR SIGNIFICANTLY MODIFIED / DIRECT:

CCS-R4 001 NRC EXAM HISTORY: None

DIRECT

#### DISTRACTOR JUSTIFICACTION (CORRECT ANSWER X'd):

- a. Plausible since this alignment is an alignment that would be used following a loss of offsite power, hut the SI alignment has the fans in low speed.
- Plausible since this alignment is an alignment that would be used following a loss of offsite power b. with the dampers aligned for the SI alignment, but the SI alignment has the fans in low speed.
- Plausible since the fans arc aligned per the SI alignment, but the dampers are aligned per the loss of ¢. offsite power alignment.
- X d. Following an SI actuation, the containment fan coolers shift to low speed and the post-accident dampers open.

#### **DIFFICULTY ANALYSIS:**

**COMPREHENSIVE/ANALYSIS** 



**DIFFICULTY RATING:** 3

EXPLANATION: Knowledge of the response of Containment Cooling to an SI signal

Following a Reactor Trip and Safety injection due to a RCS leak, the Critical Safety Function Status Trees (CSFST) are being monitored.

When monitoring the CSFST for RCS Inventory, if PRZ level is indicating greater than 92%, why is a check of RVLIS then performed?

- a. Determine if the cause of the high PRZ level is excessive RCS inventory or voiding in the Reactor Vessel head
- b. Determine if SI termination criteria is met to allow reducing the excessive RCS inventory
- c. Determine if Adverse Containment conditions have caused erroneous indications of the PRZ level instruments
- d. Determine if the cause of the high PRZ level is excessive RCS inventory or expansion due to an RCS heatup

#### ANSWER:

a. Determine if the cause of the high PRZ level is excessive RCS inventory or voiding in the Reactor Vessel head

QUESTION NUMBER:	16	TIER/GROUP:		1/1	
		KAIMPORTANCE:	RO	3.2	SRO
		10CFR55 CONTENT:	41(b)	7	43(b)

KA: 000008G2.1.28

STREET CRANES

Knowledge of the purpose and function of major system components and controls. (Pressurizer Vapor Space Accident)

#### **OBJECTIVE:** ICCM-3.0-1

LIST the two major function5 of the Inadequate Core Cooling Monitor (ICCM)

**DEVELOPMENT REFERENCES:** EOP Background for Inventory Status Tree, **F-0.6**, p 8 LP3.12, pg 7

#### **REFERENCES SUPPLIED TO APPLICANT:** None

QUESTION SOURCE: NEW SIGNIFICANTLY MODIFIED

DIRECT

BANK NUMBER FOR SIGNIFICANTLY MODIFIED/DIRECT: 3.12 001

NRC EXAM HISTORY: None

#### DISTRACTOR JUSTIFICACTION (CORRECT ANSWER X'd):

- **X a.** Once a determination has been made that PRZ level is **full** RVLIS is then used to confirm whether the cause *of the* full PRZ is excessive inventory or voiding in the head region.
  - **h.** Plausible since RVLIS is *used* throughout the EOP network to determine if **st** termination criteria has been met, but in this instance it is used to determine the cause of the high PRZ level.
  - **c.** Plausible since a steam space break in the PRZ will affect the level indications, **hut** RVLIS is used to determine the cause of the PRZ high level condition.
  - **d.** Plausible since RVLIS is part of the Inadequate Core Cooling Monitoring System and a *heat* up of the RCS will cause expansion of the RCS, but but RVLIS is used to determine the cause of the PRZ high level condition.

#### **DIFFICULTY ANALYSIS:**

**COMPREHENSIVE/ ANALYSIS** 

KNOWLEDGE/RECALL

**DIFFICIJLTY RATING:** Knowledge of the purpose of monitoring RVLIS during accident conditions **EXPLANATION:** 

Given the following conditions:

- The plant is shutdown for work on Reactor Coolant Pump seals.
- The Reactor Vessel Head is still installed.
- The running Residual Heat Removal (RHR) pump trips and the crew is unable to start the standby RHR pump.
- Time to reach core boiling is determined to be 26 minutes.
- Time to reach core boil-off is determined to be 53 minutes.

Of the following two (2) methods of RCS makeup. in accordance with AOP-020, "Loss of RCS Inventory or Residual Heat Removal While Shutdown," which of the foliowing is the **PREFERRED** method of makeup and why is it preferred over the other method?

- a. Gravity feed from the RWST to the RCS is preferred over starting a CSIP since starting a CSIP under these conditions would violate 'TechnicalSpecifications
- b. Gravity feed **from** the RWST to the RCS is preferred over starting a CSIP since Reactor Makeup to the CSIP **may** be insufficient to makeup for core boil-off
- c. Starting a CSIP is preferred over gravity feed from the RWST since gravity feed flow may be insufficient to makeup for core boil-off even if the RCS is depressurized
- d. Starting a CSIP is preferred over gravity feed from the RWST since the RCS may be pressurized and prohibit gravity flow

#### **ANSWER:**

d. Starting a CSIP *is* preferred over gravity feed from the RWST since the RCS may be pressurized and prohibit gravity flow

QUESTION NUMBER:	17	TIER/GROUP:		1/1	
		KA IMPORTANCE:	RO	3.1	SRO
		10CFR55 CONTENT:	41(b)	8/10	43(b)

KA: 000025AK3.01

Knowledge of the reasons for the following responses as they apply to the Loss of Residual Heat Removal System: Shift to alternate flowpath

#### **OBJECTIVE:** AOP-3.20-3

Given a set of entry conditions and a copy of AOP-020, DETERMINE the appropriate response

DEVELOPMENT REFERENCES:	AOP-020, pg <b>9</b>			
	AOP-020-BD, pg 19			
<b>REFERENCES SUPPLIED TO APP</b>	LICANT: None			
QUESTION SOURCE: X NEW	SIGNIFICANTLY MODIFIED	DIRECT		
BANK NUMBER FOR SIC	<b>GNIFICANTLY MODIFIED / DIRECT:</b>	New		
	NRC EXAM HISTORY:	None		
DISTRACTOR JUSTIFKCACTION (CORRECT ANSWER X'd):				

- **a.** Plausible since TS requires that a CSIP he made inoperable before these plant conditions are established, but GP-008 requires that at least one CSIP be functional under these conditions.
- **b.** Piausible since the CSIP can provide more flow than Reactor Makeup is capable of providing, but the suction source for the CSIP would **he** the RWST.
- **c.** Plausible since starting a CSIP is preferred to gravity feed. but only because the RCS may he pressurized. If the RCS is depressurized, gravity feed will provide adequate **flow**.
- **X** d. If the RCS is pressurized, gravity flow may he insufficient to provide adequate makeup to the RCS.

#### **DIFFICULTY ANALYSIS:**

**X** COMPREHENSIVE /ANALYSIS



**DIFFICIJLTY RATING:** 3

**EXPLANATION:** Analysis of piant conditions to determine appropriate response and reason for response
Given the following conditions:

- Containment temperature is 96 "F.
- Containment Fan Coolers (AII-1 / 2 / 3 / 4) are operating in the Normal Cooling Mode.
- A loss of offsite power occurs and the piant responds as expected.

The Containment Fan Coolers should be aligned with one (1) fan associated with each fan cooler operating in ...

- a. high speed and discharging to the concrete airshaft
- b. high speed and discharging to the post-accident discharge duct
- c. low speed and discharging to the concrete airshaft
- d. low speed and discharging to the post-accident discharge duct

# ANSWER:

a. high speed and discharging to the concrete airshaft

<b>QUESTION NUMBER</b>	18	TIER/GROUP:		1/1		
		KA IMPORTANCE:	RO	2.7	SRO	
		10CFR55 CONTENT:	41(b)	None	43(b)	5

KA: 000056AA2.09

Ability to determine and interpret the following as they apply to the **Loss of** Offsite Power: Operational status **of** reactor building cooling unit

**OBJECTIVE:** CCS-3.0-R4

PREDICT the response(s) of the Containment Cooling Subsystems to the following signals.

LOSP

<b>DEVELOPMENT REFERENCES:</b>	SD-169 pg	14
<b>REFERENCES SUPPLIED TO APP</b>	LICANT	None

QUESTION SOURCE: NEW X SIGNIFICANTLY MODIFIED

BANK NUMBER FOR SIGNIFICANTLY MODIFIED / DIRECT:

Y MODIFIED / DIRECT: CCS-R4 001 NRC EXAM HISTORY: None

DIRECT

# DISTRACTOR JUSTIFICACTION (CORRECT ANSWER X'd):

**x a.** One fan per unit will start **on** high speed and discharge to the concrete airshaft.

- **b.** Plausible since one fan **per** unit **will** start on high speed, hut the discharge is to the concrete airshaft not *the* post-accident discharge duct.
- c. Plausible since this fan response is the response to a LOCA start signal and they do discharge to the concrete airshaft, but the fans operate in high speed following a loss of offsite power.
- **d.** Plausible since this is the response to a LOCA **start** signal, but the fans operate in high speed and they discharge to the concrete airshaft following a loss **of** offsite power.

#### DIFFICULTY ANALYSIS:

**COMPREHENSIVE/ ANALYSIS** 



DIFFICULTY RATING: 3

**EXPLANATION:** 

: Knowledge of the response of the containment fan cooler fans to a loss of offsite **power** 

Given the following conditions:

- The crew has determined that control rod F-10 in Control Bank D is misaligned by 18 steps.
- Actions are being performed in accordance with AOP-001, "Malfunction of Rod Control and Indication System."

The crew will attempt to align control rod F-10 and the remaining rods in Control Bank D by placing the Rod Selector Switch to ...

- a. HANK D and opening the lift coil disconnect switches for the remaining rods in Control Bank D.
- b. MANUAL, and opening the lift coil disconnect switches for the remaining rods in Control Rank D.
- c. BANK D and opening the lift coil disconnect switch for control rod F-10.
- d. MANUAL and opening the lift coil disconnect switch for control rod F-10.

#### **ANSWER:**

a. BANK D and opening the lift coil disconnect switches for the remaining rods in Control Hank D.

<b>QUESTION NUMBER</b>	19	<b>TIEWGROUP:</b>		1/2	
		KAIMPORTANCE:	RO	2.5	SRO
		10CFR55 CONTENT:	41(b)	7	<b>43(b)</b>

KA: 000005AK2.02

Knowledge of the interrelations between the Jnoperable / Stuck Control Rod and the foliowing: Breakers, relays, disconnects, and control room switches

# **OBJECTIVE:** AOP-3.1-6

Given a set of plant conditions and a copy of AOP-001, DETERMINE the appropriate response.

D	EVE	CLOPMENT REFERENCES: AOP-001 pg 17-18
R	EFE	CRENCES SUPPLIED TO APPLICANT: None
Q	UES	STION SOURCE: X NEW SIGNIFICANTLY MODIFIED DIRECT
		BANK NUMBER FOR SIGNIFICANTLY MODIFIED / DIRECT: New
		NRC EXAM HISTORY None
D	[ST]	RACTOR JUSTIFICACTION (CORRECT ANSWER X'd):
X	a.	The affected individual bank position should be selected and the inoperable rod will he attempted to be moved by opening the lift coil disconnect switches for the remaining rods in the bank.
	b.	Plausible since the inoperable rod will <b>be</b> attempted to he moved by opening the lift coil disconnect switches for the remaining rods in the bank, but the affected individual bank position should be selected.
	c.	Plausible since the affected individual bank position should <b>be</b> selected, but the inoperable <b>rod</b> will be attempted to <b>he</b> moved by opening the lift coil disconnect switches for the remaining rods in the bank.

**d.** Plausible since the inoperable rod is in Bank D, but movement should be attempted by using the individual bank select position.

# **DIFPICIJLTY ANALYSIS:**

COMPREHENSIVE /ANALYSI
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UIFFICTJLTY RATING: 3

**EXPLANATION.** Knowledge of the means for a **misaligned** rod **per** procedure

Given the following conditions:

- ERFIS is inoperable.
- Plant parameters are as follows:
  - ICCM highest TC =  $672^{\circ}$  F
  - RCS WR temperature (highest) =  $688^{\circ}$  F
  - RCS pressure PT-440 = 1535 psig
  - RCS pressure PT-402 = 1635 psig
  - e CNMT pressure PT-951 = 4.5 psig

What value of superheat should be reported?

a. 63 °F

- b. 71 **''I'**
- **c**. 79 °F
- d. 87 °F

### **ANSWER:**

a. 63 °F

<b>QUESTION NUMBER:</b>	20	TIER/GROUP:		1/2		
		KAIMPORTANCE:	RO	4.6	SRO	
		10CFR55 CONTENT:	41(b)	None	<b>43(b)</b>	5

#### KA: 000074EA2.01

Ability to determine or interpret the following as they apply to a Inadequate Core Cooling: Subcooling margin

#### **OBJECTIVE:** 3.19-4

Given a set of conditions during EOP implementation, DETERMINE the correct response or required action based upon the EOP User's Guide general information

• Determining an RCS subcooling value

<b>DEVELOPMENT REFERENCES:</b>	Users Guide, pg 27, 34-35
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<b>REFERENCES SUPI</b>	PLIED TO AF	PPLICANT:	Steam Tables

QUESTION SOLJRCE: NEW X SIGNIFICANTLY MODIFIED

DIRECT

3.19-R4 003

None

#### DISTRACTOR JUSTIFICACTION (CORRECT ANSWER X'd):

**X a.** When ERFIS *is* not available, the highest ICCM temperature should be used. If ERFIS is not available and adverse containment conditions exist, PT-402 should be used for pressure. Saturation temperature for 1635 psig is 609 "F, so the amount of superheat is 63 °F (672-609).

BANK NUMBER FOK SIGNIFICANTLY MODIFIED / DIRECT:

- **b.** Plausible since the superheat determined using the ICCM temperature and saturation for the lowest RCS pressure of **1535** psig (not used because of adverse containment conditions) is 71 °F (672-601)
- **c.** Plausible since the superheat determined using the hot leg temperature (not used if ICCM is available) and saturation for the PT-402 pressure of 1635 psig is 79 "I:(688-609).
- **d.** Plausible since the superheat determined using the hot leg temperature (not used if ICCM is available) and saturation for the lowest RCS pressure of 1535 psig (not used because of adverse containment conditions) is 87 °F (688-601).

# **DIFFICIJLTY ANALYSIS:**

**COMPREHENSIVE/ ANALYSIS** 



**NRC EXAM HISTORY** 

DIFFICULTY RATING: 3

**EXPLANATION:** Knowledge of instruments to use and calculation of subcooling by applying steam tables

A failure of a Containment Fan Cooler Unit. while the system was aligned to maximum cooling mode, causes equilibrium Containment temperature to increase from  $119^{\circ}$ F to  $126^{\circ}$ F.

How does Pressurizer ievel indication change due to this increase in Containment temperature?

- a. Level indicates higher than actual due to reference leg density decreasing
- b. Level indicates lower than actual due to reference leg density decreasing
- c. Level indicates higher than actual due to reference leg density increasing
- d. Level indicates lower than actual due to reference leg density increasing

# **ANSWER:**

a. Level indicates higher than actual due to reference leg density decreasing

<b>QUESTION NUMBER:</b>	21	TIEWGROUP:		2/1	
		KA IMPORTANCE:	RO	3.0	SRO
		10CFR55 CONTENT:	<b>41(b)</b>	7	<b>43(b)</b>

KA: 022K3.02

Knowledge of the effect that a loss or malfunction of the CCS will have on the following: Containment instrumentation readings

**OBJECTIVE:** PZRLC-3.O-4

DESCRIBE how various errors would affect the pressurizer level indication in the Main Control Room

#### DEVELOPMENT REFERENCES: LP-PZRLC-3.0 pg 10 **REFERENCES SUPPLIED TO APPLICANT:** None. DIRECT **QUESTION SOURCE:** X NEW SIGNIFICANTLY MODIFIED BANK NUMBER FOR SIGNIFICANTLY MODIFIED /DIRECT: New NRC EXAM HISTORY None DISTRACTOR JUSTIFICACTION (CORRECT ANSWER X'd): X a. Reference leg density decreases as containment temperature increases which causes level lo indicate higher than actual. b. Plausible since reference leg density changes as containment temperature increases which causes level to indicate different than actual. c. Plausible since reference log density changes as containment temperature increases which causes level to indicate different than actual. d. Plausible since reference leg density changes as containment temperature increases which causes level

to indicate different than actual.

# DIFFICULTY ANALYSIS:

**X** COMPREHENSIVE/ANALYSIS

KNOWLEDGE / RECALL

**DIFPICIJLTY RATING:** 3

**EXPLANATION:** Analyze the effect of the temperature change on pressurizer level

TAXABLE INC.

Given the following conditions:

- The unit is operating at 12% power.
- The following RCP vibrations are observed:

<b>INDICATION</b>	<u>RCP 'A'</u>	<u>RCP 'B'</u>	<u>RCP 'C'</u>
Frame Vibration	3.6 mil and ↑ at 0.3 mil per hr	2.8 mil and stable	<b>4</b> mil and 1'at 0.1 <b>mil</b> per hr
Shaft Vibration	12 mil and ↑ at 0.3 mil per hr	7 mils and stable	I4 mils and <b>1</b> 'at 0.6 mils per hour

Which of the following describes the actions required for this condition?

- a. Stop RCP 'A' and initiate a plant shutdown
- b. 'Trip the reactor, stop RCP 'A', and go to PATH-1
- c. Stop RCP 'C' and initiate a plant shutdown
- d. 'Trip the reactor. stop RCP 'C', and go to PATH-I

# **ANSWER:**

a. Stop RCP 'A' and initiate a plant shutdown

<b>QUESTION NUMBER:</b>	22	TIER/GROUP:		211	
		KAIMPORTANCE:	RO	2.9	SKO
		10CFR55 CONTENT:	41(b)	5	43(b)

**KA:** 003A1.01

CONTRACTOR OF A DESCRIPTION OF A DESCRIP

Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the RCPS controls including: RCP vibration

# **OBJECTIVE:** AOP-3.18-3

Given a set of plant conditions and a copy of AOP-018, DETERMINE the appropriate response

DEVELOPMENT REFERENCES: AOP-018, p 28	
<b>REFERENCES SIJPPLIED TO APPLICANT:</b> AOP-018, Attachment 1 (Shee	et 2 of 2 ONLY)
QUESTION SOURCE: NEW X SIGNIFICANTLY MODIFIED	DIRECT
<b>BANK NUMBER FOR SIGNIFICANTLY MODIFIED / DIRECT:</b>	AOP-3.18 017
NRC EXAM HISTORY:	None
DIGTRA CTOD HIGTIFICA CTION (CODDECT ANGWED VIA).	

#### DISTRACTOR JUSTIFICACTION (CORRECT ANSWER X'd):

- **X** a. 'A' RCP vibration has exceeded limits and the pump must he stopped. With the plant in Mode 2, a reactor trip is not required, hut the plant must he shutdown.
  - h. Plausible since these would be the correct actions if the plant was in Mode 1, but the plant is in Mode 2.
  - **c.** Plausible since these are the correct actions, hut 'C' RCP has not reached any trip limits while 'A' KCP has.
  - **d.** Plausible since these would be the correct actions if the plant was in Mode 1, hut 'C' RCP has not reached any trip limits while 'A' RCP has and the plant is in Mode 2.

# **DIFFICULTY ANALYSIS:**

X COMPREHENSIVE / ANALYSIS



DIFFICULTY RATING: 3

EXPLANATION:

**ON:** Analysis to determine which RCP must be stopped and comparison to power level to determine proper action

ALB-009-8-1, PRESSURIZER RELIEF TANK HIGH-LOW LEVEL PRESS OK 'TEMP, alarms due to a high temperature condition.

Which of the following describes how the Pressurizer Relief Tank (PRT) is normally cooled. in accordance with OP-100, "Reactor Coolant System"?

- a. Recirculate the I'RT through the Reactor Coolant Drain Tank heat exchanger, using Component Cooling Water to cool the heat exchanger
- b. Recirculate the I'RT through the Reactor Coolant Drain Tank heat exchanger, using Service Water to cool the heat exchanger
- c. Drain the PRT to the Reactor Coolant Drain Tank while making **up** to the PRT from the Demineralized Water Storage **'Tank**
- d. Drain the **PRT** to the Reactor Coolant Drain Tank while making up to the PRT from the Reactor Makeup Water Storage Tank

### ANSWER

a. Recirculate the I'KT through the Reactor Coolant Drain Tank heat exchanger, using Component Cooling Water to cool the heat exchanger

<b>QUESTION NUMBEK:</b>	23	<b>TIEWGROUP:</b>		2/1	
		KAIMPORTANCE:	RO	2.6	SRO
		10CFR55 CONTENT	41(b)	7	43(b)

#### KA: 007K4.01

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

#### **OBJECTIVE:** PZR-3 0-3

Given a flow, diagram of the PRT or associated subsystems and the appropriate procedure, correctly **AI** IGN the PRT for filling, draining, recirculation, or cooldown

<b>DEVELOPMENT REFERENCES:</b>	APP-ALB-009, pg 29	
	OP-100, pg <b>30</b>	
<b>REFERENCES SUPPLIED TO APP</b>	LICANT: None	
QUESTION SOURCE: X NEW	SIGNIFICANTLY MODIFIED	DIRECT
BANK NUMBER FOR SI	GNIFICANTLY MODIFIED / DIRECT:	New
	NRC EXAM HISTORY:	None
DISTRACTOR JUSTIFICACTION	(CORRECT ANSWER X'd):	
$\mathbf{V}$ = N_{1} = 1, $\mathbf{v}$ = $\mathbf{f}$ (1 = $\mathbf{D}\mathbf{D}^{T}$ ) = $\mathbf{v}$		

- **X a.** Normal cooling of the PR'I is accomplished by recirculating the PRT water through the RCDT heat exchanger, which is cooled by CCW.
  - **h.** Plausible since normal cooling of the PRT is accomplished by recirculating the PRT water through the RCDT heat exchanger, hut it is cooled by CCW, not SW.
  - **c.** Plausible since a rapid cooldown of the I'RT would be accomplished by draining to the RCDT **and** making up to the PRT, hut the makeup source **is** RMUW, not the DWST.
  - **d.** Plausihle since this method would **he.**used for a rapid cooldown of the PKT, hut **is** not the normal cooldown method used.

# **DIFFICULTY ANALYSIS:**

**COMPREHENSIVE/ ANALYSIS** 



DIFFICULTY RATING: 2

**EXPLANATION:** Knowledge of the design method of cooling the PRT

Which of the foliowing describes the effect of a loss of 125 VDC Bus DP-1A-SA?

- a. Emergency Diesel Generator A-SA loses excitation power
- b. Power is lost to the Emergency Escape Air Lock
- c. Master relays in  ${\tt SSPS}$  'Train A lose power
- d. Main Turbine DC Rearing Oil Pump loses power

# **ANSWER:**

a. Emergency Diesel Generator **4-SA** loses excitation power

QUES	TION NUMBER	24	<b>TIEWGROUP:</b>		1/1	
			KA IMPORTANCE:	RO	3.4	SRO
			<b>I@CFR55</b> CONTENT:	41(b)	7	43(b)
KA:	064K2.03					
K	nowledge of EDG b	ous powe	er supplies to the followin	g: Contro	l power	
OBJI	ECTIVE: AOP-3	.25-3				
(	Given plant conditio	ns, DIS	CUSS the following notes	, caution	s, and pro	ocedural steps as they apply
•	• The effects of a	loss of a	DC bus on equipment op	erability	ŕ	
DEV		EDENIC				
DEVI	ELOPMEN I KEF	EKENC	<b>ES:</b> AOP-3.23, p 39			
KEFI	EKENCES SUPPL		APPLICANI: None	;		
QUE	STION SOURCE:	XN	EW SIGNIFICA	NTLY	MODIF	IED DIRECT
	BANK NUMI	BER FO	R SIGNIFICANTLY M	ODIFIE	D/DIRI	ECT: New
			NR	CEXAN	A HISTO	<b>DRY:</b> None
DIST	<b>RACTOR JIJSTIF</b>	FICACI	TON (CORRECT ANSW	VER X'd	l):	
Xa.	DP-1A-SA supplie	es the EI	DG governor and generato	r excitati	on contro	ol circuits.
b.	Piansible since the	emerge	ncy escape air lock is pow	vered from	n DC, bi	it not the emergency DC bus.
C.	Plausible since <b>SS</b> but the emergency powered by <b>48</b> vde	PS receit bus onl	ves input from the emerge y supplies the <b>Rx</b> Trip Bre is produced in <b>SSPS</b> via th	ency DC eaker shu 1e instrui	bus <b>and</b> t int trip po nent buse	the master relays operate on DC, ower and the master relays are es.
d.	Plausible since the specifically address	DC hea sed in th	ring oil pump is powered the EOPs, hut it is powered	by DC a by the n	nd is one on-safety	of the only DC Loads related 250 VDC.
DIFF	ICULTY ANALYS	SIS:				
	COMPREHENSI	VE/AN	ALYSIS X I	KNOWL	EDGE /	RECALL

# DIFFICULTY RATING: 2

**EXPLANATION:** Knowledge of the source of control power to the EDGs

Given the following indications during **a** plant startup being performed in accordance with GP-005, "Power Operation":

- Power Kange Channel N-41 26.0% •
- Power Range Channel N-42 ۰ 24.5%
- Power Range Channel N-43 • 24.5%
- Power Range Channel N-44 25.0% • 25.5%
- Loop 'A' ΔΤ
- Loop 'B' AT 25'5% 25.556
- Loop °C' ΔT
- Turbine Load 24.5% (DEH units converted to percent load) ٠

Which of the following power levels should be reported as being actual reactor power'?

- a. 24.5%
- h. 25.0%
- c. 25.5%
- d. 26.0%

# **ANSWER:**

c. 25.5%

QUESTIONNUMBER	25	<b>TIER/GROUP:</b>		22	
		KA IMPORTANCE:	RO	3.6	SRO
		10CFR55 CONTENT:	41(b)	5	<b>43(b</b> )

# KA: 002K5.10

Knowledge of the operational implications of the following concepts as they apply to the RCS:Relationship between reactor power and RCS differential temperature

#### **OBJECTIVE:** XIS-3.0-13

Discuss the cautions associated with monitoring NI power levels during plant start-up and power operations

<b>DEVELOPMENT REFERENCES:</b>	GP-005, pg	12
<b>REFERENCES SUPPLIED TO APP</b>	LICANT:	None

<b>QUESTION SOURCE:</b>	Γ	NEW	Х	SIGNIFICANTLY	MODIFIED
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BANK NUMBER FOR SIGNIFICANTLY MODIFIED / DIRECT:

	DIRECT
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NIS-R 10003

None

# DISTRACTOR JUSTIFICACTION (CORRECT ANSWER X'd):

- **a.** Plausible since this is the lowest given power ievel and may be considered to be the **most** conservative, but GP-005 provides guidelines for which power level should be considered.
- **b.** Plausible since this is the average NIS power level, but the highest as identified by GP-005 requirements is the average loop **AT**.
- X e. Until a calorimetric is performed at 30% power, true reactor power shall be assumed equal to the highest of the following indicators: average Power Range NI value, average percent ΔT, or Main Turbine.load
  - **d.** Plausible since this is the highest given power level and may be considered to be the most conservative, but GP-005 provides guidelines for which power level should be considered

#### **DIFFICULTY ANALYSIS:**

COMPREHENSIVE / ANALYSI	S
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NRC EXAM HISTORY:

**DIFFICIJLTY RATING:** 3

**EXPLANATION:** Calculation of average power indications and determination of most conservative value

AH-82A, NORMAL PURGE SUPPLY FAN AH-82A, fails to start when the control switch is placed in START.

Which of the following interlocks would prevent the fan from starting?

- a. Normal Purge Inlet and Discharge Valves are open
- h. AH-82A fan inlet damper has failed to open
- c. Electric heating coil breaker is tripped
- d. Containment differential pressure is zero

#### ANSWER

d. Containment differential pressure is zero

<b>QUESTION NUMBER:</b>	26	TIEWGROUP:		2/2	
		KA IMPORTANCE:	RO	3.0	SRO
		10CFR55 CONTENT:	<b>41(b)</b>	5	<b>43(b)</b>

KA: 029A1.03

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

# **OBJECTIVE:** CVS-3.0-R2

LOCATE the controls and EXPLAIN the interlocks associated with the following major components

NCPMU units, including AH-82 fans

#### **DEVELOPMENT REFERENCES:** OP-168, p 8

**REFERENCES SUPPLIED TO APPLICANT:** None SIGNIFICANTLY MODIFIED **QUESTION SOURCE:** Х NEW BANK NUMBER FOR SIGNIFICANTLY MODIFIED / DIRECT:

DIRECT

#### New

NRC EXAM HISTORY: None

# DISTMCTOR JUSTIFICACTION (CORRECT ANSWER X'd):

- a. Plausible since the valves are interlocked to close if fan AH-824 is stopped, but are manually opened prior to the start of the fan.
- b. Plausible since the inlet damper is interlocked to open when the fan is started, but are closed when the fan is started.
- c. Plausible since the heating coils are interlocked with the fan operation, but the heaters are enabled to operate when the fan is running and do not prevent the fan from starting.
- **X** d. Fan AH-82A will only start if containment  $\Delta P$  is more negative than -0.400 INWG.

#### **DIFFICULTY ANALYSIS:**

**COMPREHENSIVE / ANALYSIS** 

X KNOWLEDGE / RECALL

**DIFFICULTY RATING: 3** 

Knowledge of interlocks associate with containment purge fans **EXPLANATION:** 

\*\*\*\*\*\*\*

Given the following conditions:

- The plant is at the Point of Adding Heat (POAH) when a SG PORV fails open.
- RCS temperature decreases and stabilizes at 548 °F.

Which of the following predicts the plant response and the operator actions required in accordance with GP-004, "Reactor Startup"?

- a. Reactor power increases; withdraw control rods and dilute, in a controlled manner. to restore RCS temperature to program within 15 minutes
- b. Reactor power increases; trip the reactor if RCS temperature **CANNOT** be restored above 551°F in a controlled manner within 15 minutes
- c. The reactor becomes subcritical: trip the reactor if criticality **CANNOT** be restored in a controlled manner within 15 minutes
- d. The reactor becomes subcritical; immediately trip the reactor

#### **ANSWER:**

b. Reactor power increases; trip the reactor if RCS temperature CANNOT be restored above 551 °F in a controlled **manner** within 15 minutes

QUESTION NUMBER.	27	TIER/GROUP:		2/1	
		KA IMPORTANCE:	RO	3.3	SRO
		10CFR55 CONTENT:	41(b)	5	43(b)

# KA: 039A2.05

CONTRACTOR OF A DESCRIPTION OF A DESCRIP

Ability to (a) predict the impacts of the following malfunctions or operations on the MRSS; and (b) based on predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: increasing steam demand, its relationship to increases in reactor power

#### **OBJECTIVE:** IE-3.10-1

Apply the philosophies of OMM-001 and PLP-629 regarding safe and conservative decisions that must *be* made by a control *room* crew

<b>DEVELOPMENT REFERENCES</b>	: GP-004 pg 9 P & L # 19	
	OMM-001 pg 66-67	
	IE-LP-3 10 (Salem Event, SOEK 94-01)	
<b>REFERENCES SUPPLIED TO A</b>	PLICANT: None	
QUESTION SOLJRCE: NEW	SIGNIFICANTLY MODIFIED	DIRECT
BANK NUMBER FOR S	IGNIFICANTLY MODIFIED / DIRECT:	New
	NRC EXAM HISTORY:	None
DISTRACTOR JUSTIFICACTIO	N (CORRECT ANSWER X'd):	
a. Plausible since reactor power methods of reactivity control s 551 "F, not to program.	will increase, but temperature is not to be resto imultaneously and the 15 minute limit is to res	red using two different tore tempcrature above

- X b. The first operator action should be to attempt to stop the cause (e.g., secure the overfeeding) of the transient. Temperature may then be recovered by using control rods in a slow and controlled manner. 'temperature has to be restored to greater than 551 "Fwithin 15 minutes due to the requirements of TS 3.1.1.4.
  - **c.** Plausible since the 15 minute time limit is associated with restoration, hut the reactor does not become subcritical.
  - **d.** Plausible since the reactor is to be tripped if it becomes subcritical due to a malfunction per OMM-001, but the reactor does not become subcritical.

#### **DIFFICIJLTY ANALYSIS:**

Х	COMPREHENSIVE / ANALYSIS
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KNOWLEDGE / RECALL

DIFFICULTY RATING: 3

**EXPLANATION:** Analyze t

Analyze the plant response to an increase in steam demand and determine appropriate actions

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

<u>Time</u>	Ambient Temp	CT Basin Temp
1500	35 °F	<i>64</i> °F
1900	20 °F	60 °F
2300	10 °F	58 °F

Which of the following describes the correct CT Deicing Gate Valve alignment for these conditions?

	<u>1900</u>	<u>2300</u>
a.	Full Open	Full Open
h.	Full Open	Half Open
c.	Half Open	Full Open
d.	Half Open	Half Open
ANSW	/ <b>ER:</b>	

h.	Full Open	Half Open
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QUESTION NUMBER:	25	TIER/GROUP:		3	
		KA IMPORTANCE:	RO	2.5	SRO
		10CFR55 CONTENT:	41(b)	10	43(b)

**KA:** 2.1.25

CONTRACTOR AND ADDR.

Ability to obtain and interpret station reference materials such as graphs, monographs, and tables which contain performance data

# **OBJECTIVE:** CT-R3

Given OF-141, Attachment 5, ANALYZE a set of adverse weather conditions and DESCRIBE the operation of the Cooling Tower System to prevent ice damage to the fill material

# DEVELOPMENT REFERENCES: OP-141, pg SO Attachment 5

**REFERENCES SUPPLIED TO APPLICANT:** OP-141, Attachment 5 **OUESTION SOURCE:** NEW SIGNIFICANTLY MODIFIED

QN SOURCE:	NEW	X SIGNIFICANTLY	MODIFIED

BANK NUMBER FOR SIGNIFICANTLY MODIFIED / DIRECT: NRC EXAM HISTORY:

CT-R3	001
CI-R3	001

None

DIRECT

#### DISTRACTOR JUSTIFICACTION (CORRECT ANSWER X'd):

- **a.** Plausible since **valves** should be open at 1900, but are required to he changed to half open at 2300.
- **X b.** At 1500 conditions call for valves to be full open, at 1900 conditions call for no change in position, and at 2300 conditions call for change to half open.
  - c. Plausible since valves should be changed between 1900 and 2300, hut should go from full open to half open.
  - **d.** Plausible since valves should be half open at 2300, but should be full open at 1900 due to no change from 1500.

### **DIFFICULTY ANALYSIS:**

**X** COMPREHENSIVE/ANALYSIS



**DIFFICULTY RATING:** 3

**EXPLANATION:** Application of given data to curve to determine required operation of deicing valves

# **QCESTION:** 29

Following a transition to PATH-2 for a SGTR in 'A'SG, which of the following actions are taken to minimize or prevent radiological releases through the SG PORV?

- a. Increase 'A' SG PORV setpoint on PK 308A1 SA to 90% (1170 psig)
- b. Increase 'A' SG PORV setpoint on PK 308A1 SA to 88% (1145 psig)
- c. Place 'A'SG PORV PK 308A1 SA in MANUAL with zero output
- d. Manually isolate 'A' SG PORV by closing 1MS-59

# **ANSWER:**

b. Increase 'A' SG PORV setpoint on PK 308A1 SA to 88% (1145 psig)

DIRECT

New

<b>QUESTION NIJMBER:</b>	29	TIER/GROUP:		3		
		KAIMPORTANCE:	RO	2.7	SRO	
		10CFR55 CONTENT:	<b>41(b)</b>	None	<b>43(b)</b>	None

**KA:** 2.3.11

-

Ability to control radiation releases

# **OBJECTIVE:** EOP-3.2-2

DEMONSTRATE the below-assumed operator knowledge from the HNP Step Deviation Documents and the WOG ERGs that support performance of EOP actions

• Method of isolating SGTR

<b>DEVELOPMENT REFERENCES:</b>	PATH-2 pg 8
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**REFERENCES SUPPLIED TO APPLICANT:** None

QUESTION SOLJRCE: X NEW | SIGNIFICANTLY MODIFIED

BANK NUMBER FQR SIGNIFICANTLY MODIFIED / DIRECT:

NRC EXAM HISTORY: None

# DISTRACTOR JIJSTIFICACTION (CORRECT ANSWER X'd):

- **a.** Plausible since PORV setpoint **is** adjusted, but should be adjusted to 1145 psig and 1170 psig is the first safety setpoint.
- **X** b. The SG PORV is to be set at 88% to minimize the likelihood of a release, but lower than the SG safety sctpoints.
  - c. Plausible since this action would be taken if the SG were faulted instead ofruptured.
  - **d.** Plausible since this action would be taken if the SG PORV were to fail open, but this would also cause the safeties to be challenged and should not be performed unless necessary.

#### **DIFFICIJLTY ANALYSIS:**

COMPREHENSIVE / ANALYSIS



DIFFICULTY RATING: 3

**EXPLANATION:** Knowledge of steps required to isolate a SGTR

Which of the following two (2) conditions are both identified by EPP-013, "LOCA Outside Containnient," as being used to identify that the LOCA has been isolated?

- a. RCS pressure increasing
  - e RAB local room temperatures
- b. RAB local room temperatures
  - RAB radiation levels decreasing
- c. R4B radiation levels decreasing
  - Local observation of the isolation
- d. RCS pressure increasing
  - Local observation of the isolation

# ANSWER

- d. RCS pressure increasing
  - Local observation of the isolation

<b>QUESTION NIJMBER: 30</b>	<b>TIERGROUP:</b>		1/1	
	KA IMPORTANCE:	RO	3.5	SRO
	10CFR55 CONTENT	41(b)	8/10	43(b)

#### **KA:** WE04EK1.2

Knowledge of the operational implications of the following concepts as they apply to the (LOCA Outside Containment) Normal, abnormal and emergency operating procedures associated with (LOCA Outside Containment)

#### **OBJECTIVE:** 2.3-R4

Using appropriate plant procedures and prints, determine the foliowing:

• Transitions to other EOPs

#### DEVELOPMENT REFERENCES: EPP-013 pg 5

**REFERENCES SUPPLIED TO APPLICANT:** None

QUESTION SOURCE: NEW

SIGNIFICANTLY MODIFIED X DIRECT

3.3 024

BANK NUMBER FOR SIGNIFICANTLY MODIFIED/DIRECT: NRC EXAM HISTORY:

**ORY:** None

#### DISTRACTOR JUSTIFICACTION (CORRECT ANSWER X'd):

- a. Plausible since RCS pressure increasing is one of the indications used. but local temperatures are not used in EPP-013.
- **b.** Plausible since these may both be indications that might support that the leak is isolated, but pressurizer level may **not** be indicative of actual RCS inventory or the leak being isolated and is not used in EPP-013.
- e. Plausible since local observation *is* one of the indications used, but **RAB** radiation levels may be elevated for some time after isolation and is not used in RPP-013.
- **X d.** EPP-013 determines that the LOCA outside containment is isolated if RCS pressure is increasing and if local observation confirms the isolation.

# **DIFFICULTY ANALYSIS:**

**COMPREHENSIVE / ANALYSIS** 



DIFFICIJLTY RATING: 3

**EXPLANATION:** 

**ON:** Knowledge of the conditions required by EPP-013 to determine that a **LOCA** outside containment is isolated

Which of the following is the reason for purposely tripping the Reactor Coolant Pumps (KCPs) under accident conditions'?

- a. Ensure RCPs are available later in the event if they should be needed *in* response to an inadequate core cooling condition
- b. Prevent RCP runout in the event of a large break LOCA
- c. Prevent excessive depletion of RCS inventory through a small break in the RC'S
- d. Prevent damage to RCPs due to pumping a two-phase mixture event

#### **ANSWER:**

c. Prevent excessive depletion of RCS inventory though a small break in the RCS

QUESTION NUMBER:	<b>3</b> 1	<b>TIEWGROUP:</b>		1/1	
		KA IMPORTANCE:	RO	4.2	SRO
		10CFR55 CONTENT:	41(b)	5/10	43(b)

#### KA: 000009EK3.23

Knowledge of the reasons for the following responses as the apply to the small break LOCA: RCP tripping requirements

#### **OBJECTIVE: BD-3.1-1**

Analyze the Reactor Coolant Pump (RCP) trip criteria. This analysis should include, at the minimum, the following topics:

The reason for purposely tripping the RCPs under certain accident conditions •

**DEVELOPMENT REFERENCES:** Generic Issues of ERG Background – Executive Volume

#### LP-BD-3.1 pg 8 **REFERENCES SUPPLIED TO APPLICANT:** Sone

**QUESTION SOURCE:** SIGNFICANTLY MODIFIED NEW

BANK NIJMREK FOR SIGNKFICANTLY MODIFIED / DIRECT:

NRC EXAM HISTORY: None

**X DIRECT** 

BD-3.1 001

#### DISTRACTOR JUSTIFICACTION (CORRECT ANSWER X'd):

- a. Plausible since for most accidents it is desirable to have RCPs available, particularly those cases where an inadequate core cooling condition might exist.
- b. Plausible since little work is required by the RCPs in the event of a large break LOCA, hut this would result in a lower pump current, not a runout condition.
- X c. Tripping the RCPs during the early stages of a small break LOCA limits the amount of mass lost out the break, thereby increasing the mass available for heat removal in the event the pumps were not tripped but tripped **æ** a later time.
  - d. Plausible since KCPs are not designed to pump a two-phase mixture and it would be desirable to protect the pumps from damage.

#### **DIFFICULTY ANALYSIS:**

**COMPREHENSIVE/ ANALYSIS** 

KNOWLEDGE / RECALL

**DIFFICULTY RATING:** 2

Knowledge of the reasons for tripping RCPs during G small break LOCA **EXPLANATION:** 

Given the following conditions:

- The unit is in Mode **3** at normal operating pressure
- Pressurizer Pressure Control is in AUTO.
- Pressurizer Pressure Channel PT-445 fails high.
- PRZ Pressure Channel indications are:
  - PI-444 2050 psig
  - PI-445 2500 psig
  - PI-455 2050 psig
  - PI-456 1950 psig
  - PI-457 2050 psig

Assuming **NO** operator actions, which of the following describes the expected conditions of the PRZ Pressure PORVs and Spray Valves?

- a. e PRZ PORV 1RC-114 closed
  - PRZ PORVs 1RC-116 and 1RC-118 open
  - PRZ Spray Valves PCV-444C and PCV-444D open
- b. FRZ PORV 1RC-114 open
  - PRZ PORVs 1RC-116 and 1RC-118 closed
  - PRZ Spray Valves PCV-444C and PCV-444D open
- c. PRZ PORV 1RC-1 I4 closed
  - PRZ PORV 1RC-116 and IKC-118 open
  - e PRZ Spray Valves PCV-444C and FCV-444D closed
- d. PRZ PORV 1RC-114 open
  - PRZ PORVs 1RC-116 and 1RC-118 closed
  - PRZ Spray Valves PCV-444C and PCV-444D closed

# ANSWER

- c. PRZ PORV 1RC-114 closed
  - PRZPORV 1RC-116 and 1RC-118 open
  - PRZ Spray Valves PCV-444C and PCV-444D closed

The noun names were provided for the following valves: IRC-I14, PRZ PORV PCV-444B

1RC-116, PRZ PORV PCV-445B 1RC-118, PRZ PORV PCV-444A

<b>QUESTION NUMBER:</b>	32	<b>TIEWGROUP:</b>		lil	
		KA IMPORTANCE:	RO	2.6	SRO
		10CFR55 CONTENT:	<b>41(b)</b>	4	43(b)

#### KA: 000024AK2.03

Knowledge of the interrelations between the Pressurizer Pressure Control Malfunctions and the following: Controllers and positioners

#### **OBJECTIVE:** PZRPC-3.0-3

Given the status of the various pressurizer pressure channels, the position of various pressure controlrelated control switch positions and the status of Controllers PK-444A, PK-444C, and PK-444D, PREDICT the responses of the following functions:

- Pressurizer spray valves
- Pressurizer Power-Operated Relief Valves (PORVs)
- Pressurizer pressure permissive P-11

# **DEVELOPMENT REFERENCES:** SI)-100.3, pg 12, 16, 38-39 **REFERENCES SUPPLIED TO APPLICANT:** None

QUESTION SOURCE: NEW SIGNIFICANTLY MODIFIED

BANK NUMBER FOR SIGNIFICANTLY MODIFIED/DIRECT:



NRC EXAM HISTORY: None

#### DISTRACTOR JUSTIFICACTION (CORRECT ANSWER X'd):

- **a.** Plausible since PORVs 116 and 118 will open until actual pressure drops below **2000** psig, but the spray valves are controlled by the other channel and will not open.
- **b.** Plausible since this would he the response of the system if the failed channel was 444, but with 445 failed, none of these components are affected.
- **X c.** PT-445 controls **only** PORVs 116 and 118. The PORVs will open and remain open until 2/3 of the protection channels 455/456/457 decrease below the P-11 setpoint of 2000 psig. Spray valves are controlled **by** channel 444.
  - d. Plausible since the spray valves will remain closed, but 445 controls PORVs 116 and 118, not 114.

#### **DIFFICULTY ANALYSIS:**

COMPREHENSIVE/ANALYSIS

KNOWLEDGE / RECALL

DIFFICULTY RATING: 3

**EXPLANATION:** Analysis of the failure **and** current plant conditions to determine expected response of pressure control

Which one of the following correctly describes how and why the Variable Speed Fluid Coupling (VSFC) varies the speed of the Condensate Booster Pumps (CBPs)?

- a. VSFC oil is bypassed around the hydraulic coupling as necessary to maintain a constant feed pump suction pressure
- b. VSFC oil *is* bypassed around the hydraulic coupling as necessary to maintain the CBP recirc valves closed
- c. VSFC hydraulic coupling is varied as necessary to maintain a constant feed pump suction pressure
- d. VSFC hydraulic coupling is varied as necessary to maintain the CBP recirc valves closed

# **ANSWER:**

c. VSFC hydraulic coupling is varied **as** necessary to maintain a constant feed pump suction pressure

<b>QUES</b>	TION NUMBER	33	TIER/GROUP:		2/I	
		KA	IMPORTANCE:	RO	3.2	SRO
		10CF	<b>R55 CONTENT:</b>	<b>41(b)</b>	7	43(b)
KA:	056G2.1.28					
K	nowledge of the pur	rpose and fun	ction of major system	m compo	nents and	controls. (Condensate)
OBJE	ECTIVE: CFW-3 DESCRIBE the bas subsystems • CBP Variable S	3.0-4 sic construction Speed Fluid C	on and operation of t Coupling ( <b>VSFC</b> )	he follow	ing CFW	System components /
DEVI	ELOPMENT REF	ERENCES:	SD-134, p 7, 17			
REFE	ERENCES SUPPL	IED TO API	PLICANT: Non	e		
QUE	STION SOURCE:	NEW	SIGNIFICA	ANTLY	MODIFI	ED X DIRECT
	BANK NUMI	BER FOR SI	GNIFICANTLY N	<b>IODIFIE</b>	D/DIRE	CT: CFW-R3 001
			NF	RC EXAN	A HISTO	RY: None
DIST	RACTOR JUSTIF	ICACTION	(CORRECT ANS	WER X'd	):	
a.	Plausible since oil pump. but the oil c	adjusts the h loes not bypa	ydraulic coupling to ss the hydraulic cou	maintain pling	a constant	suction pressure at the feed
b.	Plausible since <b>oil</b> does not maintain	adjusts the h the CBP reci	ydraulic coupling, b rc valves closed.	ut it does	not bypass	s the hydraulic coupling and
Xc.	An oil bath betwee maintain a constan	en <b>the</b> motor and suction pres	and pump coupling coupling as ure at the feed pum	causes the	pump to	operate at a variable speed to
d.	Plausible since an variable <b>speed</b> , but the CBP recirc val	oil bath betw t it is designe ves closed.	een the motor and p d to maintain a cons	ump coup tant suction	oling cause on pressure	es the pump to operate at <b>a</b> e at the feed pump rather than
DIFF	ICULTY ANALYS	SIS:				
	COMPREHENSI	VE / ANALY	(SIS	KNOWL	EDGE / I	RECALL

**DIFFICULTY RATING:** 3

**EXPLANATION:** Knowledge of the operation of the CBPs

Given the following conditions:

- The plant is operating at 100% power.
- A tube leak has been detected on 'B' SG.
- The Condenser Vacuum Pump Rad Monitor, REM-1TV-3534, and H-X-15 curves are being monitored every 15 minutes to estimate the leak rate.
- CVPE is operating with **NO** motivating air.

Which of the following readings noted on REM-ITV-3534 is the **MINIMUM** reading that would require a plant shutdown per Technical Specifications'?

- a. 5.40 E 7
- b. 6.00 E -7
- c. 1.08 E -6
- d. 1.80 E -6

#### **ANSWER:**

e. 1.08 E -6

QUESTION NUMBER:	34	<b>TIEWGROUP:</b>		112		
		KAIMPORTANCE:	RO	3.2	SRO	
		10CFR55 CONTENT:	41(b)	None	43(b)	5

#### **KA:** 000037AA2.10

Ability to determine and interpret the following as they apply to the Steam Generator Tuhe Leak: Tech-Spec limits for **RC'S** leakage

# **OBJECTIVE:** AOP-3.16

For a primary-to-secondary leak, DESCRIBE when a power reduction or unit shutdown is required.

D	EVI	ELOPMENT REFERENCES:	AOP-016 pg 15 Curves H-X-15a/b/c			
R	EFF	ERENCES SWPLIED TO APPL	LICANT: Curves H-X- 15a/b/c			
Q	UES	STION SOURCE: NEW	<b>X</b> SIGNIFICANTLY MODIFIED	DIRECT		
		BANK NUMBER FOR SIG	INFICANTLY MODIFIED / DIRECT:	Harris NRC 2000-80		
			NRC EXAM HISTORY:	None		
D	IST	<b>TRACTOR JUSTIFICACTION (</b>	CORRECT ANSWER X'd):			
	<i>a</i> .	<ul> <li>Plausible since this exceeds would exceed PSAL 2 limits if operating on full motivating air (curve EX-1Sa), but the incorrect curve is used.</li> </ul>				
	b.	Plausible since this exceeds would (curve H-X-15b), but the incorrect	d exceed <b>PSAL 2</b> limits if operating on inter ct curve is used.	rmediate motivating air		
x	c.	Lowest level that would exceed 7	75 gpd (PSAL,2) which would require a TS s	hutdown.		
	d.	Plausible since this exceeds the <b>P</b>	<b>SAL</b> 3 limit which would require a TS shutc	lown, but this is not the		

**d.** Plausible since this exceeds the **PSAL** 3 limit which would require a TS shutdown, but this is not the lowest level that would require the shutdown.

# **DIFFICULTY ANALYSIS:**

X COMPREHENSIVE/ ANALYSIS

KNOWLEDGE / RECALL

DIFFICULTY RATING: 3

**EXPLANATION:** Interpretation of plant data on RCS leakage curve and comparison to procedural requirements

FRP-J.2, "Response to Containment Flooding," directs that the containment sump be sampled for activity. and then to notify the operations staff of sump level and the sample results.

Receiving this information will allow a decision to be made on which of the following actions?

- a. If the Containment Spray System may be secured
- b. If the CNMT spray additive tank should **be** isolated
- c. If Iimergency Service Water to containment should he isolated
- d. If sump water may he transferred to tanks outside containment

# ANSWER

d. If sump water may be transferred to tanks outside containment

<b>QUESTION NUMBER:</b>	35	TIER/GROUP:		1/2	
		KA IMPORTANCE:	RO	2.7	SRO
		10CFR55 CONTENT:	41(b)	8/10	43(b)

# KA: WE15EK1.2

Knowledge of the operational implications of die following concepts as they apply to the (Containment Flooding) Normal, abnormal and emergency operating procedures associated with (Containment Flooding)

#### **OBJECTIVE:** 3.13-4

- Given the following EOP steps, notes, and cautions, DESCRIBE the associated basis
- Sampling the CNMT sump for activity (5.2)

DEVELOPMENT REFERENCES:	FRP-J.2, pg 4	
REFERENCES SUPPLIED TO APPL	LICANT: None	
QUESTION SOURCE: NEW	SIGNIFICANTLY MODIFIED	DIRECT
BANK NUMBER FOR SIG	NIFICANTLY MODIFIED / DIRECT:	3.13 010
	NRC EXAM HISTORY	None

#### DISTRACTOR JUSTIFICACTION (CORRECT ANSWER X'd):

- **a.** Plausible since the plant operations staff does make the determination when Containment Spray **is** to be secured, but this sample is to determine whether the water can be transferred.
- **h.** Plausible since if flooding has occurred it is likely that a large KCS leak has also occurred and the spray chemical addition tank miry have emptied to containment and would no longer be needed, but this sample is to determine whether the water can be transferred.
- **c**. Plausible since a potential source of flooding is the ESW system to the fan coolers, but this sample is to determine whether the water can be transferred and ESW isolation would be determined by the operating crew based on ESW indications.
- **X d.** The containment sump is sampled to determine if excess water **can** be transferred to storage tanks located outside containment.

# DIFFICULTY ANALYSIS:

**EXPLANATION:** 

COMPREHENSIVE/ ANALYSIS	× KNOWLEDGE / RECALL
DIFFICULTY RATING: 2	—

Knowledge of purpose for sampling sumps following flooding inside containment
Given the following conditions:

- RHR Pump A-SA is tagged out.
- Following a large break LOCA, the crew was performing EPP-010, "Transfer to Cold Leg Recirculation."
- 1SI-301, CONTAINMENT SUMP TO RIIR PUMP B-SB, failed to open and the crew transitioned to EPP-012, "Loss of Emergency Coolant Recirculation."
- Both Containment Spray Pumps automatically transferred to the Containment Sump.
- Two (2) Containment Fan Coolers are operating.
- Containment pressure is 12 psig and decreasing slowly.
- While performing EPP-012 the Reactor Operator notes that RWST level is 2% with both CSIPs, both Containment Spray Pumps, and RIIR Pump B-SB operating.

Which of the following actions are to be taken?

- a. Stop the RIIR pump ONLY
- b. Stop both CSIPs and the RHR pump ONLY
- c. Stop both CSIPs, the RHK pump. and one Containment Spray pump ONLY
- d. Stop both CSIPs, the RHR pump, and both Containment Spray pumps

#### **ANSWER:**

b. Stop both CSIPs and the RIIR pump ONLY

<b>QUESTION NUMBER:</b>	36	TIER/GROUP:		1/1	
		KAIMPORTANCE:	RO	3.7	SRO
		10CFR55 CONTENT:	<b>41(b)</b>	8/10	<b>43(b)</b>

#### K4: WE11EK1.1

Knowledge of the operational implications of the following concepts as they apply to the (Loss **of** Emergency Coolant Recirculation) Components, capacity, and function of emergency systems

### ORJECTIVE: 2.3-S2

Predict how each of the following could impact efforts to maintain core cooling during a LOCA

• Failure of valves to realign for cold-leg recirculation

DEVELOPMENT REFERENCES: EPP-012 pg 42	
REFERENCES SUPPLIED TO APPLICANT: None	
QUESTION SOURCE: NEW X SIGNIFICANTLY MODIFIED	DIRECT
BANK NUMBER FOR SIGNIFICANTLY MODIFIED / DIRECT:	3.3-R5 004
NRC EXAM HISTORY	None

#### DISTKACTOR JUSTIFICACTION (CORRECT ANSWER X'd):

- **a.** Plausible since the RHR pump is still aligned to the RWST and must be stopped, but the CSIPs are also aligned to the RWST and must likewise he stopped.
- **X** b. The RHR pump and the CSIPs arc still aligned to the RWST and must he stopped when the RWST empty alarm is received at 3% level.
  - c. Plausible since the RHK pump and the CSIPs must he stopped, hut the spray pumps can continue to operate since they are no longer aligned to the RWST.
  - **d.** Plausible since the RHR pump and the CSIPs must he stopped, but the spray **pumps** can continue to operate since they are no longer aligned *to* the RWST.

### DIFFICULTY ANALYSIS:

**X COMPREHENSIVE / ANALYSIS** 



DIFFICULTY RATING: 3

**EXPLANATION:** Analyze plan

Analyze plant conditions to determine which pumps are taking a suction from the KWST *to* determine the pnmps which are to be stopped

LT-115, VCT Level, has failed LOW. The Unit-SCO directs the Reactor Operator to maintain VCT level between 20% arid 70%.

Which of the following describes how VCT level will be maintained in accordance with AOP-003, "Malfunction of Reactor Makeup Control"?

- a. When level lowers to 20%, automatic makeup will begin raising level
  - When level increases to 70%, 1CS-120 (LCV-112A), Letdown VCT/Hold Up *Tank*, will begin diverting letdown to the Hold Up Tank
- b. When level lowers to 20%, the operator must start a manual makeup to raise VCT level
  - When level increases to 70%, 1CS-120 (LCV-112A), Letdown VCT/Hold Up Tank, will begin diverting letdown to the Hold Up Tank
- *c.* When level lowers to 20%, automatic makeup will begin raising level
  - When level increases to 70%, the operator must align 1CS-120 (LCV-112A), Letdown VCT/Hold Up Tank, to the Hold Up Tank
- d. U'hen level lowers to 20%, the operator must start a manual makeup to raise VCT level
  - When level increases to 70%, the operator must align 1CS-120 (LCV-112A), Letdown VCT/Hold Up Tank. to the Hold Up Tank

### ANSWER.

- b. e When level lowers to 20%, the operator must start a manual makeup to raise VCT level
  - When level increases to 90%. IC§-120 (LCV-112A), Letdown VCT/Hold Up Tank, will begin diverting letdown to the Hold Up Tank

DIRECT

New

<b>QUESTION NUMBER</b>	37	TIER/GROUP:		2/1	
		KA IMPORTANCE:	RO	3.0	SRO
		10CFR55 CONTENT	<b>41(b)</b>	5	<b>43(b</b> )

KA: 004A1.06

Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the CVCS controls including: VCT level

### **OBJECTIVE:** CVCS-R5

PREDICT the response of the CVCS to the following failures c. LT-112 or LT-115 failure (high or low)

### DEVELOPMENT REFERENCES: AOP-003, pg 5-6, 16

**REFERENCES SUPPLIED TO APPLICANT:** None

QUESTIQN SOURCE: X NEW SIGNIFICANTLY MODIFIED

BANK NUMBER FOR SIGNIFICANTLY MODIFIED / DIRECT:

EXAM	HISTORY	None

### DISTRACTOR JUSTIFICACTION (CORRECT ANSWER X'd):

**a.** Plausible since LT-112 will still control CS-120 properly, causing a divert to the HUT, but the operator must perform a manual blended flow due **to** the failure of LT-115.

NRC

- **X b.** A low failure of LT-115 will disable auto makeup capabilities which will required the operator to perform a manual blended flow **and** the modulate divert to the HUT is controlled by LT-I 12.
  - **c.** Plausible since operator action **is** required **to** perform one of the two evolutions, hut the automatic makeup, not the divert, must be controlled by the operator.
  - **d.** Plausible since a low failure of LT-115 will disable auto makeup capabilities which will required the operator to perform a manual blended flow, but the modulate divert to the HUT is controlled by LT-112.

### **DIFFICULTY ANALYSIS:**

X COMPREHENSIVE/ANALYSIS



DIFFICULTY RATING: 3

**EXPLANATION:** Analysis of plant response to failures in CVCS to determine the proper operator response

The plant is operating at 100% power with all equipment operable and properly aligned.

Which of the following describes changes to the Component Cooling Water System alignment following a Safety Injection signal?

- a. CCW to the Gross Failed Fuel Detector and Primary Sample Panel isolates
- **b.** Both CCW pumps start and the Non-Essential header isolates
- c. CCW to and from the RCP Motor Coolers isolates
- d. Both CCW pumps start and the Thermal Barrier Hx Return isolates

## **ANSWER:**

a. CCW to the Gross Failed Fuel Detector and Primary Sample Panel isolates

<b>QUESTION NZJMBER:</b>	38	<b>TIEWGROW:</b>		2/1	
		KA IMPORTANCE:	RO	3.6	SRO
		10CFR55 CONTENT:	41(b)	7	43(b)

**KA:** 008A3.08

Ability to monitor automatic operation of the CCWS, including: Automatic actions associated with the CCWS that occur as a result of a safety injection signal

#### **OBJECTWE:** CCWS-3.0-R2

STATE how the CCWS responds during each of the following conditions:

Safety Injection signal ٠

#### DEVELOPMENT REFERENCES: SD-I45 pg 16-17 **REFERENCES SUPPLIED TO APPLICANT:** Xone **QUESTION SOURCE:** NEW SIGNIFICANTLY MODIFIED BANK NUMBER FOR SIGNIFICANTLYMOI

DIFIED/DIRECT	CCV

**NRC EXAM HISTORY:** 

CCWS-R2	002
None	

**X** DIRECT

#### DISTRACTOR JUSTIFICACTION (CORRECT ANSWER X'd):

**X** a. On an SI signal, both the GFFD and sample panel receive isolation signals

- b. Plausible since the pumps will get a start signal, but only the GFFD and sample panel in the nonessential header are isolated.
- Plausible since the CCW to RCP isolations close on a Phase.B signal, hut Phase B is not generated by c. an SI signal.
- d. Plausible since the pumps will get a start signal; but the thermal barrier heat exchangers are only isolated on a Phase B signal.

#### **DIFFICULTY ANALYSIS:**

**COMPREHENSIVE/ANALYSIS** 

KNOWLEDGE / RECALL

**DIFFICULTY RATING:** 3

**EXPLANATION:** Knowledge of the response of CCWS to an SI signal

Given the following conditions:

- The plant is operating at 23% power.
- Steam pressure channel PI-475 is selected for control of SG 'A'.
- Steam pressure transmitter **PT-475** fails high.

Assuming **NO** operator action, which of the following statements describes the response of the Steam Generator Water Level Control System (SGWLCS)?

- An increase in steam flow from SG 'A' is sensed and responds by increasing 1FW-140, MN FW A REG BYP FK-479.1, position to increase feed flow to SG 'A' and level increases
- h. An increase in steam flow from SG 'A' is sensed and responds by increasing 1FW-133, MAIN FW A REGULATOR FM-478, position to increase feed flow to SG 'A' and level increases
- c. A decrease in steam flow from SG 'A' is sensed and responds by decreasing 1FW-140, MN FW A REG BYP FK-479.1, position to decrease feed flow to SG 'A' and level decreases
- d. A decrease in steam flow from SG 'A' is sensed and responds by decreasing 1FW-133, MAIN FW A REGULATOR FK-478, position to decrease feed flow to SG 'A' and level decreases

### **ANSWER:**

b. An increase in steam flow from SG 'A' is sensed and responds by increasing 1FW-133, MAIN FW A REGULATOR FK-478, position to increase feed flow to SG 'A' and level increases

QUESTION NUMBER	39	TIER/GROUP:		21	
		KA IMPORTANCE;	RO	3.0	SKO
		10CFR55 CONTENT:	<b>41(b)</b>	7	43(b)

#### KA: 059A4.08

Ability to manually operate and monitor in the control room: Feed regulating valve controller

#### **OBJECTIVE:** SGWLC-3.0-2

Given the status of the various SGWLC related control switch positions and controllers, PREDICT how a malfunction **of** the fallowing will effect the SGWLC System:

• SG pressure channels

# DEVELOPMENT REFERENCES: SD-126.02 pg 4,8 REFERENCES SUPPLIED TO APPLICANT: None

 QUESTION SOURCE:
 NEW
 ×
 SIGNIFICANTLY MODIFIED

BANK NUMBER FOR SIGNIFICANTLY MODIFIED / DIRECT: NRC EXAM HISTORY:

	DIRECT
SG	WLC-R2 002

None

#### DISTRACTOR JUSTIFICACTION (CORRECT ANSWER X'd):

- **a.** Plausible since steam pressure failing high causes the steam flow to increase, resulting in SF > FF, but the feed reg valve is in operation at this power level.
- **X b.** Steam pressure failing high causes the steam flow to increase, resulting in SF > FF. The feed **reg** valve, in operation at 15% power, opens to cause FF and level to increase.
  - **c.** Plausible since steam pressure failing **causes** the steam flow to change, resulting in a SF FF mismatch, but the feed reg valve will open to increase FF.
  - **d.** Plausible since steam pressure failing causes the steam **flow** to change, resulting in a SF FF mismatch, but the feed reg valve will **open** to increase FF.

#### **DIFFICULTY ANALYSIS:**

**X** COMPREHENSIVE/ANALYSIS



DIFFICULTY RATING: 3

**EXPLANATION:** 

Analyze the effect of the failure on the control system and recognize which valve will be controlling at the power level given

### **QIJESTION:** 40

The plant is operating at 80% power with rod control in automatic and pressurizer pressure at 2240 psig.

After a rapid power reduction the plant is stabilized at 40% power, when the Reactor Operator notes the following conditions:

- Pressurizer pressure is 2275 psig and slowly decreasing.
- Pressurizer levei is 43% and slowly decreasing.
- Both pressurizer spray valves indicate mid-position.
- All pressurizer backup heaters are de-energized.

These conditions are indicative of ...

- a. a normal plant response following an outsurge from the pressurizer.
- b. a failure in the Pressurizer Pressure control circuitry, which opened the spray valves.
- c. a failure in the Pressurizer Level control circuitry, which failed to energize the backup heaters.
- d. a normal plant response following an insurge into the pressurizer.

### **ANSWER:**

c. a failure in the Pressurizer Levei control circuitry, which failed to energize the backup heaters.

<b>QUESTION NUMBER:</b>	40	<b>TIEWGROW:</b>		212	
		KAIMPORTANCE:	RO	3.1	SRO
		10CFR55 CONTENT:	<b>41(b)</b>	7	43(b)

**KA:** 01IK6.04

Knowledge of the effect of a loss or malfunction on the following will have on the PZR LCS: Operation of PZR level controllers

#### **OBJECTIVE:** PZRLC-3.0-5

EXPLAIN how the system controls pressurizer level, including the input parameters and the components that receive output signals

DEVELOPMENT REFERENCES:	SD-100.3 pg 14-15	
REFERENCES SUPPLIED TO APP	PLICANT: None	
QUESTION SOURCE: NEW	<b>×</b> SIGNIFICANTLY MODIFIED	D
BANK NUMBER FOR SI	GNIFICANTLY MODIFIED / DIRECT:	PZRL

C-R4 001

#### DISTRACTOR JIJSTIFICACTION (CORRECT ANSWER X'd):

- a. Plausible since the response is correct, with the exception of the pressurizer heaters not being energized, for an outsurge from the pressurizer.
- h. Plausible since a downpower should result in an insurge which would cause the spray valves to open, but the heaters should also be energized.
- **x** c. A rapid downpower transient will result in an insurge to the pressurizer. This should result in the. conditions noted, including a high pressurizer level causing the heaters to be energized even during a high pressure condition causing the spray valves to be open. The heaters not being energized with level more than 5% high is indicative of a level control system failure.
  - d. I'lausible since the response is correct, with the exception of the pressurizer heaters not being energized, for an insurge to the pressurizer.

### **DIFFICULTY ANALYSIS:**

**COMPREHENSIVE/ANALYSIS** X



NRC EXAM HISTORY: None

### DIFFICULTY RATING: 3

**EXPLANATION:** 

Analysis of the expected plant response and the actual plant response to an insurge into the pressurizer

The operators *are* performing a start up to full power with Main Feedwater Pump B under clearance.

Which of **the** following causes an immediate start signal to **ONLY** the Motor Driven AFW Pumps?

- a. SG A level is 18%
  - SG B level is 39%
  - SG C level is 38%
  - Loss of Emergency Bus IA-SA
- b. SG A level is 34%
  - SG B level is 33%
  - SG C level is 22%
  - Loss of Emergency Bus 1B-SB
- c. SGA level is 25%
  - SG B level is 26%
  - SG C level is 27%
  - Main Feedwater Pump A trips
- d. SG A level is 24%
  - SG B level is 23%
  - SG C level is 28%
  - Main Feedwater Pump A trips

### **ANSWER:**

- c. SGA level is 25%
  - SG B level is 26%
  - SG C level is 27%
  - Main Feedwater Pump A trips

<b>QUESTION NUMBER</b>	41	<b>TIEWGROUP:</b>		2/2	
		KAIMPORTANCE:	RO	4.2	SRO
		10CFR55 CONTENT:	<b>41(b)</b>	2-9	<b>43(b)</b>

#### KA: 035K1.01

Knowledge of the physical connections and/or cause-effect relationships between **the** S/GS and the following systems: MFW/AFW systems

#### **OBJECTIVE:** AFS-3.0-R5

State the automatic start signals associated with the:

- MDAFW pumps
- TDAI'W pumps

#### DEVELOPMENT REFERENCES: SD-137 pg 12-13

**REFERENCES SUPPLIED TO APPLICANT:** None

QUESTION SOURCE: X NEW SIGNIFICANTLY MODIFIED

DIRECT

New

### NRC EXAM HISTORY: Xone

**BANK NUMBER FOR SIGNIFICANTLY MODIFIED / DIRECT:** 

#### DISTRACTOR SIJSTIFICACTION (CORRECT ANSWER X'd):

- **a.** Plausible since the SG levels will cause *a* start of only the MDAFW' Pumps, hut the loss of the emergency bus starts the train related MDAFW Pump and the TDAFW Pump.
- **b.** Plausible since the SG levels will cause a start of only the MDAFW Pumps, hut the loss of the emergency bus starts the train related MDAFW Pump and the TDAFW Pump.
- **X c.** With all **3** SG levels above 25%, no start signals occur, however the trip of MFW Pump **A** will cause both MDAFW Pumps to start since the B MFW Pump is already secured.
  - **d.** Plausible since the trip of MFW Pump A will cause both **MDAFW** Pumps to start **since** the **B** MFW Pump is already secured, but 2 SG levels below 25% start the TDAFW Pump and the **MDAFW** Pumps.

### **DIFFICULTY ANALYSIS:**

**X** COMPREHENSIVE / ANALYSIS



DIFFICULTY RATING: 3

**EXPLANATION:** Analysis of conditions which determine AFW pump starts

In accordance with FRP-H.1, "Response to Loss of Secondary Heat Sink," why must an RCS bleed **and** feed path be immediately established when the conditions for a total loss of heat sink are diagnosed?

- **a.** The increase in steam production in the core will overpressurize the RCS, increasing the likelihood of the PRZ safety valves opening and an increased loss of RCS inventory
- b. The increase in RCS temperature will increase RCS pressure and decrease SI flow, increasing the likelihood of core uncovery
- c. The loss of natural circulation will result in SI flow being directed to the reactor vessel without mixing with the RCS, increasing the likelihood of thermal shock of the reactor vessel
- d. The increase in IZCS temperature will increase primary-to-secondary  $\Delta P$ , increasing the likelihood of a SGTR

### **ANSWER:**

b. The increase in RCS temperature will increase RCS pressure and decrease SI flow, increasing the likelihood **of core** unwvery

<b>QUESTION NUMBER:</b>	42	<b>TIEWGROUP:</b>		1/1	
		KAIMPORTANCE:	КО	3.9	SRO
		10CFR55 CONTEXT:	41(b)	7	43(b)

### KA: WE05EK2.2

Knowledge **of** the interrelations between the (Loss of Secondary Heat Sink) and the following: Facilitys 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

#### **OBJECTIVE:** 3.11-R4

Given the following EOP steps, notes, and cautions, DESCRIBE the associated basis

• Prompt initiation of Bleed and Feed

DEVELOPMENT REFERENCES:	FRP-H.1, pg 19, 22	
	LP-3.11, pg 10-12	
<b>REFERENCES SUPPLIED TO APH</b>	PLICANT: Xone	
QUESTION SOURCE: NEW	SIGNIFICANTLY MODIFIED	<b>X DIRECT</b>
BANK NUMBER FOR SI	GNIFICANTLY MODIFIED / DIRECT:	3.1i-K4 015
	NRC EXAM HISTORY.	None
<b>DISTRACTOR JUSTIFICACTION</b>	(CORRECT ANSWER X'd):	

- **a.** Piausible since an increase in RCS pressure could result in the safely valves lifting if the PORVs were to fail, but steam production in the core is not likely to be occurring at the onset **of** the **Loss of** heat sink.
- **X b.** Failure to establish RCS bleed and feed when required will result in an increase in RCS temperature which will cause an increase in RCS pressure. This will result in decreased SI flow and core uncovery.
  - c. Plausible since a heat sink is required for natural circulation **and** a concern in FRP-P.1 is that cold SI flow could cause thermal shock of the reactor vessel, but core uncovery due to a **loss** of SI flow **as** pressure increases will also reduce the SI flow that could cause thermal shock.
  - **d.** Plausible since an increase in primary-to-secondary AP could result in a SGTR, but the concern is that an increase in temperature and pressure could result in less SI flow and core uncovery.

#### **DIFFICULTY ANALYSIS:**

	COMPREHENSIVE/ ANALYSIS
--	-------------------------

KNOWLEDGE / RECALL

**DIFFICULTY RATING:** 3

**EXPLANATION:** Knowledge of the effect of delaying RCS bleed and feed during a loss of heat sink

Given the following conditions:

- The plant had been operating at 100% for three (3) weeks when a Reactor Trip occurred.
- Six (6)hours following the trip, a reactor startup is planned.

Which one of the following is **PROHIBITED** at **SHNPP** as a result of industry wide premature criticality events?

- a. A difference of 400 pcm between the POWERTRAX and EXSPACK ECCs
- b. Operators performing the EXSPACK estimated critical conditions (ECC)
- c. Delaying the startup until xenon begins to decay
- d. A startup rate in excess of +0.3 dpm

### ANSWER:

a. A difference of 400 pcm between the POWERTRAX and EXSPACK ECCs

<b>QUESTION NUMBER:</b>	43	TIER/GROUP:		3		
		KAIMPORTANCE:	RO	3.7	SRO	
		10CFR55 CONTENT:	41(b)	None	<b>43(b)</b>	None

**KA:** 2.2.1

Ability to perform pre-startup procedures for the facility, including operating those controls associated with plant equipment that could affect reactivity

#### **OBJECTIVE:** GP-3.4-6

SUMMARIZE at least three conditions which have contributed to premature criticality events within the industry; **also** SUMMARIZE actions taken at SHNPP **to** prevent similar occurrences

DEVELOPMENT REFERENCES: GP-004 pg 10	
REFERENCESSUPPLIED TO APPLICANT: None	
QUESTION SOURCE: NEW X SIGNIFICANTLY MODIFIED	DIRECT
<b>BANK NUMBER FOR SIGNIFICANTLY MODIFIED / DIRECT:</b>	GP-3.4 01 1
NRC EXAM HISTORY:	None

### DISTRACTOR JUSTIFICACTION (CORRECT ANSWER X'd):

- X a. The threshold for performing a reactor startup following a power history of >80% equilibrium power is 250 pcm difference helveen POWERTRAX and EXSPACK and 500 pcm for transient history and steady state below 80%.
  - **b.** Plausible since SHNPP required any manual ECC calculations he performed by Reactor Engineering, but **EXSPACK** is normally performed hy Operations.
  - **c.** Plausible since xenon decay will he adding positive reactivity to the core while the **startup** is being performed, but is accounted for in the time after trip **in** the ECC.
  - **d.** Plausible since excessive startup rates can contribute to **lack** of reactivity control, hut limitations are placed on startup rate after criticality **is** achieved.

#### **DIFFICULTY ANALYSIS:**

	COMPREHENSIVE/ ANALYSIS	
i an		



**DIFFICULTY RATING:** 3

**EXPLANATION:** Knowledge of the administrative requirements prior to criticality heing achieved

Given the following conditions:

- The plant was operating at 80% power.
- Actions of AOP-010, "Feedwater Malfunctions," **due** to a trip of Main Feedwater Pump **A**.
- The crew is using transient annunciator response.

Which of the following annunciators is the Unit-SCO required to be informed of in accordance with OMM-001, "Conduct of Operations"?

- a. ALB-05-7-4, CCW PUMP A'I'RIP OR CLOSE CKT TROUBLE
- b. ALB-06-1-1, CHARGING PUMP DISCHARGE IIEADERIII / LO FLOW
- c. CTMP-4-2, CLG TWR M-U PUMP 1 TRIP OR START FAIL
- d. ALB-23-2-11, STEAM TUNNEL HIGH TEMP

### ANSWER

a. ALB-05-7-4, CCW PUMP A TRIP OR CLOSE CKT TROIJBLE

QUESTIONNUMBER:	44	TIER/GROUP:		3	
		KAIMPORTANCE:	RO	3.3	SRO
		10CFR55 CONTENT:	41(b)	10	43(b)
<b>KA:</b> 2.4.31					
Knowledge <b>of</b> annur	ciators a	larms and indications, and	l use of th	he respo	nse instructions
<b>OBJECTIVE:</b> PP-2.0	)-R3				
<b>DISCUSS</b> the requir <b>k</b> MCB annunciator	ements i 3	n OMM-001/AP-002/AP-	100 conc	erning tl	he following:
DEVELOPMENT REF	FERENC	CES: OMM-001 pg 10			
<b>REFERENCES SUF'PI</b>	LED TO	APPLICANT: None	•		
QUESTION SOURCE:	XN	IEW SIGNIFICA	NTLY	MODIF	TIED DIRECT
BANK NUM	BER FO	OR SIGNIFICANTLY M	ODIFIE	D/DIR	ECT: New
		NR	C EXAN	M HIST	ORY: None
DISTRACTOR JUSTI	FICAC	FION (CORRECT ANS)	VER X'd	l):	
<b>X a.</b> Required to he in	formed of	of this annunciator due <b>to</b> a	required	l entry in	nto an additional AOP.
<b>b.</b> Plausible since th	is could	indicate a ieak in the RCS	, but no /	AOP ent	ry conditions are met.
<b>c.</b> Plausible since th	is could	indicate a loss of CW coo	ling <b>flow</b>	, but no	AOP entry conditions are met
<b>d.</b> Plausible since th	is could	indicate a steam leak. but	no AOP	entry co	nditions are met
DIFFICULTY ANALY	'SIS:				
<b>X</b> COMPREHENS	IVE/AN	ALYSIS	KNOWI	LEDGE	/ RECALL
DIFFICULTY R	ATING	3			
EXPLANATION	: An	alysis of relative important	ce and re	quireme	nts to prioritize annunciators

### **QIJESTION: 45**

Given the following conditions:

- A Reactor Trip occurred from 100% power.
- The plant stabilized at **557** "F for several minutes.
- Shortly thereafter, a Safety Injection signal actuated.

Which of the following describes the effect of this sequence on the Main Feedwater System?

- a. After the Reactor Trip occurred, the SGs could be fed using the Feedwater Reg Bypass Valves
  - Alter the SI occurred, the SGs could be fed using the Feedwater Reg Bypass Valves
- b. After the Reactor Trip occurred, the SGs could be fed using the Main Feedwater Reg Valves or the Feedwater Reg Bypass Valves
  - After the SI occurred, Main Feedwater could NOT he used to feed the SGs
- c. After the Reactor Trip occurred, the SGs could be fed using the Feedwater Keg Bypass Valves
  - After the SI occurred, Main Feedwater could NOT bc used to feed the SGs
- d. After the Reactor Trip occurred, the SGs could be fed using the Main Feedwater Reg Valves or the Feedwater Reg Bypass Valves
  - Alter the SI occurred, the SGs could be fed using the Feedwater Reg Bypass Valves

### **ANSWEW:**

- c. After the Reactor Trip occurred, the SGs could be fed using the Feedwater Reg Bypass Valves
  - After the SI occurred, Main Feedwater could NOT be used to feed the SGs

<b>QUESTION NUMBER</b>	45	<b>TIEWGROUP:</b>		2/1	
		KA IMPORTANCE:	RO	3.2	SRO
		10CFR55 CONTENT:	<b>41(b)</b>	7	<b>43(b)</b>

#### **KA:** 059K4.19

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

#### **OBJECTIVE:** AFW-3.0-A6

EXPLAIN the response of major CFW System valves to the following signals/conditions

- Main Feedwater Isolation Signal (MFIS)
- Reactor trip (P-4) coincident with low  $T_{avg}$  (< 564°F)

#### DEVELOPMENT REFERENCES: SD-103 pg 26

**REFERENCES SUPPLIED TO APPLICANT:** None

QUESTION SOURCE: X NEW

SIGNIFICANTLY MODIFIED

DIRECT

BANK NUMBER FOR SIGNIFICANTLY MODIFIED / DIRECT: New

NRC EXAM HISTORY: None

#### DISTRACTOR JUSTIFICACTION (CORRECT ANSWER X'd):

- **a.** Plausihle since on a reactor trip with low Tave (**564** "F), the SGs can still he fed with the bypass valves. but on an SI or high-high SG level MFW can no Longer supply the SGs.
- **b.** Plausible since the SGs can no longer be fed using MFW on an SI, but on a reactor trip only the bypass valves can he used to feed the SGs.
- **X c.** On a reactor trip with low Tave (564 °F), the SGs can still he fed with the bypass valves, but on an SI or high-high SG level MFW can no longer supply the SGs.
  - **d.** Plausible since **on** a reactor trip with low Tave (**564** °F), the SGs can still he **fed** with the bypass valves, but not the main feed reg valves. and on an SI or high-high SG level MFW can no longer supply the SGs.

#### DIFFICULTY ANALYSIS:

**COMPREHENSIVE/ ANALYSIS** 

KNOWLEDGE / RECALL

**DIFFICULTY RATING:** 3

**EXPLANATION:** 

Comprehension that on a reactor trip where the plant stabilizes at no-load temperature, the P-4 with Low Tave signal allows feeding with the bypass and SI isolates all MFW

Which of the following describes the design of Phase **A** and a Phase B Containment Isolation signals?

- a. Phase A ONLY limits radioactive releases following a LOCA
  - Phase B <u>ONLY</u> limits radioactive releases following a LOCA or secondary system break inside Containment
- h. Phase A limits radioactive releases <u>AND</u> minimizes Containment overpressurization following a LOCA
  - Phase B limits radioactive releases <u>AND</u> minimizes Containment overpressurization following a LOCA or secondary system break inside Containment
- c. Phase A <u>ONLY</u> limits radioactive releases following a LOCA
  - Phase B limits radioactive releases following a LOCA <u>AND</u> prevents an excessive RCS cooldown following a secondary system break inside Containment
- d. a Phase A limits radioactive releases <u>AND</u> minimizes Containment overpressurization following a LOCA
  - Phase €limits radioactive releases following a LOCA <u>AND</u> prevents **an** excessive RCS cooldown following **a** secondary system break inside Containment

### **ANSWER:**

- a. Phase. A <u>ONLY</u> limits radioactive releases following a LOCA
  - Phase B <u>ONLY</u> limits radioactive releases following a LOCA or secondary system break inside Containment

<b>QUESTION NUMBER</b>	46	TIER/GROUP:		1/1	
		KA IMPORTANCE:	RO	3.5	SRO
		10CFR55 CONTENT	<b>41(b)</b>	5/10	43(b)

KA: 000011EK3 06

Knowledge of the reasons for the following responses as the apply to the Large Break LOCA: Actuation of Phase A and B during LOCA initiation

### **OBJECTIVE:** CIS-3.0-1

STATE the purpose of the Containment Isolation System

DEVELOPMENT REFERENCES:	SD-1 14 pg <b>4-5</b>	
REFERENCES SUPPLIED TO APPL	LICANT: None	
QUESTION SOURCE: NEW	SIGNIFICANTLY MODIFIED	DIRECT
BANK NUMBER FOR SIG	SNIFICANTLY MODIFIED / DIRECT:	CIS 006
		CIS 009
	NRC EXAM HISTORY:	None

#### DISTRACTOR JUSTIFICACTION (CORRECT ANSWER X'd):

- **X a.** Phase **A** serves to limit the release of radioactive materials to atmosphere following a LQCA. Phase B acts to limit radioactive releases by actuating on a LOCA or a steam or feedwater line break inside containment.
  - **b.** Plausible since both Phase A and Phase B act to limit the release of radioactive materials to atmosphere, hut overpressurization is limited by spray actuation. main steam line isolation, and feed water isolation.
  - **c.** Plausible since both Phase **A** and Phase **B** act to limit the release of radioactive materials to atmosphere, but overpressurization and RCS cooldowns are limited by spray actuation, main steam line isolation, and feed water isolation.
  - **d.** Plausible since both Phase **A** and Phase **B** act to limit the release of radioactive materials to atmosphere, but overpressurization and RCS cooldowns are limited by spray actuation, main steam line isolation, and feed water isolation.

#### **DIFFICULTY ANALYSIS:**



### DIFFICULTY RATING: 2

**EXPLANATION:** Knowledge of purpose of Phase A and Phase B signals

An entry into FRP-S.1. "Response to Nuclear Power Generation/ATWS," has been made from PATH-1. The following conditions currently exist:

- The reactor trip breakers are closed.
- Rods are being inserted manually.
- Control Bank D is at 12 steps.
- Power Range Instruments are all indicating 8%.
- Intermediate Range SUR is NEGATIVE

Which of the following conditions is required by FRP-S.1 to allow a return to PATH-I?

- a. One of the reactor trip breakers must be opened
- b. Both of the reactor trip breakers must be opened
- c. Power Range indication must be reduced below 5%
- d. Control Bank A must be inserted fully

#### **ANSWER:**

c. Power Range indication must be reduced below 5%

QUESTION NUMBER	47	<b>TIEWGROUP:</b>		1/1		
		KAIMPORTANCE:	RO	4.4	SRO	
		10CFR55 CONTENT:	<b>41(b)</b>	Xone	<b>43(b)</b>	5

#### KA: 000029EA2.01

Ability to determine or interpret the following as they apply to a ATWS: Reactor nuclear instrumentation

#### **OBJECTIVE:** 3.1-3

**DEMONSTRATE** the below-assumed operator knowledge from the SHNPP Step Deviation Documents and WOG ERGs that support performance of EOP actions: a. Verification of reactor trip

#### **DEVELOPMENT REFERENCES:** FRP-S.1, pg 14

KEFERENCES SGPPLIED TO APPLICANT: None

QUESTION SOURCE: NEW X SIGNIFICANTLY MODIFIED

BANK NUMBER FOR SIGNIFICANTLY MODIFIED / DIRECT:

**DIRECT** 3.15-R5 002

None

#### DISTRACTOR JUSTIFICACTION (CORRECT ANSWER X'd):

- a. Plausible since this would cause the reactor to be tripped, but it is not required to he done to exit FRP-S.l.
- **b.** Plausible since this would cause the reactor to be tripped, but it **is** not required to be done to exit FRP-S.1.
- **X c.** Exiting FRP-S.1 requires that PK NIS be less than 5% and IR NIS startup rate be negative. Reactor trip breaker position is not a condition for exiting the procedure, although actions are taken to open the breakers.
  - d. Plausible since this would cause the reactor to be adequately shutdown, but it is not required to be done to exit FRP-S.1.

#### **DIFFICULTY ANALYSIS:**

COMPREHENSIVE/ANALYSIS



NRC EXAM HISTORY

DIFFICULTY RATING: 3

**EXPLANATION:** Knowledge of the procedural requirements to exit **FRP-S.1** 

Given the following conditions:

- A plant cooldown is being performed.
- All Steam Generators (SGs) are currently at approximately 50 psig.
- Auxiliary Feed Water (AFW) Pump A-SA is being used to feed the SGs.
- The supply breaker on 120 VAC 1DP-1A-S1 for 1AF-19, AUX FW MOTOR PMP A-SA DISCHARGE VLV, trips open.

Assuming **NO** operator actions. which of the following describes the effect of this loss of power on the operation of AFW Pump A-SA?

- a. Operates at shutoff head
- b. Operates on minimum recirculation flow
- c. Operates on maximum recirculation flow
- d. Operates at runout conditions

### **ANSWER:**

d. Operates at runout conditions

<b>QUESTION NUMBER:</b>	<b>48</b>	TIER/GROUP:		2/1	
		KAIMPORTANCE:	RO	2.5	SRO
		10CFR55 CONTENT:	41(b)	7	<b>43(b)</b>

**KA:** 061K6.01

Knowledge of the effect of a **Loss** or malfunction of the following will have on the AFW components: Controllers **and** positioners

#### **OBJECTIVE:** AFS-3.0-R5

DESCRIBE how the AFW system is impacted by a loss of 120vac uninterruptible power supplies (SI, SII, SIII, SIV)

#### **DEVELOPMENT REFERENCES:** SD-137, pg 8-9 **DEFEDENCES SUDDI JED TO ADDI JCANT:** No

**REFERENCES SUPPLIED TO APPLICANT:** None

QUESTION SOURCE: NEW X SIGNIFICANTLY MODIFIED

RANK NUMBER FOR SIGNIFICANTLY MODIFIED / DIRECT:

	DIK	ECI
AF	S-A3	001

AFS-A3 007

None

### DISTRACTOR JUSTIFICACTION (CORRECT ANSWER X'd):

a. Plausible since power is lost to the discharge valve, but the valve fails open causing flow to increase

- **b.** Plausible since power is lost to the discharge valve, but the valve fails open cawing flow to increase.
- **c.** Plausible since the valve fails open **and** flow- increases, but the pump does not run on recirculation flow.
- **X d.** The loss of power causes AFW Pump A-SA to reach runout conditions due *to* 1AF-19 failing open and having the SGs at such a low pressure.

### DIFFICULTY ANALYSIS:

**X COMPREHENSIVE/ANALYSIS** 

KNOWLEDGE / RECALL

NRC EXAM HISTORY:

**DIFFICIJLTY RATING:** 3

**EXPLANATION:** Analysis of the effect of a failure of the PCV after determining the fail position

Given the following conditions:

- The plant is in Mode 3 during a dilution of the RCS to the required boron concentration.
- A batch liquid release from the Secondary Waste Sample Tank (SWST) to the cooling tower discharge is in progress.

Which of the following sets of conditions would require entry into AOP-008, "Accidental Release of Liquid Waste"?

- a. ALB-004-2-2, REFUELING WATER STORAGE LOW LEVEL, alarms.
  - KWST level is at 94% and slowly decreasing.
- b. ALE-019-1-4. HOTWELL HIGH-LOW LEVEL. alarms.
  - Iiotwcll level is at 14% and slowly decreasing.
- c. An AO reports a leak in the NSW System inside the Turbine Building.
  - FI-9301.1, NSW Discharge Flow, indicates high.
- d. ALE-005-6-1, CCW SIJRGE TANK HIGH-LOW LEVEL, alarms.
  - CCW Surge Tank level is 39% and slowly decreasing.

### **ANSWER:**

- a. ALB-004-2-2. REFUELING WATER STORAGE LOW LEVEL, alarms.
  - RWST level is at 94% and slowly decreasing.

<b>QUESTION NUMBER:</b> 49	Ð	TIER/GRO	UP:		112	
	I	KA IMPORTAN	ICE:	RO	4.0	SRO
	10	CFR55 CONTE	NT:	41(b)	10	43(b)

#### **KA:** 00005YG2.4.4

Ability to recognize abnonnal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures. (Accidental Liquid Radwaste Release)

### **OBJECTIVE:** AOP-3.8

IDENTIFY symptoms that require entry into AOP-008, Accidental Release of Liquid Waste

DEVELOPMENT REFERENCES:	AOP-008, p 3 AOP-022, p 3 ALB-005, p 39	
<b>REFERENCES SUPPLIED TO APPL</b>	LICAST: None	
QUESTION SOURCE: NEW	SIGNIFICANTLY MODIFIED	X DIRECT
BANK NUMBER FOR SIG	<b>NIFICANTLY MODIFIED / DIRECT:</b>	AOP-3.8 001
	NRC EXAM HISTORY:	None
DISTRACTOR JUSTIFICACTION (	CORRECT ANSWER X'd):	

- **X** a. Under these conditions no water should be taken out of the KWST, so the decreasing level and alarm will require entry into AOP-008.
  - **b.** Plausible since water is being released to the Turbine Building, but actions are taken per **AOP-010** to address this.
  - c. Plausible since water is being released to the Turbine Building, but actions taken in response to a SW leak are per AOP-022.
  - **d.** Plausible since water is being lost from the CCW system, but actions taken in response to a CCW leak are per AQP-014.

**DIFFICULTY ANALYSIS:** 

COMPREHENSIVE / ANALYSIS

KNOWLEDGE/RECALL

DIFFICULTY RATING: 2

**EXPLANATION:** Knowledge of entry requirements for accidental liquid release

Which of the following actions would be most effective in responding to a Pressurized Thermal Shock condition in accordance with FRP-P.1, "Response to Pressurized Thermal Shock?"

- a. From the MCB, close the block valve for any open PRZ PORV
- b. From the MCB, isolate any stuck open steam dump valve
- c. Direct an operator to the steam tunnel to locally isolate any stuck open SG PORV
- d. Direct an operator to the steam tunnel to locally isolate any stuck open MSIV

#### **ANSWER:**

c. Direct an operator to the steam tunnel to locally isolate any stuck open SG PORV

<b>QUESTION NUMBER:</b>	50	<b>TIEWGROUP:</b>		1/2	
		KAIMPORTANCE:	RO	2.9	SRO
		10CFR55 CONTENT:	<b>41(</b> b)	7	<b>43(b)</b>

### KA: WE08G2.1.30

Ability to locate and operate components, including local controls. (Pressurized Thermal Shock)

#### **OBJECTIVE:** 3.14-1

DESCRIHF the purpose **of the** following EOPs including the type of event for which they were designed and the major actions performed

• FRP-P.1, Response to Imminent Pressurized Thermal Shock

### **DEVELOPMENT REFERENCES:** FRP-P.1, pg 6

REFERENCES SUPPLIED TO AP	PLICANT: None	
QUESTION SOURCE: X NEW	SIGNIFICANTLY MODIFIED	DIRECT
BANK NUMBER FOH S	IGNIFICANTLYMODIFIED / DIRECT:	New
	NRC EXAM HISTORY	None

### DISTRACTOR JUSTIFICACTION (CORRECT ANSWER X'd):

3

- **a.** Plausible since closing the block valve for a stuck open PRZ PORV is an action taken in FRP-J.l, though it is performed to maintain RCS inventory and will cause pressure to increase which would cause the severity of a **PIS** event to worsen.
- **b.** Plausible **since** a stuck open steam dump valve would contribute to the cooldown associated with a PTS event, but individual steam dump valves cannot be operated from the MCB.
- **X** e. A stuck open SG PORV would contribute to the cooldown associated with a PTS event. Locally isolating the SG PORV would stop any cooldown caused by the SG PORV.
  - **d.** Plausible since locally closing a stuck open **MSIV** would assist in terminating a cooldown, but the MSIV is located in the RAW and not the steam tunnel.

### **DIFFICULTY ANALYSIS:**

X COMPREHENSIVE/ANALYSIS



**DIFFICULTY RATING:** 

**EXPLANATION:** Analysis of plant conditions during a PTS event to determine the most appropriate course of action

Given the following conditions:

- RHR Pump **1A-SA** is operating during a plant heat up
- The RHR Pump 1A-SA control power fuses blow.

Which of the following describes how the Main Control Board pump indication and local breaker control is affected by the loss of the control power fuses?

- a. Main Control Board red / green running indications will be lost
  - The breaker will trip
  - Local open / closed light indication and local breaker control will be lost until control power is restored
- b. Main Control Board red / green running indications will be lost
  - The breaker remains closed
  - Local open / closed light indication will be lost, hut local breaker control is possible without the control power
- c. Main Control Board red / green running indications will be available
  - The breaker will trip
  - Local open / closed light indication is available, but local breaker control is possible without the control power
- d. Main Control Board red / green running indications will be available
  - The breaker remains closed
  - Local open / closed light indication is available, hut local breaker control will he lost until control power is restored

### ANSWER

- b. Main Control Board red / green running indications will be lost
  - The breaker remains closed
  - Local open / closed light indication will be lost, but local breaker control is possible without the control power

<b>QUESTION NUMBER</b>	51	TIER/GROUP:		2/1	
		KA IMPORTANCE:	RO	2.6	SRO
		10CFR55 CONTENT	<b>41(b)</b>	4	43(b)

### KA: **062A4.04**

Ability to manually operate and/or monitor in the control room: Local operation of breakers

### **OBJECTIVE:** 480V-3.0-R1

State the function of breaker control power and discuss the effects of a loss of breaker control power

DEVELOPMENT REFERENCES:	OP-156.02, p 10, 61 <b>480V-LP-3.0</b> , p 11	
REFERENCES SUPPLIED TO APP	LICANT: Xone	
QUESTION SOURCE: NEW	SIGNIFICANTLY MODIFIED	X DIRECT
BANK NUMBER FOR SIG	GNIFICANTLY MODIFIED / DIRECT:	480V-R1 001
	NRC EXAM HISTORY:	None
DISTRACTOR JUSTIFICACTION	(CORRECT ANSWER X'd):	

- **a.** Plausible since MCB and local indication will be lost, but the breaker will not trip open on the loss of control power and local breaker control is still possible.
- **X b.** A loss of control power will cause MCB and local indication to go out, but the breaker remains closed and local breaker control is still possible.
  - **c.** I'lausible since local breaker operation is still available. but the breaker will not trip and MCB and local indication will be lost.
  - **d.** Plausible since the breaker remains closed, but the loss of control power **will** result in a loss of MCB and local indication and the breaker can still he locally operated.

#### **DIFFICULTY ANALYSIS:**

COMPREHENSIVE / ANALYSIS



DIFFICULTY RATING: 3

**EXPLANATION:** Knowledge of the effect of a loss of control power to a 480V breaker

Which of the following situations would result in **an** inadvertent dilution of the RCS during Mode 1 operation and, after the crew has adjusted core reactivity to compensate for the change in boron concentration. which procedure would be used to address the cause of the event?

- a. RCP thermal barrier heat exchanger leak
  - AOP-016, "Excessive Primary Plant Leakage"
- b. e 4 tube leak in the CVCS Letdown heat exchanger
  - AOP-014, "Loss of Component Cooling Water"
- c. A mixed bed demineralizer that was last in service three weeks ago is mistakenly placed in service at the end-of-cycle
  - AOP-033, "Chemistry Out of Tolerance"
- d. A tube leak in the Seal Water heat exchanger
  - AOP-014, "Loss of Component Cooling Water"

### ANSWER

- d. A tube **Ieak** in the Seal Water heat exchanger
  - e AOP-014, "Loss of Component Cooling Water"

<b>QUESTION NUMBER:</b>	52	<b>TIEWGROUP:</b>		2/1	
		KA IMPORTANCE:	RO	4.2	SRO
		10CFR55 CONTENT:	41(b)	5	43(b)

#### KA: 004A2.06

Ability to (a) predict the impacts of the following malfunctions or operations on the CVCS; and (b) based on those predictions, use procedures to correct, control, **or** mitigate the consequences of those malfunctions or operations: Inadvertent boration/dilution

#### OBJECTIVE: IE-3.12-3

Identify systems whose operation may alter RCS boron concentration and discuss how operation of these systems may affect boron concentration

<b>DEVELOPMENT REFERENCES:</b>	<b>SOER</b> 94-2, p 11-12	
	AOP-014, <b>p</b> 3, 20	
	AOP-14-BD, p 20	
<b>REFERENCES SUPPLIED TO APP</b>	PLICANT: None	
QUESTION SOURCE: NEW	<b>X</b> SIGNIFICANTLY MODIFIED	DIRECT
BANK NUMBER FOR SI	<b>GNIFICANTLY MODIFIED / DIRECT:</b>	TE-3.12-R3 001
	NRC EXAM HISTORY:	None

#### DISTRACTOR JUSTIFICACTION (CORRECT ANSWER x'd):

- **a.** Plausihle since the thermal harrier interfaces with a non-borated system (CCW), hut leakage would be out of the RCS to CCW and would not affect **RCS** boron concentration.
- **b.** Plausible since CCW cools the heat exchanger and would dilute the RCS if leakage from CCW were to occur, but letdown is at a higher pressure than CCW.
- **c.** Plausible since boron concentration will change in CVCS, but this would result in an inadvertent horation rather than a dilution.
- X d. A seal water IIX leak will result in CVCS being diluted by CCW. This failure is to be addressed by AOP-014.

#### **DIFFICULTY ANALYSIS:**

COMPREHENSIVE/ ANALYSIS



DIFFICULTY RATING: 3

**EXPLANATION:** Analyze the effect of each failure on RCS boron concentration and determine the required procedure to address the failure

Given the following conditions:

- **e** The plant is in Mode 4.
- The RCS in a solid plant condition.
- RHR pump 1A-SA is in service.

In accordance with GP-007, "Normal Plant Cooldown," which of the following actions should be taken to raise PRZ pressure to a new steady-state value?

- a. Throttle 1CS-28, HC-142.1 RHR LETDOWN, in the shut direction
- b. Shut 1CS-7, 45 GPM LETDOWN ORIFICE A
- c. Adjust the setpoint for 1CS-38, PK-145.1 LTDN PRESSURE, to cause the valve to go in the shut direction
- d. Adjust the setpoint for 1CS-231, FK-122.1 CHARGING FLOW, to cause the valve to go in the open direction

### ANSWER

c. Adjust the setpoint for 1CS-38, PK-145.1 LTDN PRESSURE, to cause the valve to go in the shut direction

DIRECT

<b>QIJESTION NIJMREK:</b>	53	TIER/GROUP:		2/1	
		KA IMPORTANCE:	RO	2.9	SRO
		<b>10CFR55 CONTENT</b>	41(b)	2-9	43(b)

#### **K4:** 010K1.06

Knowledge of the physical connections and/or cause-effect relationships between the PZR PCS and the following systems: CVCS

#### **OBJECTIVE:** GP-3.7-2

With regard to RCS cooldown, **DESCRIBE** the following per GP-007

• The two methods used to control RCS pressure, including the elements of each

#### DEVELOPMENT REFERENCES: GP-007, p 41

KEFERENCES SUPPLIED TO APPLICANT: Xone

QUESTION SOURCE: NEW SIGKIFICANTLY MODIFIED

BANK NUMBER FOR SIGNIFICANTLY MODIFIED/DIRECT:

YMODIFIED/DIRECT: Harris LOCT 587 NRC EXAM HISTORY: None

### DISTRACTOR JUSTIFICACTION (CORRECTANSWER X'd):

- **a.** Plausible since this would cause an increase in RCS pressure, hut 1CS-38 will respond to cause pressure to lower again.
- **b.** Plausible since this would cause an increase in RCS pressure, but 1CS-38 will respond to cause pressure to lower again.
- **X c.** Adjusting the setpoint of 1CS-38 will cause the backpressure on the RHR pump and the RCS to increase and is the method **of** control used.
  - **d.** Plausible since this would cause an increase in RCS pressure, hut 1CS-38 will respond to cause pressure to lower again.

#### DIFFICULTY ANALYSIS:

X COMPREHENSIVE / ANALYSIS



**DIFFICIJLTY RATING:** 3

**EXPLANATION:** Comprehension of the effects of adjusting CVCS components on PRZ pressure
125 VDC battery 1A-SA is currently loaded at 292 amps and is expected to be discharged in 4 hours.

If DC load shedding is performed such that the loading on the battery is reduced from 292 amps to 146 amps. how long should the battery be available to supply the remaining loads?

- a. 4 hours
- b. More than 4 hours, but less than 8 hours
- c. 8 hours
- d. More than 8 hours

## **ANSWER:**

d. More than 8 hours

<b>QUESTION NUMBER:</b>	54	TIER/GROUP:		2/1	
		KAIMPORTANCE:	RO	2.5	SRO
		10CFR55 CONTENT:	<b>41(b)</b>	5	43(b)

KA: 063A1.01

Ability to predict and/or monitor changes in parameters associated with operating the DC electrical system controls including: Battery capacity as it is affected **by** discharge rate

#### **OBJECTIVE:** DCP-3.0-A3

STATE the function and EXPLAIN the basic operation of the following major components of the DC Power System:

• Batteries

DEVELOPMENT REFERENCES:	EPP-001, p 55 ADEL-LP-2.6, p 3	
REFERENCES SUPPLIED TO APP	LICANT: None	
QUESTION SOURCE: X NEW	SIGNIFICANTLY MODIFIED	DIRECT
BANK NUMBER FOR SIG	GNIFICANTLY MODIFIED / DIRECT:	New
	NRC EXAM HISTORY:	None
DISTRACTOR JUSTIFICACTION	(CORRECT ANSWER X'd):	

- **a.** Plausible since the battery is rated for 4 hours, hut at a discharge rate of approximately 293 amps per hour and decreasing the discharge rate would increase the capacity.
- **b.** Plausible since the discharge rate has been decreased which would extend the capacity of the battery for a period of time. but the time **would** he more than doubled.
- **c.** Plausible since the discharge rate has been halved, so it would appear that the capacity would he doubled, hut it is a non-linear relationship.
- X d. Reducing the discharge rate on a battery increases the battery capacity in a non-linear function such that decreasing the discharge rate by half, increases the capacity by more than double.

# **DIFFICULTY ANALYSIS:**

X COMPREHENSIVE/ ANALYSIS



DIFFICULTY RATING: 4

**EXPLANATION:** Calculation of the nominal discharge rate of a battery and comprehension of the effect of reducing discharge rate on battery capacity

Given the following conditions:

- The plant has experienced a Large Break Loss of Coolant Accident during a reactor startup.
- All equipment functioned as designed and the crew has reached the point in PATH-1 where monitoring Critical Safety Function Status Trees is required.

Which one of the following statements describes the **IMMEDIATE** result that voiding in the downcomber region would have on the Source Range instrumentation and procedure used to mitigate these piant conditions'?

- a. The displacement of downcomber water would increase the neutron leakage and result in a higher source range count rate.
  - The crew should continue in PATH-1 rather than transition to FRP-S.2, "Response to Loss of Core Shutdown."
- b. A decrease in downcomber water density would reduce fission and result in a lower source range count rate.
  - The crew should transition to FRP-S.2, "Response to **Loss** of Core Shutdown," rather than continue in PATII-1.
- c. The displacement of boron from the downcomber region would increase fission and result in a higher source range count rate.
  - The crew should continue in PATH-1 rather than transition to FRP-S.2, "Response to Loss of Core Shutdown.
- d. A decrease in downcomber water density would reduce fission and result in a lower source range count rate.
  - The crew should continue in PATH-1 rather than transition to FRP-S.2, "Response to Loss of Core Shutdown."

## ANSWER:

- a. The displacement of downcomber water would increase the neutron leakage and result in a higher source range count rate.
  - The crew should continue in PATH-1 rather than transition to FW-S.2, "Response to Loss of Core Shutdown."

DIRECT

INPO 20608

<b>QUESTION NUMBER:</b>	55	<b>TIENGROUP:</b>		2!2	
		KAIMPORTANCE:	RO	3.3	SRO
		10CFR55 CONTENT:	41(b)	5	<b>43(b)</b>

KA: 015A2.05

Ability to (a) predict the impacts of the following malfunctions or operations on the NIS; and (b based on those predictiow, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Core void formation

## **OBJECTIVE:** BD-3.10-7

Explain the NIS response to different void fractions in the core and downcomer region

### **DEVELOPMENT REFERENCES:** HO-BD-3.10 pg **26-24**

**REFEREXCES SUPPLIED TO APPLICANT:** None

QUESTION SOURCE: NEW SIGNIFICANTLY MODIFIED

BANK NUMBER FOR SIGNIFICANTLY MODIFIED / DIRECT:

NRC EXAM HISTORY: None

### DISTRACTOR JUSTIFICACTION (CORRECT ANSWER X'd):

- X a. Downcomber voiding results in higher source range indication due to increased leakage. The crew should continue in PAIR-1 rather than transfer to FRP-S.2 since entry conditions to FRP-S.2 are a Yellow path condition.
  - **b.** Plausible since a severe decrease in core **water** density would result in less moderation and a lower power level, but downcomber density has little effect on core reactivity.
  - **c.** Plausible since displacing core boron would result in a higher power level, but downcomber density has little effect on core reactivity.
  - **d.** Plausible since a severe decrease in core water density would result in less moderation and a lower power level, but downcomber density has little effect on core reactivity.

#### **DIFFICULTY ANALYSIS:**

**X** COMPREHENSIVE/ANALYSIS



## DIFFICULTY HATING: 3

**EXPLANATION:** Analysis of the effects of core voiding on SR indication and knowledge of the procedure hierarchy during the performance of the EOPs

## **QIJESTION:** 56

Given the following conditions:

- A transition has just been made to FRP-S.1, "Response to Nuclear Power Generation / ATWS," from PA?''-I.
- The Reactor Operator is manually inserting control rods.
- All Turbine Throttle Valve (TV) and Turbine Governor Valve (GV) indications show the RED light OFF and the GREEN light ON, with the exception of TV-3 and GV-2 which have both the RED light and GREEN light ON.
- Turbine speed is decreasing, and is currently 1680 **rpm.**
- The Main Steam Isolation Valve (MSIV) Bypass valves are closed

Which of the following actions should he taken next?

- a. Verify all AFW pumps running
- b. Manually trip the Turbine from the MCB
- c. Place both Turbine DEH pumps in PULL-TO-LOCK
- d. Shut all MSIVs

## **ANSWER:**

b. Manually trip the Turbine from the MCB

<b>QUESTION NUMBER:</b>	56	TIER/GROUP:		2/2	
		KAIMPORTANCE:	RO	2.8	SRO
		10CFR55 CONTENT:	<b>41(b)</b>	7	43(b)

# KA: 045.44.06

Ability to manually operate and/or monitor in the control **room:** Turbine stop valves

### **OBJECTIVE:** 3.15-4

Given the following EOP steps, notes, and cautions, DESCRIBE the associated basis

• Order of preference for turbine trip steps from the MCB

DEVELOPMENT REFERENCES: FRP-S.1 pg 4 REFERENCES SUPPLIED TO APPLICANT: None	
QUESTION SOURCE: NEW X SIGNIFICANTLY MODIFIED BANK NIJMBER FOR SIGNIFICANTLY MODIFIED / DIRECT:	<b>DIRECT</b> 3.15-R2 001
NRC EXAM HISTORY:	None
DISTRACTOR JUSTIFICACTION (CORRECT ANSWER X'd):	
<b>a</b> Plausible since $\mathbf{GV}$ 2 and $\mathbf{TV}$ . The associated with opposite steam chasts and	l it may be accumed

- **a.** Plausible since GV-2 and **TV-3** are associated with opposite steam chests and it may be assumed **that** as long as the GVs are closed for 1 steam chest and the TVs are closed for the other steam chest with turbine speed decreasing, and starting AFW is the next step in the procedure, however the turbine should not be considered to be tripped.
- **X b.** Verification of a turbine trip requires either **all** 4 TVs be closed or all 4 GVs be closed. If one set of these valves are not **all** closed, then the RNO directs manually tripping the turbine from the MCB.
  - c. Plausihle since the turbine should not be considered to be tripped based on indications, and this is an RNO action, but should not be performed until a manual trip from the MCB is attempted.
  - **d.** Piausible since the turbine should not be considered to be tripped based on indications, and this is **an** RNO action, but should not be performed until a manual trip from the MCN is attempted.

### **DIFFICULTY ANALYSIS:**



3



**DIFFICULTY RATING:** 

**EXPLANATION:** Knowledge of the required indications for a turbine **trip** and the priority for tripping the turbine if a trip cannot be verified

Given the foilowing conditions:

- The Main Control Room has been evacuated and control transferred to the Auxiliary Control Panel (ACP).
- AOP-004, "Remote Shutdown," is being performed when a loss of offsite power coincident with a Safety Injection signal occur.

Which of the following describes the response of the plant?

- a. The Emergency Diesel Generators automatically start and the sequencers load the EDGs due to the undervoltage signal
- b. The Emergency Diesel Generators automatically start and the sequencers load the EDGs due to the safety injection signal
- c. The Emergency Diesel Generators automatically start, hut must be manually loaded with the required loads
- d. The Emergency Diesel Generators must he manually started and manually loaded with the required loads

## **ANSWER:**

a. The Emergency Diesel Generators automatically start and the sequencers ioad the EDGs due to the undervoltage signal

<b>QUESTION NUMBER</b>	57	<b>TIEWGROUP:</b>		2/1	
		KA IMPORTANCE:	RO	3.6	SRO
		10CFR55 CONTENT:	<b>41(b)</b>	7	<b>43(b)</b>

KA: 064A3.07

Ability to monitor automatic operation of the ED/G system, including: Load sequencing

### **OBJECTIVE:** AOP-3.4-R5

DISCUSS how a transfer to the auxiliary control panel would affect the following inputs to the ESF sequencers

- Safety injection signal
- Safety bus undervoltage signal

**DEVELOPMENT REFERENCES:** AOP-004 pg 91 AOP-004-BD pg 26 SD-155.02 pg 6-9 **REFERENCES SUPPLIED TO APPLICANT:** None **QUESTION SOURCE:** NEW SIGNIFICANTLY MODIFIED DIRECT Х BANK NUMBER FOR SIGNIFICANTLY MODIFIED / DIRECT: AOP-3.4-R6 001 **NRC EXAM HISTORY:** None DISTRACTOR JUSTIFICACTION (CORRECT ANSWER X'd): **X** a. The EDGs should automatically start on the UV condition and the UV signal will still cause the sequencer to operate. Only the SIAS input to the sequencer is defeated upon transfer to the ACP. b. Plausible since the EDG will automatically start, but loading will be based upon the UV signal. c. I'lausible since the EDG will automatically start, hut loading will be based upon the UV signal d. Plausible since many automatic functions are defeated when control is transferred to the ACP, but the EDG will automatically start and loading will be based upon the UV signal.

### **DIFFICULTY ANALYSIS:**

X COMPREHENSIVE/ANALYSIS



**DIFFICULTY RATING:** 3

**EXPLANATION:** Analysis of the effect of **a** transfer to the **ACP** on the EDG and sequencer operation

Given the following conditions:

- The unit is operating at 100% power.
- Following maintenance on 1A-SA Emergency Diesel Generator (EDG), it is determined that a common mode failure exists which renders both EDGs innperable.

Which of the following actions are required to be taken within one (1) hour of declaring both EDGs inoperable'?

- a. Verify and recover required functions
- b. Restore one (1) of the EDGs to operable status
- c. Verify off site **power** availability
- d. Initiate actions to place the unit in Hot Standby

### **ANSWER:**

c. Verify off site power availability

<b>QUESTION NUMBER:</b>	58	TIER/GROUP:		3		
		KAIMPORTANCE:	RO	2.6	SRO	
		10CFR55 CONTENT:	41(b)	None	<b>43(b)</b>	2

#### **KA:** 2.2.24

Ability to analyze the affect of maintenance activities on LCO status

#### **OBJECTIVE:** DE3.0-20

Given a plant mode of operation and the applicable LCO-related parameters for an EDG, DETERMINE if a Technical Specification one-hour (or less) action statement applies

DEVELOPMENT REFERENCES: TS 3.8.1.1, pg 3/4 8-3 OST-1023, pg 1-2

**REFERENCES SUPPLIED TO APPLICANT:** None

**X SIGNIFICANTLY MODIFIED QUESTION SOTJRCE:** NEW

BANK NUMBER FOR SIGNIFICANTLY MODIFIED / DIRECT:

NRC EXAM HISTORY: None

DIRECT

Harris LOCT 385

### DISTRACTOR JUSTIFTCACTION (CORRECT ANSWER X'd):

- a. Plausible since it is an action for the EDG operability, however it is not a requirement to verify nor recover in a 1-hour time frame.
- Plausihle since restoration of one EDG to operable status is required, but it is required to be performed h within 2 honrs not 1 hour.
- **X c.** OST-1023 is required to he performed within one hour to verify off site power capability
  - d. Plausible since TS 3.0.3 would be required to be entered if an additional loss of off site capability also existed, but with only the 2 EDGs inoperable this is not required.

#### **DIFFICULTY ANALYSIS:**

**COMPREIIENSIVE/ ANALYSIS** 



DIFFICULTY RATING: 3

Knowledge of 1 hour actions required by Technical Specifications **EXPLANATION:** 

Given the following conditions:

- The plant has experienced a small break LOCA
- The crew has transitioaed to EPP-009, "Post LOCA Cooldown and Depressurization."
- The ERFIS computer is failed.
- Containment pressure peaked at 8 psig, but is now 4.5 psig and decreasing slowly

Present pressure indications are:

- PI-455.1, PRZ PRESSURE CHI = 1800 psig
- PI-456, PRZ PRESSURE CH II = 1770 psig
- PI-457, PRZ PRESSURE CH III = 1740 psig
- PI-402.1, RCS WIDE RANGE PRESSURE = 1840 psig
- PI-404, RCS WIDE RANGE PRESSURE = Failed High

Which of the following will be used to determine the primary plant pressure?

- a. Use PI-457 down to 1700 psig and use PI-402.1 below 1700 psig
- b. Use PI-456 down to 1700 psig and use PI-402.1 below 1700 psig
- c. Use PI-455.1 down to 1700 psig and use PI-402.1 below 1700 psig
- d. Use PI-402.1 at all pressures

### ANSWER

d. Use PI-402.1 at all pressures

<b>QUESTION NUMBER:</b>	59	<b>TIEWGROUP:</b>		3	
		KAIMPORTANCE:	RO	3.5	SRO
		10CFR55 CONTENT:	<b>41(b)</b>	6	43(b)

## **KA:** 2.4.3

Ability to identify post-accident instrumentation

#### **OBJECTWE:** 3.19

DESCRIBE Control Room usage of EPPs, foldouts, and FRPs as it relates to the following: g. Use of RCS wide-range pressure indication

BANK NUMBER FOR SIGNIFICANTLY MODIFIED / DIRECT:

#### DEVELOPMENT REFERENCES: EOP Users Guide pg 27, 38

#### **REFERENCES SUPPLIED TO APPLICANT:** None

QUESTION SOURCE: NEW X SIGNIFICANTLY MODIFIED

**DIRECT** Harris LOCI' 846

NRC EXAM HISTORY: None

#### DISTRACTOR JUSTIFICACTION (CORRECT ANSWER X'd):

- **a.** Plausible since PI-454 is the lowest reading of the pressures and would be the **most** conservative, but with adverse containment conditions the post-accident instrument PI-402. I is to be **used**.
- Plausible since PI-456 is the highest reading of the pressures and would likely provide the highest indication until 1700 psig is reached, but with adverse containment conditions the post-accident instrument PI-402.1 is to be used.
- **c.** Plausible since PI-455 is the median reading of the pressures and would likely **provide** the average indication until 1700 psig is reached, but with adverse containment conditions the post-accident instrument PI-402.1 is to be used.
- **X d.** Adverse containment conditions still exist so the post-accident instrument, PI-402.1 is to be used at all pressures.

### DIFFICULTY ANALYSIS:

**X** COMPREHENSIVE/ANALYSIS



DIFFICULTY RATING: 3

**EXPLANATION:** Analysis of plant conditions and instrument failures to determine indications to use during adverse containment

Assuming that all other equipment is operable, which of the following would require **an** entry into Technical Specification 3.8.2.1, "DC Sources -- Operating (Modes 1-4)," action statements?

- a. EMERGENCY BUS A-SA TO AIJX BUS D TIE BREAKER 105 SA trips open and EDG IA-SA automatically starts and loads
- b. 480V EMERGENCY BUS 1.43-SA main feeder breaker trips open
- c. BATTERY CHARGER 1A-SA is placed under clearance
- d. EMERGENCY BATTERY IA-SA is placed on a float charge

## **ANSWER:**

b. 480V EMERGENCY BUS 1A3-SA main feeder breaker trips open

DIRECT

<b>QUESTION NUMBER:</b>	60	TIER/GROUP:		2/1		
		KAIMPORTANCE:	RO	3.2	SRO	
		10CFR55 CONTENT	41(b)	None	<b>43(b)</b>	2/3

### KA: 000058G2.1.33

Ability to recognize indications for system operating parameters which are entry-level conditions for technical specifications. (Loss of DC Power)

### **OBJECTIVE:** DCP-3.0-R1

Given the name of a component in the DC power system, state whether or not that component is Technical Specification related

TS 3.8.2.1, p 3/4 8-12							
<b>SD-156,</b> p 24							
PLICANT: None							
SIGNIFICANTLY MODIFIED							
BANK NUMBER FOR SIGNIFICANTLY MODIFIED / DIRECT:							
NRC EXAM HISTORY:	None						
(	TS 3.8.2.1, p 3/4 8-12 SD-156, p 24 LICANT: None SIGNIFICANTLY MODIFIED GNIFICANTLYMODIFIED / DIRECT: NRC EXAM HISTORY:						

## DISTRACTOR JUSTIFICACTION (CORRECT ANSWER X'd):

- a. Plausible since the Program A sequencer (LOSP) will strip some MCCs which supply DC battery chargers, but the A-SA and the B-SA battery chargers will remain capable of maintaining power to the A-SA battery.
- X b. A loss of 480V Emergency AC Bus 1A3-SA will result in a loss of both MCCs 1A21-SA and 1A31 S.4, which would cause both A train battery chargers to be inoperable.
  - Plausible since removing a battery charger from service would result in a TS entry if the other charger e. is also out of service, but a single charger will not result in an entry to an action statement.
  - d. I'lausible since a float charge is a surveillance requirement and most surveillances make the associated equipment inoperable, but the normal configuration of the battery is on a float charge.

### **DIFFICULTY ANALYSIS:**

**COMPREHENSIVE / ANALYSIS** 

KNOWLEDGE/RECALL

**DIFFICULTY RATING:** 3

Analysis of the effect of a loss of AC power requiring a TS entry for DC power EXPLANATION:

Given the following conditions:

- The plant is operating at 100% power when ALB-010-1-1B. RCPA IJPPER OIL KSVR LOW;-LEVEL, alarm is received.
- The operator checks the computer points for GD AOP-018 and finds RCP 'A' motor thrust-bearing temperature at 195°F and RCP 'A' upper radial bearing at 185°F with both slowly increasing.

Which of the following actions are required?

- a. Stop RCP 'A'and initiate a rapid plant shutdown in accordance with AOP-038, "Rapid Downpower"
- b. Manually trip the reactor and go to PATH-1, stopping RCP 'A'as time permits
- c. Continue monitoring RCP 'A' temperatures, tripping the reactor and entering PATH-1 if RCP 'A' temperatures exceed 300°F
- d. Stop RCP 'A', manually trip the reactor and go to PATH-1

### **ANSWER:**

b. Manually trip the reactor and go to **PATH-1**; stopping RC'P 'A'as time permits

<b>QDESTION NUMBER: 61</b>	TIEWGROUP:		1/1		
	KA IMPORTANCE:	RO	3.4	SRO	
	10CFR55 CONTENT:	<b>41(b)</b>	None	<b>43(b)</b>	5

### KA: 000015/17AA2.08

Ability to determine and interpret the following as they apply to the Reactor Coolant Pump Malfunctions (Loss of RC Flow.): When to secure KCPs on high bearing temperature

### **OBJECTIVE:** AOP-3.18-3

Given a set of plant conditions and a copy of AOP-018, DETERMINE the appropriate response

## DEVELOPMENT REFERENCES: AOP-018 pg 21, 27

#### **REFERENCES SUPPLIED** TO **APPLICANT:** None

QUESTION SOCRCE: NEW X SIGNIFICANTLY MODIFIED

BANK NUMBER FOR SIGNIFICANTLY MODIFIED / DIRECT:

	L	<b>)</b> ]]	R	E	C	]	ſ
					-		

None

AOP-3.18 019

# DISTRACTOR JUSTIFICACTIOW (CORRECT ANSWER X'd):

- **a.** Plausible since the RCP is to be stopped, but must be stopped immediately which requires that the reactor be tripped.
- **X b. RCP** motor temperatures require the pump be stopped. With power **above** 48%, the reactor must be tripped prior to tripping the RCP.
  - **c.** Plausible since this is a trip setpoint for stator winding temperature, but the pump must be tripped immediately based on the given temperatures.
  - **d.** Piausible since these are the correct actions. but the reactor should be tripped first and the pump stopped when time permits.

## **DIFFICULTY ANALYSIS:**

COMPREHENSIVE/ ANALYSIS



NRC EXAM HISTORY:

DIFFICULTY HATING: 2

**EXPLANATION:** Knowledge of RCP motor temperature tripping requirements

# QIJESTION: 62

Given the following conditions:

- Path-2 is being performed due to an SGTR.
- The MSIV on the ruptured SG is mechanically stuck open.
- The Main Steam Isolation Valves (MSIVs) on the intact SGs are closed.
- The Condenser is available for Steam Dump operation.
- A cooldown to 485 "F from 557 "I; at the maximum rate is required.

Which of the following describes the method to accomplish this cooldown in accordance with PATII-2 and the EOP User's Guide?

- a. Fully open the Steam Dumps as fast as possible
- b. Fully open the Stem Dumps as fast **as** possible without causing a main steam line isolation
- c. Fully open the intact SG PORVs as fast as possible
- d. Fully open the intact SG PORVs as fast as possible without causing a main steam line isolation

# ANSWER

c. Fully open the intact SG PORVs as fast as possible

<b>QUESTION NUMBER</b>	62	TIER/GROUP:		1/1	
		KA IMPORTANCE:	RO	4.3	SRO
		10CFR55 CONTENT:	41(b)	7	<b>43(b)</b>

#### KA: 000038EA1.36

Ability to operate and monitor the following as they apply to a SGTR: Cooldown of RCS to specified teruperature

#### **OBJECTIVE:** 3.19-R4

Given a set of conditions during EOP implementation, DETERMINE the correct response or required action based upon the EOP User's Guide general information

Dumping steam at maximum rate

**DEVELOPMENT REFERENCES:** EOP User's Guide, p 38

PATH-2 Guide, p 8, 10

#### **REFERENCES SUPPLIED TO APPLICANT:** None

QTJESTION SOURCE: NEW X SIGNIFICANTLY MODIFIED

BANK NUMBER FOR SIGNIFICANTLY MODIFIED / DIRECT:



EOP-3.19-R4 001

NRC EXAM HISTORY: None

### DISTRACTOR JCJSTIFICACTION (CORRECT ANSWER X'd):

3

- **a.** Plausible since the maximum cooldown rate can be achieved using maximum steam dump flow, but causing too great a rate of pressure drop will result **in** the MSIVs going closed which is undesirable and it is also undesirable to use steam dumps when the ruptured SG **MSIV** is open.
- **h.** Plausible since the maximum cooldown rate is desirable using maximum steam dump flow without causing too great a rate of pressure drop will result in the **MSIVs** going closed, but it is also undesirable to use steam dumps when the ruptured SG **MSIV** is open.
- **X c.** During a SGTR cooldown only the intact SGs should be used to cooldown the **KCS** and since the MSIVs on the intact SGs are closed, tire PORVs should be used. The valves should be opened as fast as possible since generation of an MSIV signal is not a concern.
  - **d.** Plausible since causing the **MSIVs** to close is not desirable when steam dumps arc being used, but when already using PORVs to dump steam this is not a concern.

### **DIFFICULTY AXALYSIS:**

**COMPREHENSIVE / ANALYSIS** 



#### DIFFICULTY RATING:

**EXPLANATION:** Knowledge of the EOP Users Guide requirement for performing a 'maximum rate' cooldown

# **QCESTION:** 63

Given the following conditions:

- After transferring resin, it is noted that RM-1WR-3644A, SPENT RESIN PUMP 1-44., radiation monitor is indicating 10 mRem/hr.
- The monitor is physically located 20 feet away from a suspected clog in the pipe which is the source of the monitor indication.
- An operator must hang a clearance on a **valve** that is located 5 feet from the suspected clog in the pipe.

What is the dose rate in the area where the operator will be hanging the clearance? (ASSUME THE CLOG IN THE PIPE IS A POINT SOURCE)

- a. 20 mRem/hr
- b. 40 mRem/hr
- c. 80 mRem/hr
- d. 160mRem/hr

## ANSWER

d. 160 mRem/hr

QUESTION NUMBER: 6	63	TIER/GROUP:		2/1	
		KAIMPORTANCE:	RO	2.5	SRO
		10CFR55 CONTENT:	41(b)	5	43(b)

**KA:** 073K5.02

Knowledge of the operational implications as they apply to concepts as they apply to the PRM system: Radiation intensity changes with source distance

## **OBJECTIVE:** RP-3.5-21

Calculate dose rates at different distances from point sources and line sources

### DEVELOPMENT REFERENCES: RP-LP-3.5 pg 22 and

Attachment 1 pg 7

**REFERENCES SUPPLIED TO APPLICANT:** None

QUESTION SOURCE: NEW SIGNIFICANTLY MODIFIED

DIRECT

BANK NUMBER FOR SIGNIFICANTLYMODIFIED/DIRECT: NRC EXAM HISTORY:

Y: None

New

### DISTRACTOR JUSTIFKCACTION (CORRECT ANSWER X'd):

- a. Plausible if the square root of the distances is taken, instead of squared as they should be  $(10mR/hr \times 20^{1/2} \text{ ft} = 20 \text{ mR/hr } \times 5^{1/2} \text{ ft})$ .
- **b.** I'lausible if the distances are not squared as they should be  $(10mR/hr \times 20 ft = 40 mR/hr \times 5 ft)$ .
- **c.** Plausible if a mathematical error is made (value selected as a distractor due to the progression of other numbers in distracters).
- **X** d. Using the formula  $I_1 d_1^2 = I_2 d_2^2$ , the intensity of the source at 5 feet is calculated to be 160 mRem/hr.

### **DIFFICULTY ANALYSIS:**

**X COMPREHENSIVE / ANALYSIS** 

KNOWLEDGE/RECALL

DIFFICULTY RATING: 3

**EXPLANATION:** Calculation of distance using inverse square for radiation

Given the following conditions:

- The Control Room has been evacuated due to a fire.
- AOP-004, "Remote Shutdown," is being performed.
- The crew has located the most recent OST-1036, "Shutdown Margin Calculation." and determined that 5.000 gallons of boric acid must be added to the RCS.
- Boric Acid Tank level is 77%.

What level will the Boric Acid Tank be at when the 5,000 gallons of boric acid are added to the RCS **AND** why is there a concern about required shutdown margin during the performance of AOP-004?

- a. Final Boric Acid Tank level should be approximately 62% to ensure adequate shutdown margin is maintained in the event that access to the Control Room is prevented until the core has reached xenon-free conditions
- b. Final Boric Acid Tank level should be approximately 56% to ensure adequate shutdown margin is maintained in the event that access to the Control Room is prevented until the core has reached xenon-free conditions
- c. Final Boric Acid 'lank level should be approximately 62% to ensure adequate shutdown margin is maintained in the event that a cooldown to Cold Shutdown conditions is required
- d. Final Boric Acid Tank level should be approximately 56% to ensure adequate shutdown margin is maintained in the event that a cooldown to Cold Shutdown conditions is required

## **ANSWER:**

c. Final Boric Acid Tank level should be approximately 62% to ensure adequate shutdown margin is maintained in the event that a cooldown to Cold Shutdown conditions is required

<b>QUESTION NUMBER:</b>	64	<b>TIEWGROUP:</b>		1/2	
		KAIMPORTANCE:	RO	3.3	SRO
		10CFR55 CONTENT:	<b>41(b)</b>	5/10	<b>43(</b> b)

#### **KA:** 000068AK3.13

Knowledge of the reasons for the following responses as they apply to the Control Room Evacuation: Performing a shutdown margin calculation, including horon needed and horation time

### **OBJECTIVE:**

Given a set of plant conditions and a copy of AOP-004, Remote. Shutdown, DETERMINE. the appropriate course of action

<b>DEVELOPMENT REFERENCES:</b>	AOP-004-BD pg 47	
	Curve D-2	
<b>REFERENCES SUPPLIED TO APP</b>	<b>LICANT:</b> Curve I>-2	
QUESTION SOURCE: X NEW	SIGNIFICANTLY MODIFIED	DIRECT
BANK NUMBER FOR SIG	<b>GNIFICANTLY MODIFIED / DIRECT:</b>	New
	NRC EXAM HISTORY:	None

#### DISTRACTOR JUSTIFICACTION (CORRECT ANSWER X'd):

- **a.** Plausible since the **RAT** level will be at 62% following the 5,000 gallon addition, hut shutdown margin is **a** concern in the event of a cooldown.
- **b.** Plausible since errors occur when the graph is read, but the BAT level will he at 62% and shutdown margin is a concern in the event of a cooldown.
- X c. A boration is only performed in the event that a cooldown is required to be performed during the perfomlance of AOP-004. Using Curve D-2, 77% level corresponds to 27,000 gallons. Adding 5,000 gallons to the RCS will leave 22,000 gallons, which corresponds to a BAT level of 62%.
  - **a.** Plausible since a boration is only performed in the event that a cooldown is required to be performed during the performance of AOP-004, hut **BAT** level will indicate 62% and not 56%.

### DIFFICIJLTY ANALYSIS:

X
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DIFFICULTY RATING: 3

**EXPLANATION:** Knowledge of the reason for performing a boration while operating the plant from the shutdown panel **and** the ability to apply a plant curve

Given the following conditions:

- The reactor is critical at  $10^{-8}$  amps.
- The Channel I inverter output breaker trips.

Which of the following occurs as a result of the breaker tripping?

- a. Reactor power remains at 10<sup>-8</sup> amps and Power Range Channel N-42 deenergizes
- b. Reactor power remains at  $10^{-8}$  amps and Power Range Channel N-41 deenergizes
- c. The reactor trips due to Intermediate Range Channel N-36 deenergizing
- d. The reactor trips due to Intermediate Range Channel N-35 deenergizing

## **ANSWEK:**

d. The reactor trips due to Intermediate Range Channel N-35 deenergizing

<b>QIJESTION NUMBER</b>	65	TIEWGROUP:		2/1	
		KA IMPORTANCE:	RO	3.3	SRO
		10CFR55 CONTENT:	41(b)	7	43(b)

KA: 012K2.01

Knowledge of bus power supplies to the following: RPS channels, components, and interconnections

#### **OBJECTIVE:** AOP-3.24-2

RECOGNIZE automatic actions that are associated with loss of an instrument bus or loss of NNS UPS

DEVELOPMENT REFERENCES:	AOP-024, p 23, 25, 29, 34	
<b>REFERENCES SIJPPLIED TO APP</b>	LICAXT: None	

QIJESTION SOURCE: NEW SIGNIFICANTLY MODIFIED BANK NUMBER FOR SIGNIFICANTLY MODIFIED /DIRECT:

	DIRECT
Ha	rris LOCT 457

NRC EXAM HISTORY None

## DISTRACTOR JUSTIFICACTION (CORRECT ANSWER X'd):

- a. Plausible since a loss of power would result in a loss of PR Channel, but the trip occurs due to a loss of N-35.
- **b.** Plausible since a loss of power would result in a **loss** of PR Channel, but the trip occurs due to a loss of N-35.
- **c.** Plausible since a reactor trip would occur **due** to N-36 if instrument bus II were lost, but the reactor trips on **a** loss of instrument bus I due to a loss of N-35.
- **X** d. A reactor trip would occur doe to N-35 failing if instrument bus I being lost.

# **DIFFICULTY ANALYSIS:**

**×** COMPREHENSIVE / ANALYSIS

KNOWLEDGE / RECALL

DIFFICULTY RATING: 2

**EXPLANATION:** Analysis of the effect of a loss of instrument bus power on plant conditions

Given the following conditions:

- An earthquake has caused damage to the Main Reservoir dam.
- Main and Auxiliary Reservoir levels are both currently 240 feet and stable.
- AOP-022, "Loss of Service Water," is being performed for *a* Loss of Ultimate Heat Sink.
- a Emergency Service Water (ESW) pumps have been aligned to the Main Reservoir.
- a One (1) Normal Service Water (NSW) pump is operating.

Which of the following pumps are required to be operating to provide water to the SSE Fire Protection Header once the ESW header is aligned to the fire protection header'?

- a. ONLY an ESW pump
- b. An ESW pump AND an ESW Booster pump
- c. ONLY a second NSW pump
- d. A second NSW pump AND an ESW Booster pump

### ANSWER

b. An ESW pump AND an ESW Booster pump

<b>QUESTION NUMBER:</b>	66	TIER/GROUP:		211	
		KA IMPORTANCE:	RO	2.5	SRO
		10CFR55 CONTENT:	41(b)	2-9	<b>43(b)</b>

### KA: 076KI.15

Knowledge of the physical connections and/or cause-effect relationships between the SWS and the following systems: FPS

### **OBJECTIVE:** FP-3.0-3

STATE the sources of fire water available to the plant including automatic actuation signals

DEVELOPMENT REFERENCES:	AOP-022 <b>pg</b> 30 OP-139 pg 27	
REFERENCES SUPPLIED TO API	PLICAXT: None	
QIJESTION SOURCE: NEW	<b>X</b> SIGNIFICANTLY MODIFIED	DIRECT
<b>BANK NUMBER FOR SI</b>	GNIFICANTLY MODIFIED / DIRECT:	FP 020
	NRC EXAM HISTORY:	None

## DISTRACTOR JUSTIFICACTION (CORRECT ANSWER X'd):

- a. Plausible since an ESW pump is started, but an ESW Booster pump is also required.
- **X b.** An ESW pump, aligned to the Main Reservoir, is started, along with an **ESW** Rooster pump to supply the SSE fire protection header.
  - **c.** Plausible since the first **NSW** pump is **not** required to be tripped provided cooling tower basin level is adequate and **NSW** supplies the ESW header (which can supply the fire protection header), but an ESW pump is required.
  - **d.** Plausible since an ESW Booster pump is required to supply the fire header, but an ESW pump is required to supply the booster pump.

### **DIFFICULTY ANALYSIS:**

**COMPREHENSIVE/ ANALYSIS** 



**DIFFICULTY RATING:** 3

**EXPLANATION:** Knowledge of the system alignments available to supply the fire header

Given the following conditions:

- The plant is being cooled down to 140°F for maintenance which will **NOT** require the RCS be opened.
- The crew is in the process of placing the first Residual Heat Removal (RHR) train in service for RCS cooling.
- a Current boron concentrations are as follows:

•	KHR (train to be placed in service) boron	1021 pprn
•	Required Shutdown Margin boron	I200 ppm
	RC'S boron	1341 ppm
٠	Cold Shutdown boron	1450 ppm
•	Refueling boron	2261 ppm

Before the RHR train can he placed in service for RCS cooling, RHR boron concentration must be increased by a **MINIMUM** of...

- a. 179 ppm.
- b. 320 ppm.
- c. 729 ppm.
- d. 1240 ppm.

## ANSWER

a. 179 ppm.

QUESTION NUMBER:	67	TIEWGROUP:		2/1	
		KAIMPORTANCE:	RO	3.2	SRO
		10CFR55 CONTENT:	<b>41(b)</b>	5	<b>43(b)</b>

#### KA: 005K5.09

Knowledge of the operational implications of the following concepts as they apply the RHRS: Dilution and boration considerations

#### **OBJECTIVE:** RIIRS-2.0-12

APPLY precautions and limitations of OP-111, RHRS to Hypothetical System Configurations

### DEVELOPMENT REFERENCES: OP-111pg 7

REFERENCES SUPPLIED TO APPLICA	NT: None	
QUESTION SOURCE: X NEW	SIGNIFICANTLY MODIFIED	DIRECT
BANK NUMBER FOR SIGNIF	ICANTLY MODIFIED / DIRECT:	New
	NRC EXAM HISTORY:	Xone

# DISTRACTOR JKJSTIFICACTIOK (CORRECT ANSWER X'd):

3

- X a. KHR boron must he greater than or equal to the required SDM or the required refueling concentration. The boron concentration requirements will be dependent on the intended use of the RHR System. Using the RHR system for cooldown purposes requires that the boron concentration he greater than or equal to the required shutdown margin.
  - **b.** Plausible since this **is** the difference between RIIR and RCS boron concentration, but only the required **SDM** boron **is** needed.
  - **c.** Plausible since this is the difference between RHR and Cold Shutdown boron concentration, but only the required SDM boron is needed.
  - **d.** Plausible since this is the difference between RHR and refueling boron concentration, and refueling conditions occur at 140°F, hut only the required **SDM** boron is needed.

## **DIFFICULTY ANALYSIS:**

X COMPREHENSIVE / ANALYSIS



#### **DIFFICULTY RATING:**

**EXPLANATION:** Application of actual versus required boron concentration – must determine minimum limiting requirement

Given the following conditions:

- A liquid waste discharge from a Treated Laundry and Hot Shower (TL&HS) Tank is in progress.
- REM-1WL-3540, Treated Laundry and Hot Shower Tank Pump Discharge Monitor. goes into high alarm.

Which of the following terminates the discharge?

- a. The running TL&HS Tank Pump will automatically trip
- b. 3LHS-301, Treated L&HS **Tks** Discharge to Cooling Tower Blowdown, will automatically close
- c. 3LHS-293, Flow Control Valve Treated L&HS Tk to Enviro, will automatically close
- d. 3LHS-396, TL&HS Tank Pump Discharge Isolation Valve, will automatically close

### ANSWER

d. 3LHS-396, TL&HS Tank **Pump** Discharge Isolation Valve, will automatically close

QUES	TION NUMBER:	68	Т	IER/GROUP:		2 <i>i</i> 2		
			KAIM	<b>PORTANCE:</b>	RO	3.6	SRO	
			10CFR5	<b>5 CONTENT</b>	41(b)	7	<b>43(b)</b>	
KA:	<b>068A3.02</b> bility to monitor au	tomati	c operation	n of the Liquid	Radwaste S	System i	ncluding: Auton	natic isolation
		IDÝ	0.7	•		•	C	
ORII	LUIWE: LWPS	-LF-3.	0-7	с <i>с</i> :	. 1 1.	1	1	
D L'	ESCRIBE the autor	natic p	brotection	reatures associa	ted with di	scharges	s to the environn	nent from the
L	** 1 1.7							
DEV	ELOPMENT REF	EREN	ICES: A	OP-005, p 17-2	28			
REFI	ERENCES SUPPL	IED T	TO APPLI	CANT: No	ne			
QUE	STION SOURCE:		NEW	X SIGNIFIC	CANTLY	MODIF	TIED D	IRECI
	<b>BANK NUMI</b>	BER F	OR SIGN	IFICANTLY	MODIFIE	D/DIR	ECT: RMS-	A6 005
				N	RC EXAN	A HIST	ORY None	
DIST	RACTOR JUSTIE	ICAC	CTION (C	ORRECT ANS	SWER X'd	l):		
a.	Plausible since the	e pumr	will stop	the discharge, b	out there is	no auto	trip due to high	rad.
		r r	· · · · · · · · · · · · · · · · · · ·	0,1			r	
b.	Plausible since clo closure signal.	osing tl	his valve v	vill stop the disc	charge. but	this valv	ve does not recei	ive an automatic
C.	Plausible since thi	s valv	e is in the t	flow path and w	vill stop the	dischar	ge, but this valv	e does not
0.	receive an automa	tic clo	sure signa	l.	F		8-,	
Xd.	On a high rad leve	l as se	ensed by R	EM 3540 the d	ischarge is	olation v	valve will autom	atically close
	terminating any re	lease	in progress					
DIFF	ICULTY ANALY	SIS:						
Π	COMPREHENSI	VE / A	AXALYSI	s	KNOWI	EDGE	/ RECALL	
المنقدر بدبي	<b>DIFFICULTY RA</b>	TING	<b>:</b> 2	L	4			

**EXPLANATION:** Knowledge of liquid radwaste design and operation

Assuming **NO** operator actions, which of the following describes the effect of a loss of instrument air on Volume Control Tank (VCT) level?

- a. VCT level decreases due to maximum charging and letdown isolation valves closing
- b. VCT level decreases due to maximum charging and letdown being diverted **to** the Hold Up Tank
- c. VCT level increases due to minimum charging and the letdown pressure control valve failing open
- d. VCT level increases due to minimum charging and the letdown orifice isolation valves failing open

## ANSWER

**a.** VCT level decreases due to maximum charging and letdown isolation valves closing

<b>QUESTION NUMBER:</b>	69	TIER/GROUP:		2/1	
		KA IMPORTANCE:	RO	4.4	SRO
		10CFR55 CONTENT:	41(b)	7	43(b)

## **KA:** 078K3.02

Knowledge of the effect that a loss or malfunction of the IAS will have on the following: Systems having pneumatic valves and controls

### **OBJECTIVE:** AOP-3.17-4

Given a set of entry conditions, and a copy of AOP-017, DETERMINE the appropriate response.

DE	VE	CLOPMENT REFEKENCES: AOP-017 pg 37
RE	FE	RENCES SUPPLIED TO APPLICANT: None
QU	ES	STION SOURCE: NEW X SIGNIFICANTLY MODIFIED DIRECT
		BANK NUMBER FOR SIGNIFICANTLY MODIFIED/DIRECT: CVCS-R3 008
		NRC EXAM HISTORY: None
DIS	T	RACTOR JUSTIFICACTION (CORRECT ANSWER X'd):
Χa	<b>ı</b> .	Charging flow control fails open and letdown isolation valves fail closed on a loss of air, so VCT level will decrease.
ł	).	Plausible since VCT level will decrease, but it will be due to letdown isolating, not diverting water to the hold <b>up tank.</b>
C	).	Plausible since the Letdown pressure control valve fails open on a loss of air, but the letdown isolation valves fail closed, isolating letdown.
Ċ	1.	Plausible since the charging flow control valve and the letdown orifice valve all fail on <b>a loss</b> of air, but fail in the opposite direction as that which would cause this response.

### **DIFFICULTY ANALYSIS:**

X COMPREHENSIVE / ANALYSIS



DIFFICULTY RATING: 3

**EXPLANATION:** 

**ON:** Analyze the response of CVCS after determining the fail position **of** various CVCS valves on a loss of IA

Given the following conditions:

- Following a plant trip, EPP-004, "Reactor Trip Response," is being performed.
- The crew is verifying Natural Circulation conditions as **a** result of a loss of power to all KCPs.
- Five (5) core exit thermocouples are failed.

How do the failed core exit thermocouples affect indications used to verify Natural Circulation'?

- a. The Core Exit Temperature indications will be HIGHER than actual
  - RCS Subcooling will indicate MORE subcooling than actual
- b. The Core Exit Temperature indications will be HIGHER than actual
  - RCS Subcooling will indicate LESS subcooling than actual
- c. Core Exit Temperature indications will indicate LOWER than actual
  - RCS Subcooling will indicate MORE subcooling than actual
- d. Core Exit Temperature indications will indicate the SAME as actual
  - RCS Subcooling will indicate the SAME subcooling as actual

# **ANSWER:**

- d. Core Exit Temperature indications will indicate the SAME as actual
  - RCS Subcooling will indicate the SAME subcooling as actual

<b>QUESTION NUMBER:</b>	70	TIER/GROUP:		2/2	
		MAIMPORTANCE:	RO	3.5	SRO
		10CFR55 CONTENT:	41(b)	7	<b>43(b)</b>

## **KA:** 017K3.01

Knowledge of the effect that a loss or malfunction of the ITM system will have on the following: Natural circulation indications

### **OBJECTIVE:** ICCM-3.0-R6

DESCRIBE how the plant's subcooling monitor information is processed

DEVELOPMENT REFERENCES:	SD-106 <b>pg</b> 5, 14 ICCM-LP-3.0 pg 11, 14-15	
<b>REFERENCES SUPPLIED TO APP</b>	LICANT: None	
QUESTION SOURCE: X NEW	SIGNIFICANTLY MODIFIED	DIRECT
BANK NUMBER FOR SIG	GNIFICANTLY MODIFIED /DIRECT:	New
	NRC EXAM HISTORY:	None
DISTKACTOR JUSTIPICACTION	(CORRECT ANSWER X'd):	

- **a.** Plausible since the thermocouples are failed, but a failed thermocouple indicates 50°F (low) and not high.
- **b.** Plausible since the thermocouples are failed, but a failed thermocouple indicates 50°F (low) and not high.
- **c.** Piausible since the failed thermocouples indicate 50°F(low), but the ICCM indication uses the highest thermocouples and not the lowest.
- **X d.** The failed thermocouples will not be used to process the indication **by** the ICCM, *so* there will be no change on core exit temperatures and subcooling margin.

#### **DIFFICULTY ANALYSIS:**

COMPREHENSIVE/ ANALYSIS



DIFFICIJLTY RATING: 3

**EXPLANATION:** Analyze the effect of failed thermocouples on temperatures and subcooling margin

Which of the following EOP network procedures may be directly entered and which associated action is to be performed without direction from the Unit-SCO?

- a. FRP-S.I. "Response to Nuclear Power Generation / ATWS"
  - Initiate emergency boration of the RCS
- b. FRP-H.1, "Response to Loss of Secondary Heat Sink"
  - Attempt to start an AFW Pump
- c. EPP-001, "Loss of AC Power to 1A-SA and 1B-SB Ruses"
  - Manually trip the turbine if still online
- d. EPP-005, "Natural Circulation Cooldown"
  - Attempt to start an KCI'

# ANSWER

- c. EPP-001, "Loss of AC Power to 1A-SA and IN-SI3 Buses"
  - Manually trip the turbine if still online

DIRECT

New

QUESTION NUMBER 71	l	<b>TIEWGROUP:</b>		3	
		KA IMPORTANCE:	RO	4.3	SRO
		10CFR55 CONTENT:	41(b)	10	43(b)

## **KA:** 2.4.1

Knowledge of EOP entry conditions and immediate action steps

### **OBJECTIVE:** 3.19-1

DESCRIBE Control Room usage of the EOP network as it relates to the following

• Entry into EOP network

<b>DEVELOPMENT REFERENCES:</b>	EOP-EPP-001 pg 3
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EOP Users Guide pg 13

### **REFERENCES SUPPLIED TO APPLICANT:** None

QUESTION SOURCE: X NEW SIGNIFICANTLY MODIFIED

BANK NUMBER FOR SIGNIFICANTLY MODIFIED / DIRECT:

NRC EXAM HISTORY: None

# DISTRACTOR JIJSTIFICACTION (CORRECT ANSWER X'd):

- a. Plausible since FRP-S.1 contains immediate actions, but is entered only by direction in PATH-1.
- **h.** Plausible since FRP-H.1 is a high importance procedure, but is only entered when directed by other procedures.
- **X c.** EPP-001 can be entered directly and contains immediate operator actions to manually trip the turbine.
  - **d.** Plausible since EPP-005 may be entered whenever a natural circulation cooldown *is* required, but it contains no immediate operator actions.

## **DIFFICULTY ANALYSIS:**

COMPREHENSIVE / ANALYSIS

KNOWLEDGE/RECALL

**DIFFICULTY RATING:** 2

**EXPLANATION:** Knowledge of BOPs which can be entered directly
Which of the following is a reason that containment pressure greater than 45 psig is considered an extreme challenge to the containment critical safety function'?

- a. Containment structural failure is imminent
- b. Containment leakage could be in excess of design basis leakage
- c. Hydrogen recombiner efficiency is significantly reduced at the pressure
- d. Containment temperature is high enough to prevent adequate core cooling

## ANSWER

b. Containment leakage could be in excess of design basis ieakage

<b>QUESTION NUMBER:</b>	72	<b>TIEWGROUP:</b>		2/1	
		KAIMPORTANCE:	RO	3.1	SRO
		10CFR55 CONTENT:	41(b)	10	<b>43(b)</b>

K4: 103G2.4.6

Knowledge of symptom based EOP mitigation strategies. (Containment)

#### **OBJECTIVE:** 3.13-4

Given the following EOP steps, notes, and cautions, DESCRIBE the associated basis

• CSF decision points

DEVELOPMENT REFERENCES	S: LP-3.13 pg 7	
<b>REFERENCES SUPPLIED TO A</b>	PPLICANT: None	
QUESTION SOURCE: NEV	W SIGNIFICANTLY MODIFIED	X DIRECT
BANK NUMBER FOR	SIGNIFICANTLY MODIFIED / DIRECT:	3.13-R4 001
	NRC EXAM HISTORY:	None
DISTRACTOR JIJSTIFICACTIO	DN (CORRECT ANSWER X'd):	
<b>a.</b> Plausible since this is above t	he postulated pressure following a large break L	OCA or steam brea

- **a.** Plausible since this is above the postulated pressure following a large break LOCA or steam break, but containment failure is not expected to occur until several times **this** value.
- **X** b. 45 psig is above the pressure that design containment leakage rates assumed in off-site radiological analysis.
  - **c.** Plausible since the recombiners are located in containment and are conceivably affected by the high pressure, but the 45 psig is selected based on exceeding design leakage rates.
  - **d.** Plausible since core cooling **in** the event of a LOCA is **based** upon transferring heat to the injection water which is then collected in containment for recirc, but the 45 **psig** is selected based on exceeding design leakage rates.

#### **DIFFICULTY ANALYSIS:**

**COMPREHENSIVE/ANALYSIS** 

KNOWLEDGE / RECALL

DIFFICULTY RATING: 3

**EXPLANATION:** Knowledge of the basis for **CSFST** decision points for containment pressure

Assuming the plant is at 100% power steady-state conditions, which of the following would require independent verification instead of concurrent verification'!

- a. Removal of control power fuses for a clearance on RHR pump 1B-SB
- h. Pcrfonnance of PIC portions of OWP-RP due to the failure of PRZ pressure transmitter PT-455
- c. Installing a jumper in PIC-02 for a surveillance test
- d. Lifting leads in Rod Control Power Cabinet 1BD for troubleshooting

### **ANSWER:**

a. Removal of control power fuses for a clearance on RHR pump IB-SB

<b>QUESTION NUMBER:</b>	73	TIER/GROUP:		3	
		KAIMPORTANCE:	RO	3.6	SRO
		10CFR55 CONTENT:	<b>41(b)</b>	10	43(b)

**KA:** 2.2.13

Knowledge of tagging and clearance procedures

**OBJECTIVE:** PP-3.11-7

DEFINE concurrent verification and independent verification

DEVELOPMENT REFERENCES: OPS-NGGC-1303, pg 12-13 **REFERENCES SUPPLIED TO APPLICANT:** None **QUESTION SOURCE:** NEW SIGNIFICANTLY MODIFIED Х DIRECT BANK NUMBER FOR SIGNIFICANTLY MODIFIED / DIRECT: Harris LOCT 635 **NRC EXAM HISTORY** None DISTRACTOR JUSTIFICACTION (CORRECT ANSWER X'd): **X** a. Concurrent verification is not needed on 480V breakers as they would have independent verification since no adverse action would occur as a result of removing the fuses. b. Plausible since an OWP directs these actions, but concurrent verification is required since the incorrect switch operation could result in an RPS or ESF actuation. c. Plausible since a surveillance test directs these actions, but concurrent verification is required since the incorrect switch operation could result in an RPS or ESF actuation.

**d.** Plausible since a **work** order directs these actions, but concurrent verification is required since the incorrect switch operation could result in an RPS.

### **DIFFICULTY ANALYSIS:**

COMPREHENSIVE / ANALYSIS X KNOWLEDGE / RECALL

DIFFICULTY RATING: 3

**EXPLANATION:** Knowledge of the conditions when concurrent verification is **not** permitted

Given the following conditions:

- Following an accident, EPP-015, "Uncontrolled Depressurization of All Steam Generators," is being performed.
- The operators have reduced AFW flow to all stem generators (SG) to minimum as they continue attempts to isolate the SGs.

Which of the following describes the expected plant response to the AFW flow reduction and what actions arc to be taken as SG pressures decrease'?

- a. RCS hot leg temperatures will eventually begin to increase and the crew will then transition to EPP-008, "Safety Injection Termination"
- b. RC'S hot leg temperatures will eventually begin to increase and the crew will then increase AFW flow while continuing in **EPP-015**, "Uncontrolled Depressurization of All Steam Generators."
- c. The SGs will eventually become completely depressurized and the crew will then transition to EPP-014, "Faulted Steam Generator Isolation."
- d. The SGs will eventually become completely depressurized and the crew will then transition to EPP-008, "Safety Injection Termination."

## ANSWER

b. RCS hot leg temperatures will eventually begin *to* increase and the crew will then increase AFW flow while continuing in EPP-015, "Uncontrolled Depressurization of All Stem Generators."

QCESTIONNUMBER	74	TIER/GROUP:		1/1	
		KA IMPORTANCE:	RO	3.4	SRO
		10CFR55 CONTENT:	<b>41(b)</b>	7	43(b)

#### KA: WE12EK2.1

Knowledge of the interrelations between the (Uncontrolled Depressurization of all Steam Generators) and the following: Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features

#### **OBJECTIVE:** 3.9-4

Given actions taken in these emergency procedures, **PREDICT** the plant response to these actions

DEVELOPMEXT REFERENCES: EPP-015, p 8		
<b>REFERENCES SUPPLIED TO APPLICANT:</b> None		
QUESTION SOURCE: X NEW SIGNIFICAN	TLY MODIFIED	DIRECT
BANK NUMBER FOR SIGNIFICANTLY MC	DIFIED /DIRECT:	New
NRC	<b>EXAM HISTORY:</b>	None

#### DISTRACTOR JUSTIFICACTION (CORRECT ANSWER X'd):

- **a.** Plausible since hot leg temperatures will eventually increase, but the correct action is to stabilize temperature by increasing AFW flow and adjusting steaming rate, if possible.
- X h. As SG pressure and steam flow decrease, RCS hot leg temperatures will eventually stabilize and may increase. Adjusting feed flow and steam dump will control RCS hot leg temperatures.
  - e. Plausible since if no SG can be isolated the SGs will completely depressurize and there is a foldout page to transition to EPP-014 if SG pressure increases (will be stable when depressurized), and the crew will eventually end up in GP-007.
  - d. Plausible since if no SG can be isolated the SGs will completely depressurize and RCS pressure will increase due to SI flow so the operators would desire to terminate SI, but the crew will eventually end up in GP-007.

### **DIFFICULTY ANALYSIS:**

**COMPREHENSIVE / ANALYSIS** Х



### DIFFICULTY RATING: 3

**EXPLANATION:** 

Analyze SG response to decreasing pressure and reduced AFW flow and determine correct response

The crew is implementing EPP-012, "Loss of Emergency Coolant Recirculation." They are now determining Containment Spray requirements with the following conditions:

- Containnient pressure 12 psig •
- RWST level 3% •
- Cuntainnieiit Fan Coolers running 3 • 2
- Containment Spray Pumps running •

Which of the following actions should be taken?

- Start an additional Containment Fan Cooler a.
- Secure both Containment Spray Pumps b.
- Secure one Containment Spray Pump c.
- Secure one Containment Fan Cooler d.

### **ANSWER.**

Secure both Containment Spray Pumps b.

<b>QUESTION NUMBER:</b>	75	TIER/GROUP: 2/1				
		KA IMPORTANCE:	RO	3.2	SRO	
		10CFR55 CONTENT:	41(b)	5	43(b)	

KA: 026A2.08

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: Safe securing of containment spray (when it can he done)

#### **OBJECTIVE: 3.3-3**

Given the title of an EOP foldout item, state the parameters to monitored for implementation.

DEVELOPMENT REFEREN	NCES: EPP-	-012, p <b>3</b> , 14	
REFERENCES SUPPLIED	<b>FO APPLICA</b>	NT: None	
QUESTION SOURCE:	NEW	SIGNIFICANTLY MODIFIED	DIRECT
BANK NUMBER	FOR SIGNIF	ICANTLYMODIFIED / DIRECT:	3.3-R5 004
		NRC EXAM HISTORY:	None

#### DISTRACTOR JUSTIFICACTION (CORRECT ANSWER X'd):

- **a.** Plausible since the more Containment Fan Coolers that are running in EPP-012, the fewer spray pumps are required but no actions direct starting additional **fans.**
- **X** b. With RWST level below 3% all pumps taking a suction off the **RWST** must be secured, including the Containment Spray Pumps.
  - c. Plausible since this action would be taken per EPP-012 if the **RWST still** had sufficient water, but with the **KWST** empty all pumps must be stopped.
  - **d.** Plausible since action is taken to stop equipment that is **used** to remove heat from containment, but the pumps are stopped, not the fans.

#### **DIFFICULTY ASALYSIS:**

COMPREHENSIVE/ANALYSIS



DIFFICULTY RATING: 3

**EXPLANATION:** Knowledge of the conditions for securing containment spray