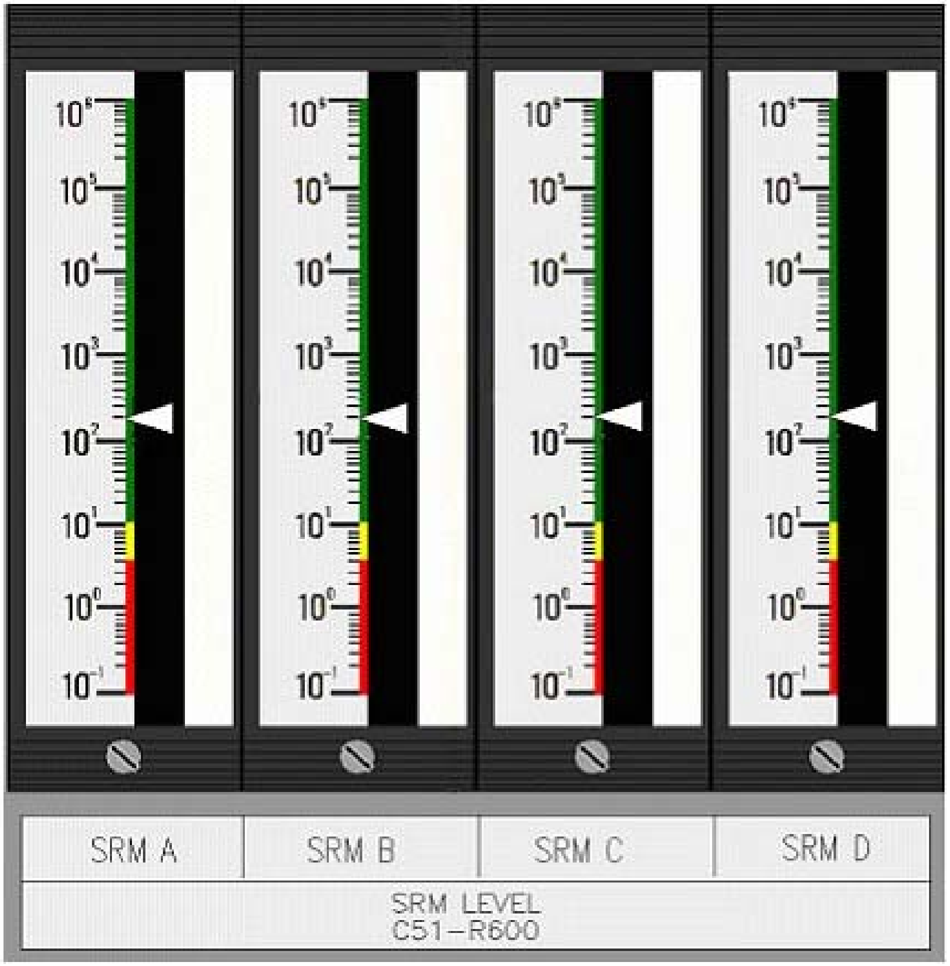
1. The initial SRM count rates are as observed below.



The Unit Two control room staff is ready to withdraw control rods for a reactor startup.

Which one of the following identifies when criticality is expected to be achieved IAW 0GP-02, Approach To Criticality and Pressurization of the Reactor?

A. At ~800 cpm

B. At ~1000 cpm

C. At ~3200 cpm

D. At ~6400 cpm

2. Unit Two is in MODE 2 starting up after a refueling outage.
The 2A CRD Pump has tripped and the operator is unable to restart the pump.

The following conditions exist:

Reactor water level	187 inches
Reactor power	Range 8 on all IRM's
Reactor pressure	700 psig
Charging water pressure	700 psig
Reactor temperature	505°F
2B CRD Pump	Out-of-service

Which one of the following identifies when a manual scram is required to be inserted IAW 0AOP-02.0, Control Rod Malfunction/Misposition?

A. If one control rod scrams.

B. If there are nine or more inoperable rods.

C. If A-05 (3-2) *Rod Drift* alarms due to a single control rod drift.

D. If A-07 (6-1) *CRD Accum Lo Press Hi Level* alarms due to low pressure.

3. Unit One is operating at 32% power when one of the four Main Steam Line Flow Transmitter inputs to the Feedwater Level Control System has failed downscale.

   Which one of the following identifies the effect this will have, if any, on the RWM?

   The RWM will:

   A. display BYPASSED.

   B. provide alarms ONLY.

   C. provide alarms and enforce rod blocks.

   D. NOT provide alarms or enforce rod blocks.

4. The BOP operator is aligning RHR Loop B to transfer water from the Suppression Pool to the Auxiliary Surge Tank.

   Which one of the following identifies how far the suppression pool level is expected to drop if 3,100 gallons is transferred IAW 1OP-17, Residual Heat Removal System Operating Procedure?

   A. ~½ inch

   B. ~1½ inch

   C. ~4 inches

   D. ~5 inches

5. Unit Two was operating at rated power when a LOCA occurred. ADS has automatically initiated and reactor pressure is lowering.

   Which one of the following identifies the highest reactor pressure that will allow RHR injection flow to be seen on E11-FI-R603B, RHR System B Flow?

   A. ~400 psig.

   B. ~300 psig.

   C. ~200 psig.

   D. ~100 psig.

6. Unit Two is in day 4 of a refueling outage with RHR Loop 2B operating in Shutdown Cooling IAW 2OP-17, Residual Heat Removal System Operating Procedure.

   Which one of the following completes the statements below?

   The lowest reactor pressure that will cause a Group 8 isolation is __(1)__ psig.

   The Group 8 isolation pressure signal __(2)__ cause E11-F015B, Inboard Injection Vlv to auto close.

   A. (1) ~135
      (2) will

   B. (1) ~135
      (2) will NOT

   C. (1) ~200
      (2) will

   D. (1) ~200
      (2) will NOT

7. During accident condition on Unit Two the following plant conditions exist:

RPV water level	-30 inches
Reactor power	4%
Suppr pool temp	142°F
Suppr pool level	-24 inches

HPCI operation is required.

Which one of the following identifies:
(1) the preferred suction source for HPCI and
(2) the reason that suction source is preferred?

A. (1) Suppression pool.
   (2) To prevent continued rise in suppression pool level.

B. (1) Suppression pool.
   (2) To provide a warmer source of injection to the reactor.

C. (1) CST.
   (2) To prevent damage to the HPCI pump due to cavitation.

D. (1) CST.
   (2) To prevent overheating of HPCI lubricating and control oil.

8. Which one of the following identifies the Unit Two HPCI turbine speed control power supply?

   A. 125 VDC Panel 3A

   B. 125 VDC Panel 3B

   C. 125 VDC Panel 4A

   D. 125 VDC Panel 4B

9. Unit Two is operating at rated power when the following alarm is received:

   A-01 (2-10) *Core Spray Loop A Sys Press Low*

   Which one of the following identifies the impact of this condition on the Core Spray System?

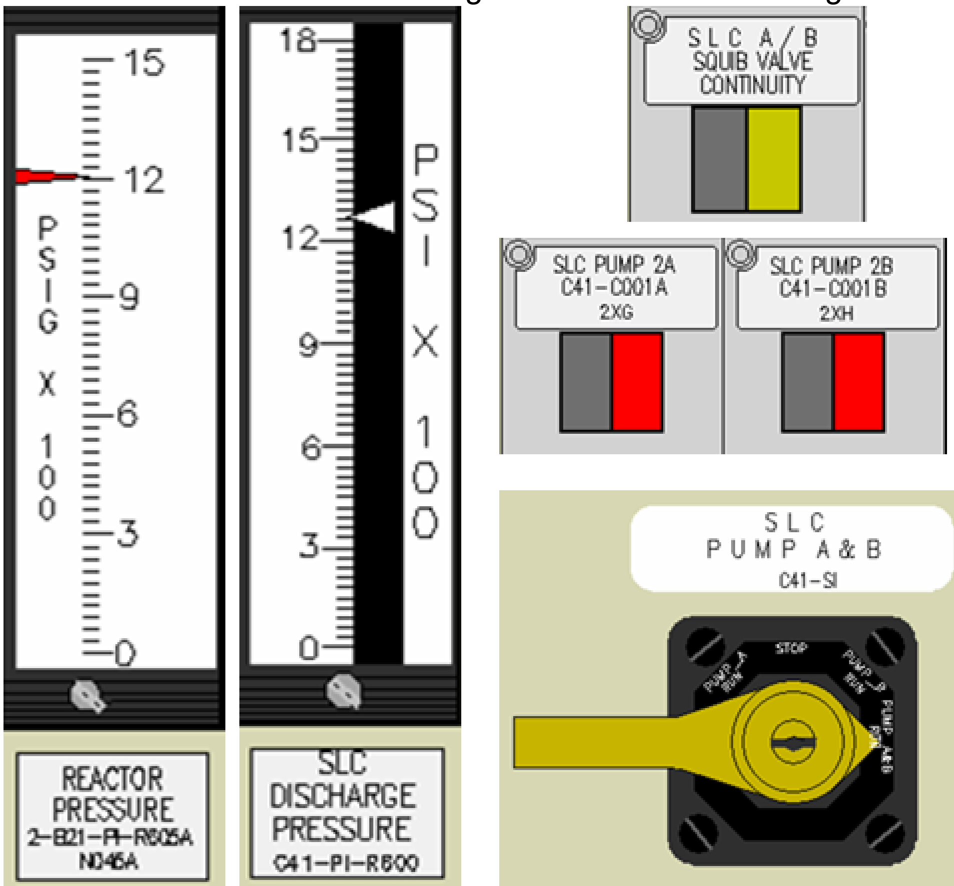
   A. Core Spray Pump A may cause piping damage, if started.

   B. Core Spray Pump A is incapable of producing an ADS Logic permissive signal, if started.

   C. E21-F005A, Inboard Inject Valve, will immediately open if the Core Spray Initiation Logic is actuated.

   D. E21-F004A, Outboard Inject Valve, can be opened while E21-F005A, Inboard Inject Valve, is open.

10. The OATC observes the following indications after initiating SLC during an ATWS.



Which one of the following completes the statements below?

Squib valve __(1)__ has failed to fire.

IAW 2OP-05, Standby Liquid System Operating Procedure, the OATC is required to __(2)__.

A. (1) A
   (2) place the CS-S1, SLC Pump A & B, in the PUMP A RUN position

B. (1) A
   (2) leave the CS-S1, SLC Pump A & B, in the PUMP A/B RUN position

C. (1) B
   (2) place the CS-S1, SLC Pump A & B, in the PUMP A RUN position

D. (1) B
   (2) leave the CS-S1, SLC Pump A & B, in the PUMP A/B RUN position

11. Which one of the following identifies which RPS MG Set and EPA breakers that trip on a loss of 480 VAC Substation E7?

RPS MG Set __(1)__ EPA breakers __(2)__.

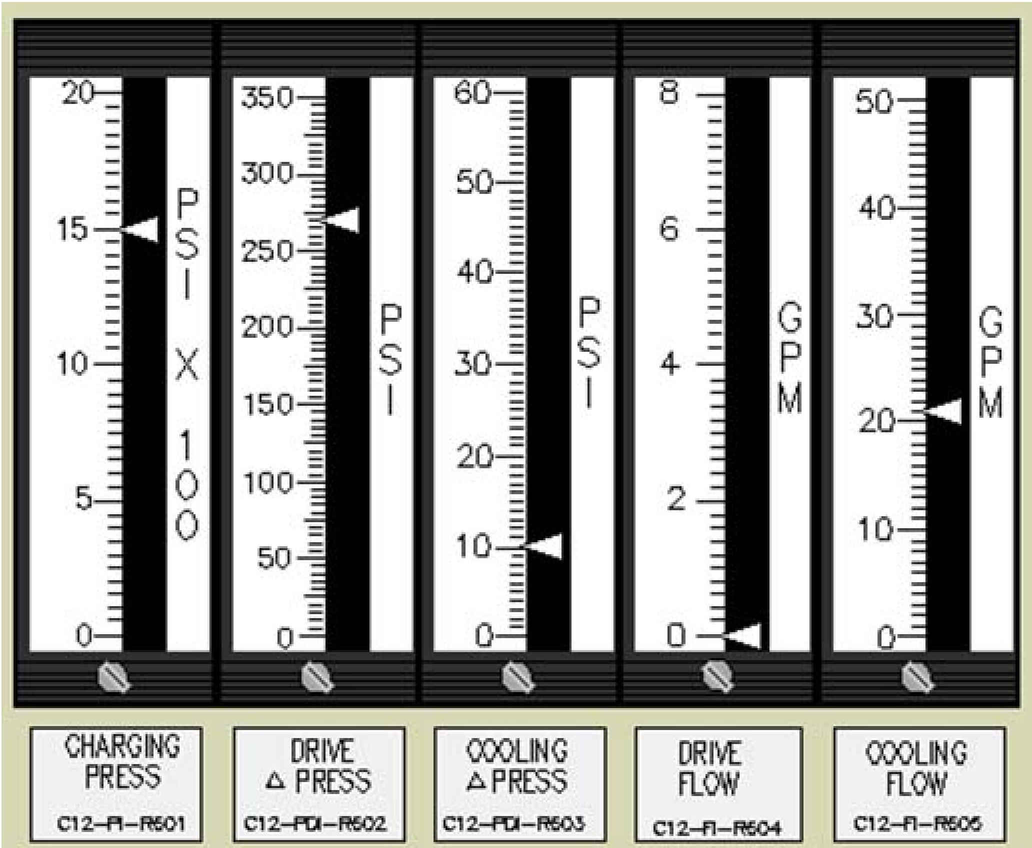
A. (1) A
   (2) 1 & 2 ONLY

B. (1) B
   (2) 3 & 4 ONLY

C. (1) A
   (2) 1 & 2 and alternate source EPA breakers 5 & 6

D. (1) B
   (2) 3 & 4 and alternate source EPA breakers 5 & 6

12. Unit Two is operating at rated power when A-05 (1-2) *CRD Hyd Temp High* annunciates and the OATC observes the following CRD indications.



Which one of the following completes the statements below?

A-05 (1-2) *CRD Hyd Temp High* setpoint is __(1)__ °F.

The APP will provide guidance to adjust C11-FC-R600, CRD Flow Controller, in the __(2)__ direction.

A. (1) 350
   (2) open

B. (1) 350
   (2) closed

C. (1) 340
   (2) open

D. (1) 340
   (2) closed

13. Which one of the following completes the statement below?

The Intermediate Range Monitor (IRM) detectors may be positioned full in __(1)__, full out __(2)__, or any intermediate position.

A. (1) 18 inches above the core centerline
   (2) bottom of the core

B. (1) 18 inches above the core centerline
   (2) 24 inches below the core

C. (1) at the core centerline
   (2) bottom of the core

D. (1) at the core centerline
   (2) 24 inches below the core

14. The reactor has just been declared critical during a reactor startup IAW 0GP-02, Approach To Criticality and Pressurization of the Reactor, with SRM channel A bypassed. A-05 (2-2) *Rod Out Block* and A-05 (2-3) *SRM Upscale/Inop* are in alarm.

As the operator attempts to withdraw SRM B detector is stuck and will not retract from the full in position.

Which one of the following completes the statement below?

Rods cannot be withdrawn until the IRMs are ranged to Range ______.

A. 2

B. 3

C. 7

D. 8

15. A plant startup is in progress. The OATC was withdrawing SRMs when a control rod block occurred. The following nuclear instrument indications are noted:

SRM	Counts	Position
A	95	Mid Position
B	190	Mid Position
C	$6x10^4$	Full In
D	155	Mid Position

IRM	Counts	Range
A	25/125	3
B	65/125	2
C	35/125	3
D	15/125	3
E	12/125	2
F	55/125	3
G	30/125	2
H	25/125	3

Which one of the following actions will clear the control rod block?

A. Inserting SRM A.

B. Withdrawing SRM C.

C. Ranging IRM G ONLY to range 3.

D. Ranging IRM B and G to range 3.

16. Unit Two is operating at rated power with the following conditions:

A-05 (2-2) *Rod Out Block*	In alarm
A-05 (4-8) *OPRM Trip Enabled*	NOT in alarm
A-06 (2-8) A*PRM Upscale*	NOT in alarm
A-06 (5-7) *Flow Ref Off Normal*	In alarm

Which one of the following completes the statements below?

A total recirc flow channel has failed __(1)__.

IAW APP A-06 (5-7) *Flow Ref off Normal,* the OATC will __(2)__ the affected APRM.

A. (1) downscale
   (2) bypass

B. (1) downscale
   (2) place the mode switch in INOP for

C. (1) upscale
   (2) bypass

D. (1) upscale
   (2) place the mode switch in INOP for

17. A reactor vessel instrument reference leg (with both level and pressure instruments) has CRD backfill in service.

A blockage of reference leg causes the instrument piping outside containment to equalize with CRD pressure.

Which one of the following completes the statements below?

The blockage will cause indicated level on the affected level instruments to __(1)__.

An expected pressure alarm for these conditions would be __(2)__.

A. (1) lower
(2) A-04 (1-8) *Steam Line Lo Press A*

B. (1) lower
(2) A-07 (3-2) *Reactor Press High*

C. (1) rise
(2) A-04 (1-8) *Steam Line Lo Press A*

D. (1) rise
(2) A-07 (3-2) *Reactor Press High*

18. Given the following plant conditions with RCIC in pressure control mode:

RCIC controller output	70%
E51-F022, Bypass to CST Vlv.	Throttled
RCIC Flow	300 gpm
RPV pressure	810 psig, slowly lowering
RCIC controller	Automatic set @ 300 gpm

Which one of the following identifies two independent actions that will stabilize RPV pressure?

The RO can throttle the E51-F022 in the ____(1)____ direction, or by ____(2)____ the RCIC Flow Controller auto setpoint.

A. (1) open
   (2) lowering

B. (1) open
   (2) raising

C. (1) close
   (2) lowering

D. (1) close
   (2) raising

19. Unit Two has inserted a manual scram.

Suppression Pool temperature is 90°F and rising due to HPCI/RCIC usage
Suppression Pool level is -25 inches
CST level is 21 feet

Which one of the following identifies:
(1) the lowest Suppression Pool Temperature that requires PCCP entry and
(2) the current suction source for the RCIC system?

A. (1) 96°F.
   (2) CST.

B. (1) 96°F.
   (2) Suppression Pool.

C. (1) 106°F.
   (2) CST.

D. (1) 106°F.
   (2) Suppression Pool.

20. Which one of the following completes the statements below concerning operation of the SRVs?

__(1)__ causes annunciation of A-03 (1-10) *Safety / Relief Valve Open*.

Upon receipt of this alarm, at least one SRV __(2)__ will be illuminated on the apron section of RTGB Panel P601.

A. (1) High temperature on recorder B2I-TR-6l4
   (2) red light ONLY

B. (1) High temperature on recorder B2I-TR-6l4
   (2) red and amber lights

C. (1) Activation of a SRV sonic detector
   (2) red light ONLY

D. (1) Activation of a SRV sonic detector
   (2) red and amber lights

21. Which one of the following states the normal electrical power supply to the following Unit One RHR Suppression Pool Cooling valves?

(1) 1-E11-F024A, RHR Torus Cooling Isolation Valve
(2) 1-E11-F028A, RHR Torus Spray Valve

A. (1) E5
(2) E5

B. (1) E5
(2) E7

C. (1) E7
(2) E5

D. (1) E7
(2) E7

22. Unit Two is operating at power with DG3 under clearance for maintenance activities. Bus E3 Master/Slave Breakers trip.

Which one of the following completes the statements below?

The __(1)__ RWCU isolation valve auto closes.

Technical Specification LCO 3.6.1.3, Primary Containment Isolation Valves (PCIVs), states each PCIV, except __(2)__, shall be OPERABLE.

A. (1) Inboard
   (2) reactor building-to-suppression chamber vacuum breakers

B. (1) Inboard
   (2) main steam isolation valves (MSIVs)

C. (1) Outboard
   (2) reactor building-to-suppression chamber vacuum breakers

D. (1) Outboard
   (2) main steam isolation valves (MSIVs)

23. During a line break inside the drywell, plant conditions are:

RPV water level	200 inches
RPV pressure	800 psig
Drywell pressure	12 psig

Which one of the following completes the statements below?

In order to initiate Suppression Pool Sprays, operation of the "2/3 Core Height LPCI Initiation" keylock override switch is __(1)__.

The Suppression Pool Spray valves __(2)__ automatically close when drywell pressure lowers below 2.7 psig.

A. (1) required
   (2) will

B. (1) required
   (2) will NOT

C. (1) NOT required
   (2) will

D. (1) NOT required
   (2) will NOT

24. Which one of the following identifies the loads that can be supplied by the Backup Nitrogen System?

A. Inboard MSIVs, SRV Accumulators, and Hardened Wetwell Vent Isolation valves.

B. Inboard MSIVs, Suppression Chamber to Drywell Vacuum Breakers, and Hardened Wetwell Vent Isolation valves.

C. SRV Accumulators, Reactor Building to Suppression Chamber Vacuum Breakers, and Hardened Wetwell Vent Isolation valves.

D. SRV Accumulators, Suppression Chamber to Drywell Vacuum Breakers, and Reactor Building to Suppression Chamber Vacuum Breakers

25. Which one of the following identifies the affect that a loss of E8 will have on the Unit Two Safety Relief Valve (SRV) system?

A. Inability to manually operate SRV's from the RTGB

B. Inability to manually operate SRV's from the RSDP

C. Loss of SRV position indication on the RTGB

D. Loss of SRV position indication on the RSDP

26. Unit Two is being shutdown for entry into the main generator for repairs.

Which one of the following completes the statement below concerning the flowpath for purging the Main Generator IAW 2OP-27.3, Generator Gas System Operating Procedure?

Carbon Dioxide exits through the __(1)__ distribution tube in the main generator while __(2)__ is admitted through the other distribution tube.

A. (1) upper
   (2) Hydrogen

B. (1) upper
   (2) Service Air

C. (1) bottom
   (2) Hydrogen

D. (1) bottom
   (2) Service Air

27. Unit Two is operating at 30% power when a Heater Drain (HD) Deaerator level controller failure results in HD Deaerator level rising to 62 inches.

Which one of the following completes the statements below?

MVD-LV-266 / 267, Deaerator Extraction Line MRVs, are __(1)__.

EX-V11 / V12, 9th Stage Extraction Steam Non Return Valves, are __(2)__.

A. (1) open
(2) open

B. (1) open
(2) closed

C. (1) closed
(2) open

D. (1) closed
(2) closed

28. Unit Two is performing plant heatup and pressurization with the reactor at 250 psig. Reactor Feed Pump (RFP) 2A indicates 185 RPM with the following status:

Suction valve is open
Recirc valve is open
Discharge valve is closed
UA-04 (1-2) *RFP A Turbine Tripped* is clear
HPU oil pressure is 275 psig
Reactor water level is 200 inches
A-07 (2-2) *Reactor Water Level High / Low* is in alarm

The operator depresses the RFPT A Start push button on XU-1 panel.

Which one of the following identifies how the 2A RFP will respond?

A. Rolls to 1000 RPM.

B. Rolls to 2450 RPM.

C. Remains at 185 RPM.

D. Trips on emergency shutdown logic.

29. Given the following plant conditions on Unit One:

MODE 2 at 6% power
RPV pressure is 800 psig
SULCV is in Auto (40% valve demand)
Master Level Controller is in Manual set at 187 inches

A loss of UPS V7A results in blank displays on the Startup Level and Master Level Controllers.

Which one of the following identifies the response of the SULCV and the effect on reactor water level based on the above conditions?

The SULCV will:

A. close and the reactor will scram on low reactor water level.

B. open and the running Reactor Feed Pump will trip on high level.

C. remain at 40% valve demand position irrespective of reactor level changes.

D. change valve position as required to maintain reactor water level at 187 inches.

30. Unit One primary containment venting is being performed IAW 1OP-10, Standby Gas Treatment System Operating System with the following plant status:

1-VA-1F-BFV-RB, SBGT DW Suct Damper	Open
1-VA-1D-BFV-RB, Reactor Building SBGT Train 1A Inlet Valve	Closed
1-VA-1H-BFV-RB, Reactor Building SBGT Train 1B Inlet Valve	Closed

Which one of the following completes the statements below concerning the predicted SBGT response if drywell pressure reaches 1.9 psig?

1-VA-1F-BFV-RB __(1)__.

Both 1-VA-1D-BFV-RB and 1-VA-1H-BFV-RB __(2)__.

A. (1) auto closes
   (2) auto open

B. (1) auto closes
   (2) remain closed

C. (1) remains open
   (2) auto open

D. (1) remains open
   (2) remain closed

31. The following sequence of events occur on Unit Two:

1156 Reactor scram due to high drywell pressure
1158 Off-site power is lost, DG4 locks out
1200 Reactor water level drops below LL2
1202 Bus E2 cross-tie breaker is placed to MAINT
1204 Reactor water level drops below LL3
1206 Bus E4 cross-tie breaker is placed to MAINT
1208 Reactor pressure lowers to 410 psig

Which one of the following identifies the earliest time that E4 is allowed to be energized from E2 IAW 0AOP-36.1, Loss of Any 4160V Buses or 480V E-Buses?

A. 1206

B. 1208

C. 1214

D. 1216

32. The indications and status of the UPS System are:

	Primary UPS	Standby UPS
Load on UPS (DS10)	OFF	OFF
Load on Inverter (DS151)	OFF	ON
Load on Alternate (DS152)	ON	OFF
Alt Source Failure (DS11)	OFF	OFF
Manual Bypass Switch (S1)	NORM	BYP TEST

Which one of the following identifies the status of UPS System Loads?

A. de-energized.

B. powered from the primary inverter.

C. powered from the standby inverter.

D. powered from the alternate source.

33. Which one of the following completes the statements below regarding 125/250 VDC Station Distribution?

In the equalize charge mode, the charger output voltage is at a __(1)__ voltage when compared to the float charge mode.

The 125 VDC batteries are sized to supply emergency power at a 150 amp rate for __(2)__ hours.

A. (1) lower
(2) 8

B. (1) lower
(2) 10

C. (1) higher
(2) 8

D. (1) higher
(2) 10

34. During an ATWS on Unit Two, RPV level is being controlled at Top of Active Fuel.

The RHR pumps have been overridden OFF.

A fault then occurs on Bus 2C which results in loss of Bus E4.

Which one of the following identifies the RHR pump response as DG4 re-energizes Bus E4?

A. RHR pumps 2B and 2D both remain overridden off.

B. RHR pumps 2B and 2D both restart 10 seconds later.

C. RHR pump 2D restarts 10 seconds later, RHR pump 2B remains off.

D. RHR pump 2B restarts 10 seconds later, RHR pump 2D remains off.

35. Unit Two is operating at rated power with Offgas Train A in full load.
A tube rupture occurs inside the Offgas Aftercondenser.

Which one of the following parameters will lower in response to this event?

A. Aftercondenser Outlet Temperature

B. Offgas Filter differential pressure

C. Main condenser vacuum

D. Aftercondenser Level

36. Which one of the following identifies the action that is required to be taken in response to annunciator UA-05 (1-9) *Fan Clg Unit CS Pump Rm A Inl Press Lo*?

IAW the APP, the reactor operator will open:

A. SW-V105, Nuc SW Supply Vlv.

B. SW-V101, Conv SW Supply Vlv.

C. SW-V143, Well Water Supply Vlv.

D. SW-V117, Nuc SW to Vital header Vlv.

37. A reactor recirc pump has tripped on Unit Two.

Which one of the following completes the statement below for determining stability region compliance?

The primary indication of total core flow is determined using:

A. Core Support Plate Delta-P.

B. PPC Point U2NSSWDP (WDP).

C. Total Core Flow recorder (R613).

D. PPC Point U2CPWTCF (WTCF).

38. Both Units were operating at rated power when ALL switchyard PCB position indications turn green.

Diesel Generator status:

DG1	Running loaded
DG2	Under clearance
DG3	Running loaded
DG4	Tripped on low lube oil pressure

Which one of the following identifies the AOP(s) that Unit One and Unit Two are required to perform?

Unit One is required to perform __(1)__.
Unit Two is required to perform __(2)__.

A. (1) 0AOP-36.1, Loss of Any 4160V Buses or 480V E-Buses
(2) 0AOP-36.2, Station Blackout

B. (1) 0AOP-36.1, Loss of Any 4160V Buses or 480V E-Buses
(2) 0AOP-36.1, Loss of Any 4160V Buses or 480V E-Buses

C. (1) 0AOP-36.2, Station Blackout
(2) 0AOP-36.2, Station Blackout

D. (1) 0AOP-36.2, Station Blackout
(2) 0AOP-36.1, Loss of Any 4160V Buses or 480V E-Buses

39. Which one of the following identifies how the manually initiated, automatically executed, fast bus transfer capability is affected following a loss of 125V DC Panel 9A?

The fast bus transfer will ____(1)____ if attempted for 4 KV Bus 1B.
The fast bus transfer will ____(2)____ if attempted for 4 KV Bus 1C.

A. (1) occur
(2) NOT occur

B. (1) occur
(2) occur

C. (1) NOT occur
(2) NOT occur

D. (1) NOT occur
(2) occur

40. Which one of the following completes the statements below concerning the Turbine Trip / Turbine Stop Valve (TSV) closure scram?

Anticipates the pressure, neutron flux, and heat flux rise due to the __(1)__ in voids.

The TSV closure scram is automatically bypassed on a signal from __(2)__.

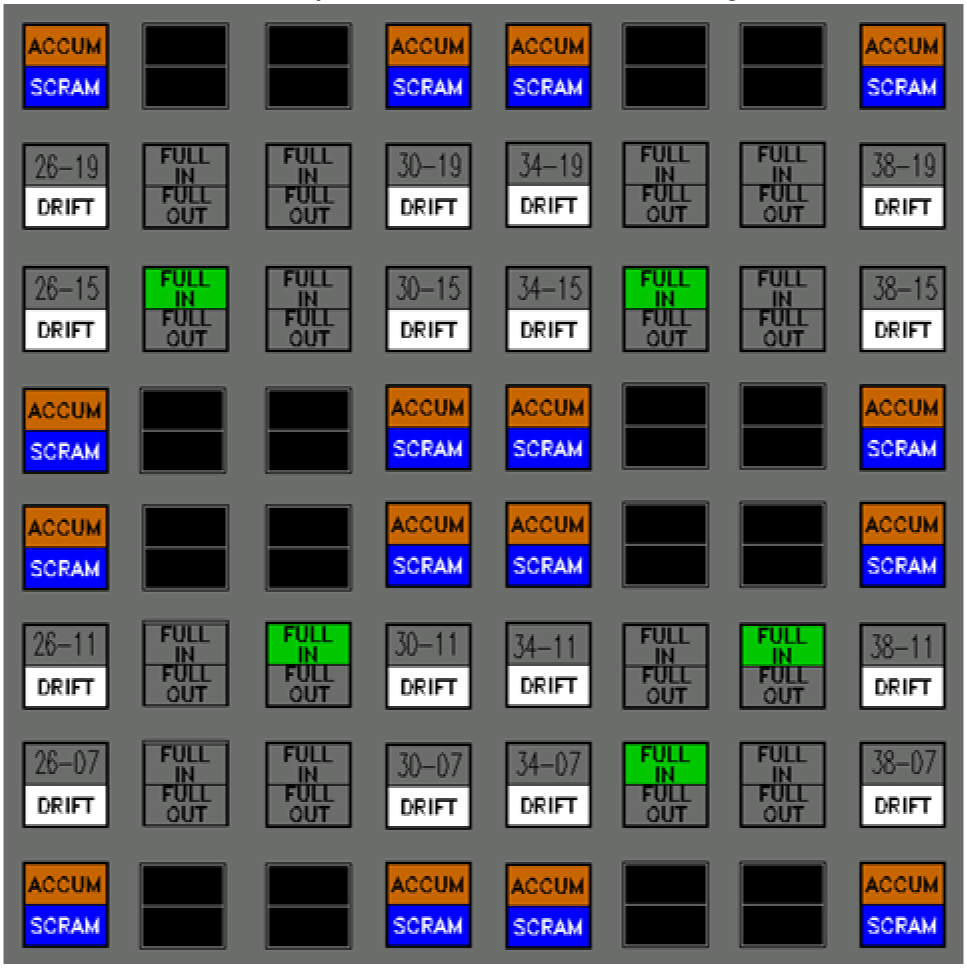
A. (1) increase
   (2) total steam flow

B. (1) increase
   (2) turbine first stage pressure

C. (1) decrease
   (2) total steam flow

D. (1) decrease
   (2) turbine first stage pressure

41. Unit Two was manually scrammed with the following indications.



Which one of the following completes the statements below?

__(1)__ ATWS has occurred.

The reactor __(2)__ remain shutdown under all conditions without boron.

A. (1) A hydraulic
(2) will

B. (1) A hydraulic
(2) will NOT

C. (1) An electrical
(2) will

D. (1) An electrical
(2) will NOT

42. Following a reactor scram on Unit One, plant conditions are:

Reactor water level	220 inches, rising
Reactor pressure	350 psig, steady
Drywell ref leg temp	205°F, steady

Which one of the following identifies the indicated level (on level indicator N027A/B) that corresponds to the bottom of the Main Steam Lines?

(Reference provided)

A. 240 inches

B. 245 inches

C. 250 inches

D. 255 inches

43. Unit Two is operating at 60% when Reactor Recirculation Pump 2A speed begins to slowly rise.

Which one of the following identifies an immediate action required IAW 2AOP-03.0, Positive Reactivity Addition?

A. Insert control rods.

B. Depress the Man Runback pushbutton.

C. Depress 2A Emerg Stop A pushbutton.

D. Depress 2A VFD Lower Fast pushbutton.

44. Which one of the following completes the statements below IAW LEP-02, Alternate Control Rod Insertion?

The RWM is bypassed using a __(1)__.

The reason that the RWM is bypassed is because the __(2)__.

A. (1) keylock switch
   (2) Emergency Rod In Notch Override switch will not work when an Insert Block exists

B. (1) joystick
   (2) Emergency Rod In Notch Override switch will not work when an Insert Block exists

C. (1) keylock switch
   (2) Mode Switch in Shutdown generates a Control Rod Block

D. (1) joystick
   (2) Mode Switch in Shutdown generates a Control Rod Block

45. Which one of the following systems used during plant shutdown from outside the control room has both flow indication and flow control capability at the Remote Shutdown Panel?

A. CRD

B. RCIC

C. RHR Loop B

D. RHRSW Loop B

46. Unit Two is performing a reactor startup.

The following events occur prior to rolling the main turbine:

Bus 2C experiences a fault and trips
Unit Two NSW header ruptures in the Service Water Building
All Unit Two Service Water pumps supplying the NSW Header are manually tripped

Which one of the following identifies the status of the Diesel Generators and the cooling water supply?

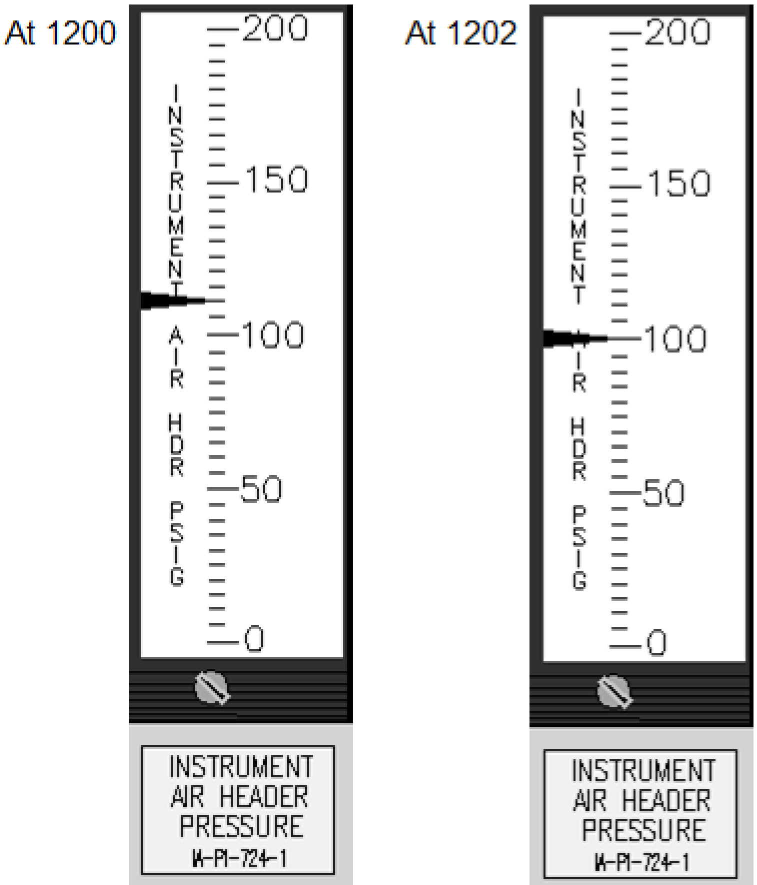
A. ONLY DG4 is running with cooling water supplied from the Unit One NSW Pumps.

B. ONLY DG4 is running with cooling water supplied from the Unit Two CSW Pumps

C. DG2 is running with cooling water supplied from the Unit One NSW Pumps and DG4 is running with cooling water supplied from the Unit One NSW Pumps.

D. DG2 is running with cooling water supplied from the Unit One NSW Pumps and DG4 is running with cooling water supplied from the Unit Two CSW Pumps.

47. During operation at rated power with the instrument air NOT cross-tied, the following indication is observed:



Assuming the situation continues to degrade at the current rate, which one of the following represents the earliest time that the MSIVs may start drifting closed IAW 0AOP-20.0, Pneumatic (Air/Nitrogen) System Failures?

A. 1203

B. 1208

C. 1210

D. 1212

48. Unit Two is in Cold Shutdown with both Reactor Recirculation pumps shutdown. Shutdown Cooling (SDC) has been established using RHR Loop B.

Which one of the following completes the statement below for a loss of shutdown cooling under the above conditions IAW 0AOP-15.0, Loss of Shutdown Cooling?

RPV Level must be raised to at least __(1)__ inches to establish __(2)__.

A. (1) 254
   (2) natural circulation

B. (1) 254
   (2) feed and bleed evolutions

C. (1) 200
   (2) natural circulation

D. (1) 200
   (2) feed and bleed evolutions

49. Which one of the following is a Plant Design Feature credited for minimizing the radiological impact of a Design Bases Refueling Accident IAW the Updated Final Safety Analysis Report (UFSAR)?

A. Control Building Ventilation Radiation Monitoring System auto start of CREV.

B. Reactor Building Ventilation Radiation Monitoring System auto start of SBGT.

C. Refueling Bridge Boundary Zone Control System preventing fuel movements into forbidden areas.

D. Spent Fuel Pool and Cooling System maintaining spent fuel pool level greater than 23 feet over irradiated fuel.

50. The following conditions exist on Unit Two:

Drywell pressure	2 psig
Drywell temperature	180°F
Reactor water level	95 inches
Reactor pressure	450 psig

Which one of the following completes the statements below?

The Drywell Cooler fans __(1)__ running.

The DW Lower Vent Dampers are in the __(2)__ position.

A. (1) are
   (2) MIN

B. (1) are
   (2) MAX

C. (1) are NOT
   (2) MIN

D. (1) are NOT
   (2) MAX

51. A loss of off-site power occurs on Unit Two with the following plant conditions:

Reactor water level	200 inches - stable
HPCI	In MAN in pressure control
RCIC	Tripped, ready for restart
Reactor pressure	1125 psig and rising

If reactor pressure is allowed to continue to rise, which one of the following identifies the reason the HPCI system will trip?

A. Turbine overspeed

B. High reactor water level

C. Steam Line High Flow

D. High turbine exhaust pressure

52. Which one of the following completes the statements below?

The purpose of the RHR Heat Exchangers is to reject heat from the suppression pool to the __(1)__ System.

In order to increase an established cooldown rate of the suppression pool IAW 2OP-17, Residual Heat Removal System Operating Procedure, throttle __(2)__ E11-F048A, HX 2A Bypass Valve.

A. (1) Service Water
   (2) open

B. (1) Service Water
   (2) closed

C. (1) Reactor Building Closed Cooling Water
   (2) open

D. (1) Reactor Building Closed Cooling Water
   (2) closed

53. During an accident, reactor pressure and drywell reference leg area temperature are in the Unsafe region of the Reactor Saturation Limit.

Which one of the following reactor water level instruments are least likely to become unreliable due to reference leg flashing?

A. Fuel zone

B. Wide Range

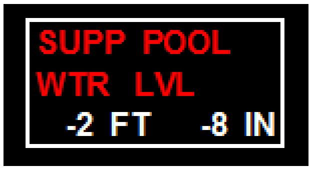
C. Narrow Range

D. Shutdown Range

54. With Unit One at rated power, the following control room indications are observed:

A-01 (3-7) *Suppression Chamber Lvl Hi/Lo* in alarm

ERFIS indication



Which one of the following completes the statements below?

The suppression chamber water level is __(1)__.

This condition requires entry into __(2)__.

A. (1) low
(2) LCO 3.6.2.2, Suppression Pool Water Level and PCCP

B. (1) low
(2) LCO 3.6.2.2, Suppression Pool Water Level, ONLY

C. (1) high
(2) LCO 3.6.2.2, Suppression Pool Water Level and PCCP

D. (1) high
(2) LCO 3.6.2.2, Suppression Pool Water Level, ONLY

55. During an accident, Unit Two plant conditions are:

Reactor water level	-35 inches, lowering
Reactor pressure	900 psig
Drywell average temp	185°F
Drywell ref leg temp	215°F
Injection sources	None available

Under these conditions, which one of the following is the LOWEST RPV water level that still assures adequate core cooling is being maintained?

(Reference provided)

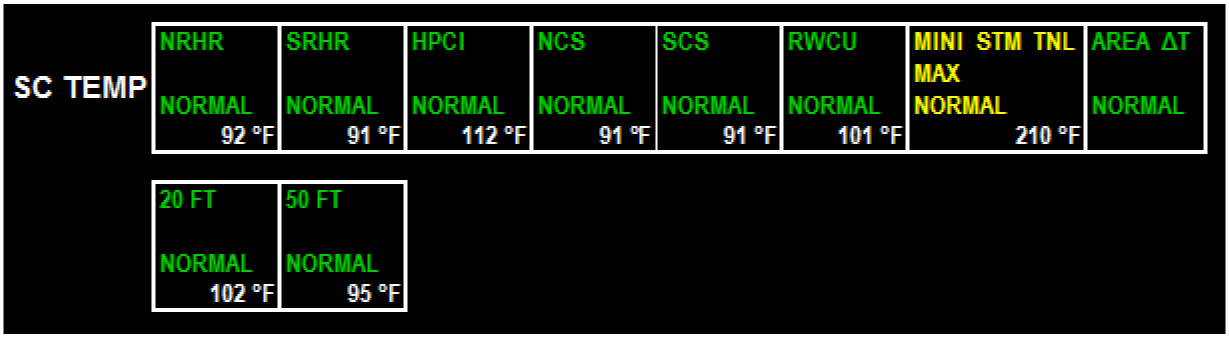
A. -45 inches

B. -60 inches

C. -72.5 inches

D. -82.5 inches

56. Unit Two is operating at rated power.
The following ERFIS indications are observed ten minutes into the event:



Which one of the following identifies the status of the HPCI and RCIC systems based on the conditions above?

A. HPCI ONLY is isolated.

B. RCIC ONLY is isolated.

C. Both HPCI and RCIC are isolated.

D. Neither HPCI nor RCIC are isolated.

57. Which one of the following radiation annunciators requires entry into RRCP?

A. UA-03 (1-6) *RBCCW Liquid Process Rad High*

B. UA-03 (2-3) *Rx Bldg Roof Vent Rad High*

C. UA-03 (2-7) *Area Rad Rx Bldg High*

D. UA-03 (4-5) *Process Rx Bldg Vent Rad High*

58. Unit Two is at rated power when the following annunciators are received:

UA-03 (5-2) *Process Off-Gas Rad High*
UA-03 (4-5) *Process Rx Bldg Vent Rad High*
UA-03 (3-5) *Process Rx Bldg Vent Rad Hi-Hi*

Which one of the following identifies the automatic actions that should occur?

A. PASS sample valves close and AOG-HCV-102, AOG System Bypass Valve, shuts (if open).

B. Group 6 initiation and AOG-HCV-102, AOG System Bypass Valve, shuts (if open).

C. Process Off-Gas Timer initiation and SBGT initiation.

D. Group 6 isolation and SBGT initiation.

59. Following a complete loss of RBCCW, a manual reactor scram was inserted.
Following the scram, the Scram Discharge Volume ruptured.
Plant conditions are:

Drywell average temp	190°F
Drywell pressure	2.3 psig
Rx Bldg 20' south temp	195°F

UA-12 (1-4) *South RHR Rm Flood Lvl Hi-Hi* is in alarm
UA-12 (1-3) *South CS Rm Flood Lvl Hi-Hi* is in alarm

Which one of the following identifies the operator action required by SCCP?

A. Perform emergency depressurization.

B. Reset RPS to isolate the primary system discharge.

C. Commence a reactor cooldown not to exceed 100°F/hr.

D. Rapidly depressurize to the main condenser irrespective of cooldown rate.

60. An ATWS condition currently exists on Unit Two with the following plant conditions:

Reactor Power	4%
Reactor pressure	controlled by EHC
Drywell pressure	2.1 psig
Reactor water level	95 inches
LEP-02 Section 3	jumpers have just been installed

Which one of the following completes the statements below concerning the required actions prior to resetting RPS IAW LEP-02, Alternate Control Rod Insertion, Section 3?

ARI is placed to __(1)__ and then RESET.
The SDV Vents and Drains are confirmed to be __(2)__.

A. (1) NORM
(2) open

B. (1) NORM
(2) closed

C. (1) INOP
(2) open

D. (1) INOP
(2) closed

61. Unit Two has experienced a leak in the steam tunnel and the control building ventilation has realigned.

Which one of the following identifies:
(1) in what location will 1 mR/hr cause annunciator UA-03 (6-7) *Area Rad Control Room High* and
(2) the reason the control building ventilation has realigned?

A. (1) Control room.
   (2) To protect all Main Control Room personnel from elevated radiological conditions.

B. (1) Control room.
   (2) To protect personnel working in the Control Room and the control building from elevated radiological conditions.

C. (1) Ventilation intake duct.
   (2) To protect all Main Control Room personnel from elevated radiological conditions.

D. (1) Ventilation intake duct.
   (2) To protect personnel working in the Control Room and the control building from elevated radiological conditions.

62. Unit Two is in MODE 3 following a seismic event with the following plant conditions:

Reactor level	55 inches
Reactor pressure	500 psig
Drywell pressure	9 psig

UA-01 (4-4) *Instr Air Press-Low* in Alarm
UA-01 (4-5) *Service Air Press-Low* in Alarm
UA-01 (1-2) *RB Inst Air Receiver 2B Press Low* in Alarm

Which one of the following completes the statements below?

RNA-SV-5481, Div II Backup N2 Rack Isol Vlv, is __(1)__.

RNA-SV-5261, Div II Non-Inrpt RNA, is __(2)__.

A. (1) open
(2) open

B. (1) open
(2) closed

C. (1) closed
(2) open

D. (1) closed
(2) closed

63. Unit One was operating at rated power when a loss of the SAT occurs with the following plant conditions:

Reactor water level	120 inches
Reactor pressure	320 psig
Drywell pressure	13 psig
DG1	Running loaded
DG2	Tripped/Unavailable

Which one of the following completes the statements below concerning the operation of the RBCCW system?

A & C RBCCW pumps __(1)__ running.

RCC-V-28 and RCC-V-52, DW Header Equipment Isolation Valves, __(2)__.

A. (1) are
(2) auto closed

B. (1) are
(2) remain open

C. (1) are NOT
(2) auto closed

D. (1) are NOT
(2) remain open

64. A Unit One reactor building fire has occurred affecting safe shutdown Train B equipment.

Which one of the following identifies a component that is classified as ASSD Train B Equipment IAW 0ASSD-00, User's Guide?

A. CSW Pump 1B

B. NSW Pump 1B

C. HPCI System

D. CRD Pump 1B

65. During rated power operation, plant status is:

UA-06 (1-2) *Gen Under Freq Relay* in alarm
Generator frequency is 59.2 Hertz

Which one of the following identifies why the turbine must be tripped if frequency remains at its present value?

To prevent damage to the:

A. Generator.

B. Main Transformer.

C. Low Pressure Turbine.

D. High Pressure Turbine.

66. A grid disturbance occurs with the following Unit One plant parameters:

Generator Load	980 MWe
Generator Reactive Load	160 MVARs, out
Generator Gas Pressure	50 psig

Which one of the following identifies the available options that will place the Unit within the Estimated Capability Curve?

(Reference provided)

A. Raise gas pressure to 58 psig or lower power to 940 MWe.

B. Raise gas pressure to 58 psig or raise reactive load to 240 MVARs.

C. Raise gas pressure to 58 psig or lower reactive load to 70 MVARs.

D. Lower power to 940 MWe or raise reactive load to 240 MVARs.

67. Which one of the following completes the statement below concerning the purpose of the High Pressure Coolant Injection (HPCI) System IAW Technical Specifications Bases?

HPCI is designed to provide sufficient coolant injection to maintain the reactor core covered during a __(1)__ Loss-Of-Coolant-Accident to maintain fuel cladding temperatures below __(2)__.

A. (1) small break
(2) 1800°F

B. (1) small break
(2) 2200°F

C. (1) large break
(2) 1800°F

D. (1) large break
(2) 2200°F

68. TIP traces are in progress with all TIP drawer Mode Switches in Auto.

A small steam leak in containment causes drywell pressure to rise to 2.7 psig.

Which one of the following predicts the final TIP ball valve position indication(s) and also identifies all available location(s) for verifying their position?

A. Green light indication illuminated on each TIP drawer at Back Panel P607 ONLY.

B. White Valve Light illuminated on each TIP drawer at Back Panel P607 ONLY.

C. Red light indication illuminated on P601 Panel and on each TIP drawer at Back Panel P607.

D. Green light indication illuminated on P601 Panel and a white Valve Light illuminated on each TIP drawer at Back Panel P607.

69. Which one of the following Scram Immediate Operator actions has a different setpoint between Unit One and Unit Two?

A. Tripping of the main turbine.

B. Tripping of the first feed pump.

C. Master level controller setpoint setdown.

D. Placing the reactor mode switch to Shutdown.

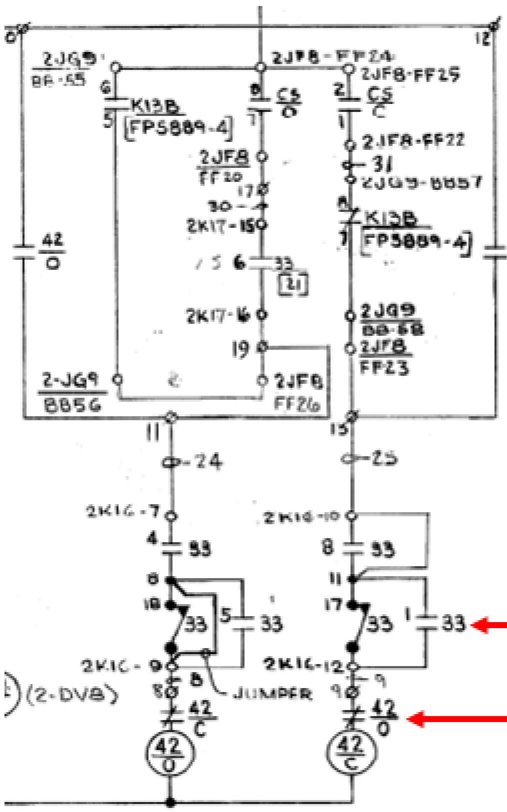
70. IAW OPS-NGGC-1301, Equipment Clearance, which one of the following identifies who can waive the requirement for a double valve isolation?

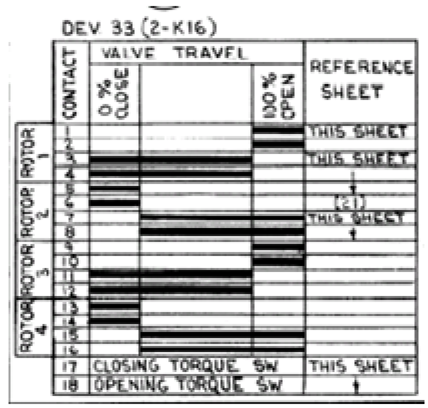
A. Assistant Operations Manager - Shift

B. Maintenance Manager

C. Work Week Manager

D. Plant Manager

71. 



Which one of the following completes the statements below concerning the contacts identified in the drawing?

This contact closes when the valve is __(1)__.

This contact opens when the $\frac{42}{O}$ relay is __(2)__.

A. (1) Full open
   (2) energized

B. (1) Full open
   (2) de-energized

C. (1) NOT full open
   (2) energized

D. (1) NOT full open
   (2) de-energized

72. Which one of the following completes the following statements IAW 0OI-01.03, Non-Routine Activities, Section 5.6.1, Primary Containment Access.

The TIP system __(1)__ required to be placed under clearance.

A clearance to prevent the withdrawal of control rods __(2)__ required.

A. (1) is
(2) is

B. (1) is
(2) is not

C. (1) is not
(2) is

D. (1) is not
(2) is not

73. Unit Two is in MODE 1 when the following alarms and indications occur:

UA-23 (2-6) *Main Steam Line Rad Hi*	In alarm
RWCU Conductivity Recorder	rising reactor water conductivity
Reactor power	remains steady
No other annunciators are in alarm	

Initiation of which one of the following identifies the cause of these conditions?

A. Zinc injection.

B. Resin injection.

C. Hydrogen injection.

D. Noble metals injection.

74. Alternate shutdown cooling using SRV's has been established IAW 0AOP-15.0, Loss of Shutdown Cooling. SRV B21-F013B is currently open. The cooldown rate is approaching 100°F/hr. The CRS has directed you to lower the cool down rate.

RHR A/C
B21-F013F B21-F013H
B21-F013G B21-F013J
B21-F013A B21-F013B B21-F013K
B21-F013C B21-F013D
B21-F013E B21-F013L

Which one of the following completes the statement below IAW the 0AOP-15.0 cooldown table above?

The RO can lower the cooldown rate by closing B21-F013B and opening ______.

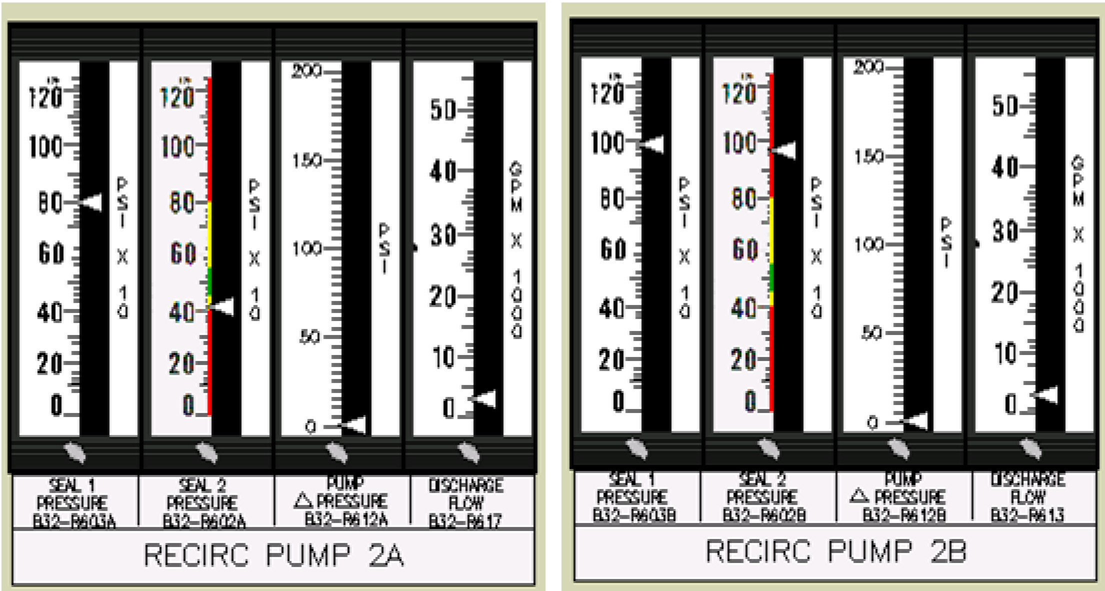
A. B21-F013A

B. B21-F013C

C. B21-F013J

D. B21-F013K

75. Unit Two was at power when a trip and lockout of BOP Bus 2B required insertion of a manual reactor scram. Shortly after the scram, the following indications are noted:



Drywell pressure	1.4 psig, rising
Average drywell temp	140°F, rising

Which one of the following completes the statement below?

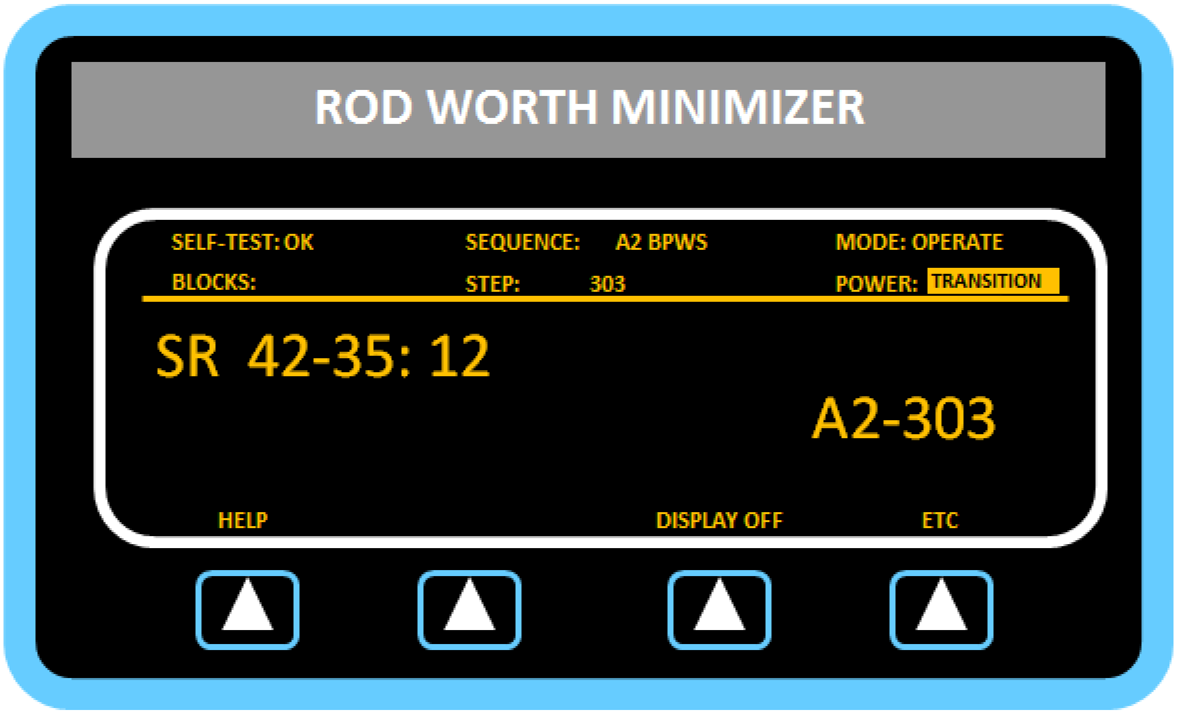
The crew will be required to enter __(1)__ and isolate Recirc Pump __(2)__.

A. (1) 0AOP-14.0
(2) 2A

B. (1) 0AOP-14.0
(2) 2B

C. (1) PCCP
(2) 2A

D. (1) PCCP
(2) 2B

76. 

Which one of the following completes the statements below concerning the Rod Worth Minimizer (RWM)?

The RWM channel functional test was NOT required to be performed __(1)__ any control rod was withdrawn at <8.75% RTP in MODE 2 IAW Surveillance Requirement 3.3.2.1.2.

Currently total steam flow is __(2)__%.

A. (1) until
(2) 18

B. (1) until
(2) 20

C. (1) until 1 hour after
(2) 18

D. (1) until 1 hour after
(2) 20

77. Following a large line break DBA LOCA, plant conditions are:

Reactor water level	-50 inches (N036/N037)
Reactor pressure	5 psig
Core Spray	One loop available, injecting at 4800 gpm
RHR	One loop available, injecting at 17,000 gpm
Suppression pool temp.	148°F

The CRS has reached step RC/L-44 in RVCP:

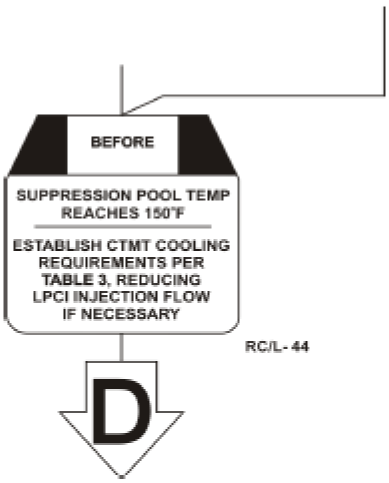


TABLE 3

MINIMUM CONTAINMENT COOLING REQUIREMENTS

MINIMUM PUMP REQUIREMENTS	FLOW (GPM)
1 - RHR PUMP PER LOOP WITH HX BYPASS VALVE CLOSED	7700/LOOP
1 - RHR SW PUMP PER LOOP	4000/LOOP
2 - RHR PUMPS WITH HX BYPASS VALVE CLOSED	11,500
2 - RHR SW PUMPS	8000

Which one of the following identifies the basis for reduction in RPV injection when reactor water level is below Minimum Steam Cooling Reactor Water Level?

A. Prevent exceeding the Heat Capacity Temperature Limit.

B. Maintain long term operation of the Core Spray and RHR Pumps.

C. Minimize off-site releases per Alternative Source Term calculations.

D. Prevent exceeding design temperature limits for Primary Containment.

78. Unit One is performing a reactor startup, prior to the point of adding heat.

IRM C is bypassed due to erratic operation.
IRM A fails downscale.

Which one of the following completes the statements below?

Addressing ONLY Technical Specification 3.3.1.1, Reactor Protection System (RPS) Instrumentation, requires placing the channel in trip in __(1)__ hours.

IAW AD-OP-ALL-0101, Event Response and Notifications, the plant manager will be directly notified of this event by the __(2)__.

(Reference provided)

A. (1) 6
(2) Shift Manager

B. (1) 6
(2) Site Duty Manager

C. (1) 12
(2) Shift Manager

D. (1) 12
(2) Site Duty Manager

79. Unit Two is at rated power. The following conditions occur:

At 0200 Voter Channel 4 is declared inoperable
At 0600 APRM Channel 4 is declared inoperable

Which one of the following identifies the required action(s) and maximum completion time(s) to maintain compliance with Technical Specifications?

Reference provided

A. Place Voter Channel 4 in trip by 1400 ONLY.

B. Place APRM Channel 4 in trip by 1200 ONLY.

C. Place Voter Channel 4 **and** APRM Channel 4 in trip by 0800.

D. Place **either** Voter Channel 4 **or** APRM Channel 4 in trip by 1800.

80. Unit One is operating at rated power.

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.4.3.1	Operate each SGT subsystem for ≥ 10 continuous hours with heaters operating.	31 days

On 10/13/14 at 1200 hours it is discovered that this SR was last performed on 09/01/14 at 0400 hours.

Which one of the following is correct IAW Technical Specifications?

A. The time between surveillances is acceptable IAW SR 3.0.2.

B. The time between surveillances is unacceptable. Enter TS 3.0.3 immediately.

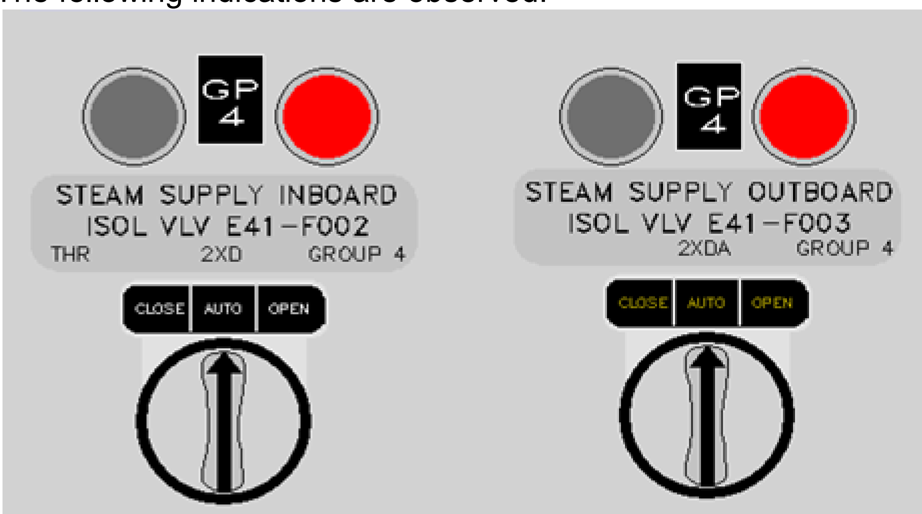
C. The time between surveillances is unacceptable. Entry into the applicable Conditions and Required Actions for the missed surveillance is immediately required.

D. The time between surveillances is unacceptable. Entry into the applicable Conditions and Required Actions may be delayed for up to 31 days to permit performance of the surveillance.

81. Unit Two was operating at rated power when the following alarms/conditions are reported:

UA-03 (2-7) *Area Rad Rx Bldg High*
UA-03 (4-5) *Process Rx Bldg Vent Rad Hi-Hi*
UA-05 (6-10) *Rx Bldg Isolated*
UA-05 (4-6) *SBGT Sys A Failure*
A-02 (5-7) *Stm Leak Det Ambient Temp High*
UA-05 (6-7) *Rx Bldg Static Press Dif-Low*
A-01 (3-5) *HPCI Isol Trip sig A Initiated*
A-01 (4-5) *HPCI Isol Trip sig B Initiated*

The following indications are observed:



Which one of the following completes the statements below?

A release through the Reactor Building blowout panels would be considered __(1)__ release.

The highest Emergency Action Level classification for the given conditions is __(2)__.

(Reference provided)

A. (1) a ground
(2) an Alert

B. (1) a ground
(2) a Site Area Emergency

C. (1) an elevated
(2) an Alert

D. (1) an elevated
(2) a Site Area Emergency

82. Which one of the following identifies:
   (1) the minimum conditions that will cause the control room ventilation system to automatically align in the Fire Protection mode and
   (2) the required Technical Specifications (TS) / Technical Requirements Manual (TRM) actions IAW 0OP-37, Control Building Ventilation System Operating Procedure, if the system was initiated for 20 minutes with minimum local smoke and with charcoal exposure doubtful?

A. (1) Smoke detected in **both** Unit One **and** Unit Two makeup air ductwork.
   (2) Initiate an LCO on the affected train IAW TS 3.7.3, CREV System, and TRM 3.18, CREV System-Smoke Protection Mode, ONLY.

B. (1) Smoke detected in **both** Unit One **and** Unit Two makeup air ductwork.
   (2) Initiate an LCO on the affected train IAW TS 3.7.3, CREV System, and TRM 3.18, CREV System-Smoke Protection Mode, and take the action specified in TS 5.5.7, Ventilation Filter Testing Program (VFTP).

C. (1) Smoke detected in **either** Unit One **or** Unit Two makeup air ductwork.
   (2) Initiate an LCO on the affected train IAW TS 3.7.3, CREV System, and TRM 3.18, CREV System-Smoke Protection Mode, ONLY.

D. (1) Smoke detected in **either** Unit One **or** Unit Two makeup air ductwork.
   (2) Initiate an LCO on the affected train IAW TS 3.7.3, CREV System, and TRM 3.18, CREV System-Smoke Protection Mode, and take the action specified in TS 5.5.7, Ventilation Filter Testing Program (VFTP).

83. Unit Two was operating at rated power when a trip of 2A RFP occurred followed immediately by a trip of the 2B Reactor Recirc pump.
The following plant conditions exist:

Reactor power	52%
Total core flow (WTCF)	36.96 Mlbm/hr
OPRM system	Inoperable

Which one of the following completes the statements below?

The current operating point on the appropriate Power to Flow Map is __(1)__.

Verifying the current operating point on the Power to Flow Map is directed by __(2)__ Supplementary actions.

(Reference provided)

A. (1) 5% Buffer Region
(2) 2AOP-04.0, Low Core Flow, ONLY

B. (1) 5% Buffer Region
(2) 2AOP-04.0, Low Core Flow AND 0AOP-23.0, Condensate/Feedwater System Failure,

C. (1) Region B - Immediate Exit
(2) 2AOP-04.0, Low Core Flow, ONLY

D. (1) Region B - Immediate Exit
(2) 2AOP-04.0, Low Core Flow AND 0AOP-23.0, Condensate/Feedwater System Failure,

84. Which one of the following completes the statements below IAW Technical Specification 3.3.2.2, Feedwater and Main Turbine High Water Level Trip Instrumentation?

Three channels of feedwater and main turbine high water level trip instrumentation are required to be operable __(1)__.

The bases for the high water level trip indirectly initiating a reactor scram from the main turbine trip is to mitigate the reduction in __(2)__.

A. (1) in MODE 1
(2) MCPR

B. (1) in MODE 1
(2) LHGR

C. (1) when thermal power is >23% RTP
(2) MCPR

D. (1) when thermal power is >23% RTP
(2) LHGR

85. The following plant conditions exist on Unit Two:

An ATWS with a spurious Group I Isolation has occurred
HPCI is injecting to the RPV to maintain RPV level
A-01 (1-5) *Suppression Chamber Lvl Hi-Hi* is in alarm

Which one of the following identifies:

(1) the reason that HPCI is re-aligned from its current suction source and
(2) the procedure that contains the steps to perform the actions to transfer the HPCI suction valves?

A. (1) To prevent pump bearing damage
(2) HPCI Hard Card, HPCI Injection in EOPs

B. (1) To prevent pump bearing damage
(2) SEP-10, Circuit Alteration Procedure

C. (1) To prevent HPCI exhaust check valve damage
(2) HPCI Hard Card, HPCI Injection in EOPs

D. (1) To prevent HPCI exhaust check valve damage
(2) SEP-10, Circuit Alteration Procedure

86. Unit One was at full power when all offsite power was lost.
The following is the Emergency Diesel Generator status:

DG1	Locked out on fault
DG2	Running and loaded
DG3	Running and loaded
DG4	Locked out on fault

Which one of the following completes the statements below?

The __(1)__ CRD pump must be started to re-establish the CRD system.

__(2)__ contains the step for placing the CRD Flow Control, C11-FC-R600, in manual with manual potentiometer at minimum setting following the loss of the CRD pump?

A. (1) 1A
(2) 1OP-08, Control Rod Hydraulic System Operating Procedure.

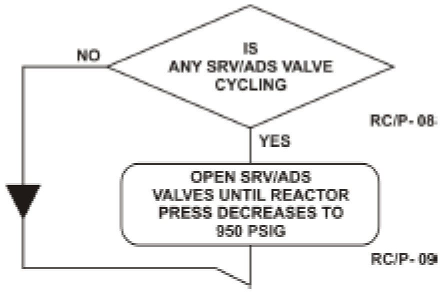
B. (1) 1A
(2) 0AOP-02, Control Rod Malfunction/Misposition.

C. (1) 1B
(2) 1OP-08, Control Rod Hydraulic System Operating Procedure.

D. (1) 1B
(2) 0AOP-02, Control Rod Malfunction/Misposition.

87. During an ATWS on Unit One the following annunciators/indications are observed:

A-05 (3-6) *Reactor Vess Hi Press Trip*
A-03 (1-10) *Safety / Relief Valve Open*
SRV A, C, F, and G are cycling open



Which one of the following completes the statements below?

The highest that reactor pressure reached was at least __(1)__ psig.

The bases for Step RC/P-09 of LPC is to __(2)__.

A. (1) 1060
(2) conserve SRV accumulator pressure

B. (1) 1060
(2) minimize heat discharged to the suppression pool

C. (1) 1130
(2) conserve SRV accumulator pressure

D. (1) 1130
(2) minimize heat discharged to the suppression pool

88. Unit One is at rated power. 0AOP-30.0, Safety/Relief Valve Failures, has been entered for a stuck open SRV F and the supplementary actions are being performed. The following torus temperatures are observed:

93° F	Suppression Pool Temp at location 45° on ERFIS
91° F	Suppression Pool Temp at location 90° on ERFIS
90° F	Suppression Pool Temp at location 135° on ERFIS
91° F	Suppression Pool Temp at location 180° on ERFIS
93° F	Suppression Pool Temp at location 225° on ERFIS
97° F	Suppression Pool Temp at location 270° on ERFIS
112° F	Suppression Pool Temp at location 315° on ERFIS
96.1° F	Blk Wtr Avg Supp Pool on CAC-TR-4426-1A

Which one of the following identifies:
(1) the required action IAW Technical Specification 3.6.2.1, Suppression Pool Average Temperature, and
(2) the consequences of pulling SRV F fuses in the incorrect order?

(Reference provided)

A. (1) Enter Condition A.
   (2) Loss of power to the SRV tailpipe temperature sensors.

B. (1) Enter Condition A.
   (2) The power sensing relay would be required to shift.

C. (1) Enter Condition D.
   (2) Loss of power to the SRV tailpipe temperature sensors.

D. (1) Enter Condition D.
   (2) The power sensing relay would be required to shift.

89. Unit Two is executing RVCP with the following conditions present:

Reactor water level	55 inches (N036/N037) and rising
Supp. chamber pressure	1.5 psig
Core Spray	One loop injecting at 3000 gpm
RHR	One loop injecting at 8800 gpm
Supp. pool level	-5 feet 7 inches
Supp. pool temp	178° F

Which one of the following actions are required IAW RVCP to ensure there is no Core Spray or RHR pump damage?

(Reference provided)

A. Raise Core Spray flow to 5000 gpm and shutdown the RHR pump(s).

B. Raise Core Spray flow to 5000 gpm and lower RHR flow to 8,000 gpm.

C. Raise Core Spray flow to 3600 gpm and shutdown the RHR pump(s).

D. Raise Core Spray flow to 3600 gpm and lower RHR flow to 8,000 gpm.

90. Unit One is shutting down for a forced outage IAW GP-05, Unit Shutdown, due to a failing reactor recirculation pump seal #1.
RCIC is in day 4 of a 7 day LCO.
The reactor mode switch is placed in SHUTDOWN as directed by the procedure.
The startup level control valve fails and HPCI is manually placed in service to maintain RPV water level.
Reactor water level dropped to 150 inches before being restored and maintained in the normal band.

Which one of the following completes the statement below?

IAW 0OI-01.07, Notifications, this event meets the conditions for reportability within:

(Reference provided)

A. 4 hour ONLY.

B. 8 hours ONLY.

C. 1 hour AND 4 hours.

D. 4 hours AND 8 hours.

91. A fuel bundle has been dropped in the Unit Two Spent Fuel Pool with area radiation values as indicated on Attachment 1, Area Radiation Monitoring.

Which one of the following completes the statements below?

An area __(1)__ exceeded the Max Norm Operating Radiation Limit.

The Alternate Source Term Implementation analysis dictates that the maximum allowable time to manually start the Control Room Emergency Ventilation system is __(2)___ minutes.

(Reference provided)

A. (1) has
(2) 15

B. (1) has
(2) 20

C. (1) has NOT
(2) 15

D. (1) has NOT
(2) 20

92. During accident conditions, the source term from the Unit One Turbine Building Ventilation must be estimated IAW 0PEP-03.6.1, Release Estimates Based Upon Stack/Vent Readings. Available data:

1-D12-RR-4548-3-2-1	Reading 7.425 E-1 μCi/cc
1-VA-FT-3358	Failed low (Turbine Building Vent Flow)
Turb Bldg HVAC	2 exhaust fans running
Sample results	1.284 E+4 μCi/sec (taken 1 hour ago)

Which one of the following identifies the highest emergency action level classification that is required for these conditions?

(Reference provided)

A. Unusual Event

B. Alert

C. Site Area Emergency

D. General Emergency

3.7.2 Service Water (SW) System and Ultimate Heat Sink (UHS)

LCO 3.7.2 SW System and UHS shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

93. IAW Technical Specification 3.7.2, Service Water (SW) System and Ultimate Heat Sink (UHS), which one of the following inoperable pumps, by itself, would require entry into an action statement?

A. CSW Pump 1B

B. CSW Pump 2B

C. NSW Pump 1B

D. NSW Pump 2B

94. Which one of the following events would require you to direct a Reactor Scram in order to maintain safe operation of the facility?

1. With Unit Two in MODE 1, an electrical fire has resulted in erratic or questionable indications on numerous main control room nuclear instruments

2. An earthquake has occurred in which the National Earthquake Center reports horizontal ground accelerations of 0.08 g were registered. Operating Basis Earthquake (OBE) exceedance light is energized. All other plant indications indicate the plant is currently stable.

3. Power is at 50% and power ascension is in progress after a refuel outage. An accident on the Refuel Floor involving spent fuel has caused the Shift Manager to declare a Site Area Emergency.

4. Department of Homeland Security has increased the National Threat Advisory System (NTAS) Level to elevated threat for Brunswick County.

A. Event 1

B. Event 2

C. Event 3

D. Event 4

95. Which one of the following completes the statements below concerning the Unit Two Turbine Bypass System?

The **minimum** number of inoperable turbine bypass valves that would require entry into an action statement of LCO 3.7.6, Main Turbine Bypass System, is __(1)__.

The capacity of the Unit Two Turbine Bypass System is __(2)__%.

A. (1) two
   (2) 20.6

B. (1) two
   (2) 69.6

C. (1) three
   (2) 20.6

D. (1) three
   (2) 69.6

96. The following information was obtained during the last scram timing for control rod 18-19 IAW 0PT-14.2.1, Single Rod Scram Insertion Times Test.

Control Rod	Insertion	Position Notch	Time (Secs)
18-19	5%	46	0.438
	20%	36	1.188
	50%	26	2.026
	90%	6	3.349

Unit One is operating at rated power when control rod 18-19 scram accumulator has depressurized and cannot be repaired for two days.

All other control rods and control rod scram accumulators are operable.

Concerning control rod 18-19, which one of the following completes the statements below?

The scram times __(1)__ within Technical Specification 3.1.4, Control Rod Scram Times.

IAW Technical Specification 3.1.5, Control Rod Scram Accumulators the control rod __(2)__ be declared SLOW.

(Reference provided)

A. (1) are
(2) can

B. (1) are
(2) cannot

C. (1) are NOT
(2) can

D. (1) are NOT
(2) cannot

97. During accident conditions, an auxiliary operator is needed to enter the reactor building for local emergency actions to prevent fuel damage. Due to elevated reactor building radiation levels, it is estimated the operator will receive 7.5 rem.

Which one of the following completes the statements below?

The estimated dose of 7.5 rem __(1)__ exceed EPA-400 limits.

The Site Emergency Coordinator __(2)__ authorize exceeding 10CFR20 limits IAW 0PEP-3.7.6, Emergency Exposure Controls.

A. (1) will not
   (2) can

B. (1) will not
   (2) cannot

C. (1) will
   (2) can

D. (1) will
   (2) cannot

98. Unit Two is shutdown to support drywell entry due to Recirculation Pump oil level concerns. Reactor coolant temperature is 200°F.

E&RC has determined that the drywell atmosphere is **not** suitable for unfiltered release.

Which one of the following completes the statements below IAW 2OP-24, Section 6.3.13, Primary Containment Purging (Deinerting) Through the SBGT System?

This section __(1)__ be performed under the current plant conditions.

If drywell pressure was above 0.7 psig, deinerting could result in __(2)__.

A. (1) can
(2) contamination of the RB 50'

B. (1) cannot
(2) contamination of the RB 50'

C. (1) can
(2) exceeding ODCM Main Stack release rates

D. (1) cannot
(2) exceeding ODCM Main Stack release rates

99. A fire in the control building fire area requires entry into 0ASSD-01, Alternative Safe Shutdown Procedure Index. The CRS has determined that alternate safe shutdown actions are required. Both Unit One and Unit Two have been manually scrammed.

Which one of the following completes the statements below IAW 0ASSD-01?

The next action that is required is to __(1)__.

Following this action both units will __(2)__.

A. (1) place MSIV control switches in close
   (2) perform 0ASSD-01, Alternative Safe Shutdown Procedure Index concurrently with 0ASSD-02, Control Building.

B. (1) trip both Reactor Recirc pumps
   (2) perform 0ASSD-01, Alternative Safe Shutdown Procedure Index concurrently with 0ASSD-02, Control Building.

C. (1) place MSIV control switches in close
   (2) exit 0ASSD-01, Alternative Safe Shutdown Procedure Index and enter 0ASSD-02, Control Building

D. (1) trip both Reactor Recirc pumps
   (2) exit 0ASSD-01, Alternative Safe Shutdown Procedure Index and enter 0ASSD-02, Control Building

100. The following alarms and indications exist on Unit One:

A-05 (5-6) *Pri Ctmt Press Hi Trip* is in alarm
A-03 (6-9) *Reactor Low Wtr Level Initiation* is in alarm
A-03 (5-1) *Auto Depress Timers Initiated* is in alarm
Reactor coolant sample yields a result of 310 µCi/gm Iodine-131
Inboard and Outboard MSIV logic lights are illuminated
No area radiation or temperatures are above Max Normal Operating Levels

Which one of the following completes the statement below?

These alarms and indications establish that a loss of the _____ exists.

(Reference provided)

A. Containment AND Fuel Clad Barriers ONLY

B. Reactor Coolant System AND Fuel Clad Barriers ONLY

C. Reactor Coolant System AND Containment Barriers ONLY

D. Containment, Reactor Coolant System AND Fuel Clad Barriers

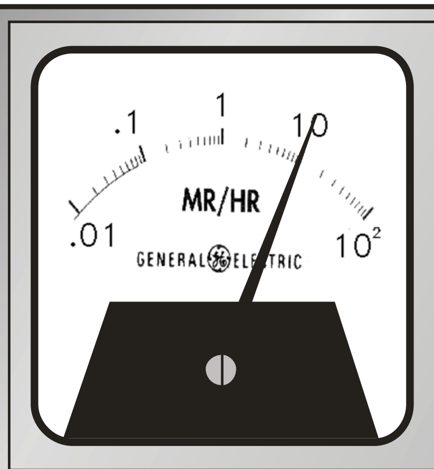
SRO Written Exam Reference Index

1. Attachment 1, Area Radiation Monitoring
2. 0EOP-01-UG, User's Guide, Attachment 10, Figure 24, Secondary Containment Area Radiation
3. 0EOP-01-UG, User's Guide, Attachment 5, Figure 5, Core Spray NPSH Limit
4. 0EOP-01-UG, User's Guide, Attachment 5, Figure 6, RHR NPSH Limit
5. 0EOP-01-UG, User's Guide, Attachment 5, Figure 9, Unit 1 Core Spray Vortex Limit
6. 0EOP-01-UG, User's Guide, Attachment 5, Figure 10, Unit 2 Core Spray Vortex Limit
7. 0EOP-01-UG, User's Guide, Attachment 5, Figure 11, Unit 1 RHR Vortex Limit
8. 0EOP-01-UG, User's Guide, Attachment 5, Figure 12, Unit 2 RHR Vortex Limit
9. 0EOP-01-UG, User's Guide, Attachment 6, Figure 17A, Unit 2 Reactor Water Level at TAF
10. 0EOP-01-UG, User's Guide, Attachment 6, Figure 18A, Unit 2 Reactor Water Level at LL-4 (Minimum Steam Cooling Level)
11. 0EOP-01-UG, User's Guide, Attachment 6, Figure 19A, Unit 2 Reactor Water Level at LL-5 (Minimum Zero Injection Level)
12. 0EOP-01-UG, User's Guide, Attachment 6, Figure 21, Reactor Water Level at MSL (Main Steam Line Flood Level)
13. 0OI-01.07, Attachment 1, Reportability Evaluation Checklist
14. 1OP-27, Figure 1, Estimated Capability Curves
15. 0PEP-02.1, Brunswick Nuclear Plant Initial Emergency Actions
16. 0PEP-03.6.1, Attachment 3, Source Term Calculation From #1 Turbine Vent
17. TS 3.1.4, Control Rod Scram Times
18. TS 3.1.5, Control Rod Scram Accumulators
19. TS 3.3.1.1, RPS Instrumentation
20. TS 3.6.2.1, Suppression Pool Average Temperature
21. B2C21 Core Operating Limits Report, Figure 2, Stability Option III Power/Flow Map, OPRM Inoperable, Two Loop Operation, 2923 MWt.
22. B2C21 Core Operating Limits Report, Figure 4, Stability Option III Power/Flow Map, OPRM Inoperable, Single Loop Operation, 2923 MWt.

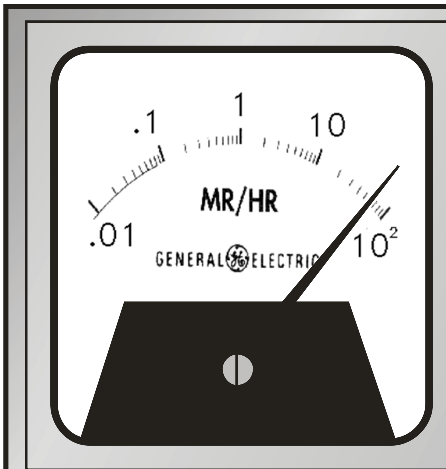
ATTACHMENT 1

AREA RADIATION MONITORING

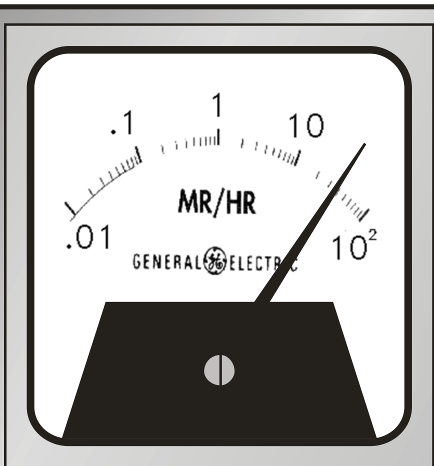
U-2 RX BLDG
SAMPLING STATION
ARM CHANNEL 2-24



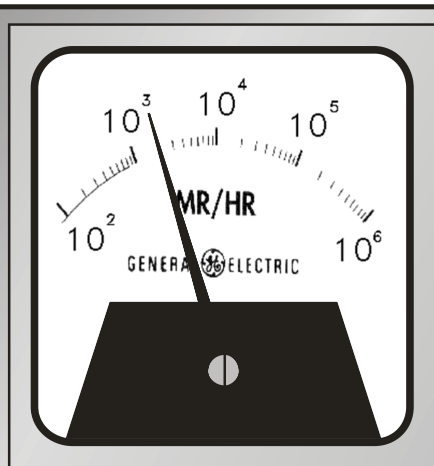
U-2 RX BLDG NORTH
AIRLOCK DOOR AREA
ELEV 50 FT
ARM CHANNEL 2-25



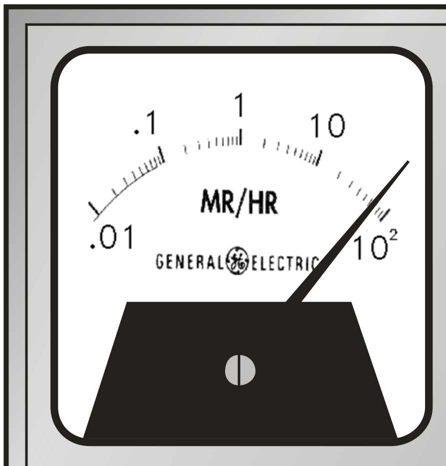
U-2 RX BLDG
CASK WASH AREA
ELEV 117 FT
ARM CHANNEL 2-29



U-2 RX BLDG
NORTH OF FUEL
STORAGE POOL
ELEV 117 FT
ARM CHANNEL 2-27



U-2 RX BLDG
BETWEEN RX AND
FUEL STORAGE POOL
ELEV 117 FT
ARM CHANNEL 2-28



U-2 RX BLDG
SPENT FUEL POOL
COOLING SYSTEM
ELEV 80 FT
ARM CHANNEL 2-30

Secondary Containment Temperature and Radiation Limits

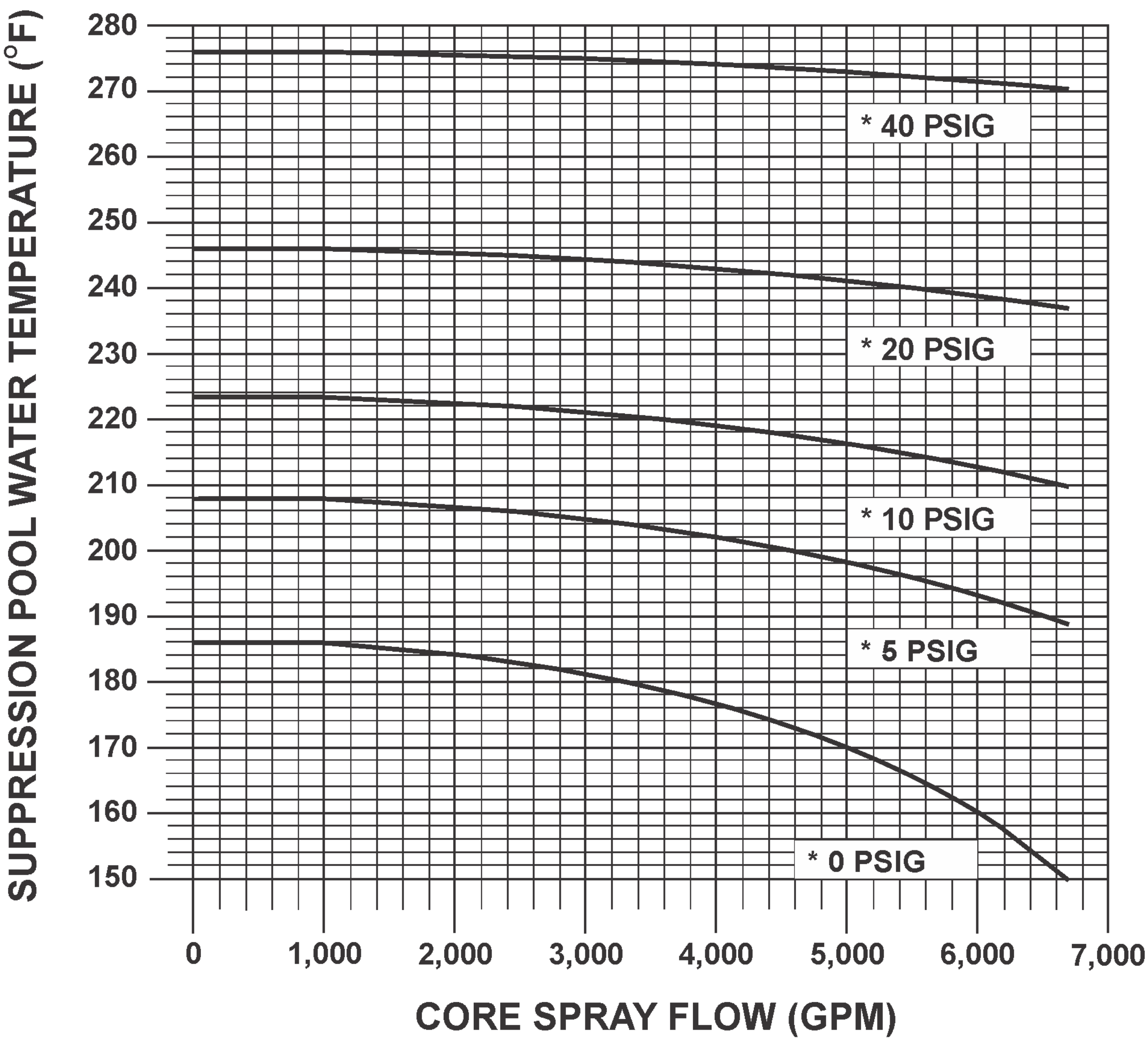
FIGURE 24
Secondary Containment Area Radiation

TABLE 3 AREA RADIATION LIMITS				
PLANT AREA	PLANT LOCATION DESCRIPTION	ARM CHANNEL	MAX NORM OPERATING VALUE (mR/HR)	MAX SAFE OPERATING VALUE (mR/HR)
N CORE SPRAY	N CORE SPRAY ROOM	15	200	* 7000
S CORE SPRAY	S CORE SPRAY ROOM	16	200	* 7000
N RHR	N RHR ROOM	17	200	* 7000
S RHR	S RHR ROOM	18	200	* 3000
HPCI	HPCI ROOM	N/A	N/A	* 3000
RX BLDG 20 FT ELEV	N ACROSS FROM TIP ROOM	19	80	* 2000
	DRYWELL ENTRANCE	20		
	DECON ROOM	22		
	RAILROAD DOORS	23		
RX BLDG 50 FT ELEV	SAMPLE STATION	24	80	* 2000
	RX BLDG AIR LOCK	25		
RX BLDG 117 FT ELEV	N OF FUEL STORAGE POOL	27	80	* 7000
	BETWEEN RX & FUEL POOL	28	1000	7000
	CASK WASH AREA	29	90	* 7000
RX BLDG 80 FT ELEV	SPENT FUEL COOLING SYSTEM	30	90	* 3000

* CONTACT E&RC TO DETERMINE IF MAX SAFE OPERATING VALUE IS EXCEEDED

FIGURE 5

Core Spray NPSH Limit

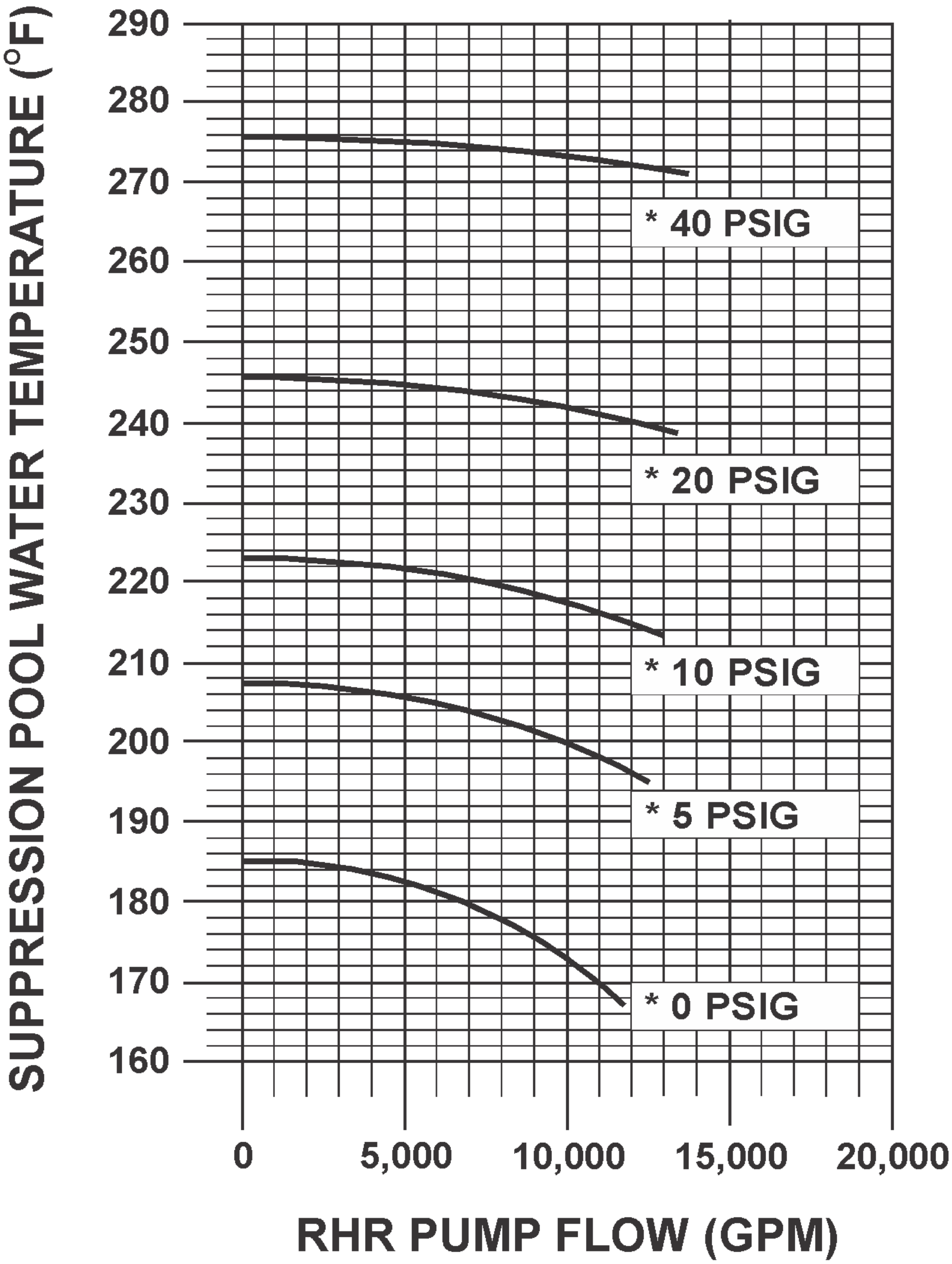


SUBTRACT 0.5 PSIG FROM INDICATED SUPPRESSION CHAMBER PRESSURE FOR EACH FOOT OF WATER LEVEL BELOW A SUPPRESSION POOL WATER LEVEL OF -31 INCHES (-2.6 FEET).

*SUPPRESSION CHAMBER PRESSURE (CAC-PI-1257-2A OR CAC-PI-1257-2B)

FIGURE 6

RHR NPSH Limit



SUBTRACT 0.5 PSIG FROM INDICATED SUPPRESSION CHAMBER PRESSURE FOR EACH FOOT OF WATER LEVEL BELOW A SUPPRESSION POOL WATER LEVEL OF -31 INCHES (-2.6 FEET).

*SUPPRESSION CHAMBER PRESSURE (CAC-PI-1257-2A OR CAC-PI-1257-2B)

FIGURE 9

Unit 1 Core Spray Vortex Limit

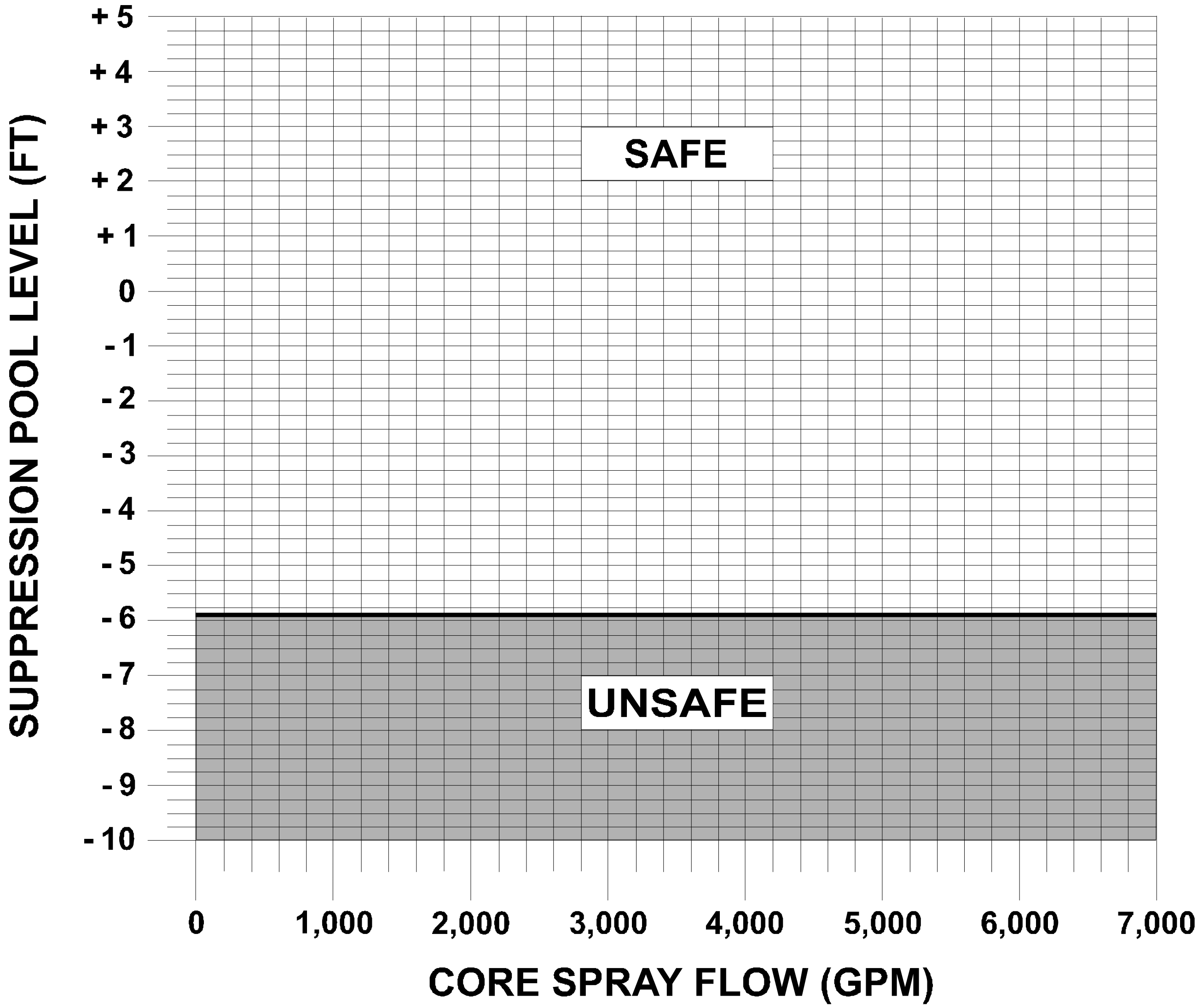


FIGURE 10
Unit 2 Core Spray Vortex Limit

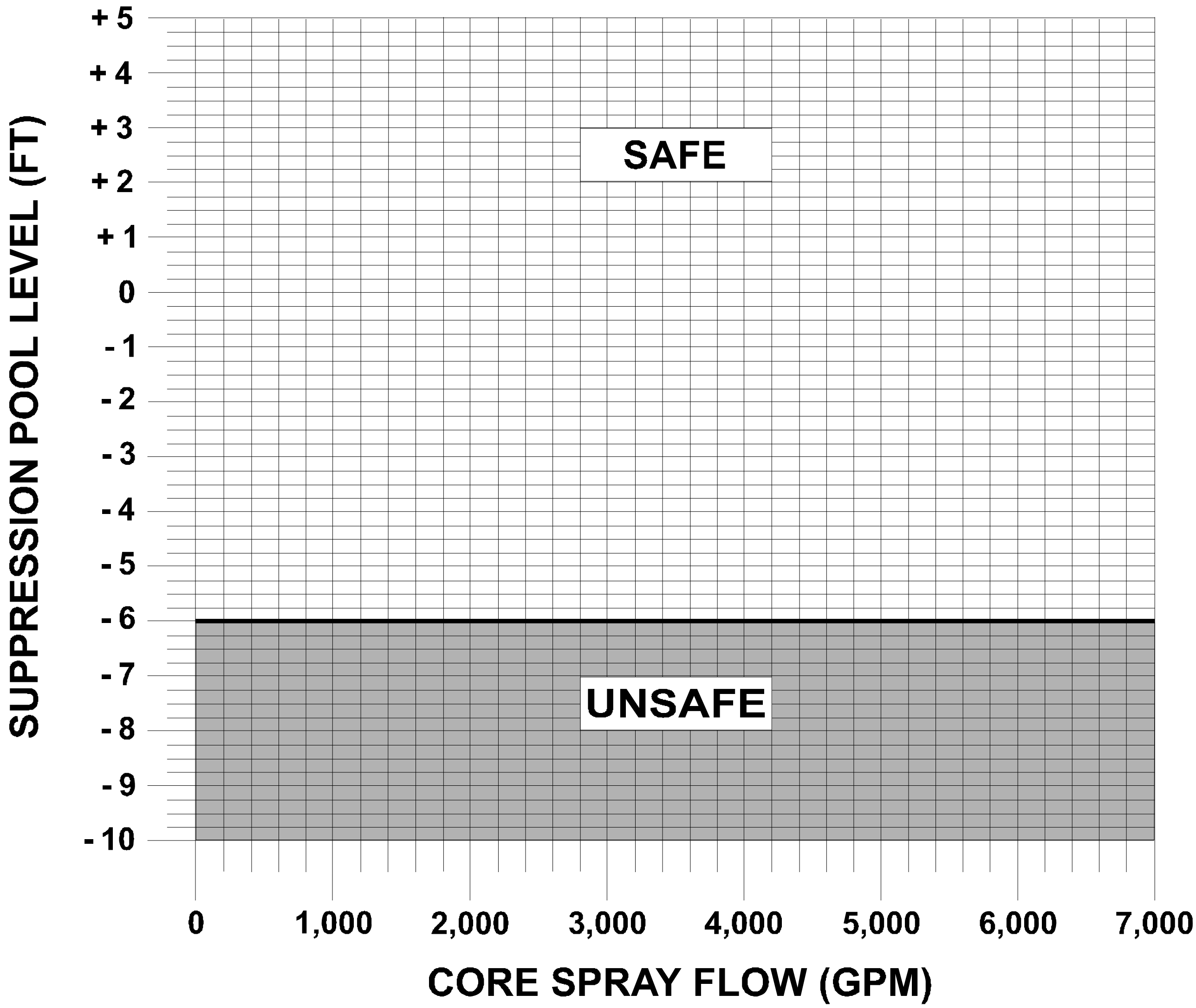


FIGURE 11
Unit 1 RHR Vortex Limit

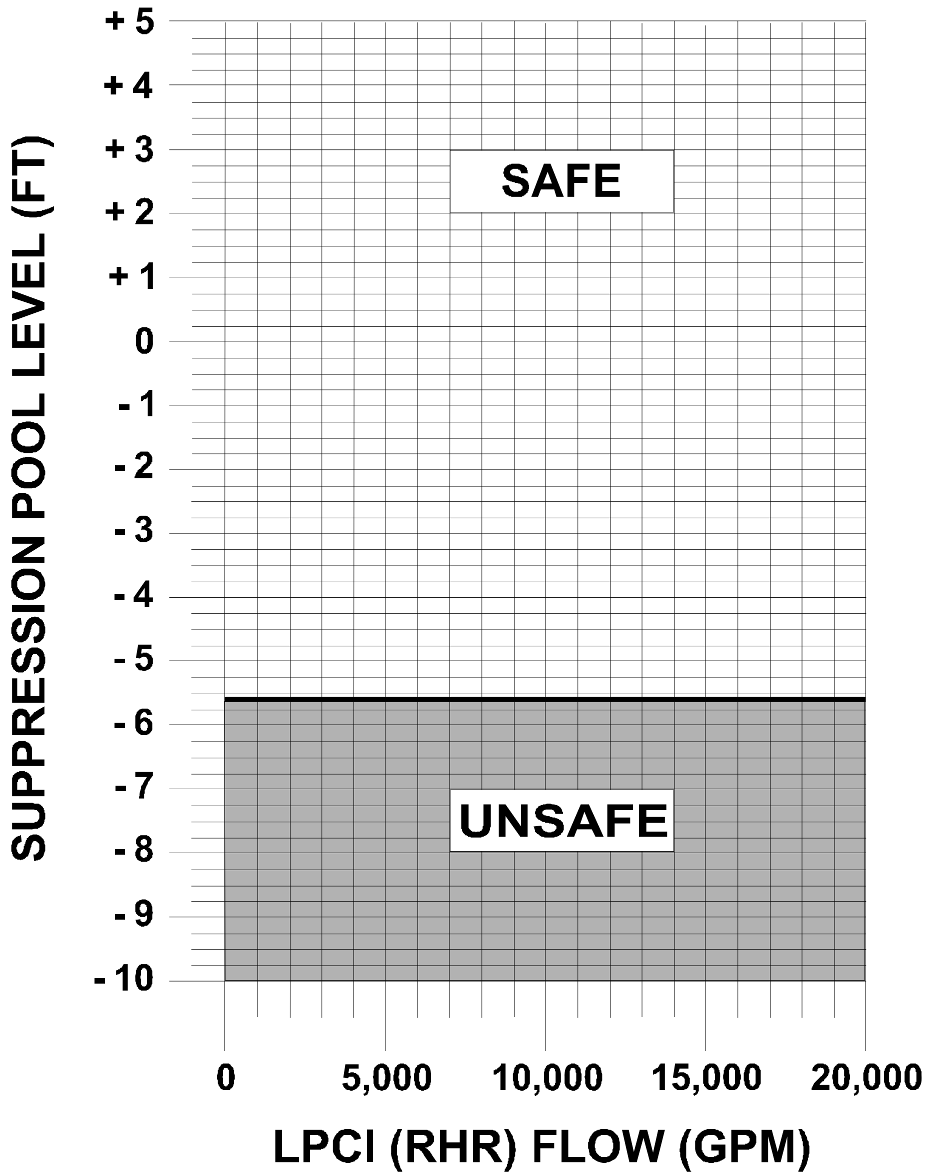


FIGURE 12
Unit 2 RHR Vortex Limit

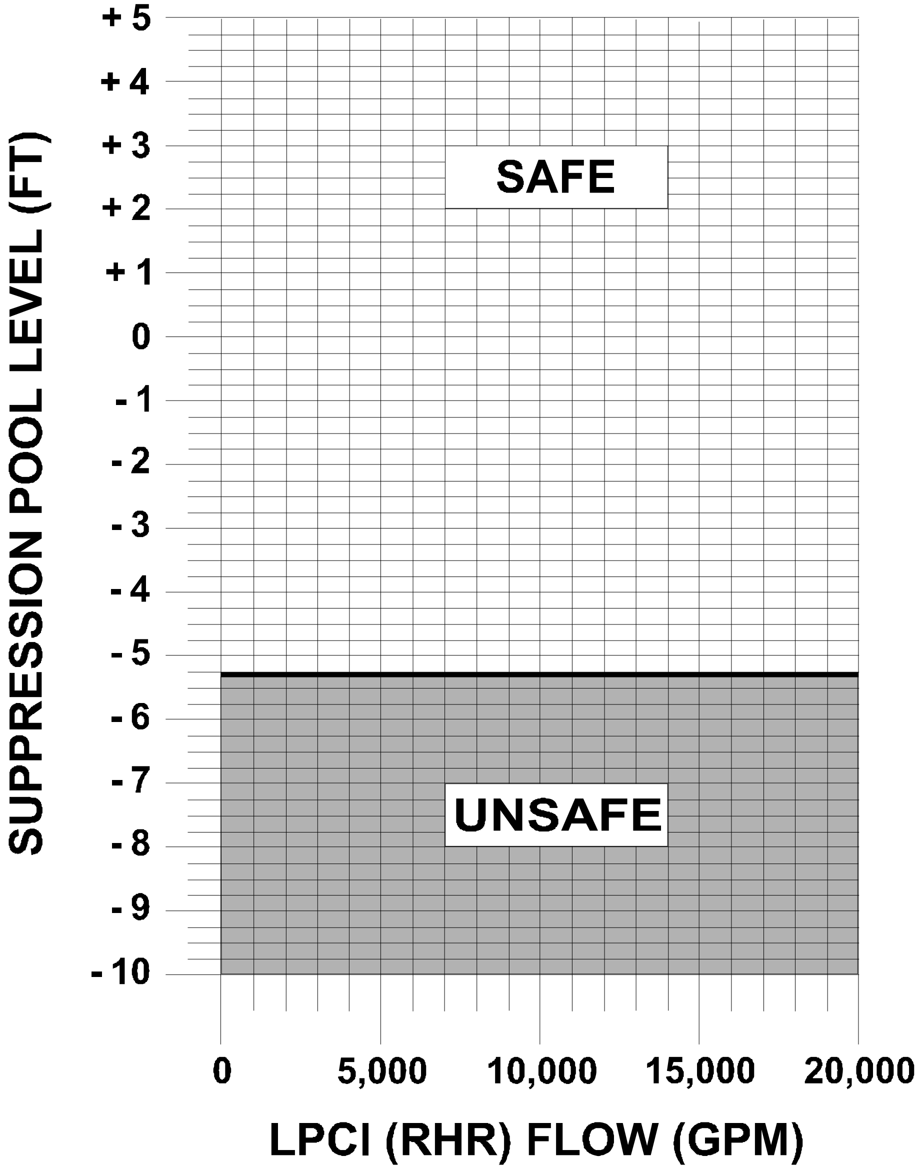
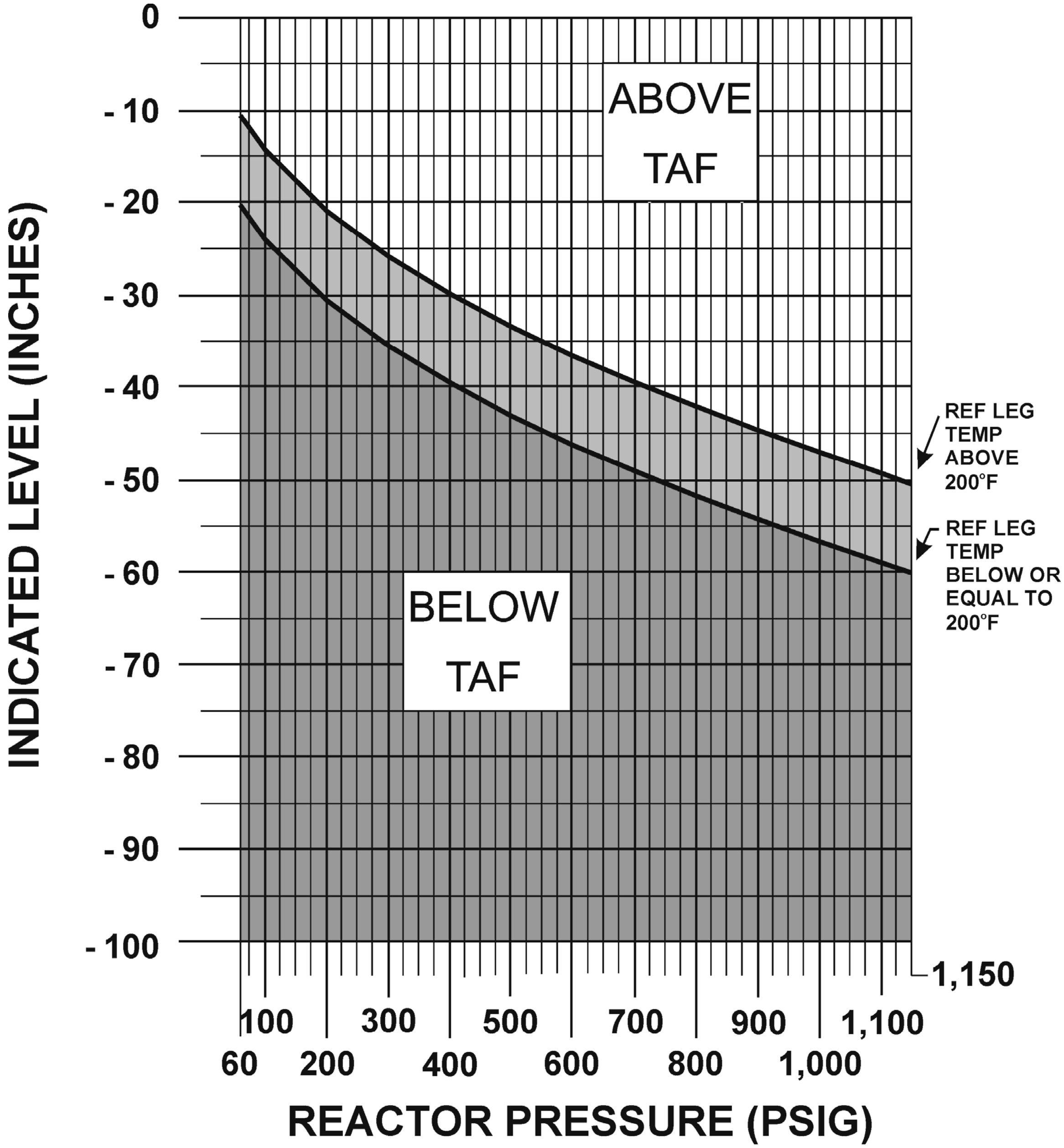


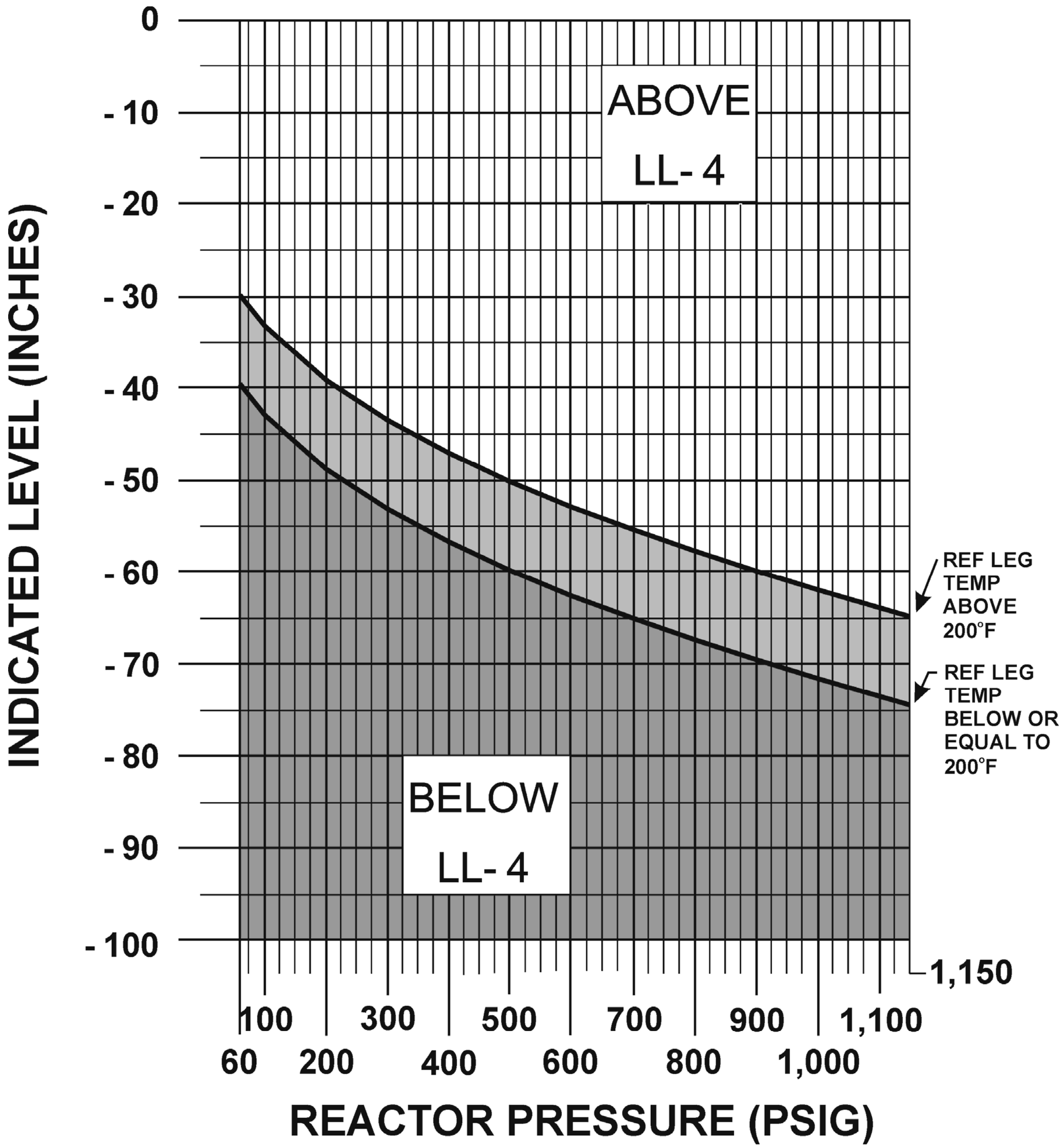
FIGURE 17A

Unit 2 Reactor Water Level at TAF



WHEN REACTOR PRESSURE IS LESS THAN
60 PSIG, USE INDICATED LEVEL.
TAF IS -7.5 INCHES.

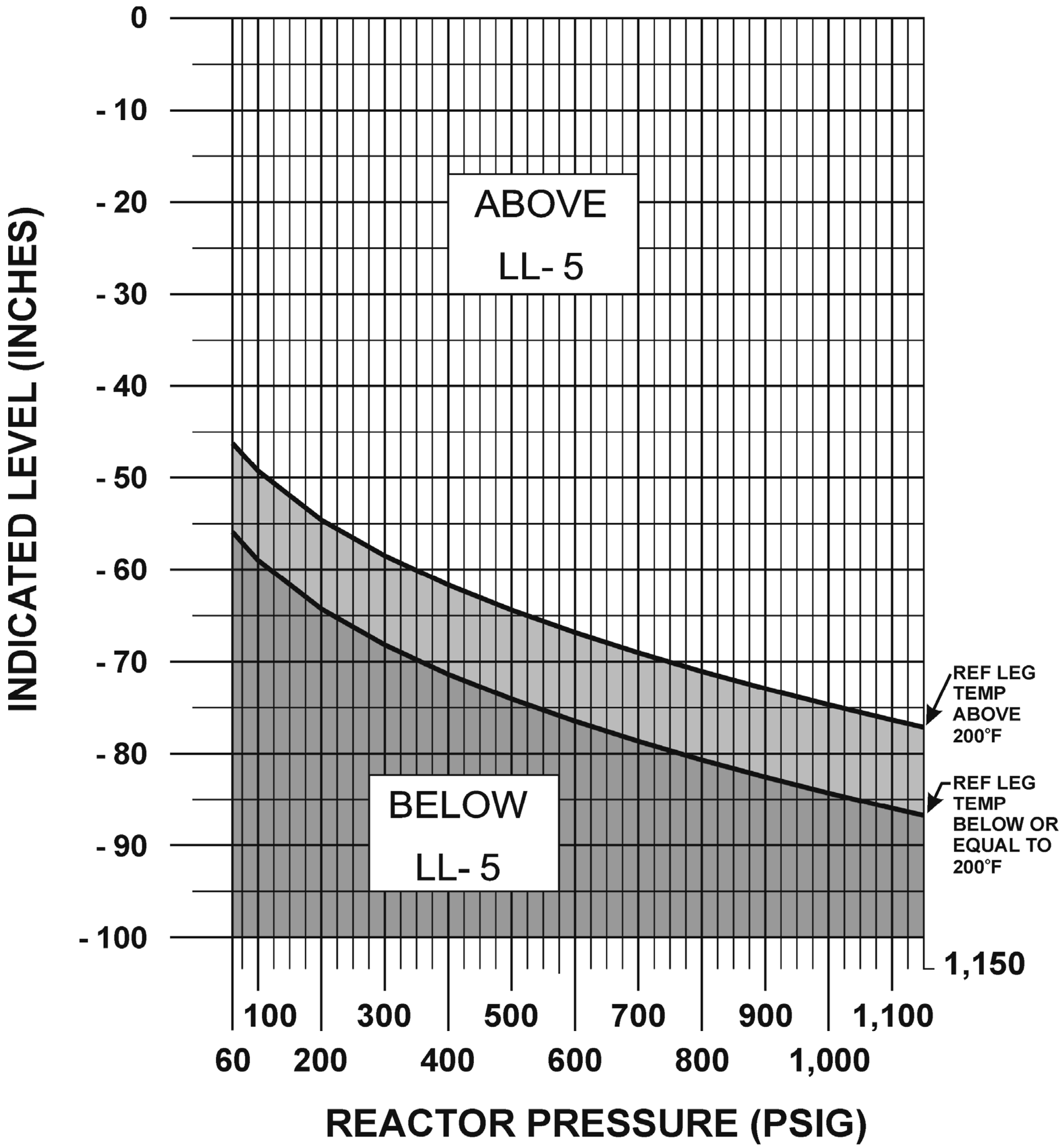
ATTACHMENT 6
Page 15 of 19
FIGURE 18A
Unit 2 Reactor Water Level at LL-4
(Minimum Steam Cooling Level)



WHEN REACTOR PRESSURE IS LESS THAN
60 PSIG, USE INDICATED LEVEL.
LL-4 IS -27.5 INCHES.

FIGURE 19A

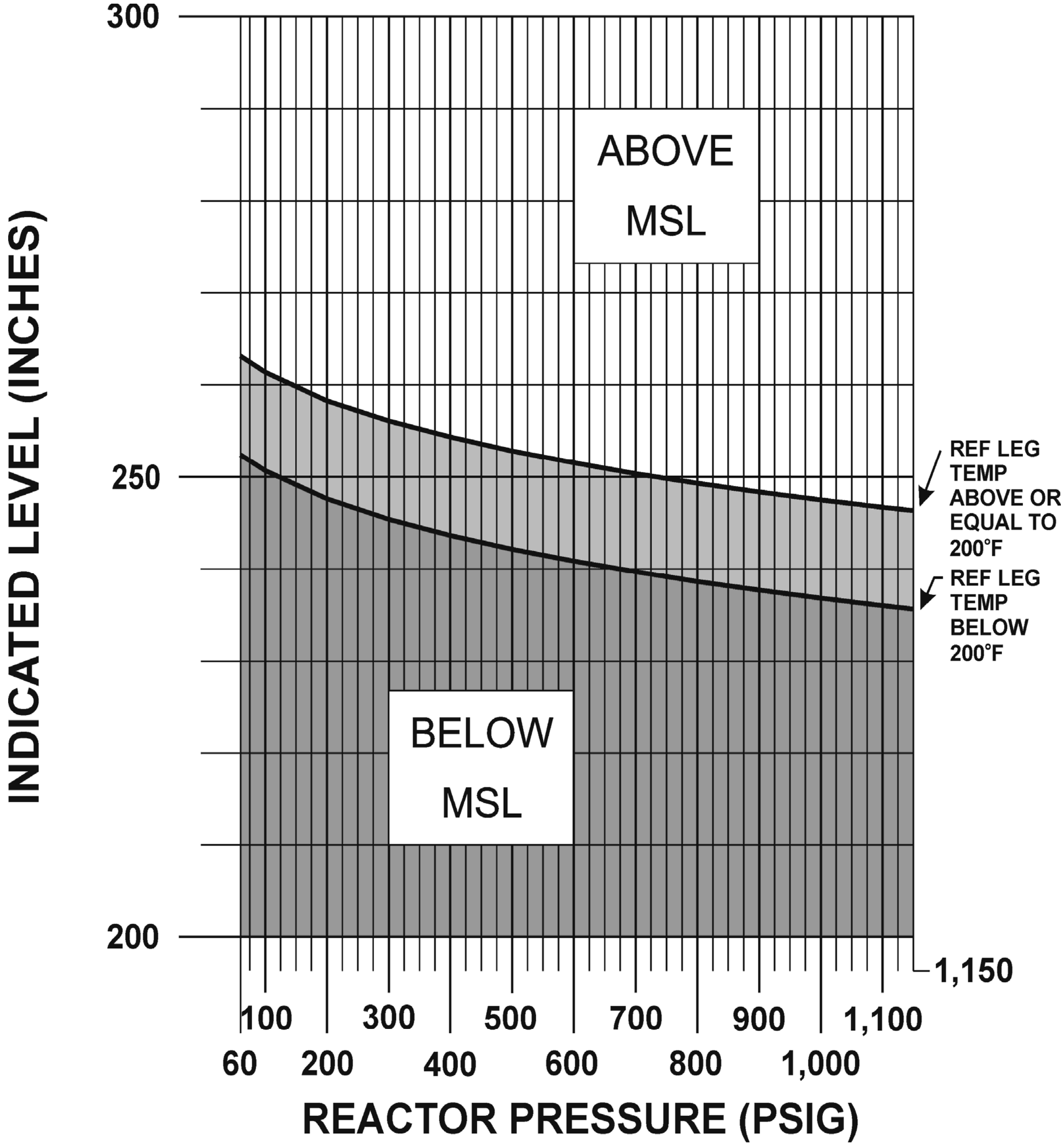
Unit 2 Reactor Water Level at LL-5
(Minimum Zero Injection Level)



WHEN REACTOR PRESSURE IS LESS THAN
60 PSIG, USE INDICATED LEVEL.
LL-5 IS -45.0 INCHES.

FIGURE 21

Reactor Water Level at MSL
(Main Steam Line Flood Level)



WHEN REACTOR PRESSURE IS LESS THAN
60 PSIG, USE INDICATED LEVEL.
MSL IS +250 INCHES.

Reportability Evaluation Checklist

NOTE

If the answer to the following question is YES, then Accelerated Verbal Notification to the NRC is required within 15 minutes. Reference 0AOP-40.0, Security Events, for notification content.

15 MINUTE REPORTABILITY			
ITEM #	**YES**	**NO**	**DESCRIPTIVE QUESTION**
NA			Has a Hostile Action occurred? [NRC Bulletin 2005-02]

NOTE

- NUREG-1022, Rev. 3 is a reference to provide additional guidance on reportability.
- If the answer to any of the following questions is YES, the event is reportable within 1 hour.
- If all answers to the following questions are NO, the event is not reportable within 1 hour.

1 HOUR REPORTABILITY			
ITEM #	**YES**	**NO**	**DESCRIPTIVE QUESTION**
1.1			Is the event a deviation from technical specifications as per 10 CFR 50.54(X)? [10 CFR 50.72(b)(1)]
1.2			Does the event involve by-product, source or special nuclear material possessed by the licensee that might have or threatens to cause:
1.2.1			Any individual's exposure to reach or exceed 25 Rems total effective dose equivalent (TEDE); 75 Rems eye dose equivalent; or 250 Rads shallow-dose equivalent to the skin or extremities? [10 CFR 20.2202(a)(1)]
1.2.2			The release of radioactive material inside or outside of a restricted area, such that, had an individual been present for 24 hours, the individual could have received an intake 5 times the occupational annual limit on intake? [10 CFR 20.2202(a)(2)]
1.3			ISFSI - Does the event involve accidental criticality or loss of any special nuclear material? [10 CFR 72.74(a)]

Reportability Evaluation Checklist

NOTE

- If the answer to any of the following questions is YES, the event is reportable within 4 hours.
- If all answers to the following questions are NO, the event is not reportable within 4 hours.

4 HOUR REPORTABILITY

ITEM #	YES	NO	DESCRIPTIVE QUESTION
2.1			**NOTE** Includes any Safety Limit violation (Tech Spec 2.2). Is plant shutdown required by technical specifications being initiated? [10 CFR 50.72(b)(2)(i)]
2.2			Has the event resulted in or should have resulted in an Emergency Core Cooling System (ECCS) discharge into the Reactor Coolant System as a result of a valid signal, except when the actuation resulted from and was part of a pre-planned sequence during testing or reactor operation? [10 CFR 50.72(b)(2)(iv)(A)]
2.3			Did the event or condition result in actuation of the reactor protection system (RPS) when the reactor was critical, except when the actuation resulted from and was part of a pre-planned sequence during testing or reactor operation? [10 CFR 50.72(b)(2)(iv)(B)]
2.4			**NOTE** • Such an event may include an on-site fatality or an inadvertent release of radioactively contaminated materials. • Outside Government Agency notifications (e.g., North Carolina Wildlife Resource Commission) as a result of sea turtle takes resulting in injury or death that are determined to be causally related to BSEP operations are reportable to the NRC under 10 CFR 50.72(b)(2)(xi). Is the event a situation, as related to the health and safety of the public or on-site personnel, or protection of the environment, for which a news release is planned or notification to other government agencies has been or will be made? [10 CFR 50.72(b)(2)(xi)] [10 CFR 72.75(b)(2)]
2.5			**NOTE** For further information refer to AD-SY-ALL-0150, Reporting Safeguards, Security, and Fitness for Duty Events. Has any licensed material been lost, stolen, or missing in an aggregate quantity equal to or greater than 1,000 times the quantity specified in 10 CFR 20 Appendix C under such circumstances that it appears that an exposure could result to persons in unrestricted areas? [10 CFR 20.2201(a)(i)]

Reportability Evaluation Checklist

4 HOUR REPORTABILITY			
ITEM #	**YES**	**NO**	**DESCRIPTIVE QUESTION**
2.6			ISFSI – Departure from License Condition. Has an action been taken in an emergency that departs from a condition or a technical specification contained in a license or certificate of compliance issued under 10 CFR 72 when the action was immediately needed to protect the public health and safety and no action consistent with license conditions or technical specifications that could provide adequate or equivalent protection was immediately apparent as per 72.32(d)? [10 CFR 72.75(b)(1)]

NOTE

- If the answer to any of the following questions is YES, the event is reportable within 8 hours.
- If all the answers to the following questions are NO, the event is not reportable within 8 hours.

8 HOUR REPORTABILITY			
ITEM #	**YES**	**NO**	**DESCRIPTIVE QUESTION**
3.1			Has the event or condition resulted in the condition of the nuclear power plant, including its principal safety barriers, being seriously degraded? [10 CFR 50.72(b)(3)(ii)(A)]
3.2			Has the event or condition resulted in the nuclear power plant being in an unanalyzed condition that significantly degrades plant safety? [10 CFR 50.72(b)(3)(ii)(B)]
3.3			Did the event or condition result in valid actuation of any of the systems listed below except when the actuation resulted from and is part of a pre-planned sequence during testing or reactor operation? [10 CFR 50.72(b)(3)(iv)(A)]
			NOTE Automatic OR Manual initiation of the systems listed below is reportable. NUREG-1022, Section 3.2.6 discussion, should be referenced for additional information.
3.3.1			These systems are: Reactor protection system (RPS) including: reactor scram and reactor trip. [10 CFR 50.72(b)(3)(iv)(B)(1)]

Reportability Evaluation Checklist

8 HOUR REPORTABILITY			
ITEM #	**YES**	**NO**	**DESCRIPTIVE QUESTION**
3.3.2			General containment isolation signals affecting containment isolation valves in more than one system or multiple main steam isolation valves (MSIVs). • Main Steam Isolation. • Main Steam Line Drain Isolation. • HPCI Steam Line Isolation. • RCIC Steam Line Isolation. • RWCU Suction Isolation. • Primary Containment Isolation. • Secondary Containment Isolation. • SGTS Actuation. • Combustible Gas Control (CAD). [10 CFR 50.72(b)(3)(iv)(B)(2)]
3.3.3			Emergency core cooling systems (ECCS), including: • Core Spray (CS) • High Pressure Coolant Injection (HPCI) • Low Pressure Coolant Injection (LPCI) function of the • Residual Heat Removal (RHR) • Automatic Depressurization (ADS) System [10 CFR 50.72(b)(3)(iv)(B)(4)]
3.3.4			Reactor Core Isolation Cooling (RCIC) [10 CFR 50.72(b)(3)(iv)(B)(5)]
3.3.5			Containment heat removal and depressurization systems including containment spray and fan cooler systems. • RHR Suppression Pool Cooling. • Drywell Spray System Actuation. [10 CFR 50.72(b)(3)(iv)(B)(7)]
3.3.6			Emergency Diesel Generators (DGs) [10 CFR 50.72(b)(3)(iv)(B)(8)]

Reportability Evaluation Checklist

8 HOUR REPORTABILITY			
ITEM #	**YES**	**NO**	**DESCRIPTIVE QUESTION**
3.4			Could the event or condition at the time of discovery have prevented the fulfillment of the safety function of structures or systems that are needed to: [10 CFR 50.72(b)(3)(v)] These criteria cover an event or condition in which scoped in SSCs could have failed to perform their intended function because of one or more personnel errors, including procedure violations; equipment failures; inadequate maintenance; or design, analysis, fabrication, equipment qualification, construction, or procedural deficiencies and no redundant equipment in the same system was OPERABLE. However, individual component failures need not be reported if redundant equipment in the same system was OPERABLE and available to perform the required safety function. [10 CFR 50.72(b)(3)(vi)] **NOTE** No Event Notification (i.e., per 10 CFR 50.72(b)(3)(v)) is required for conditions which could have prevented fulfillment of the safety function that are discovered when the affected system is INOPERABLE or when the affected system is INOPERABLE but considered available. If the condition is discovered when the system is OPERABLE, an EN will be made per 10 CFR 50.72(b)(3)(v).
3.4.1			Shut down the reactor and maintain it in a safe shutdown condition? [10 CFR 50.72(b)(3)(v)(A)]
3.4.2			Remove residual heat? [10 CFR 50.72(b)(3)(v)(B)]
3.4.3			Control the release of radioactive material? [10 CFR 50.72(b)(3)(v)(C)]
3.4.4			**NOTE**: RCIC INOPERABILITY is not reportable as a single train system per 10 CFR 50.72(b)(3)(v)(d). TS Basis 3.5.3 states that the RCIC System is not an ESF system and no credit is taken in the safety analysis for RCIC System operation. As such, consistent with Example 2 on NUREG 1022, Revision 3, RCIC Failure is not reportable under 10 CFR 50.72(b)(3)(v)(d). Mitigate the consequences of an accident? [10 CFR 50.72(b)(3)(v)(D)]
3.5			Does the event require the transport of a radioactively contaminated person to an off-site medical facility for treatment? [10 CFR 50.72(b)(3)(xii)] [10 CFR 72.75(c)(3)]

Reportability Evaluation Checklist

NOTE

- Additional reportability guidance concerning loss of emergency preparedness capabilities is contained in Section 3.2.13 of NUREG-1022, Rev. 3. Consultation with an Emergency Preparedness representative is advised when assessing the significance of the loss of capability.
- 0PLP-37, Equipment Important to Emergency Preparedness and ERO Response, is a reference for assistance in determining equipment important to Emergency Preparedness and whether planned or unplanned OPERABILITY of the equipment may be reportable.

8 HOUR REPORTABILITY			
ITEM #	**YES**	**NO**	**DESCRIPTIVE QUESTION**
3.6			Has the event resulted in a major loss of emergency assessment capability, off-site response capability, or communications capability (i.e., significant portion of the Main Control Room indication, emergency notification system, or off-site notification system)? [10 CFR 50.72(b)(3)(xiii)] Major loss of emergency or off-site notification system is considered to be/but not limited to: a. Loss of: 1) Selective signaling; OR NRC Emergency Notification System (ENS); AND 2) Commercial telephone network. b. INOPERABILITY for greater than or equal to 1 hour of: 1) Seven or more off-site sirens; OR 2) All off-site sirens in one county.
3.7			ISFSI –Important to Safety Defect Has a defect been discovered in any Independent Spent Fuel Storage structure, system, or component that is important to safety? [10 CFR 72.75(c)(1)]
3.8			ISFSI – Reduction in Effectiveness Has a condition been discovered which results in a significant reduction in the effectiveness of any Independent Spent Fuel Storage cask confinement system during use? [10 CFR 72.75(c)(2)]

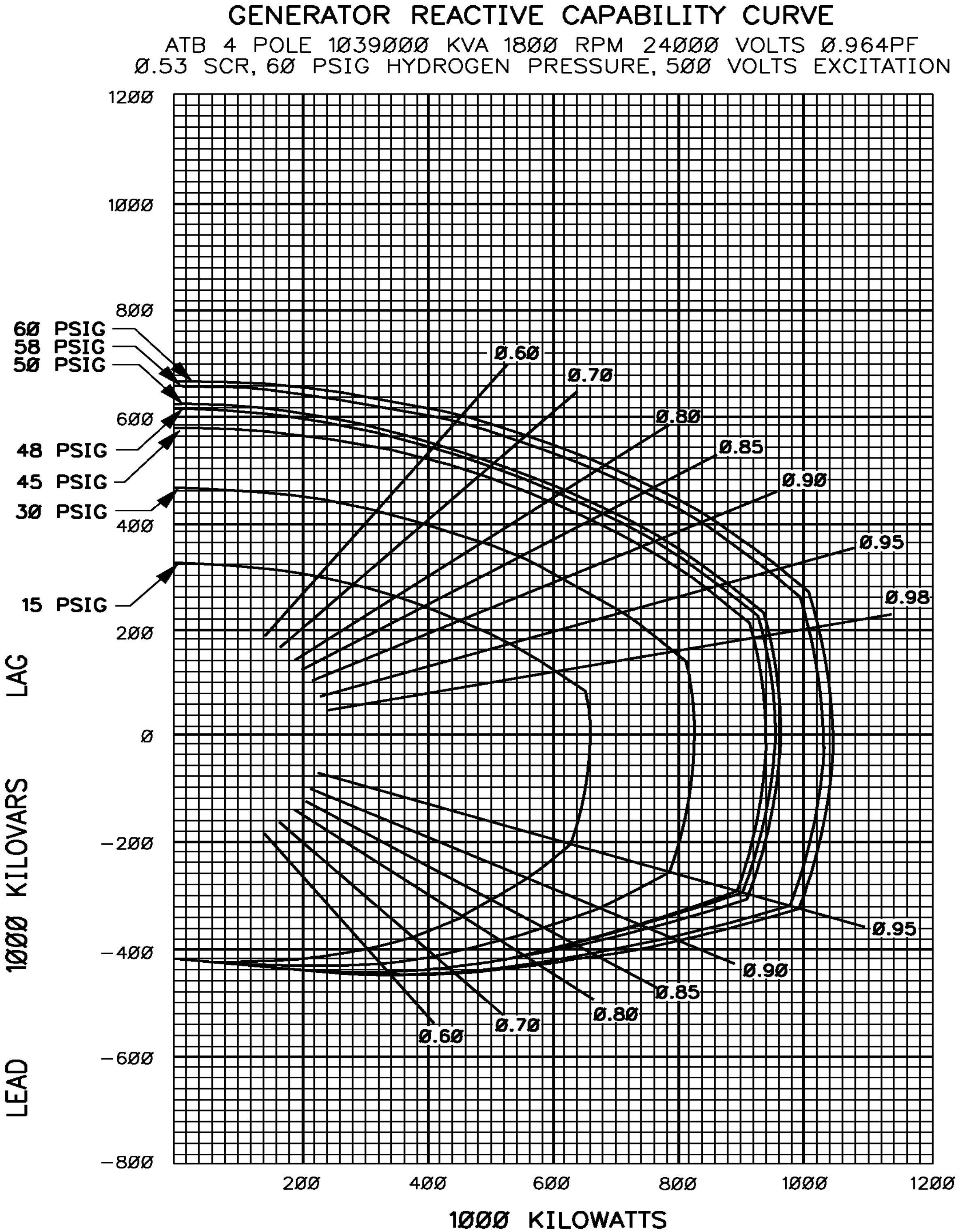
Reportability Evaluation Checklist

NOTE

If the answer to any of the following questions is YES, the event is reportable within 24 hours.

24 HOUR REPORTABILITY			
ITEM #	**YES**	**NO**	**DESCRIPTIVE QUESTION**
4.1 4.1.1			Does the incident involve the loss of control of licensed material possessed by BNP which might have caused or threatens to cause: Any individual's exposure in a period of 24 hours to exceed: 5 Rems total effective dose equivalent (TEDE); or 15 Rems eye dose equivalent; or 50 Rems shallow-dose equivalent to the skin or extremities? [10 CFR 20.2202(b)(1)]
4.1.2			The release of radioactive material inside or outside of a restricted area, so that, had an individual been present for 24 hours, the individual could have received an intake in excess of one occupational annual limit on intake? [10 CFR 20.2202(b)(2)]
4.2			ISFSI – Equipment Important to Safety Disabled or Failed to Function Does the event involve equipment important to safety which is disabled or fails to function as designed when: The equipment is required by certificate of compliance to be available and OPERABLE to prevent releases that could exceed regulatory limits, to prevent exposures to radiation or radioactive materials that could exceed regulatory limits, or to mitigate the consequences of an accident; and, No redundant equipment was available and OPERABLE to perform the required safety function. [10 CFR 72.75(d)(1)]

FIGURE 1
Page 1 of 1
Estimated Capability Curves



Source Term Calculation From #1 Turbine Vent

Release rate is read in µCi/sec directly from 1-D12-RR-4548-4 (effluent channel) when the 1-VA-FT-3358 flow instrument loop is operational. The following calculations are necessary when this loop is not operational.

TIME	MONITOR READING[1] (µCi/cc)	FLOW[2] (cfm)	CONVERSION FACTOR $\frac{cc/sec}{cfm}$	RELEASE RATE[3] (µCi/sec)
			472	

[1] The monitor automatically selects the most accurate operational channel, either low, mid, or high range. Read the µCi/cc from the appropriate channel (low, mid, or high) of 1-D12-RR-4548-3-2-1.

[2] If not available, use 15,500 cfm

[3] Release Rate (µCi/sec) = (µCi/cc) x (cfm) x (472)

3.1 REACTIVITY CONTROL SYSTEMS

3.1.4 Control Rod Scram Times

LCO 3.1.4

a. No more than 10 OPERABLE control rods shall be "slow," in accordance with Table 3.1.4-1; and

b. No more than 2 OPERABLE control rods that are "slow" shall occupy adjacent locations.

APPLICABILITY: MODES 1 and 2.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Requirements of the LCO not met.	A.1 Be in MODE 3.	12 hours

Table 3.1.4-1 (page 1 of 1)
Control Rod Scram Times

---NOTES---

1. OPERABLE control rods with scram times not within the limits of this Table are considered "slow."

2. Enter applicable Conditions and Required Actions of LCO 3.1.3, "Control Rod OPERABILITY," for control rods with scram times > 7 seconds to notch position 06. These control rods are inoperable, in accordance with SR 3.1.3.3, and are not considered "slow."

NOTCH POSITION	SCRAM TIMES WHEN REACTOR STEAM DOME PRESSURE $\geq$ 800 psig[(a)(b)] (seconds)
46	0.44
36	1.08
26	1.83
06	3.35

(a) Maximum scram time from fully withdrawn position, based on de-energization of scram pilot valve solenoids at time zero.

(b) When reactor steam dome pressure is < 800 psig, established scram time limits apply.

3.1 REACTIVITY CONTROL SYSTEMS

3.1.5 Control Rod Scram Accumulators

LCO 3.1.5 Each control rod scram accumulator shall be OPERABLE.

APPLICABILITY: MODES 1 and 2.

ACTIONS

--NOTE--
Separate Condition entry is allowed for each control rod scram accumulator.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One control rod scram accumulator inoperable with reactor steam dome pressure ≥ 950 psig.	A.1 ---------------NOTE------------ Only applicable if the associated control rod scram time was within the limits of Table 3.1.4-1 during the last scram time Surveillance. --------------------------------- Declare the associated control rod scram time "slow." <u>OR</u> A.2 Declare the associated control rod inoperable.	 8 hours 8 hours

(continued)

3.3 INSTRUMENTATION

3.3.1.1 Reactor Protection System (RPS) Instrumentation

LCO 3.3.1.1 The RPS instrumentation for each Function in Table 3.3.1.1-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.1.1-1.

ACTIONS

--NOTE--
Separate Condition entry is allowed for each channel.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more required channels inoperable.	A.1 Place channel in trip. OR A.2 ---------------NOTE------------- Not applicable for Functions 2.a, 2.b, 2.c, 2.d, or 2.f. ------------------------------------- Place associated trip system in trip.	12 hours 12 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. ------------NOTE---------------- Not applicable for Functions 2.a, 2.b, 2.c, 2.d, or 2.f. ----------------------------------- One or more Functions with one or more required channels inoperable in both trip systems.	B.1	Place channel in one trip system in trip.	6 hours
	OR		
	B.2	Place one trip system in trip.	6 hours
C. One or more Functions with RPS trip capability not maintained.	C.1	Restore RPS trip capability.	1 hour
D. Required Action and associated Completion Time of Condition A, B, or C not met.	D.1	Enter the Condition referenced in Table 3.3.1.1-1 for the channel.	Immediately
E. As required by Required Action D.1 and referenced in Table 3.3.1.1-1.	E.1	Reduce THERMAL POWER to < 26% RTP.	4 hours

(continued)

3.6 CONTAINMENT SYSTEMS

3.6.2.1 Suppression Pool Average Temperature

LCO 3.6.2.1

APPLICABILITY:

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Suppression pool average temperature > 95°F but ≤ 110°F. AND THERMAL POWER > 1% RTP. AND Not performing testing that adds heat to the suppression pool.	A.1 Verify suppression pool average temperature ≤ 110°F. AND A.2 Restore suppression pool average temperature to ≤ 95°F.	Once per hour 24 hours
B. Required Action and associated Completion Time of Condition A not met.	B.1 Reduce THERMAL POWER to ≤ 1% RTP.	12 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. Suppression pool average temperature > 105°F. <u>AND</u> THERMAL POWER > 1% RTP. <u>AND</u> Performing testing that adds heat to the suppression pool.	C.1	Suspend all testing that adds heat to the suppression pool.	Immediately
D. Suppression pool average temperature > 110°F but ≤ 120°F.	D.1	Manually scram the reactor.	Immediately
	<u>AND</u>		
	D.2	Verify suppression pool average temperature ≤ 120°F.	Once per 30 minutes
	<u>AND</u>		
	D.3	Be in MODE 4.	36 hours
E. Suppression pool average temperature > 120°F.	E.1	Depressurize the reactor vessel to < 200 psig.	12 hours
	<u>AND</u>		
	E.2	Be in MODE 4.	36 hours

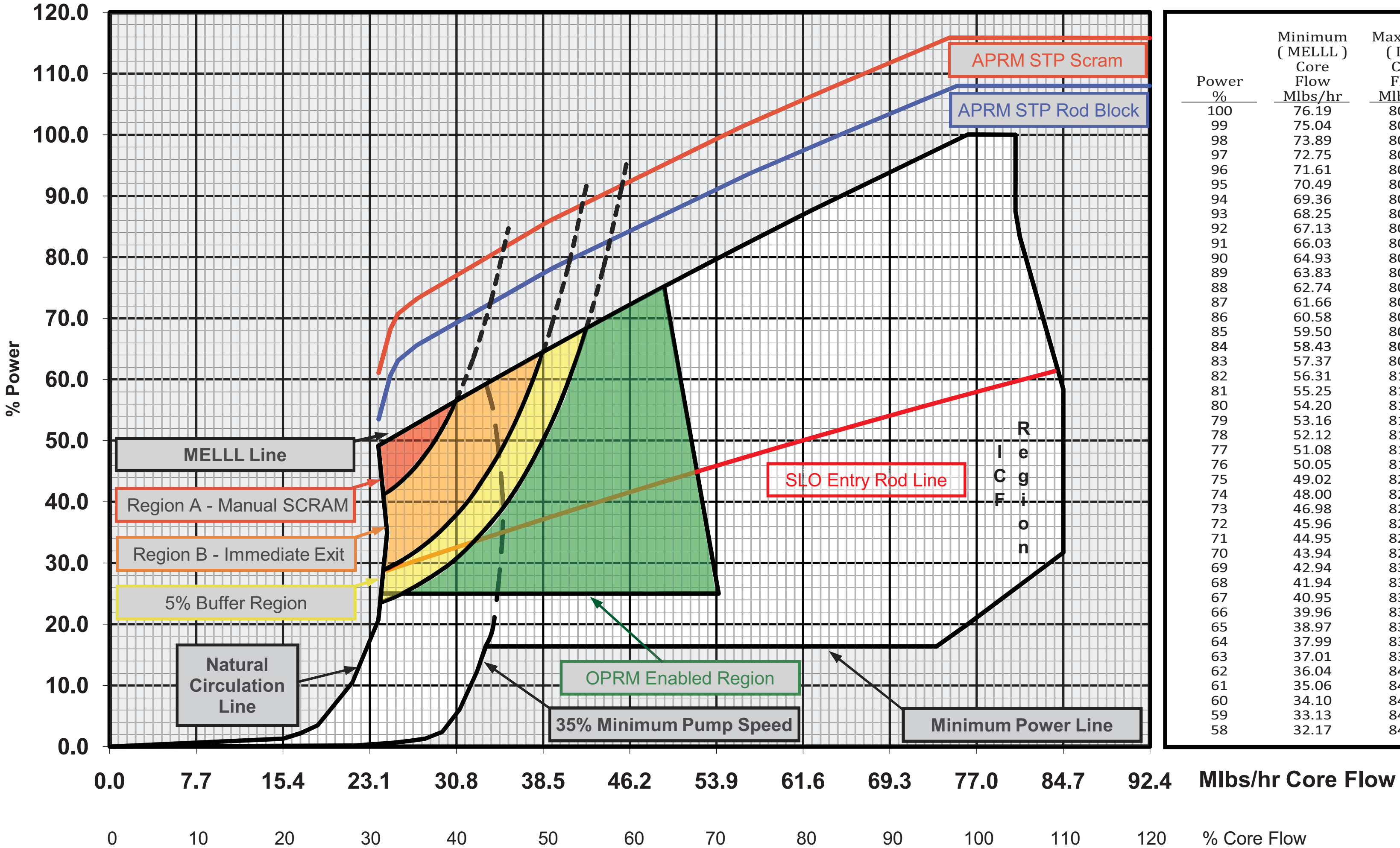
SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.2.1.1	Verify suppression pool average temperature is within the applicable limits.	24 hours AND 5 minutes when performing testing that adds heat to the suppression pool

Figure 2
Stability Option III Power/Flow Map

OPRM Inoperable, Two Loop Operation, 2923 MWt

This Figure supports Improved Technical Specification 3.3.1.1 and the Technical Requirements Manual Specification 3.3



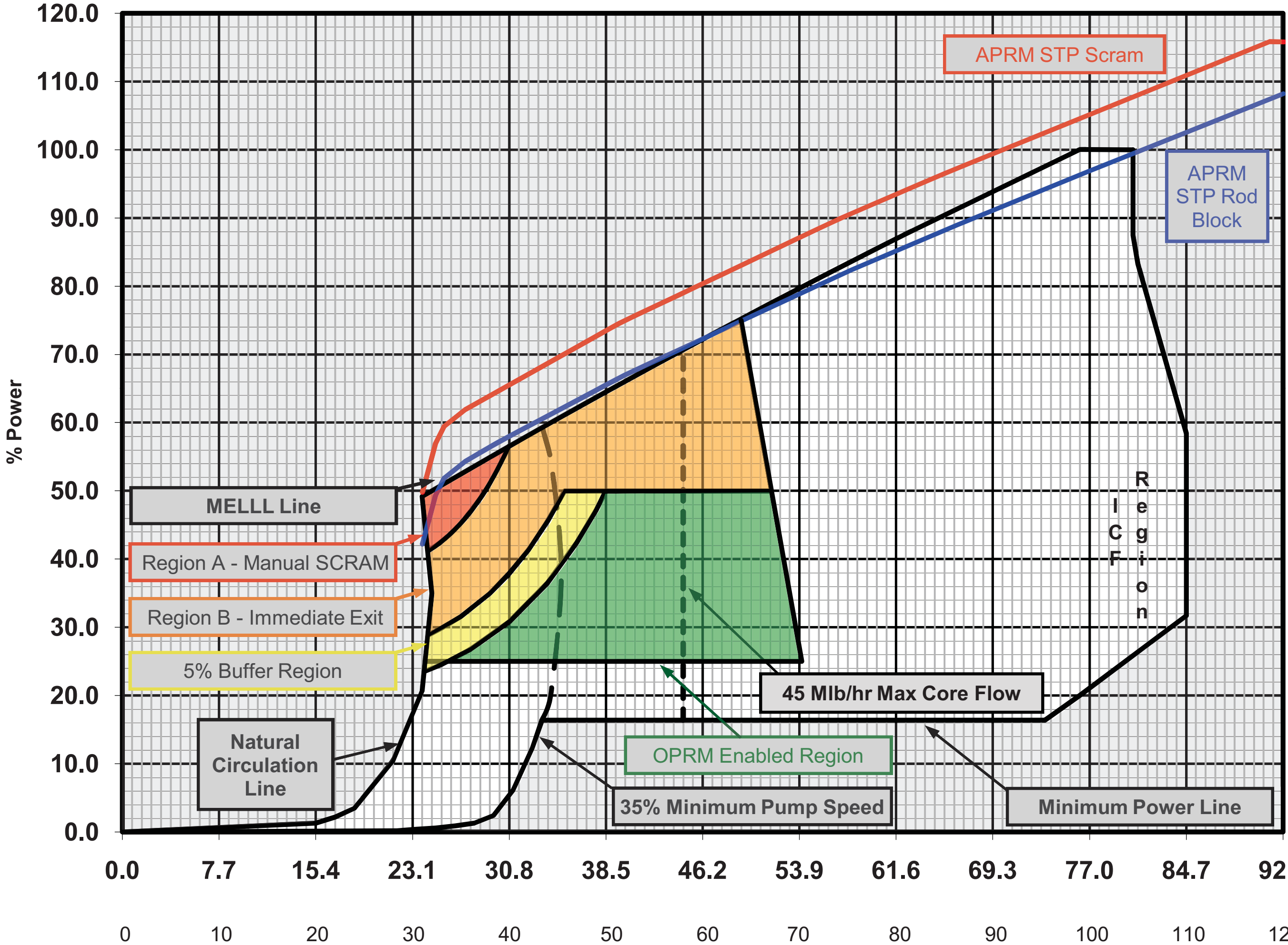
Power %	Minimum (MELLL) Core Flow Mlbs/hr	Maximum (ICF) Core Flow Mlbs/hr
100	76.19	80.47
99	75.04	80.47
98	73.89	80.47
97	72.75	80.47
96	71.61	80.47
95	70.49	80.47
94	69.36	80.47
93	68.25	80.47
92	67.13	80.47
91	66.03	80.47
90	64.93	80.47
89	63.83	80.47
88	62.74	80.47
87	61.66	80.51
86	60.58	80.60
85	59.50	80.69
84	58.43	80.79
83	57.37	80.90
82	56.31	81.05
81	55.25	81.21
80	54.20	81.36
79	53.16	81.51
78	52.12	81.67
77	51.08	81.82
76	50.05	81.98
75	49.02	82.13
74	48.00	82.29
73	46.98	82.44
72	45.96	82.60
71	44.95	82.75
70	43.94	82.91
69	42.94	83.06
68	41.94	83.22
67	40.95	83.37
66	39.96	83.52
65	38.97	83.68
64	37.99	83.83
63	37.01	83.99
62	36.04	84.14
61	35.06	84.30
60	34.10	84.45
59	33.13	84.61
58	32.17	84.70

Reference: 0B21-1015, Revision 7

Figure 4
Stability Option III Power/Flow Map

OPRM Inoperable, Single Loop Operation, 2923 MWt

This Figure supports Improved Technical Specification 3.3.1.1 and the Technical Requirements Manual Specification 3.3



Power %	Minimum (MELLL) Core Flow Mlbs/hr	Maximum (ICF) Core Flow Mlbs/hr
100	76.19	80.47
99	75.04	80.47
98	73.89	80.47
97	72.75	80.47
96	71.61	80.47
95	70.49	80.47
94	69.36	80.47
93	68.25	80.47
92	67.13	80.47
91	66.03	80.47
90	64.93	80.47
89	63.83	80.47
88	62.74	80.47
87	61.66	80.51
86	60.58	80.60
85	59.50	80.69
84	58.43	80.79
83	57.37	80.90
82	56.31	81.05
81	55.25	81.21
80	54.20	81.36
79	53.16	81.51
78	52.12	81.67
77	51.08	81.82
76	50.05	81.98
75	49.02	82.13
74	48.00	82.29
73	46.98	82.44
72	45.96	82.60
71	44.95	82.75
70	43.94	82.91
69	42.94	83.06
68	41.94	83.22
67	40.95	83.37
66	39.96	83.52
65	38.97	83.68
64	37.99	83.83
63	37.01	83.99
62	36.04	84.14
61	35.06	84.30
60	34.10	84.45
59	33.13	84.61
58	32.17	84.70

Reference: 0B21-1015, Revision 7

BRUNSWICK 2014-301 SRO ANSWER KEY

1.	D	26.	B	51.	B	76.	D
2.	D	27.	B	52.	B	77.	B
3.	B	28.	A	53.	B	78.	D
4.	A	29.	D	54.	A	79.	A
5.	C	30.	A	55.	C	80.	D
6.	B	31.	D	56.	A	81.	B
7.	D	32.	D	57.	B	82.	C
8.	C	33.	C	58.	D	83.	B
9.	A	34.	D	59.	A	84.	C
10.	C	35.	C	60.	D	85.	B
11.	C	36.	D	61.	A	86.	C
12.	C	37.	D	62.	A	87.	D
13.	B	38.	B	63.	D	88.	B
14.	D	39.	A	64.	B	89.	C
15.	A	40.	D	65.	C	90.	B
16.	C	41.	B	66.	A	91.	B
17.	B	42.	D	67.	B	92.	B
18.	A	43.	C	68.	D	93.	A
19.	A	44.	A	69.	D	94.	A
20.	D	45.	B	70.	A	95.	D
21.	B	46.	C	71.	A	96.	D
22.	C	47.	B	72.	B	97.	A
23.	B	48.	C	73.	B	98.	A
24.	C	49.	B	74.	B	99.	C
25.	C	50.	B	75.	A	100.	B