

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	1	1
	K/A #	A4.08 (003)	
	Importance Rating	3.2	2.9

(K&A Statement) Ability to manually operate and/or monitor in the control room: RCP cooling water supplies

Proposed Question: Common 1

Plant conditions:

- The plant is at 100% power.
- Makeup Pump 1 is out of service for maintenance.

Event:

- Reactor trip
- D1 lockout
- Two minutes later, the following conditions exist:
  - Makeup Pump 2 red RUN light OFF
  - Annunciator 6-6-C, SEAL INJ TOTAL FLOW, is in alarm
  - Annunciator 6-5-B, SEAL CCW FLOW LOW, is in alarm
  - Zero Makeup flow is indicated
  - PZR level is lowering
  - Seal Return temperatures are 180°F

Which ONE of the following actions is required?

- Trip all four Reactor Coolant Pumps.
- Close the Seal Return Isolation Valves: MU59A, MU59B, MU59C, and MU59D.
- Open MU32, Pressurizer Level Control, in HAND.
- Open MU19, RCP Seal Injection Flow Control, in HAND.

Proposed Answer: A. Trip all four Reactor Coolant Pumps.

Explanation (Optional): DB-OP-02515 first Supplementary Action requires tripping all four RCPs if CCW and Seal Injection to all RCPs is confirmed.

- A. CORRECT ANSWER
- B. Plausible since this is an action that would be taken if Seal Return Temperatures were to rise above 200°F; however there are no indications temperature has risen to that point.
- C. Plausible since pressurizer level is lowering; however it will not help with the loss of the Makeup Pump and CCW is also lost requiring the RCPs to be tripped.
- D. Plausible since this valve will be manipulated; however it will be closed and the RCPs must be tripped due to the loss of Seal Injection and CCW.

Technical Reference(s): DB-OP-02515 REACTOR COOLANT PUMP AND MOTOR ABNORMAL OPERATION (Rev 7)(Page 24) (Attach if not previously provided)  
DB-OP-02512 LOSS OF RCS MAKEUP (Rev 8)(Page 7)

Proposed references to be provided to applicants during examination: None

Learning Objective: OPS-GOP-115-02K (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # X (Note changes or attach parent)  
New \_\_\_\_\_

Question History: Last NRC Exam 2002

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 b.10  
55.43 \_\_\_\_\_

Comments: Modified from a question used on the DB 2002 ILT Exam

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	1	1
	K/A #	K6.02 (004)	
	Importance Rating	2.5	2.6

(K&A Statement) Knowledge of the effect of a loss or malfunction on the following CVCS components: Demineralizers and ion exchangers

Proposed Question: Common 2

Plant conditions:

- The plant is at 100% power.
- Annunciator 2-4-A, LETDOWN OR MAKEUP FILTER  $\Delta$ P HI, has alarmed.
- High  $\Delta$ P across Purification Demineralizer Filter 1 is indicated at PDI MU62 on Control Room Console C5702.
- Letdown flow indication is 18 gpm.

The above conditions could result in \_\_\_\_\_ by the in service Letdown Purification Demineralizer.

- deborating of the RCS
- channeling of the demineralizer resin bed
- leaching of boron from the demineralizer resin
- removal of impurities from the demineralizer resin

Proposed Answer: B. channeling of the demineralizer resin bed

Explanation (Optional):

- Plausible since this could happen if a demineralizer that is not boron saturated is placed in service
- CORRECT ANSWER
- Plausible since leaching of boron can occur from the resins if a highly boron saturated demineralizer is placed in service when RCS boron concentration is lower.
- Plausible since removal of impurities from the resin can occur if the resin is damaged

Technical Reference(s): DB-OP-06006 MAKEUP AND PURIFICATION SYSTEM (Attach if not previously provided)  
(Rev 19)(Page 7)

Proposed references to be provided to applicants during examination: None

Learning Objective: OPS-SYS-I106-03K (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 b.7  
55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	1	1
	K/A #	K4.11 (004)	
	Importance Rating	3.1	3.6

(K&A Statement) Knowledge of CVCS design feature(s) and/or interlock(s) which provide for the following: Temperature/pressure control in letdown line: prevent boiling, lifting reliefs, hydraulic shock, piping damage, and burst

Proposed Question: Common 3

Plant conditions:

- The plant is at 100% reactor power.
- Letdown flow is ~45 gpm.

Event:

- RC Letdown pressure as indicated on Computer Points P719 and P720 reads 155 psig.
- RC Letdown Temperature is 127°F.
- RC Letdown flow is 16 gpm.
- RCDT level indicator LI 1721 indicates rising level.
- Purification Demineralizer 1 is in service.

Which ONE of the following would cause the above conditions?

- MU 10A, Purification Demineralizer 1 Inlet Valve, is closed.
- MU 4, Letdown Block Orifice Isolation Valve, is closed.
- MU 1A, Letdown Cooler 1 Inlet Isolation, is closed.
- MU 3, Letdown Coolers Outlet, is closed.

Proposed Answer: A. MU 10A, Purification Demineralizer 1 Inlet Valve, is closed

Explanation (Optional): DB-OP-06006 requires verifying MU10A to be open when Purification Demineralizer 1 is in service. When MU10A is closed, high letdown pressure exists since this will isolate the letdown flowpath and pressure will rise lifting relief valve PSV 1890.

- CORRECT ANSWER
- Plausible since this is a valve that will be checked; however it is verified closed not open.
- Plausible since this valve being closed along with MU1B would isolate high pressure from the letdown line.
- Plausible since letdown flow is reduced and MU3 is in the flowpath, but MU3 closing would also lower letdown pressure and the computer points would read less.

Technical Reference(s): DB-OP-02002 (Attach if not previously provided)  
 LETDOWN/MAKEUP ALARM  
 PANEL 2 ANNUNCIATORS  
 (Rev 5)(Page 11)  
 DB-OP-06006, Makeup and  
 Purification (Rev. 19)(Page 25,  
 26)  
 OS-002, Sheet 1 Makeup and  
 Purification System

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Proposed references to be provided to applicants during examination: None

Learning Objective: \_\_\_\_\_ (As available)

Question Source: Bank # \_\_\_\_\_  
 Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
 New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
 Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 b.7  
 55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	1	1
	K/A #	K6.03 (005)	
	Importance Rating	2.5	2.6

(K&A Statement) Knowledge of the effect of a loss or malfunction on the following will have on the RHRS: RHR heat exchanger

Proposed Question: Common 4

Plant conditions:

- Plant cooldown is in progress using DH Pump 2.
- RCS temperature is 210°F.
- DH14A, DH CLR 2 OUTLET, fails closed.
- RCS pressure is 100 psig.

Which ONE of the following would be the PREFERRED method to re-establish cooling to the RCS?

- Place DH Pump 1 in service on the RCS.
- Start an RCP to provide cooling through the SGs.
- Start HPI Pump 2 and inject water from the BWST.
- Locally control DH13A, DH COOLER BYPASS, to maintain RCS temperature.

Proposed Answer: A. Place DH Pump 1 in service on the RCS.

Explanation (Optional): DB-OP-02527 provides guidance on recovering from loss of DH Removal Pump. DH14A failing closed would cause of DH Removal Pump 2 flowpath, therefore DH Removal Pump 1 would have to be placed in service.

- CORRECT ANSWER
- Below minimum NPSH for an RCP.
- HPI pump is used last.
- DHP 13A, bypass cooler, no cooling.



Technical Reference(s): DB-OP-02527 LOSS OF  
DECAY HEAT REMOVAL (Rev  
10)(Page 21) (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: OPS-GOP-127-02K (As available)

Question Source: Bank # X  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New \_\_\_\_\_

Question History: Last NRC Exam 2002

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 b.10  
55.43 \_\_\_\_\_

Comments: Question used on 2002 DB ILT Exam

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	1	1
	K/A #	A1.02 (006)	
	Importance Rating	3.0	3.6

(K&A Statement) Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the ECCS controls, including: Boron concentration in accumulator, boron storage tanks

Proposed Question: Common 5

Plant conditions:

- A Reactor Trip occurred.
- Five control rods failed to insert into the core.
- Shutdown Margin was determined to be 0.72%  $\Delta K/K$ .
- Makeup flow to the RCS is 45 gpm.
- The RCS is being borated using the Boric Acid Addition Tank Method.
- BAAT 2 is being used for boration and its concentration is 8120 ppmb.
- Boric Acid Pump 1 is running at 12 gpm.

Given the above conditions, boric acid addition is \_\_\_\_\_.

- A. adequate as long as Boric Acid Pump flow is maintained at  $\geq 12$  gpm
- B. adequate as long as long as Makeup Pump flow is  $\geq 40$  gpm
- C. inadequate due to low boron concentration in BAAT 2
- D. inadequate due to Boric Acid Pump flow being  $< 25$  gpm

Proposed Answer: D. inadequate due to Boric Acid Pump flow being  $< 25$  gpm.

Explanation (Optional): TS 3.1.1.1 requires at least 25 gpm of 7875 ppmb borated water (or its equivalent) to be injected if shutdown margin is  $< 1\%$   $\Delta K/K$ .

- A. Plausible since 12 gpm of flow would be adequate with the plant in Mode 6.
- B. Plausible if the examinee does not know the 25 gpm flowrate is boric acid flow not just Makeup Pump flow.
- C. Plausible if the examinee does not know the TS required boron concentration of the BAAT.
- D. CORRECT ANSWER

Technical Reference(s): TS 3.1.1.1 Boration Control – Shutdown Margin (Attach if not previously provided)  
 DB-OP-02000 RPS, SFAS, SFRCS TRIP, OR SG TUBE RUPTURE (Rev 20)(Page 238)

Proposed references to be provided to applicants during examination: None

Learning Objective: \_\_\_\_\_ (As available)

Question Source: Bank # \_\_\_\_\_  
 Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
 New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
 Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 b.10  
 55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	1	1
	K/A #	K1.03 (007)	
	Importance Rating	3.0	3.2

(K&A Statement) Knowledge of the physical connections and/or cause-effect relationships between the PRTS and the following systems: RCS

Proposed Question: Common 6

An RCS Water Inventory Balance is in progress per DB-SP-03357, RCS Water Inventory Balance.

The Quench Tank Drain Valve, RC225, cycling open during the RCS Water Inventory Balance will result in \_\_\_\_\_.

- A. a smaller IDENTIFIED RCS Leakrate due to lowering Quench Tank level
- B. a smaller IDENTIFIED RCS Leakrate due to a rising RC Drain Tank level
- C. a higher IDENTIFIED RCS Leakrate due to lowering Quench Tank level
- D. a higher IDENTIFIED RCS Leakrate due to rising RC Drain Tank level

Proposed Answer: A. a smaller IDENTIFIED RCS Leakrate due to lowering Quench Tank Level

Explanation (Optional): DB-SP-03357

- A. CORRECT ANSWER
- B. Plausible if the examinee does not deduce a rising RC Drain Tank level indicates higher RCS leakage.
- C. Plausible if the examinee does not know lowering Quench Tank level is not indicative of an RCS leak.
- D. Plausible if the examinee does not KNOW that the RCDT is not part of the identified leakrate determination.

Technical Reference(s): DB-SP-03357, RCS Water Inventory Balance (Rev 12) (Attach if not previously provided)  
(Page 23, 24)

Proposed references to be provided to applicants during examination: None

Learning Objective: \_\_\_\_\_ (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 b.7  
55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	1	1
	K/A #	A2.03 (008)	
	Importance Rating	3.0	3.2

(K&A Statement) Ability to (a) predict the impacts of the following malfunctions or operations on the CCWS, and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: High/low CCW temperature

Proposed Question: Common 7

Plant conditions:

- The plant is at 100% power.
- Normal equipment lineups exist.
- CCW Pump 1 in service.
- CCW Pump 3 in standby on Train 2.

Event:

- CCW Heat Exchanger 1 outlet temperature is 123°F and rising slowly.
- Annunciator 11-1-B, CCW HX 1 OUTLET TEMP HI, is in alarm.
- Computer point (T068) (T072) CC HX 1 OUT TEMP, is in alarm.

With the above conditions, \_\_\_\_\_.

- CCW Pump 1 will have to be manually stopped, and CCW Pump 3 allowed to autostart IAW DB-OP-02523, Component Cooling Water System Malfunctions
- both Emergency Diesel Generators will be rendered inoperable, due to closing their air start valves, and TS 3.8.1.1 and 3.8.1.2 will have to be entered
- CCW Pump 3 will have to be manually started, using DB-OP-06262, Component Cooling Water System Procedure, CCW Pump will trip on high temperature
- the Non-Essential CCW Isolation Valves will have to be manually closed for CCW Pump 1, due to lack of an automatic pump trip, using DB-OP-06262, Component Cooling Water System Procedure

Proposed Answer: A. CCW Pump #1 will have to be manually tripped, due to removal of the high temperature trip, and CCW Pump #3 allowed to autostart IAW DB-OP-2523.

Explanation (Optional): DB-OP-02523 requires tripping the CCW Pump if HX Outlet temperature reaches 120°F and verifying the standby CCW Pump auto starts.

- A. CORRECT ANSWER
- B. Plausible since, if desired, the affected EDG will be rendered inoperable by closing its air start valve; however the other EDG should not be affected.
- C. Plausible since CCW Pump #3 will have to be started; however it will auto start when CCW Pump #1 is tripped.
- D. Plausible since these valves will be closed for CCW Pump #1; however they should close automatically.

Technical Reference(s): DB-OP-02523 COMPONENT (Attach if not previously provided)  
COOLING WATER SYSTEM  
MALFUNCTIONS (Rev  
5)(Pages 30, 31)

Proposed references to be provided to applicants during examination: None

Learning Objective: \_\_\_\_\_ (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 b.10  
55.43 \_\_\_\_\_

Comments:



Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	1	2
	K/A #	2.4.31 (008)	
	Importance Rating	3.3	3.4

(K&A Statement) Emergency Procedures / Plan Knowledge of annunciators alarms and indications, and use of the response instructions.

Proposed Question: Common 8

Plant conditions:

- The plant is at 100% power.
- Normal equipment lineups exist.

Event:

- Annunciator 11-3-A, CCW SURGE TK LVL LO, is in alarm.
- Computer alarm L068, CCW SURGE TK LVL LO, is in alarm.
- CCW Surge Tank level is 39 inches and slowly lowering.
- CCW temperatures are steady.

Which ONE of the following actions must be taken at this CCW Surge Tank level?

- Trip the reactor.
- Lock out Waste Gas Compressor 1.
- Stop all four Reactor Coolant Pumps.
- Verify CC2645 and CC2649, Aux Bldg Return Valves, are closed.

Proposed Answer: B. Stop Waste Gas Compressor 1

Explanation (Optional): DB-OP-02523 requires securing the Waste Gas Compressor any time CCW Surge Tank Level falls to 45 inches.

- Plausible since this is an action that would be taken if level falls to 35 inches.
- CORRECT ANSWER
- Plausible since this is an action that would be taken if level falls to 35 inches.
- Plausible since this is an action that would be taken if level falls to 35 inches.

Technical Reference(s): DB-OP-02011 HEAT SINK (Attach if not previously provided)  
 ALARM PANEL 11  
 ANNUNCIATORS  
 (Rev 7)(Pages 29, 30)  
 DB-OP-02523 COMPONENT  
 COOLING WATER SYSTEM  
 MALFUNCTIONS (Rev  
 5)(Pages 4,16,17)

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Proposed references to be provided to applicants during examination: None

Learning Objective: \_\_\_\_\_ (As available)

Question Source: Bank # \_\_\_\_\_  
 Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
 New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge X  
 Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: 55.41 b.10  
 55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	1	1
	K/A #	K2.02 (010)	
	Importance Rating	2.5	2.7

(K&A Statement) Knowledge of bus power supplies to the following: Controller for PZR spray valve

Proposed Question: Common 9

Plant conditions:

- The Reactor Coolant System is recovering from a transient that raised RCS pressure to 2225 psig.
- Via auto response, RC2 has reduced RCS pressure to 2195 psig.

Event:

- Loss of NNI-X DC occurs.

What is the effect of the loss of NNI-X DC on RC2, Pressurizer Spray Valve?

- RC2 will remain open at 40% and will have to be manually closed.
- RC2 will remain open at 100% and will have to be isolated using RC11, Pressurizer Spray Block Valve.
- RC2 will close and RCS pressure will have to be controlled using RC200, Pressurizer Vent Line Stop Valve and RC2A, Pressurizer PORV.
- RC2 will close and will have to be manually operated to control RCS pressure.

Proposed Answer: D. RC2 will close and will have to be manually operated to control RCS pressure.

Explanation (Optional): Per the procedure references, on Loss of NNI-X DC, automatic control of RC2 will not function.

- Plausible since RC2 will have to be controlled manually; however it will fail closed.
- Plausible since RC11 would isolate RC2 and could be re-opened; however RC2 will fail closed and can be controlled manually.
- Plausible since RC2 will close; however it can be operated manually.
- CORRECT ANSWER

Technical Reference(s): DB-OP-02532 LOSS OF NNI/ICS POWER (Rev 6), Steps 4.2.3 & 4.2.17 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: OPS-GOP-132-09K (As available)

Question Source: Bank # X  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New \_\_\_\_\_

Question History: Last NRC Exam 5/10/04

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 b.7  
55.43 \_\_\_\_\_

Comments: As stated above, the ability to review and interpret elementary wiring diagrams is required to determine the appropriate answer. Distracter B modified to 100% open.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	1	1
	K/A #	A4.02 (010)	
	Importance Rating	3.6	3.4

(K&A Statement) Ability to manually operate and/or monitor in the control room: PZR heaters

Proposed Question: Common 10

Plant conditions:

- The plant is at 100% power.
- Normal equipment lineups.
- RCS pressure is 2155 psig.

Event:

- Pressurizer heater bank 2A suffered a loss of power due to breaker for Essential Bus E12A tripping.

Given the above conditions, Pressurizer Heater Bank 2A will be restored to normal configuration when the breaker for bus E12A is closed and the \_\_\_\_\_.

- heater control switch is placed in the ON position
- breaker for the Heater Bank 2A is cycled open then closed
- heater control switch is cycled to the OFF position and then placed in AUTO
- heater control switch is cycled to the ON position and then placed in AUTO

Proposed Answer: C. heater control switch is cycled to the OFF position and then placed in AUTO

Explanation (Optional): DB-OP-06003 note states "If power is even momentarily lost to Banks 2A or 2B, while hand switches are in AUTO, these banks will not come on until the operator places the switches in the ON position to reenergize them. This interlock prevents this load from being powered from the Diesel Generators after a loss of off-site power."

- Plausible since placing the switch to ON will energize the heater, but this is not the normal configuration.
- Plausible since this is a required method to reset many electrical components however it is not required for the Pressurizer Heater Bank.
- CORRECT ANSWER
- Plausible since this is the pressure the heaters will come on; however the switch must first be moved to the ON position.

Technical Reference(s): DB-OP-06003 PRESSURIZER OPERATING PROCEDURE (Rev 18)(Page 13) (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: (As available)

Question Source: Bank # Modified Bank # (Note changes or attach parent) New X

Question History: Last NRC Exam

Question Cognitive Level: Memory or Fundamental Knowledge Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 b.7 55.43

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	1	1
	K/A #	K2.01 (012)	
	Importance Rating	3.3	3.7

(K&A Statement) Knowledge of bus power supplies to the following: RPS channels, components, and interconnections

Proposed Question: Common 11

Loss of power to which ONE of the following busses will result in the ARTS Turbine Trip being in a two-out-of-three logic for Turbine Trip?

- A. Loss of D. C. MCC 1.
- B. Loss of Essential D. C. Distribution Panel D1P.
- C. Loss of Essential Instrumentation Distribution Panel Y1.
- D. Loss of Essential Instrumentation Distribution Panel Y1A.

Proposed Answer: C. Loss of Essential Instrumentation Distribution Panel Y1.

Explanation (Optional): DB-OP-06403 note states "Deenergizing a RPS Channel will bypass the ARTS Turbine trip for the associated ARTS Channel resulting in ARTS being in a two-out-of-three logic for Turbine Trip." Loss of power to Panel Y1 will deenergize RPS Channel 1.

- A. Plausible since this is the DC MCC that feeds D1P; however the power from Essential Bus E12A would also have to be lost and failure of the inverter YV1 to transfer to lose all power to Y1.
- B. Plausible since this is one of the two power sources to the inverter YV1 that powers Y1; however the power from Essential Bus E12A would also have to be lost and failure of the inverter YV1 to transfer to lose all power to Y1.
- C. CORRECT ANSWER
- D. Plausible since this bus is also fed by Inverter YV1; however it does not deenergize the RPS Channel.

Technical Reference(s): DB-OP-06403 REACTOR PROTECTION SYSTEM (RPS) AND NUCLEAR INSTRUMENTATION (NI) OPERATING PROCEDURE (Rev 13)(Page 24) (Attach if not previously provided)

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Proposed references to be provided to applicants during examination: None

Learning Objective: \_\_\_\_\_ (As available)

Question Source: Bank # \_\_\_\_\_  
 Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
 New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge X  
 Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: 55.41 b.7  
 55.43 \_\_\_\_\_

Comments:



Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	1	1
	K/A #	A3.02 (012)	
	Importance Rating	3.6	3.6

(K&A Statement) Ability to monitor automatic operation of the RPS, including: Bistables

Proposed Question: Common 12

Which ONE of the following will cause the respective RPS trip bistable to actuate resulting in an RPS Channel trip?

- A. Power imbalance fails to ZERO %.
- B. An RCP monitor contact fails open.
- C. Pressure input to the Shutdown Bypass pressure trip fails to zero.
- D. Temperature input to Variable Pressure/Temperature fails high.

Proposed Answer: D. Temperature input to Variable Pressure/Temperature fails high.

Explanation (Optional): Variable Pressure Temperature trip is a window and temperature failing high will cause the bistable to trip since temperature-pressure relationship will be outside the window.

- A. Incorrect. This failure mode will raise (rather than lower) the overpower trip setpoint based on total RCS flow and power imbalance, and a channel trip will not occur.
- B. Incorrect. This failure mode will not result in a change to the high flux trip based on number of RCPs running, and therefore a channel trip will not occur. This high flux trip setpoint for 4 RCPs operating is the same as the setpoint for 3 RCPs operating.
- C. Incorrect. The shutdown Bypass is a high pressure trip so input pressure failing low will not cause the bistable to trip.
- D. CORRECT ANSWER

Technical Reference(s): TS Figure 2.1-1 Reactor Core Safety Limit (Attach if not previously provided)  
 TS Table 2.2.-1RPS System Instrumentation Trip Setpoints

Proposed references to be provided to applicants during examination: None

Learning Objective: OPS-SYS-504-10K (As available)

Question Source: Bank # \_\_\_\_\_  
 Modified Bank # X (Note changes or attach parent)  
 New \_\_\_\_\_

Question History: Last NRC Exam 2005

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
 Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 b.7  
 55.43 \_\_\_\_\_

Comments: Modified from a DB NRC ILT Exam question from the 2005 exam.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	1	1
	K/A #	A3.01 (013)	
	Importance Rating	3.7	3.9

(K&A Statement) Ability to monitor automatic operation of the ESFAS including: Input channels and logic

Proposed Question: Common 13

Plant conditions:

- The plant is in Mode 3 heating up following a refueling outage.
- Three RCPs are in operation.
- RCS Temperature is 360°F.
- RCS Pressure is 660 psig.

Event :

- Pressurizer Level begins to lower rapidly.
- RCS Pressure is 387 psig and lowering.
- Containment Pressure is 19.2 psia.
- SG pressures are stable.
- SG levels are stable.

Given the above conditions, \_\_\_\_\_.

- only SFAS Level 1 will actuate to isolate Containment
- only SFAS Level 3 will actuate to start HPI and LPI
- SFAS Levels 1 and 3 will actuate, containment will be isolated; however, only LPI will start
- SFAS Levels 1, 2 and 3 will automatically actuate Containment will be isolated; HPI and LPI will start

Proposed Answer: D. SFAS Levels 1, 2 and 3 will automatically actuate Containment will be isolated; HPI and LPI will be started.

Explanation (Optional): All three SFAS levels will be actuated on high Containment pressure.

- 
- A. Plausible if the examinee thinks SFAS Level 2 will not actuate with RCS pressure below the low pressure reset point.
  - B. Plausible if the examinee thinks SFAS Level 2 will not actuate with RCS pressure below the low pressure reset point. Also SFAS Level 3 does not actuate HPI.
  - C. Plausible if the examinee thinks SFAS Level 2 will not actuate with RCS pressure below the low pressure reset point.
  - D. CORRECT ANSWER

Technical Reference(s): OPS-SYS-I506.04 SFAS (Attach if not previously provided)  
Combined LP (Page 4)  
DB-OP-06900 Plant Heatup  
(Rev 37)(Pages 58, 78, 123)

Proposed references to be provided to applicants during examination: None

Learning Objective: \_\_\_\_\_ (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 b.7  
55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	1	1
	K/A #	A2.05 (022)	
	Importance Rating	3.1	3.5

(K&A Statement) Ability to (a) predict the impacts of the following malfunctions or operations on the CCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Major leak in CCS

Proposed Question: Common 14

Plant conditions:

- A Large Break LOCA has occurred.
- Low Pressure Injection System Suctions have been transferred to the Emergency Sump.
- Conditions in Containment are being monitored using DB-OP-02000, Table 3.
- Containment Pressure is 40.1 psia and lowering.
- All SFAS operated Containment Isolation Valves have operated to isolate Containment.

Event:

- A rise in Containment Wide Range Level is noted.
- Sump samples indicate water from Service Water is leaking into the Emergency Sump.

Which ONE of the following is a potential source of this in-leakage?

- Hydrogen Dilution Blower Seal Water
- Containment Air Cooler
- Reactor Coolant Pump Seal Cooler
- Auxiliary Feedwater Line Rupture

Proposed Answer: B. Containment Air Cooler

Explanation (Optional): Service Water supplies Containment Air Coolers during a LOCA.

- 
- A. Plausible since Service Water supplies the Hydrogen Dilution Blower Seal Water, but the Blowers are turned off when Containment pressure is  $\geq 32$  psia.
  - B. CORRECT ANSWER
  - C. Plausible if the examinee does not know that RCP Seal Cooler is supplied by the Component Cooling Water, not Service Water.
  - D. Plausible since Service Water supplies the backup water supply to the AFW pump suction.

Technical Reference(s): DB-OP-02000, RPS, SFAS, (Attach if not previously provided)  
 SFRCS TRIP, OR SG TUBE  
 RUPTURE (Rev. 20) (Pg 422,  
 426,427)  
 OS-020 Sheet 1, Service Water

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Proposed references to be provided to applicants during examination: None

Learning Objective: \_\_\_\_\_ (As available)

Question Source: Bank # \_\_\_\_\_  
 Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
 New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge X  
 Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: 55.41 b.10  
 55.43 \_\_\_\_\_

Comments:



Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	<u>2</u>
	Group #	<u>1</u>	<u>1</u>
	K/A #	<u>K2.01 (026)</u>	
	Importance Rating	<u>3.4</u>	<u>3.6</u>

(K&A Statement) Knowledge of bus power supplies to the following: Containment spray pumps

Proposed Question: Common 15

Loss of power to 480V Bus \_\_\_\_\_ would prevent Containment Spray Pump 1-1 from starting.

- A. E1
- B. F1
- C. E11C
- D. F11B

Proposed Answer: A. E1

Explanation (Optional): Containment Spray Pump 1-1 is powered from 480 Volt Bus E1.

- A. CORRECT ANSWER
- B. Plausible since this is the power supply to Containment Spray Pump 1-2.
- C. Plausible since this is the power supply to Containment Spray Valve CS1530.
- D. Plausible since this is the power supply to Containment Spray Valve CS1531.

Technical Reference(s): DB-OP-06013 CS System (Rev. 16) (Page 5) (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: \_\_\_\_\_ (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge X  
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: 55.41 b.7  
55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	1	1
	K/A #	K5.08 (039)	
	Importance Rating	3.6	3.6

(K&A Statement) Knowledge of the operational implications of the following concepts as they apply to the MRSS: Effect of steam removal on reactivity

Proposed Question: Common 16

Plant conditions:

- The plant is at 50% power and 450 generated megawatts.
- Tave is 582°F.
- Rod Index of 260.
- All ICS HAND/AUTO stations are in AUTO.

Event:

- A Turbine Bypass Valve fails open.

What is the expected response of the following parameters 30 minutes after the TBV failed open, assuming no operator action?

Reactor power will \_\_\_\_\_ and Tave will \_\_\_\_\_.

- A. lower; rise
- B. rise; lower
- C. remain the same; rise
- D. rise; remain the same

Proposed Answer: D. increase; remain the same

Explanation (Optional):

- A. Plausible if the examinee does not understand that Tave will be controlled by the ICS and reactor power will be increased to maintain 582°F Tave and 450 MWe
- B. Plausible since reactor power will increase; however Tave will remain at setpoint.
- C. Plausible if the examinee does not understand that Tave will be controlled by the ICS and reactor power will be increased to maintain 582°F Tave and 450 MWe
- D. CORRECT ANSWER

Technical Reference(s): USAR (Page 15.2-47, 10.4-7) (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: \_\_\_\_\_ (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # X (Note changes or attach parent)  
New \_\_\_\_\_

Question History: Last NRC Exam 2005

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 b.5  
55.43 \_\_\_\_\_

Comments: Significantly modified from a Question used on 2005 DB ILT Exam.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	1	1
	K/A #	K4.08 (059)	
	Importance Rating	2.5	2.7

(K&A Statement) Knowledge of MFW design feature(s) and/or interlock(s) which provide for the following: Feedwater regulatory valve operation (on basis of steam flow, feed flow mismatch)

Proposed Question: Common 17

Plant conditions:

- The plant is at 100% power.
- All ICS station HAND/AUTO stations are in AUTO.
- Fouling of SG 2 tubes has resulted in a reduction in heat transfer in SG 2.

Initially, the reduction in heat transfer in SG 2 will result in a \_\_\_\_\_.

- rise in feedwater flow to SG 1 due to a feedwater temperature reduction
- reduction in feedwater flow to SG 1 due to a  $\Delta T_c$  error developing
- rise in feedwater flow to SG 2 due to feedwater temperature rising
- reduction in feedwater flow to SG 2 due to a  $\Delta T_c$  error developing

Proposed Answer: B. reduction in feedwater flow to SG 1 due to a  $\Delta T_c$  error developing

Explanation (Optional): The reduction in heat transfer in SG 2 will result in a higher TC in that loop resulting in a reduction in FW flow to SG 1 and a rise in flow to SG 2 as the  $\Delta T_c$  circuit tries to return  $\Delta T_c$  to zero.

- Plausible since feedwater temperature may have a slight reduction; however it would not raise FW flow it would reduce it.
- CORRECT ANSWER
- Plausible since a rise in FW Temperature would cause FW flow to rise; however FW temperature will not be affected by the tube fouling.
- Plausible since heat transfer rate would be reduced; however steam flow rate should not be affected only the amount the steam is superheated.

Technical Reference(s): OPS-SYS-I516 Feedwater Control Subsystem (Rev 1) (Attach if not previously provided)  
(Pages 1-4)

Proposed references to be provided to applicants during examination: None

Learning Objective: \_\_\_\_\_ (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 b.7  
55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	1	1
	K/A #	A1.01 (061)	
	Importance Rating	3.9	4.2

(K&A Statement) Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the AFW controls including: S/G level

Proposed Question: Common 18

Plant conditions:

- The plant tripped from 100% power due to a large steam leak on SG 1.
- SFAS Level 2 has actuated on low RCS pressure.
- SFRCS has isolated SG 1 on low Steam Generator pressure.
- Neither AFW Pump started when SFRCS actuated.
- AFW Pump 1 was manually started.
- AFW Pump 2 remains OOS.
- SG 1 level is at zero inches.
- SG 2 level is at 15 inches.
- SG 1 pressure is 3 psig and lowering.
- SG 2 pressure is 940 psig and slowly lowering.
- Tave is 528°F and slowly rising.

With the above conditions, SG 2 will have to be fed to \_\_\_\_\_.

- A. 55 inches at a controlled rate using the AFW Pump
- B. 130 inches at full continuous flow using the AFW Pump
- C. 40 inches at a controlled rate using the Motor Driven Feedwater Pump
- D. 49 inches at full continuous flow using the Motor Driven Feedwater Pump

Proposed Answer: B. 130 inches using the AFW Pump at full continuous flow

Explanation (Optional): Specific Rule 4 requires feeding the SG to 130 inches at full continuous AFW flow until SG level setpoint is reached. 130 inches is required because SFAS level 2 has actuated. AFW is required because the SG is dry.

- 
- A. Plausible since 55 inches would be the correct level if SFAS level 2 had not actuated; however full continuous AFW flow is required.
  - B. CORRECT ANSWER
  - C. Plausible since 40 inches is the correct level if using the Main Feedwater line; however the SG is dry and tube to shell  $\Delta T$  is  $>50$  degrees in tension so the MDFP can not be used.
  - D. Plausible since 124 inches is the correct level for SG #1 if SFAS level 2 had not actuated; however the SG #2 is dry and tube to shell  $\Delta T$  is  $>50$  degrees in tension so the MDFP can not be used.



Technical Reference(s): DB-OP-02000 RPS, SFAS, (Attach if not previously provided)  
SFRCS TRIP, OR SG TUBE  
RUPTURE (Rev 20)(Pages 75,  
79, 81, 85, 245, 280)

Proposed references to be provided to applicants during examination: None

Learning Objective: \_\_\_\_\_ (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 b.10  
55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	1	1
	K/A #	K1.03 (062)	
	Importance Rating	3.5	4.0

(K&A Statement) Knowledge of the physical connections and/or cause-effect relationships between the ac distribution system and the following systems: DC distribution

Proposed Question: Common 19

Plant conditions:

- The plant is at 100% power.
- MUP 1 is running.
- The Control Room crew was responding to a Loss of D1P and DAP IAW DB-OP-02537, Loss of D1P and DAP, but have not transferred C1 Control Power to alternate.

Event:

- Loss of Offsite Power occurs.

Given the above conditions, \_\_\_\_\_.

- Makeup Pump 1 will continue running
- EDG1 will start and load onto the C1 bus
- undervoltage load shedding will not occur on Bus C1
- MU6405, MUP1 Suction Three Way Valve, will automatically transfer to the BWST

Proposed Answer: C. Undervoltage load shedding will not occur on 4160 Volt Bus C1

Explanation (Optional): DB-OP-02537 states undervoltage load shedding will not occur due to loss of control power if bus C1 is deenergized.

- Plausible since the breaker for Makeup Pump #1 will remain closed; however the pump is not running because bus C1 is deenergized since EDG1 does not have control power
- Plausible if the examinee does not know EDG1 will not autostart until control power is transferred to D1N.
- CORRECT ANSWER
- Plausible since this valve does auto-transfer to the BWST at 10" in the Makeup Tank; however the auto-transfer is inoperable due to loss of control power.

Technical Reference(s): DB-OP-02537 LOSS OF D1P AND DAP (Rev 12 )(Pages 10-13) (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: \_\_\_\_\_ (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 b.7  
55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	1	1
	K/A #	K4.01 (063)	
	Importance Rating	2.7	3.0

(K&A Statement) Knowledge of dc electrical system design feature(s) and/or interlock(s) which provide for the following:  
Manual/automatic transfers of control

Proposed Question: Common 20

Plant conditions:

- A loss of offsite power has occurred.
- A lockout on 4160V Bus C1 has occurred.
- All other plant responses are normal.

Which ONE of the following describes the DC Electrical System configuration and the appropriate corrective action?

Batteries on DC MCC1 are being depleted to supply \_\_\_\_\_.

- A. - D1P, DAP, D1N, DAN.  
- Y1, Y3, and YAU have switched to alternate.  
- E1 and F1 should be crosstied via E11B and F11A.
- B. - D1P, DAP, D1N, DAN, Y1, Y3, and YAU.  
- E1 and F1 should be crosstied via E11B and F11A.
- C. - D1P, DAP, D1N, DAN, Y1, Y3, and YAU.  
- EDG 1 should be verified shut down.
- D. - D1P, DAP, D1N, DAN, Y1, Y3, and YAU.  
- YAU should be transferred to YAR.

Proposed Answer: C. D1P, DAP, D1N, DAN, Y1, Y3, and YAU.  
- EDG 1 should be verified shut down.

Explanation (Optional): DB-OP-02521, step 4.2.4.a states to do Attachment 5; however, with YAR alternate source dead, you do not transfer to YAR. Therefore, no actions on Attachment 5. Steps 4.2.4.b.

- 
- A. Plausible since DB-OP-2521 automatically transfers or has you transfer the busses to an alternate source; however the alternate supply is de-energized and there is no reason to transfer;
  - B. Plausible since has you transfer the busses to an alternate; however the alternate supply is de-energized and there is no reason to transfer.
  - C. CORRECT ANSWER
  - D. Plausible since DB-OP-2521 has you place YAU on alternate; however the alternate supply is de-energized and there is no reason to transfer.

Technical Reference(s): DB-OP-02521 LOSS OF AC BUS POWER SOURCES (Rev 12) (Page 12) (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: \_\_\_\_\_ (As available)

Question Source: Bank # 36846  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New \_\_\_\_\_

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 b.7  
55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	1	1
	K/A #	2.4.6 (064)	
	Importance Rating	3.1	4.0

(K&A Statement) Emergency Procedures / Plan Knowledge symptom based EOP mitigation strategies.

Proposed Question: Common 21

Plant conditions:

- The plant tripped from 100% power due to a loss of offsite power.
- Both Emergency Diesel Generators are running and supplying power to the C1 and D1 4160V busses.
- Attempts to start the SBO Diesel have been unsuccessful.
- Bus D2 is being powered from bus D1.
- EDG 1 load is 2300 KW.
- EDG 2 load is 2300 KW.

With the above conditions, the Motor Driven Feedwater Pump \_\_\_\_\_.

- A. can be started after reducing load on EDG 2
- B. can **NOT** be started until the SBO Diesel is supplying D2
- C. can be started immediately
- D. can **NOT** be started unless bus D2 is transferred to Bus C1

Proposed Answer: A. can be started after reducing load on EDG 2

Explanation (Optional): DB-OP-02000 Attachment 6 requires reducing load on EDG 2 if the Motor Driven Feedwater Pump is to be started with EDG 2 load >2250 KW.

- A. CORRECT ANSWER
- B. Plausible since the load on EDG 2 is above 2250KW; however load can be reduced prior to starting and the SBO Diesel is not required.
- C. Plausible if the examinee does not know the EDG upper load limit for starting the MDFP.
- D. Plausible since D2 could be powered from C1 and the pump started without reducing load; however transfer of the bus is not required.

Technical Reference(s): DB-OP-02000 RPS, SFAS, SFRCS TRIP, OR SG TUBE RUPTURE (Rev 20)(Page 297, Attachment 6) (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: \_\_\_\_\_ (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 b.10  
55.43 \_\_\_\_\_

Comments:



Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	1	1
	K/A #	K3.03 (064)	
	Importance Rating	3.6	3.9

(K&A Statement) Knowledge of the effect that a loss or malfunction of the ED/G system will have on the following: ED/G (manual loads)

Proposed Question: Common 22

The following events have occurred:

- A LOCKOUT of bus C1 has occurred due to a ground fault.
- EDG 1 has been shutdown using the EMERGENCY SHUTDOWN pushbutton.
- The cause of the ground fault has been located and corrected.

Which ONE of the following will occur when the C1 bus lockout is reset?

- A. EDG 1 will start but AC101, EDG 1 output breaker will NOT AUTO CLOSE until EDG 1 lockout relay is manually reset.
- B. EDG 1 will start and AC101, EDG 1 output breaker will AUTO CLOSE and energize the bus after control power has been restored to C1 bus.
- C. No equipment actuations will occur. The EDG Lockout Relay must be manually reset before EDG 1 will start, and the AC101, EDG 1 output breaker will AUTO CLOSE.
- D. ABDC1, C1 ALTERNATE supply breaker will immediately AUTO CLOSE and energize the bus.

Proposed Answer: C. No equipment actuations will occur. The EDG Lockout Relay must be manually reset before EDG 1 will start and the output breaker will AUTO CLOSE.

Explanation (Optional): DB-OP-02521 Attachment describes actions that occur when the lockout relays are reset. The diesel does not start and load until the EDG 1 Lockout Relay Reset pushbutton on C3615 is depressed.

- A. Plausible if the examinee does not know the EDG 1 lockout must be reset to start the diesel.
- B. Plausible if the examinee does not know the EDG 1 lockout must be reset to start the diesel and close its output breaker.
- C. CORRECT ANSWER
- D. Plausible if the examinee does not know the alternate supply will not automatically close.

Technical Reference(s): DB-OP-02521 LOSS OF AC  
BUS POWER SOURCES  
(Rev 12)(Pages 60, 61) (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: OPS-SYS-406-03K (As available)

Question Source: Bank # X  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New \_\_\_\_\_

Question History: Last NRC Exam 2005

Question Cognitive Level: Memory or Fundamental Knowledge X  
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: 55.41 b.10  
55.43 \_\_\_\_\_

Comments: Question used on DB ILT exam in 2005. Revised plausibility statements and question.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	1	1
	K/A #	K5.02 (073)	
	Importance Rating	2.5	3.1

(K&A Statement) Knowledge of the operational implications as they apply to concepts as they apply to the PRM system: Radiation intensity changes with source distance

Proposed Question: Common 23

Plant conditions:

- The plant is in Mode 5 preparing for refueling operations.
- Decay Heat Cooler 2 must be removed from service for maintenance.
- It is noted that RE8405, Decay Heat Cooler Room Area Radiation Monitor, is indicating 20 mrem/hr and is 10 feet from a hot spot, which is the radiation source.
- The operator will be working for 30 minutes in an area that is physically located 10 feet away from the hot spot, and another 15 minutes in an area that is 5 feet from the hot spot.

What is the dose the operator will receive during the 45 minute operation? (Assume the radiation source is a POINT source.)

- A. 20 millirem
- B. 30 millirem
- C. 50 millirem
- D. 60 millirem

Proposed Answer: B. 30 millirem

Explanation (Optional): The radiation level at 5 feet from the source is 80 millirem/hr. Spending 15 minutes at that distance would result in a dose of 20 millirem. Spending 30 minutes at 10 feet from the source will result in a dose of 10 millirem. The total would then be 30 millirem dose.

- A. Plausible if the examinee does not perform the calculation correctly.
- B. CORRECT ANSWER
- C. Plausible if the examinee does not perform the calculation correctly.
- D. Plausible if the examinee does not perform the calculation correctly.

Technical Reference(s): \_\_\_\_\_ (Attach if not previously provided)  
\_\_\_\_\_

Proposed references to be provided to applicants during examination: None

Learning Objective: \_\_\_\_\_ (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 b.12  
55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	1	1
	K/A #	A3.02 (076)	
	Importance Rating	3.7	3.7

(K&A Statement) Ability to monitor automatic operation of the SWS, including: Emergency heat loads

Proposed Question: Common 24

Plant conditions:

- The plant is shutdown due to an extended loss of offsite power event.
- Both Emergency Diesel Generators are running and are supplying the C1 and D1 busses.
- The SBO Diesel Generator is powering the D2 bus.
- Both Auxiliary Feedwater Pumps (AFP) are running being supplied by Main Steam.
- Condensate Storage Tank levels are 2.8 feet in both tanks and slowly lowering.

Event:

- Annunciator Alarm 10-5-G, AFP 1 SUCTION PRESS LO.
- AFW Pump 1 suction pressure lowers to 1.8 psig for approximately 45 seconds.

As the Control Room Operator, you will have to \_\_\_\_\_.

- stop both AFPs and transfer to the MU/HPI mode of cooling
- verify Main Steam is isolated to the AFP 1
- stop AFP 1 and start the Motor Driven Feedwater Pump
- verify the AFP 1 Emergency Suction Valve from the Service Water System opens

Proposed Answer: D. verify the AFP 1 Emergency Suction Valve from the Service Water System opens

Explanation (Optional): OPS-SYS-I213.08 describes the automatic opening of the Emergency Suction Valve from the Service Water System when AFW Pump suction pressure fall to <2 psig for >10 seconds.

- 
- A. Plausible since this would be the mode of cooling if all feedwater was lost; however feedwater will not be lost in this situation since SW will supply water to the AFPs.
  - B. Plausible since this is an automatic action that will occur if suction pressure reduces to <1psig for >60 seconds.
  - C. Plausible since the MDFP does have a power source and can receive water from the SW System; however it would require a manual valve lineup.
  - D. CORRECT ANSWER

Technical Reference(s): DB-OP-02010 FEEDWATER ALARM PANEL 10 ANNUNCIATORS (Rev 11)(Page 77) (Attach if not previously provided)  
 DB-OP-06233 AUXILIARY FEEDWATER SYSTEM (Rev 22)(Page 6)

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Proposed references to be provided to applicants during examination: None

Learning Objective: \_\_\_\_\_ (As available)

Question Source: Bank # \_\_\_\_\_  
 Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
 New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge X  
 Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: 55.41 B.7  
 55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	1	1
	K/A #	K1.16 (076)	
	Importance Rating	3.6	3.8

(K&A Statement) Knowledge of the physical connections and/or cause- effect relationships between the SWS and the following systems: ESF

Proposed Question: Common 25

Plant conditions:

- The plant tripped from 100% power due to an RCS leak.
- RCS pressure is 1250 psig and lowering.
- CTMT Pressure is 18.0 psia and slowly rising.

With the above conditions, all three \_\_\_\_\_.

- CAC Cooler Motor Operated Inlet Valves open
- CAC fans START in slow speed
- CCW Pump Breakers will close
- CCW Heat Exchanger SW Air Operated Outlet Valves go full open

Proposed Answer: D. CCW Heat Exchanger SW Air Operated Outlet Valves go full open

Explanation (Optional): DB-OP-02000 shows the SWS response to an SFAS signal states all three CCW Heat Exchanger Outlet valves SW1424, SW1429 and SW1434 open.

- Plausible if the examinee does not know the third CAC outlet valves will not receive an open signal because the breaker is open.
- Plausible if the examinee does not know the third fans will not receive a slow speed signal and start because its breaker is racked out.
- Plausible if the examinee does not know CCW Pump 3 will not receive a breaker close signal unless in service as Pump 1 or 2.
- CORRECT ANSWER



Technical Reference(s): DB-OP-02000, RPS , SFAS, SFCRS TRIP, OR SG TUBE RUPTURE (Rev. 20) (Page 430) (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: \_\_\_\_\_ (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge X  
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: 55.41 b.7  
55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	1	1
	K/A #	2.1.32 (078)	
	Importance Rating	3.4	3.8

(K&A Statement) Conduct of Operations: Ability to explain and apply all system limits and precautions.

Proposed Question: Common 26

Plant conditions:

- The plant is at 100% power.
- Station Air Compressor (SAC) 2 is in service.
- Instrument Air Dryers 3 and 4 are in service.
- Preparations are being made to place SAC 1 in service as the Lead and remove SAC 2 from service for maintenance for 2 days.

While SAC 1 is in service and SAC 2 is out of service, \_\_\_\_\_.

- A. Instrument Air Dryers 1 and 2 will be placed in service to prevent receipt of low pressure alarms
- B. all Instrument Air low point drains will be manually blown down at a minimum of once per shift to prevent moisture buildup
- C. a Temporary Diesel Air Compressor will be brought on site until SAC 2 is returned to operable status
- D. SA55, Diesel Air Compressor Inlet Valve To Station Air Compressor Receiver 2, should be closed to prevent the EIAC from surging SAC 2

Proposed Answer: A. Instrument Air Dryers 1 and 2 will be placed in service to prevent receipt of low pressure alarms

Explanation (Optional): DB-OP-06251 Limit and Precautions states "Due to design differences between Instrument Air (IA) Dryers 1 & 2 and IA Dryers 3 & 4 and differences in operating characteristics between SAC 2 and SAC 1/EIAC, it may be necessary to operate IA Dryers 1 & 2 when either the EIAC or SAC 1 is in service to prevent Low Instrument Air Pressure alarms."

- A. CORRECT ANSWER
- B. Plausible since this would be the action to take if the Instrument Air Dryers were bypassed.
- C. Plausible since this would be an action to consider if SAC 2 was going to be OOS for more than two weeks; however it will only be OOS for 8 days.
- D. Plausible since this is an action that is taken if SAC 2 is in service as the Lead compressor.

Technical Reference(s): DB-OP-06251 STATION AND INSTRUMENT AIR SYSTEM OPERATING PROCEDURE (Rev 17)(Page 6) (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: \_\_\_\_\_ (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge X  
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: 55.41 b.10  
55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	1	1
	K/A #	K3.01 (078)	
	Importance Rating	3.1	3.4

(K&A Statement) Knowledge of the effect that a loss or malfunction of the IAS will have on the following: Containment air system

Proposed Question: Common 27

Plant conditions:

- The plant is at 100% power.
- The PORV has a small leak through its seat.
- Instrument Air Containment Isolation Valve IA2011 has failed closed due to an air leak on its controller.
- CTMT IA header has depressurized.

The above conditions will result in \_\_\_\_\_.

- A. Quench Tank pressure reduction due to RC222, QT Vent to Vent Hdr, failing open
- B. Quench Tank level going high due to RC225A, QT Discharge to RCDT, failing closed
- C. Reactor Coolant Drain Tank level going high due to the Quench Tank RC232, QT Return, failing open
- D. Reactor Coolant Drain Tank pressure going high due to RC2548, RCDT Gas Outlet, to the Waste Gas System failing closed

Proposed Answer: B. Pressurizer Quench Tank level going high due to the outlet valve failing closed

Explanation (Optional): The combination of the PORV leaking and the inability to drain the Quench Tank will result in level rising.

- A. Plausible if the examinee does not know the valve fails closed.
- B. CORRECT ANSWER
- C. Plausible if the examinee does not know the valve is not fed from the containment header and it fails closed.
- D. Plausible since the valve does fail closed; however it is not fed from the containment header.

Technical Reference(s): DB-OP-02528 LOSS OF INSTRUMENT AIR (Rev 11)(Pages 73 and 75) (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: \_\_\_\_\_ (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge X  
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: 55.41 b.7  
55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	1	1
	K/A #	K3.01 (103)	
	Importance Rating	3.3	3.7

(K&A Statement) Knowledge of the effect that a loss or malfunction of the containment system will have on the following: Loss of containment integrity under shutdown conditions

Proposed Question: Common 28

The plant is in Mode 6 with Fuel Handling Operations in progress.

Under which of the following Containment integrity conditions would it be acceptable to continue Fueling Handling operations?

- A. Containment Equipment Hatch off and Spent Fuel Rollup Door 300 open.
- B. Two Containment Personnel Air Locks open with an individual standing by to close at least one airlock door.
- C. One Containment Vacuum Breaker removed for replacement.
- D. Both Containment Purge Exhaust Dampers CV5007 and CV5008 open with Purge Exhaust Fan off.

Proposed Answer: B. Two Containment Personnel Air Locks open with an individual standing by to close at least one air lock door.

Explanation (Optional): TS 3.9.4.c states the purge valves must be capable of being closed upon receipt of a high radiation signal from the containment purge and exhaust system noble gas monitor. One hour is allowed to close a valve in each purge and exhaust penetration.

- A. Plausible since core off load occurs relatively early in a refueling outage. During this period, mobilization of tools and equipment into Containment is in progress. As a result, the Equipment Hatch will be off. In order to stage more equipment in the Auxiliary Building Train Bay, requests will be made to open Door 300, not recognizing that this creates a direct path to the environment should a fuel handling accident occur. Candidates must recognized this direct path.
- B. CORRECT ANSWER
- C. Plausible since most Containment penetrations involve two active valves to provide isolation in the event of an SFAS actuation. During Refueling Operations, work on a single valve of a Containment penetration may be permitted if the remaining valve provides the required isolation. The Vacuum Breakers are unique. A single valve and a check valve, both located outside Containment provide Containment isolation. Removal of the single valve would create an unacceptable opening in Containment.
- D. Plausible since both Containment Purge Dampers are routinely open during Fuel Handling Operations. The dampers are closed if a radiological event occurs based on a Radiation Element in the Containment Purge Ventilation System. The Purge Exhaust Fan must be in service for the radiation elements to sense the event. If the dampers are open with the ventilation system in service, the open dampers would not provide the required Containment isolation.

Technical Reference(s): TS 3.9.4 Containment Penetrations (Attach if not previously provided)

\_\_\_\_\_

\_\_\_\_\_

Proposed references to be provided to applicants during examination: None

Learning Objective: \_\_\_\_\_ (As available)

Question Source: Bank # \_\_\_\_\_

Modified Bank # \_\_\_\_\_ (Note changes or attach parent)

New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_

Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 b.10

55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	<u>2</u>
	Group #	<u>2</u>	<u>2</u>
	K/A #	<u>K3.02 (001)</u>	
	Importance Rating	<u>3.4</u>	<u>3.5</u>

(K&A Statement) Knowledge of the effect that a loss or malfunction of the CRDS will have on the following: RCS

Proposed Question: Common 29

Plant conditions:

- Reactor power is at 78% when the following symptoms occur:
  - Reactor power RISING.
  - Tave is 585°F and RISING.
  - Pressurizer Pressure 2200 psig and RISING.
  - Pressurizer Level 230 inches and RISING.

Which ONE of the following would cause the above symptoms to occur INITIALLY?

- A. Uncontrolled Rod Withdrawal
- B. Failed open Turbine Bypass Valve
- C. Power Range detector failing high
- D. MFW Pump trip

Proposed Answer: A. Uncontrolled Rod Withdrawal

Explanation (Optional): As control rods withdraw reactor power, Tave, Pressurizer Pressure and Pressurizer level will rise until crosslimits actuate to raise FW flow.

- A. CORRECT ANSWER
- B. Plausible since reactor power would rise; however control rods would maintain Tave at setpoint and Pressure and Pressurizer level will not be rising.
- C. Plausible if the examinee misinterprets how the ICS will respond. The instrument failing high would cause rods to insert and the reactor power would be going down, not up.
- D. Plausible since this would cause reactor power to rise; however the ICS will work in the integrated mode and raise FW flow and steam flow to match. Tave, Pressurizer Pressure and level will not be rising.



Technical Reference(s): USAR (Page 15.2-9) (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: OPS-GOP-116-01K (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 b.5  
55.43 \_\_\_\_\_

Comments: Modified from Braidwood ILT Exam question from 2002

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	2	2
	K/A #	K5.02 (015)	
	Importance Rating	2.7	2.9

(K&A Statement) Knowledge of the operational implications of the following concepts as they apply to the NIS: Detector operation

Proposed Question: Common 30

Which ONE of the following would require stopping an approach to criticality?

- A. Low Intermediate Range compensating voltage resulting in an indicated neutron level lower than actual.
- B. Low Intermediate Range compensating voltage resulting in failure of the Intermediate Range level to be on scale when the Source Range is at 1,000 CPS.
- C. High Intermediate Range compensating voltage resulting in a lower than actual indicated startup rate (SUR) during power changes.
- D. High Intermediate Range compensating voltage resulting in the failure of the Intermediate Range to be on scale when the Source Range is at 10,000 CPS.

Proposed Answer: D. High Intermediate Range compensating voltage resulting in the failure of level to be on scale when the source range is at 10000 CPS.

Explanation (Optional): Overlap must be started by 10000 CPS otherwise 1 decade of overlap will not be available as required by TS 3.3.1.1. Excessive compensating voltage will cause the intermediate range reading to be lower than actual.

- A. Plausible if the examinee does not know low compensating voltage will result in higher than actual neutron level.
- B. Plausible since low compensating voltage will cause the intermediate range to come on scale early; however the problem would be the intermediate range coming on scale prior to the source range reaching 1000 CPS.
- C. Plausible if the examinee does not know that high compensating voltage will result in indicated SUR being higher than actual during power changes.
- D. CORRECT ANSWER

Technical Reference(s): DB-OP-06912 APPROACH TO CRITICALITY (Rev 9)(Page 25) (Attach if not previously provided)  
 OPS-SYS-I502.06 Nuclear Instrumentation (Rev 6)(Page 13)  
 \_\_\_\_\_  
 \_\_\_\_\_

Proposed references to be provided to applicants during examination: None

Learning Objective: \_\_\_\_\_ (As available)

Question Source: Bank # \_\_\_\_\_  
 Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
 New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
 Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 b.1  
 55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	<u>2</u>
	Group #	<u>2</u>	<u>2</u>
	K/A #	<u>A4.02 (016)</u>	
	Importance Rating	<u>2.7</u>	<u>2.6</u>

(K&A Statement) Ability to manually operate and/or monitor in the control room: Recorders

Proposed Question: Common 31

Plant conditions:

- The plant is at 100% power.
- Selected Pressurizer Level indication is from LT RC14-1.

Event:

- A loss of NNI-X AC Power has occurred.

With the loss NNI-X AC Power, \_\_\_\_\_.

- transferring PZR temperature to TT RC15-2 will restore Compensated PZR Level indication to the recorder
- Pressurizer level control will remain in automatic with Compensated Level indication available on the Compensated PZR Level Recorder
- compensated PZR level will have to be obtained from the recorder since the computer Compensated PZR Temperature indication is not available
- Pressurizer level control will have to be transferred to manual and Compensated PZR level may be obtained from the computer, since the recorder is not available

Proposed Answer: D. Pressurizer level control will have to be transferred to manual and Compensated PZR level may be obtained from Computer since the recorder is not available.

Explanation (Optional): DB-OP-02532 requires placing PZR level control to manual if LT RC14-1 is selected for control and the level recorder is not available if NNI-X AC power is lost.

- Plausible since this is an action that is taken; however it will not restore recorder operation.
- Plausible if the examinee does not know which indicators are powered from NNI-X AC power; however PZR level control must be placed in manual due to LT RC14-1 losing power.
- Plausible if the examinee does not know the recorder loses power and the computer is still available.
- CORRECT ANSWER

Technical Reference(s): DB-OP-02532 LOSS OF NNI/ICS POWER (Rev 6) (Attach if not previously provided)  
(Page 15)

Proposed references to be provided to applicants during examination: None

Learning Objective: \_\_\_\_\_ (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge X  
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: 55.41 b.7  
55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	2	2
	K/A #	K4.01 (017)	
	Importance Rating	3.4	3.7

(K&A Statement) Knowledge of ITM system design feature(s) and/or interlock(s) which provide for the following: Input to subcooling monitors

Proposed Question: Common 32

Plant conditions:

- The plant is at 100% power.
- Essential Bank 2 Pressurizer Heater Bank Control Switch is in the ON position.
- RCS pressure is 2155 psig and stable.

Event:

- Pressurizer level decreases to 37”.

Which ONE of the following explains the status of the Essential Bank 2 heaters?

- The heater bank is energized because manual control overrides the Pressurizer low-low level heater cutoff.
- The heater bank is de-energized because the Pressurizer low-low level heater cutoff overrides manual control.
- The heater bank is energized because Pressurizer level is above the low-low level heater cutoff point.
- The heater bank is de-energized because RCS pressure is above the heater bank cycle setpoint.

Proposed Answer: A. The heater bank is energized because manual control overrides the Pressurizer low level heater cutoff.

Explanation (Optional): OPS-SYS-I104 identifies that heaters in ON or OFF defeat all pressure control signals and the Low-Low level interlock.

- A. CORRECT ANSWER.
- B. Plausible if the candidate does not know that the low-low level heater override does not override heaters in manual control.
- C. Plausible if the candidate does not know the low-low level heater cutoff level.
- D. Plausible if the candidate does not know that the heater ON switch overrides all signals.

Technical Reference(s): DB-OP-06003, Pressurizer Operating Procedure (Rev 18) (Page 13, 45) (Attach if not previously provided)  
 \_\_\_\_\_  
 OPS-SYS-I104 (Rev 6) (Page 10)  
 \_\_\_\_\_

Proposed references to be provided to applicants during examination: None

Learning Objective: \_\_\_\_\_ (As available)

Question Source: Bank # \_\_\_\_\_  
 Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
 New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge X  
 Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: 55.41 b.7  
 55.43 \_\_\_\_\_

Comments:



Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	2	2
	K/A #	A3.01 (034)	
	Importance Rating	2.5	3.1

(K&A Statement) Ability to monitor automatic operation of the Fuel Handling System, including: Travel limits

Proposed Question: Common 33

Which ONE of the following will prevent the Main Fuel Handling Bridge from positioning over the transfer basket?

- A. Transfer Carriage stopped in the transfer tube.
- B. Transfer Carriage Control Switch in the Containment Building is ON.
- C. During frame-up operation of the upending frame.
- D. During frame-down operation of the upending frame.

Proposed Answer: D. During frame-down operation of the upending frame.

Explanation (Optional): DB-NE-06306 Note states "During frame-down operation of the upending frame, the Main Fuel Handling Bridge cannot be positioned over the un-ending frame."

- A. Plausible if the examinee does not know the travel interlocks.
- B. Plausible since this switch should be in the OFF position; however it will not prevent the bridge from locating over the basket.
- C. Plausible since it cannot be positioned over the basket during down operation; however it is not restricted during up operation.
- D. CORRECT ANSWER

Technical Reference(s): DB-NE-06306 Fuel Transfer System Operating Procedure (Rev 1)(Page 12) (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: \_\_\_\_\_ (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge X  
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: 55.41 b.7  
55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	2	2
	K/A #	A1.02 (035)	
	Importance Rating	3.5	3.8

(K&A Statement) Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the S/GS controls including: S/G pressure

Proposed Question: Common 34

Plant conditions:

- The plant is at 100% power.
- Normal equipment lineups exist.

Event:

- Main Steam Isolation Valve MS100 begins traveling closed inadvertently due to a malfunction in its air operator.
- MS 100 stops traveling at 62%.
- SG 2 outlet pressure spikes up to 1027 psig during the transient.
- Turbine Header pressure is 910 psig.

With the above conditions, \_\_\_\_\_.

- the Turbine Bypass Valves will open because SG 2 pressure is >920 psig
- the Atmospheric Vent Valves will open because SG 2 pressure is >1025 psig
- neither the Turbine Bypass Valves and Atmospheric Vent Valves will open because Turbine Header Pressure is 910 psig
- both the Turbine Bypass Valves and Atmospheric Vent Valves will open because SG 2 pressure is >985 psig

Proposed Answer: B. the Atmospheric Vent Valves will open due to SG #2 pressure being >1025 psig

Explanation (Optional): DB-OP-06201 Limits and Precautions states pressure control is transferred to the AVVs when either MSIV is less than 90% and the measured variable for pressure control is transferred from Turbine Header Pressure to Steam Generator Outlet Pressure.

- A. Plausible since 920 psig is the TBV setpoint with the reactor and turbine reset and the ULD>17%; however the TBVs will be closed due to the MSIV being <90% open.
- B. CORRECT ANSWER
- C. Plausible since during normal operation both sets of valves would be closed at 910 psig; however the AVVs will be operating off of SG pressure due to the MSIV being <90% open.
- D. Plausible since 985 psig Header Pressure is the reactor trip setpoint for the TBVs; however, they will be closed due to the MSIV being <90% open and the AVVs will be operating off of SG pressure.

Technical Reference(s): DB-OP-06201 MAIN STEAM SYSTEM OPERATING PROCEDURE (Rev 7)(Pages 5, 6) (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: \_\_\_\_\_ (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 b.7  
55.43 \_\_\_\_\_

Comments: Question assumes Header Pressure setpoint of 870 psig.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	<u>2</u>
	Group #	<u>2</u>	<u>2</u>
	K/A #	<u>K6.03 (041)</u>	
	Importance Rating	<u>2.7</u>	<u>2.9</u>

(K&A Statement) Knowledge of the effect of a loss or malfunction on the following will have on the SDS: Controller and positioners, including ICS, S/G, CRDS

Proposed Question: Common 35

Plant conditions:

- The turbine tripped at 60% power.
- The reactor failed to trip and the 480 Volt Unit Substation E2 and F2 breakers were momentarily opened.
- All CRD Breakers are still closed.

With the above conditions Turbine Bypass Valves will control Header Pressure at \_\_\_\_\_.

- A. 880 psig
- B. 920 psig
- C. 995 psig
- D. 1025 psig

Proposed Answer: A. 880 psig

Explanation (Optional): The CRD Trip Confirm circuit will not be made up in this situation due to the A and C Trip breakers being closed. This will preclude the shifting of the Header Pressure bias to 125 psig and it will instead go to zero due to the turbine being tripped. This will result in header pressure controlling at 870 psig.

- A. CORRECT ANSWER
- B. Plausible since is the controlling pressure with the turbine and reactor on line.
- C. Plausible since this would be the correct pressure if the trip confirm circuit is made up.
- D. Plausible since the TBVs will open at 1025 psig even if in manual if they do not open at setpoint plus bias.

Technical Reference(s): OPS-SYS-I501.04 Control Rod Drive Electrical (REV 4) (Attach if not previously provided)  
 (Page 16)  
 DB-OP-06402 CRD OPERATING PROCEDURE  
 (Rev 14)(Page 140)  
 DB-OP-02008 Trips Alarm Panel 8 Annunciators (Rev 4)  
 (Page 3)  
 DB-OP-06401 INTEGRATED CONTROL SYSTEM OPERATING PROCEDURE  
 (Rev 6)(Page 68)

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Proposed references to be provided to applicants during examination: None

Learning Objective: \_\_\_\_\_ (As available)

Question Source: Bank # \_\_\_\_\_  
 Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
 New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
 Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 b.7  
 55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	<u>2</u>
	Group #	<u>2</u>	<u>2</u>
	K/A #	<u>K1.03 (056)</u>	
	Importance Rating	<u>2.6</u>	<u>2.6</u>

(K&A Statement) Knowledge of the physical connections and/or cause-effect relationships between the Condensate System and the following systems: MFW.

Proposed Question: Common 36

Plant conditions:

- ICS is in full automatic mode.
- Two Main Feedwater Pumps are operating.
- Four Reactor Coolant Pumps are operating.

Which of the following conditions will cause a runback of the Unit Load Demand Subsystem?

- Deaerator tank level 3 feet with reactor power at 63%.
- Trip of one Reactor Coolant Pump with reactor power at 73%.
- Trip of two Reactor Coolant Pumps with reactor power at 45%.
- MFP discharge pressure 1400 psig with reactor power at 65%.

Proposed Answer: A. Deaerator tank level 3 feet with reactor power at 63%.

Explanation (Optional):

- CORRECT ANSWER
- Plausible since a loss of one RCP will cause a runback; however 73% is below the runback point of 75%.
- Plausible since a loss of two RCPs will cause a runback; however the runback is to 45% power.
- MFP discharge pressure runback is 1433 psig.



Technical Reference(s): DB-OP-2014 MSR/ICS ALARM PANEL 14 ANNUNCIATORS (Rev 4)(Pages 13, 14, 25) (Attach if not previously provided)  
 DB-OP-02010 FEEDWATER ALARM PANEL 10 ANNUNCIATORS (Rev 11) (Page 5)

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Proposed references to be provided to applicants during examination: None

Learning Objective: \_\_\_\_\_ (As available)

Question Source: Bank # X  
 Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
 New \_\_\_\_\_

Question History: Last NRC Exam 2000

Question Cognitive Level: Memory or Fundamental Knowledge X  
 Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: 55.41 \_\_\_\_\_  
 55.43 \_\_\_\_\_

Comments: Used on DB ILT NRC Exam in 2000

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	<u>2</u>
	Group #	<u>2</u>	<u>2</u>
	K/A #	<u>K4.01 (075)</u>	
	Importance Rating	<u>2.5</u>	<u>2.8</u>

(K&A Statement) Knowledge of circulating water system design feature(s) and interlock(s) which provide for the following: Heat sink

Proposed Question: Common 37

Plant conditions:

- The plant is at 100% power.
- Circulating Water is supplying secondary loads due to a previous trip of Service Water Pump 1.
- Service Water Pump 3 has been started as 1 and recovery efforts are in progress using DB-OP-02511, Loss of Service Water Pumps/Systems.
- Service Water Loop 2 has been chosen as the Primary Loop.
- Water temperature in the Forebay is 36°F.

Event:

- A pipe break occurs on the Service Water Return line to the Forebay upstream of SW2930, Intake Forebay.
- Service Water header pressure has dropped to 26 psig.
- DP across the TPCW Heat Exchanger Outlet check valve SW57 is 0.1 psid.

Given these conditions, Service Water \_\_\_\_\_.

- discharge to the Intake Structure, SW2929, will automatically open
- crossconnect Valve from Circulating Water, CT 2955, will automatically close
- Loop 1 Non-essential Header Supply Valve, SW1399, will be manually opened
- Loop 2 Non-essential Header Supply Valve, SW1395, will be manually closed

Proposed Answer: B. crossconnect Valve from Circulating Water CT 2955 will automatically close.

Explanation (Optional): CT2955 automatically closes if DP across the TPCW Heat Exchanger Outlet check valve falls below .3 psid for leak isolation.

- 
- A. Plausible since this valve does have an automatic opening signal; however it opens on high pressure not low pressure.
  - B. CORRECT ANSWER
  - C. Plausible because this valve will be opened during the SW Pump trip recovery since Loop 2 was chosen as the Primary Loop; however it will automatically close at 50 psig SW header pressure.
  - D. Plausible since this valve will have to be verified closed; however it will automatically close at 50 psig SW header pressure.

Technical Reference(s): DB-OP-2511 LOSS OF SERVICE WATER PUMPS/SYSTEMS (Rev 11) (Page 37) (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: \_\_\_\_\_ (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge X  
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: 55.41 b.7  
55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	2	2
	K/A #	A2.01 (079)	
	Importance Rating	2.9	3.2

(K&A Statement) Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the SAS controls including: Cross-connection with IAS

Proposed Question: Common 38

Plant conditions:

- The plant is at 100% power.
- Normal equipment lineups exist.

Event:

- The Lead Station Air Compressor 1-1 (SAC 1) trips and the Lag SAC 1-2 fails to start.

With the above conditions, the cross-tie valve to Service Air, SA6445, will \_\_\_\_\_.

- close at 95 psig in the SAC 1-1 Air Receiver and can be reopened at >100 psig
- close at 100 psig in the SAC 1-2 Air Receiver and can be reopened at >104 psig
- remain open when the EIAC automatically starts at 100 psig in the EIAC 1-1 Air Receiver
- close at 95 psig in the EIAC 1-1 Air Receiver and can be reopened when EIAC Air Pressure is >95 psig

Proposed Answer: D. close at 95 psig in the EIAC 1-1 Air Receiver and can be reopened when EIAC Air Pressure is >95 psig..

Explanation (Optional): EIAC 1-1 starts at 95 psig in the EIAC Air receiver and cross-tie valve SA6445 closes at 95 psig in the EIAC 1-1 Air Receiver to isolate Service Air. It can be reopened at >95 psig.

- Plausible since the valve will close at 95 psig; however it is 95 psig in the EIAC Air Receiver.
- Plausible since it can be reopened at 104 psig; however it closes at 95 psig in the EIAC Air Receiver.
- Plausible since the valve would remain open if pressure stays above 95 psig in the EIAC Air Receiver; however the EIAC compressor does not auto start until 95 psig in the Air Receiver.
- CORRECT ANSWER

Technical Reference(s): OPS-SYS-I602.08 Plant Air (Rev 9)(Pages 18, 19) (Attach if not previously provided)

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DB-OP-02528 LOSS OF INSTRUMENT AIR (Rev 11) (Page 13, 28)

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Proposed references to be provided to applicants during examination: None

Learning Objective: \_\_\_\_\_ (As available)

Question Source: Bank # \_\_\_\_\_

Modified Bank # \_\_\_\_\_ (Note changes or attach parent)

New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge X

Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: 55.41 b.7

55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	1	1
	K/A #	AK3.02 (008)	
	Importance Rating	3.6	4.1

(K&A Statement) Knowledge of the reasons for the following responses as they apply to the Pressurizer Vapor Space Accident:  
Why PORV or code safety exit temperature is below RCS or PZR temperature

Proposed Question: Common 39

The reason for the PORV exit temperature being lower than Pressurizer temperature after it has lifted is because it is a constant \_\_\_\_\_.

- A. Entropy process which results in a wet vapor of lower temperature after passing through the valve seat
- B. Entropy process which results in a lower temperature superheated steam downstream of the valve
- C. Enthalpy process which results in a wet vapor of lower temperature after passing through the valve seat
- D. Enthalpy process which results in a lower temperature superheated steam downstream of the valve

Proposed Answer: C. The process is a constant Enthalpy process which results in a wet vapor of lower temperature after passing through the valve seat.

Explanation (Optional):

- A. Plausible since the fluid is a wet vapor of lower temperature after passing through the valve seat; however it is a constant Enthalpy process.
- B. Plausible if the examinee does not know the exit condition of the steam is a wet vapor and not superheated.
- C. CORRECT ANSWER
- D. Plausible since it is a constant Enthalpy process; however the stema condition is not superheated.

Technical Reference(s): OLC-BAT-I131 (Rev 11) (Attach if not previously provided)

Proposed references to be provided to applicants during examination: Mollier Diagram

Learning Objective: OLC-BAT-311-02K (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 b.14  
55.43 \_\_\_\_\_

Comments:



Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	1	1
	K/A #	EA2.25 (009)	
	Importance Rating	3.9	4.1

(K&A Statement) Ability to determine or interpret the following as they apply to a small break LOCA: Reactor trip setpoints

Proposed Question: Common 40

Plant conditions:

- The plant is at 100% power.
- Normal equipment lineups exist.
- A RCS leak develops in the containment building.
- RCS Pressure is 2020 psig and lowering at 20 psig/min.
- Containment Pressure is 15.7 psia and rising at 0.3 psia/min.
- Pressurizer level is 165 inches and lowering at 5 inches/min.
- Makeup Pump 1 is running.

With the above conditions, the \_\_\_\_\_.

- A. reactor will trip on low RCS pressure before reaching the Tech. Spec. reactor trip setpoint for high containment pressure
- B. procedure required manual trip setpoint for Pressurizer level will be reached before reaching the Tech. Spec. reactor trip setpoint for low RCS pressure
- C. reactor will trip on high containment pressure before reaching the Tech. Spec. reactor trip setpoint for low RCS pressure
- D. procedure required manual trip setpoint for Pressurizer level will be reached before reaching the Tech. Spec. reactor trip setpoint for high containment pressure

Proposed Answer: A. reactor will trip on low RCS pressure before reaching the Tech Spec reactor trip setpoint for high containment pressure

Explanation (Optional): It will take 10 minutes to reach 18.7 psia (4 psig) which is the high containment pressure setpoint for RPS to trip the reactor. It will take 6 minutes to reach 1900 psig which is the low RCS pressure Tech Spec setpoint. It will take 13 minutes to reach 100 inches which is the manual trip limit of the Immediate Manual Actions of DB-OP-02522, Small RCS Leaks.

Technical Reference(s): DB-OP-02522 Small RCS Leaks (Rev 6)(Page 5) (Attach if not previously provided)  
TS Table 2.2-1 RPS Instrumentation Setpoints

Proposed references to be provided to applicants during examination: None

Learning Objective: \_\_\_\_\_ (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 b.10  
55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	1	1
	K/A #	EA2.05 (011)	
	Importance Rating	3.3	3.7

(K&A Statement) Ability to determine or interpret the following as they apply to a Large Break LOCA: Significance of charging pump operation

Proposed Question: Common 41

Plant conditions:

- The reactor tripped from 100% power due to a large break LOCA which was followed by a loss of offsite power.
- Both Emergency Diesel Generators are running powering the C1 and D1 4160V busses.
- RCS Pressure is 188 psig.
- LPI flow in Loop 1 is 1350 gpm.
- LPI flow in Loop 2 is 950 gpm.
- BWST Level is at 9.2 feet and lowering at 3 feet per hour.

Given these conditions, the HPI pumps can \_\_\_\_\_.

- A. be stopped since LPI flow exists in both loops
- B. be stopped since LPI Loop 1 has reached 1350 gpm
- C. NOT be stopped since they will be needed for Piggyback Operation
- D. NOT be stopped and the HPI Alternate Minimum Recirc Flowpath must be placed in service

Proposed Answer: C. NOT be stopped since they will be needed for Piggyback Operation.

Explanation (Optional): HPI can not be terminated until BOTH LPI lines are at least 1350 gpm for 20 minutes or more. Since BWST level is approaching 9 feet Piggyback Operation will be necessary.

- A. Plausible since HPI can be terminated when flow in both loops is at least 1350 gpm for 20 minutes.
- B. Plausible since 1350 gpm is the correct flowrate; however both loops must be at 1350 gpm for at least 20 minutes.
- C. CORRECT ANSWER
- D. Plausible since the pumps can not be stopped; however the HPI Alternate Minimum Recirc Flowpath is only placed in service if BWST level is lowering at <2 feet per hour.

Technical Reference(s): DB-OP-02000 (Rev 20) (Attach if not previously provided)  
(Pages 165, 171, 242)

Proposed references to be provided to applicants during examination: None

Learning Objective: \_\_\_\_\_ (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 b.10  
55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	1	1
	K/A #	AK2.10 (015)	
	Importance Rating	2.8	2.8

(K&A Statement) Knowledge of the interrelations between the Reactor Coolant Pump Malfunctions (Loss of RC Flow) and the following: RCP indicators and controls

Proposed Question: Common 42

Plant conditions:

- Reactor power is 72%.
- CCW flow is normal.
- RCPs 1-1, 1-2, AND 2-2 are in operation.
- RCP 1-1 computer alarm lower bearing temperature has exceeded the alarm setpoint and is increasing with actual temperature at 200°F.

Which ONE of the following actions is correct in accordance with DB-OP-02515, Reactor Coolant Pump and Motor Abnormal Operation?

- A. Trip RCP 1-1 and then trip the reactor.
- B. Trip the reactor and then trip RCP 1-1.
- C. Reduce power to 28% and then trip RCP 1-1.
- D. Reduce power to 49% and then trip RCP 1-1.

Proposed Answer: B. Trip the reactor and then trip RCP 1-1.

Explanation (Optional):

- A. The reactor is tripped prior to tripping RCP 1-1.
- B. CORRECT ANSWER
- C. Plausible since this is the point the reactor would be tripped during a rapid shutdown without makeup capability; however operation is not permitted with only two RCPs running.
- D. Plausible since this would be below the one RCP/loop trip setpoint; however operation is not permitted with only two RCPs running.

Technical Reference(s): DB-OP-02515 REACTOR COOLANT PUMP AND MOTOR ABNORMAL OPERATION (Rev 7)(Page 28) (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: \_\_\_\_\_ (As available)

Question Source: Bank # X  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New \_\_\_\_\_

Question History: Last NRC Exam 2000

Question Cognitive Level: Memory or Fundamental Knowledge X  
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: 55.41 b.10  
55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	1	1
	K/A #	2.1.23 (022)	
	Importance Rating	3.9	4.0

(K&A Statement) Conduct of Operations: Ability to perform specific system and integrated plant procedures during all modes of plant operation.

Proposed Question: Common 43

Plant conditions:

- The plant is at 100% power.
- Makeup Pump 2 is OOS due to a bearing oil leak.
- ICS is in full AUTO.

Event:

- 6-5-C, SEAL INJ FLOW LO
- 6-6-C, SEAL INJ TOTAL FLOW
- MU Pump 1 is running with discharge pressure and flow erratic.
- MU-32 is opening.
- MU-19 is opening.
- MU tank level is 6 inches and lowering.
- PZR level is 186 inches and lowering.

The crew enters DB-OP-02512, Loss of RCS Makeup, and trips MU Pump 1.

Which ONE of the following additional actions is required?

- Trip the reactor and start an HPI pump.
- Lineup and start HPI piggyback operation.
- Fill the Makeup Tank and restart MU Pump 1.
- Align MU Pump 1 to BWST and start the pump.

Proposed Answer: B. Lineup and start HPI piggyback operation.

Explanation (Optional): With the standby MU Pump not available DB-OP-02512 requires initiating Piggyback Operation and then commencing a shutdown.

- 
- A. Plausible since tripping the reactor would be a required action if Pressurizer level falls below 165 inches,
  - B. CORRECT ANSWER
  - C. Plausible since filling the Makeup Tank would provide a suction source; however it is not an action in the procedure and the Makeup Pump would have to be vented prior to starting.
  - D. Plausible since aligning the suction to the BWST would provide a source of water; however the Makeup pump would have to be vented.



Technical Reference(s): DB-OP-02512 LOSS OF RCS MAKEUP (rev 8)(Pages 7, 8) (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: \_\_\_\_\_ (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # X (Note changes or attach parent)  
New \_\_\_\_\_

Question History: Last NRC Exam 2005

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 b.10  
55.43 \_\_\_\_\_

Comments: Modified from question used on the 2005 DB ILT Exam

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	1	1
	K/A #	AK1.01 (025)	
	Importance Rating	3.9	4.3

(K&A Statement) Knowledge of the operational implications of the following concepts as they apply to Loss of Residual Heat Removal System: Loss of RHRS during all modes of operation

Proposed Question: Common 44

Which ONE of the following would require Containment Closure to be accomplished following a loss of Decay Heat Removal?

- A. RCS Temperature rises to 140°F and stabilizes.
- B. The head is removed and the Refueling Canal is 23 feet.
- C. The RCS is at reduced inventory.
- D. The Decay Heat Removal System has been Out of service for greater than one hour in Mode 5.

Proposed Answer: C. The RCS is at reduced inventory with only one Steam Generator operable.

Explanation (Optional): DB-OP-02527 requires Containment Closure if the RCS is at reduced inventory which includes either SG not operable.

- A. Plausible if the examinee does not know the temperature for Containment Closure would be 200 °F.
- B. Plausible since closure would be required if Refueling Canal level was <23 feet with the head off.
- C. CORRECT ANSWER
- D. Plausible since Containment Closure would be required in this situation if the plant was in Mode 6 during fuel handling operations.

Technical Reference(s): DB-OP-02527 LOSS OF DECAy HEAT REMOVAL (Rev 10)(Page 16) (Attach if not previously provided)  
 TS 3.9.8.1 Decay Heat Removal and Coolant Circulation All Water Levels

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Proposed references to be provided to applicants during examination: None

Learning Objective: \_\_\_\_\_ (As available)

Question Source: Bank # \_\_\_\_\_  
 Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
 New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge X  
 Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: 55.41 b.10  
 55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	1	1
	K/A #	AA2.06 (026)	
	Importance Rating	2.8	3.1

(K&A Statement) Ability to determine and interpret the following as they apply to the Loss of Component Cooling Water: The length of time after the loss of CCW flow to a component before that component may be damaged

Proposed Question: Common 45

Following a loss of Component Cooling Water during an emergency event, \_\_\_\_\_.

- A. both trains of MU, LPI, and HPI pumps may be operated for up to one hour
- B. both trains of HPI and LPI Pumps can be operated up to one hour; the MU pumps must be tripped immediately
- C. one train of LPI and HPI pumps can be operated for up to one hour; the other train must be tripped immediately
- D. one MU pump can be operated indefinitely, as long as the MU Pump room HVAC unit is in service

Proposed Answer: A. both sets of MU, LPI, and HPI pumps may be operated for up to one hour

Explanation (Optional): DB-OP-02523 states the HPI, LPI and MU pumps may be operated for up to one hour on loss of CCW.

- A. CORRECT ANSWER
- B. Plausible since both sets of pumps can be operated up to an hour; however the MU pumps do not have to be tripped.
- C. Plausible since one set of pumps can be run for up to an hour; however the other set does not have to be secured.
- D. Plausible since one MU pump can be run up to an hour; however the HVAC unit does not have to be in service.

Technical Reference(s): DB-OP-02523 COMPONENT COOLING WATER SYSTEM MALFUNCTIONS (Rev 5) (Page 44) (Attach if not previously provided)

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Proposed references to be provided to applicants during examination: None

Learning Objective: \_\_\_\_\_ (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # X (Note changes or attach parent)  
New \_\_\_\_\_

Question History: Last NRC Exam 2005

Question Cognitive Level: Memory or Fundamental Knowledge X  
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: 55.41 b.10  
55.43 \_\_\_\_\_

Comments: Modified from 2005 DB ILT Exam question

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	1	1
	K/A #	2.1.2 (027)	
	Importance Rating	3.0	4.0

(K&A Statement) Conduct of Operations: Knowledge of operator responsibilities during all modes of plant operation.

Proposed Question: Common 46

Plant conditions:

- The plant is 100% power.
- RCS Tave is 582°F.
- Pressurizer level is 218 inches and rising slowly.
- Annunciator 4-4-B, HOT LEG PRESS HI, is in alarm.
- Annunciator 4-4-C, HOT LEG PRESS LO, is in alarm.
- Annunciator 4-1-D, PZR RLF VLV OPEN, is in alarm.
- Reactor Coolant Loop 1 Hot Leg pressure instrument indicates 2500 psig.
- Reactor Coolant Loop 2 Hot Leg pressure instrument indicates 2050 psig and lowering.

Which ONE of the following actions must be taken?

- A. Close RC11, PORV Block Valve.
- B. Close RC 10, Pressurizer Spray Block Valve.
- C. Place the Pressurizer Heater control in OFF.
- D. Open RC2, Pressurizer Spray Valve in Manual.

Proposed Answer: A. Close RC11, PORV Block Valve.

Explanation (Optional): DB-OP-02513 requires closing RC11, PORV Block Valve for failure of the Pressure Input to Heaters, Spray and PORV. The above conditions are indication of the failure of the pressure input.

- A. CORRECT ANSWER
- B. Plausible since this would isolate the Spray Valve; however the Spray Valve can be closed in manual and remain available for manual operation with the instrument failed.
- C. Plausible since this action would be correct if Reactor Coolant Loop 2 Hot Leg pressure instrument was the one that is failing; however indications are that the Loop 1 instrument is failed high. Pressurizer heaters will already be off and must be energized in manual.
- D. Plausible since the Spray Valve would be opened if actual pressure were high and it will have to be manipulated; however it will be closed in manual due to being opened by the failed instrument.

Technical Reference(s): DB-OP-02513 PRESSURIZER SYSTEM ABNORMAL OPERATION (Rev 6)(Page 9, 16, 28) (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: \_\_\_\_\_ (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 b.3  
55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	1	1
	K/A #	EK2.06 (029)	
	Importance Rating	2.9	3.1

(K&A Statement) Knowledge of the interrelations between the and the following an ATWS: Breakers, relays, and disconnects

Proposed Question: Common 47

Plant conditions:

- The plant is at 100% power.
- Control rod Group 7 is on the Auxiliary Power Supply due to a problem in its normal programmer.
- 120 volt bus YAR tripped the previous shift and troubleshooting is in progress.
- Annunciator 5-6-J, DSS NTNM, is in alarm due to the YAR bus failure.

Event:

- Both Main Feedwater Pumps trip.
- ARTS and RPS fail to automatically trip the reactor.
- Pressing both manual trip pushbuttons fails to trip the reactor.
- RCS pressure is at 2450 psig.

With the above conditions, \_\_\_\_\_.

- the Diverse Scram System will trip the reactor and all rods will insert
- the Diverse Scram System will NOT trip the reactor due to the loss of power to YAR
- only Group 7 rods will insert due to being on the Auxiliary Power Supply
- only Groups 1-6 will insert due to Group 7 rods being on the Auxiliary Power Supply

Proposed Answer: B. the Diverse Scram System will NOT trip the reactor due to the loss of power to YAR.

Explanation (Optional): Both DSS channels must energize to cause a reactor trip. Since power is lost to Channel 1 it will not energize to trip the D Electronic trip.



- 
- A. Plausible if the examinee does not know it takes both channels to energize to trip the reactor.
  - B. CORRECT ANSWER
  - C. Plausible if the examinee does not know the DSS system does not affect rods on the Auxiliary Power Supply; however no rods will fall because it takes both channels to energize to trip the reactor.
  - D. Plausible since the DSS system does not affect rods on the Auxiliary Power Supply; however no rods will fall because it takes both channels to energize to trip the reactor.

Technical Reference(s): DB-OP-06402 CRD OPERATING PROCEDURE (Rev 14)(Page 109) (Attach if not previously provided)  
 DB-OP-02005 PRIMARY INSTRUMENTATION ALARM PANEL 5 ANNUNCIATORS (Rev 10)(Page 108)

Proposed references to be provided to applicants during examination: None

Learning Objective: \_\_\_\_\_ (As available)

Question Source: Bank # \_\_\_\_\_  
 Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
 New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
 Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 b.6  
 55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	1	1
	K/A #	EK1.01 (038)	
	Importance Rating	3.1	3.4

(K&A Statement) Knowledge of the operational implications of the following concepts as they apply to the SGTR: Use of steam tables

Proposed Question: Common 48

Plant conditions:

- The plant tripped due to a Steam Generator Tube Rupture event in SG 1.
- All four Reactor Coolant Pumps are operating.
- RCS pressure and temperature are being reduced in preparation to isolate the affected SG.
- DB-OP-02000, RPS, SFAS, SFRCS TRIP, or SG Tube Rupture has been implemented, and the crew is preparing to isolate the faulted SG.
- RCS That is at 522°F and steady.
- RCS pressure is 946 psig and lowering.
- SG 1 level is 215 inches.
- SG 2 level is 40 inches.

Given the above conditions, which ONE of the following actions will have to be taken?

- A. Stop steaming SG 1 using DB-OP-02000, Attachment 17, SG Isolation for SGTR.
- B. Continue cooldown on SG 2 to 500°F using DB-OP-02000, Section 8, Steam Generator Tube Rupture.
- C. Trip all four RCPs and go to DB-OP-02000, Section 5, Loss of Subcooled Margin.
- D. Trip two Reactor Coolant Pumps and cooldown using DB-OP-02000, Section 13, RCS Subcooled with SG Removing Heat.

Proposed Answer: C. Trip all four RCPs and go to DB-OP-02000 Section 11 RCS Saturated with SG Removing Heat Cooldown.

Explanation (Optional): Subcooling margin is lost and DB-OP-02000 requires tripping all four RCPs. Cooldown will be using Section 11 since the RCS is saturated.

- A. Plausible since this would be the action if SG 1 level was at 220 inches or RCS Temperature was 520°F; however SCM is only 18°F with the given conditions so RCPs must be tripped.
- B. Plausible since 500°F is the target temperature for SG isolation with all RCPs running; however SCM is lost which will require tripping the RCPs and going to Section 11.
- C. CORRECT ANSWER
- D. Plausible if the examinee does not correctly calculate subcooling margin.

Technical Reference(s): DB-OP-02000 , RPS, SFAS, (Attach if not previously provided)  
 SFRCS TRIP, OR SG TUBE  
 (Rev 20)(Page 115, 117, 121,  
 239)

Proposed references to be provided to applicants during examination: Steam Tables

Learning Objective: \_\_\_\_\_ (As available)

Question Source: Bank # \_\_\_\_\_  
 Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
 New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
 Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 b.10  
 55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	1	1
	K/A #	AA1.04 (054)	
	Importance Rating	4.4	4.5

(K&A Statement) Ability to operate and / or monitor the following as they apply to the Loss of Main Feedwater (MFW): HPI, under total feedwater loss conditions

Proposed Question: Common 49

Plant conditions:

- The plant tripped from 100% power due to loss of both Main Feedwater Pumps.
- Efforts to establish Auxiliary Feedwater have failed and the Motor Driven Feedwater Pump tripped shortly after it was started.
- MU/HPI PORV cooling has been established.
- Both Makeup Pumps and both HPI Pumps are running.
- HPI line flow indicators read as follows:
  - HP3A 250 gpm
  - HP3B 170 gpm
  - HP3C 265 gpm
  - HP3D 155 gpm

With the above conditions, HPI flow must \_\_\_\_\_.

- A. be balanced in both HPI trains
- B. not be throttled to balance HPI flow
- C. be balanced through the HP3C and HP3D flow indicators
- D. be balanced through the HP3A and HP3B flow indicators

Proposed Answer: B. not be throttled to balance HPI flow

Explanation (Optional): DB-OP-02000 section 6 Lack of Heat Transfer states flow balancing is not required when HPI is being placed in service for MU/HPI Cooling.

- A. Plausible since under leak conditions both trains would have to be balanced due to two readings in the Unacceptable Region of Figure 3.
- B. CORRECT ANSWER
- C. Plausible since under leak conditions flow would have to be balanced due to HP3B being in the Unacceptable Region of Figure 3.
- D. Plausible since under leak conditions flow would have to be balanced due to HP3D being in the Unacceptable Region of Figure 3.

Technical Reference(s): DB-OP-02000 RPS, SFAS, SFRCS TRIP, OR SG TUBE RUPTURE (Rev 20)(Pages 251, 312, 327) (Attach if not previously provided)  
 Basis and Deviation Document for DB-OP-02000 (Rev 13)(Page 335)

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Proposed references to be provided to applicants during examination: None

Learning Objective: \_\_\_\_\_ (As available)

Question Source: Bank # \_\_\_\_\_  
 Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
 New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge X  
 Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: 55.41 b.10  
 55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	1	1
	K/A #	EA1.04 (055)	
	Importance Rating	3.5	3.6

(K&A Statement) Ability to operate and monitor the following as they apply to a Station Blackout: Reduction of loads on the battery

Proposed Question: Common 50

Plant conditions:

- The plant is at 100% power.
- Normal equipment lineups exist.

Event Time Line:

- 06:35 Reactor trip due to loss of offsite power and neither Emergency Diesel Generator auto starts.
- 06:37 The Command SRO initiates procedure DB-OP-02521, Loss of AC Bus Power Sources.

If efforts to manually start the EDGs fail, the \_\_\_\_\_.

- Main Turbine DC Bearing Oil Pump must be stopped by 06:50
- Main Feedwater Pump EBOP pumps must be stopped by 07:05
- Reactor Coolant Pump DC oil Lift Pumps must be stopped by 06:52
- Auxiliary Feedwater Pump speed control must be in manual control by 07:07

Proposed Answer: B. Main Feedwater Pump EBOP pumps must be stopped by 07:05

Explanation (Optional): DB-OP-02521 requires that Selective Battery Load Shedding be completed before 30 minutes have elapsed since the initiating event if power has been lost to DC MCC 1 and DC MCC 2 as has occurred in this situation. The Main Feedwater Pump EBOP pumps are part of the load shedding.

- Plausible since 06:50 is 15 minutes from the initiating event and if AC power can not be restored within 15 minutes Selective Load shedding is to be performed; however the Main Turbine DC Bearing Oil Pump is not one of the components that is secured.
- CORRECT ANSWER
- Plausible since the RCP Oil Lift Pumps are one of the components that will be shed; however up to 30 minutes is allowed.
- Plausible since Auxiliary Feedwater Pump speed control may be transferred to manual; however it is not part of the load shedding.

Technical Reference(s): DB-OP-02521 LOSS OF AC BUS POWER SOURCES Rev 12)(Pages 8, 22, 89) (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: \_\_\_\_\_ (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 b.10  
55.43 \_\_\_\_\_

Comments:



Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	1	1
	K/A #	AK3.01 (056)	
	Importance Rating	3.5	3.9

(K&A Statement) Knowledge of the reasons for the following responses as they apply to the Loss of Offsite Power: Order and time to initiation of power for the load sequencer

Proposed Question: Common 51

Plant conditions:

- The plant tripped from 100% due to a loss of offsite power.
- Both Emergency Diesel Generators have started and energized the C1 and D1 4160V Essential Busses.

Event:

- Large Break LOCA resulting in SFAS Level 1- 4 actuations.

Following the SFAS actuation, \_\_\_\_\_ will be the first to start because \_\_\_\_\_.

- LPI Pump 1 / SFAS Level 3 signal is present
- HPI Pump 1 / it is on Sequencer Step 1 Time 0
- Containment Spray Pump 1 / SFAS Level 4 signal is present
- Component Cooling Water Pump 1 / the sequencer does not control CCW Pump operation

Proposed Answer: D. Component Cooling Water Pump 1 / the sequencer does not control CCW Pump operation

Explanation (Optional): The CCW Pump is independent of the sequencer and will start as soon as power is restored.

- Plausible since LPI will start because SFAS Level 3 signal is present; however it starts 10 seconds after the bus is energized
- Plausible since HPI will start; however it starts 5 seconds after the SFAS Level 2 signal occurs since it is on Step 2 of the sequencer.
- Plausible since the Containment Spray Pump will start and Containment Pressure reached 40 psig as evidenced by the SFAS Level #4 actuation; however it will not start until 20 seconds after the bus is re-energized.
- CORRECT ANSWER

Technical Reference(s): OPS-SYS-I506.04 Safety Features Actuation System (Rev 4)(Page 16) (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: \_\_\_\_\_ (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 b.7  
55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	1	1
	K/A #	2.4.4 (062)	
	Importance Rating	4.0	4.3

(K&A Statement) Emergency Procedures/Plan: Ability to recognize abnormal indications for system operating parameters which are entry level conditions for emergency and abnormal operating procedures.

Proposed Question: Common 52

Plant conditions:

- The plant is operating at 95% power.
- Service Water Pump 3 in operation on Train 1.
- Component Cooling Water Pump 3 is in operation.

1. Annunciator Alarms

- 11-3-C, SW PMP 3 STRNR DISCH PRESS LO
- 11-6-C, SW PMP 3 STRNR DP HI
- 11-3-B, CCW HX 3 OUTLET TEMP HI

2. Computer Alarms

- X002, SW PMP MTR TRBL
- T083, CC HX 3 OUT TEMP
- P945, SW HDR 1 PRESS

Which ONE of the following sections of DB-OP-02511, Loss of Service Water Pumps/Systems, would be entered based on the above conditions?

- A. Loss of SW Loop 1
- B. Loss of SW Loop 2
- C. Loss of all Service Water pumps
- D. Service Water Non-Seismic Line Rupture

Proposed Answer: A. Loss of SW Loop 1

Explanation (Optional):

- A. CORRECT ANSWER
- B. No indication of SW header 2 problem, i.e low pressure
- C. No indication of problem with SW pumps 1 or 2. One of them has to be running, also no indication of SW header 2 low pressure, implying that pump 2 is running on header 2
- D. This would also affect both SW headers. There would also be indication of high temperature on TPCW heat exchangers

Technical Reference(s): DB-OP-02511 LOSS OF SERVICE WATER (Attach if not previously provided)  
PUMPS/SYSTEMS (Rev 11)  
(Page 4)(Section 2, symptoms)

Proposed references to be provided to applicants during examination: None

Learning Objective: OPS-GOP-111-01K (As available)

Question Source: Bank # 29029  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New \_\_\_\_\_

Question History: Last NRC Exam 2004

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 b.10  
55.43 \_\_\_\_\_

Comments: Reordered answer and distracters. Question used on DB ILT Exam in 2004

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	1	1
	K/A #	AK3.04 (065)	
	Importance Rating	3.0	3.2

(K&A Statement) Knowledge of the reasons for the following responses as they apply to the Loss of Instrument Air: Cross-over to backup air supplies

Proposed Question: Common 53

Which ONE of the following would preclude using the Temporary Diesel Air Compressor during a Severe Loss of Instrument Air event?

- A. The station air system is being used for breathing air.
- B. The leak or rupture is in the Station Air System piping.
- C. The air will be used to supply the Instrument Air System.
- D. The air compressor is an oil flooded air compressor (i.e., The Worthington Blue Brute).

Proposed Answer: A. The station air system is being used for breathing air

Explanation (Optional): DB-OP-06251 requires verifying Station Air is not being used for breathing air prior to starting the Temporary Diesel Air Compressor due to the potential for introducing Carbon Monoxide into the system.

- A. CORRECT ANSWER
- B. Plausible since the air compressor will be tied into the Station Air Receivers; however there is not restriction on where the leak is for using the air compressor.
- C. Plausible since the air compressor should ONLY be used in an emergency due to the possibility of introducing oil into the air system.
- D. Plausible since there is a caution to only use an oil flooded compressor in an emergency due to the possibility of introducing oil into the air system.

Technical Reference(s): DB-OP-06251 STATION AND INSTRUMENT AIR SYSTEM OPERATING PROCEDURE (Rev 17)(Page 57) (Attach if not previously provided)  
 DB-OP-02528 LOSS OF INSTRUMENT AIR (Rev 11) (Page 12)

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Proposed references to be provided to applicants during examination: None

Learning Objective: \_\_\_\_\_ (As available)

Question Source: Bank # \_\_\_\_\_  
 Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
 New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge X  
 Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: 55.41 b.10  
 55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	1	1
	K/A #	EK1.3 (E04)	
	Importance Rating	4.0	4.0

(K&A Statement) Knowledge of the operational implications of the following concepts as they apply to the (Inadequate Heat Transfer): Annunciators and conditions indicating signals, and remedial actions associated with the (Inadequate Heat Transfer).

Proposed Question: Common 54

Plant conditions:

- The plant tripped from 100% power due to a loss of both Main Feedwater Pumps.
- The Motor Driven Feedwater Pump was OOS prior to the trip and both Auxiliary Feedwater Pumps failed to start.
- The Startup Feedwater Pump (SUFPP) is available for use.
- Problems initiating MU/HPI Cooling have resulted in the Command SRO entering the Inadequate Core Cooling Section of DB-OP-02000.
- Incore Thermocouple Temperatures are 650°F.
- RCS pressure is 840 psig.
- SG 1 pressure is 760.
- SG 2 pressure is 745.
- SG 1 level is < 5 inches.
- SG 2 level is < 5 inches.

With the above conditions, \_\_\_\_\_.

- A. one SG will be fed at a time at approximately 300 gpm flow using the SUFPP
- B. both SGs will be fed simultaneously at approximately 300 gpm flow per SG using the SUFPP
- C. the SUFPP via Main Feedwater line is unavailable due to high tube-to-shell  $\Delta T$
- D. the SUFPP via the Main Feedwater line is unavailable due to the SGs being dry

Proposed Answer: A. one SG will be fed at a time at approximately 300 gpm flow using the SUFPP.

Explanation (Optional): DB-OP-02000 Attachment 5 allows the SUFPP to be used to feed a dry SG via the Main Feedwater header as long as tube-to-shell  $\Delta T$  is less than 50°F in tension. The attachment prefers feeding one SG at a time to promote natural circulation.



- 
- A. CORRECT ANSWER
  - B. Plausible since both SGs could be fed; however the SUFP capacity is only approximately 300 gpm.
  - C. Plausible if the examinee does not know the tube-to-shell  $\Delta T$  limit is in tension not compression.
  - D. Plausible since the SGs are dry; however they can be fed by the SUFP as long as the tube-to-shell  $\Delta T$  limit is satisfied.

Technical Reference(s): DB-OP-02000 RPS, SFAS, (Attach if not previously provided)  
 SFRCS TRIP, OR SG TUBE  
 RUPTURE (Rev 20)(Pages  
 280, 285)  
 DB-OP-06226 STARTUP FEED  
 PUMP OPERATING  
 PROCEDURE (Rev 9)(Pages  
 12,13)

Proposed references to be provided to applicants during examination: None

Learning Objective: \_\_\_\_\_ (As available)

Question Source: Bank # \_\_\_\_\_  
 Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
 New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
 Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 b.10  
 55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	1	1
	K/A #	EA1.2 (E05)	
	Importance Rating	3.6	3.6

(K&A Statement) Ability to operate and / or monitor the following as they apply to the (Excessive Heat Transfer) Operating behavior characteristics of the facility.

Proposed Question: Common 55

Plant conditions:

- The plant tripped from 100% power due to a steam leak from SG 2 into the Containment Building.
- SFAS Level 2 actuations have occurred.
- SFRCS actuates on Low SG 2 steam pressure.
- SG 2 has been isolated and Trickle Feed has been established in SG 1 due to a Main steam Safety Valve which failed to completely reseal.
- A plant cooldown to Mode 5 has been ordered by the Shift Manager.

With the above conditions, the cooldown rate will be controlled using \_\_\_\_\_ and will be \_\_\_\_\_.

- Atmospheric Vent Valves / limited to 235°F/hr
- Atmospheric Vent Valves / dependent on the average cooldown rate of the SG 1 shell
- Trickle Feed / limited to 100°F/hr
- Trickle Feed / dependent on the average cooldown rate of the SG 2 shell

Proposed Answer: D. Trickle Feed / dependent on the cooldown rate of the SG 2 shell

Explanation (Optional): DB-OP-02000 Section 7 Overcooling states when RCS temperature is approximately equal to the average shell temperature of the affected SG then cool the RCS at a rate approximately equal to the average shell temperature cooldown rate. And since Trickle Feed was established in SG 1 it will be used to establish the cooldown.

- Plausible since 235°F/hr is the emergency cooldown rate.
- Plausible if the examinee does not know the limiting SG is the affected SG.
- Plausible since Trickle Feed would be used; however cooldown is limited to a rate approximately equal to the average shell temperature cooldown rate.
- CORRECT ANSWER

Technical Reference(s): DB-OP-02000 RPS, SFAS, (Attach if not previously provided)

SFRCS TRIP, OR SG TUBE  
RUPTURE (Rev 20)(Pages 87,  
93, 95)

Proposed references to be provided to applicants during examination: None

Learning Objective: \_\_\_\_\_ (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 b.5  
55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	1	1
	K/A #	EK2.2 (E010)	
	Importance Rating	3.5	4.0

(K&A Statement) Knowledge of the interrelations between the (Post-Trip Stabilization) and the following: Facility's heat removal systems, including primary coolant, emergency coolant, the decay heat removal systems, and relations between the proper operation of these systems to the operation of the facility.

Proposed Question: Common 56

The following plant conditions exist:

The reactor automatically tripped from 95% power

All expected automatic and operator actions have occurred

The Unit Supervisor is directing trip recovering in accordance with DB-OP-06910, Trip Recovery

Placing the Turbine Bypass Valves in HAND prior to resetting the CRD breakers will \_\_\_\_\_.

- ensure the required Shutdown Margin is maintained above the Technical Specification minimum
- prevent Pressurizer level from rising off-scale high when the CRD breaks are reset
- prevent an uncontrolled cooldown of the Reactor Coolant System when the CRD breakers are reset
- ensure Steam Generator pressure remains below the Main Steam Safety Valve setpoints

Proposed Answer: C. prevent an uncontrolled cooldown of the Reactor Coolant System when the CRD breakers are reset

Explanation (Optional): DB-OP-06910 states the TBVs shall be placed in hand prior to resetting CRD to prevent the removal of the +115 psi bias when the CRDs are reset. Without the TBVs in hand, the steam pressure would lower due to the 0 bias being inserted and cause the RCS to cooldown.

- Incorrect due to SDM is ensured by raising boron concentration or xenon rising post-trip with the RCS >500°F.
- Incorrect since Pressurizer level will lower when Tave lowers if TBVs are left in AUTO.
- CORRECT ANSWER
- Incorrect since SG pressure will lower if TBVs are left in AUTO.

Technical Reference(s): DB-OP-06910 Trip Recovery (Rev 12) (Page 36) (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: OPS-GOP-207-02K (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge X  
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: 55.41 b.10  
55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	2	2
	K/A #	AA2.03 (001)	
	Importance Rating	4.5	4.8

(K&A Statement) Ability to determine and interpret the following as they apply to the Continuous Rod Withdrawal: Proper actions to be taken if automatic safety functions have not taken place

Proposed Question: Common 57

Plant conditions:

- DB-OP-06912, Approach to Criticality, is in progress.
- Nuclear Instruments 1 and 2 read approximately 100 cps.
- Rod Index is 150.

The RO withdraws Group 6 to 75% and notes Group 7 Control ON is indicated before releasing the insert/withdraw switch.

Event:

- Annunciator 5-6-E, CRD SEQ FAULT, is in alarm.
- Computer point Q265, CRD SEQ FAULT, is in alarm.
- Sequence Inhibit light on the Rod Control Panel is ON.
- Rod control panel has a constant OUT COMMAND.

Which ONE of the following events is occurring, and what is the correct response?

- Group 6 rods are continuing to withdraw. / Depress and hold the "Rod Stop" pushbutton.
- Group 6 rods are continuing to withdraw. / Trip the reactor and initiate AFW and isolation of both steam generators.
- Group 7 rods are continuing to withdraw. / Trip the reactor and initiate AFW and isolation of both steam generators.
- Group 7 rods are continuing to withdraw. / Depress and hold the "Rod Stop" pushbutton.

Proposed Answer: D. Group 7 rods are continuing to withdraw/Depress and hold the "Rod Stop" pushbutton.

Explanation (Optional): Group 7 rods have to be the rods that continue to withdraw as evidenced by the Sequence Fault alarm which comes in when Group 6 is <80% and Group 7 is >7%. DB-OP-02516 requires pressing the Rod Stop Pushbutton as the first immediate manual action.

- 
- A. Plausible since Depressing and holding the Rod Stop pushbutton is the correct action; however the examinee must diagnose that Group 7 is moving out not Group 6.
  - B. Plausible if the examinee misdiagnoses which group is withdrawing.
  - C. Plausible since Group 7 is moving out; however the reactor does not have to be tripped unless out motion continues after depressing the Rod Stop pushbutton.
  - D. CORRECT ANSWER



Technical Reference(s): DB-OP-02516 CRD Malfunctions (Rev 9)(Pages 5, 6, 10) (Attach if not previously provided)

DB-OP-06402 CRD OPERATING PROCEDURE (Rev 14)(Page 142)

OPS-SYS-I501.04 Control Rod Drive Electrical (Rev 4) (Page 31)

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Proposed references to be provided to applicants during examination: None

Learning Objective: \_\_\_\_\_ (As available)

Question Source: Bank # \_\_\_\_\_

Modified Bank # \_\_\_\_\_ (Note changes or attach parent)

New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_

Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 b.6

55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	2	2
	K/A #	AK3.03 (005)	
	Importance Rating	3.6	4.1

(K&A Statement) Knowledge of the reasons for the following responses as they apply to the Inoperable / Stuck Control Rod: Tech-Spec limits for rod mismatch

Proposed Question: Common 58

The reason for maintaining an inoperable/stuck control rod in Group 7 within  $\pm 6.5\%$  of the group average is to ensure \_\_\_\_\_.

- A. a 1 %  $\Delta k/k$  shutdown margin is maintained with one rod stuck in the withdrawn position
- B. axial power imbalance remains within the limits specified in the Core Operating Limits Report
- C. ejected rod worth will not be  $>0.65\%$   $\Delta k$  at rated thermal power for the remainder of the fuel cycle
- D. the initial condition maximum linear heat rate will not be above the value assumed in the LOCA analysis

Proposed Answer: D. the initial condition maximum linear heat rate will not be above the value assumed in the LOCA analysis

Explanation (Optional):

- A. Plausible since a stuck rod is a shutdown margin concern; however the deviation from group average is not a factor.
- B. Plausible since maintaining axial power imbalance within limits would be a concern for a Group 8 stuck rod.
- C. Plausible since ejected rod worth is a concern for a misaligned rod; however the  $\pm 6.5\%$  from group average is just the trigger point for doing a calculation of the ejected rod worth it is not a factor in the value.

Technical Reference(s): TS 3.1.3.1 Movable Control Assemblies and Basis (Attach if not previously provided)  
 TS 3.1.1.1 Shutdown Margin and Basis  
 TS 3.4.2 Axial Power Imbalance

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Proposed references to be provided to applicants during examination: None

Learning Objective: OPS-GOP-431-01K (As available)

Question Source: Bank # \_\_\_\_\_  
 Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
 New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge X  
 Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: 55.41 b.5  
 55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	2	2
	K/A #	AK2.02 (060)	
	Importance Rating	2.7	3.1

(K&A Statement) Knowledge of the interrelations between the Accidental Gaseous Radwaste Release and the following: Auxiliary building ventilation system

Proposed Question: Common 59

Plant conditions:

- The plant is at 100% power.
- Normal equipment lineups exist.

Event:

- Annunciator 9-1-G, FIRE OR RADIATION TROUBLE, is in alarm.
- A high radiation signal on Control Room Alarm Panel C5765 from Radwaste Ventilation Monitor, RE 5405A, has been received.

With the above conditions, the running Radwaste Ventilation train will \_\_\_\_\_.

- have to be shutdown manually and Emergency Ventilation System Train 1 manually started
- have to be shutdown manually, Radwaste Area Vent System to Emergency Ventilation System damper, HA5299B, will open and Emergency Ventilation System Train 1 will auto-start
- shutdown automatically and Emergency Ventilation System Train 1 will auto-start
- shutdown automatically, Radwaste Area Vent System to Emergency Ventilation System damper, HA5299B, will open and Emergency Ventilation System Train 1 will be manually started

Proposed Answer: D. shutdown automatically, Radwaste Area Vent System to Emergency Ventilation System damper, HA5299B, will open and Emergency Ventilation System train 1 will be manually started.

Explanation (Optional): DB-OP-06504 Note provides the following information: A High Radiation signal from RE 5405A, B or C will cause the running Radwaste Ventilation train to shutdown and Radwaste Area Vent System to Emergency Ventilation System damper, HA5299B, to open. The EVS train will have to be started manually.

- 
- A. Plausible since the EVS will have to be manually started; however the Radwaste Ventilation train will shutdown automatically.
  - B. Plausible since the Radwaste Area Vent System to Emergency Ventilation System damper, HA5299B will open; however the Radwaste Ventilation train will shutdown automatically and the EVS will not auto-start.
  - C. Plausible since the Radwaste Ventilation train will shutdown; however the EVS will not auto-start.
  - D. CORRECT ANSWER

Technical Reference(s): DB-OP-06504 EMERGENCY VENTILATION SYSTEM (Rev 11)(Pages 31, 34, 35) (Attach if not previously provided)

OPS-SYS-I109.04 Radwaste Ventilation, Containment Purge, EVS (Rev 4)(Page10)

DB-OP-06512 AUXILIARY BUILDING RADIOACTIVE VENTILATION SYSTEM (Rev 14)(Page 4)

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Proposed references to be provided to applicants during examination: None

Learning Objective: \_\_\_\_\_ (As available)

Question Source: Bank # \_\_\_\_\_

Modified Bank # \_\_\_\_\_ (Note changes or attach parent)

New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge X

Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: 55.41 b.13

55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	2	2
	K/A #	EA1.09 (074)	
	Importance Rating	3.7	3.8

(K&A Statement) Ability to operate and monitor the following as they apply to a Inadequate Core Cooling: CVCS

Proposed Question: Common 60

Plant conditions:

- The plant tripped from 100% power due to a large RCS leak.
- SFAS Level 1, 2, and 3 signals have actuated.
- While trying to mitigate the RCS leak a loss of offsite power occurred.
- Efforts to establish primary to secondary heat transfer have failed and both HPI pumps failed to start following the re-energizing of C1 and D1 4160V Essential Busses.
- Both Makeup Pumps are available to be started.
- RCS Pressure is 285 psig.
- Incore temperature of 418°F.
- Pressurizer level indicates 0 inches.

Which ONE of the following Makeup System lineups should be established?

- A. One Makeup running with suction from the Makeup Tank.
- B. One Makeup Pump in service taking suction from the BWST and letdown isolated.
- C. Both Makeup Pumps running taking suction from the BWST and the Alternate Injection line in service.
- D. Both Makeup Pumps running with one taking suction from the BWST and one from the Makeup Tank and the Alternate Injection line in service.

Proposed Answer: C. Both Makeup Pumps running taking suction from the BWST and the Alternate Injection line in service.

Explanation (Optional): DB-OP-02000 Attachment 8 requires both Makeup Pumps to be running (if available) with suctions locked on to the BWST, the Alternate Injection Line in service and letdown will be isolated.

- 
- A. Plausible if the examinee does not know the Makeup pump suction will be locked on the BWST.
  - B. Plausible since the Makeup pump suction will be locked on the BWST; however both Makeup pumps should be running.
  - C. CORRECT ANSWER
  - D. Plausible since both Makeup Pumps and the Alternate Injection line will be in service; however both pump suction will be locked on the BWST.



Technical Reference(s): DB-OP-02000 RPS, SFAS, (Attach if not previously provided)  
SFRCS TRIP, OR SG TUBE  
RUPTURE (Rev 20)(Pages 45,  
143, 300, 330, 339)

Proposed references to be provided to applicants during examination: None

Learning Objective: \_\_\_\_\_ (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 b.10  
55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	2	2
	K/A #	AK1.2 (A01)	
	Importance Rating	3.5	3.8

(K&A Statement) Knowledge of the operational implications of the following concepts as they apply to the (Plant Runback) Normal, abnormal and emergency operating procedures associated with (Plant Runback).

Proposed Question: Common 61

Plant conditions:

- The plant is at 83% power.
- Normal equipment lineups exist.
- The ICS is in automatic.

Event:

- Reactor Coolant Pump 1-1 trips.
- During the ICS runback, Rod 7-1 drops.

With the above conditions, \_\_\_\_\_.

- the reactor will be manually tripped
- reduce reactor power to <45% within one hour
- reduce reactor power to <60% within one hour
- commence a reactor shutdown to Hot Standby within six hours

Proposed Answer: B. reduce reactor power to 45% within one hour

Explanation (Optional): DB-OP-02014 has the operator verify the runback to 75% power due to the tripped RCP. DB-OP-02516 requires reducing reactor power to <45% due to the combination of the dropped rod and only having 3 RCPs operating.

- Plausible if the examinee believes the reactor must be tripped due to being above the 3 RCP power value; however there is no three RCP trip RPS trip.
- CORRECT ANSWER
- Plausible since this would be the correct power level to go to with four RCPs in operation and a dropped rod.
- Plausible since this is an action that would be taken if more than one control rod is dropped.

Technical Reference(s): DB-OP-02014 MSR/ICS Alarm Panel 14 Annunciators (Rev 4) (Page 25) (Attach if not previously provided)  
 DB-OP-06401 INTEGRATED CONTROL SYSTEM OPERATING PROCEDURE (Rev 6)(Page 49)  
 DB-OP-02516 CRD Malfunctions (Rev 9)(Page14)

Proposed references to be provided to applicants during examination: None

Learning Objective: \_\_\_\_\_ (As available)

Question Source: Bank # \_\_\_\_\_  
 Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
 New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
 Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 b.10  
 55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>1</u>	<u>1</u>
	Group #	<u>2</u>	<u>2</u>
	K/A #	<u>AK3.2 (A04)</u>	
	Importance Rating	<u>3.4</u>	<u>3.6</u>

(K&A Statement) Knowledge of the reasons for the following responses as they apply to the (Turbine Trip) Normal, abnormal and emergency operating procedures associated with (Turbine Trip).

Proposed Question: Common 62

Following a Main Turbine trip, Generator Breakers ACB34560, ACB34561, and Generator and Exciter field breakers should open \_\_\_\_\_.

- A. immediately to limit RCS cooldown if the turbine trip was due to a reactor trip
- B. immediately to prevent turbine overspeed if it was due to a main transformer fault
- C. after a delay to bleed excess turbine steam if the trip was due to low oil pressure
- D. after a delay to allow generator voltage to decay if the turbine trip was due low vacuum

Proposed Answer: C. after a delay to bleed excess steam if the trip was due to low EHC pressure.

Explanation (Optional): DB-OP-02500 states the ACB34560, ACB34561, and Generator and Exciter field breakers should open automatically as indicated on Panels C5722 or C5723 after a delay to bleed excess steam after a Turbine trip when not due to a Generator trip. The EHC trip is not a generator trip so the opening of the breakers will be delayed.

- A. Plausible since a delay in the turbine to trip would cause the RCS to cooldown; however if the trip is other than a generator trip there is a short delay to bleed excess steam.
- B. Plausible since the trip would be immediate on a Main Transformer Fault; however it is not to prevent a turbine overspeed condition it is to protect the generator.
- C. CORRECT ANSWER
- D. Plausible since the trip will be delayed if the trip is not due to a generator trip; however the reason is to bleed excess steam.

Technical Reference(s): DB-OP-02500 TURBINE TRIP (Attach if not previously provided)  
(Rev 8)(Page 7)

Proposed references to be provided to applicants during examination: None

Learning Objective: \_\_\_\_\_ (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge X  
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: 55.41 b.7  
55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	2	2
	K/A #	2.1.32 (A06)	
	Importance Rating	3.4	3.8

(K&A Statement) Conduct of Operations: Ability to explain and apply all system limits and precautions.

Proposed Question: Common 63

Plant conditions:

- The plant has been tripped.
- Control Room evacuated due to a serious fire in the Control Room.
- DB-OP-02519, Serious Control Room Fire, has been initiated and is in progress.
- Makeup Pump 1 has been started locally.
- The Shift Manager has directed you as the Primary Side Reactor Operator to establish makeup flow by throttling open MU6420, Normal Make-Up Flow Controller Bypass.

In this situation, MU6420 must be throttled to maintain a \_\_\_\_\_.

- A. minimum of 2260 psig discharge pressure to ensure flow is <250 gpm for NPSH concerns
- B. minimum of 250 gpm from Makeup Pump 1 to ensure adequate flow as the RCS cools down
- C. maximum of 2260 psig discharge pressure to prevent pump runout
- D. maximum of 250 gpm flow due to Makeup Pump 1 operation in piggyback

Proposed Answer: A. minimum of 2260 psig discharge pressure to ensure flow is <250 gpm for NPSH concerns.

Explanation (Optional): DB-OP-02519 Caution states "The minimum Makeup Pump 1 discharge pressure is 2260 psig as indicated on PI MU25A. This will limit flow to <250 gpm." DB-OP-02000 Rule 3 provides guidance that throttling to 250 gpm will provide adequate NPSH with suction from the BWST for all BWST levels >18 feet and in this situation suction will be from the BWST.

- A. CORRECT ANSWER
- B. Plausible since 250 gpm is the value in the caution; however flow should be <250 gpm.
- C. Plausible since 2260 is the discharge pressure in the caution; however it is a minimum pressure.
- D. Plausible if candidate does not know that makeup flow is not limited to 250 gpm in piggyback operation.

Technical Reference(s): DB-OP-02519 SERIOUS CONTROL ROOM FIRE (Rev 11) (Pages 29) (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: (As available)

Question Source: Bank # Modified Bank # (Note changes or attach parent) New X

Question History: Last NRC Exam

Question Cognitive Level: Memory or Fundamental Knowledge X Comprehension or Analysis

10 CFR Part 55 Content: 55.41 b.10 55.43

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	2	2
	K/A #	EK1.3 (E09)	
	Importance Rating	3.5	3.5

(K&A Statement) Knowledge of the operational implications of the following concepts as they apply to the (Natural Circulation Cooldown) Annunciators and conditions indicating signals, and remedial actions associated with the (Natural Circulation Cooldown).

Proposed Question: Common 64

Plant conditions:

- The plant tripped from 100% power due to a loss of offsite power.
- A cooldown has been commenced to comply with Tech. Spec. requirements.
- DB-OP-06903, Plant Shutdown and Cooldown has been initiated.
- Cooldown rate is 36°F/hr.

Event:

- Pressurizer level begins to rise.
- Makeup Tank level begins to rise.
- Annunciator 2-2-B, MU TK LVL HI, is in alarm.
- Reactor vessel head vent temperature indicates 18°F subcooled on T012.

Which ONE of the following actions should be taken?

- Raise the cooldown rate to 50°F/hr.
- Reduce Seal Injection flow to 3 gpm for each RCP.
- Set Pressurizer Level control to 100 inches in auto.
- Immediately raise RCS Pressure to restore subcooling margin.

Proposed Answer: D. Immediately raise RCS Pressure to restore subcooling margin.

Explanation (Optional): Since the indications of a head bubble are received DB-OP-06903 requires raising RCS Pressure to restore subcooling margin.

- Plausible since this is the maximum cooldown rate on natural circulation and it would promote lowering Pressurizer level; however it is not the procedure directed action.
- Plausible since this is an action that would be taken if the plant was to be maintained in Hot Standby; however it will not help the head bubble situation.
- Plausible since Pressurizer level is a concern; however the procedure directed action is to place MU32 in hand and adjust demand as necessary.
- CORRECT ANSWER



Technical Reference(s): DB-OP-06903 PLANT SHUTDOWN AND COOLDOWN (Rev 27)(Pages 74, 75) (Attach if not previously provided)

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Proposed references to be provided to applicants during examination: None

Learning Objective: \_\_\_\_\_ (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 b.10  
55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	2	2
	K/A #	EK2.2 (E14)	
	Importance Rating	3.8	3.8

(K&A Statement) Knowledge of the interrelations between the (EOP enclosures) and the following Facility's heat removal systems, including primary coolant, emergency coolant, the decay heat removal systems, and relations between the proper operation of these systems to the operation of the facility.

Proposed Question: Common 65

Plant conditions:

- The plant tripped from 100% power due to a large break LOCA.
- SFAS Levels 1-4 have all actuated.
- Containment Air Cooler 1 lost Service Water and Containment Air Cooler 2 fan tripped post LOCA.
- Efforts to restore a Containment Air Cooler are continuing.
- Both trains of LPI are in service taking suction from the Containment Emergency Sump.

Event:

- Flow and amps begin to fluctuate on both LPI Pumps.
- DB-OP-02000, Attachment 27, Mitigation of Containment Emergency Sump Degradation, has been initiated.

In this situation, \_\_\_\_\_.

- one LPI Pump will be secured
- both LPI trains will be throttled to <1000 gpm
- one Containment Spray Pump will be secured
- both Containment Spray trains will be throttled to <1100 gpm

Proposed Answer: C. one Containment Spray Pump will be secured

Explanation (Optional): DB-OP-02000 Attachment 27 provides guidance to secure one Containment Spray Pump. The second Pump does not get secured even if conditions did not improve since there are no Containment Air Coolers in service.

- 
- A. Plausible since this may help would prevent damage to one of the LPI Pumps; however the correct action is to secure one Containment Spray Pump and the LPI Pumps are needed for core cooling.
  - B. Plausible since both trains of LPI will be throttled; however they are not to be throttled to less than 1350 gpm.
  - C. CORRECT ANSWER
  - D. Plausible since both trains do automatically throttle when suction is transferred to the emergency sump; however the correct action is to secure one Containment Spray Pump and 1100 gpm is the low flow alarm point for the pumps.

Technical Reference(s): DB-OP-02000 RPS, SFAS, SFRCS TRIP, OR SG TUBE RUPTURE (Rev 20)(Pages 415, 417) (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: \_\_\_\_\_ (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 b.10  
55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	3	3
	Group #	1	1
	K/A #	2.1.33	
	Importance Rating	3.4	4.0

(K&A Statement) Conduct of Operations: Ability to recognize indications for system operating parameters which are entry-level conditions for technical specifications.

Proposed Question: Common 66

The plant is at 50% power and 300 EFPD.

Which ONE of the following would require entry into Tech. Specs.?

- A. Group 7 rods are 100% withdrawn.
- B. Group 8 rods are 90% withdrawn.
- C. Rod 5-4 is 96% withdrawn.
- D. Rod 2-2 is 92% withdrawn.

Proposed Answer: D. Rod 2-2 is 92% withdrawn.

Explanation (Optional): Tech. Spec. 3.1.3.5

- A. T.S. 3.1.3.6 allows Group 7 rods to be at 100% at any power level.
- B. T.S. 3.1.3.9 allows APSRs to be at any position until the end of core life.
- C. T.S. 3.1.3.1 requires all rods to be within 6.5% of the group average.
- D. CORRECT ANSWER

Technical Reference(s): Tech. Spec. 3.1.3.5 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: OPS-GOP-431-01K (As available)

Question Source: Bank # X  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New \_\_\_\_\_

Question History: Last NRC Exam 2002

Question Cognitive Level: Memory or Fundamental Knowledge X  
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: 55.41 b.10  
55.43 \_\_\_\_\_

Comments: Question used on DB ILT Exam in 2002. Changed to memory level.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	3	3
	Group #	1	1
	K/A #	2.1.19	
	Importance Rating	3.0	3.0

(K&A Statement) Conduct of Operations: Ability to use plant computer to obtain and evaluate parametric information on system or component STATUS

Proposed Question: Common 67

Plant conditions:

- The plant is at 100% power.
- Annunciator 5-4-E, TILT, IMBALANCE, ROD INS LIMITS, is in alarm.
- An unexpected transient resulted in Group 7 Regulating Rods going below their insertion limits.
- Problems with the Group 7 programmer assembly have delayed the ability to return the rods to their normal position.

Which ONE of the following actions must be taken?

- A. Disable the alarm status for the point on the computer to allow re-flash of the alarm.
- B. Obtain a Group 38 printout from the computer daily to verify the parameter causing the alarm is within limits.
- C. Raise the frequency for verifying proper rods position to once every four hours due to the computer alarm being present.
- D. Refer to DB-NE-03220, Imbalance, Tilt & Rod Index Calcs- Group 38 Alarms Inoperable, due to the alarm being in solid.

Proposed Answer: D. Refer to DB-NE-03220, Imbalance, Tilt & Rod Index Calcs- Group 38 Alarms Inoperable, due to the alarm being in solid.

Explanation (Optional): DB-OP-02005 actions are to determine if Group 38 is operable, if Group 38 is operable, then refer to DB-NE-03220 for actions. action that would be taken.

- 
- A. Plausible since this would allow re-flash of the alarm; however the alarm will ref-lash without removing the point from scan and the point is needed for monitoring purposes.
  - B. Plausible since this is an action that should be taken, but it is an hourly requirement, not a daily requirement
  - C. Plausible since this is an action that would be taken if the alarm were inoperable..
  - D. CORRECT ANSWER



Technical Reference(s): DB-OP-02005 PRIMARY INSTRUMENTATION ALARM PANEL 5 ANNUNCIATORS (Rev 10)(Pages 65, 66) (Attach if not previously provided)  
 DB-OP-03006 MISCELLANEOUS INSTRUMENT SHIFT CHECK (Rev 25)(Page 5)

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Proposed references to be provided to applicants during examination: None

Learning Objective: \_\_\_\_\_ (As available)

Question Source: Bank # \_\_\_\_\_  
 Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
 New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
 Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 b.10  
 55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	3	3
	Group #	2	2
	K/A #	2.2.27	
	Importance Rating	2.6	3.5

(K&A Statement) Equipment Control: Knowledge of the refueling process.

Proposed Question: Common 68

Which ONE of the following meets T.S. 3.9.2, Refueling Operations, Instrumentation, requirements during Mode 6?

- A. One source range neutron flux monitor with visual and audible indication in the Control Room and in containment.
- B. One source range neutron flux monitor with visual and audible indication in the Control Room and audible indication in containment.
- C. Two cross core source range neutron flux monitors, one with visual indication in the Control Room and one with audible indication in containment.
- D. Two cross core source range neutron flux monitors, each with visual indication in the Control Room and one with audible indication in the containment and Control Room.

Proposed Answer: D. Two source range neutron flux monitors, each with visual indication in the Control Room and one with audible indication in the containment and control room.

Explanation (Optional): DB-NE-06300 requires "As a minimum when in Mode 6, two source range neutron flux monitors, one from each side of the core, shall be operable, each with continuous visual indication in the Control Room and one with audible indication in the containment and control room. (Refer to Technical Specification 3.9.2)"

- A. Plausible since visual and audible indication in the control room is required; however two instruments are required to be operable and visual indication is not required in the containment.
- B. Plausible since visual and audible indication in the control room is required and audible indication in containment is required; however two instruments are required to be operable.
- C. Plausible since two instruments are required to be operable; however each must have visual indication in the control room and one with audible indication in the containment and control room.
- D. CORRECT ANSWER

Technical Reference(s): DB-NE-06300 Fuel Loading and Refueling Limits and Precautions (Rev 5)(Page 05) (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: \_\_\_\_\_ (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge X  
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: 55.41 b.10  
55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	3	3
	Group #	2	2
	K/A #	2.2.1	
	Importance Rating	3.7	3.6

(K&A Statement) Equipment Control: Ability to perform pre-startup procedures for the facility, including operating those controls associated with plant equipment that could affect reactivity.

Proposed Question: Common 69

Plant conditions:

- A reactor startup is in progress.
- Current rod index is 240.
- The upper rod index limit is 240.
- Criticality was not achieved during rod withdrawal and the Reactor Engineer determined the amount of positive reactivity required is  $< .5\% \Delta k/k$ .

Which ONE of the following is the next action to be taken?

- Insert Control Rods to an index of 150.
- Begin emergency boration to achieve 1% shutdown margin.
- Add demineralized water to lower rod index and continue the reactor startup.
- Review the ECP, Raise boron concentration and continue the reactor startup.

Proposed Answer: A. Insert Control Rods to an index of 150

Explanation (Optional): DB-OP-06912 states "Control rods will be inserted to 150RI if criticality is not achieved during rod withdrawal, and the Reactor Engineer determines the amount of positive reactivity required is  $< .5\% \Delta k/k$ . After a re-review of the ECP and associated inputs, the appropriate Boron concentration adjustment will be completed, and the approach to criticality will be re-initiated from 150RI."

- CORRECT ANSWER
- Plausible if the examinee does not realize SDM is adequate for this situation and emergency boration is not necessary.
- Plausible since this is an action that will be taken; however the operator must insert rods to a Rod Index of 150 before even reviewing the ECP.
- Plausible since the ECP will be reviewed and the startup will be able to be continued after adjusting boron concentration; however boron concentration will be lowered not raised.

Technical Reference(s): DB-OP-06912 APPROACH TO CRITICALITY (Rev 9)(Page 5) (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: \_\_\_\_\_ (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # X (Note changes or attach parent)  
New \_\_\_\_\_

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 b.1  
55.43 \_\_\_\_\_

Comments: Significantly modified from a question used on the 2004 DB ILT exam

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	3	3
	Group #	3	3
	K/A #	2.3.11	
	Importance Rating	2.7	3.2

(K&A Statement) Radiation Control: Ability to control radiation releases.

Proposed Question: Common 70

Plant conditions:

- A release of the Clean Waste Monitor Tank (CWMT) 1 will be started at 0930.
- The release rate will be 8 gpm.
- While preparing to start the release it was discovered that FI1700A and FQI1700A, CWMT Discharge to Collection Box, did not meet their channel functional test.

The CWMT release can continue provided \_\_\_\_\_.

- at least two independent verifications of the discharge valving lineup are performed
- at least two independent verifications of the release rate calculations are done
- the dilution flow is manually calculated every 30 minutes
- the release flowrate is estimated at least once per four hours

Proposed Answer: D. the release flowrate is estimated at least once per four hours

Explanation (Optional): DB-OP-03011 states "If both flow indication channels are inoperable every effort should be made to restore one flow indication channel to operable status prior to the release. However, the ODCM specifies if both flow indication channels are inoperable then the release may proceed if the flowrate is estimated at least once per four hours. This flowrate may be based upon CWMT volume changes over a given time period (preferred method) or the use of the CWMT transfer pump curves."

- Plausible since this is an action that would be taken for a Rad Monitor being out of service; however it is not required for an OOS flow indicator.
- Plausible since this is an action that would be taken for a Rad Monitor being out of service; however it is not required for an OOS flow indicator.
- Plausible since this is the action that would be taken if the High Discharge Flowrate Setpoint computer point (F130 or F132) selected for the release is NOT operating.
- CORRECT ANSWER

Technical Reference(s): DB-OP-03011)(Rev 13)(Pages 4, 5, 72, 73) (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: OPS-SYS-111-09K (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # X (Note changes or attach parent)  
New \_\_\_\_\_

Question History: Last NRC Exam 2002

Question Cognitive Level: Memory or Fundamental Knowledge X  
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: 55.41 b.13  
55.43 \_\_\_\_\_

Comments: Significantly modified from a question used on the 2002 DB ILT exam (could be considered new)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>3</u>	<u>3</u>
	Group #	<u>3</u>	<u>3</u>
	K/A #	<u>2.3.4</u>	
	Importance Rating	<u>2.5</u>	<u>3.1</u>

(K&A Statement) Radiation Control: Knowledge of radiation exposure limits and contamination control, including permissible levels in excess of those authorized.

Proposed Question: Common 71

Which ONE of the following exposures would require permission from the Director - Plant Operations before exceeding the limit?

- A. 0.5 rems Embryo/Fetus Dose Equivalent
- B. 3 rems Total Effective Dose Equivalent
- C. 12 rems Lens Dose Equivalent
- D. 40 rems Shallow Dose Equivalent

Proposed Answer: B. 3 Rems TEDE

Explanation (Optional): NG-DB-0243 Attachment 1 Administrative Control Limits requires Responsible Section Manager, Radiation Protection Manager and Plant Manager permission before exceeding 3 Rems TEDE.

- A. Plausible if the examinee does not know 500 mrem can not be exceeded.
- B. CORRECT ANSWER
- C. Plausible if the examinee does not know the required permission for exposure limits.
- D. Plausible if the examinee does not know the required permission for exposure limits.



Technical Reference(s): NG-DB-00243 Personnel Dosimetry Program (Rev 3) (Page 21) (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: (As available)

Question Source: Bank # Modified Bank # (Note changes or attach parent) New X

Question History: Last NRC Exam

Question Cognitive Level: Memory or Fundamental Knowledge X Comprehension or Analysis

10 CFR Part 55 Content: 55.41 b.12 55.43

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	3	3
	Group #	3	3
	K/A #	2.3.9	
	Importance Rating	2.5	3.4

(K&A Statement) Radiation Control: Knowledge of the process for performing a containment purge.

Proposed Question: Common 72

A Containment Purge Release was being prepared in accordance with DB-OP-03012, Radioactive Gaseous Batch Release.

The Containment Purge was temporarily delayed while investigating a problem with one of the purge exhaust fans.

With the purge being delayed, \_\_\_\_\_.

- A. a new Containment Purge Release permit must be initiated when the fan problem is resolved
- B. the current release permit can be used as long as the purge is started within 7 days of the sample
- C. the Containment Purge Release Permit can be used indefinitely as long as CTMT is sampled every 24 hours
- D. the current release permit can be used as long as the Containment is sampled every 24 hours until the release is started up to 72 hours

Proposed Answer: D. the current release permit can be used as long as the containment is sampled every 24 hours until the release is started up to 72 hours.

Explanation (Optional): DB-OP-03012 states "The permit for a Containment Purge radioactive gaseous batch release is valid for a 72 hour period. WHEN the station is in Modes 5 OR 6, THEN a Radioactive Gaseous Batch Release is NORMALLY required only for the first 24 hours of the Containment Purge. Once samples indicate that a radioactive gaseous batch release is NOT required, Containment ventilation is considered a continuous release. IF the containment release is NOT started within 24 hours of the initial sample, THEN CTMT must be sampled every 24 hours until release is started to verify conditions do NOT exist to invalidate this release permit."

- 
- A. Plausible since this would be the case if the problem were not resolved within 72 hours of the initiation of the permit.
  - B. Plausible since the permit is good for 72 hours after initiation, not 72 hours after the first sample is taken.
  - C. Plausible if the examinee does not know the permit can still be used as long as another sample is taken within 24 hours of the first sample.
  - D. CORRECT ANSWER

Technical Reference(s): DB-OP-03012 RADIOACTIVE GASEOUS BATCH RELEASE (Rev 9)(Page 48) (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: \_\_\_\_\_ (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge X  
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: 55.41 b.13  
55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	3	3
	Group #	4	4
	K/A #	2.4.5	
	Importance Rating	2.9	3.6

(K&A Statement) Emergency Procedures / Plan: Knowledge of the organization of the operating procedures network for normal, abnormal, and emergency evolutions.

Proposed Question: Common 73

The following procedures take priority over DB-OP-02000, RPS, SFAS, SFRCS TRIP, or SG Tube Rupture, with the exception of \_\_\_\_\_.

- A. DB-OP-02529, Fire Procedure
- B. DB-OP-02501, Serious Station Fire
- C. DB-OP-02519, Serious Control Room Fire
- D. DB-OP-02508, Control Room Evacuation

Proposed Answer: A. DB-OP-02529, Fire Procedure

Explanation (Optional): DB-OP-01003 States "Direction provided in DB-OP-02000 takes priority over abnormal procedures with the following exceptions:

- DB-OP-02501, Serious Station Fire
  - DB-OP-02519, Serious Control Room Fire
  - DB-OP-02508, Control Room Evacuation
  - Any other Abnormal Procedures that may delay entry into DB-OP-02000 will be specifically stated in the other abnormal procedures."
- A. CORRECT ANSWER
  - B. Plausible if the examinee does not know this is one of the procedures that takes priority over DB-OP-02000.
  - C. Plausible if the examinee does not know this is one of the procedures that takes priority over DB-OP-02000.
  - D. Plausible if the examinee does not know this is one of the procedures that takes priority over DB-OP-02000.

Technical Reference(s): DB-OP-01003 OPERATIONS (Attach if not previously provided)  
PROCEDURE USE  
INSTRUCTIONS (Rev 9)  
(Page 9)

Proposed references to be provided to applicants during examination: None

Learning Objective: \_\_\_\_\_ (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge X  
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: 55.41 b.10  
55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>3</u>	<u>3</u>
	Group #	<u>4</u>	<u>4</u>
	K/A #	<u>2.4.4</u>	
	Importance Rating	<u>4.0</u>	<u>4.3</u>

(K&A Statement) Emergency Procedures / Plan: Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures.

Proposed Question: Common 74

The following plant conditions have occurred from 80% power:

- ICS runback in progress.
- Deaerator 1 level indicates 7.7 feet.
- Deaerator 2 level indicates 0 feet.
- MFPT 1 speed indicates 4945 rpm.
- MFPT 2 speed indicates 0 rpm.
- Train 2 DC Bus and Instrument AC breaker indicating lights are off on Control Room Panel C5715, Electrical Distribution.
- Annunciator Alarms received:
  - 1-6-J, INV YVB TRBL
  - 16-6-E, STAT CLNT AC CTRL VOLTAGE LO
  - 14-2-D, ICS/NNI 118VAC PWR TRBL

The above conditions indicate a loss of \_\_\_\_\_ has occurred.

- A. YAU
- B. YBU
- C. D1P and DAP
- D. NNI/ICS AC and DC Power

Proposed Answer: B. YBU.

Explanation (Optional):

- 
- A. Plausible since an ICS runback will occur and Annunciator (14-2-D) also occur for a loss of YAU; however the #1 Deaerator and #1 MFPT are affected by loss of YAU.
  - B. CORRECT ANSWER
  - C. Plausible since some console light status indications are affected, an ICS runback will occur and the Deaerator Storage Tank levels will be affected; however MFPT speed is not affected and the listed annunciators are not received.
  - D. Plausible since MFPT speed is affected, Annunciator (14-2-D) occurs, console light indications are affected and a plant transient occurs; however Deaerator level indication is not affected and Annunciators (1-6-J) and (16-6-E) are not received.



Technical Reference(s): DB-OP-02542 LOSS OF YBU (Attach if not previously provided)  
(Rev 3)(Page 3)  
DB-OP-02541 LOSS OF YAU  
(Rev 4)(Page 3)  
DB-OP-02537 LOSS OF D1P  
AND DAP (Rev 12)(Page 5)  
DB-OP-02532 LOSS OF  
NNI/ICS POWER (Rev  
6)(Pages 8, 9)

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Proposed references to be provided to applicants during examination: None

Learning Objective: OPS-GOP-141-01K (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # X (Note changes or attach parent)  
New \_\_\_\_\_

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 b.10  
55.43 \_\_\_\_\_

Comments: Significantly modified from a questions used on the 2005 DB ILT exam

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>3</u>	<u>3</u>
	Group #	<u>4</u>	<u>4</u>
	K/A #	<u>2.4.47</u>	
	Importance Rating	<u>3.4</u>	<u>3.7</u>

(K&A Statement) Emergency Procedures / Plan: Ability to diagnose and recognize trends in an accurate and timely manner utilizing the appropriate control room reference material.

Proposed Question: Common 75

Plant conditions:

- The plant is at 50% power.

Event:

- The following annunciators are in alarm:
  - 14-6-D, ICS IN TRACK
  - 8-5-A, SWYD ACB 34560 TRIP
  - 8-5-B, SWYD ACB 34561 TRIP
  - 14-3-F, HPT MN STM PRESS
  - 16-1-D, GEN FAULT TRIP
  - 16-3-D, NEG SEQ CURRENT HI
  - 16-5-B, VOLTS/HZ HI
  - C5725, B.S. NMBR 1 LINE T.T. TRBL
  - C5725, LEMOYNE NMBR 1 LINE T.T. TRBL
  - C5725, O.E. NMBR 1 LINE T.T. TRBL
- Indicated MWe is 40.
- MSIVs, TBVs and AVVs are all lifting.
- The Turbine EHC is in manual.

Which ONE of the following events is in progress?

- A. Load Rejection
- B. Reactor/Turbine Trip
- C. Loss of Offsite Power
- D. Abnormal Transient Without a Scram

Proposed Answer: A. Load Rejection

Explanation (Optional):

- 
- A. CORRECT ANSWER
  - B. Plausible since the MSIVs, TBVs and AVVs will open on a turbine trip, EHC will go to manual and Annunciator (14-6-D) ICS IN TRACK will be in alarm; however the other annunciators will not be in alarm and MWe will be zero.
  - C. Plausible since the MSIVs and AVVs will be open and many of the annunciators will be in alarm; however indicated MWe will be zero.
  - D. Plausible since the MSIVs, TBVs and AVVs will open, Annunciator (14-6-D) ICS IN TRACK will be in alarm and EHC will be in manual; however the other annunciators will not be in alarm and MWe will be zero.

Technical Reference(s): DB-OP-02520 LOAD REJECTION (Rev 3)(Page 3) (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: \_\_\_\_\_ (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 b.10  
55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	1
	Group #	_____	1
	K/A #	2.1.23 (007)	_____
	Importance Rating	_____	4.0

(K&A Statement) Conduct of Operations: Ability to perform specific system and integrated plant procedures during all modes of plant operation.

Proposed Question: SRO 76

Plant conditions:

- The plant was at 18% power getting ready to synchronize the Main Generator to the grid.
- A Loss of Offsite Power occurs.
- The following indications are noted immediately:
  - All Power Range NIs indicated 0%
  - IR SUR indication is -0.3 dpm
  - Rod 2 in Group 2 indicates 100% withdrawn
  - Reactor Trip Breaker A is CLOSED
  - Reactor Trip Breaker B is OPEN
  - Both EDGs failed to AUTO start

Which ONE of the following actions will be taken?

- A. REFER TO DB-OP-02521, Loss of AC Bus Power Sources.
- B. Emergency Borate the RCS per DB-OP-02000, Specific Rule 1.
- C. Implement DB-OP-02000, Specific Rule 6, Power for C1 and D1 Buses or EDG Start.
- D. Momentarily de-energize 480 volt Unit Substations E2 and F2 per DB-OP-02000, Section 3.0, Immediate Actions.

Proposed Answer: C. Implement DB-OP-02000 Specific Rule 6, Power For C1 And D1 Buses or EDG Start

Explanation (Optional): DB-OP-02000 first supplemental action includes implementing Rule 6 for the power failure.

- 
- A. Plausible since this is an action that would be taken in Specific Rule 6 if efforts to start the diesels fails.
  - B. Plausible since a rod has stuck out; however emergency boration is not required since power is lowering in the Intermediate Range.
  - C. CORRECT ANSWER
  - D. Plausible since a rod is stuck out and one Reactor Trip Breaker did not open; however power is lowering in the Intermediate Range.

Technical Reference(s): DB-OP-02000 RPS, SFAS, (Attach if not previously provided)  
SFRCS TRIP, OR SG TUBE  
RUPTURE (Rev 20)(Pages 13,  
17, 247, 248)

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Proposed references to be provided to applicants during examination: None

Learning Objective: \_\_\_\_\_ (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 \_\_\_\_\_  
55.43 b.5

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	1
	Group #	_____	1
	K/A #	AA2.20 (008)	
	Importance Rating	_____	3.6

(K&A Statement) Ability to determine and interpret the following as they apply to the Pressurizer Vapor Space Accident: The effect of an open PORV or code safety, based on observation of plant parameters

Proposed Question: SRO 77

Plant conditions:

- The plant is at 100% power.
- RCS pressure is 2023 psig and lowering rapidly at 10 psig/minute.
- Tave is 582°F and stable.
- Pressurizer level 220 inches and stable.
- Makeup tank level is lowering slowly.
- Containment pressure 14.7 psig and stable.
- Quench tank pressure and temperature are rising.

Which ONE of the following actions will be taken and why?

- A. IAW DB-OP-02513, Pressurizer Malfunctions, close RC11 PORV Block Valve due to a leaking PORV.
- B. IAW DB-OP-02522, Small RCS Leaks, close RC10 Pressurizer Spray Block Valve due to a leaking Pressurizer Spray Valve.
- C. Refer to DB-SP-03357, RCS Water Inventory Balance, and determine the RCS Leakrate due to an RCS leak existing.
- D. Refer to DB-OP-02504, Rapid Shutdown, and commence a plant shutdown due to a leaking Pressurizer Code Safety.

Proposed Answer: A. IAW DB-OP-02513, Pressurizer Malfunctions, close RC11 PORV Block Valve due to a leaking PORV.

Explanation (Optional): Lowering RCS pressure with no change in Tave or Pressurizer level and rising Quench Tank level and pressure are indications of a leaking PORV. DB-OP-02513 requires closing the PORV Block Valve in this situation.



- A. CORRECT ANSWER
- B. Plausible since lowering RCS pressure with no change in Tave or Pressurizer level are symptoms of a failed open Spray Valve; however Quench Tank pressure and level would not be rising.
- C. Plausible since this is an action that will be taken after the PORV Block Valve is closed.
- D. Plausible since lowering RCS pressure with no change in Tave or Pressurizer level are symptoms of a failed open Spray Valve and commencing a shutdown is the correct action for a leaking code safety with lowering RCS pressure; however Quench Tank pressure and level would not be rising.

Technical Reference(s): DB-OP-02513 (Rev 6)(Pages 4, 5, 6, 18) (Attach if not previously provided)

DB-OP-02522 Small RCS  
Leaks (Rev 6)(Pages 3, 4)

Proposed references to be provided to applicants during examination: None

Learning Objective: \_\_\_\_\_ (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 \_\_\_\_\_  
55.43 b.5

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	1
	Group #	_____	1
	K/A #	2.4.50 (022)	_____
	Importance Rating	_____	3.3

(K&A Statement) Emergency Procedures / Plan Ability to verify system alarm setpoints and operate controls identified in the alarm response manual.

Proposed Question: SRO 78

Plant conditions:

- The plant was at 100% power.
- Makeup Pump 1 was OOS for maintenance.
- Makeup Pump 2 tripped one hour ago.
- A rapid shutdown is in progress and the plant has reached the SG Low Level Limits.
- Reactor power has continued down to approximately 25% power.
- Annunciator 4-2-E, PZR LVL LO, is received and Pressurizer level indicates 158 inches.

Given the above conditions, \_\_\_\_\_.

- A. the reactor will be tripped and RCS pressure reduced to between 1700 and 1800 psig IAW DB-OP-02512, Loss of RCS Makeup
- B. LPI/HPI Piggyback operation will be initiated and the shutdown continued to Hot Standby IAW DB-OP-02504, Rapid Shutdown
- C. the reactor will be tripped and HPI initiated to meet the requirements of Tech. Spec. 3.0.3 to be in Mode 3 within one hour
- D. the shutdown will be continued to achieve Hot Shutdown within the next 71 hours IAW Tech Spec 3.1.2.4, Makeup Pumps – Operating

Proposed Answer: A. the reactor will be tripped and RCS pressure reduced to between 1700 and 1800 psig IAW DB-OP-02512.

Explanation (Optional):

- A. CORRECT ANSWER
- B. Plausible since LPI/HPI Piggyback operation should already be in service; however the reactor will be tripped IAW DB-OP-2512.
- C. Plausible since TS 3.0.3 does apply; T.S. 3.0.3 requires a shutdown to start within one hour and be in Mode 3 in six hours.
- D. Plausible since this Tech Spec does apply to the loss of one pump and requires restoring the second pump to operable status within 72 hours.

Technical Reference(s): TS 3.0.3 LCO Applicability (Attach if not previously provided)  
 TS 3.1.2.4 Makeup Pumps  
 DB-OP-02512 LOSS OF RCS  
 MAKEUP (Rev 8)(Pages 9, 10,  
 19)  
 DB-OP-02004 REACTOR  
 COOLANT ALARM PANEL 4  
 ANNUNCIATORS (Rev 6)(Page  
 18)

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Proposed references to be provided to applicants during examination: None

Learning Objective: \_\_\_\_\_ (As available)

Question Source: Bank # \_\_\_\_\_  
 Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
 New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
 Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 \_\_\_\_\_  
 55.43 b.5

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	1
	Group #	_____	1
	K/A #	AA2.06 (025)	_____
	Importance Rating	_____	3.4

(K&A Statement) Ability to determine and interpret the following as they apply to the Loss of Residual Heat Removal System:  
Existence of proper RHR overpressure protection

Proposed Question: SRO 79

Plant conditions:

- The plant is in Mode 3 cooling down in preparation for a refueling outage.
- RCS pressure is 252 psig.
- RCS temperature is 287°F.
- Preparing to start Decay Heat Removal Loop 1.

Event:

- While attempting to open Decay Heat Suction Valve, DH12, 480V Bus E11B tripped.
- RCS Temperature has reduced to 278°F while trying to open DH12.

Which ONE of the following actions must be taken?

- A. Within one hour open, manual bypass valves DH21 and DH23.
- B. Within one hour, disable the capability of both Makeup Pumps to inject water into the RCS.
- C. Within 8 hours, reduce Makeup Tank level to ≤73 inches.
- D. Within 8 hours, disable the automatic transfer function of Makeup Pump suction to the BWST on low Makeup Tank level.

Proposed Answer: A. Within one hour open manual bypass valves DH21 and DH23.

Explanation (Optional): TS 3.4.2 requires DHR Relief Valve DH4849 to be operable and DH11 and DH12 to be open in Modes 4 and 5. When RCS temperature went below 280 °F the plant entered Mode 4. With DH12 closed there is a one hour timeclock to open DH21 and DH23.

- A. CORRECT ANSWER
- B. Plausible since the applicable time frame is one hour; however the required action is to open DH21 and DH23.
- C. Plausible since this is an action to take for DH 4849 being inoperable; however the action does not have to be taken within one hour.
- D. Plausible since this is an action to take for DH 4849 being inoperable; however the action does not have to be taken within one hour.

Technical Reference(s): TS 3.4.2 Safety Valves – Shutdown (Attach if not previously provided)  
 TS Table 1.1 Operational Modes  
 OPS-SYS-I303.06 (Rev 6)(Pages 14-16)

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Proposed references to be provided to applicants during examination: None

Learning Objective: \_\_\_\_\_ (As available)

Question Source: Bank # \_\_\_\_\_  
 Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
 New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
 Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 \_\_\_\_\_  
 55.43 b.2

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	1
	Group #	_____	1
	K/A #	2.1.32 (065)	_____
	Importance Rating	_____	3.8

(K&A Statement) Conduct of Operations: Ability to explain and apply all system limits and precautions.

Proposed Question: SRO 80

Plant conditions:

- The plant was manually tripped from 100% power 35 minutes ago due to a severe loss of instrument air.
- Efforts to restore instrument air have failed and air pressure has been at 0 psig for over 30 minutes.
- DB-OP-02528, Loss of Instrument Air has been initiated.

Given the above conditions, which ONE of the following DB-OP-02528 Attachment actions must be implemented and why?

- A. Attachment 5, RCP Seal Return Restoration - trip all four RCPs due to the potential for seal damage due to loss of seal return flow for >30 minutes.
- B. Attachment 6, RCP Seal Injection Restoration – throttle MU19 to establish 3 gpm of seal injection flow to prevent loss of RCPs if CCW is lost.
- C. Attachment 7, CCW Actions - verify CC43 CCW to Auxiliary Building Header is closed to prevent excessive CCW flow in the event of an SFAS Level 2 actuation.
- D. Attachment 9, Containment Air Coolers - open the in service CAC outlet valves to ensure adequate containment cooling in the event of an SFAS Level 2 actuation.

Proposed Answer: A. Attachment 5 RCP Seal Return Restoration - trip all four RCPs due to the potential for seal damage due to loss of seal return flow for >30 minutes.

Explanation (Optional): Attachment 5 caution states “Extended operation of RCPs with the seal return closed can cause seal damage. Limit running RCPs to less than 30 minutes with seal return isolated.”



- A. CORRECT ANSWER
- B. Plausible since Seal Injection flow should be reestablished; however it will be adjusted to 9 gpm per pump using the individual RCP seal inlet valve MU66A-D since they fail closed and MU19 fails open.
- C. Plausible since closing CC43 is an action that would have to be taken if an SFAS Level 2 signal occurs; however the valve will be opened by the attachment due to CC1495 CCW to Auxiliary Building Non-Essential Inlet failing closed.
- D. Plausible since this is an action that would have to be taken in the event of an SFAS Level 2 actuation; however these valves will be throttled by the attachment to control containment temperature.

Technical Reference(s): DB-OP-02528 Loss of Instrument Air (Rev 11)(Pages 36, 39, 44, 49) (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: \_\_\_\_\_ (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge X  
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: 55.41 \_\_\_\_\_  
55.43 b.5

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	1
	Group #	_____	1
	K/A #	EA2.1 (E10)	
	Importance Rating	_____	4.0

(K&A Statement) Ability to determine and interpret the following as they apply to the (Post-Trip Stabilization) Facility conditions and selection of appropriate procedures during abnormal and emergency operations

Proposed Question: SRO 81

Plant conditions:

- The plant tripped from 100% due to a loss of offsite power.
- DB-OP-02000, RPS, SFAS, SFRCS TRIP, or SG Tube Rupture, has been initiated by the Command SRO.
- The T<sub>sat</sub> meters are currently out of service.
- Incore Thermocouple temperature is 597°F and rising.
- T<sub>hot</sub> is currently 587°F and rising.
- T<sub>cold</sub> is currently 535°F and slowly lowering.
- RCS pressure is 1665 psig and slowly lowering.
- Steam Generator pressures are 942 psig and slowly lowering.
- The AVVs are closed.

The above conditions indicate \_\_\_\_\_.

- A. a loss of subcooling margin requiring transition to Section 5.0, Lack of Adequate Subcooling Margin
- B. a lack of heat transfer requiring transition to Section 6.0, Lack of Heat Transfer
- C. an overcooling is in progress requiring transition to Section 7.0, Overcooling
- D. natural circulation flow exists and the crew should refer to DB-OP-06903, Plant Shutdown and Cooldown

Proposed Answer: A. a loss of subcooling margin requiring transition to Section 5.0  
Lack of Adequate Subcooling Margin

Explanation (Optional): With the T<sub>sat</sub> meters out of service and no natural or forced circulation the incore thermocouples should be used to determine subcooling margin and in this situation saturation temperature for the current RCS pressure is 611°F which is only a 14°F SCM.

- A. CORRECT ANSWER
- B. Plausible since there is no natural circulation flow, which would indicate a lack of heat transfer; however the loss of subcooling margin is a higher priority symptom.
- C. Plausible since SG pressure is below 960 psig and TC is lowering; however there is no natural circulation flow and the loss of subcooling margin is a higher priority symptom.
- D. Plausible if the examinee determines there is natural circulation flow.

Technical Reference(s): DB-OP-02000 RPS, SFAS, (Attach if not previously provided)  
SFRCS TRIP, OR SG TUBE  
RUPTURE (Rev 20)(Pages 19,  
21)

Proposed references to be provided to applicants during examination: None

Learning Objective: \_\_\_\_\_ (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 \_\_\_\_\_  
55.43 b.5

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	1
	Group #	_____	2
	K/A #	2.1.27 (032)	
	Importance Rating	_____	2.9

(K&A Statement) Conduct of Operations: Knowledge of system purpose and or function.

Proposed Question: SRO 82

Both Source Range Nuclear Instruments (NI1 and NI2) are required to be operable in \_\_\_\_\_.

- A. Mode 2 during a startup with the Intermediate range at  $5 \times 10^{-8}$  amps
- B. Mode 2 with the CRD breakers closed and the CRD system capable of rod withdrawal
- C. Mode 3 while withdrawing Group 1 Rods to the 100% position
- D. Mode 3 while deborating to the Estimated Critical Boron concentration

Proposed Answer: B. Mode 2 with the CRD breakers closed and the CRD system capable of rod withdrawal.

Explanation (Optional): TS Table 3.3-1 requires both Source Range NIs to be operable in Mode 2 with the CRD breakers closed and the CRD system capable of rod withdrawal.

- A. Plausible since they are both required while the Intermediate Range is  $< 10^{-10}$  amps.
- B. CORRECT ANSWER
- C. Plausible if the examinee does not know only one channel is required in Mode 3.
- D. Plausible if the examinee does not know only one channel is required in Mode 3.

Technical Reference(s): TS Table 3.3-1 Reactor Protection System Instrumentation  
DB-OP-06001 BORON CONCENTRATION CONTROL (Rev 11)(Page 5) (Attach if not previously provided)

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Proposed references to be provided to applicants during examination: None

Learning Objective: \_\_\_\_\_ (As available)

Question Source: Bank # \_\_\_\_\_  
 Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
 New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge X  
 Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: 55.41 \_\_\_\_\_  
 55.43 b.2

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	1
	Group #	_____	2
	K/A #	AA2.2 (A06)	_____
	Importance Rating	_____	4.2

(K&A Statement) Ability to determine and interpret the following as they apply to the (Shutdown Outside Control room) Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments.

Proposed Question: SRO 83

Plant conditions:

- The plant has been tripped due to a serious fire in the Control Room.
- All four RCPs are running.
- The Control Room staff has manned the appropriate stations outside the Control Room.
- DB-OP-02501, Serious Station Fire, has been implemented.
- DB-OP-06903, Plant Shutdown and Cooldown, is being referred to.
- RCS Pressure is 1675 psig and stable.
- RCS Tave is 450°F and lowering at 77°F/hr.

Event:

- HPI Pump 2 starts automatically
- Pressurizer level is 97 inches
- RCS Pressure is 1710 psig
- Cooldown rate is 80°F/hr

With the above conditions, \_\_\_\_\_.

- HPI Pump 2 will be stopped and RCS pressure will be reduced to 1650 so the SFAS signal can be blocked
- HPI Pump 2 will be stopped and Pressurizer level will be reduced to <85 inches to prevent an overpressurization potential
- HPI Pump 2 will be left running and RCS cooldown rate will be lowered to < 50°F/hr to prevent the development of a head bubble
- HPI Pump 2 will be left running and RCS cooldown rate will be raised to 100°F/hr to return the operating point to the desired envelope

Proposed Answer: B. HPI Pump 2 will be stopped and Pressurizer level will be reduced to <85 inches to prevent an overpressurization potential



Explanation (Optional): DB-OP-06903 states "Pressurizer level is limited to less than 85 inches when the RCS is less than 500°F until DH 11 and DH 12 are opened, DH 4849 is OPERABLE, and HPI Pump breakers are racked out (Ref: Serial 2460). DH 4849 provides over-pressurization protection in the event MU 32 fails open during MU System operation. If DH 4849 is, or becomes, inoperable, Tech Spec 3.4.2 shall be referred to and appropriate action taken." DB-OP-02501 has the operator open the breaker for HPI Pump 2 following the spurious SFAS actuation.

- A. Plausible since HPI Pump 2 will be stopped and the SFAS signal would normally be blocked in this pressure range; however it could be blocked at 1710 psig.
- B. CORRECT ANSWER
- C. Plausible if the examinee does not know the allowable cooldown rate is 100 °F/hr since the RCPs are operating and a head bubble will not form and that HPI Pump 2 will be stopped.
- D. Plausible since one of the goals is to return to the desired operating point after a transient; however the plant parameters are already within the window of the operating point and HPI Pump 2 will be stopped.

Technical Reference(s): DB-OP-06903 Plant Cooldown (Attach if not previously provided)  
 (Rev 27) (Page 10)  
 TS 3.4.2 Safety Valves  
 DB-OP-02501 SERIOUS  
 STATION FIRE (Rev 12)  
 (Page 23)

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Proposed references to be provided to applicants during examination: None

Learning Objective: \_\_\_\_\_ (As available)

Question Source: Bank # \_\_\_\_\_  
 Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
 New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
 Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 \_\_\_\_\_  
 55.43 b.1

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	1
	Group #	_____	2
	K/A #	EA2.2 (E09)	_____
	Importance Rating	_____	4.0

(K&A Statement) Ability to determine and interpret the following as they apply to the (Natural Circulation Cooldown) Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments

Proposed Question: SRO 84

Plant conditions:

- The plant tripped from 100% power due to a loss of all four RCPs.
- An SFRCS actuation on loss of four RCPs has started both Auxiliary Feedwater Pumps.
- SG 1 Level is 51 inches.
- SG 2 level is 55 inches.
- SG pressures are 715 psig.
- RCS Tave is 528°F.
- RCS Pressure is 2150 psig.
- A natural circulation cooldown is in progress.

Which ONE of the following actions must be taken prior to blocking the SFRCS Low Pressure trip?

- A. Reduce both SG levels to <50 inches.
- B. Start the Motor Driven Feedwater Pump.
- C. Verify BOTH MFPs are tripped, or disabled by closing manual valves.
- D. Verify the RCS is borated to the Boron Concentration to ensure 1% Shutdown Value With Tavg <300°F.

Proposed Answer: C. Verify BOTH MFPs are tripped, or disabled by closing manual valves.

Explanation (Optional): TS 3.7.9 Requires both SG levels to be  $\leq 50$  inches with the SFRCS Low Pressure trip bypassed and a MFP capable of supplying the SGs while in Mode 3. Since SG level will have to be maintained high for natural circulation flow the MFPs will have to be tripped or disabled to satisfy the TS.

- 
- A. Plausible since the TS could be met by lowering SG levels: however SG level setpoint is 55 inches in this situation.
  - B. Plausible since running a MDFP could feed the SGs; however the MFPs would still have to be disabled.
  - C. CORRECT ANSWER
  - D. Plausible since borating the RCS is required; however the RCS is borated to the Boron Concentration to Ensure 1% Shutdown Value With TAVG <500°F and >300°F.

Technical Reference(s): TS 3.7.9 Steam Generators (Attach if not previously provided)  
DB-OP-02000 RPS, SFAS,  
SFRCS TRIP, OR SG TUBE  
RUPTURE (Rev 20)(Page 245)

Proposed references to be provided to applicants during examination: None

Learning Objective: \_\_\_\_\_ (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 \_\_\_\_\_  
55.43 b.2

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	1
	Group #	_____	2
	K/A #	2.4.31 (E13)	
	Importance Rating	_____	3.4

(K&A Statement) Emergency Procedures / Plan Knowledge of annunciators, alarms and indications, and use of the response instructions.

Proposed Question: SRO 85

Plant conditions:

- The plant tripped from 100% power due to a large SG 2 tube leak.
- The RCS was experiencing increased activity prior to the trip due to a leaking fuel assembly.
- SFAS Level 2 has actuated.
- DB-OP-02000, Section 8, has been implemented for the Tube Rupture.
- SG 2 level is at 201 inches and rising at 3 inches per minute.
- RCS pressure is at 1120 psig and lowering at 10 psig per minute.
- RCS temperature is 520°F.
- RCS cooldown rate is 72°F/hr.
- RC2, Pressurizer Spray Valve, is stuck closed.
- Main Condenser Vacuum is 20" HgA and rising.

Which ONE of the following actions must be taken?

- A. Stop steaming the SG 2 by performing a SG Isolation.
- B. Raise the steaming on SG 2 to a maximum RCS cooldown rate of 100°F/hr.
- C. Open RC239A, PZR Steam Space Sample Valve until RCS pressure is reduced to <1000 psig.
- D. Reduce RCS Pressure close to the minimum adequate SCM by manually cycling the PORV and pressurizer heaters.

Proposed Answer: D. Reduce RCS Pressure close to the minimum adequate SCM by manually cycling the PORV and pressurizer heaters.

Explanation (Optional): DB-OP-02000 Note states "The decision to use the PORV Method or the PZR Vent Line Method should be based on the rate the affected SG(s) is filling OR the rate activity is being released to the environment. The Pressurizer Vent Line method is the preferred method unless SG level will reach 220 inches before RCS pressure is less than 1000 psig or a significant release to the environment from the affected SG is in progress." SG level will reach 220 inches before pressure is <1000 psig so the PORV method should be used to prevent the potential of lifting the SG AVVs or Safety Valves.

- A. Plausible since isolating the SG will be accomplished; however RCS pressure is too high at this point to prevent lifting the AVVs.
- B. Plausible since raising the steaming rate of the affected SG is an action that will be taken; however the cooldown rate target is 235°F/hr not 100°F/hr.
- C. Plausible since using the pressurizer vent line would be the correct action if RCS pressure could be lowered to <1000 psig prior to reaching 220 inches in the SG; however the SG will reach 220 inches before pressure is <1000 psig. In addition the vent line would only be manually cycled not just opened until RCS pressure was <1000 psig.
- D. CORRECT ANSWER

Technical Reference(s): DB-OP-02000 RPS, SFAS, (Attach if not previously provided)  
SFRCS TRIP, OR SG TUBE  
RUPTURE (Rev 20)(Section 8,  
Pages 111, 115)

Proposed references to be provided to applicants during examination: None

Learning Objective: \_\_\_\_\_ (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 \_\_\_\_\_  
55.43 b.4

Comments:



Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	2
	Group #	_____	1
	K/A #	2.1.33 (004)	_____
	Importance Rating	_____	4.0

(K&A Statement) Conduct of Operations: Ability to recognize indications for system operating parameters which are entry-level conditions for technical specifications.

Proposed Question: SRO 86

Plant conditions:

- The plant is in Hot Standby coming out of a refueling outage.
- Makeup Pump 2 is running.
- No other plant equipment problems exist.

Event:

- Makeup Pump 1 Suction Valve, MU6405, is selected to the Makeup Tank and its controller is being worked on due to failure to switch to the BWST.

Given the above conditions, the plant \_\_\_\_\_.

- can remain in Hot Standby provided DH7B is returned to service within 72 hours
- can remain in Hot Standby because a Boron Injection flowpath from the BWST to the RCS via the Decay Heat Removal Pump still exists
- must be placed in Hot Shutdown within six hours due to not having two operable Boron Injection flowpaths from the BWST
- must be placed in Cold Shutdown due to not having any operable flowpaths

Proposed Answer: A. can remain in Hot Standby provided DH7B is returned to service within 72 hours

Explanation (Optional):

- CORRECT ANSWER
- Plausible since this flowpath exists: however in Hot Standby RCS pressure is greater than DH Removal Pump discharge pressure.
- Plausible since the plant would have to be placed in Cold Shutdown if neither flowpath was available; however there is a flowpath from the BWST via DH Pump 1.
- Plausible since the plant would have to be placed in Cold Shutdown if both flowpaths were lost; however one flowpath does exist from the BWST via DH Pump 1.

Technical Reference(s): TS 3.1.2.2.b Flow Paths - Operating (Attach if not previously provided)

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\_\_\_\_\_

Proposed references to be provided to applicants during examination: None

Learning Objective: \_\_\_\_\_ (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge X  
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: 55.41 \_\_\_\_\_  
55.43 b.2

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	2
	Group #	_____	1
	K/A #	2.1.32 (005)	_____
	Importance Rating	_____	3.8

(K&A Statement) Conduct of Operations: Ability to explain and apply all system limits and precautions.

Proposed Question: SRO 87

Plant conditions:

- The plant is in Mode 6 with core reload in progress.
- Water level in the Refueling Canal is 23.2 feet above the active fuel.
- Decay Heat Removal Pump 2 is OOS for maintenance for 72 hours.

Event:

- Decay Heat Removal Pump 1 tripped 20 minutes ago due to a motor failure.

Given the above conditions, core reload \_\_\_\_\_.

- A. can continue for another 40 minutes if Decay Heat Removal Pump 1 is not returned to service
- B. can continue since there is >23 feet of water above the active fuel
- C. must be suspended and all Containment penetrations closed within four hours
- D. must be suspended due to the inability to maintain core temperature below 212°F

Proposed Answer: C. must be suspended and all Containment penetrations closed within four hours

Explanation (Optional): TS 3.9.8.1 requires the DH Removal loop to be in operation to ensure sufficient cooling capacity is available to remove decay heat and maintain reactor vessel water temperature <140°F. With no Decay Heat Removal Pumps available all operations involving an increase in reactor decay heat load must be suspended.

- A. Plausible since The Decay Heat Removal Loop can be removed from service for up to one hour in an 8 hour period during Core Alterations; however this situation was a trip of the pump and no backup is available.
- B. Plausible since core alterations can be conducted with level >23 feet and the DH Removal Pump off; however this situation was a trip of the pump and no backup is available.
- C. CORRECT ANSWER
- D. Plausible since Technical Specification for Mode 6 is 140°F, not 212°F. At 212°F the core would start boiling and additional actions are required.

Technical Reference(s): TS 3.9.8.1 and Basis Decay Heat Removal and Coolant Circulation All Levels (Attach if not previously provided)

\_\_\_\_\_

\_\_\_\_\_

Proposed references to be provided to applicants during examination: None

Learning Objective: \_\_\_\_\_ (As available)

Question Source: Bank # \_\_\_\_\_

Modified Bank # \_\_\_\_\_ (Note changes or attach parent)

New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge X

\_\_\_\_\_

10 CFR Part 55 Content: 55.41 \_\_\_\_\_

55.43 b.2

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	2
	Group #	_____	1
	K/A #	A2.03 (007)	_____
	Importance Rating	_____	3.9

(K&A Statement) Ability to (a) predict the impacts of the following malfunctions or operations on the P S; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations:  
Overpressurization of the PZR

Proposed Question: SRO 88

Plant conditions:

- The plant is at 100% power.
- RC222, Quench Tank Vent, is open to reduce Quench Tank pressure.
- All other equipment lineups are normal.

Event:

- The Turbine tripped on a generator fault.
- The reactor failed to automatically trip but was manually tripped.
- The PORV opened following the turbine trip and did not fully seat.
- DB-OP-06004, Quench Tank Procedure is being referred to.
- RCS pressure is 1900 psig and lowering at 10 psig/hour.
- Containment pressure is 14.7 psia and steady.

Given the above conditions, the Quench Tank pressure \_\_\_\_\_.

- and temperature will rise and RC222, Quench Tank Vent, will have to be closed IAW Section 2.0, Limits and Precautions, to prevent water carryover to the Waste Gas System
- and temperature will rise and temperature will have to be lowered manually IAW Section 4.5, Lowering Quench Tank Temperature Manually, to prevent Rupture Disk failure
- will remain steady and level will rise requiring it to be lowered manually IAW Section 4.2, Lowering Quench Tank Level Manually, to prevent Quench Tank overflow
- will rise and level will remain steady requiring pressure to be lowered manually IAW Section 4.3, Lowering Quench Tank Pressure Manually, to prevent lifting Quench Tank Relief Valve

Proposed Answer: A. and temperature will rise and RC222 will have to be closed IAW Section 2.0 Limits and Precautions

Explanation (Optional): DB-OP-06004 limit and precautions states "RC222, QUENCH TANK VENT TO VENT HEADER, should be kept closed during steam discharge into the Quench Tank to minimize water carryover to the Gaseous Radwaste System."

- A. CORRECT ANSWER
- B. Plausible since pressure and temperature will rise; however the Quench Tank Recirc Pump should start automatically to lower temperature.
- C. Plausible since level will rise; however the Quench Tank Discharge Valve to the RCDT should open automatically to control level.
- D. Plausible since pressure will rise; however RC222 should be closed to prevent water carryover to the vent header.

Technical Reference(s): DB-OP-06004 Quench Tank (Attach if not previously provided)  
(Rev 7)(Pages 3, 31)

Proposed references to be provided to applicants during examination: None

Learning Objective: \_\_\_\_\_ (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 \_\_\_\_\_  
55.43 b.5

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	2
	Group #	_____	1
	K/A #	A2.06 (012)	_____
	Importance Rating	_____	4.7

(K&A Statement) Ability to (a) predict the impacts of the following malfunctions or operations on the RPS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Failure of RPS signal to trip the reactor

Proposed Question: SRO 89

Plant conditions:

- The plant was at 74% power following a power reduction and securing of RCP 1-1 due to a problem with the motor.

Event:

- A small steam leak has occurred in Containment.
- Reactor power rises to 82%.
- RCS Pressure is 1970 psig and rising.
- RCS Tave is 574°F and rising.
- Pressurizer level is 195 inches and rising.
- Containment pressure is 18.3 psia and rising.

Given the above conditions, \_\_\_\_\_ assumed in the Accident Analysis.

- reduce power to <75% IAW DB-OP-06902, Power Operations, to prevent going below the minimum allowable DNBR value
- the reactor must be tripped IAW DB-OP-02000, RPS, SFAS, SFRCS TRIP, or SG Tube Rupture, to prevent exceeding the initial condition maximum allowable flux value
- reduce power to <75% IAW DB-OP-06902, Power Operations, to prevent exceeding the initial condition LOCA kw/ft
- a rapid shutdown must be commenced IAW DB-OP-02504, Rapid Shutdown, to prevent exceeding the containment maximum design conditions

Proposed Answer: B. the reactor must be tripped IAW DB-OP-02000, RPS, SFAS, SFRCS TRIP, or SG Tube Rupture, to prevent exceeding the initial condition maximum allowable flux value



Explanation (Optional): The maximum power level for three RCPs operating in TS 2.2 Limiting Safety System Setpoints has been exceeded and the reactor must be tripped to prevent going below the minimum allowable DNBR.

- A. Plausible since DNBR is the concern, however the reactor should be tripped, not reduced in power.
- B. CORRECT ANSWER
- C. Plausible since 75% power would be the runback setpoint for the ICS for three RCPs; however a trip setpoint has been reached and the reactor should be tripped.
- D. Plausible since Containment Pressure is rising; however a trip setpoint has been reached and the reactor should be tripped preventing a challenge to the Containment High Pressure trip.

Technical Reference(s): TS 2.2 and Basis (Attach if not previously provided)

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Proposed references to be provided to applicants during examination: None

Learning Objective: \_\_\_\_\_ (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 \_\_\_\_\_  
55.43 b.5

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	2
	Group #	_____	1
	K/A #	2.1.14 (026)	_____
	Importance Rating	_____	3.3

(K&A Statement) Conduct of Operations: Knowledge of system status criteria which require the notification of plant personnel.

Proposed Question: SRO 90

With the plant in Mode 3, which ONE of the following conditions would require notification of the Duty Operations Manager and the Duty Plant Manager?

- A. Winter Storm Watch is issued for Ottawa County.
- B. Containment Spray Pump 1 trips on overcurrent during a routine surveillance test.
- C. Receipt of annunciator 5-6-G RPS Shutdown Bypass initiated during RPS testing.
- D. A planned Yellow Risk Category entry due to maintenance on the Decay Heat Removal Pump.

Proposed Answer: B. Containment Spray Pump 1 trips on overcurrent during a routine surveillance test.

Explanation (Optional): Examinee must recognize entry into TS 3.6.2.1 Containment Spray System which is applicable in Mode 3. DB-OP-00002 requires notification of the Duty Operations Manager and the Duty Plant Manager for unplanned entry into a TS LCO.

- A. Plausible since an would require notification for a Storm Warning.
- B. CORRECT ANSWER
- C. Plausible since equipment malfunction (including an alarm or condition which cannot be reset or corrected by the operators which may affect the plant or public safety) would require notification; however this is an expected alarm during the RPS surveillance testing.
- D. Plausible since an unplanned entry into a higher risk category would require notification.

Technical Reference(s): DB-OP-00002 Operations Section Event/Incident Notifications And Actions (Rev 17) (Page 19) TS 3.6.2 Containment Spray System (Attach if not previously provided)

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Proposed references to be provided to applicants during examination: None

Learning Objective: OPS-GOP-510-01K (As available)

Question Source: Bank # \_\_\_\_\_  
 Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
 New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge X  
 Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: 55.41 \_\_\_\_\_  
 55.43 b.5

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	2
	Group #	_____	2
	K/A #	2.4.31 (016)	_____
	Importance Rating	_____	3.4

(K&A Statement) Emergency Procedures / Plan Knowledge of annunciators, alarms and indications, and use of the response instructions.

Proposed Question: SRO 91

Plant conditions:

- The plant is at 100% power.
- Normal equipment lineups exist.

Event:

- All ICS HAND/AUTO station lights are off.
- Annunciator Alarms Received:
  - 14 5-C, ICS HIGH LOAD LIMIT
  - 14 2 D, ICS/NNI 118V AC PWR TRBL
- Computer Alarms Received:
  - Q546, ICS IN TRACK
  - Q525, ICS/NNI 118 VAC PWR TRBL

With the above conditions, \_\_\_\_\_.

- A. power will have to be manually reduced IAW DB-OP-06401, Rapid Power Reduction, due to the Turbine Bypass Valves failing open
- B. power will be stabilized with the ICS in Hand IAW DB-OP-06401, Integrated Control System Operating Procedure, and the Turbine Bypass Valves will be operated manually if needed
- C. the reactor will be manually tripped IAW DB-OP-02532, Loss of NNI/ICS Power, and the Atmospheric Vent Valves will be operated in Hand control
- D. the reactor will automatically trip and Main Feedwater control valves will have to be controlled manually IAW DB-OP-02000, Specific Rule 4

Proposed Answer: C. the reactor will be manually tripped IAW DB-OP-02532 Loss Of NNI/ICS Power and the Atmospheric Vent Valves will be operated in Hand control

Explanation (Optional): DB-OP-02532 requires the reactor to be tripped as an immediate action on Loss of ICS AC Power, DC Power or Both and the above indications are for a loss of ICS AC power.

- A. Plausible since the Turbine Bypass Valves are affected; however they fail closed.
- B. Plausible since the Turbine Bypass Valves are affected; however they fail closed and the reactor will be manually tripped.
- C. CORRECT ANSWER
- D. Plausible since the reactor will automatically trip on high pressure due to loss of Main Feedwater; however the Main Feedwater Block Valves fail closed so AFW will have to be used.

Technical Reference(s): DB-OP-02532 Loss Of NNI/ICS Power (Rev 6)(Pages 8, 14, 34) (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: \_\_\_\_\_ (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 \_\_\_\_\_  
55.43 b.5

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	2
	Group #	_____	2
	K/A #	2.4.30 (033)	_____
	Importance Rating	_____	3.6

(K&A Statement) Emergency Procedures / Plan Knowledge of which events related to system operations/status should be reported to outside agencies.

Proposed Question: SRO 92

Which ONE of the following would require notification of the NRC Region III within four hours of occurrence?

- A trip of the running Spent Fuel Cooling Pump.
- Receipt of Annunciator Alarm 3-3-B, SFP TEMP HI, due to a trip of the running CCW Pump.
- The standby Emergency Ventilation System train servicing the Spent Fuel Pool becomes inoperable.
- A pipe wall leak at the Spent Fuel Cooling Pump common suction valve SF6 resulting in a Spent Fuel Pool level of 22.5 feet above the fuel.

Proposed Answer: D. A leak at the Spent Fuel Cooling Pump common suction valve SF6 resulting in a Spent Fuel Pool level of 22.5 feet above the fuel.

Explanation (Optional): DB-OP-00002 Event Notification Worksheet requires 4 hour notification for either one of the following:

- A defect in any spent fuel storage structure, system, or component important to safety.
- A significant reduction in the effectiveness of any spent fuel storage confinement system during use.

The leak put the Spent Fuel Pool level below the TS limit of 23 feet and is in the common suction line which will affect the ability to operate either pump until repaired, which meets either requirement.

- Plausible since loss of one pump could be a reduction in effectiveness; however the second pump is available and one Decay Heat Removal Pump is required to be available as a backup to the SF System.
- Plausible since loss of one CCW pump could be a reduction in effectiveness; however the second pump is available and one Decay Heat Removal Pump is required to be available as a backup to the SF System.
- Plausible since this is a TS entry condition; however it is not a significant event with one Emergency Ventilation System train in operation so the only required notification is the NRC Site Representative.
- CORRECT ANSWER



Technical Reference(s): DB-OP-00002 Operations Section Event/Incident Notifications And Actions (Rev 17)(Pages 12, 16) (Attach if not previously provided)  
 TS 3.9.11 Storage Pool Water Level  
 TS 3.9.12 Storage Pool Ventilation

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Proposed references to be provided to applicants during examination: None

Learning Objective: \_\_\_\_\_ (As available)

Question Source: Bank # \_\_\_\_\_  
 Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
 New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge X  
 Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: 55.41 \_\_\_\_\_  
 55.43 b.7

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	2
	Group #	_____	2
	K/A #	A2.03 (035)	
	Importance Rating	_____	3.6

(K&A Statement) Ability to (a) predict the impacts of the following malfunctions or operations on the S/GS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Pressure/level transmitter failure

Proposed Question: SRO 93

Plant conditions:

- The plant is at 100% power.
- Normal equipment lineups exist.

Event:

- SG 2 Outlet Pressure Transmitter, PT SP12A1, fails high without a SASS actuation.

With the above conditions, \_\_\_\_\_.

- to maintain the plant at power both Main Feedwater H/A stations will be placed in manual IAW DB-OP-02014, Annunciator Alarm 14-6-F, ICS SG 2 BTU LIMIT, due to reducing feedwater flow
- to maintain the plant at power the Turbine Bypass Valves will have to be placed in manual and closed IAW DB-OP-02014, Annunciator Alarm 14-3-F, HPT MN STM PRESS, due to the rising SG pressure indication
- the reactor will trip and only Loop 2 Main Feedwater H/A station will have to be placed in manual IAW DB-OP-02000, Specific Rule 4, Steam Generator Control, due to reducing feedwater flow
- the reactor will trip and the Atmospheric Vent Valves will have to be placed in manual and closed IAW DB-OP-02000, Section 7, Overcooling, due to the reduction in SG 2 pressure

Proposed Answer: D. the reactor will trip and the Atmospheric Vent Valves will have to be placed in manual and closed IAW DB-OP-02000 Section 7, Overcooling, due to the reduction in SG 2 pressure.

Explanation (Optional): OPS-SYS-I515.03 describes the affect if # 2 SG press fails high: "Due to changes in turbine configuration this is pretty much non survivable from 100% due to turbine CV arrangement. Over power trips come in due to MTC effects on reactivity once the AVV and TBVs on this side open when press gets to 1035." DB-OP-02000 Section 7 Overcooling will require initiating Attachment 20 To isolate the sources of the overcooling.

- 
- A. Plausible since this is an action to take for this alarm; however with the given failure the reactor will trip and manual control will not be necessary.
  - B. Plausible since this is an action that will have to be taken; however the reactor will trip in this situation.
  - C. Plausible since the reactor will trip; however manual control of feedwater will not be necessary since the low level limit control is downstream of the BTU limit.
  - D. CORRECT ANSWER

Technical Reference(s): OPS-SYS-I515.03 Integrated Master (Rev 3)(Page 11) (Attach if not previously provided)  
 DB-OP-02000 RPS, SFAS, SFRCS TRIP, OR SG TUBE RUPTURE (Rev 20)(Pages 75, 260, 364)  
 DB-OP-02014, Annunciator Alarm (14-3-F) HPT MN STM PRESS (Rev 4) (Page 29)  
 DB-OP-02014, Annunciator Alarm (14-6-F) ICS SG 2 BTU LIMIT Rev 4) (Page 63)

Proposed references to be provided to applicants during examination: None

Learning Objective: \_\_\_\_\_ (As available)

Question Source: Bank # \_\_\_\_\_  
 Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
 New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
 Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 \_\_\_\_\_  
 55.43 b.5

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	3
	Group #	_____	1
	K/A #	2.1.20	_____
	Importance Rating	_____	4.2

(K&A Statement) Conduct of Operations: Ability to execute procedure steps.

Proposed Question: SRO 94

Prior to lowering any engaged or disengaged grapple, the indexed position of the fuel handling bridge shall be \_\_\_\_\_.

- A. independently verified by an individual that is not aware of the specified bridge and mast position
- B. concurrently verified by an individual that is not aware of the specified bridge and mast position
- C. concurrently verified by the individual that directed the bridge operator to the specified bridge and mast locations
- D. independently verified by the individual that directed the bridge operator to the specified bridge and mast locations

Proposed Answer: A. independently verified by an individual that is not aware of the specified bridge and mast position

Explanation (Optional): DB-NE-06101 Limits and Precautions Note states "When a second individual assists the bridge operator by directing motion to fine tune the bridge location, the individual can still perform the independent verification."

- A. CORRECT ANSWER
- B. Plausible if the examinee does not know the person involved in fine tuning the bridge location can be used for independent verification.
- C. Plausible since the person that assisted in fine tuning the bridge can be used; however independent verification is required.
- D. Plausible since the person independent verification is required: however it can not be the person directing fuel operations.

Technical Reference(s): DB-NE-00003, (Attach if not previously provided)  
FUEL/COMPONENT SHUFFEL  
(Rev 8)(Page 4)

Proposed references to be provided to applicants during examination: None

Learning Objective: \_\_\_\_\_ (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge X  
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: 55.41 \_\_\_\_\_  
55.43 b.7

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	3
	Group #	_____	2
	K/A #	2.2.33	_____
	Importance Rating	_____	2.9

(K&A Statement) Equipment Control: Knowledge of control rod programming.

Proposed Question: SRO 95

Plant conditions:

- The plant is in Mode 2 preparing for an approach to criticality.
- Maintenance has been completed within the Control Rod Patch Panels.

As a minimum, the Control Rod programming must be verified correct using \_\_\_\_\_.

- Absolute Position indicators and moving each affected control rod group following the maintenance
- Absolute Position indicators and moving each affected assembly following the maintenance
- Absolute and Relative Position indicators and moving each group after the control rod drive patches are locked
- Absolute and Relative Position indicators and moving each assembly after the control rod drive patches are locked

Proposed Answer: D. Absolute and Relative Position indicators and moving each assembly after the control rod drive patches are locked

Explanation (Optional): TS 3.1.3.7 Rod Program Surveillance Requirements for maintenance within the patch panel requires the control rod patches to be locked following then maintenance and then each assembly must be selected and actuated from the control room and verification of movement of the proper rod by both absolute and relative position indicators.

- Plausible if the examinee does not know absolute and relative indications must be used and each rod must be tested after the panels are locked.
- Plausible since moving each assembly is required; however both the absolute and relative indicators must be used and the panels must be locked.
- Plausible since both indications must be used and the panels must be locked; however each assembly must be tested..
- CORRECT ANSWER

Technical Reference(s): TS 3.1.3.7 Rod Program (Attach if not previously provided)  
Surveillance Requirements

Proposed references to be provided to applicants during examination: None

Learning Objective: \_\_\_\_\_ (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge X  
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: 55.41 \_\_\_\_\_  
55.43 b.6

Comments:



Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	3
	Group #	_____	2
	K/A #	2.2.7	_____
	Importance Rating	_____	3.2

(K&A Statement) Equipment Control: Knowledge of the process for conducting tests or experiments not described in the safety analysis report.

Proposed Question: SRO 96

The plant is in Mode 3 performing an HPI flow surveillance test for operability determination.

An engineer involved in the test has requested that the discharge valve on HPI Pump 1 be throttled to 75% to evaluate the affect on running current after the pump has been started.

In this situation, performance of the test can be approved after \_\_\_\_\_.

- A. a cross-discipline review is completed
- B. completing a 10 CFR 50.59 evaluation
- C. concurrence of a second SRO is obtained
- D. obtaining permission from the Shift Manager

Proposed Answer: B. completing a 10 CFR 50.59 evaluation

Explanation (Optional): Performing this additional test without prior evaluation could result in performing a test outside the bounds of the UFSAR, which requires a 10 CFR 50.59 evaluation before continuing.

- A. Plausible since a cross-discipline review will be performed; however the test can not be approved without a 10 CFR 50.59 evaluation.
- B. CORRECT ANSWER
- C. Plausible if the examinee thinks the test can be performed without any approvals after the pump start test is performed.
- D. Plausible since the Shift Manager can provide approval for emergent changes on back shifts.

Technical Reference(s): NOBP-LP-4003A, FENOC 10 (Attach if not previously provided)  
CFR 50.59 User Guidelines  
(Rev 3)(Page 56)

Proposed references to be provided to applicants during examination: None

Learning Objective: \_\_\_\_\_ (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge X  
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: 55.41 \_\_\_\_\_  
55.43 b.1

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	3
	Group #	_____	3
	K/A #	2.3.1	_____
	Importance Rating	_____	3.0

(K&A Statement) Radiation Control: Knowledge of 10CFR20 and related facility radiation control requirements

Proposed Question: SRO 97

Which of the following parameter limits is established to ensure that any radioactivity released to the environment will remain within the limits of 10 CFR 20, Standards for Protection Against Radiation?

- A. Primary system activity
- B. Secondary system activity
- C. Primary to secondary leakage
- D. Liquid Waste discharge activity

Proposed Answer: D. Liquid Waste discharge activity

Explanation (Optional): Only choice with limits related to 10CFR20 release to unrestricted areas.

- A. Plausible if the examinee does not know Primary system activity ensures small fraction of limits of 10CFR100 will not be exceeded for an accident.
- B. Plausible if the examinee does not know Secondary system activity is caused by primary to secondary leakage and level of primary activity. No relation to 10CFR20 limits.
- C. Plausible if the examinee does not know Primary to secondary leakage is related to primary activity, and ensures small fraction of 10CFR 100 limits are not exceeded in an accident.
- D. CORRECT ANSWER

Technical Reference(s): ODCM (Rev 21) (Page 1) (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: OPS-GOP-521-01K (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New X

Question History: Last NRC Exam 2005

Question Cognitive Level: Memory or Fundamental Knowledge X  
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: 55.41 \_\_\_\_\_  
55.43 b.2,  
b.4

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	3
	Group #	_____	3
	K/A #	2.3.10	_____
	Importance Rating	_____	3.3

(K&A Statement) Radiation Control: Ability to perform procedures to reduce excessive levels of radiation and guard against personnel exposure.

Proposed Question: SRO 98

Plant conditions:

- RP has detected a Hot Spot on an elbow in the discharge piping of Makeup Pump 2.
- A suggestion has been made to hang lead blankets from the MUP 2 recirculation line to reduce the dose rate.

This plan of action \_\_\_\_\_.

- A. can be authorized by the Shift Manager
- B. requires a temporary modification prior to implementation
- C. requires an Engineering Evaluation prior to implementation
- A. can be authorized by the Manager - RP

Proposed Answer: C. requires an Engineering Evaluation prior to implementation

Explanation (Optional):

- A. Plausible since the Shift Manager concurs with the shielding; however an Engineering Evaluation is required.
- B. Plausible since this would normally only be a temporary modification; however an Engineering Evaluation is required.
- C. CORRECT ANSWER
- D. Plausible since the Supervisor - RP has to review the form, not the Manager – RP.

Technical Reference(s): DB-HP-01802 Control of Shielding (Rev 9) (Page 10) (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: OPS-GOP-I511-06 (As available)

Question Source: Bank # 28873  
Modified Bank #                      (Note changes or attach parent)  
New                                     

Question History: Last NRC Exam                                     

Question Cognitive Level: Memory or Fundamental Knowledge                       
Comprehension or Analysis                     X                    

10 CFR Part 55 Content: 55.41                       
55.43                     b.4                    

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	3
	Group #	_____	4
	K/A #	2.4.36	_____
	Importance Rating	_____	2.8

(K&A Statement) Emergency Procedures / Plan: Knowledge of chemistry / health physics tasks during emergency operations.

Proposed Question: SRO 99

Which ONE of the following is a primary responsibility of the Emergency Radiological Protection Manager following activation of the Emergency Response Organization due to a plant event?

- A. Approving all exposures in excess of 10 CFR 20, Standards for Protection Against Radiation, limits.
- B. Making protective action recommendations to state and local authorities.
- C. Approving changes in the emergency classification based on radiological conditions.
- D. Recommending in writing, to the Emergency Director the need for KI administration to essential personnel.

Proposed Answer: D. Recommending in writing, to the Emergency Director the need for KI administration to essential personnel.

Explanation (Optional): RA-EP-02620 lists as one of the duties of the Emergency Radiological Protection Manager to evaluate, recognize and formally recommend in writing, to the Emergency Director the need for emergency dose authorization and KI administration to essential personnel at DBNPS.

- A. Plausible since he should be recommending the authorization; however it is not his responsibility to approve them.
- B. Plausible since he will probably be involved in the decision-making; however approval is not required.
- C. Plausible since he will probably be involved in the decision-making; however approval is not required.
- D. CORRECT ANSWER

Technical Reference(s): RA-EP-02620 Emergency Dose Control and Potassium Iodide Distribution (Rev 5)(Pages 4, 6) (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: \_\_\_\_\_ (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge X  
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: 55.41 \_\_\_\_\_  
55.43 b.4

Comments:



Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	3
	Group #	_____	4
	K/A #	2.4.28	_____
	Importance Rating	_____	3.3

(K&A Statement) Emergency Procedures / Plan: Knowledge of procedures relating to emergency response to sabotage.

Proposed Question: SRO 100

Plant conditions:

- The plant is in Mode 6 preparing for refueling operations.
- The Shift Manager has just received a report from the Supervisor-Shift Security that a security threat exists with a potential for industrial sabotage.

In this situation, the Shift Manager must \_\_\_\_\_.

- implement a Site Evacuation IAW DB-OP-02544, Security Events or Threats
- declare an Unusual Event and activate the Emergency Organization IAW RA-EP-01600, Unusual Event
- notify the NRC within four hours IAW DB-OP-00002, Operations Section Event/Incident Notifications and Actions
- initiate Containment Closure IAW DB-PF-03270, Containment Atmosphere Closure Verification for Core Alterations

Proposed Answer: B. declare an Unusual Event and activate the Emergency Organization IAW RA-EP-1600, Unusual Event

Explanation (Optional): RA-EP-1500 requires declaring an unusual event based on the security report.

- Plausible since this is an action that may be taken if there was an Imminent Airborne Attack.
- CORRECT ANSWER
- Plausible since the NRC will have to be notified; however they must be notified within one hour due to the Unusual Event declaration.
- Plausible since containment closure may be required for some intrusion events; however it is not required for a sabotage threat.

Technical Reference(s): RA-EP-1500 Emergency Classification (Rev 7)(Page 50) (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: \_\_\_\_\_ (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge X  
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: 55.41 \_\_\_\_\_  
55.43 b.5

Comments: