FINAL AS GIVEN (RO)

2009B ONS SRO NRC Examination - Q 1

Given the following Unit 1 conditions:

Initial conditions:

- Reactor power = 100%

Current conditions:

- RCS pressure = 2078 psig decreasing
- Pzr level = 350 inches increasing
- 1SA-18/A-1 (Pressurizer Relief Valve Flow) actuated
- ALL 1RC-66 flow monitor red lights are illuminated

Immediate Manual Actions of AP/44 (Abnormal Pressurizer Pressure Control) directs the operator to __(1)__ AND the actual setpoint (psig) for the Low RCS Pressure RPS trip is __(2)__.

Which ONE of the following completes the above statement?

A. 1. Close 1RC-4
   2. 1800

B. 1. Close 1RC-4
   2. 1810

C. 1. Manually trip the reactor
   2. 1800

D. 1. Manually trip the reactor
   2. 1810

2009B ONS SRO NRC Examination - Q 2

Given the following Unit 1 conditions:

- Time = 03:00
- Reactor power = 100%
- 1A and 1C RBCUs operating in HIGH speed
- 1B RBCU is operable and OFF
- Large Break LOCA occurs

Which ONE of the following describes RBCU status at 03:04?

A. 1A and 1C RBCUs operating in HIGH speed and 1B RBCU is OFF

B. 1A and 1C RBCUs operating in LOW speed and 1B RBCU is OFF

C. ALL RBCUs operating in LOW speed

D. ALL RBCUs will be OFF

2009B ONS SRO NRC Examination - Q 3

Given the following Unit 1 conditions:

- Reactor power = 100%

	1B1 RCP	1B2 RCP
UPPER Cavity Pressure	1426 psig stable	714 psig stable
LOWER Cavity Pressure	2140 psig stable	1412 psig stable
Motor Stand Velocity Vibration	0.8 mil stable	3.2 mils stable
Spool Piece Displacement	6.5 mils stable	14.5 mils stable

Which ONE of the following describes the required actions in accordance with AP/16 (Abnormal Reactor Coolant Pump Operation)?

A. Immediately trip the reactor and then trip the 1B1 RCP

B. Immediately trip the reactor and then trip the 1B2 RCP

C. Reduce reactor power to < 70% and then trip 1B1 RCP

D. Reduce reactor power to < 70% and then trip 1B2 RCP

2009B ONS SRO NRC Examination - Q 4

Given the following Unit 1 conditions:

Initial conditions:

- Reactor power = 100%

Current conditions:

- 1HP-120 (RC VOLUME CONTROL) air line is severed

Pzr level will INITIALLY __(1)__ AND __(2)__ will be used FIRST to control Pzr level in accordance with plant procedures.

Which ONE of the following completes the statement above?

A. 1. increase
   2. 1HP-26

B. 1. increase
   2. 1HP-122 (RC Volume Control Bypass)

C. 1. decrease
   2. 1HP-26

D. 1. decrease
   2. 1HP-122 (RC Volume Control Bypass)

2009B ONS SRO NRC Examination - Q 5

Given the following two sets of plant conditions:

1. Reactor trips from 100% power. Pressurizer level decreases off scale low during the initial cooldown then returns on scale. Lowest Subcooling margin indication during the transient = 18° F. Pressurizer level is returned to 100 inches, RCS pressure = 2100 psig and Pressurizer temperature = 635° F.

2. From an initial Reactor power of 100%, ICS MAX Runback is used to decrease power to 80% to stop the 1D2 HDP. Pressurizer level remains approximately 220 inches during the runback and when the runback is stopped, RCS pressure = 2100 psig and Pressurizer temperature = 643° F.

Which ONE of the following describes the response of the two scenarios if attempting to increase RCS pressure to 2200 psig with ALL Pressurizer heaters energized and Pressurizer level maintained constant AND the reason for the response?

A. Scenario # 1 will reach 2200 psig first because Pressurizer level is lower and therefore less heat is required to raise the temperature of the water.

B. Scenario # 2 will reach 2200 psig first because the Pressurizer in Scenario #1 is subcooled.

C. Both scenarios would reach 2200 psig at approximately the same time because starting pressure is equal in both scenarios.

D. Neither scenario would reach 2200 psig because the spray valve will overcome the RCS pressure increase even with ALL Pressurizer heaters energized.

2009B ONS SRO NRC Examination - Q 6

Given the following Unit 1 conditions:

- Reactor in MODE 3
- RCS temperature = 555 °F slowly decreasing
- SGTR tab in progress due to SGTR in 1A SG

Which ONE of the following;

1) is the range (minimum - maximum) of RCS temperature (degrees F) where the EOP directs isolating the 1A SG?

2) would require steaming the 1A SG after isolation in accordance with the EOP?

A. 1. 535 - 552
   2. When the 1A SG approaches overfill conditions

B. 1. 535 - 552
   2. When the 1A SG tube-to-shell delta T = (-)76 degrees F

C. 1. 525 - 532
   2. When the 1A SG approaches overfill conditions

D. 1. 525 - 532
   2. When the 1A SG tube-to-shell delta T = (-)76 degrees F

2009B ONS SRO NRC Examination - Q 7

Given the following conditions:

Initial conditions:

- All three units Reactor power = 100%

Current conditions:

- All Unit's 4160v Main Feeder Busses are de-energized
- Unit 1, 2, and 3 EOP Blackout tabs in progress

Which ONE of the following describes the required status of Unit 1 Essential Inverters in accordance with the EOP Enclosure 5.38 (Restoration of Power) AND the reason for the status?

A. remain energized to provide power to ES channels

B. remain energized to provide control power to 4160v switchgear

C. de-energized to prevent inverter damage

D. de-energized to extend available battery life

2009B ONS SRO NRC Examination - Q 8

Given the following Unit 1 conditions:

Initial conditions:

- Reactor power = 100%
- Loss of offsite power occurs

Current conditions:

- Main Feeder Buses remain de-energized

1) The position of 1MS-112 (SSRH Control) is __(1)__.

2) 1MS-77 (MS to MSRH) __(2)__ be operated from the control room switch.

Which ONE of the following completes the statements above?

A. 1. open
   2. can

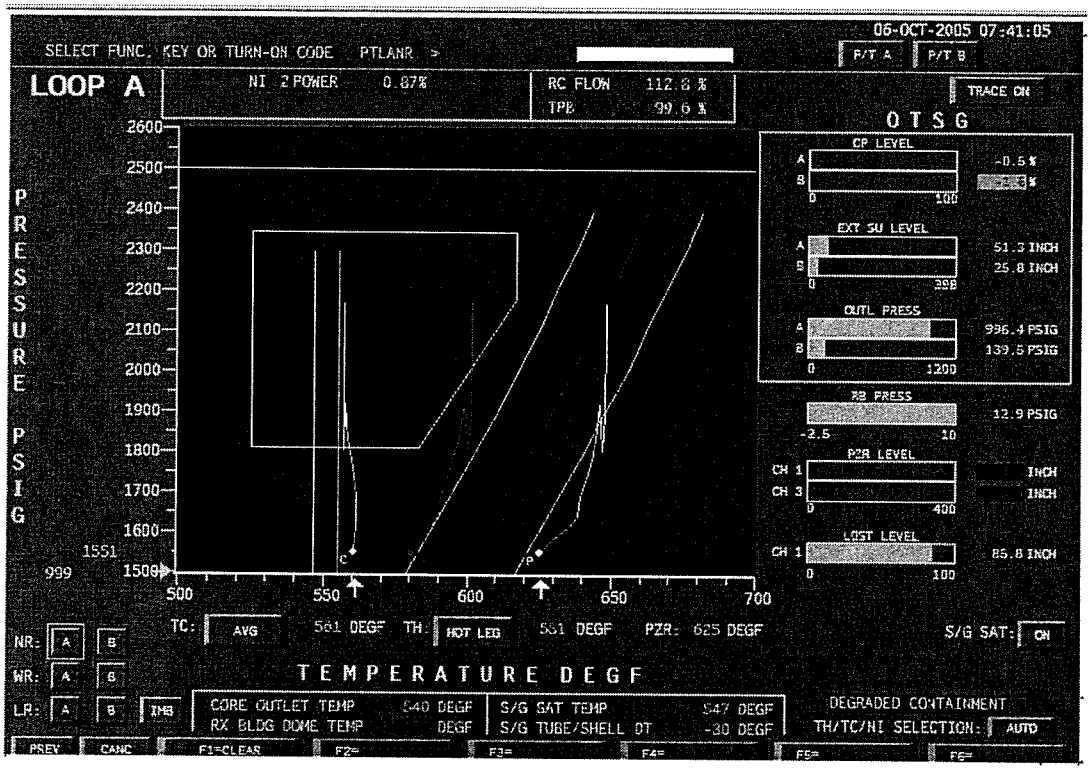
B. 1. closed
   2. can

C. 1. open
   2. can NOT

D. 1. closed
   2. can NOT

2009B ONS SRO NRC Examination - Q 9

Given the following Unit 1 conditions:



- Main Steam Line Break occurred 20 seconds ago
- Plant response as indicated above

1) The EOP will direct the operator to __(1)__.

2) The __(2)__ MDEFWP(s) will automatically start.

Which ONE of the following completes the statement above?

A. 1. Secure LPI pumps
   2. 1A ONLY

B. 1. Throttle HPI
   2. 1A ONLY

C. 1. Secure LPI pumps
   2. 1A and 1B

D. 1. Throttle HPI
   2. 1A and 1B

2009B ONS SRO NRC Examination - Q 10

Given the following Unit 3 conditions:

Initial conditions:

- Reactor power = 100%
- Reactor trip

Current conditions:

- ALL TBV's are in AUTO and closed
- Main Steam pressure cycling between 1050 psig and 1070 psig

1) The current conditions are a result of __(1)__.

2) The __(2)__ will be used to restore control of MS pressure in accordance with the EOP.

Which ONE of the following completes the statements above?

A. 1. Condenser vacuum = 6" hg
   2. TBV's in MANUAL

B. 1. Condenser vacuum = 6" hg
   2. Atmospheric Dump Valves

C. 1. Selected Turbine Header Pressure failed low
   2. TBV's in MANUAL

D. 1. Selected Turbine Header Pressure failed low
   2. Atmospheric Dump Valves

2009B ONS SRO NRC Examination - Q 11

Given the following Unit 1 conditions:

- SBLOCA has occurred
- ALL SCM's = 0°F stable
- RCS pressure = 745 psig slowly decreasing
- LOCA Cooldown Tab in progress

Which ONE of the following describes:

1) the HIGHEST Rx vessel head level (inches) that would indicate voiding in the Rx vessel head?

2) conditions that would make the RV head level NOT valid?

A. 1. 523
   2. Starting 1A LPI pump

B. 1. 523
   2. Open Reactor vessel head high point vents

C. 1. 161
   2. Starting 1A LPI pump

D. 1. 161
   2. Open Reactor vessel head high point vents

2009B ONS SRO NRC Examination - Q 12

Given the following Unit 1 conditions:

Initial conditions:

- Reactor in MODE 5
- Reactor vessel level = 84 inches stable
- Normal LPI decay heat removal in service
- 1C LPI pump operating

Current conditions:

- Reactor vessel level = 84 inches stable
- 1C LPI pump amps are cycling 5 – 55 amps
- 1C LPI pump discharge pressure is fluctuating

Which ONE of the following describes:

1) the Immediate Manual Action(s) required by AP/26 (Loss of Decay heat Removal)?

2) how RCS temperature will be controlled once normal decay heat removal has been restored?

A. 1. Secure the 1C LPI pump ONLY
   2. Adjusting LPSW to LPI coolers

B. 1. Secure the 1C LPI pump ONLY
   2. Adjusting LPI flow through LPI coolers

C. 1. Secure the 1C LPI pump and start the 1A LPI pump
   2. Adjusting LPSW to LPI coolers

D. 1. Secure the 1C LPI pump and start the 1B LPI pump
   2. Adjusting LPI flow through LPI coolers

2009B ONS SRO NRC Examination - Q 13

Given the following Unit 1 conditions:

Initial conditions:

- Reactor power = 100%
- Feedwater and Reactor in MANUAL

Current conditions:

- BOTH Main Feedwater pumps trip
- Reactor power = 35% decreasing
- RCS pressure = 2378 psig increasing
- Rule 1 (ATWS/Unanticipated Nuclear Power Production) in progress

__(1)__ will be the FIRST to add negative reactivity to the reactor AND the position of the PORV is __(2)__.

Which ONE of the following completes the statement above?

A. 1. Moderator temperature coefficient
   2. open

B. 1. Moderator temperature coefficient
   2. closed

C. 1. Control Rods
   2. open

D. 1. Control Rods
   2. closed

2009B ONS SRO NRC Examination - Q 14

Given the following Unit 2 conditions:

Initial conditions:

- Reactor power = 100%
- Both Main FDW pumps trip
- 2A and 2B MDEFDW pumps did NOT start
- TDEFWP did NOT start

Current conditions:

- Tave = 566°F stable
- Recovery from CBP feed with the TDEFDW pump is in progress
- TDEFWP is running and flow has been verified

1) Tave will INITIALLY be controlled by throttling __(1)__.

2) INITIALLY a SG level __(2)__ be established.

Which ONE of the following completes the statements above?

A. 1. EFDW flow
   2. will NOT

B. 1. the TBVs
   2. will NOT

C. 1. EFDW flow
   2. will

D. 1. the TBVs
   2. will

2009B ONS SRO NRC Examination - Q 15

Given the following Unit 1 conditions:

- Reactor power = 100%
- OAC Computer Out of Service
- 1KVIC deenergized

Which ONE of the following describes the instrumentation used to determine axial imbalance in accordance with OP/1/A/1105/014 (Control Room Instrumentation Operation And Information)?

A. Incore Detectors

B. Backup Incore Detectors

C. Imbalance readout indications in RPS cabinets

D. Control Room Power Range Dixon gauge indications

2009B ONS SRO NRC Examination - Q 16

Given the following Unit 1 conditions:

- Reactor power = 100%
- SA-141 (SA to IA Controller) failed closed

Which ONE of the following would result in the Auxiliary Instrument Air system being required to maintain 1HP-5 OPEN assuming NO operator actions are taken?

A. Unit 1 blackout occurs

B. Mechanical failure of the Primary IA compressor

C. 2 inch IA header rupture in Unit 1 East Penetration room

D. 230KV Red Bus lockout occurs in the 230KV switchyard

2009B ONS SRO NRC Examination - Q 17

Given the following Unit 3 conditions:

- A voltage disturbance is occurring
- AP/34 (Degraded Grid) initiated
- Power Factor is leading
- Generator Mwe = 900
- Generator Hydrogen pressure = 60 psig
- Generator output voltage = 18.3 kV

Which ONE of the following is the limit on MVARs in accordance with the Generator Capacity Curve?

REFERENCE PROVIDED

A. 250

B. 290

C. 350

D. 475

2009B ONS SRO NRC Examination - Q 18

Given the following Unit 1 conditions:

Initial conditions:

- Reactor power = 100%

Current conditions:

- Both Main Feedwater pumps tripped
- EFDW NOT available
- 1TD de-energized
- RCS pressure = 2217 psig slowly increasing

1) The __(1)__ will be aligned FIRST to provide decay heat removal in accordance with the EOP.

2) AP/11 (Recovery from Loss of Power) __(2)__ be used to restore power to 1TD.

Which ONE of the following completes the statements above?

A. 1. HPI Pumps
   2. will

B. 1. HPI Pumps
   2. will NOT

C. 1. Condensate Booster Pumps
   2. will

D. 1. Condensate Booster Pumps
   2. will NOT

2009B ONS SRO NRC Examination - Q 19

Given the following Unit 3 conditions:

- Reactor power = 100%

Which ONE of the following would result in an AUTOMATIC injection of HPI AND would require performing EOP Encl. 5.1 (ES Actuation)?

A reactor trip _____.

A. followed by an inadvertent ES channel 1 actuation

B. due to a Steam Line break on piping between 3B2 MSR outlet and inlet to C LP Turbine

C. with main and startup feedwater control valves in HAND

D. concurrent with a failure of the TBV 125 psi bias to be applied following the trip

2009B ONS SRO NRC Examination - Q 20

Given the following Unit 1 conditions:

Initial conditions:

- Reactor power = 68% stable
- 1B2 RCP secured
- Control Rod Group 7 position = 65% withdrawn

Current conditions

- Control Rod Group 7 Rod 1 drops to 40% withdrawn

1) The CRD system __(1)__ generate a runback fault.

2) The MAXIMUM final power level (Core Thermal Power) directed by AP/1 (Unit Runback) is __(2)__.

Which ONE of the following completes the statements above?

A. 1. will
   2. $\leq$ 60%

B. 1. will
   2. $\leq$ 45%

C. 1. will NOT
   2. $\leq$ 60%

D. 1. will NOT
   2. $\leq$ 45%

2009B ONS SRO NRC Examination - Q 21

Given the following Unit 1 conditions:

Initial conditions:

- Mode 6
- Fuel assemblies are being loaded into the core
- All four SR NIs in service
- SR 1NI-1 and SR 1NI-3 are the designated NIs for Fuel Handling

Current conditions:

- Power supply to SR 1NI-1 fails (0 vdc)

Which ONE of the following describes the impact on fuel movement in accordance with OP/1/A/1502/007 (Operations Defueling/Refueling Responsibilities)?

A. Allowed to continue because two other SR NIs remain in service

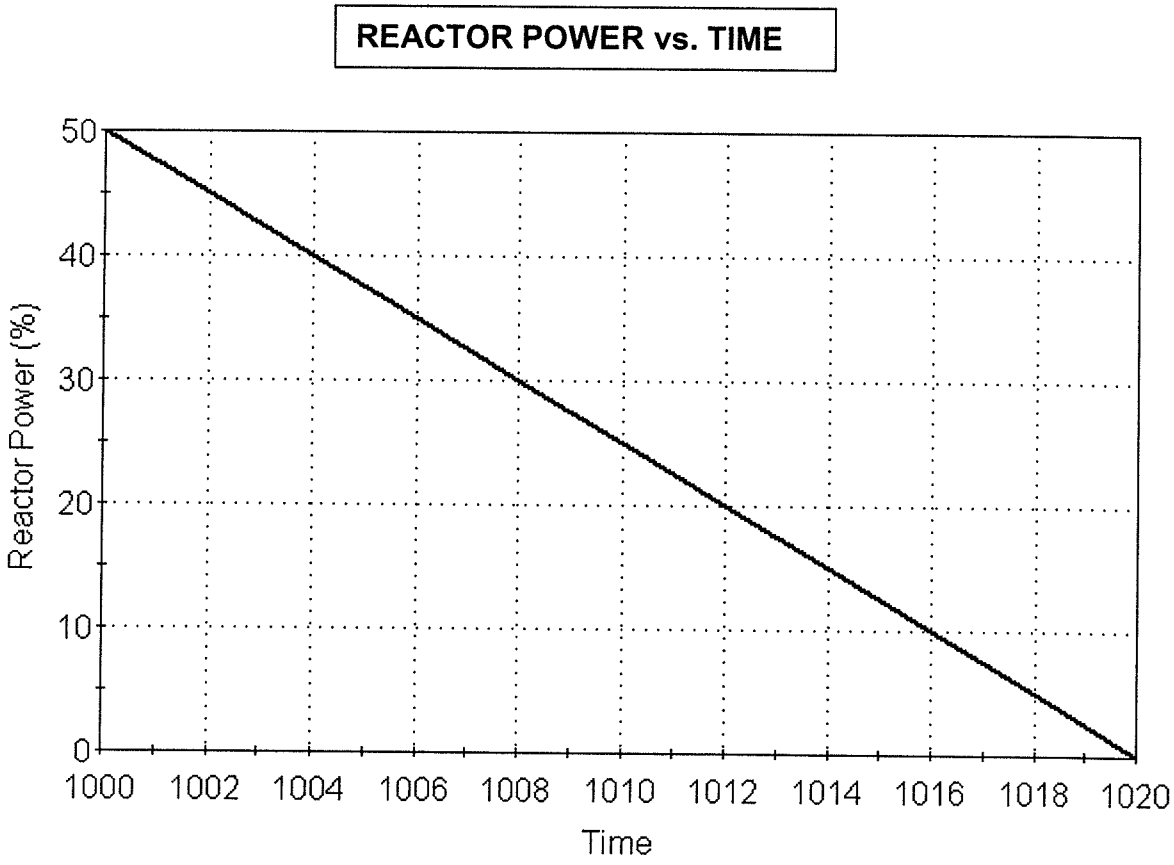
B. Allowed to continue because SR NI-3 is still in service

C. Required to be stopped until another SR NI is designated because other NIs are procedurally allowed to be designated

D. Required to be stopped and cannot be resumed until SR 1NI-1 is returned to service because other NIs are NOT procedurally allowed to be designated

2009B ONS SRO NRC Examination - Q 22

Given the following graph:



Which ONE of the following states the LATEST time that 1RIA-59 and 1RIA-60 (Main Steam Line N16 Detectors) will be used to provide a valid indication of Steam Generator tube leakage in accordance with the EOP?

A. 1004

B. 1012

C. 1014

D. 1020

2009B ONS SRO NRC Examination - Q 23

Given the following Unit 1 conditions:

- Reactor in MODE 3
- Unit shutdown in progress
- Containment declared NOT OPERABLE

The MAXIMUM Completion Time allowed by Tech Spec 3.6.1 (Containment) to restore Containment to OPERABLE is __(1)__ AND the HIGHER RCS temperature (degrees F) that would result in being in MODE 4 is __(2)__.

Which ONE of the following completes the statement above?

A. 1. One hour
   2. 245

B. 1. Immediately
   2. 245

C. 1. One hour
   2. 255

D. 1. Immediately
   2. 255

2009B ONS SRO NRC Examination - Q 24

Given the following Unit 1 conditions:

Initial conditions:

- Time = 1200
- Reactor power = 100%
- 1A steam generator tube leak = 2.1 gpd stable
- RCS activity = 0.25 µCi/ml DEI increasing

Current conditions:

- Time = 1400
- NO change in 1A SG tube leak rate
- RCS activity = 0.65 µCi/ml DEI increasing

Which ONE of the following describes the response of the radiation monitors between 1200 and 1400?

A. 1RIA-59 (N-16 monitor) and 1RIA-40 (CSAE Off-gas) increased.

B. 1RIA-16 (Main Steam Line Monitor) and 1RIA-40 increased.

C. 1RIA-59 increased while1RIA-40 remained constant.

D. 1RIA-16 increased while 1RIA-40 remained constant.

2009B ONS SRO NRC Examination - Q 25

Given the following Unit 1 conditions:

Initial conditions:

- Reactor power = 100%
- Turbine Building Flood occurs

Current conditions:

- AP/10 (Turbine Building Flood) in progress

1) CCW pumps are tripped __(1)__ in accordance with AP/10.

2) Core decay heat is removed using __(2)__ in accordance with the EOP.

Which ONE of the following completes the statements above?

A. 1. to establish gravity flow through CCW-8
   2. SSF-ASW

B. 1. to establish gravity flow through CCW-8
   2. HPI Forced Cooling

C. 1. as part of isolating the most probable source of the flooding
   2. SSF-ASW

D. 1. as part of isolating the most probable source of the flooding
   2. HPI Forced Cooling

2009B ONS SRO NRC Examination - Q 26

Given the following Unit 1 conditions:

- Reactor tripped from 100% power due to SBLOCA
- Subcooling Margin = 0°F stable

Which ONE of the following is the reason the EOP directs increasing SG levels to the Loss of Subcooling Margin Setpoint level?

A. Establish a large secondary side inventory in support of a rapid RCS cooldown.

B. Establish a large secondary side inventory to ensure that a loss of coupling will NOT occur if a momentary loss of EFDW occurs.

C. Ensure a secondary water level higher than the primary water level inside the SG tubes to establish boiler condenser mode heat transfer

D. Ensure a secondary side inventory sufficient to minimize the consequences of a total loss of feedwater during boiler condenser mode heat transfer

2009B ONS SRO NRC Examination - Q 27

Given the following Unit 1 conditions:

Initial conditions:

- Time = 1200
- Reactor power = 100%
- 1TA and 1TB lockout occurs

Current condition:

- Time = 1300
- Plant cooldown in progress

1) The source of feedwater to the steam generators is __(1)__.

2) Steam generator levels are __(2)__.

Which ONE of the following completes the statements above?

A. 1. Main Feedwater
   2. 25 inches SUR

B. 1. Main Feedwater
   2. 50% OR

C. 1. Emergency Feedwater
   2. 30 inches XSUR

D. 1. Emergency Feedwater
   2. 240 inches XSUR

2009B ONS SRO NRC Examination - Q 28

Given the following Unit 1 conditions:

- EOP in progress
- RCP starting interlock jumpers installed on 1A1 RCP

Which ONE of the following will PREVENT the start of the 1A1 RCP?

A. CC-7 and CC-8 are closed

B. Total Seal Injection flow = 20 gpm

C. RCP Motor Oil Lift system pressure = 575 psig

D. RCP start switch NOT being placed in the BYPASS position

2009B ONS SRO NRC Examination - Q 29

Given the following Unit 1 conditions:

- Reactor power = 100%
- 1HP-31 (RCP Seal Flow Control) is closed

1) The cooling medium for the RCP MOTORS is __(1)__.

2) ALL cooling for the RCP SEALS __(2)__ been lost.

Which ONE of the following completes the statements above?

A. 1. LPSW
   2. has

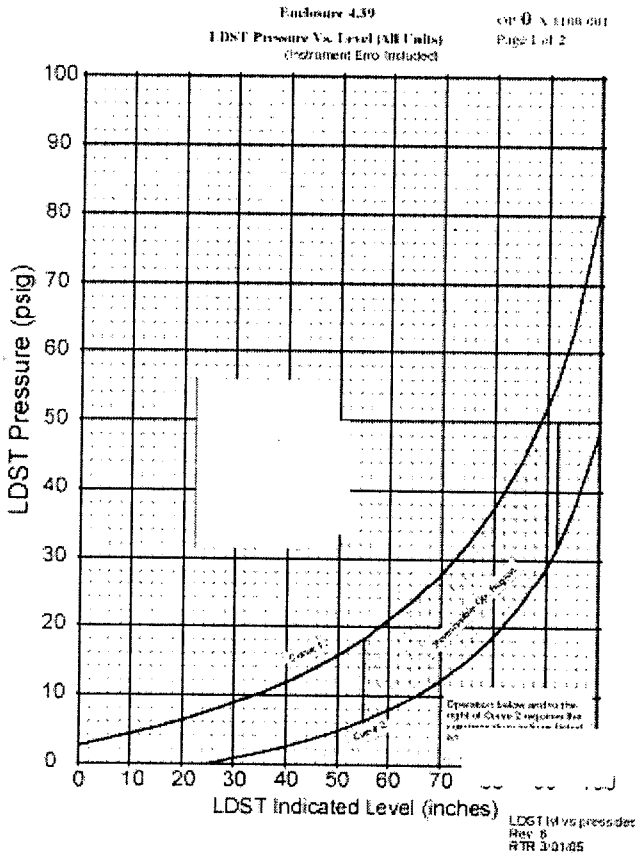
B. 1. LPSW
   2. has NOT

C. 1. CC
   2. has

D. 1. CC
   2. has NOT

2009B ONS SRO NRC Examination - Q 30

Given the following chart:



Which ONE of the following sets of LDST parameters would require declaring BOTH HPI trains inoperable when in MODE 1?

Level (inches) / Pressure (psig)

A. 95 / 10

B. 90 / 35

C. 60 / 10

D. 50 / 30

2009B ONS SRO NRC Examination - Q 31

Given the following Unit 2 conditions:

- Reactor in MODE 3
- RCS Cooldown in progress
- 2A LPI cooler isolated due to cooler leak

Which ONE of the following states the LPI Decay Heat Removal mode that will be used for the INITIAL transition to LPI cooling in accordance with OP/2/A/1104/004 (Low Pressure Injection System)?

A. Series

B. Normal

C. Switchover

D. High Pressure

2009B ONS SRO NRC Examination - Q 32

Given the following Unit 1 conditions:

Initial conditions:

- Reactor power = 100%
- Emergency Feedwater NOT available
- 1C LPI pump NOT available
- 1HP-27 is failed closed

Current conditions:

- Reactor Trips on loss of Main Feedwater
- 1HP-409 will NOT open

1) A __(1)__ would be a precursor to fuel temperatures exceeding design limits.

2) __(2)__ would indicate fuel uncovery has occurred or is imminent.

Which ONE of the following completes the above statements?

A. 1. SBLOCA
   2. Core SCM = (-)2°F stable

B. 1. LBLOCA
   2. Core SCM = (-)2°F stable

C. 1. SBLOCA
   2. Reactor Vessel head level = 12 inches stable

D. 1. LBLOCA
   2. Reactor Vessel head level = 12 inches stable

2009B ONS SRO NRC Examination - Q 33

Given the following Unit 1 conditions:

- Reactor power = 100%
- Loss of ALL feedwater occurs

1) The MINIMUM RCS pressure (psig) at which Quench Tank level would begin to INCREASE is __(1)__.

2) The MINIMUM Quench Tank Pressure (psig) at which Containment pressure would begin to INCREASE is __(2)__.

Which ONE of the following completes the statements above?

A. 1. 2450
   2. 49

B. 1. 2450
   2. 55

C. 1. 2500
   2. 49

D. 1. 2500
   2. 55

2009B ONS SRO NRC Examination - Q 34

1) __(1)__ would result in an increase in CC Cooler outlet temperature.

2) CC Cooler Outlet temperature can be monitored from the Unit 1 Control Room using the __(2)__.

Which ONE of the following completes the statements above?

A. 1. Throttling open 1HP-7 (Letdown Control)
   2. OAC indication ONLY

B. 1. Throttling open 1HP-7 (Letdown Control)
   2. OAC AND temperature gage in Control Room

C. 1. Placing 1HP-14 (LDST Bypass) in "BLEED"
   2. OAC indication ONLY

D. 1. Placing 1HP-14 (LDST Bypass) in "BLEED"
   2. OAC AND temperature gage in Control Room

2009B ONS SRO NRC Examination - Q 35

1) A __(1)__ will result in the CC surge tank level DECREASING.

2) The level that is maintained on the CC Surge Tank Level gage on 1AB3 in accordance with AP/20 (Loss of Component Cooling) is __(2)__ inches.

Which ONE of the following completes the statements above?

A. 1. Letdown cooler leak
   2. 12-18

B. 1. Letdown cooler leak
   2. 18-30

C. 1. CRD Cooling Coil leak
   2. 12-18

D. 1. CRD Cooling Coil leak
   2. 18-30

2009B ONS SRO NRC Examination - Q 36

Given the following Unit 2 conditions:

Initial conditions:

- Reactor power = 100%
- 2A MSLB occurs inside containment

Current conditions:

- RB Pressure peaked at 2.6 psig and is slowly decreasing
- Pressurizer Level decreased to 32" and is now 82" increasing
- RCS pressure decreased to 1540 psig and is now 1920 psig slowly increasing

1) Pressurizer heater banks 2 thru 4 are __(1)__.

2) ES digital channels __(2)__ have actuated.

Which ONE of the following completes the statements above?

A. 1. Off
   2. 1 and 2 ONLY

B. 1. On
   2. 1 and 2 ONLY

C. 1. Off
   2. 1 thru 6

D. 1. On
   2. 1 thru 6

2009B ONS SRO NRC Examination - Q 37

Given the following Unit 1 conditions:

Initial conditions:

- Reactor power = 100%

Current conditions:

- 1B1 Reactor coolant pump trips

Which ONE of the following describes the RPS trip that will prevent exceeding the DNBR safety limit?

A. High flux

B. Flux/Pump

C. Flux/Flow/Imbalance

D. High RCS Temperature

2009B ONS SRO NRC Examination - Q 38

Given the following Unit 1 conditions:

- Reactor power = 100%
- 1A CC pump operating

Which ONE of the following contains conditions, either of which will result in a trip of the 1A CC pump independently of the other?

A. 1. CC Surge Tank level = 10 inches decreasing
   2. ES 1 thru 6 actuation

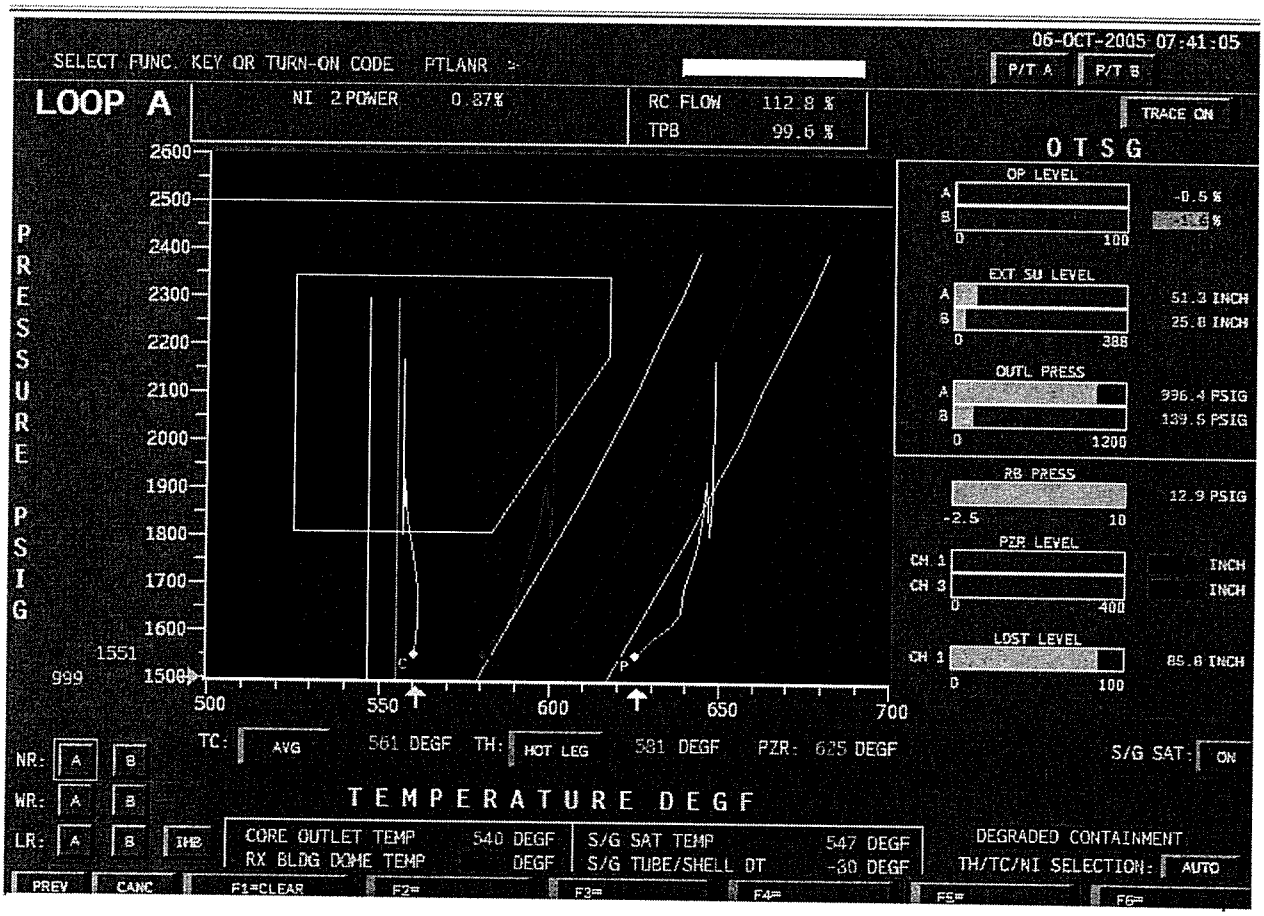
B. 1. CC Surge Tank level = 10 inches decreasing
   2. 1XN de-energized

C. 1. Primary IA compressor trips
   2. Closure of 1CC-7

D. 1. ES 1 thru 6 actuation
   2. Closure of 1CC-7

2009B ONS SRO NRC Examination - Q 39

Given the following Unit 1 conditions:



- Main Steam Line Break occurs from 100% power
- Plant responds as indicated above:

Which ONE of the following states the MINIMUM Pressurizer level (inches) that is required by Rule 5 (Main Steam Line Break) once Pressurizer level returns on scale?

A. > 80

B. > 100

C. > 180

D. > 220

2009B ONS SRO NRC Examination - Q 40

Given the following Unit 1 conditions:

Initial conditions:

- Reactor power = 100%

Current conditions:

- Large Break LOCA occurs
- 1A RBS pump did NOT start

1) The RB Spray system __(1)__ perform its safety function.

2) EOP Enclosure 5.1 (ES Actuation) directs the RO to __(2)__.

Which ONE of the following completes the statements above?

A. 1. can
   2. immediately start the 1A RBS pump

B. 1. can
   2. notify the SRO to evaluate starting the 1A RBS pump

C. 1. can NOT
   2. immediately start the 1A RBS pump

D. 1. can NOT
   2. notify the SRO to evaluate starting the 1A RBS pump

2009B ONS SRO NRC Examination - Q 41

Given the following Unit 1 conditions:

1SA-1

	1	2	3	4	5	6	7	8	9	10	11	12
A	RP CHANNEL A TRIP	RP CHANNEL A LOW PRESS TRIP	RP CHANNEL A FLUX/IMB/FLOW TRIP	RP CHANNEL A HIGH TEMP TRIP	RP CHANNEL A PRESS/TEMP TRIP	RP CHANNEL A HIGH PRESS TRIP	RP CHANNEL A RCP / FLUX TRIP	RP CHANNEL A HIGH FLUX TRIP	RP CHANNEL A R.B. HIGH PRESS TRIP	ES CHANNEL 1 TRIP	ES CHANNEL 5 TRIP	ICS LOSS OF ACS POWER FUSE BLOWN
B	RP CHANNEL B TRIP	RP CHANNEL B LOW PRESS TRIP	RP CHANNEL B FLUX/IMB/FLOW TRIP	RP CHANNEL B HIGH TEMP TRIP	RP CHANNEL B PRESS/TEMP TRIP	RP CHANNEL B HIGH PRESS TRIP	RP CHANNEL B RCP / FLUX TRIP	RP CHANNEL B HIGH FLUX TRIP	RP CHANNEL B R.B. HIGH PRESS TRIP	ES CHANNEL 2 TRIP	ES CHANNEL 6 TRIP	ICS AUTO/HAND POWER FUSE BLOWN
C	RP CHANNEL C TRIP	RP CHANNEL C LOW PRESS TRIP	RP CHANNEL C FLUX/IMB/FLOW TRIP	RP CHANNEL C HIGH TEMP TRIP	RP CHANNEL C PRESS/TEMP TRIP	RP CHANNEL C HIGH PRESS TRIP	RP CHANNEL C RCP / FLUX TRIP	RP CHANNEL C HIGH FLUX TRIP	RP CHANNEL C R.B. HIGH PRESS TRIP	ES CHANNEL 3 TRIP	ES CHANNEL 7 TRIP	LP INJECTION PUMP "A" DIFF. PRESS LOW
D	RP CHANNEL D TRIP	RP CHANNEL D LOW PRESS TRIP	RP CHANNEL D FLUX/IMB/FLOW TRIP	RP CHANNEL D HIGH TEMP TRIP	RP CHANNEL D PRESS/TEMP TRIP	RP CHANNEL D HIGH PRESS TRIP	RP CHANNEL D RCP / FLUX TRIP	RP CHANNEL D HIGH FLUX TRIP	RP CHANNEL D R.B. HIGH PRESS TRIP	ES CHANNEL 4 TRIP	ES CHANNEL 8 TRIP	LP INJECTION PUMP "B" DIFF. PRESS LOW
E	CRD SEQUENCE FAULT	CRD TRIP BKR A TRIP	CRD TRIP BKR B TRIP	CRD TRIP BKR C TRIP	CRD TRIP BKR D TRIP	CRD ELECTRONIC TRIP E	CRD ELECTRONIC TRIP F	RC PUMP 1A1 OIL TANK LEVEL HIGH	RC PUMP 1A2 OIL TANK LEVEL HIGH	RC PUMP 1B1 OIL TANK LEVEL HIGH	RC PUMP 1B2 OIL TANK LEVEL HIGH	LP INJECTION PUMP "C" DIFF. PRESS LOW

Initial conditions:

- Reactor power = 45% stable

Current conditions:

- Reactor power = <1% WR decreasing
- Core SCM = 0°F stable
- RCS pressure = 140 psig decreasing
- Reactor Building pressure = 16.4 psig increasing
- 1SA-1 alarms as indicated above

Which ONE of the following describes actions <u>required</u> by the EOP?

A. Secure running LPI pumps ONLY (Encl. 5.1 ES Actuation)

B. Manually actuate ES Digital Channels 7 & 8 ONLY (Encl. 5.1 ES Actuation)

C. Secure running LPI pumps <u>and</u> Feed to LOSCM setpoint with Emergency Feedwater (Encl. 5.1 ES Actuation and Rule 2 Loss of SCM)

D. Manually actuate ES Digital Channels 7 & 8 <u>and</u> Feed to LOSCM setpoint with Emergency Feedwater (Encl. 5.1 ES Actuation and Rule 2 Loss of SCM)

2009B ONS SRO NRC Examination - Q 42

Which ONE of the following describes the reason that the allowed RCS cooldown rate is more restrictive when performing a natural circulation cooldown?

A. Minimize the possibility of flashing in the RCS Hot Legs

B. Minimize the possibility of drawing a steam bubble in the reactor vessel head area

C. Ensure thermal stresses on reactor vessel inner wall remain within design limits

D. Ensure thermal stresses on the Auxiliary Pressurizer spray line remain within design limits

2009B ONS SRO NRC Examination - Q 43

Given the following Unit 1 conditions:

Initial Conditions:

- Reactor power = 100%
- Two AFIS pressure transmitters on 1A SG fail high

Current Conditions:

- 1A Main Steam Line break occurs
- 1A SG pressure = 480 psig rapidly DECREASING

1) The status of AFIS is __(1)__.

2) Rule 5 (Main Steam Line Break) will give direction to __(2)__.

Which ONE of the following completes the statements above?

A. 1. actuated
   2. open 1AS-40 while closing 1MS-47

B. 1. actuated
   2. select OFF for 1A MD EFDW Pump

C. 1. NOT actuated
   2. open 1AS-40 while closing 1MS-47

D. 1. NOT actuated
   2. select OFF for 1A MD EFDW Pump

2009B ONS SRO NRC Examination - Q 44

1) The power supply to the 3B MDEFWP is __(1)__.

2) The 3B MDEFWP motor is cooled by __(2)__.

Which ONE of the following completes the statements above?

A. 1. 3TD
   2. LPSW

B. 1. 3TD
   2. Air

C. 1. 3TE
   2. LPSW

D. 1. 3TE
   2. Air

2009B ONS SRO NRC Examination - Q 45

Given the following Unit 1 conditions:

Initial conditions:

- 450 EFPD
- Reactor trip from 45%
- HPI Forced Cooling in progress

Current conditions:

- TDEFWP available
- Enclosure 5.40 (Recovery From HPI Forced Cooling) in progress

Which ONE of the following would result in a DECREASE in the amount of feedwater flow indicated by Enclosure 5.13 (Total Feedwater Flow Required to Match NSSS Heat) when determining the INITIAL feed rate required to remove decay heat?

A. Recovery delayed 1 hour due to proximity to 3 psig RB pressure

B. Event occurred at 25 EFPD instead of 450 EFPD

C. Initial trip was from 25% power instead of 45%

D. Three RCP's operating prior to initiating HPI FC

2009B ONS SRO NRC Examination - Q 46

Given the following Unit 2 conditions:

- Reactor power = 100%
- 2TD de-energizes

Which ONE of the following remains <u>available</u>?

A. C LPSW Pump

B. 2C HPI Pump

C. 2B LPI Pump

D. 2C RBCU

2009B ONS SRO NRC Examination - Q 47

Which ONE of the following are loads that are BOTH powered by the Power Batteries?

A. Mulsifyer systems and TDEFWP Auxiliary Oil Pump

B. PCB-9 Control Power and CCW-8 (CCW Emergency Discharge to the tailrace)

C. Main FWPT Auxiliary Oil Pump and PCB-9 Control Power

D. TDEFWP Auxiliary Oil Pump and CCW-8

2009B ONS SRO NRC Examination - Q 48

Given the following conditions:

- ACB-3 closed
- Switchyard isolation has occurred

1) A __(1)__ will PREVENT KHU-1 from Emergency starting.

2) The LOWER KHU-2 output voltage that will allow ACB-2 to close is __(2)__.

Which ONE of the following completes the statements above?

A. 1. STARTUP INHIBIT
   2. 12.6KV

B. 1. NORMAL LOCKOUT
   2. 12.6KV

C. 1 STARTUP INHIBIT
   2. 12.3KV

D. 1. NORMAL LOCKOUT
   2. 12.3KV

2009B ONS SRO NRC Examination - Q 49

Given the following conditions:

- All three Oconee units are in Mode 1
- Keowee Hydro Unit 2 is generating to the grid
- ALL KHU 2 Forebay level sensors are NOT operable

Which ONE of the following describes the action(s) required in accordance with SLC's?

A. Manually input Forebay level into the digital governor AND suspend commercial operation of the KHU's

B. Manually input Forebay level into the digital governor ONLY

C. Suspend commercial operation of the KHU's ONLY

D. Declare BOTH KHU's NOT Operable

2009B ONS SRO NRC Examination - Q 50

Given the following Unit 1 conditions:

Initial conditions:

- Reactor power = 100%
- 1A GWD tank release in progress
- 1RIA-38 OOS

Current conditions:

- Loss of power to RM-80 skid of 1RIA-37
- 1SA8/B9 RM PROCESS MONITOR RADIATION HIGH in alarm
- 1SA8/B10 RM PROCESS MONITOR FAULT in alarm

1) 1GWD-4 (A GWD TANK DISCHARGE) will __(1)__.

2) The GWD tank release may __(2)__ in accordance with OP/1-2/A/1104/018 (GWD System).

Which ONE of the following completes the statements above?

A. 1. remain open
   2. continue as long as 1RIA-37 is re-energized within one hour

B. 1. automatically close
   2. be re-initiated as long as 1RIA-37 is re-energized within one hour

C. 1. remain open
   2. continue as long as two independent samples agree prior to restarting the release

D. 1. automatically close
   2. be re-initiated as long as two independent samples agree prior to restarting the release

2009B ONS SRO NRC Examination - Q 51

Given the following Unit 1 conditions:

Initial conditions:

- Reactor power = 100%
- A and B LPSW pumps operating

Current conditions:

- LPSW line break in Turbine Building Basement
- LPSW Pressure = 65 psig decreasing

The LPSW header pressure setpoint at which LPSW to the RBCU's will automatically isolate is __(1)__ psig AND Unit 1&2 LPSW system AND Unit 3 LPSW system will be cross-tied __(2)__ in accordance with AP/24 (Loss of LPSW).

Which ONE of the following completes the statement above?

A. 1. 18
   2. ANYTIME normal system pressure can NOT be restored

B. 1. 18
   2. ONLY if NO Unit 1 and 2 LPSW pumps are available

C. 1. 25
   2. ANYTIME normal system pressure can NOT be restored

D. 1. 25
   2. ONLY if NO Unit 1 and 2 LPSW pumps are available

2009B ONS SRO NRC Examination - Q 52

Given the following Unit 2 conditions:

Initial conditions:

- Reactor power = 100%
- 2FDW-35 and 44 (Startup FDW Control Valves) are 100% open
- 2FDW-32 and 41 (Main FDW Control Valves) are 60% open

Current conditions:

- IA pressure = 60 psig slowly decreasing

1) 2FDW-35 and 2FDW-44 have failed __(1)__.

2) 2FDW-32 and 2FDW-41 __(2)__.

Which ONE of the following completes the statements above?

A. 1. closed
   2. are controlling Main FDW flow.

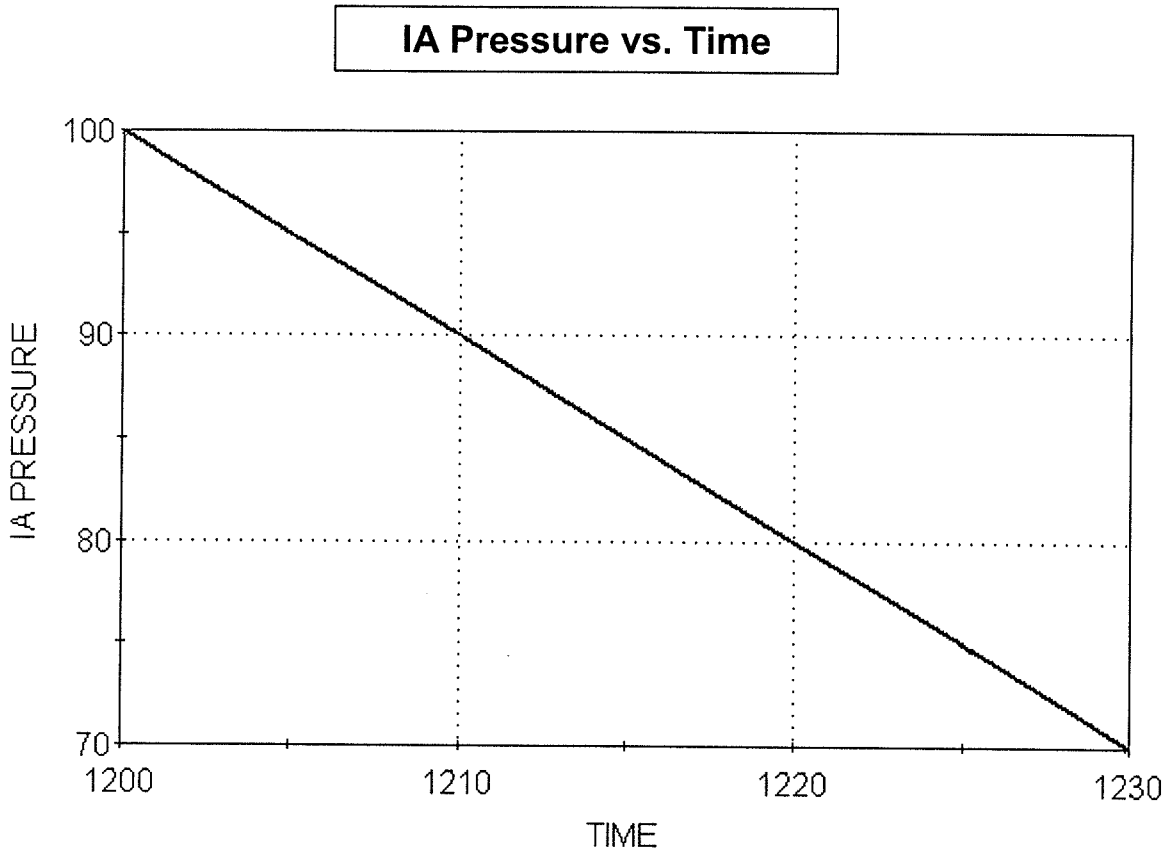
B. 1. closed
   2. have failed closed

C. 1. open
   2. have failed open

D. 1. "as is"
   2. have failed "as is"

2009B ONS SRO NRC Examination - Q 53

Given the following conditions:



Which ONE of the following describes the EARLIEST time at which SA-141 (SA to IA Controller) will automatically open?

A. 1215

B. 1212

C. 1210

D. 1207

2009B ONS SRO NRC Examination - Q 54

Which ONE of the following will receive a signal to close if ES Digital Channel 2 was inadvertently actuated on Unit 1?

A. 1LPSW-21

B. 1LPSW-6

C. 1GWD-12

D. 1LWD-2

2009B ONS SRO NRC Examination - Q 55

Given the following Unit 3 conditions:

- Reactor power = 100%
- Personnel Hatch Interlock Mechanism NOT OPERABLE

Which ONE of the following describes the MINIMUM actions required in accordance with Tech Spec 3.6.2 (Containment Air Locks)?

A. Declare Containment NOT Operable immediately

B. Declare BOTH doors in the air lock NOT Operable immediately

C. Verify ALL OPERABLE doors in the air lock are closed within one hour

D. Verify at least ONE OPERABLE door in the air lock is closed within one hour

2009B ONS SRO NRC Examination - Q 56

Which ONE of the following conditions would result in a Control Rod Out Inhibit?

A. Reactor power = 52% and Group 6 Rod 5 becomes misaligned by > 9 inches

B. Reactor power = 52% and Control Rod Group 1 loses its Group Out Limit

C. Count rate = 675 cps increasing and ALL Safety rods NOT withdrawn to their Group Out Limit and Safety Rods Out Bypass NOT enabled

D. Count rate = 675 cps increasing and Wide Range NI-1 startup rate = 2.1 dpm

2009B ONS SRO NRC Examination - Q 57

Given the following Unit 1 conditions:

- Reactor power = 100%
- ALL Absolute Position Indications (API) for Group 6 Rod 3 fail to "0"

1) A CRD Asymmetric Fault __(1)__ be generated.

2) The action that would be required in accordance with Tech Specs if all API and RPI indications for Group 6 Rod 3 become unavailable is to __(2)__.

Which ONE of the following completes the statements above?

A. 1. will
   2. immediately declare Group 6 Rod 3 NOT operable

B. 1. will
   2. begin RCS boration within 15 minutes

C. 1. will NOT
   2. immediately declare Group 6 Rod 3 NOT operable

D. 1. will NOT
   2. begin RCS boration within 15 minutes

2009B ONS SRO NRC Examination - Q 58

1) The power supply to 1NI-6 Power Range detector is __(1)__.

2) The RPS channel will __(2)__ if that power supply is deenergized.

Which ONE of the following completes the statements above?

A. 1. 1KVIB
   2. trip

B. 1. 1KVIB
   2. NOT trip

C. 1. 1KVIC
   2. trip

D. 1. 1KVIC
   2. NOT trip

2009B ONS SRO NRC Examination - Q 59

Given the following Unit 1 conditions:

Initial conditions:

- Reactor power = 100%

Current conditions:

- SBLOCA occurs
- IMAs & Symptom check complete

Which ONE of the following states the Core Exit Thermocouples (CETCs) that are being used by the Core Subcooling Monitors in ICCM?

A. ALL 47 CETCs

B. ONLY 24 qualified CETCs

C. ONLY 12 highest qualified CETCs for that train

D. ONLY 5 highest qualified CETCs for that train

2009B ONS SRO NRC Examination - Q 60

Which ONE of the following will result in automatic closure of RB Purge isolation valves 3PR-1,2,3,4,5,AND 6?

A. 3RIA-45 HIGH alarm

B. 3RIA-46 ALERT alarm

C. Manual actuation of ES channels 5 and 6

D. Low RCS pressure actuation of ES channels 1 and 2

2009B ONS SRO NRC Examination - Q 61

Given the following Unit 1 conditions:

Initial Conditions:

- Reactor in MODE 6
- Fuel Transfer Canal is full
- LPI in Normal Decay Heat Removal
- 1B Spent Fuel Cooling Pump operating and aligned to Refueling Cooling Mode in accordance with OP/1/A/1102/015 (Filling and Draining FTC)

Current conditions:

- 1SF-1 and 1SF-2 are inadvertently closed

Which ONE of the following describes the:

1) response of the Fuel Transfer Canal level?

2) position of 1SF-1 and 1SF-2 once the unit returns to MODE 1?

A. 1. Remain constant
   2. Open

B. 1. Remain constant
   2. Remain closed

C. 1. Decrease
   2. Open

D. 1. Decrease
   2. Remain closed

2009B ONS SRO NRC Examination - Q 62

Given the following Unit 2 conditions:

Initial conditions:

- Reactor in MODE 6
- Fuel Transfer Canal slightly above 21.34' mark on canal wall
- RB Hatch closed
- RB Purge is operating
- 2SF-1 AND 2SF-2 are open

Current conditions:

- RB Purge fan trips

Which ONE of the following predicts the response of actual Fuel Transfer Canal level over the next ten (10) minutes?

A. Initially increases then returns to previous level

B. Increases then remains constant

C. Initially decreases then returns to previous level

D. Decreases then remains constant

2009B ONS SRO NRC Examination - Q 63

Given the following Unit 1 conditions:

Initial conditions:
- Reactor power = 100%

Current conditions:
- Reactor trip
- "Trip Confirm" signal NOT generated by the Diamond

1) The status of the Turbine Load Status Flag is __(1)__.

2) The TBVs will control at __(2)__.

Which ONE of the following completes the statements above?

A. 1. TRUE
   2. setpoint

B. 1. TRUE
   2. setpoint + 125 psig

C. 1. FALSE
   2. setpoint

D. 1. FALSE
   2. setpoint + 125 psig

2009B ONS SRO NRC Examination - Q 64

Given the following Unit 1 conditions:

- Reactor power = 100%

1) The Hotwell Pump suction valve breakers are __(1)__.

2) The suction valve control switches are located in the __(2)__.

Which ONE of the following completes the statements above?

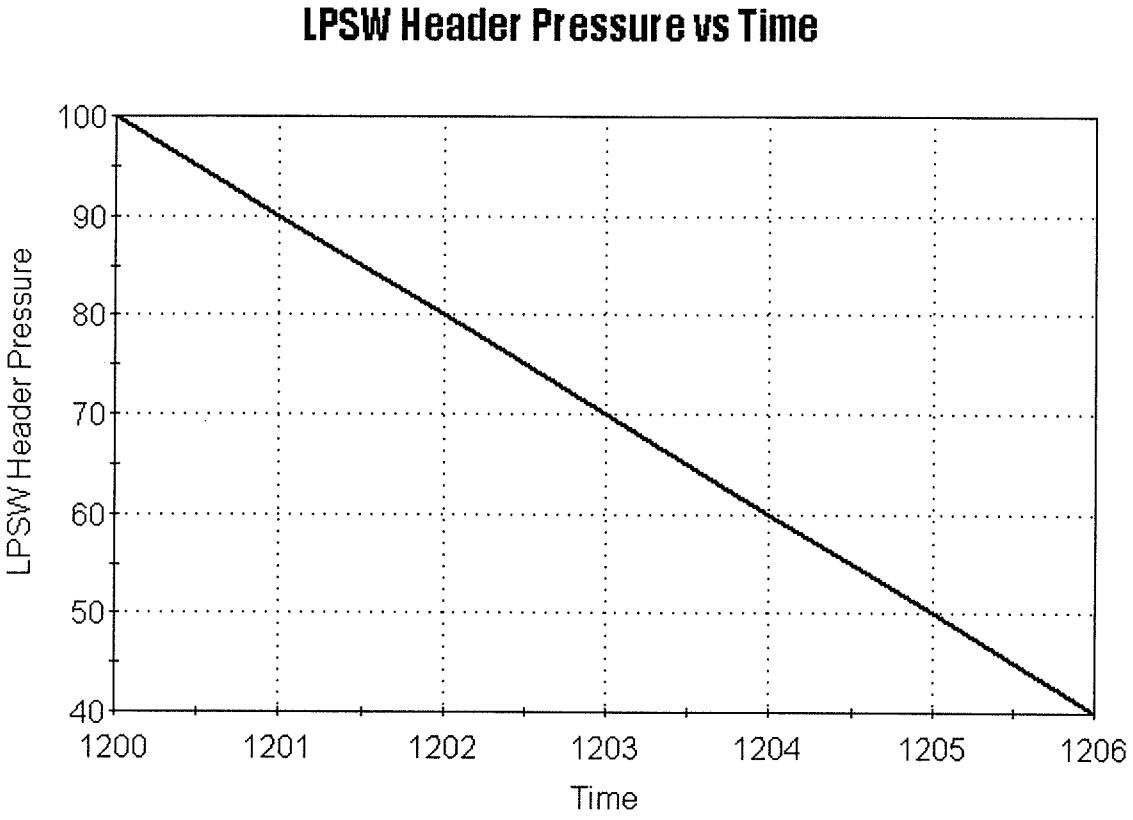
A. 1. open
   2. Turbine Building Basement adjacent to Hotwell Pump sump

B. 1. open
   2. Control Room on 1VB3

C. 1. closed
   2. Turbine Building Basement adjacent to Hotwell Pump sump

D. 1. closed
   2. Control Room on 1VB3

2009B ONS SRO NRC Examination - Q 65



- 3A LPSW pump operating
- 3B LPSW pump in AUTO
- Unit 3 LPSW system transient occurs as described in graph above

Which ONE of the following states the earliest time that LPSW header pressure will START the timer for the Standby LPSW pump auto start circuit?

A. 1201

B. 1203

C. 1204

D. 1205

2009B ONS SRO NRC Examination - Q 66

Which ONE of the following lists of items will always require a plant page (except for unanticipated automatic starts and emergency situations) in accordance with OMP 1-02 (Rules of Practice)?

A. ALL 4911 calls
Closing PCB-18

B. ALL AP entries
Starting and stopping 1B1 RCP

C. Starting a 4160V Motor
Closing PCB-18

D. Starting and stopping 1B1 RCP
Starting a 4160V Motor

2009B ONS SRO NRC Examination - Q 67

Which ONE of the following describes what should be used in the case of a large Hydrogen leak in accordance with OP/1/A/1106/017 (Hydrogen System) to maintain Hydrogen concentration below the lower flammability limit?

A. CO_2

B. Water

C. Halon

D. Foam fire retardant

2009B ONS SRO NRC Examination - Q 68

Given the following conditions:

Initial conditions:

- Time = 1200
- Unit 1 reactor power = 100%
- Unit 3 reactor power = 100%
- Site Area Emergency declared on Unit 2

Current conditions:

- Time = 1400
- TSC/OSC remain activated
- Unit 3 requires an NEO to place Unit 3 BWST in recirc

Which ONE of the following describes who will communicate with the NEO in accordance with OMP 1-07 (Operations Emergency Response Organization) to have them place the Unit 3 BWST in recirc?

A. OSM liaison

B. OSC Ops liaison

C. Unit 3 CRSRO

D. Unit 3 RO

2009B ONS SRO NRC Examination - Q 69

Given the following Unit 1 conditions:

- Reactor power = 100%
- Group 8 movement is required for imbalance control

Which ONE of the following:

1) describes the MINIMUM actions required prior to using the joystick to move Group 8 rods?

2) states if Group 7 rods will respond to neutron error while group 8 is selected?

A. 1. Place Diamond panel Group Select switch to Group 8 ONLY
   2. Yes

B. 1. Place Diamond panel Group Select switch to Group 8 ONLY
   2. No

C. 1. Select SEQUENCE OVERRIDE and Place Diamond panel Group Select switch to Group 8
   2. Yes

D. 1. Select SEQUENCE OVERRIDE and Place Diamond panel Group Select switch to Group 8
   2. No

2009B ONS SRO NRC Examination - Q 70

Given the following Unit 1 conditions:

Initial conditions:

- Reactor power = 100%

Current conditions:

- Keowee Emergency Start channels 1 and 2 inoperable

1) The MAXIMUM Completion Time allowed by Tech Specs to declare both KHU's NOT OPERABLE is __(1)__.

2) The resulting Tech Spec Required Action(s) is/are to __(2)__.

Which ONE of the following completes the statements above?

A. 1. Immediately
   2. energize at least ONE Standby Bus from a Lee Combustion Turbine via an isolated path within 1 hour

B. 1. One hour
   2. energize at least ONE Standby Bus from a Lee Combustion Turbine via an isolated path within 1 hour

C. 1. Immediately
   2. energize BOTH Standby Buses from a Lee Combustion Turbine via an isolated path within 1 hour

D. 1. One hour
   2. energize BOTH Standby Buses from a Lee Combustion Turbine via an isolated path within 1 hour

2009B ONS SRO NRC Examination - Q 71

Given the following Unit 1 conditions:

- Reactor power = 100%

Which ONE of the following describes a condition that would require entry into a Tech Spec ACTIONS table?

A. UST level = 7.6 feet

B. BWST level = 45.3 feet

C. 1C RPS NR Th fails high

D. 230KV Dacus Black and White lines isolated

2009B ONS SRO NRC Examination - Q 72

Which ONE of the following describes the actions taken and why, in accordance with the SGTR tab, to limit the activity released to the atmosphere?

A. The Condensate Steam Air Ejectors are lined up to the Main Steam system to prevent cross contamination.

B. The TD EFDW pump is placed in "Pull To Lock" to prevent feeding the affected SG with contaminated water.

C. The Auxiliary Steam systems for all three units are split to prevent cross contamination.

D. Core SCM is minimized to reduce the primary to secondary leak rate.

2009B ONS SRO NRC Examination - Q 73

Which ONE of the following describes:

1) a condition where Emergency Dose Limits (EDLs) would be in effect?

2) the MAXIMUM whole body EDL (Rem) if performing EOP actions that are NOT to save a life or protect valuable property?

A. 1. 50 gpm Primary to Secondary leak
   2. 5

B. 1. 50 gpm Primary to Secondary leak
   2. 10

C. 1. 50 gpm RCS hot leg weld leak
   2. 5

D. 1. 50 gpm RCS hot leg weld leak
   2. 10

2009B ONS SRO NRC Examination - Q 74

Which ONE of the following describes:

1) an acceptable reason for the Procedure Director to interrupt an operator who is performing Rule 2?

2) the bases behind limiting the interruptions of operators who are performing Rules?

A. 1. Perform a Crew Brief
   2. Minimize Operator errors

B. 1. Inform the operator that ACC Conditions exist
   2. Minimize Operator errors

C. 1. Perform a Crew Brief
   2. Ensures completion of Time Critical Actions

D. 1. Inform the operator that ACC Conditions exist
   2. Ensures completion of Time Critical Actions

2009B ONS SRO NRC Examination - Q 75

The following are Log entries from the Emergency Coordinator (EC/OSM) Log following an event at Oconee Unit 2.

1112 – EC/OSM declared a General Emergency based on 2RIA-57 readings.

1117 - EC/OSM provided the following offsite protective recommendations to the Offsite Communicator:

- Evacuation of Pickens A0, A1, B1, C1, and Oconee A0, D1, E1, F1
- Shelter of Pickens A2, B2, C2, and Oconee D2, E2, F2.

1120 - EC/OSM signed message form to provide offsite recommendations.

1122 - Station Manager in the control room began turnover to TSC.

1125- Present time of day.

Which ONE of the following describes the MAXIMUM number of minutes the Offsite Communicator has to initiate the notifications to State and Counties <u>from the present time</u>?

A. 2

B. 7

C. 10

D. 15

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FEED IN THIS DIRECTION

	T	F
1	Ⓐ	●
2	Ⓐ	Ⓑ
3	Ⓐ	Ⓑ
4	Ⓐ	Ⓑ
5	Ⓐ	●
6	Ⓐ	Ⓑ
7	Ⓐ	Ⓑ
8	Ⓐ	Ⓑ
9	●	Ⓑ
10	Ⓐ	●
11	Ⓐ	Ⓑ
12	●	Ⓑ
13	Ⓐ	●
14	●	Ⓑ
15	Ⓐ	●
16	Ⓐ	Ⓑ
17	Ⓐ	Ⓑ
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32	●	Ⓑ
33	Ⓐ	●
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73	●	Ⓑ
74	Ⓐ	Ⓑ
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76	Ⓐ	Ⓑ
77	Ⓐ	Ⓑ
78	●	Ⓑ
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82	Ⓐ	●
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86	Ⓐ	●
87	Ⓐ	Ⓑ
88	Ⓐ	●
89	Ⓐ	●
90	●	Ⓑ
91	Ⓐ	Ⓑ
92	●	Ⓑ
93	Ⓐ	●
94	Ⓐ	Ⓑ
95	●	Ⓑ
96	Ⓐ	Ⓑ
97	Ⓐ	Ⓑ
98	●	Ⓑ
99	Ⓐ	Ⓑ
100	Ⓐ	Ⓑ

ANSWER KEY INFO.
OF KEYS
ITEM COUNT

PERFORMANCE ASSESSMENT
% OF TOTAL SCORE (00 = 100%)
POINTS EARNED
EQUAL PT VALUE

BAR CODE

FEED IN THIS DIRECTION

NUMBER CORRECT
PERCENT CORRECT
ROSTER NUMBER
SCORE
RESCORE

SCANTRON

COMBINED POINTS EARNED
COMBINED PERCENT CORRECT
LETTER GRADE
SCORE
RESCORE

100 ITEM

STUDENT ID NUMBER

NAME KEY
SUBJECT
PERIOD DATE

MARKING INSTRUCTIONS
Use a No. 2 Pencil
Ⓐ ● Ⓒ Ⓓ Ⓔ
Fill oval completely
Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ
Erase cleanly

Q17

Duke Energy Oconee Nuclear Station **DEGRADED GRID**	Procedure No. **AP/3/A/1700/034** Revision No. **007** Electronic Reference No. **OP009654**

PERFORMANCE

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1. Entry Conditions {1}{2}

1.1 Grid Voltage or Frequency alarms

1.2 Notification from the SOC/TCC of any of the following:

- Actual or predicted low MW reserve
- Actual or suspected grid voltage or frequency alarms
- NERC Alert 2 or 3 declaration
- RTCA indicates problem
- RTCA **NOT** working

2. Automatic Systems Actions

None

3. Immediate Manual Actions

None

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4. Subsequent Actions

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.1 Verify any of the following: __ Voltage or frequency alarm __ RTCA (Real Time Contingency Analysis) indicates switchyard voltage would be inadequate for an Oconee Rx trip.	__ **GO TO** Step 4.42.
4.2 Record time of first alarm or notification from TCC: Time: _____	
4.3 __ Verify Unit 1 and Unit 2 SROs are aware of grid alarms or notification from TCC.	Notify the following of grid alarms or notification from TCC: __ U1 SRO __ U2 SRO
4.4 __ Verify Unit 1 is performing AP/1/34 (Degraded Grid).	Notify the following: __ OSM to reference OMP 1-14 (Notifications) __ STA
4.5 __ Verify Unit 3 generator on line.	__ **GO TO** Step 4.33.

NOTE

A large grid disturbance at 100 % FP operation may cause NIs to approach the Hi flux trip.

4.6 __ **IAAT** Rx power is ≥ 100 % FP, **THEN** decrease the CTPD Set Window as needed to prevent Hi Flux trip.	
4.7 __ Verify Unit 1 is performing AP/1/34 (Degraded Grid).	__ Notify TCC that the RTCA (Real Time Contingency Analysis) needs to be performed.
4.8 __ Notify TCC of the status of U3 generator VOLTAGE REGULATOR MODE (Auto / Manual).	

IF AT ANY TIME:

(4.6) Rx power is ≥ 100 % FP ... (decrease the CTPD Set Window as needed to prevent Hi flux trip)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.9 __ Verify Unit 2 is performing AP/2/34 (Degraded Grid).	Notify Keowee Operator of the following: __ Monitor Keowee Generator Voltage when any Keowee unit is generating to the grid. __ Trip any Keowee unit generating to the grid with Keowee Generator Voltage ≤ 13.2 kV. {3}
4.10 __ Verify generator output within limits of the appropriate capability curve based on generator voltage: ✓ | Generator Voltage | Enclosure | > 18.05 kV | 5.1 | ≤ 18.05 kV | 5.2	1. __ Adjust MVARs to maintain generator output within limits of the appropriate capability curve. 2. __ **IF** generator output **CANNOT** be maintained within limits by adjusting MVARs, **THEN** reduce MWs as required.

IF AT ANY TIME:

(4.6) Rx power is ≥ 100 % FP ... (decrease the CTPD Set Window as needed to prevent Hi flux trip)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.11 __ **IAAT** generator output **CANNOT** be maintained within appropriate capability curve, **THEN** perform Steps 4.12 - 4.14.	__ **GO TO** Step 4.15.
4.12 __ Verify reactor > 50 % power.	__ **GO TO** Step 4.14.
4.13 Perform the following: A. __ Manually trip reactor. B. __ **GO TO** Unit 3 EOP.	
4.14 Perform the following: {2} A. Open the following: __ PCB 58 __ PCB 59 B. __ **GO TO** AP/1 (Load Rejection).	

IF AT ANY TIME:

(4.6) Rx power is ≥ 100 % FP ... (decrease the CTPD Set Window as needed to prevent Hi flux trip)

(4.11) generator output **CANNOT** be maintained within appropriate capability curve ... (take generator off line)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.15 __ Monitor frequency using UNDERFREQUENCY MONITOR screen on the EHC HMI Panel and compare to Maximum Allowable Time: **Frequency Limit** / **Maximum Allowable Time** ≥ 59.5 Hz — Unlimited < 59.5 Hz — 48 min < 58.6 Hz — 8 min < 58.1 Hz — 48 sec < 57.6 Hz — 0 sec	
4.16 __ **IAAT** the Maximum Allowable Time for a given frequency band is reached, **AND** the turbine is still on line, **THEN** perform Steps 4.17 - 4.19.	__ **GO TO** Step 4.20.
4.17 __ Verify reactor is > 50% power.	__ **GO TO** Step 4.19.
4.18 Perform the following: A. __ Manually trip reactor. B. __ **GO TO** Unit 3 EOP.	
4.19 Perform the following: {2} A. Open the following: __ PCB 58 __ PCB 59 B. __ **GO TO** AP/1 (Load Rejection).	

IF AT ANY TIME:

(4.6) Rx power is ≥ 100 % FP ... (decrease the CTPD Set Window as needed to prevent Hi flux trip)

(4.11) generator output **CANNOT** be maintained within appropriate capability curve … (take generator off line)

(4.16) the Maximum Allowable Time for a given frequency is reached **AND** turbine is still on line … (take generator off line)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.20 __ Verify generator MVARs oscillating > ± 100 MVARs from steady state.	__ **GO TO** Step 4.24.
4.21 __ Place VOLTAGE REGULATOR MODE in manual.	
4.22 __ Verify generator output within limits of the appropriate capability curve based on generator voltage: ✓ | **Generator Voltage** | **Enclosure** | > 18.05 kV | 5.1 | ≤ 18.05 kV | 5.2	1. __ Adjust MVARs using VOLTAGE ADJUST to maintain generator output within limits of the appropriate capability curve. 2. __ **IF** generator output **CANNOT** be maintained within limits by adjusting MVARs, **THEN** reduce MWs as required.
4.23 __ Notify TCC that VOLTAGE REGULATOR MODE is in manual.	
4.24 __ **IAAT** TCC/SOC directs unit separation from the grid, **THEN** perform the following: A. __ **PERFORM** a rapid power decrease to ≤ 50 % using AP/29 (Rapid Unit Shutdown). B. Open the following: __ PCB 58 __ PCB 59 C. __ **GO TO** AP/1 (Load Rejection).	

IF AT ANY TIME:

(4.6) Rx power is ≥ 100 % FP ... (decrease the CTPD Set Window as needed to prevent Hi flux trip)

(4.11) generator output **CANNOT** be maintained within appropriate capability curve … (take generator off line)

(4.16) the Maximum Allowable Time for a given frequency is reached **AND** turbine is still on line … (take generator off line)

(4.24) TCC/SOC directs unit separation from the grid … (decrease power to ≤ 50 % and perform a load rejection)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
NOTE OP/0/A/1107/016 (Removal And Restoration of Switchyard Electrical Equipment) Enclosure (Grid Low Voltage Response) will give guidance for sliding links. Once links are slid, all Units will no longer be in TS 3.0.3, due to being in unanalyzed condition due to effect of post-trip voltage on ECCS systems.	
4.25 __ **IAAT** notified by TCC that Real Time Contingency Analysis indicates that switchyard voltage would be inadequate for an Oconee Rx trip, **THEN** perform Step 4.26.	__ **GO TO** Step 4.27.
4.26 __ Verify Unit 1 is performing OP/0/A/1107/016 (Removal And Restoration of Switchyard Electrical Equipment) Enclosure (Grid Low Voltage Response) per AP/1/34 (Degraded Grid). {4}	__ Initiate OP/0/A/1107/016 (Removal And Restoration of Switchyard Electrical Equipment) Enclosure (Grid Low Voltage Response). {4}
4.27 __ Verify Unit 1 is performing AP/1/34 (Degraded Grid).	__ Notify WCC SRO to enter risk code SSA_GRID into the Plant Risk Evaluation Program and evaluate the results. {5}
4.28 __ **WHEN** the grid is stable, as determined by the TCC, **THEN** continue.	
4.29 __ Verify Unit 2 is performing AP/2/34 (Degraded Grid).	__ Notify Keowee Operator that Keowee Generator Voltage monitoring is no longer required. {3}

IF AT ANY TIME:

(4.6) Rx power is ≥ 100 % FP ... (decrease the CTPD Set Window as needed to prevent Hi flux trip)

(4.11) generator output **CANNOT** be maintained within appropriate capability curve ... (take generator off line)

(4.16) the Maximum Allowable Time for a given frequency is reached **AND** turbine is still on line ... (take generator off line)

(4.24) TCC/SOC directs unit separation from the grid ... (decrease power to ≤ 50 % and perform a load rejection)

(4.25) notified by TCC that Real Time Contingency Analysis indicates that switchyard voltage would be inadequate ... (ensure OP/0/A/1107/016 Enclosure performed)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.30 __ Verify OP/0/A/1107/016 (Removal And Restoration of Switchyard Electrical Equipment) Enclosure (Grid Low Voltage Response) in progress or complete.	__ **GO TO** Step 4.32.
4.31 __ Verify Unit 1 is performing OP/0/A/1107/016 (Removal And Restoration of Switchyard Electrical Equipment) Enclosure (Recovery From Grid Low Voltage). {4}	__ Initiate OP/0/A/1107/016 (Removal And Restoration of Switchyard Electrical Equipment) Enclosure (Recovery From Grid Low Voltage). {4}
4.32 __ **WHEN** CR SRO directs, **THEN EXIT** this procedure.	

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.33 __ Verify Unit 1 is performing AP/1/34 (Degraded Grid).	__ Notify TCC that the RTCA (Real Time Contingency Analysis) needs to be performed.
4.34 __ Verify Unit 2 is performing AP/2/34 (Degraded Grid).	Notify Keowee Operator of the following: __ Monitor Keowee Generator Voltage when <u>any</u> Keowee unit is generating to the grid. __ Trip <u>any</u> Keowee unit generating to the grid with Keowee Generator Voltage ≤ 13.2 kV. {3}

NOTE

OP/0/A/1107/016 (Removal And Restoration of Switchyard Electrical Equipment) Enclosure (Grid Low Voltage Response) will give guidance for sliding links. Once links are slid, all Units will no longer be in TS 3.0.3, due to being in unanalyzed condition due to effect of post-trip voltage on ECCS systems.

4.35 __ **IAAT** notified by TCC that Real Time Contingency Analysis indicates that switchyard voltage would be inadequate for an Oconee Rx trip, **THEN** perform Step 4.36.	__ **GO TO** Step 4.37.
4.36 __ Verify <u>Unit 1</u> is performing OP/0/A/1107/016 (Removal And Restoration of Switchyard Electrical Equipment) Enclosure (Grid Low Voltage Response) per AP/1/34 (Degraded Grid). {4}.	__ Initiate OP/0/A/1107/016 (Removal And Restoration of Switchyard Electrical Equipment) Enclosure (Grid Low Voltage Response). {4}
4.37 __ **WHEN** the grid is stable, as determined by the TCC, **THEN** continue.	

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.38 __ Verify Unit 2 is performing AP/2/34 (Degraded Grid).	__ Notify Keowee Operator that Keowee Generator Voltage monitoring is no longer required. {3}
4.39 __ Verify OP/0/A/1107/016 (Removal And Restoration of Switchyard Electrical Equipment) Enclosure (Grid Low Voltage Response) in progress or complete.	__ **GO TO** Step 4.41.
4.40 __ Verify Unit 1 is performing OP/0/A/1107/016 (Removal And Restoration of Switchyard Electrical Equipment) Enclosure (Recovery From Grid Low Voltage). {4}	__ Initiate OP/0/A/1107/016 (Removal And Restoration of Switchyard Electrical Equipment) Enclosure (Recovery From Grid Low Voltage). {4}
4.41 __ **WHEN** CR SRO directs, **THEN EXIT** this procedure.	

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.42 Verify <u>any</u> of the following: __ Actual <u>or</u> predicted Megawatt reserves < 500 MWe. __ NERC (National Electric Reliability Commission) Alert 2 <u>or</u> 3 declaration. __ RTCA (Real Time Contingency Analysis) indicates that 230 kV switchyard voltage would be inadequate if further grid degradation occurs. {6}	__ **GO TO** Step 4.48.
4.43 __ Verify that RTCA indicates that 230 kV switchyard voltage would be inadequate if further grid degradation occurs. {6}	__ **GO TO** Step 4.45.

NOTE

- TS 3.8.1 J should be entered if one more failure would cause 230 kV voltage to be degraded.
- OP/0/A/1107/016 (Removal And Restoration of Switchyard Electrical Equipment) is performed per steps 4.25 or 4.35 if an Oconee Rx trip could cause the 230 kV switchyard degradation. OP/0/A/1107/016 will direct the TS 3.8.1. J entry for theses cases.

4.44 __ Enter TS 3.8.1 Required Action J. {6}	

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.45 __ Verify the following equipment is available: {6} • KHU underground and overhead power paths • Lee Combustion Turbines and associated power path • Control and Power Batteries • SSF • TDEFWP	__ Initiate action to restore out of service equipment.
4.46 __ Notify WCC that the following equipment should remain in service until this AP is exited: {6} • KHU underground and overhead power paths • Lee Combustion Turbines and associated power path • Control and Power Batteries • SSF • TDEFWP	

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.47 __ Notify WCC SRO to enter risk code SSA_GRID into the Plant Risk Evaluation Program and evaluate the results. {6}	
4.48 __ Verify TCC reports RTCA program out of service. {6}	__ **GO TO** Step 4.50.
4.49 __ Monitor switchyard voltage and frequency on OAC. {6}	
4.50 __ **IAAT** switchyard voltage or frequency alarms are received, **AND** RTCA is out of service, **THEN** contact System Engineering to perform an Operability evaluation on off site power sources. {6}	
4.51 __ **WHEN** conditions permit, **THEN EXIT.**	

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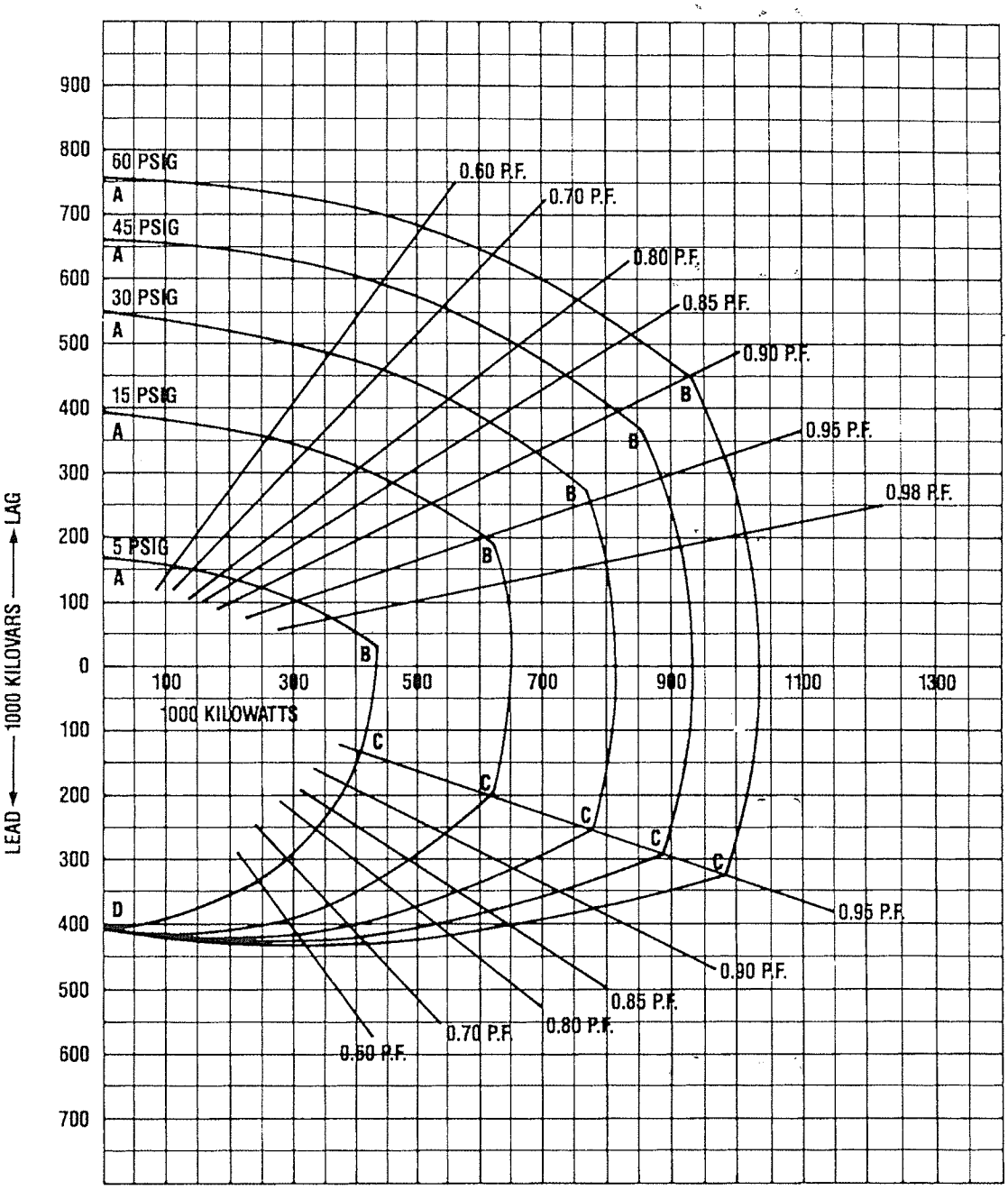

CURVE AB LIMITED BY FIELD HEATING
CURVE BC LIMITED BY ARMATURE HEATING
CURVE CD LIMITED BY ARMATURE CORE END HEATING

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1. Instructions for use of Encl 5.1 (Generator Capability Curve) are as follows:
   A. Locate Unit Megawatts on the horizontal axis. (1000 kilowatts = 1 megawatt)
   B. Depending on whether power factor is leading or lagging. Move perpendicular away from the 1000 KILOWATTS axis until intersecting actual generator hydrogen pressure. If between two pressures curves, visually interpolate generator hydrogen pressure.
   C. From this point of intersection with generator pressure, move horizontally to the left to intersect the 1000 KILOVARS axis. This point determines the generator MVAR limit. (1000 KILOVARS = 1 MVAR)

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Enclosure 5.2

Generator Reduced Capability Curve

Figure 5.2A

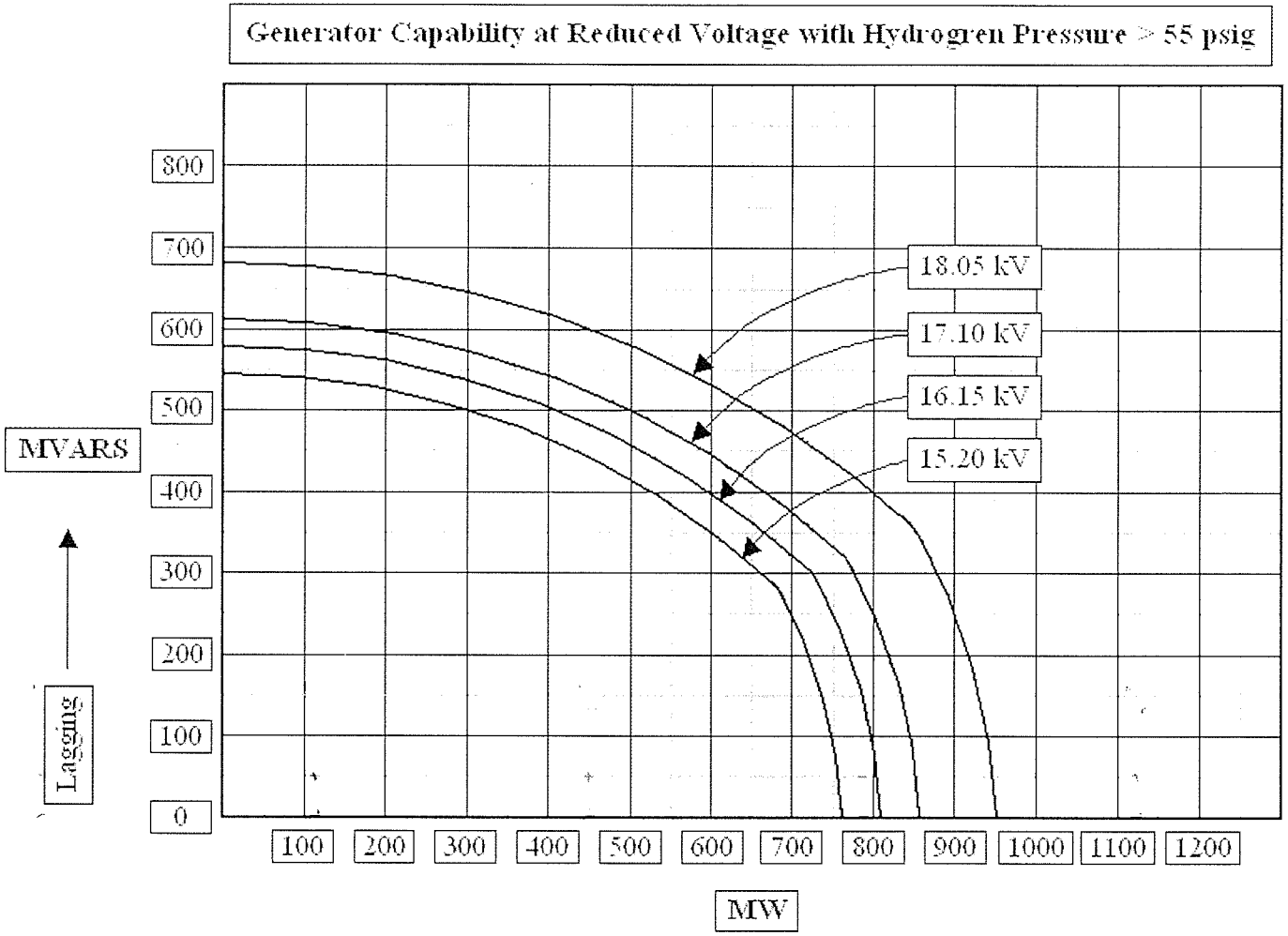

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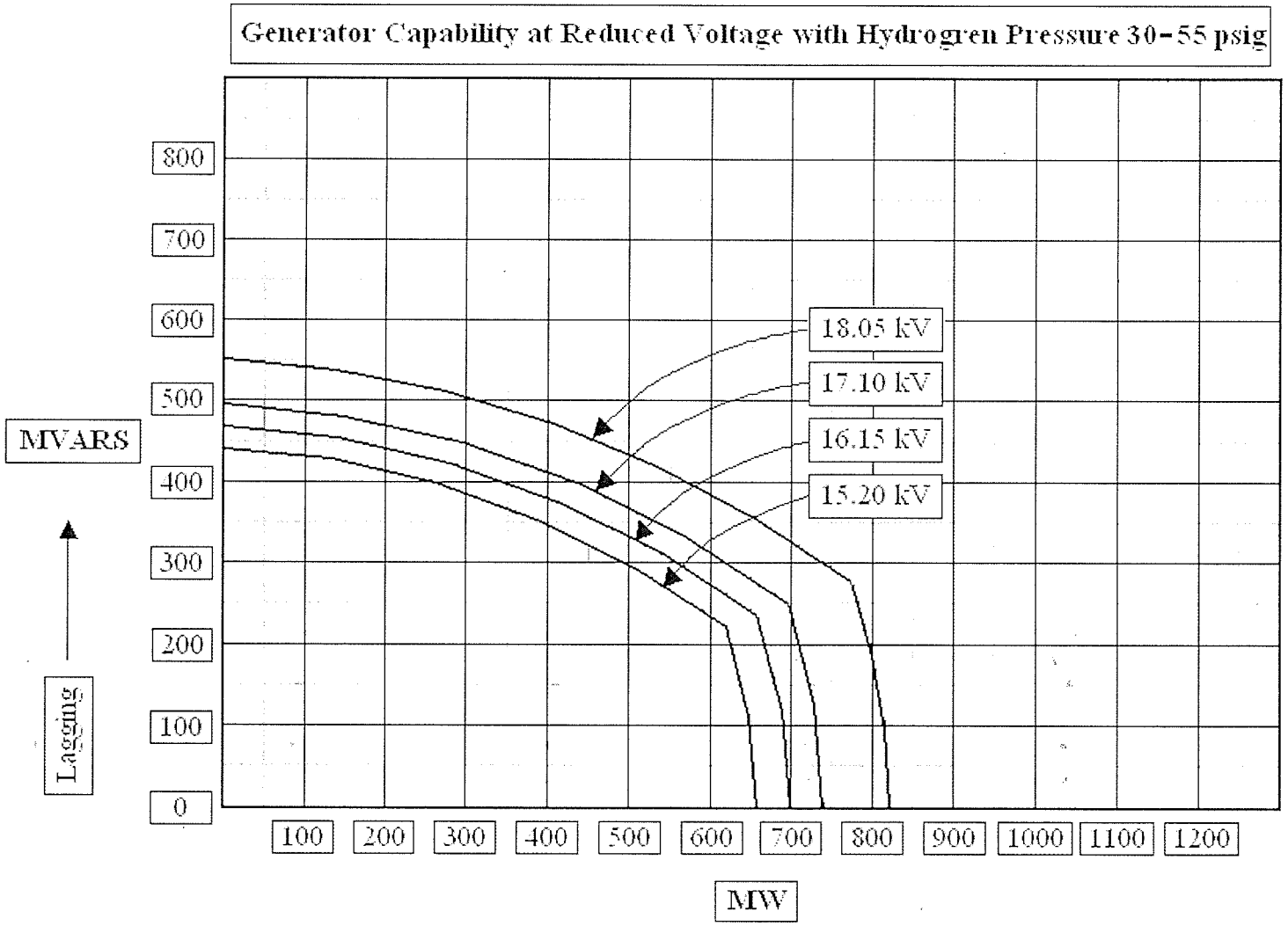
Figure 5.2B


Generator Capability at Reduced Voltage with Hydrogren Pressure 30-55 psig
MVARS
Lagging
800
700
600
500
400
300
200
100
0
18.05 kV
17.10 kV
16.15 kV
15.20 kV
100
200
300
400
500
600
700
800
900
1000
1100
1200
MW

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1. Instructions for use of Encl 5.2 (Generator Reduced Capability Curve) are as follows:
   A. Select appropriate Figure based on Generator Hydrogen pressure. If Generator Hydrogen pressure > 55 psig, use Figure 5.2A. If Generator Hydrogen pressure is 30 - 55 psig, use Figure 5.2B.
   B. Locate Unit Megawatts on the horizontal axis on appropriate Figure.
   C. Move perpendicular up from Megawatts until intersecting actual generator voltage. If between two voltage curves, drop to the next lowest voltage curve.
   D. From this point of intersection with generator voltage curve move horizontally to the left to intersect the MVARs vertical axis. This point determines the generator MVAR limit. Acceptable MVA is below and to the left of the generator voltage curve.

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1. SOER 99-01/PIP O-00-00354 Corrective Action #15 - Created a procedure to mitigate degraded grid conditions.
2. PIP-O-01-01864 - Corrective Action #1 states to use switchyard PCBs instead of generator output breakers. These are actually one in the same and no change is required.
3. PIP-O-00-00354 Corrective Action #27-Added guidance to notify Keowee Operator to monitor Keowee Generator Voltage on Keowee units generating to the grid and trip them if Keowee Generator Voltage is ≤ 13.2 kV.
4. PIP-O-03-4351 OP/0/A/1107/016 provides guidance to allow ONS to exit TS conditions associated with Degraded Grid and is not required to mitigate a Degraded Grid event. Thus, it is not considered an AP Support Procedure.
5. PIP-O-04-6469 Risk codes added to AP/6 and AP/34 to evaluate work and OOS equipment.
6. PIP-G-07-761. Guidance added per request from NGD Duty Engineering Group. Guidance tells ONS proper actions to take based on various grid problems.

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IF AT ANY TIME:

(4.6) Rx power is ≥ 100 % FP ... (decrease the CTPD Set Window as needed to prevent Hi flux trip)

(4.11) generator output **CANNOT** be maintained within appropriate capability curve ... (take generator off line)

(4.16) the Maximum Allowable Time for a given frequency is reached **AND** turbine is still on line ... (take generator off line)

(4.24) TCC/SOC directs unit separation from the grid ... (decrease power to ≤ 50 % and perform a load rejection)

(4.25) notified by TCC that Real Time Contingency Analysis indicates that switchyard voltage would be inadequate ... (ensure OP/0/A/1107/016 Enclosure performed)

(4.35) notified by TCC that Real Time Contingency Analysis indicates that switchyard voltage would be inadequate ... (ensure OP/0/A/1107/016 Enclosure performed)

(4.50) switchyard voltage or frequency alarms are received, **AND** RTCA is out of service ... (contact System Engineering)

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