

FINAL SUBMITTAL

HARRIS EXAM
50-400/2004-301

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

FINAL SRO
WRITTEN EXAM WITH ANSWERS

**U.S. Nuclear Regulatory Commission
Site-Specific
SRO Written Examination**

Applicant information

Name:

Date: 03/04/04

Facility/Unit: Harris

Region: II

Reactor Type: Westinghouse

Start Time: 0800

Finish Time:

instructions

Use the answer sheets provided to document your answers. Staple this cover sheet OR top of the answer sheets. To pass the examination you must achieve a final grade of at least 80.00 percent overall, with a 70.00 percent or better on the SRO-only items if given in conjunction with the RO exam; SRO-only exams given alone require an 80.00 percent to pass. You have eight hours to complete the combined examination, and three hours if you are only taking the SRO portion.

Applicant Certification

All work done on this examination is my own. I have neither given nor received aid

Applicant's Signature

Results

RO / SRO-Only / Total Examination Values	Points
Applicant's Scores	____ / ____ / ____ Points
Applicant's Grade	____ / ____ / ____ Percent

QUESTION: 1

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°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%
- b. 42%
- c. 58%
- d. 63%

ANSWER:

- b. 42%

QUESTION NUMBER: 1 **TIEWGROUP:** 1/1
KAIMPORTANCE: 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.O-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

DEVELOPMENT REFERENCES: Steam Tables
OP-126 pg. 8

REFERENCES SUPPLIED TO APPLICANT: Steam Tables

QUESTION SOURCE: NEW SIGNIFICANTLY MODIFIED DIRECT

BANK NUMBER FOR SIGNIFICANTLY MODIFIED / DIRECT: SDCS-R4 004

NRC EXAM HISTORY: None

DISTRACTOR JUSTIFICATION (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 is used to determine the range of the instrument, but 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).

DIFFICULTY ANALYSIS:

COMPREHENSIVE / ANALYSIS

KNOWLEDGE / RECALL

DIFFICULTY RATING: 3

EXPLANATION: Must determine required steam pressure for RCS temperature and then calculate setpoint

QUESTION: 2

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 following actions should be 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

QUESTION NUMBER: 2 **TIEWGROLJP:** 1/1
KA IMPORTANCE: RO 4.0 **SRO**
10CFR55 CONTENT: 41(b) 10 **43(b)**

KA: 000022G2.4.4

Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures. (Loss of Reactor Coolant Makeup)

OBJECTIVE: AOP-3.3-R1

IDENTIFY symptoms that require entry into AOP-003, Malfunction of Reactor Makeup Control

DEVELOPMENT REFERENCES: AOP-003, pg 12-13, 25-26

REFERENCES SUPPLIED TO APPLICANT: None

QUESTION SOURCE: NEW SIGNIFICANTLY MODIFIED DIRECT

BANK NUMBER FOR SIGNIFICANTLY MODIFIED / DIRECT: AOP-3.3-R1 1

NRC EXAM HISTORY: None

DISTRACTOR JUSTIFICATION (CORRECT ANSWER X'd):

- a. Plausible since alternate dilution is a viable method of diluting the RCS, but with 1CS-151 failed closed, alternate dilution will not function either.
- b. Plausible since adjusting turbine load will result in a change in RCS temperature, but temperature is low requiring dilution, and raising turbine load will further lower it.
- c. Plausible since alternate dilution is a viable method of diluting the RCS, but with 1CS-151 failed closed, alternate dilution will not function either.
- X d.** With 1CS-151 closed, the only option available to dilute is to perform a local manual dilution.

DIFFICULTY ANALYSIS:

COMPREHENSIVE/ ANALYSIS

KNOWLEDGE/ RECALL

DIFFICULTY RATING: 3

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

QUESTION: 3

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-SI.

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 TIERGROUP: 211
 KA IMPORTANCE: RO 4.3 SRO
 10CFR55 CONTENT: 41(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:: ESFAS- 3.0-4

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

DEVELOPMENT REFERENCES: AOP-024 pg 22
SD-103 pg 9, 11, 13

REFERENCES SUPPLIED TO APPLICANT: None

QUESTION SOURCE: NEW SIGNIFICANTLY MODIFIED DIRECT

BANK NUMBER FOR SIGNIFICANTLY MODIFIED /DIRECT: ESFAS-3.0-R4 001

NRC EXAM HISTORY: None

DISTRACTOR JUSTIFICATION (CORRECT ANSWER X'd):

- a. Plausible since Train SA slave relays will not actuate, but Train SB relays will still actuate,
- b. Plausible since one train of Phase A will not actuate, but the train that will not actuate is Train SA.
- X c. A loss of Bus IDP-1A-S1 under these conditions will result in a B signal to both trains of ESFAS, resulting in an SI and Phase A signal. Train SA slave relays, however, are powered from IDP-1A-S1 and are energized to actuate, so Train SA slaves will not perform their function.
- d. Plausible since SI and Phase A signals will be generated on both trains of ESFAS, but Train SA slave relays will not actuate due to not having power.

DIFFICULTY ANALYSIS:

COMPREHENSIVE/ ANALYSIS

KNOWLEDGE / RECALL

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

QUESTION: 4

Given the following conditions:

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

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

- a. All Control Bank '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 are fully inserted

ANSWER:

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

QUESTION: 5

Given the following conditions:

- A large steam break has occurred inside Containment.
- During the performance of PATH-I, the crew determined Containment pressure to be **18** psig and they verified proper operation of the Containment Spray System.
- A transition has just been made to EPP-014, "Faulted Stearn 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 FW-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 10psig 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 FRP-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

QUESTION: 6

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 following describes the strategy used to re-establish feed under these conditions?

- a. Feed ONLY one (1) SG to ensure RCS 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

QUESTION NUMBER: 6 TIEWGROUP: 1/1
 KA IMPORTANCE: RQ 3.6 SRO
 10CFR55 CONTENT: 41(b) 8/10 43(b)

KA: 000054AK1.02

Knowledge of the operational implications of the following concepts as they apply to Loss of Main Feedwater (MFW): Effect of feedwater introduction on dry SG

OBJECTIVE: 3.11-4

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

- Feed restoration

DEVELOPMENT REFERENCES: FRP-H.1, pg 47
LP-3.11, pg 12

REFERENCES SUPPLIED TO APPLICANT: None

QUESTION SOURCE: NEW SIGNIFICANTLY MODIFIED DIRECT

BANK NUMBER FOR SIGNIFICANTLY MODIFIED / DIRECT: New

NRC EXAM HISTORY: None

DISTRACTOR JUSTIFICATION (CORRECT ANSWER X'd):

- a. Plausible 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.

DIFFICULTY ANALYSIS:

COMPREHENSIVE / ANALYSIS

KNOWLEDGE / RECALL

DIFFICULTY RATING: 3

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

QUESTION: 7

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 CSEP 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-180.1, KCP **SEAL** WTR INJ FLOW, to establish 8 to 13 gpm 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 / **422**, RCP A / B / C SEAL INJ MANUAL ISOL, to establish 8 to 13 gpm seal injection flow
- d. Locally adjust 1CS-340 / 381 / 422, **RCP** A / 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 IIC-186.1, RCP SEAL WTR INJ FLOW, to establish **8** to 13 gpm seal injection flow

QUESTION: 8

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, SI RESET – AUTO SI BLOCKED, 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 RESET – 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, SI RESET – AUTO SI BLOCKED, 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: 9

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?

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

ANSWER:

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

QUESTION NUMBER: 9 TIER/GROUP: 2/1
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)
- Containment Spray Actuation

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

REFERENCES SUPPLIED TO APPLICANT: None

QUESTION SOURCE: NEW SIGNIFICANTLY MODIFIED DIRECT

BANK NUMBER FOR SIGNIFICANTLY MODIFIED / DIRECT: Harris LOCT 139

NRC EXAM HISTORY None

DISTRACTOR JUSTIFICATION (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 deenergized to actuate and CSAS is energized to actuate.
- d. Plausible since the 2 failed channels will cause an SI actuation, but CSAS is energized to actuate and 1 channel is in a deenergized condition so CSAS will not occur.

DIFFICULTY ANALYSIS:

COMPREHENSIVE / ANALYSIS KNOWLEDGE / RECALL

DIFFICULTY RATING: 3

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

QUESTION: 10

Given the following conditions:

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

Outward rod *motion* is inhibited by ...

- a. C-4, OPAT rod stop.
- h. 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.

QUESTION NUMBER: 10 **TIEWGROUP:** 2
KAIMPORTANCE: RO 3.7 **SRO**
10CFR55 CONTENT: 41(b) 7 **43(b)**

KA: 001K4.07

Knowledge of **CRDS** design feature(s) and/or interlock(s) which provide for the following: **Rod stops**

OBJECTIVE: XIS-3.0-9

DISCUSS the operation of the following NI trip-related functions:

b. SR, IR and PR (low) trip blocks

DEVELOPMENT REFERENCES: OP-105 pg 26
AOP-024 pg 6

REFERENCES SUPPLIED TO APPLICANT: None

QUESTION SOURCE: NEW SIGNIFICANTLY MODIFIED DIRECT

BANK NUMBER FOR SIGNIFICANTLY MODIFIED/DIRECT: NIS-R6 003

NRC EXAM HISTORY None

DISTRACTOR JUSTIFICATION (CORRECT ANSWER X'd):

- a. Plausible since causes rod stop, but coincidence is 2/4 instead of 1/4
- b. Plausible since causes rod stop, but coincidence is 2/4 instead of 1/4
- X c. PR rod stop is 1/4 coincidence. With **S2-SB** deenergized, ER N-42 is tripped.
- d. Plausible since this causes a rod stop, and coincidence is 1/2, but IR rod stop is blocked above P-10 by manual operator action. Must have 2/4 PR below P-10 to reset.

DIFFICULTY ANALYSIS:

COMPREHENSIVE / ANALYSIS **KNOWLEDGE / RECALL**

DIFFICULTY RATING: 3

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

QUESTION: 11

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. zirc-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 PRT 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: 12

EPP-001. "Loss of AC Power to **1A-SA** and **IB-SB** Buses," is being performed. Concurrent to the 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 **14-SA**:

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

Which of the following actions is the **FIRST** to be taken following the restoration of off-site power?

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

ANSWER

- c. Stabilize SG pressures

QUESTION NUMBER: 12 TIER/GROUP: 1/1
KAIIMPORTANCE: RO 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 SUPPLIED TO APPLICANT: None

QUESTION SOURCE: NEW SIGNIFICANTLY MODIFIED DIRECT

BANK NUMBER FOR SIGNIFICANTLY MODIFIED / DIRECT: New

NRC EXAM HISTORY: None

DISTRACTOR JUSTIFICATION (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.
- b. Plausible since a small break LOCA exists and RCS inventory is being lost, but the first action is to stabilize SG pressure.
- X e. 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.

DIFFICULTY ANALYSIS:

COMPREHENSIVE / ANALYSIS

KNOWLEDGE / RECALL

DIFFICULTY RATING: 3

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

QUESTION: 13

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 initiated by ~~the~~ Reactor Operator prior to performance
- b. • 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 initiated by *the* SCO prior to performance
- d. • Step must be initiated 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 initiated 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

QUESTION NUMBER: 13 **TIEWGROUP:** 3
KA IMPORTANCE: RO 3.9 SRO
10CFR55 CONTENT: 41(b) None 43(b) Xone

KA: 2.1.23

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

REFERESCES SUPPLIED TO APPLICANT: Some

QUESTION SOURCE: NEW SIGNIFICANTLY MODIFIED DIRECT

RANK NUMBER FOR SIGNIFICANTLY MODIFIED / DIRECT: New

NRC EXAM HISTORY: None

DISTRACTOR JUSTIFICATION (CORRECT ANSWER X'd):

- Plausible since the KO 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.
 - Plausible since a written explanation must be provided in the Comments section, but a supervisor must initial the step prior to performance.
 - Plausible since a supervisor must initial the step prior to performance, but a written explanation must be 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 KNOWLEDGE / RECALL

DIFFICULTY RATING: 2

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

QUESTION: 14

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. 1500mRem
- h. 2000 mRem
- c. 3500 mRem
- d. 4500 mRem

ANSWER:

- h. 2000 mRem

QUESTION NUMBER: 14 **TIER/GROUP:** 3
KAIMPORTANCE: RO 2.5 **SRO**
10CFR55 CONTENT: 41(b) 12 **43(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

DEVELOPMENT REFERENCES: NGGM-PM-002, pg 11

REFERENCES SUPPLIED TO APPLICANT: Some

QUESTION SOURCE: NEW SIGNIFICANTLY MODIFIED DIRECT

BANK NUMBER FOR SIGNIFICANTLY MODIFIED / DIRECT: PP-3.7-R1 002

NRC EXAM HISTORY: None

DISTRACTOR JUSTIFICATION (CORRECT 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 Progress Energy TEDE shall not exceed 2 Rem and 4 Rem total dose if non-Progress Energy occupational dose for the current year is determined.
- c. Plausible since he is permitted to receive a total of 4 Rem between the 2 utilities and he already has 500 mRem, but the more limiting is the 2 Rem Progress Energy dose.
- d. Plausible 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:

COMPREHENSIVE / ANALYSIS

KNOWLEDGE / RECALL

DIFFICULTY RATING: 2

EXPLANATION: Knowledge of administrative dose limits

QUESTION: 15

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 shut.
- h. 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 dampers open.

QUESTION NUMBER: 15 TIEWGROUP: 2/1
KAIMPORTANCE: RO 3.2 SRO
10CFR55 CONTENT: 41(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 Subsystems to the following signals.

- SI

DEVELOPMENT REFERENCES: SD-169, p 14

REFERENCES SUPPLIED TO APPLICANT: None

QUESTION SOURCE: NEW' SIGNIFICANTLY MODIFIED DIRECT

BANK NUMBER FOR SIGNIFICANTLY MODIFIED / DIRECT: CCS-R4 001

NRC EXAM HISTORY: None

DISTRACTOR JUSTIFICATION (CORRECT ANSWER X'd):

- a. Plausible since this alignment is an alignment that would be used following a loss of offsite power, but the SI alignment has the fans in low speed.
- h. Plausible since this alignment is an alignment that would be used following a loss of offsite power with the dampers aligned *for* the SI alignment, but the SI alignment has the fans in low speed.
- c. Plausible since the fans are 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 KNOWLEDGE / RECALL

DIFFICULTY RATING: 3

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

QUESTION: 16

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 **TIEWGROUP:** 1/1
KAIMPORTANCE: RO 3.2 **SRO**
10CFR55 CONTENT: 41(b) 7 **43(b)**

KA: 000008G2.1.28

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 functions 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 JUSTIFICATION (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 PKZ is excessive inventory or voiding in the head region.
- b. Plausible since RVLIS is used throughout the EOF network to determine if SI termination criteria has been met, but in this instance it is used to determine the cause of the high PRZ level.
- e. Plausible since a steam space break in the PRZ will affect the level indications, but 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 RVLIS is used to determine the cause of the PRZ high level condition.

DIFFICULTY ANALYSIS:

COMPREHENSIVE / ANALYSIS KNOWLEDGE / RECALL

DIFFICULTY RATING: Knowledge of the purpose of monitoring RVLIS during accident conditions

EXPLANATION:

QUESTION: 17

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 following 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 Technical Specifications
- b. Gravity feed from the KWST 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 **TIEWGROUP:** 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 9
AOP-020-BD, pg 19

REFERENCES SUPPLIED TO APPLICANT: None

QUESTION SOURCE: NEW SIGNIFICANTLY MODIFIED DIRECT

BANK NUMBER FOR SIGNIFICANTLY MODIFIED / DIRECT: New

NRC EXAM HISTORY: None

DISTRACTOR JUSTIFICATION (CORRECT ANSWER X'd):

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

DIFFICULTY ANALYSIS:

COMPREHENSIVE / ANALYSIS **KNOWLEDGE / RECALL**

DIFFICULTY RATING: 3

EXPLANATION: Analysis of plant conditions to determine appropriate response and reason for response

QUESTION: 18

Given the following conditions:

- Containment temperature is **96** °F.
- Containment Fan Coolers (AH-1/2/3/4) are operating in the Normal Cooling Mode.
- A loss of offsite power occurs and the plant 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

QUESTION NUMBER: I8 **TIEWGROUP:** 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

DEVELOPMENT REFERENCES: SD-169pg 14

REFERENCES SUPPLIED TO APPLICANT: None

QUESTION SOURCE: NEW SIGNIFICANTLY MODIFIED DIRECT

BANK NUMBER FOR SIGNIFICANTLY MODIFIED / DIRECT: CCS-R4 001

NRC EXAM HISTORY: None

DISTRACTOR JUSTIFICATION (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, but the discharge is to the concrete airshaft not the post-accident discharge duct.
- e. 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

KNOWLEDGE / RECALL

DIFFICULTY RATING: 3

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

QUESTION: 19

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. BANK 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 Bank 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 Bank D.

QUESTION NUMBER: 19 **TIEWGROUP:** 1/2
KA IMPORTANCE: RO 2.5 **SRO**
10CFR55 CONTENT: 41(b) 7 **43(b)**

KA: 000005AK2.02

Knowledge of the interrelations between the Inoperable / Stuck Control Rod and the following: 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

DEVELOPMENT REFERENCES: AOP-001 pg 17-18

REFERENCES SUPPLIED TO APPLICANT: None

QUESTION SOURCE: NEW SIGNIFICANTLY MODIFIED DIRECT

BANK NUMBER FOR SIGNIFICANTLY MODIFIED / DIRECT: New

NRC EXAM HISTORY: None

DISTRACTOR JUSTIFICATION(CORRECT ANSWER X'd):

- X a.** The affected individual bank position should be selected and the inoperable rod will be 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 be attempted to be 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 be selected, but the inoperable rod will be attempted to be 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.

DIFFICULTY ANALYSIS:

COMPREHENSIVE / ANALYSIS

KNOWLEDGE / RECALL

DIFFICULTY RATING: 3

EXPLANATION: Knowledge of the means for a misaligned rod per procedure

QUESTION: 20

Given the following conditions:

- EKFIS is inoperable.
- Plant parameters are as follows:
 - ICCM highest **TC** = 672° F
 - RCS WR temperature (highest) = **688" F**
 - RCS pressure PT-440 = 1535 psig
 - RCS pressure PT-402 = 1635 psig
 - CNMT pressure P1-95 1 = 4.5 psig

What value of superheat should be reported?

- a. 63 °F
- b. 71 °F
- c. 79 °F
- d. 87 °F

ANSWER

- a. 63 °F

QUESTION NUMBER: 20 **TIEWGROUP:** 1/2
KA IMPORTANCE: RO 4.6 **SRQ**
10CFR55 CONTENT: 41(b) Noue **43(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

DEVELOPMENT REFERENCES: Users Guide, pg 27, 34-35

REFERENCES SUPPLIED TO APPLICANT: Steam Tables

QUESTION SOURCE: NEW SIGNIFICANTLY MODIFIED DIRECT

BANK NUMBER FOR SIGNIFICANTLY MODIFIED / DIRECT: 3.19-R4 003

NRC EXAM HISTORY: Kone

DISTRACTOR JUSTIFICATION (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).
- b.** Plausible since tire 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 °F (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).

DIFFICULTY ANALYSIS:

COMPREHENSIVE/ ANALYSIS

KNOWLEDGE / RECALL

DIFFICULTY RATING: 3

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

QUESTION: 21

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 °F to 126 °F.

How does Pressurizer level 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

QUESTION NUMBER: 21 **TIER/GROUP:** 2/1
KAIMPORTANCE: RO 3.0 **SRO**
10CFR55 CONTENT: 41(b) 7 **43(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-3.0-4

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

QUESTION SOURCE: NEW SIGNIFICANTLY MODIFIED DIRECT

BANK NUMBER FOR SIGNIFICANTLY MODIFIED / DIRECT: New

NRC EXAM HISTORY: None

DISTRACTOR JUSTIFICATION (CORRECT ANSWER X'd):

- X a. Reference leg density decreases as containment temperature increases which causes level to 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 leg 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:

COMPREHENSIVE / ANALYSIS

KNOWLEDGE / RECALL

DIFFICULTY RATING: 3

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

QUESTION: 22

Given the following conditions:

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

<u>INDICATION</u>	<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	4 mil and ↑ at 0.1 mil per hr
Shaft Vibration	12 mil and ↑ at 0.3 mil per hr	3 mils and stable	14 mils and ↑ 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-1

ANSWER:

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

QUESTION: 23

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 PRT through the **Keactor** Coolant Drain Tank heat exchanger, using Component Cooling Water to cool the heat exchanger
- b. Recirculate the PKT through the Reactor Coolant **Drain** Tank heat exchanger, using Service Water to cool the heat exchanger
- c. Drain the PRT to the Keactor 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 Keactor Makeup Water Storage Tank

ANSWER:

- a. Recirculate the PRT through the Keactor Coolant Drain Tank heat exchanger, using Component Cooling Water to cool the heat exchanger

QUESTION NUMBER: 23 **TIER/GROUP:** 211
KA IMPORTANCE: RO 2.6 **SRO**
10CFR55 CONTENT: 41(b) 7 **43(b)**

K4: 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 ALIGN the PRT for filling, draining, recirculation, or cooldown

DEVELOPMENT REFERENCES: APP-ALB-009, pg 29
OP-100, pg 30

REFERENCES SKIPPED TO APPLICANT: None

QUESTION SOURCE: NEW SIGNIFICANTLY MODIFIED DIRECT

BANK NUMBER FOR SIGNIFICANTLY MODIFIED / DIRECT: New

NRC EXAM HISTORY: None

DISTRACTOR JUSTIFICATION (CORRECT ANSWER X'd):

- X a.** Normal cooling of the PRT 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, but it is cooled by CCW, not SW.
- e.** Plausible since a rapid cooldown of the PRT would be accomplished by draining to the RCDT and making up to the PRT, but the makeup source is RMUW, not the DWST.
- d.** Plausible since this method would be used for a rapid cooldown of the PRT, but is not the normal cooldown method used.

DIFFICULTY ANALYSIS:

COMPREHENSIVE / ANALYSIS KNOWLEDGE / RECALL

DIFFICULTY RATING: 2

EXPLANATION: Knowledge of the design method of cooling the PRT

QUESTION: 24

Which of the following 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 SSPS Train A lose power
- d. Main Turbine DC Hearing Oil Pump loses power

ANSWER:

- a. Emergency Diesel Generator A-SA loses excitation power

QUESTION NUMBER: 24 **TIER/GROUP:** 1/1
KA IMPORTANCE: RO 3.4 **SRO**
10CFR55 CONTENT: 41(b) 7 **43(b)**

KA: 064K2.03

Knowledge of EDG bus power supplies to the following: Control power

OBJECTIVE: AOP-3.25-3

Given plant conditions?DISCUSS the following notes, cautions, and procedural steps as they apply

- The effects of a loss of a DC bus on equipment operability

DEVELOPMENT REFERENCES: AOP-3.25, p 39

REFERENCES SUPPLIED TO APPLICANT: None

QUESTION SOURCE: NEW SIGNIFICANTLY MODIFIED DIRECT

BANK NUMBER FOR SIGNIFICANTLY MODIFIED / DIRECT: New

NRC EXAM HISTORY None

DISTRACTOR JUSTIFICATION (CORRECT ANSWER X'd):

- X a.** DP-1A-SA supplies the EDG governor and generator excitation control circuits.
- h.** Plausible since the emergency escape air lock is powered from DC, but not the emergency DC bus.
- c.** Plausible since **SSPS** receives input from the emergency DC bus and the master relays operate on DC, but the emergency bus only supplies the Rx Trip Breaker shunt trip power and the master relays are powered by 48 vdc which is produced in SSPS via the instrument buses.
- d.** Plausible since the DC bearing oil pump is powered by DC and is one of the only DC loads specifically addressed in the EOPs, but it is powered by the non-safety related 250 VDC.

DIFFICULTY ANALYSIS:

COMPREHENSIVE / ANALYSIS KNOWLEDGE / RECALL

DIFFICULTY RATING: 2

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

QUESTION: 25

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

- Power Range Channel N-41 26.0%
- Power Range Channel N-42 24.5%
- Power Range Channel N-43 24.5%
- Power Range Channel N-44 25.0%
- Loop 'A' ΔT 25.5%
- Loop 'B' ΔT 25.5%
- Loop 'C' ΔT 25.5%
- Turbine Load 24.5% (DEH units converted to percent load)

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

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

ANSWER.

- c. 25.5%

QUESTION NUMBER: 25 **TIEWGROUP:** 2/2
KA IMPORTANCE: RO 3.6 **SRO**
10CFR55 CONTENT: 41(b) 5 **43(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: NIS-3.0-13

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

DEVELOPMENT REFERENCES: GP-005, pg 12

REFERENCES SUPPLIED TO APPLICANT: None

QUESTION SOURCE: NEW SIGNIFICANTLY MODIFIED DIRECT

HANK NUMBER FOR SIGNIFICANTLY MODIFIED/DIRECT NIS-R10 003

NRC EXAM HISTORY: None

DISTRACTOR JUSTIFICATION (CORRECT ANSWER X'd):

- a. Plausible since this is the lowest given power level and may be considered to be the most conservative, but GP-005 provides guidelines for which power level should be considered.
- h. Plausible since this is the average NIS power level; but the highest as identified by GP-005 requirements is the average loop AT.
- X c. 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/ANALYSIS KNOWLEDGE / RECALL

DIFFICULTY RATING: 3

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

QUESTION: 26

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

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

- a. Normal Purge Inlet and Discharge Valves are open
- b. **AII-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

QUESTION NUMBER 26 TIER/GROUP: 2/2
KAIMPORTANCE: RO 3.0 SRO
10CFR55 CONTENT: 41(b) 5 43(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

QUESTION SOURCE: NEW SIGNIFICANTLY MODIFIED DIRECT

BANK NUMBER FOR SIGNIFICANTLY MODIFIED/DIRECT: New

NRC EXAM HISTORY: None

DISTRACTOR JUSTIFICATION (CORRECT ANSWER X'd):

- a. Plausible since the valves are interlocked to close if fan AH-82A 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 AP is more negative than -0.400 INWG

DIFFICULTY ANALYSIS:

COMPREHENSIVE/ ANALYSIS KNOWLEDGE/RECALL

DIFFICULTY RATING: 3

EXPLANATION: Knowledge of interlocks associated with containment purge fans

QUESTION: 27

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

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

DEVELOPMENT REFERENCES: GP-004 pg 9 P & L # 19
OMM-001 pg 66-69
IE-LP-3.10 (Salem Event, SOER 94-01)

REFERENCES SUPPLIED TO APPLICANT: None

QUESTION SOURCE: NEW SIGNIFICANTLY MODIFIED DIRECT

HANK NUMBER FOR SIGNIFICANTLY MODIFIED / DIRECT: New-

NRC EXAM HISTORY: None

DISTRACTOR JUSTIFICATION (CORRECT ANSWER X'd):

- a. Plausible since reactor power will increase, but temperature is not to be restored using two different methods of reactivity control simultaneously and the 15 minute limit is to restore temperature above 551 °F, not to program.
- 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 °F within 15 minutes due to the requirements of TS 3.1.1.4.
- c. Plausible since the 15 minute time limit is associated with restoration, but 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.

DIFFICULTY ANALYSIS:

COMPREHENSIVE / ANALYSIS KNOWLEDGE / RECALL

DIFFICULTY RATING: 3

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

QUESTION: 28

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

<u>Time</u>	<u>Ambient Temp</u>	<u>CT Basin Temp</u>
1500	35 °F	64 °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 |
| b. | Full Open | Half open |
| c. | Half Open | Full Open |
| d. | Half Open | Half Open |

ANSWER:

- | | | |
|----|-----------|-----------|
| b. | Full Open | Half Open |
|----|-----------|-----------|

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

ANSWER:

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

QUESTION NUMBER: 29 TIEWGROUP: 3
KA IMPORTANCE: RO 2.7 SRO
10CFR55 CONTENT: 41(b) None 43(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 SGTK

DEVELOPMENT REFERENCES: PATH-2 pg 8

REFERENCES SUPPLIED TO APPLICANT: None

QUESTION SOURCE: NEW SIGNIFICANTLY MODIFIED DIRECT

BANK NUMBER FOR SIGNIFICANTLY MODIFIED/DIRECT: New

NRC EXAM HISTORY: None

DISTRACTOR JUSTIFICATION (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 setpoints.
- c. Plausible since this action would be taken if the SG were faulted instead of ruptured
- d. Plausible since this action would be taken if the SG POKV were to fail open, but this would also cause the safeties to be challenged and should not be performed **unless** necessary.

DIFFICULTY ANALYSIS:

COMPREHENSIVE / ANALYSIS

KNOWLEDGE / RECALL

DIFFICULTY RATING: 3

EXPLANATION: Knowledge of steps required to isolate a SGTR

QUESTION: 30

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

- a.
 - RCS pressure increasing
 - RAB local room temperatures
- b.
 - RAB local room temperatures
 - RAB radiation levels decreasing
- c.
 - RAB 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

QUESTION NUMBER: 30 TIEWGROUP: 1/1
KAIMPORTANCE: 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 following:

- Transitions to other EOPs

DEVELOPMEXI REFERENCES: EPP-013 pg 5

REFEHNENCES SUPPLIED TO APPLICANT None

QUESTION SOURCE: NEW SIGNIFICANTLY MODIFIED DIRECT

BANK NUMBER FOR SIGNIFICANTLY MODIFIED / DIRECT: 3.3 024

NRC EXAM HISTORY: None

DISTRACTOR JUSTIFICATION (CORRECT ANSWER X'd):

- a. Plausible since RCS pressure increasing is one of the indications used, hut local temperatures are not used in EPP-013.
- b. Plausible since those 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 RAH radiation levels may be elevated for some time after isolation and is not used in EPP-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

KNOWLEDGE/RECALL

DIFFICULTY RATING: 3

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

QUESTION: 31

Which of the following is the reason for purposely tripping the Reactor Coolant Pumps (RCPs) 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 RCS
- d. Prevent damage to RCPs due to pumping a two-phase mixture event

ANSWER

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

QUESTION NUMBER: 31 TIER/GROUP: 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 they apply to the small break EOCA: 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: None

QUESTION SOURCE: NEW SIGNIFICANTLY MODIFIED DIRECT

RANK NUMBER FOR SIGNIFICANTLY MODIFIED/DIRECT: BD-3.1 001

NRC EXAM HISTORY: None

DISTRACTOR JUSTIFICATION (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, but 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 at a later time.
- d. Plausible since RCPs 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: 7

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

QUESTION: 32

Given the following conditions:

- o The unit is in Mode 3 at normal operating pressure
- o Pressurizer Pressure Control is in AUTO.
- o Pressurizer Pressure Channel PT-445 fails high.

- o PRZ Pressure Channel indications are:
 - o PI-444 2050 psig
 - e PI-445 2500 psig
 - PI-455 2050 psig
 - o 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 IRC-114 closed
 - PRZ PORVs 1RC-116 and 1RC-118 open
 - o PRZ Spray Valves PCV-444C and PCV-444D open

- b.
 - o PRZ PORV IRC-114 open
 - PRZ PORVs 1RC-116 and 1RC-118 closed
 - e PRZ Spray Valves PCV-444C and PCV-444D open

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

- d.
 - o PRZ PORV IRC-114 open
 - PRZ PORVs 1RC-116 and 1RC-118 closed
 - o PRZ Spray Valves PCV-444C and PCV-444D closed

ANSWER:

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

The noun names **were** provided for the following valves:

1RC-114, PRZ PORV PCV-444B
1RC-116, PRZ PORV **PCV-445B**
1RC-118, PRZ PORV PCV-444A

QUESTION: 33

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
- h. 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 CRP recirc valves closed

ANSWER:

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

QUESTION NUMBER: 33 TIER/GROUP: 211
KA IMPORTANCE: RO 3.2 SRO
10CFR55 CONTENT: 41(b) 7 43(b)

KA: 056G2.1.28

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

OBJECTIVE: CFW-3.0-4

DESCRIBE the basic construction and operation of the following CFW System components 1 subsystems

- CBP Variable Speed Fluid Coupling (VSFC)

DEVELOPMENT REFERENCES: SD-134. p 7, 17

REFERENCES SUPPLIED TO APPLICANT: None

QUESTION SOURCE: NEW SIGNIFICANTLY MODIFIED DIRECT

BANK NUMBER FOR SIGNIFICANTLY MODIFIED / DIRECT: CFW-R3 001

NRC EXAM HISTORY: None

DISTRACTOR JUSTIFICATION (CORRECT ANSWER X'd):

- a. Plausible since oil adjusts the hydraulic coupling to maintain a constant suction pressure at the feed **pump**, but the oil **does** not bypass the hydraulic coupling
- h. Plausible since oil adjusts the hydraulic coupling, but it does not bypass the hydraulic **coupling** and does not maintain the CBP recirc valves closed.
- X c. An oil bath between the motor and pump coupling causes the pump to operate at a variable speed to maintain a constant suction pressure at the feed **pump**.
- d. Plausible since an oil bath between the motor and pump coupling causes the pump to operate at a variable speed, but it is designed to maintain a constant suction pressure at the feed **pump** rather than the CBP recirc valves closed.

DIFFICULTY ANALYSIS:

COMPREHENSIVE / ANALYSIS

KNOWLEDGE / RECALL

DIFFICULTY RATING: 3

EXPLANATION: Knowledge of the operation of the CBPs

QUESTION: 34

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-1TV-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. **1.08E -4**
- d. 1.80 E -6

ANSWER:

- c. 1.08 E-6

QUESTION NUMBER: 34 TIEWGROUP: 1/2
KA IMPORTANCE: 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 Tube Leak: Tech-Spec limit? for RCS leakage

OBJECTIVE: AOP-3.16

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

DEVELOPMENT REFERENCES: AOP-016 pg 15
Curves H-X-15a/b/c

REFERENCES SUPPLIED TO APPLICANT: Curves H-X-15a/b/c

QUESTION SOURCE: NEW SIGNIFICANTLY MODIFIED DIRECT

BANK NUMBER FOR SIGNIFICANTLY MODIFIED/DIRECT: Harris NRC 2000-80

NRC EXAM HISTORY: None

DISTRACTOR JUSTIFICATION (CORRECT ANSWER X'd):

- a. Plausible since this exceeds would exceed PSAL 2 limits if operating on full motivating air (curve H-X-15a), but the incorrect curve is used.
- h. Plausible since this exceeds would exceed PSAL 2 limits if operating on intermediate motivating air (curve H-X-15b), but the incorrect curve is used.
- X c. Lowest level that would exceed 75 gpd (PSAL 2) which would require a TS shutdown.
- 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:

COMPREHENSIVE / ANALYSIS KNOWLEDGE / RECALL

DIFFICULTY RATING: 3

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

QUESTION: 35

FRP-J.?, "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 Emergency Service Water to containment should be isolated
- d. If sump water may be transferred to tanks outside containment

ANSWER:

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

QUESTION: 36

Given the following conditions:

- RIIR Pump A-SA is tagged out.
- Following a large break LOCA, the crew was performing EPP-010, "Transfer to Cold Leg Recirculation."
- ISI-301, CONTAINMENT SIJMP TO RHR 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 R-SB operating.

Which of the following actions are to be taken?

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

ANSWER

- b. Stop both CSIPs and the RIIR pump ONLY

QUESTION NUMBER: 36 **TIER/GROUP:** 1/1
KA IMPORTANCE: RO 3.4 **SRO**
10CFR55 CONTENT: 41(b) 8/10 **43(b)**

KA: 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

OBJECTIVE: 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 SIGNIFICANTLY MODIFIED DIRECT

BANK NUMBER FOR SIGNIFICANTLY MODIFIED / DIRECT: 3.3-R5 OW

NRC EXAM HISTORY None

DISTRACTOR JUSTIFICATION (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 be stopped.
- X b.** The RHK pump and the CSIPs are still aligned to the KWST and must be stopped when the RWST empty alarm is received at 3% level.
- c. Plausible since the RHR pump and the CSIPs must be stopped, but the spray pumps can continue to operate since they are no longer aligned to the RWST.
- d. Plausible since the RNK pump and the CSIPs must be stopped, but the spray pumps can continue to operate since they are no longer aligned to the RWST.

DIFFICULTY ANALYSIS:

COMPREHENSIVE / ANALYSIS

KNOWLEDGE / RECALL

DIFFICULTY RATING: 3

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

QUESTION: 37

LT-115, VCT Level, has failed LOW. The Unit-SCO directs the Reactor Operator to maintain VCT level between 20% and 40%.

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
- e.
 - 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.
 - When 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.
 - 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

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

QUESTION SOURCE: NEW SIGNIFICANTLY MODIFIED DIRECT

BANK NUMBER FOR SIGNIFICANTLY MODIFIED / DIRECT: New

NRC EXAM HISTORY: None

DISTRACTOR JUSTIFICATION (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.
- 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-112.
- c. Plausible since operator action **is** required to perform one of the two evolutions, but the automatic makeup. not the divert, **must** he 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:

COMPREHENSIVE / ANALYSIS KNOWLEDGE / RECALL

DIFFICULTY RATING: 3

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

QUESTION: 38

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

QUESTION NUMBER: 38 TIER/GROUP: 2/1
KA IMPORTANCE: RO 3.6 SRO
10CFR55 CONTENT: 41(b) 7 43(b)

K4: 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

OBJECTIVE: CCWS-3.0-R2

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

- Safety Injection signal

DEVELOPMENT REFERENCES: SD-145 pg 16-17

REFERENCES SUPPLIED TO APPLICANT: None

QUESTION SOURCE: NEW SIGNIFICANTLY MODIFIED DIRECT

BANK NUMBER FOR SIGNIFICANTLY MODIFIED / DIRECT: CCWS-R2 002

NRC EXAM HISTORY: None

DISTRACTOR JUSTIFICATION (CORRECT ANSWER X'd):

- X a. On an SI signal, both the GFFD and sample panel receive isolation signals.
- h. Plausible since the pumps will get a start signal, but only the GFFD and sample panel in the non-essential header are isolated.
- c. Plausible since the CCW to RCP isolations close on a Phase B signal, but Phase B is not generated by 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

QUESTION: 39

Given the following conditions:

- The plant is operating **at** 23% power.
- Steani pressure channel PT-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)?

- a. An increase in steam flow from SG 'A' is sensed and responds by increasing 1FW-140, MN FW A KEG BYP FK-479.1, position to increase feed flow to SG 'A' and level increases
- 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
- 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: 2/1
KA IMPORTANCE: RO 3.0 SRO
10CFR55 CONTENT: 41(b) 7 43(b)

K4: 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 following 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 DIRECT

BANK NUMBER FOR SIGNIFICANTLY MODIFIED / DIRECT: SGWLC-R2 002

NRC EXAM HISTORY: None

DISTRACTOR JUSTIFICATION (CORRECT ANSWER X'd):

- 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.
- 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.
- 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 PF.

DIFFICULTY ANALYSIS:

COMPREHENSIVE/ ANALYSIS

KNOWLEDGE/RECALL

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

QUESTION: 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 level is 45% **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 Level control circuitry, which failed **to** energize the backup heaters.

QUESTION NUMBER 40 TIEWGROUP: 2/2
KA IMPORTANCE: RO 3.1 SRO
10CFR55 CONTENT: 41(b) 7 43(b)

K4: OIHK6.04

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 APPLICANT: None

QUESTION SOURCE: NEW SIGNIFICANTLY MODIFIED DIRECT

BANK NUMBER FOR SIGNIFICANTLY MODIFIED / DIRECT: PZRLC-R7 001

NRC EXAM HISTORY: None

DISTRACTOR JUSTIFICATION (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.
- b. Plausible since a downpower should result in an insurge which would cause **the** spray valves to open, hut 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. Plausible since the respnse is correct, with the exception of the pressurizer heaters not being energized, for an insurge to the pressurizer.

DIFFICULTY ANALYSIS:

COMPREHENSIVE / ANALYSIS

KNOWLEDGE / RECALL

DIFFICTJLTY RATING: 3

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

QUESTION: 41

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 1.4-SA

- b.
 - SG A level is 34%
 - SG B level is 33%
 - SG C level is 22%
 - Loss of Emergency Bus 1B-SB

- c.
 - SG A 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 4 trips

ANSWER:

- c.
 - SG **4** level is 25%
 - SG B level is 26%
 - SG C level is 27%
 - Main Feedwater Pump A trips

QUESTION: 42

In accordance with FRP-H.I, "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 uncover
- 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 RCS temperature will increase primary-to-secondary AP, 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 uncover

QUESTION: 43

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 SHINPP 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

QUESTION NUMBER 43 **TIER/GROUP:** 3
KA IMPORTANCE: RO 3.7 **SRO**
10CFR55 CONTENT: 41(b) None **43(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

REFERENCES SUPPLIED TO APPLICANT: None

QUESTION SOURCE: NEW SIGNIFICANTLY MODIFIED DIRECT

BANK NUMBER FOR SIGNIFICANTLY MODIFIED / DIRECT: GP-3.4 011

NRC EXAM HISTORY: None

DISTRACTOR JUSTIFICATION (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 between POWEKTRAX and EXSPACK and 500 pcm for transient history and steady state below 80%.
- h.** Plausible since SHNPP required any manual ECC calculations he performed by Reactor Engineering, but EXSPACK is normally performed by Operations.
- c.** Plausible since xenon decay will be 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, but limitations are placed on startup rate after criticality is achieved.

DIFFICULTY ANALYSIS:

COMPREHENSIVE / ANALYSIS KNOWLEDGE / RECALL

DIFFICULTY RATING: 3

EXPLANATION: Knowledge of the administrative requirements prior to criticality being achieved

QUESTION: 44

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 'TRIP OR CLOSE CKT TROUBLE
- b. ALB-06-1-1, CHARGING PUMP DISCHARGE HEADER HI / 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 OK CLOSE CKT TROUBLE

QUESTION NUMBER: 44 **TIENGROUP:** 3
KAIMPORTANCE: KO 3.3 **SRO**
10CFR55 CONTENT: 41(b) 10 **43(b)**

KA: 2.4.31

Knowledge of annunciators alarms and indications, and use of the response instructions

OBJECTIVE: PP-2.0-R3

DISCUSS the requirements in OMM-001/AP-002/AP-100 concerning the following:

k. MCB annunciators

DEVELOPMENT REFERENCES: OMM-001 pg 10

REFERENCES SUPPLIED TO APPLICANT: None

QUESTION SOURCE: NEW SIGNIFICANTLY MODIFIED DIRECT

BANK NUMBER FOR SIGNIFICANTLY MODIFIED / DIRECT New

NRC EXAM HISTORY: None

DISTRACTOR JUSTIFICATION (CORRECT ANSWER X'd):

- X a. Required to be informed of this annunciator due to a required entry into an additional AOP.
- b. Plausible since this could indicate a leak in the RCS, but no AOP entry conditions are met.
- e. Plausible since this could indicate a loss of CW cooling flow, but no AOP entry conditions are met
- d. Plausible since this could indicate a steam leak, but no AOP entry conditions are met.

DIFFICULTY ANALYSIS:

COMPREHENSIVE/ ANALYSIS KNOWLEDGE/RECALL

DIFFICULTY RATING: 3

EXPLANATION: Analysis of relative importance and requirements to prioritize annunciators

QUESTION: 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
 - After 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** be used to feed the SGs
- 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
- d.
 - 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, the SGs could be fed using *the* Feedwater Reg Bypass Valves

ANSWER:

- 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

QUESTION NUMBER: 45 TIER/GROUP: 2i1
KAIMPORTANCE: RO 3.2 SRO
10CFR55 CONTENT: 41(b) 7 43(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} ($< 564^{\circ}F$)

DEVELOPMENT REFERENCES: SD-103 pg 26

REFERENCES SUPPLIED TO APPLICANT: None

QUESTION SOURCE: NEW SIGNIFICANTLY MODIFIED DIRECT

BANK NUMBER FOR SIGNIFICANTLY MODIFIED / DIRECT: New

NRC EXAM HISTORY: None

DISTRACTOR JUSTIFICATION (CORRECT ANSWER X'd):

- a. Plausible since on a reactor trip with low T_{ave} ($564^{\circ}F$), the SGs can still be 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 be used to feed the SGs.
- X c. On a reactor trip with low T_{ave} ($564^{\circ}F$), the SGs can still be 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 T_{ave} ($564^{\circ}F$), the SGs can still be 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 T_{ave} signal allows feeding with the bypass and SI isolates all MFW

QUESTION: 46

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 **ONLY** limits radioactive releases following a LOCA or secondary system break inside Containment
- b.
 - Phase A limits radioactive releases **AND** minimizes Containment overpressurization following a LOCA
 - Phase B limits radioactive releases **AND** minimizes Containment overpressurization following a LOCA or secondary system break inside Containment
- c.
 - Phase A **ONLY** limits radioactive releases following a LOCA
 - e Phase B limits radioactive releases following a LOCA **AND** prevents an excessive RCS cooldown following a secondary system break inside Containment
- d.
 - Phase A limits radioactive releases **AND** minimizes Containment overpressurization following a LOCA
 - Phase B limits radioactive releases following a LOCA **AND** prevents an excessive RCS cooldown following a secondary system break inside Containment

ANSWER

- a.
 - Phase A **ONLY** limits radioactive releases following a LOCA
 - e Phase B **ONLY** limits radioactive releases following a LOCA or secondary system break inside Containment

QUESTION NUMBER 46 TIEWGROUP: 1/1
KA IMPORTANCE: KO 3.5 SRO
10CFR55 CONTENT 41(b) 5/10 43(b)

KA: 000011EK3.06

Knowledge of the reasons for the following responses as they 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-114 pg 4-5

REFERENCES SUPPLIED TO APPLICANT: None

QUESTION SOURCE: SEW SIGNIFICANTLY MODIFIED DIRECT

BANK NUMBER FOR SIGNIFICANTLY MODIFIED / DIRECT: CIS 006
CIS 009

NRC EXAM HISTORY: None

DISTRACTOR JUSTIFICATION (CORRECT ANSWER X'd):

- X a. Phase A serves to limit the release of radioactive materials to atmosphere following a LOCA. 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, but 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:

COMPREHENSIVE / ANALYSIS KNOWLEDGE / RECALL

DIFFICULTY RATING: 2

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

QUESTION: 47

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-17

- 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 **TIEWGROUP:** 1/1
KA IMPORTANCE: RO 4.4 **SKO**
10CFR55 CONTENT: 41(b) Xone **43(b)** 5

KA: 000029CA2.01

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 REFEMENCES: FRP-S.1, pg 14

REFERENCES SIJPLIED TO APPLICANT: None

QUESTION SOCKCE: NEW SIGNIFICANTLY MODIFIED DIRECT

BANK NUMBER FOR SIGNIFICANTLY MODIFIED / DIRECT: 3.15-R5 002

NRC EXAM HISTORY: None

DISTRACTOR JUSTIFICATION (CORRECT ANSWER X'd):

- a. Plausible since this would cause the reactor to be hipped, hut it is not required to he done to exit FRP-S.1.
- b. Plausible since this would cause the reactor to be tripped, but it is not required to he done to exit FRP-S.1.
- X c. Exiting FRP-S.1 requires that PR NIS be less than 5% and IR NIS startup rate he 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 he adequately shutdown, hut it is not required to he done to exit FRP-S.1.

DIFFICULTY ANALYSIS:

COMPREHENSIVE / ANALYSIS KNOWLEDGE / RECALL

DIFFICULTY RATING: 3

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

QUESTION: 48

Given the following conditions:

- A plant cooldown is being performed.
- a 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 IDP-1A-S1 for 1AF-19 A1JX 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

QUESTION NUMBER: 48 TIEWGROUP: 2/1
KA IMPORTANCE: RO 2.5 SRO
10CFR55 CONTENT: 41(b) 7 43(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

REFERENCES SUPPLIED TO APPLICANT: None

QUESTION SOURCE: NEW SIGNIFICANTLY MODIFIED DIRECT

BANK NUMBER FOR SIGNIFICANTLY MODIFIED / DIRECT: AFS-A3 001
AFS-A3 007

NRC EXAM HISTORY: None

DISTRACTOR JUSTIFICATION (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 causing 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:

COMPREHENSIVE / ANALYSIS KNOWLEDGE / RECALL

DIFFICULTY RATING: 3

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

QUESTION: 49

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.
 - RWST level is at 94% and slowly decreasing.
- b.
 - ALB-019-1-4, HOTWELL HIGH-LOW LEVEL, alarms.
 - Hotwell 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.
 - ALB-005-6-1, CCW SURGE 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.
 - KWST level is at 94% and slowly decreasing.

QUESTION: 50

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 FORV
- 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

QUESTION: 51

Given the following conditions:

- RIIR 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.
 - e 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, but local breaker control is possible without the control power
- c.
 - Main Control Board red / green running indications will be available
 - The breaker will trip
 - e Local open / closed light indication is available, but local breaker control is possible without the control power
- d.
 - e Main Control Board red / green running indications will be available
 - e The breaker remains closed
 - Local open / closed light indication is available, but local breaker control will be 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

QUESTION NUMBER: 51 **TIER/GROUP:** 2/1
KA IMPORTANCE: RO 2.6 **SRO**
10CFR55 CONTENT: 41(b) 7 **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
480V-LP-3.0, p 11

REFERENCES SUPPLIED TO APPLICANT: None

QUESTION SOURCE: NEW SIGNIFICANTLY MODIFIED DIRECT

BANK NUMBER FOR SIGNIFICANTLY MODIFIED / DIRECT: 480V-R1 001

NRC EXAM HISTORY: None

DISTRACTOR JUSTIFICATION (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. Plausible 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 be locally operated.

DIFFICULTY ANALYSIS:

COMPREHENSIVE/ANALYSIS

KNOWLEDGE / RECALL

DIFFICULTY RATING: 3

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

QUESTION: 52

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. • A 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 leak in the Seal Water heat exchanger
 - AOP-014, "Loss of Component Cooling Water"

QUESTION NUMBER: 52 **TIER/GROUP:** 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

DEVELOPMENT REFERENCES: SOER 94-2, p 11-12
AOP-014, p 3, 20
AOP-14-BD, p 20

REFERENCES SUPPLIED TO APPLICANT: None

QUESTION SOURCE: NEW SIGNIFICANTLY MODIFIED DIRECT

BANK NUMBER FOR SIGNIFICANTLY MODIFIED / DIRECT: IE-3.12-R3 001

NRC EXAM HISTORY: None

DISTRACTOR JUSTIFICATION (CORRECT ANSWER X'd):

- a. Plausible since the thermal barrier interfaces with a non-borated system (CCW), but 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 boration rather than a dilution.
- X d. A seal water HX leak will result in CVCS being diluted by CCW. This failure is to be addressed by AOP-014.

DIFFICULTY ANALYSIS:

COMPREHENSIVE/ ANALYSIS KNOWLEDGE / RECALL

DIFFICULTY RATING: 3

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

QUESTION: 53

Given the following conditions:

- The plant is in Mode 4.
- The RCS in a solid plant condition.
- IPHR 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 *ICs-4*, 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

QUESTION NUMBER: 53 **TIER/GROUP:** 2/1
KA IMPORTANCE: KO 2.3 **SRO**
10CFR55 CONTENT: 41(b) 2-9 **43(b)**

KA: 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 **KCS** 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

REFERENCES SUPPLIED TO APPLICANT: None

QUESTION SOURCE: NEW SIGNIFICANTLY MODIFIED DIRECT

BANK NUMBER FOR SIGNIFICANTLY MODIFIED/DIRECT: Harris LOCT 587

NRC EXAM HISTORY: None

DISTRACTOR JUSTIFICATION (CORRECT ANSWER X'd):

- a. Plausible since this would cause an increase in RCS pressure, but ICS-38 will respond to cause pressure to lower again.
- b. Plausible since this would cause an increase in RCS pressure, but ICS-38 will respond to cause pressure to lower again.
- X c.** Adjusting the setpoint of ICS-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, but ICS-38 will respond to cause pressure to lower again.

DIFFICULTY ANALYSIS:

COMPREHENSIVE / ANALYSIS KNOWLEDGE / RECALL

DIFFICULTY RATING: 3

EXPLANATION: Comprehension of the effects of adjusting CVCS components on PRZ pressure

QUESTION: 54

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

QUESTION: 55

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 PA?“-1 where monitoring Critical Safety Function Status Trees is required.

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

- The displacement of downcomer 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.”
- A decrease in downcomer 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 PATH-1.
- The displacement of boron from the downcomer region would increase fission and result in a higher source range count rate.
 - The crew should continue in PAIH-1 rather than transition to FRP-S.2, “Response to Loss of Core Shutdown.”
- A decrease in downcomer 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.

- The displacement of downcomer water would increase the neutron leakage and result in a higher source range count rate.
 - The crew should continue in PATH-I rather than transition to FRP-S.2, “Response to Loss of Core Shutdown.”

QUESTION: 56

Given the following conditions:

- A transition has just been made to FRP-S.1, “Response to Nuclear Power Generation / ATWS,” from PATH-1.
- 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 be taken next?

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

ANSWER:

- b. Manually trip the Turbine from the MCB

QUESTION: 57

Given the following 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, but must be manually loaded with the required loads
- d. The Emergency Diesel Generators must be manually started and manually loaded with the required loads

ANSWER

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

QUESTION: 58

Given the following conditions:

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

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 Not Standby

ANSWER:

- c. Verify off site power availability

QUESTION: 59

Given the following conditions:

- The plant has experienced a small break LOCA
- The crew has transitioned to EPP-009, "PostLOCA 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:

- a PI-455.1, PRZ PRESSURE CH I = 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-403; 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

QUESTION NUMBER 59 TIER/GROUP: 3
KAIIMPORTANCE: RO 3.5 SRO
10CFR55 CONTENT: 41(b) 6 43(b)

KA: 2.4.3

Ability to identify post-accident instrumentation

OBJECTIVE: 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

DEVELOPMENT REFERENCES: EOP Users Guide pg 27, 38

REFERENCES SUPPLIED TO APPLICANT: None

QUESTION SOURCE: NEW SIGNIFICANTLY MODIFIED DIRECT

BANK NUMBER FOR SIGNIFICANTLY MODIFIED / DIRECT: Harris LOCT 846
NRC EXAM HISTORY None

DISTRACTOR JUSTIFICATION (CORRECT ANSWER X'd):

- a. Plausible since Pi-457 is the lowest reading of the pressures and would be the most conservative, but with adverse containment conditions the post-accident instrument PI-402.1 is to be used.
- b. 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:

COMPREHENSIVE/ ANALYSIS KNOWLEDGE/ RECALL

DIFFICULTY RATING: 3

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

QUESTION: 60

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 AUX BUS D TIE BREAKER 105 SA trips open and EDG 1A-SA automatically starts and loads
- b. 480V EMERGENCY BUS 1A3-SA main feeder breaker trips open
- c. BATTERY CHARGER 1A-SA is placed under clearance
- d. EMERGENCY BATTERY 1A-SA is placed on a float charge

ANSWER:

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

QUESTION NUMBER: 60 TIEWGROUP: 2/I
KA IMPORTANCE: RO 3.2 SRO
10CFR55 CONTEXT: 41(b) None 43(b) 2/3

KA: 00005SG2.1.33

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

DEVELOPMENT REFERENCES: TS 3.8.2.1, p 3/4 8-12
SD-156, p 24

REFERENCES SUPPLIED TO APPLICANT: None

QUESTION SOURCE: NEW SIGNIFICANTLY MODIFIED DIRECT

BANK NUMBER FOR SIGNIFICANTLY MODIFIED / DIRECT: New

NRC EXAM HISTORY: None

DISTRACTOR JUSTIFICATION (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 h. A loss of 480V Emergency AC Bus 1.43-SA will result in a loss of both MCCs 1A21-SA and 1A31-SA, which would cause both A train battery chargers to be inoperable.
- c. Plausible since removing a battery charger from service would result in a TS entry if the other charger is also out of service, but a single charger will not result in an entry to an action statement.
- d. Plausible 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

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

QUESTION: 61

Given the following conditions:

- The plant is operating at 100% power when ALB-010-1-1B. RCP A UPPER OIL RSVK 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 AOF-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 PATII-1 if RCP 'A' temperatures exceed 300°F
- d. Stop RCP 'A', manually trip the reactor and go to PATII-1

ANSWER:

- b. Manually trip the reactor and go to PATH-1, stopping RCP 'A' as time permits

QUESTION NUMBER: 61 **TIEWGROUP:** 1/1
KA IMPORTANCE: RO 3.4 **SRO**
10CFR55 CONTENT: 41(b) None 43(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 RCPs 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 SOURCE: NEW SIGNIFICANTLY MODIFIED DIRECT

BANK NUMBER FOR SIGNIFICANTLY MODIFIED / DIRECT: AOP-3.18 019

NRC EXAM HISTORY None

DISTRACTOR JUSTIFICATION (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 KCP.
- 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. Plausible since these are the correct actions, but the reactor should be tripped first and the pump stopped when time permits.

DIFFICULTY ANALYSIS:

COMPREHENSIVE/ANALYSIS KNOWLEDGE/RECALL

DIFFICULTY RATING: 2

EXPLANATION: Knowledge of RCP motor temperature tripping requirements

QUESTION: 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 °F at the maximum rate is required.

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

- a. Fully open the Steam Dumps as **fast** as possible
- b. Fully open the Steam 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

QUESTION NUMBER: 62 **TIER/GROUP:** 1/1
KAIMPORTANCE: RO 4.3 **SRO**
10CFR55 CONTENT: 41(b) 7 **43(b)**

KA: 000038EA1.36

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

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

QUESTION SOURCE: NEW SIGNIFICANTLY MODIFIED DIRECT

BANK NUMBER FOR SIGNIFICANTLY MODIFIED / DIRECT: EOP-3.19-R4 001

NRC EXAM HISTORY: None

DISTRACTOR JUSTIFICATION (CORRECT ANSWER X'd):

- 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.
- b. 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 RCS and since the MSIVs on the intact SGs are closed, the 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 are being used, but when already using PORVs to dump steam this is not a concern.

DIFFICULTY ANALYSIS:

COMPREHENSIVE / ANALYSIS

KNOWLEDGE / RECALL

DIFFICULTY RATING: 3

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

QUESTION: 63

Given the following conditions:

- After transferring resin, it is noted that RM-1 WR-3644A. SPENT RESIN PUMP 1-4A, 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. 160 mRem/hr

ANSWER:

- d. **160 mRem/hr**

QUESTION NUMBER: 63 TIENGROUP: 2/1
KA IMPORTANCE: 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-3.5-2i

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 SIGNIFICANTLY MODIFIED/DIRECT: New

NRC EXAM HISTORY: None

DISTRACTOR JUSTIFICATION (CORRECT ANSWER X'd):

- a. Plausible if the square root of the distances is taken, instead of squared as they should be (10mR/hr x 20^{1/2} ft = 20 mR/hr x 5^{1/2} ft).
- b. Plausible if the distances are not squared as they should be (10mR/hr x 20 ft = 40 mR/hr x 5 ft)
- c. Plausible if a mathematical error is made (value selected as a distracter 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:

COMPREHENSIVE/ANALYSIS

KNOWLEDGE/RECALL

DIFFICULTY RATING: 3

EXPLANATION: Calculation of distance using inverse square for radiation

QUESTION: 64

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 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
- 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

QUESTION: 65

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^{-8} amps and Power Range Channel N-42 deenergizes
- b. Reactor power remain? 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

ANSWER

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

QUESTION NUMBER: 65 TIER/GROUP: 211
KAIMPORTANCE: 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

REFEHNENCES SUPPLIED TO APPLICANT: None

QGESTION SOURCE: NEW SIGNIFICANTLY MODIFIED DIRECT

RANK NUMBER FOR SIGNIFICANTLY MODIFIED / DIRECT: Harris LOCI 457

NRC EXAM HISTORY: None

DISTRACTOH JUSTIFICATION (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 due 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

QUESTION: 66

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 West Sink.
- Emergency Service Water (ESW) pumps have been aligned to the Main Reservoir.
- 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
- h. 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

QUESTION: 67

Given the following conditions:

- o The plant is being cooled down to 140°F for maintenance which will **NOT** require the RCS be opened.
- o The crew is in the process of placing the first Residual Heat Removal (RIIR) train in service for RCS cooling.
- Current boron concentrations are as follows:
 - o RIIR (train to be placed in service) boron 1021 ppm
 - Required Shutdown Margin boron 1200 ppm
 - RCS boron 1341 ppm
 - o Cold Shutdown boron 1750 ppm
 - Refueling boron 2261 ppm

Before the RIIR train can be placed in service for RCS cooling, RHK 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: 64 TIER/GROUP: 2/1
KAIIMPORTANCE: RO 3.2 SRO
10CFR55 CONTENT: 41(b) 5 43(b)

KA: 005K5.09

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

OBJECTIVE: KHRS-2.0-12

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

DEVELOPMENT REFERENCES: OP-111 pg 7

REFERENCES SUPPLIED TO APPLICANT: Xone

QUESTION SOURCE: NEW SIGNIFICANTLY MODIFIED DIRECT

BANK NUMBER FOR SIGNIFICANTLY MODIFIED / DIRECT: New

NRC EXAM HISTORY: None

DISTRACTOR JUSTIFICATION (CORRECT ANSWER X'd):

- X a. RHR boron must be 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 be greater than or equal to the required shutdown margin.
- b. Plausible since this is the difference between RHR 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, but only the required SDM boron is needed.

DIFFICULTY ANALYSIS:

COMPREHENSIVE / ANALYSIS KNOWLEDGE / RECALL

DIFFICULTY RATING: 3

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

QUESTION: 68

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

QUESTION NUMBER: 68 TIER/GROUP: 2/2
KA IMPORTANCE: RO 3.6 SRO
10CFR55 CONTENT: 41(b) 7 43(b)

KA: 068A3.02

Ability to monitor automatic operation of the Liquid Radwaste System including: Automatic isolation

OBJECTIVE: LWPS-LP-3.0-7

DESCRIBE the automatic protection features associated with discharges to the environment from the LWPS

DEVELOPMENT REFERENCES: AOP-005, p 27-28

REFERENCES SUPPLIED TO APPLICANT: None

QUESTION SOURCE: NEW SIGNIFICANTLY MODIFIED DIRECT

BANK NUMBER FOR SIGNIFICANTLY MODIFIED /DIRECT: RMS-A6 005

NRC EXAM HISTORY: None

DISTRACTOR JUSTIFICATION (CORRECT ANSWER X'd):

- a. Plausible since the pump will stop the discharge, but there is no auto trip due to high rad
- b. Plausible since closing this valve will stop the discharge, but this valve does not receive an automatic closure signal.
- c. Plausible since this valve is in the flow path and will stop the discharge, but this valve does not receive an automatic closure signal.
- X d.** On a high rad level as sensed by REM 3540, the discharge isolation valve will automatically close, terminating any release in progress.

DIFFICULTY ANALYSIS:

COMPREHENSIVE/ ANALYSIS KNOWLEDGE/ RECALL

DIFFICULTY RATING: 2

EXPLANATION: Knowledge of liquid radwaste design and operation

QUESTION: 69

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

QUESTION: 70

Given the following conditions:

- e Following a plant trip, EPP-004, "Reactor Trip Response," is being performed.
- e The crew is verifying Natural Circulation conditions as a result of a loss of power to all RCPs.
- 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
 - KCS Subcooling will indicate MORE subcooling than actual
- b. • The Core Exit Temperature indications will be HIGHER than actual
 - KCS 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. e Core Exit Temperature indications will indicate the SAME as actual
 - RCS Subcooling will indicate the SAME subcooling as actual

QUESTION: 71

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.1, "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 **IA-SA** and 1B-SB Ruses"
 - **Manually** trip the turbine if still online
- d. • EPP-005. "Natural Circulation Cooldown"
 - Attempt to start an RCP

ANSWER

- c. • EPP-001, "Loss of AC Power to 1A-SA and 1B-SB Ruses"
 - Manually trip the turbine if still online

QUESTION: 72

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 leakage

QUESTION: 73

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
- b. Performance of PIC portions of OWP-RP due to the failure of PRZ pressure transmitter PT-455
- c. Installing a juniper 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 1B-SB

QUESTION: 74

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 steam 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 are 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. 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 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 Steam Generators.”

QUESTION: 75

The crew is implementing EPP-012. "Loss of Emergency Coolant Recirculation." They are now determining Containment Spray requirements with the following conditions:

- Containment pressure 12 psig
- RWST level 3%
- Containment Fan Coolers running 3
- Containment Spray Pumps running 2

Which of the following actions should be taken?

- a. Start **an** additional Containment Fan Choler
- b. Secure both Containment Spray **Pumps**
- c. Secure one Containment Spray Pump
- d. Secure one Containment Fan Cooler

ANSWER

- b. Secure both Containment Spray Pumps

QUESTION: 76

Given the following conditions:

- While operating at 100% power, a drop in PRZ pressure resulted in a Reactor Trip and Safety Injection.
- Containment pressure is **3.6** psig and stable.
- RCPs have been stopped.
- RVLIS Full Range is indicating 20%.
- Core Exit Thermocouples are indicating **745°F**.
- PRZ level is currently indicating **>100%**.
- PRZ pressure has stabilized at 1400 psig.
- RCS Wide Range Hot Leg Temperatures are indicating **680°F**.

Which of the following conditions currently exists?

- a. A PRZ steam space break has occurred and a transition to FRP-C.1, "Response to Inadequate Core Cooling," is required
- b. A PRZ steam space break has occurred and a transition to FRP-C.2, "Response to Degraded Core Cooling," is required
- c. An RCS hot leg break has occurred and a transition to FRP-C.1, "Response to Inadequate Core Cooling," is required
- d. An RCS hot leg break has occurred and a transition to FRP-C.2, "Response to Degraded Core Cooling," is required

ANSWER

- a. A PRZ steam space break has occurred and a transition to FRP-C.1, "Response to Inadequate Core Cooling," is required

QUESTION: 77

Which of the following describes a condition in Technical Specifications and its bases which would require Emergency Boration in accordance with AOP-002, "Emergency Boration"?

- a. • During the recovery from a Main Feedwater Pump trip, Control Rods are determined to be below the **rod** insertion limit
 - Control the reactivity transient associated with a steam line break
- b. • During the recovery from a Main Feedwater Pump trip. Control Rods are determined to be below the rod insertion limit
 - Control the reactivity transient associated with an inadvertent dilution
- c. • During a reactor startup. the Reactor achieves criticality with **Bank C** rods at 105 steps
 - Control the reactivity transient associated with a steam line break
- d. • During a reactor startup, the Reactor achieves criticality with Bank C rods at 105 steps
 - Control the reactivity transient associated **with an** inadvertent dilution

ANSWER

- c. • During a reactor startup, the Reactor achieves criticality with Bank C rods at 105 steps
 - Control the reactivity transient associated with a steam line break

QUESTION NUMBER: 77 TIEWGROUP: 1/2
KA IMPORTANCE: RO SRO 3.7
10CFR55 CONTENT: 41(b) 43(b) 2

KA: 000024G2.2.25

Knowledge of bases in technical specifications for limiting conditions for operations and safety **limits**.
(Emergency Boration)

OBJECTIVE:

DEVELOPMENT REFERENCES: TS Bases 3/4.1.1
AOP-002 BD
GP-004

REFERENCES SUPPLIED TO APPLICANT: None

QUESTION SOURCE: NEW SIGNIFICANTLY MODIFIED DIRECT

BANK NUMBER FOR SIGNIFICANTLY MODIFIED / DIRECT: AOP-3.2-R1 001

NRC EXAM HISTORY None

DISTRACTOR JUSTIFICATION (CORRECT ANSWER X'd):

- a. Plausible since if this condition existed for 2 hours, Emergency Boration would be required. Additionally, in Modes 1 & 2, **SDM** is required to control the reactivity transient associated with a steam line **break**. However, it is not required during transient conditions, allowing the 2 hours to restore **rod** position.
- b. Plausible since if this condition existed for 2 hours, Emergency Boration would be required. However, it is not required during transient conditions, allowing the 2 hours to restore rod position.
- X e. Emergency boration is required if SDM is not met. Criticality at steady state conditions is considered to be a loss of SDM. In Modes 1 & 2, SDM is required to control the reactivity transient associated with a steam **Line** break.
- d. Plausible since Emergency boration **is** required if SDM **is** not **met**. Criticality **at** steady state conditions is considered to be a loss of SDM. However, the concern for an inadvertent dilution is related to a shutdown condition.

DIFFICULTY ANALYSIS:

COMPREHENSIVE / ANALYSIS

KNOWLEDGE / RECALL

DIFFICULTY RATING: 2

EXPLANATION: Knowledge of the requirements for initiating Emergency Boration and the bases for these actions.

QUESTION NUMBER: 78 TIEIUGROUP: 27i
K4 IMPORTANCE: RO SRO 3.8
10CFR55 CONTENT: 41(b) 43(b) 5

KA: 006A2.04

Ability to (a) predict the impacts of the following malfunctions or operations on the ECCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Improper discharge pressure

OBJECTIVE:

DEVELOPMENT REFERENCES: EPP-OOX
User's Guide

REFERENCES SUPPLIED TO APPLICANT: None

QUESTION SOURCE: NEW SIGNIFICANTLY MODIFIED DIRECT

BANK NUMBER FOR SIGNIFICANTLY MODIFIED / DIRECT: 3.19-R4 35

NRC EXAM HISTORY: None

DISTRACTOR JUSTIFICATION (CORRECT ANSWER X'd):

- a. Plausible since the charging flow isolation valves being open can result in pump runout, but even after the valve is closed a transition is required to PATH-1.
- X b. The charging flow isolation valves being open at the same time as the BIT valves can result in pump runout, but even after the valve is closed a transition is required to PATH-1.
- e. Plausible since the alternate miniflow isolation valves being open will result in increased flow, but the valves are closed at this point and even if open after the valve is closed a transition is required to PATH-1.
- d. Plausible since the alternate miniflow isolation valves being open will result in increased flow and a transition is required to PATH-1, but the valves are closed at this point.

DIFFICULTY ANALYSIS:

COMPREHENSIVE / ANALYSIS

KNOWLEDGE / RECALL

DIFFICULTY RATING: 3

EXPLANATION: Must analyze given conditions to determine that runout is occurring as a result of failing to close the charging valves first and also determining that a transition is still required to PATH-1

QUESTION: 78

Given the following conditions:

- A Reactor Trip and Safety Injection have occurred due to a **small** break **LOCA**.
- The crew has isolated the break and has just established normal charging in accordance with EPP-008, "Safety Injection Termination."
- They then check Safety Injection Reinitiation criteria and determine that Safety Injection flow is required.
- When they open the **BIT** Outlet valves, 1SI-3 and 1SI-4, they note that CSIP discharge pressure is low and oscillating.

Which of the following actions is to be taken?

- a. Isolate the charging line due to the CSIP operating at runout conditions and continue in EPP-008, "Safety Injection Termination."
- b. Isolate the charging line due to the CSIP operating at runout conditions and transition to PATH-1.
- c. Isolate the alternate miniflow line due to the CSIP cavitating and continue in EPP-008, "Safety Injection Termination."
- d. Isolate the alternate miniflow line due to the CSIP cavitating and transition to PATH-1.

ANSWER:

- b. Isolate the charging line due to the CSIP operating at runout conditions and transition to PATH-1.

QUESTION: 79

Given the following conditions:

- The unit is operating at 100% power, with Control Bank D rods at 215 steps.
- ALB 13-7-1, ROD CONTROL URGENT ALARM, is in ALARM due to a failure in Power Cabinet 1AC.
- Rod Control is in MAN.
- A turbine trip occurs, but the Reactor fails to trip either automatically or manually.

Which of the following actions should the Reactor Operator be directed to take in accordance with FRP-S.1. "Response to Nuclear Power Generation / ATWS"?

- a. Place the Rod Control BANK SELECTOR in AUTO and allow rods to insert
- b. Maintain the Rod Control BANK SELECTOR in MAN and manually insert rods
- c. Place the Rod Control BANK SELECTOR in BANK D and manually insert rods
- d. Maintain rods at 215 steps

ANSWER:

- d. Maintain rods at 215 steps

QUESTION NUMBER: 79 TIEWGROUP: 22
KA IMPORTANCE: RO SNO 4.0
10CFR55 CONTEXT: 41(b) 43(b) 5

KA: 001G2.4.6

Knowledge of symptom based EOP mitigation strategies. (Control Rod Drive)

OBJECTIVE:

DEVELOPMENT REFERENCES: USERS GUIDE
FRP-S.1

REFERENCES SUPPLIED TO APPLICANT: None

QUESTION SOURCE: NEW SIGNIFICANTLY MODIFIED DIRECT

BANK NUMBER FOR SIGNIFICANTLY MODIFIED/DIRECT: New

NRC EXAM HISTORY: None

DISTRACTOR JUSTIFICATION (CORRECT ANSWER X'd):

- a. Plausible since this is an RNO action for a failure of the reactor to trip, but will not be successful due to the urgent failure in rod control.
- b. Plausible since this is an RNO action for a failure of the reactor to trip, but will not be successful due to the urgent failure in rod control.
- c. Plausible since this will allow Bank D rods to move inward, and is the only method of inserting rods with the rod control failure, but should not be used due to the potential to cause unanalyzed flux shapes.
- X d. Due to the urgent failure, rods will not move in AUTO or MAN. Although they will move in BANK D with this particular failure, moving rods in individual banks may result in unanalyzed flux shapes which could result in fuel damage.

DIFFICULTY ANALYSIS:

COMPREHENSIVE / ANALYSIS

KNOWLEDGE / RECALL

DIFFICULTY RATING: 3

EXPLANATION: Must analyze the effect of an urgent rod control failure and then apply the failure results to the plant conditions to determine the proper actions

QUESTION: 80

Given the following conditions:

- The unit was operating at 98% power with Heater Drain Pump 'A' under clearance.
- ALB 20-2-2, TURBINE RUNBACK OPERATIVE, is in alarm.
- ALB 11-4-3, REACTOR TRIP OVERTEMP AT, is in alarm.
- A turbine runback occurs.
- Reactor power is currently at **93% and** lowering as the turbine runback continues.
- Both Main Feedwater Pumps are operating.
- Heater Drain Pump 'B' is operating.
- All loop ΔT 's indicate less than the OT ΔT and OPAT setpoints.
- All OTAT and OPAT Trip Status Light Boxes are dark.

Which of the following actions should be taken'?

- a. Select 'TURBINEMANUAL due to a runback circuitry failure and go to AOP-015, "Secondary Load Rejection"
- b. Verify the runback stops at 90% load and go to AOP-015, "Secondary Load Rejection"
- c. Verify the runback stops when the OTAI' condition clears and go to AOP-015, "Secondary Load Rejection"
- d. Trip the Reactor and go to PATH-1

ANSWER

- d. Trip the Reactor and go to PATH-1

QUESTION NUMBER: 80 TIEWGROUP: 3
KA IMPORTANCE: RO SRO 4.4
10CFR55 CONTENT: 41(b) 43(b) 5

KA: 2.1.7

Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation.

OBJECTIVE:

DEVELOPMENT REFERENCES: OMM-001

REFERENCES SUPPLIED TO APPLICANT: None

QUESTION SOURCE: NEW SIGNIFICANTLY MODIFIED DIRECT

BANK NUMBER FOR SIGNIFICANTLY MODIFIED / DIRECT: New

NRC EXAM HISTORY: None

DISTRACTOR JUSTIFICATION (CORRECT ANSWER X'd):

- a. Plausible since there is no apparent cause of the turbine runback, but with the plant in a transient and a Reactor Trip First Out annunciator lit, the reactor should be tripped.
- b. Plausible since a trip of both HDPs would result in a runback to 90%, but with the plant in a transient and a Reactor Trip First Out annunciator lit, the reactor should be tripped.
- c. Plausible since the OTAT condition would result in a runback until the condition clears, but with the plant in a transient and a Reactor Trip First Out annunciator lit, the reactor should be tripped.
- X d. With the plant in a transient and a Reactor Trip First Out annunciator lit, the reactor **should** be tripped.

DIFFICULTY ANALYSIS:

COMPREHENSIVE / ANALYSIS KNOWLEDGE / RECALL

DIFFICULTY RATING: 3

EXPLANATION: Analysis of plant conditions to determine the required actions

QUESTION: 81

Given the following conditions:

- A Reactor Trip with SI occurs.
- The operators perform the immediate action steps, verify ECCS flow, and check AFW flow in accordance with PATH-I.
- Entry requirements for FRP-11.1, "Response to Loss of Secondary Heat Sink," have been met.
- RCS pressure is 175 psig.
- All SG pressures are between 300 psig and 350 psig.

Which of the following actions is to be taken?

- a. Transition to FRP-H.1, "Response to Loss of Secondary Heat Sink," and attempt to establish AFW or Main Feedwater flow
- b. Transition to FRP-H.1, "Response to Loss of Secondary Heat Sink," and initiate RCS feed and bleed.
- c. Transition to FRP-H.1, "Response to Loss of Secondary Heat Sink," and then return to PATH-1 since a secondary heat sink is **NOT** required
- d. Remain in PATH-1 since a secondary heat sink is **NOT** required

ANSWER:

- c. Transition to FRP-H.1, "Response to Loss of Secondary Heat Sink," **and** then return to PATH-1 since a secondary heat sink is **NOT** required

QUESTION NUMBER 81 TIER/GROUP: 1/1
KA IMPORTANCE: KO SRO 4.0
10CFR55 CONTENT: 41(b) 43(b) 5

KA: 00001i(32.4.6

Knowledge of symptom based EOP mitigation strategies. (Large Break I.OCA)

OBJECTIVE:

DEVELOPMENT REFERENCES: FRP-H.1

REFERENCES SUPPLIED TO APPLICANT: None

QUESTION SOURCE: NEW SIGNIFICANTLY MODIFIED DIRECT

BANK NUMBER FOR SIGNIFICANTLY MODIFIED / DIRECT: 3.11-R1 003

NRC EXAM HISTORY: None

DISTRACTOR JUSTIFICATION (CORRECT ANSWER X'd):

- a. Plausible since these are actions that are taken upon entry into FRP-H.1, but a secondary heat sink would not be required with RCS pressure < SG pressure.
- b. Plausible since these are actions that might be taken upon entry into FRP-H.1, **but** a secondary heat sink would not be required with RCS pressure < SG pressure.
- X c. Since RCS **pressure** is less than SG pressure, a secondary heat sink is not required since the SG would act as a heat source rather than a heat sink. Return is to procedure and step in effect.
- d. Plausible since RCS pressure is less than SG pressure and a secondary heat sink is not required. Return is to procedure and step in effect, not Entry Point C.

DIFFICULTY ANALYSIS:

COMPREHENSIVE/ ANALYSIS

KNOWLEDGE/RECALL

DIFFICULTY RATING: 3

EXPLANATION: Must interpret first that a secondary heat sink is not required based on RCS pressure being greater than SG pressure and then must recognize the entry point conditions for returning to PATH-1

QUESTION: 82

Given the following conditions:

- The Keactor has been taken critical and power is being increased.
- NIS IR channels **N15** and N36 are both indicating 5×10^{-11} imps.
- NIS SR channel N31 is indicating 8×10^3 cps.
- NIS SR channel N32 is indicating 7×10^4 cps.

Power should be stabilized ...

- a. at or above 10^{-10} amps, and the SR High Flux trip should then be blocked.
- b. at the current power level, and the SR High Flux trip should then be blocked.
- c. at or above 10^{-10} amps, but the SR High Flux trip should **NOT** be blocked.
- d. at the current power level, but the SR High Flux trip should **NOT** be blocked.

ANSWER:

- d. at the current power level, but the SR High Flux trip should **NOT** be blocked.

QUESTION NUMBER: 82 **TIER/GROUP:** 1/2
KA IMPORTANCE: RO **SRO** 2.9
10CFR55 CONTENT: 41(b) **43(b)** 5

KA: 000032AA2.09

Ability to determine and interpret the following as they apply to the Loss of Source Range Nuclear Instrumentation: Effect of improper HV setting

OBJECTIVE:

DEVELOPMENT REFERENCES: GP-004
ALB-0 12-4-5

REFERENCES SUPPLIED TO APPLICANT: None

QUESTION SOURCE: NEW SIGNIFICANTLY MODIFIED DIRECT

BANK NUMBER FOR SIGNIFICANTLY MODIFIED /DIRECT: New

NRC EXAM HISTORY: None

DISTRACTOR JUSTIFICATION (CORRECT ANSWER X'd):

- a. Plausible since power must be increased above 10^{-10} amps before blocking trips, but increasing power to this level will result in SR high flux trip.
- b. Plausible since power cannot be increased above 10^{-10} amps, but the block of the SR high flux trip is interlocked at this power level.
- c. Plausible since the SR high flux trip is not permitted to be blocked without at least 1 decade of overlap between SR and IR, but increasing power above 10^{-10} amps will result in a SR high flux trip.
- X d.** Less than 1 decade of overlap exists between SR and IR channel before trip would occur. Increasing power to allow blocking SR would result in trip before reaching power level and attempting to block at current power level will not be successful.

DIFFICULTY ANALYSIS:

COMPREHENSIVE / ANALYSIS KNOWLEDGE / RECALL

DIFFICULTY RATING: 3

EXPLANATION: Must determine that increasing power above 10^{-10} amp will result in a reactor trip due to SR high flux, and that attempting to block the SR high flux trip below 10^{-10} amps will not be successful. Required to not block SR high flux trip if < 1 decade of overlap exists.

QUESTION: 83

Given the following conditions:

- The reactor fails to trip when required.
- The Operators take actions per the appropriate procedure(s) and obtain the required plant/system/component responses, except that the reactor is still **NOT** tripped.
- Emergency boration **CANNOT** be initiated because of blockage in the boration flow paths.
- All Power Range channels indicate **3%**
- Startup rate is zero on both Intermediate Range channels.

Which of the following describes the correct operator actions under these conditions **AND** the primary reason for taking these actions?

- a.
 - Return to the procedure and step in effect.
 - Power is less than 5% and the IR startup rate is zero.
- b.
 - Remain in FRP-S.1, "Response to Nuclear Power Generation / ATWS," and allow the RCS to heat up while continuing efforts to establish emergency boration.
 - The heatup will insert negative reactivity.
- c.
 - Go to FRP-S.2, "Response to Loss of Core Shutdown."
 - This is required by the Subcriticality CSFST based on the current reactor conditions.
- d.
 - Remain in FRP-S.1, "Response to Nuclear Power Generation / ATWS," and maintain RCS temperature stable while continuing efforts to establish emergency boration.
 - Stable temperatures preclude positive reactivity insertion by cooldown.

ANSWER

- b.
 - Remain in FRP-S.1, "Response to Nuclear Power Generation / ATWS," and allow the RCS to heat up while continuing efforts to establish emergency boration.
 - The heatup will insert negative reactivity.

QUESTION NUMBER: 83 TIER/GROUP: 2/1
KA IMPORTANCE: RO SRO 4.0
10CFR55 CONTENT: 41(b) 43(b) 5

KA: 012G2.4.6

Knowledge of symptom based EOP mitigation strategies. (Reactor Protection)

OBJECTIVE:

DEVELOPMENT REFERENCES: FRP-S.1

REFERENCES SUPPLIED TO APPLICANT: None

QUESTION SOURCE: SEW SIGNIFICANTLY MODIFIED DIRECT

BANK NUMBER FOR SIGNIFICANTLY MODIFIED/DIRECT: 3.15-R5 11

NRC EXAM HISTORY: None

DISTRACTOR JUSTIFICATION (CORRECT ANSWER X'd):

- a. Plausible since the exit conditions for FRP-S.1 include Power Range channels < 5%, but Intermediate Range channels must indicate a negative startup rate to consider the reactor shutdown.
- X b. Intermediate range startup rate being zero indicates that the reactor is not shutdown, and since the reactor is not tripped and emergency boration cannot be established, the RCS is allowed to heat up to add negative reactivity.
- c. Plausible since the entry conditions for FRP-S.2 include Power Range channels < 5% with the Intermediate Range channels indicating a zero or positive startup rate, but a transition would not be made because FRP-S.1 is a higher priority procedure.
- d. Plausible since maintaining temperature stable would maintain power below 5%, but without emergency boration the only means of adding negative reactivity to the core, as required, is by allowing the RCS to heat up.

DIFFICULTY ANALYSIS:

COMPREHENSIVE/ANALYSIS

KNOWLEDGE/RECALL

DIFFICULTY RATING: 3

EXPLANATION: Analysis of multiple failure conditions to determine proper course of action and basis

QUESTION: 84

Given the following conditions:

- The plant is in Mode 3 with all Shutdown Rods withdrawn.
- The Digital Rod Position Indication emergency power supply is under clearance.
- The normal Digital Rod Position Indication power supply has just tripped.

Which of the following actions is to be taken?

- a. Due to the loss of all Digital Rod Position Indication, open the Reactor Trip Breakers in accordance with Technical Specification 3.1.3.3, "Position Indication System -- Shutdown"
- b. Due to the loss of all Digital Rod Position Indication and Demand Position Indication, verify that all Shutdown Bank Rods are fully withdrawn using the movable in-core detectors in accordance with AOP-001, "Malfunction of Rod Control"
- c. Due to the loss of all Digital Rod Position Indication and Demand Position Indication, commence a rotation of the RCS to ensure adequate Shutdown Margin in accordance with AOP-002, "Emergency Rotation"
- d. Due to the loss of all Digital Rod Position Indication, verify that all Shutdown Bank Rods are fully withdrawn using Demand Position Indication in accordance with AOP-001, "Malfunction of Rod Control"

ANSWER:

- a. Due to the loss of all Digital Rod Position Indication, open the Reactor Trip Breakers in accordance with Technical Specification 3.1.3.3, "Position Indication System – Shutdown"

QUESTION NUMBER: 84 TIER/GROUP: 2/1
KA IMPORTANCE: RO SRO 3.6
10CFR55 CONTENT: 41(b) 43(b) 2

KA: 014A2.02

Ability to (a) predict the impacts of the following malfunctions or operations on the RPIS; and (b) based on those on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Loss of power to the RPIS

OBJECTIVE:

DEVELOPMENT REFERENCES: TS 3.1.3.3

REFERENCES SUPPLIED TO APPLICANT: None

QUESTION SOURCE: NEW' SIGNIFICANTLY MODIFIED DIRECT

RANK NUMBER FOR SIGNIFICANTLY MODIFIED / DIRECT: New

NRC EXAM HISTORY: None

DISTRACTOR JUSTIFICATION (CORRECT ANSWER X'd):

- X a. With both DRPI indications inoperable in Mode 3, 4, or 5, 'IS requires that the Reactor Trip Breakers be opened immediately.
- b. Plausible since this would be required in the event of a loss of a single indication while operating in Mode 1 or 2, but with both indications lost in Mode 3 the Reactor Trip Breakers are to be opened per TS 3.1.3.3.
- c. Plausible since loss of indication of DRPI may lead to belief that SDM cannot be verified, which would require Emergency Boration, but the Reactor Trip Breakers are required to be opened per 'IS 3.1.3.3.
- d. Plausible since this would be required in the event of a loss of a single indication while operating in Mode 1 or 2, but with both indications lost in Mode 3 the Reactor Trip Breakers are to be opened per TS 3.1.3.3.

DIFFICULTY ANALYSIS:

COMPREHENSIVE/ ANALYSIS

KNOWLEDGE/RECALL

DIFFICULTY RATING: 3

EXPLANATION: Knowledge of Tech Spec immediate action requirements in the event of a loss of both DRPI indications

QUESTION: 85

A Senior Reactor Operator has failed to **meet** the required number of hours *this past* calendar quarter to maintain an active license.

Assuming all other requirements have been met to activate the license in the SRO position, in accordance with OMM-001, "Conduct of Operations," which of **the** following watches completed under instruction would satisfy the requirement to allow activation of the license?

- a. 24 hours as the Unit-SCO in Mode **4** AND 24 hours as the S-SO in Mode 5
- b. 24 hours as the Unit-SCO in Mode 5 AND **36** hours **as** the S-SO in Mode **4**
- c. 36 hours as the Unit-SCO in Mode 5 ANI) 12 hours as the S-SO in Mode **4**
- d. 60 hours as the Unit-SCO in Mode 5

ANSWER

- a. 24 hours as the Unit-SCO in Mode **4** AND 24 hours as the S-SO in Mode 5

QUESTION: 86

Given the following conditions:

- Following a steam generator tube rupture (SGTR), the crew has completed PATTI-2 and a transition has just been made to the SGTR recovery procedure as directed by PATII-2.
- The crew is about to commence an RCS cooldown when the BOP reports that the Condenser Available light (C-9) is **NOT** lit.

Which of the following actions should be taken to cool down the RCS?

- a. Dump steam using the intact SG PORVs and transition to EPP-018, "Post-SGTR Cooldown Using Blowdown"
- b. Dump steam using the intact SG PORVs and remain in EPP-017, "Post-SGTR Cooldown Using Backfill"
- c. Cooldown using the TDAFW Pump and transition to EPP-017, "Post-SGTR Cooldown Using Backfill"
- d. Cooldown using the TDAFW Pump and remain in EPP-018, "Post-SGTR Cooldown Using Blowdown"

ANSWER

- b. Dump steam using the intact SG PORVs and remain in EPP-017, "Post-SGTR Cooldown Using Backfill"

QUESTION NUMBER 86 TIEFUGROUP: 1/1
KA IMPORTANCE: RO SRO 4 4
10CFR55 CONTENT: 41(b) 43(b) 5

KA: 000038EA2.08

Ability to determine or interpret the following as they apply to a SGTR: Viable alternatives for placing plant in safe condition when condenser is not available

OBJECTIVE:

DEVELOPMENT REFERENCES: PATH-2
EPP-017

REFERENCES SUPPLIED TO APPLICANT: None

QUESTION SOURCE: NEW SIGNIFICANTLY MODIFIED DIRECT

RANK NUMBER FOR SIGNIFICANTLY MODIFIED / DIRECT: New

NRC EXAM HISTORY Some

DISTRACTOR JUSTIFICATION (CORRECT ANSWER X'd):

- a. Plausible since steam must be dumped using the SG PORVs or the TDAFW Pump, but the crew will remain in the preferred procedure which is EPP-017.
- X b.** Steam must be dumped using the SG PORVs or the TDAFW Pump and the crew will remain in the preferred procedure which is EPP-017.
- c. Plausible since steam must be dumped using the SG PORVs or the TDAFW Pump, but the crew will not transition to EPP-017 since they are already in this procedure as it is the preferred recovery procedure.
- d. Plausible since steam must be dumped using the SG PORVs or the TDAFW Pump, but the crew will remain in the preferred procedure which is EPP-017, not EPP-018.

DIFFICULTY ANALYSIS:

COMPREHENSIVE / ANALYSIS KNOWLEDGE / RECALL

DIFFICULTY RATING: 3

EXPLANATION: Knowledge of mitigation strategies when steam dumps are not available and knowledge of preferred recovery method from SGTR

QUESTION: 87

A LOCA occurred several hours ago. Only one (1) Containment Spray Pump is running due to actions taken in EPP-012, "Loss of Emergency Coolant Recirculation."

A transition has just been made to FW-J. 1, "Response to High Containment Pressure." Containment Pressure ~~is~~ 14 psig.

Which of the following actions should be taken'?

- a. Start the second Containment Spray Pump **if** Containment pressure does **NOT** decrease below 10 psig before exiting FW-J. 1.
- b. Start the second Containment Spray Pump per FRP-J. 1 since pressure is above 10 psig.
- c. Continue operation with one Containment Spray Pump per EPP-012 unless Containment pressure exceeds design, then start the second pump.
- d. Continue operation with one Containment Spray **Pump** per EPP-012 unless Containment pressure begins increasing, then start the second pump.

ANSWER

- c. Continue operation with one Containment Spray Pump per EPP-012 unless Containment pressure ~~exceeds~~ design, then start the second pump.

QUESTION NUMBER: 87 **TIEWGROUP:** 1/2
KA IMPORTANCE: RO **SRO** 3.8
10CFR55 CONTENT: 41(b) **43(b)** 5

KA: WE14EA2.2

Ability to determine and interpret the following as they apply to the (High Containment Pressure)
Adherence to appropriate procedures and operation within the limitations in the facility's license and
amendments

OBJECTIVE:

DEVELOPMENT REFERENCES: FRP-J.1

REFERENCES SUPPLIED TO APPLICANT: None

QUESTION SOURCE: NEW SIGNIFICANTLY MODIFIED DIRECT

BANK NUMBER FOR SIGNIFICANTLY MODIFIED/DIRECT: 3.13-R4 008

NRC EXAM HISTORY: None

DISTRACTOR JUSTIFICATION (CORRECT ANSWER X'd):

- a. Plausible since this would be a normal action directed by FRP-J.1.
- b. Plausible since this would be a normal action directed by FRP-J.1
- X c.** EPP-012 directs the operators to run Containment Spray **Pumps** based upon Containment pressure and Fan Cooler operation. These actions are taken to minimize RWST depletion. This configuration is to be maintained even if FRP-J.1 is implemented.
- d. Plausible since would better serve the intent of EPP-012, but would be contradictory to the intent of FRP-J.1 which has a higher priority concerning the operation of the Spray Pumps.

DIFFICULTY ANALYSIS:

COMPREHENSIVE / ANALYSIS

KNOWLEDGE / RECALL

DIFFICULTY RATING: 3

EXPLANATION: Must compare the relative actions in the 2 procedures and make a judgement of which condition takes precedent

QUESTION: 88

Given the following conditions:

- A large break LOCA has occurred.
- The crew has just transitioned to EPP-010, "Transfer to Cold Leg Recirculation."
- The Reactor Operator reports that RHR Pump 1A-SA tripped just before the transition was made to EPP-010.

Which of the following actions is to be taken'?

- a. Continue with the transfer to Cold Leg Recirculation and remain in EPP-010. "Transfer to Cold Leg Recirculation." but only align one (1) CSIP for recirculation
- b. Continue with the transfer to Cold Leg Recirculation and remain in EPP-010, "Transfer to Cold Leg Recirculation," aligning both CSIPs for recirculation
- c. Transition to EPP-012, "Loss of Emergency Coolant Recirculation," and reduce injection flow to a single RIIR Pump running and a single CSIP running
- d. Transition to EPP-012, "Loss of Emergency Coolant Recirculation." and secure both RIIR Pumps while maintaining both CSIPs running

ANSWER:

- b. Continue with the transfer to Cold Leg Recirculation and remain in EPP-010, "Transfer to Cold Leg Recirculation." aligning both CSIPs for recirculation

QUESTION NUMBER 88 TIEWGROUP 2/1
KA IMPORTANCE: RO SRO 4.6
10CFR55 CONTENT: 41(b) 43(b) 5

KA: 013A2.01

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

OBJECTIVE:

DEVELOPMENT REFERENCES: EPP-010

REFERENCES SUPPLIED TO APPLICANT: None

QUESTION SOURCE: NEW SIGNIFICANTLY MODIFIED DIRECT

BANK NUMBER FOR SIGNIFICANTLY MODIFIED / DIRECT: New

NRC EXAM HISTORY None

DISTRACTOR JUSTIFICATION (CORRECT ANSWER X'd):

- a. Plausible since the normal alignment would have both RHR pumps supplying both CSIPs and reducing CSIP flow would limit the pumping requirement of a single RHR pump, but both CSIPs will still be aligned for recirc.
- X b. The **steps** to align for cold leg recirculation assume only a single train of ESF equipment is available and aligns all operable equipment, including both CSIPs.
- c. Plausible since EPP-012 would be entered if the crew was unable to establish **cold** leg recirculation, but a single RIIR pump will still permit alignment.
- d. Plausible since EPP-012 would be entered if the crew **was** unable to establish cold leg recirculation, but a single RHR pump will still permit alignment.

DIFFICULTY ANALYSIS:

COMPREHENSIVE / ANALYSIS KNOWLEDGE / RECALL

DIFFICULTY RATING: 4

EXPLANATION: Analysis of the effect of a failure of a single RHR pump on the ability to align for cold leg recirc and the procedure which should be used to recover

QUESTION: 89

Which of the following situations occurring on July 1, 2003, would require that an Equipment Inoperability Record be filled out in accordance with OMM-014, "Operation of the Work Control Center"?

- a. The ERFIS computer failed and was removed from service per the OWP
- b. The SWST Discharge Radiation Monitor was removed from service per the OWP
- c. Scheduled MST-10052, Pressurizer Level Loop (L-0459), was performed
- d. During an OST for the A EDG, the E-86 A-SA, EDG Room Exhaust Fan failed

ANSWER

- d. During an OST for the A EDG, the E-86 A-SA, EDG Room Exhaust Fan Failed

QUESTION NUMBER: 89 TIEWGROUP: 3
KA IMPORTANCE: RO SRO 3.1
10CFR55 CONTENT: 41(b) 43(b) 5

KA: 2.2.19

Knowledge of maintenance work order requirements

OBJECTIVE:

DEVELOPMENT REFERENCES: OMM-014
OWP-HVAC

REFERENCES SUPPLIED TO APPLICANT: None

QUESTION SOURCE: NEW SIGNIFICANTLY MODIFIED DIRECT

BANK NUMBER FOR SIGNIFICANTLY MODIFIED / DIRECT: PP-2.4-S6 2

NRC EXAM HISTORY: None

DISTRACTOR JUSTIFICATION (CORRECT ANSWER X'd):

- a. Plausible since ERFIS affects Tech Spec operability of equipment, but an exception is provided for ERFIS per OMM-014 if it is addressed by OWP-ERFIS.
- b. Plausible since the radiation monitor is addressed in PLP-I 14 for operability of equipment, but an exception is provided for a radiation monitor per OMM-014 if it is addressed by OWP-RM.
- c. Plausible since an EIR would be required if this was corrective, but scheduled maintenance does not require it.
- X d. The EDG fan affects the operability of the EDG which requires that an EIR be completed.

DIFFICULTY ANALYSIS:

COMPREHENSIVE / ANALYSIS KNOWLEDGE / RECALL

DIFFICULTY RATING: 3

EXPLANATION: Knowledge of requirements for generating an EIK

QUESTION: 90

Given the following conditions:

- A steam break has occurred on SG 'A'.
- Following a Reactor Trip and Safety Injection, a transition has been made to EPP-015, "Uncontrolled Depressurization of All Steam Generators."

Why should the Unit-SCO direct the operators to attempt to close the Main Steam Isolation Valves before taking any other actions to isolate the SGs?

- a. To minimize the positive reactivity effects associated with the cooldown of the RCS due to more than one (1) SG blowing down **AND** to minimize the pressure rise inside Containment in the event the steam break is inside Containment
- b. To minimize the positive reactivity effects associated with the cooldown of the RCS due to more than one (1) SG blowing down **AND** to ensure **an** adequate supply of AFW in the Condensate Storage Tank in the event of a subsequent loss of all AC power
- c. To ensure an adequate supply of AFW in the Condensate Storage *Tank* in the event of a subsequent loss of all AC power **AND** to limit the likelihood of a radiological release to the environment in the event of a subsequent SGTR
- d. To minimize the pressure rise inside Containment in the event the steam break is inside Containment **AND** to limit the likelihood of a radiological release to the environment in the event of a subsequent **SGTR**

ANSWER:

- a. To minimize the positive reactivity effects associated **with** the cooldown of the RCS due to more **than** one (1) SG blowing down **AND** to minimize the pressure rise inside Containment in the event the steam break is inside Containment

QUESTION NUMBER: 90 **TIEWGROUP:** 1/1
KA IMPORTANCE: RO **SRO** 3.8
10CFR55 CONTENT: 41(b) **43(b)** 2

KA: 000040G2.1.32

Ability to explain and apply all system limits and precautions. (Steam Line Rupture - Excessive Heat Transfer)

OBJECTIVE:

DEVELOPMENT REFERENCES: EPP-015
TS Bases 3/4.7.1.5

REFERENCES SUPPLIED TO APPLICANT: None

QUESTION SOURCE: NEW SIGNIFICANTLY MODIFIED DIRECT

BANK NUMBER FOR SIGNIFICANTLY MODIFIED / DIRECT: New

NRC EXAM HISTORY None

DISTRACTOR JUSTIFICATION (CORRECT ANSWER X'd):

- X a.** The bases for the MSIVs is to prevent an excessive positive reactivity addition due to more than one SG blowing down through the break and to limit the pressure rise inside containment in the event the break is located in containment.
- h.** Plausible since a goal of shutting the MSIV is to prevent an excessive positive reactivity addition due to more than one SG blowing down through the break, but isolating AFW flow also minimizes the cooldown and is not a concern about maintaining CST inventory.
- c.** Plausible since isolating AFW flow will limit the cooldown of the RCS and the faulted SG is the most likely SG to rupture due to the differential pressure, but isolating the MSIV is concerned with excessive positive reactivity addition and the pressure rise inside containment.
- d.** Plausible since the MSIV is isolated to minimize the pressure rise inside containment and the faulted SG is the most likely SG to rupture due to the differential pressure, but isolating the MSIV is concerned with excessive positive reactivity addition and the pressure rise inside containment.

DIFFICULTY ANALYSIS:

COMPREHENSIVE / ANALYSIS KNOWLEDGE / RECALL

DIFFICULTY RATING: 3

EXPLANATION Knowledge of the TS bases for the MSIVs

QUESTION: 91

The unit has tripped due to a LOCA and ESF equipment has failed to start. As a result, FRP-C.2, "Response to Degraded Core Cooling," has been entered.

A depressurization of the Steam Generators (SGs) to 80 psig is being performed, in accordance with FRP-C.2, when the STA reports that a Red Path condition for Integrity has occurred.

Which of the following actions should be taken?

- a. Immediately transition to FRP-P.1, "Response to Imminent Pressurized Thermal Shock Conditions"
- b. Stop the S/G depressurization and, **if** the red path does not clear, transition to FRP-P.1, "Response to Imminent Pressurized Thermal Shock Conditions"
- c. Complete FRP-C.2 and then transition to FRP-P.1, "Response to Imminent Pressurized Thermal Shock Conditions," if the red path still exists
- d. Complete the S/G depressurization and then transition to FRP-P.1, "Response to Imminent Pressurized Thermal Shock Conditions," if the red path still exists

ANSWER:

- c. Complete FRP-C.2 and then transition to FRP-P.1, "Response to Imminent Pressurized Thermal Shock Conditions," if the red path still exists

QUESTION NUMBER 91 TIEFUGROUP: 1/2
 KA IMPORTANCE: RO SRO 3.8
 10CFR55 CONTENT: 41(b) 43(b) 2

JSA: WE06G2.1.32

Ability to explain and apply all system limits and precautions. (Degraded Core Cooling)

OBJECTIVE:

DEVELOPMENT REFERENCES: FRP-C.2

REFERENCES SUPPLIED TO APPLICANT: None

QUESTION SOURCE: NEW SIGNIFICANTLY MODIFIED DIRECT

BANK NUMBER FOR SIGNIFICANTLY MODIFIED / DIRECT: New

NRC EXAM HISTORY: None

DISTRACTOR JUSTIFICATION (CORRECT ANSWER X'd):

- a. Plausible since the red path for integrity **has** a higher priority than the orange path **that** caused entry into FRP-C.2, hut under these particular conditions a transition should not occur until completion of the FRP-C.2.
- h. Plausible since the red path for integrity has a higher priority than the orange path that caused entry into FRP-C.2, but under these particular conditions a transition should not occur until completion of the FRP-C.2.
- X c. During the depressurization, a red path may occur due to injecting the accumulators. A transition should not be made until the entire procedure has been completed.
- d. Plausible since the red path for integrity has a higher priority **than** the orange path that caused entry into FRP-C.2, but under these particular conditions a transition should not occur until completion **of** the FRP-C.2.

DIFFICULTY ANALYSIS:

COMPREHENSIVE/ANALYSIS KNOWLEDGE/ RECALL

DIFFICULTY RATING: 3

EXPLANATION: Must analyze plant conditions to determine that the cause of the red path is the depressurization and that, under these specific conditions, an immediate transition is not warranted

QUESTION: 32

Given the following conditions:

- The unit **is** in Mode 3.
- Instrument Ruses 1DP-1B-SII **and** 1DP-1B-SIV are both de-energized.
- Maintenance reports that Instrument Bus 1DP-1B-SII is ready to be re-energized.

In order *to* prevent an inadvertent Safeguards Actuation, which of the following must be verified prior to re-energizing the bus?

- a. Train 'A' Logic Input Error Inhibit must be verified to be in INHIBIT
- b. Train 'A' Logic Train Output must be verified to be in TEST
- c. Train 'B' Logic Input Error Inhibit must be verified to be in INHIBIT
- d. Train 'B' Logic Train Output must be verified to be in TEST

ANSWER:

- d. Train 'B' Logic Train Output must be verified to be in TEST

QUESTION NUMBER 92 TIEWGROUP 2/1
KA IMPORTANCE: BO SRO 3.4
10CFR55 CONTENT: 41(b) 43(b) 2

KA: 062G2.2.22

Knowledge of limiting conditions for operations and safety limits. (AC Electrical Distribution)

OBJECTIVE:

DEVELOPMENT REFERENCES: OP-156.02

REFERENCES SUPPLIED TO APPLICANT: Some

QUESTION SOURCE: NEW SIGNIFICANTLY MODIFIED DIRECT

BANK NUMBER FOR SIGNIFICANTLY MODIFIED [DIRECT: New

NRC EXAM HISTORY: None

DISTRACTOR JUSTIFICATION (CORRECT ANSWER X'd):

- a. Plausible since the loss of both trains of power will provide the proper coincidence, hut power must be available to the output relays to actuate. Placing the input error inhibit in INHIBIT at this time will not prevent an actuation since the logic is already made up. **Also** the incorrect Train.
- h. Plausible since the loss of both trains of power causes the SI Block signals to be lost **and** when either of the supplies is restored, power will be available to the output relays to cause **an** actuation, howevet this occurs on Train 'B' for this event.
- c. Plausible since the loss of both trains of power will provide the proper coincidence, hut power must be available **to** the output relays to actuate. Placing the input error inhibit in INHIBIT at this time will not prevent an actuation since the logic is already made up.
- X d. The loss of both trains of **power** causes the SI Block signals to **he** lost. When either **of** the supplies is restored, power will be available to the output relays to cause an actuation.

DIFFICULTY ANALYSIS:

COMPREHENSIVE / ANALYSIS KNOWLEDGE / RECALL

DIFFICULTY RATING: 3

EXPLANATION: Must determine train of SSPS affected by the **loss** of power and then analyze the effect of partially restoring power

QUESTION: 93

With the plant in Mode 3, a new system engineer has requested that CSIP 1B-SB be started with the discharge valve throttled to 75% open to determine starting current **and** flow rate under these conditions.

This evolution is **NOT** described in current procedures, nor the Updated Final Safety Analysis Report. The system engineer has developed a temporary change to the Engineering Surveillance Test for performing the evolution.

The Superintendent - Shift Operations may . . .

- a. approve the evolution when a written safety evaluation has been performed and approved.
- b. approve the evolution if the Manager-HESS concurs
- c. approve the evolution if another SRO concurs
- d. approve the evolution when Mode 5 conditions are met.

ANSWER:

- a. approve the evolution when a written safety evaluation has been performed and approved.

QUESTION NUMBER: 93 TIER/GROUP: 3
KA IMPORTANCE: RO SRO 3.3
10CFR55 CONTENT: 41(b) 43(b) 3

KA: 2.2.10

Knowledge of the process for determining if the margin of safety, as defined in the basis of any technical specification is reduced by a proposed change, test or experiment

OBJECTIVE:

DEVELOPMENT REFERENCES: REG-NGGC-0010

REFERENCES SUPPLIED TO APPLICANT: None

QUESTION SOURCE: NEW SIGNIFICANTLY MODIFIED DIRECT

BANK NUMBER FOR SIGNIFICANTLY MODIFIED/DIRECT: INPO 19840

NRC EXAM HISTORY: None

DISTRACTOR JUSTIFICATION (CORRECT ANSWER X'd):

- X a. Tests or experiments that put the facility in a situation that has not previously been evaluated or that could affect the capability of SSCs to perform their intended design functions must be evaluated under 10 CFR 50.59 before they are conducted.
- b. Plausible since a temporary procedure has been written to address the test, but the procedure must have undergone a safety review prior to implementation even if the Manager-HESS concurs.
- c. Plausible since this is a requirement for implementing 10CFR50.54(x) for deviating from plant procedures to protect the health and safety of the public, but this does not qualify as a condition under which this would be implemented.
- d. Plausible since the CSIPs are only required to be operable in Modes 1-4, but since the test falls outside the licensing basis documents a safety evaluation is required.

DIFFICULTY ANALYSIS:

COMPREHENSIVE/ ANALYSIS KNOWLEDGE/ RECALL

DIFFICULTY RATING: 3

EXPLANATION: Requires knowledge of requirements for process of performing a test not described in any licensing basis documents.

QUESTION: 94

Given the following conditions:

- e EDG 1B-SB is under clearance when a loss of offsite power occurs
- e EDG 1A-SA starts and is loaded **by** the Sequencer.
- e The BOP informs you that ESW Pump 1A-SA has tripped.

Which of the following actions are to be taken?

- a. Locally monitor EDG 1A-SA operating parameters and continue in PATH-1
- b. Open EDG **1A-SA** Output Breaker **106** and transition to EPP-001, "Loss of AC Power to 1A-SA and 1B-SB Buses"
- c. Emergency stop EDG **1A-SA** and transition to EPP-001, "Loss of AC Power to **1A-SA** and 1B-SB Huses"
- d. Emergency stop EDG 1A-SA and continue in PATII-I

ANSWER:

- c. Emergency stop EDG 1A-SA and transition to EPP-001, "Loss of AC Power to **1A-SA** and 1B-SB Buses"

QUESTION: 95

A reactor trip occurred due to a loss of offsite power. The plant is being cooled down on RIIR per EPP-006, Natural Circulation Cooldown with Steam Void in Vessel with RVLIS.

- RCS cold leg temperatures are 190°F.
- Steam generator pressures are 50 psig.
- RVLIS upper range indicates greater than 100%.
- Three CRDM fans have been running during the entire cooldown.

Steam should be dumped from all SGs to ensure ...

- a. boron concentration *is* equalized throughout the RCS prior to taking a sample to verify cold shutdown boron conditions.
- b. all inactive portions of the RCS are below 200°F prior to complete RCS depressurization.
- c. RCS and SG temperatures are equalized prior to any subsequent RCP restart
- d. RCS temperatures do not increase during the required 29 hour vessel soak period.

ANSWER

- b. all inactive portions of the RCS are below 200°F prior to complete RCS depressurization.

QUESTION NUMBER: 95 TIEWGROUP: I12
KA IMPORTANCE: RO SRO 3 8
10CFR55 CONTENT: 41(b) 43(b) 2

KA: WE09G2.1.32

Ability to explain and apply all system limits and precautions. (Natural Circulation Operations)

OBJECTIVE:

DEVELOPMENT REFERENCES: EPP-006

REFERENCES SUPPLIED TO APPLICANT: None

QUESTION SOURCE: NEW SIGNIFICANTLY MODIFIED DIRECT

BANK NUMBER FOR SIGNIFICANTLY MODIFIED/DIRECT: 3.8 006

NRC EXAM HISTORY: None

DISTRACTOR JUSTIFICATION (CORRECT ANSWER X'd):

- a. Plausible since this action would have been performed in this procedure, but must be completed prior to depressurizing the RCS below 1900psig.
- X b. SG pressure above 0 psig indicates that the SGs are above 200°F. Depressurizing the RCS under this condition will result in additional void formation in the SG u-tubes.
- c. Plausible since KCP operation throughout NC Cooldown is desirable, but will not be performed at this point in the procedure.
- d. Plausible since a **soak** period is addressed, but only if continued operation of CRDM fans had not been maintained.

DIFFICULTY ANALYSIS:

COMPREHENSIVE / ANALYSIS KNOWLEDGE / RECALL

DIFFICULTY RATING: 3

EXPLANATION: Must analyze the conditions and determine that the entire RCS is not below 200°F and the effect of depressurizing under these conditions.

QUESTION: 96

Given the following conditions:

- Refueling in progress.
- A spent fuel assembly is being moved in the Fuel Handling Building (FHB) when **it's** damaged by contacting a wall of the pool.
- Spent Fuel Pool area radiation monitor RM-1FR-3566A-SA is in HIGH alarm.
- Spent Fuel Pool area radiation monitor RM-1FR-3567B-SB is in ALERT.

Which of the following actions must the Refueling SRO direct?

- a. Immediately evacuate the FHB in accordance with AOP-013, "Fuel Handling Accident"
- b. Immediately evacuate the FHN in accordance with AOP-005, "Radiation Monitoring System"
- c. Place the assembly in a safe location and then evacuate the FHB in accordance with AOP-013, "Fuel Handling Accident"
- d. Place the assembly in a safe location and then evacuate the FIIB in accordance with AOP-005, "Radiation Monitoring System"

ANSWER:

- a. Immediately evacuate the FKB in accordance with AOP-013, "Fuel Handling Accident"

QUESTION NUMBER: 96 **TIENGROUP:** 3
KA IMPORTANCE: RO **SRQ** 3.3
10CFR55 CONTENT: 41(b) **43(b)** 4

KA: 2.3.10

Ability to perform procedures to reduce excessive levels of radiation and guard against personnel exposure.

OBJECTIVE:

DEVELOPMENT REFERENCES: AOP-013
AOP-005

REFERENCES SUPPLIED TO APPLICANT: None

QUESTION SOURCE: NEW SIGNIFICANTLY MODIFIED DIRECT

BANK NUMBER FOR SIGNIFICANTLY MODIFIED /DIRECT: Harris LOCT 53 I

NRC EXAM HISTORY: None

DISTRACTOR JUSTIFICATION (CORRECT ANSWER X'd):

- X a. Any FIIB monitor in High Alarm or Alert requires immediate evacuation in accordance with AOP-013.
- b. Plausible since any FHR monitor in High Alarm or Alert requires immediate evacuation, but these actions are performed in accordance with AOP-013, not AOP-005.
- c. Plausible since it is desirable to place the fuel assembly in a safe location prior to evacuating, but any FHR monitor in High Alarm or Alert requires immediate evacuation in accordance with AOP-013.
- d. Plausible since it is desirable to place the fuel assembly in a safe location prior to evacuating, but any FHR monitor in High Alarm or Alert requires immediate evacuation in accordance with AOP-013.

DIFFICULTY ANALYSIS:

COMPREHENSIVE / ANALYSIS KNOWLEDGE / RECALL

DIFFICULTY RATING: 3

EXPLANATION: Knowledge of the threshold requirements for determining whether the fuel assembly should be placed in a safe location prior to evacuating

QUESTION: 97

Given the following conditions:

- Power is currently at 32% during a plant startup.
- Instrument Bus IDP-1B-SIV deenergized as a result of a fault in PIC CAB-4.
- PIC CAB-4 has been isolated from Instrument Bus SIV and will be deenergized for approximately eight (8) hours while repairs are being made.

In order to put the plant in a safe condition ..

- a. place all PIC CAB-4 Reactor Trip instruments in the tripped condition in accordance with OWP-RP, "Reactor Protection."
- b. place all PIC CAB-4 ESF instruments in the tripped condition in accordance with OWP-ESF, "Engineered Safety Feature Actuation."
- c. place all MFW Regulating Valves in MANUAL in accordance with AOP-024, "Loss of Uninterruptible Power Supply."
- d. perform a plant shutdown in accordance with GP-006, "Normal Plant Shutdown From Power Operation to Hot Standby."

ANSWER:

- d. perform a plant shutdown in accordance with GP-006, "Normal Plant Shutdown From Power Operation to Hot Standby."

QUESTION NUMBER: 97 **TIEWGROUP:** 1/1
KA IMPORTANCE: RO **SRO** 4.1
10CFR55 CONTENT: 41(b) **43(b)** 2

KA: 000057G2.2.22

Knowledge of limiting conditions for operations and safety limits. (Loss of Vital AC Instrument Bus)

OBJECTIVE:

DEVELOPMENT REFERENCES: AOP-024
TS Table 3.3-3, pg 3-18 and 3-27
'IS 3.0.3, pg 0-1

REFERENCES SWPLIED TO APPLICANT: None

QUESTION SOURCE: NEW SIGNIFICANTLY MODIFIED DIRECT

BASK NUMBER FOR SIGNIFICANTLY MODIFIED/DIRECT: AOP-3.24-R4 001

NRC EXAM HISTORY: None

DISTRACTOR JUSTIFICATION (CORRECT ANSWER X'd):

- a. Plausihle since instrument failures require bistables tripped, but they are deenergized tu actuate and are already tripped since no power is available.
- b. Plausible since instrument failures require bistables tripped, hut they are deenergized to actuate and are already tripped since no power is available.
- c. Plausible since this is the immediate operator action for a loss of Instrument Bus SHH, not SIV.
- X d.** Loss of all power to PIC CAB-4 will result in 3 bistable channels of Steam Line Pressure becoming inoperable. The 'IS action is to trip the histables within six hours, but the bistables are energized to actuate. Without power availahle, this action cannot be performed and 'IS3.0.3 becomes applicable

DIFFICULTY ANALYSIS:

COMPREHENSIVE / ANALYSIS KNOWLEDGE / RECALL

DIFFICULTY RATING: 4

EXPLANATION: Must recognire that energized to actuate bistable5 cannot be placed in tripped condition without power, thus an entry into TS 3.0.3 is required, and must determine the required TS 3.0.3 actions

QUESTION: 98

During the performance of PATH-2, the STA reports that the following two (2) YELLOW path Critical Safety Function Status Trees (CSFST) exist:

- Integrity
- Heat Sink

Which of the following describes how these YELLOW paths are to be addressed and / or implemented:

- a. Both must be addressed and implemented, with Heat Sink having a higher priority than Integrity, as soon as PATH-2 actions are completed provided no other higher priority CSFST conditions exist
- b. Both must be addressed, but implemented at the discretion of the Superintendent-Shift Operations, prior to exiting from the EOP network
- c. Both must be addressed and implemented, with Heat Sink having a higher priority than Integrity, prior to exiting from the EOP network
- d. Both must be addressed, but implemented at the discretion of the Superintendent-Shift Operations, as soon as PATH-2 actions are completed provided no other higher priority CSFST conditions exist

ANSWER:

- b. Both must be addressed, but implemented at the discretion of the Superintendent-Shift Operations, prior to exiting from the EOP network

QUESTION NUMBER 98 TIEWGROUP: 3
 KA IMPORTANCE: RO SRO 4.0
 10CFR55 CONTENT: 41(b) 43(b) 5

KA: 2.4.22

Knowledge of the bases for prioritizing safety functions during abnormal/emergency operations

OBJECTIVE:

DEVELOPMENT REFERENCES: EOP User's Guide

REFERENCES SUPPLIED TO APPLICANT: None

QUESTION SOURCE: NEW SIGNIFICANTLY MODIFIED DIRECT

BANK NUMBER FOR SIGNIFICANTLY MODIFIED / DIRECT: New

NRC EXAM HISTORY: None

DISTRACTOR JUSTIFICATION (CORRECT ANSWER X'd):

- a. Plausible since they are to be addressed, but only prior to leaving the EOP network and are not required to be implemented.
- X b. All YELLOW-condition CSFSTs should be addressed prior to exiting the EOP network. However, the operator is allowed to decide if and when to implement, and whether to complete any YELLOW-condition FKP.**
- e. Plausible since they are to be addressed, but only prior to leaving the EOP network and are not required to be implemented.
- d. Plausible since they are to be addressed, but only prior to leaving the EOP network and are not required to be implemented.

DIFFICULTY ANALYSIS:

COMPREHENSIVE/ANALYSIS KNOWLEDGE/ RECALL

DIFFICULTY RATING: 2

EXPLANATION: Knowledge of the implementation criteria for yellow CSFSTs as directed by plant procedures

QUESTION: 99

Given the following conditions:

- The plant is operating at 100% power.
- Emergency DC Bus DP-1B-SB deenergizes.

Which of the following describes the effect of this loss of power on Technical Specification (TS) required equipment'?

- a. 1CS-11, CVCS NORMAL LTDN ISOL, fails shut, meeting the Containment isolation 'IS requirements
- b. Instrument Buses SIII and SIV maintain power from their inverters, meeting the onsite power distribution TS requirements
- c. TDAFW Pump loses one steam supply availability, requiring AFW TS implementation
- d. RCPs lose tripping capability, requiring RCS TS implementation

ANSWER:

- c. TDAFW Pump loses one steam supply availability, requiring AFW TS implementation

QUESTION NUMBER: 99 TIER/GROUP: 1/1
KA IMPORTANCE: RO SRO 4.0
10CFR55 CONTENT: 41(b) 43(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:

DEVELOPMENT REFERENCES: AOP-025
TS 3.7.1.2

REFERENCES SUPPLIED TO APPLICANT: None

QUESTION SOURCE: NEW SIGNIFICANTLY MODIFIED DIRECT

BANK NUMBER FOR SIGNIFICANTLY MODIFIED / DIRECT: New

NKC EXAM HISTORY: None

DISTRICTOR JUSTIFICATION (CORRECT ANSWER X'd):

- a. Plausible since ICS-11 is a containment isolation valve and is required to fail shut, but since it is inoperable TS 3.6.3 must be entered.
- b. Plausible since instrument buses SIII and SIV will still have power available from the inverter, but TS 3.5.3.1 must be entered since it requires the inverter be supplied by the DC bus.
- X c. The TDAFW Pump is inoperable due to a loss of power to steam supply valve MS-72 and TS 3.7.1.2 actions must be applied.
- d. Plausible since Train 'B' RCP tripping power is lost, but Train 'A' is available and RSS TS's do not address RCP tripping capability.

DIFFICULTY ANALYSIS:

COMPREHENSIVE / ANALYSIS

KNOWLEDGE / RECALL

DIFFICULTY RATWG: 3

EXPLANATION: Knowledge of the effect of a loss of power on the operability of the AFW system

QUESTION: 100

Which of the following actions, in accordance with the EOP-User's Guide, can the SRO direct prior to reaching the step in the EOP?

- a. Isolating **AFW** flow to a single faulted **SG** prior to determining if an intact **SG** exists
- b. Securing **AFW** flow to a known ruptured **SG** **with** level below the narrow range
- c. Securing a **CSIP** to prevent overfilling the pressurizer following an inadvertent **SI**
- d. Following **AFW** actuation from **SG** shrink, throttling **AFW** flow control valves to maintain **SG** level in the required band

ANSWER:

- d. Following **AFW** actuation from **SG** shrink, throttling **AFW** flow control valves to maintain **SG** level in the required band

QUESTION NUMBER: 100 **TIER/GROUP:** 3
KA IMPORTANCE: RO **SRO** 3.9
10CFR55 CONTENT: 41(b) 10 **43(b)**

KA: 2.4.14

Knowledge of general guidelines for EOP flowchart use

OBJECTIVE: 344-040-H6-02

Evaluate the adequacy of AOPs / EOPs for mitigation capabilities during off-normal conditions

DEVELOPMENT REFERENCES: EOP User's Guide

REFERENCES SUPPLIED TO APPLICANT: None

QUESTION SOURCE: NEW SIGNIFICANTLY MODIFIED DIRECT

BANK NUMBER FOR SIGNIFICANTLY MODIFIED /DIRECT: 3.19-R1 018

NRC EXAM HISTORY: Some

DISTRACTOR JUSTIFICATIONS (CORRECT ANSWER X'd):

- a. Plausible since the EOP User's Guide addresses isolating a faulted SG as being acceptable, but only after verifying that an intact SG is available.
- b. Plausible since the EOP User's Guide addresses isolating a ruptured SG as being acceptable, but only after verifying that level in the SG is above the tubes.
- e. Plausible since terminating SI early might be beneficial to prevent filling the pressurizer if the only event is a spurious SI, but this may result in further degradation of the plant if another undiagnosed event is in progress.
- x d.** Control of SG level in the normal band is an acceptable step to be performed out of sequence per the EOP User's Guide.

DIFFICULTY ANALYSIS:

COMPREHENSIVE / ANALYSIS

KNOWLEDGE / RECALL

DIFFICULTY RATING: 3

EXPLANATION: Must differentiate between those actions which could potentially result in degradation of the plant if taken out of sequence and those actions which would likely have little impact on the operators' abilities to diagnose other events.