Question Number: 001
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: B
K/A: 000007EK102
Question:
Given:

- Unit 1 tripped from full power following a 200 day run.
- The crew has transitioned to 1BwEP ES-0.1, REACTOR TRIP RESPONSE.
- ALL RCPs are running.
- RCS pressure is 2125 psig and stable.
- RCS temperature is 552°F and stable.
- DRPI indication for 4 rods indicates 18 steps.
- DRPI indication for 1 rod indicates 6 steps.
- ALL other rods ROD AT BOTTOM lights are lit.

The crew is required to emergency borate a MINIMUM of…(1BwEP ES-0.1, page 7 is attached)

a. 5280 gallons from the boric acid storage tank.

b. 6000 gallons from the boric acid storage tank.

c. 6600 gallons from the boric acid storage tank.

d. 22000 gallons from the RWST.

Answer:
c.
Reference:
1BwEP ES-0.1, page 7
BWD ILT LP I1-XL-EP-01
Cog Level High
Question Source Modified
QExplanation:
A is incorrect (value is 4 stuck rods).
B is incorrect (value is for no RCP's running with no stuck rods).
C is correct, with 5 stuck rods, boration required = 6600 gallons (1320 gals X 5 rods).
D is incorrect (value is for 4 stuck rods).

Question Number: 002
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: B
K/A: 000008 2.1.23
Question:
Given:

- Unit 2 is at 100% power.
- All systems are normally aligned.
- RCS pressure is 1810 psig and lowering rapidly.
- Pressurizer level is 72% and rising rapidly.
- PRT temperature, pressure and level are rising.

Based on the above indications, the operators FIRST action is to…

a. manually trip the reactor, verify the reactor tripped, and manually actuate SI.

b. manually trip the reactor and verify the reactor tripped. Do NOT manually actuate SI.

c. verify/insert control rods at 48 steps per minute.

d. close PZR PORV block valves and restore PZR pressure to normal.

Answer:
a.
Reference:
2BwEP-0
ILT LP I1-EP-XL-01
Cog Level Fundamental
Question Source New
QExplanation:
A is incorrect, PZR pressure is below reactor trip and SI setpoints and actuations have not occurred. Manual actuations required per 2BwEP-0.
B is incorrect, PZR pressure is below reactor trip and SI setpoints and actuations have not occurred. Manual reactor trip and SI actuations required per 2BwEP-0.
C is incorrect, actions would be correct if immediate action of manual reactor trip was unsuccessful per 2BwFR-S.1.
D is incorrect, actions would be correct if RCS pressure was above reactor trip setpoint.

Question Number: 003
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: B
K/A: 000009EA203
Question:
Given:

- Unit 1 is at 100% power.
- The crew placed excess letdown in service one hour ago in conjunction with normal letdown.
- 1CV8143, Excess Letdown to Seal Filter or RCDT Valve, is in the VCT position.
- The following indications are noted by the crew:
- VCT level is slowly lowering.
- ALL RCP seal injection flows have been stable for the past 55 minutes.
- ALL RCP seal return flows have been stable for the past 55 minutes.
- CC surge tank level has been rising slowly for the past 15 minutes.
- CC surge tank level is currently 76%.
- 1PR09J, Unit 1 CC Heat Exchanger Rad Monitor, is in ALERT.

Based on the above indications, a leak has developed in which of the following heat exchangers?

a. Letdown

b. 1B RCP Thermal Barrier

c. Seal Water

d. Excess Letdown

Answer:
a.
Reference:
1BwOA PRI-6
BWD ILT LP I1-OA-XL-17
Cognitive Level High
Question Source New
QExplanation:
A is correct, CC system in leakage from letdown Hx would cause stated indications.
B is incorrect, RCP thermal barrier could be source of CC system in leakage, however 1B RCP seal injection flow would rise above other seal injection flows if leak was in thermal barrier.
C is incorrect, CC system pressure is above CV system pressure in the seal water Hx, and would cause VCT level to rise vs. lower as stated in stem.
D is incorrect, excess letdown Hx could be source of CC system in leakage, however RCP seal return flow would lower with excess letdown leakage due to higher back pressure in seal return line.

Question Number: 004
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: B
K/A: 000011EK202
Question:
Given:

- Unit 1 was at 100% power.
- All systems are normally aligned.
- A large RCS LOCA occurred.
- All systems functioned as designed.
- The operating crew implemented 1BwEP-0, REACTOR TRIP OR SAFETY INJECTION, and transitioned to 1BwEP ES-1.3, TRANSFER TO COLD LEG RECIRCULATION, due to RWST level.
- The crew has completed aligning CV and SI pump suction from the RH pumps and is preparing to align the CS pumps for recirculation with the following indications.
  - RWST level is 15%.
  - CS is NOT reset.
  - SI is reset.
  - ALL CV, SI, RH, and CS pumps are running.

- A loss of offsite power occurs.
- BOTH DG output breakers have just closed.

Based on the above indications, the operators FIRST action is to…

a. start BOTH RH pumps.

b. place BOTH CV pumps in pull out.

c. verify ALL ECCS pumps start on the safe shutdown sequencer.

d. place BOTH CS pumps in pull out.

Answer:
b.
Reference:
1BwEP ES-1.3
Cognitive Level High
Question Source New
QExplanation:
A is incorrect, immediate start of RH pumps is not directed by procedure. Immediate start of pumps could over load EDGs leading to loss of ECR.
B is correct, 1BwEP ES-1.3 continuous action step requires (in the order listed) immediately placing CV pumps in pull out; allowing other equipment to sequence on EDG; manually starting RH pumps; then starting CV pumps due to CV pump suction alignment.
C is incorrect, allowing ECCS pumps to start would cause start of CV pumps with no suction source due to RH pumps not running

D incorrect, CS pumps are left in NAT and allowed to auto start. CS pump suction is aligned to RWST at current level.

Question Number: 005
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: B
K/A: 000015AA211
Question:
Given:

- A small break RCS LOCA occurred on Unit 1.
- Due to ECCS equipment failures, the crew has entered 1BwFR-C.1, RESPONSE TO INADEQUATE CORE COOLING.
- ALL RCPs are secured.
- The crew is preparing to start RCPs with the following conditions:
- CETCs = 1324°F.
- RCS pressure = 580 psig.
- ALL SG levels are adequate to support RCP operation.
- NO CC pumps running or available.
- ALL 6.9 KV buses are energized.

Based on the above conditions, an RCP will…

a. be started to temporarily restore core cooling.

b. Not be started, since minimum RCP support conditions are NOT met.

c. Not be started, since starting the RCP would add additional heat to the RCS.

d. be started to allow restoration of normal pressurizer pressure control.

Answer:
a.
Reference:
1BwFR-C.1
WOG background document for FR-C
BWD LP I1-FR-XL-02
Cognitive Level High
Question Source Bank
QExplanation:
A is correct, RCP will be started with CETC's > 1200 and adequate SG level to temporarily restore core cooling.
B is incorrect, RCP minimum support condition are met (adequate SG inventory and CETC's >1200°F)
C is incorrect, RCP start is directed by procedure to restore core cooling
D is incorrect, with CETCs > 1200°F, core voiding is occurring. RCP would not restore pressure control.

Question Number: 006
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: B
K/A: 000022AK102
Question:
Given:

- Unit 1 is at 100% power.
- All systems are normally aligned.
- PZR level is at 60%.
- 1A CV pump is running.
- 1CV121, Centrifugal Charging Pump Flow Control Valve, is in MANUAL control.
- Charging flow is 132 gpm.
- 1CV182, Charging Header Back Pressure Control Valve, is at 52% demand.
- Seal injection flows are 11 gpm per RCP.
- 1A CV pump impeller begins to slowly degrade.

In order to maintain pressurizer level at 60% AND RCP seal injection flows at 11 gpm, the operators must…

a. throttle open 1CV121 AND maintain 1CV182 at 52% demand.

b. throttle open 1CV121 and throttle closed 1CV182.

c. throttle closed 1CV121 AND 1CV182.

d. throttle closed 1CV121 and throttle open 1CV182.

Answer:
a.
Reference:
ILT LP II-CV-XL-01
Cognitive Level High
Question Source New
QExplanation:
A is correct, actions would raise charging flow to pre-transient value. Seal injection flow will return to pre-transient value with no adjustment on FCV required.
B is incorrect, actions would raise seal injection flow and lower RCS makeup flow, resulting in lowering PZR level.
C is incorrect, actions would raise seal injection flow and lower RCS makeup flow, resulting in lowering PZR level.
D is incorrect, actions would lower seal injection flow and lower RCS makeup flow, resulting in lowering PZR level.

Question Number: 007
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: B
K/A: 000025K205
Question:
Given:

- A large break RCS LOCA occurred on Unit 1.
- The operating crew has aligned both trains of ECCS and CS for cold leg recirculation per 1BwEP ES-1.3, TRANSFER TO COLD LEG RECIRCULATION.
- Containment floor water level = 35”.
- Three containment sump lights are lit on each train.
- ALL ECCS pump parameters are stable.
- RWST level = 5%.

The crew transitions to 1BwCA-1.3, SUMP BLOCKAGE CONTROL ROOM GUIDELINE.

Which of the following actions will the crew perform FIRST?

a. Throttle 1RH606 & 607, RH Pump Flow Control Valves, to align RH pumps for recirculation flow to the RCS.

b. open 1CV112D & E, RWST to CV Pumps Suction Valves, to align one CV pump suction to the RWST.

c. close 1SI8809A & B, RH to Cold Leg Isolation Valves, to align RH pumps to supply recirculation suction for one CV or one SI pump.

d. Immediately stop ALL ECCS pumps.

Answer:
c.
Reference:
1BwCA-1.3
BWD ILT LP I1-CA-XL-02A
Cognitive Level High
Question Source New
QExplanation:
A is incorrect, although RH injection flowpath is available, procedure directs aligning RH pump to supply CV or SI pump for better flow control.
B is incorrect, minimum RWST level for pump operation not met.
C is correct, procedure directs aligning RH pump to supply CV or SI pump.
D is incorrect, RH pump parameters are stable, RH pump is left running.

Question Number: 008
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: B
K/A: 000026AA106
Question:
Given:

- Unit 1 is in Mode 1 at 100% power.
- 1A CC Pump is running.
- 0 CC Pump is aligned to Bus 142.
- 0 CC Pump Bus 142 C/S is in NAT.
- 0 CC Hx is aligned to Unit 1.
- 1TK-130, Letdown Heat Exchanger Outlet Temperature Controller, is in MANUAL at 55% demand.
- Annunciator 1-2-B5, CC Pump Discharge Pressure Low, is in alarm.
- 1B CC Pump automatically started and immediately tripped due to overcurrent.

Which of the following actions would raise CC system pressure?

a. Locally close 1CC9504A, 1A RH Hx Outlet Valve.

b. Locally open 1CC9503, Spent Fuel Pool Hx Outlet FCV.

c. Raise demand on 1TK-130 to 75%.

d. Place 1B CC pump C/S in pull out.

Answer:
d.
Reference:
1BwOA PRI-6
ILT LP II-CC-IL-01
Cognitive Level High
Question Source New
QExplanation:
A is incorrect, in Mode 1 1CC9412A is closed, which isolates CC inlet to RH Hx, throttling 1CC9504A would have no effect on CC system pressure.
B is incorrect, opening 1CC9503 would lower CC system pressure.
C is incorrect, raising demand on 1CC130A would open valve, resulting in lower CC system pressure.
D is correct, placing 1B CC pump in pull out would automatically start 0 CC pump, resulting in higher system pressure.

Question Number: 009
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: B
K/A: 000029EK206
Question:
Given:

- A Unit 1 manual reactor trip was initiated due to a RCS leak inside containment.
- The following indications are present on 1PM05J:
  - Reactor Trip Breakers (RTA and RTB) green indicating lights are LIT.
  - Reactor Trip Breakers (RTA and RTB) red indicating lights are NOT LIT.

Which of the following describes the current status of the components associated with each Reactor Trip Breaker? (Assume RTA AND RTB are NOT mechanically bound)

Each reactor trip breaker circuit has…

a. energized BOTH the undervoltage coil AND shunt trip coil.

b. failed to de-energize the undervoltage coil AND failed to energize the shunt trip coil.

c. de-energized BOTH the undervoltage coil AND shunt trip coil.

d. failed to energize the undervoltage coil AND failed to de-energize the shunt trip coil.

Answer:
b.
Reference:
ILT LP II-RP-XL-01
Cognitive Level High
Question Source Modified
Qexplanation:
A is incorrect. UV trip is de-energize to actuate.
B is correct, when manual reactor trip is actuated, reactor trip breakers did not open. Failure of reactor trip breakers to open caused by failure of both UV and shunt trip to actuate. UV trip is de-energize to actuate and shunt trip is energize to actuate.
C is incorrect, shunt trip is energize to actuate.
D is incorrect, UV trip is de-energize to actuate and shunt trip is energize to actuate.

Question Number: 010
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: B
K/A: 000040AK303
Question:
Given:

- Unit 2 was at 100% power, all systems normally aligned.
- A large steam break occurred outside containment, downstream of the MSIVs.
- A manual reactor trip and MS isolation were actuated.
- All systems functioned as designed.

Based on the above conditions, the ES Non-Return Check Valves…

a. close to minimize the RCS cooldown from the steam line break.

b. close to prevent over speeding the main turbine due to reverse steam flow from the FW heaters.

c. open to drain condensed steam in the ES piping to prevent water hammer.

d. open to prevent over pressurizing the FW heaters shells.

Answer:
b.
Reference:
ILT LP I1-MS-XL-01
ILT LP I1-ES-XL-01
Cognitive Level Fundamental
Question Source New
Qexplanation:
A is incorrect, break is downstream of MSIVs, MSIVs close to isolate break.
B is correct, ES non-return check valves close on turbine trip to prevent turbine overspeed.
C is incorrect, ES non-return check valves close, condensed steam is drained by ES spill valves which open on turbine trip.
D is incorrect, ES non-return check valves close, overpressure protection is provided by heater shell relief

Question Number: 011
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: B
K/A: 000054AA101
Question:
Given:

- Unit 1 was at 100% power.
- Unit 2 is defueled.
- Unit 1 reactor was manually tripped due to lowering SG NR levels.
- Operators are verifying AF system alignment in step 15 of 1BwEP-0, REACTOR TRIP OR SAFETY INJECTION, with the following indications:
- 1A AF pump is OOS.
- 1B AF pump is running with 760 gpm discharge flow.
- Annunciator 1-3-A7, AF Pump Suction Pressure Low, is in alarm.
- Annunciator 1-3-E7, AF Pump SX Suction Valves Armed, is in alarm.
- AF pump suction pressure is 17.5 psia.
- ALL SG NR levels are 0%.
- Unit 1 CST level is 30% and lowering rapidly
- Unit 2 CST is empty for maintenance.

Based on the above indications, the operators FIRST action(s) is(are) to…

a. cross-tie Unit 1 and Unit 2 CSTs.

b. verify open 1SX006B and 1SX017B, 1B AF Pump SX Suction Valves.

c. establish feed flow per 1BwFR-H.1, LOSS OF SECONDARY HEAT SINK.

d. throttle 1AF005E-H, AF Flow Control Valves, to 0% to raise AF pump suction pressure.

Answer:
b.
Reference:
1BwEP-0
ILT-LP-I1-AF-XL-01
Cognitive Level Fundamental
Question Source New
QExplanation:
A is incorrect, crosstie of CSTs would be ineffective since Unit 2 CST is empty and would further lower Unit 1 CST level.
B is correct, 1BwEP-0 OAS directs verifying SX suction valves open when annunciator 1-3-E7 is in alarm.
C is incorrect, minimum AF flow requirements are met with 1B AF pump running.
D is incorrect, throttling 1AF005E-H would raise AF pump suction pressure, however AF flow would drop below minimum required of 500 gpm.

Question Number: 012
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: B
K/A: 000056 2.1.33
Question:
Given:

- Unit 1 is in mode 6, core off load is in progress.
- A loss of off-site power occurs.
- All systems function as designed.

Tech Specs require the Unit 1 operators to…

a. suspend the core off load immediately.

b. verify both Unit 2 DGs are operable within 1 hour.

c. verify unborated water source isolation valves closed within 1 hour.

d. perform 1BwOSR 3.8.1.1, Normal and Alternate Off-Site Power Availability Surveillance, within 1 hour.

Answer:
a.
Reference:
T.S. 3.8.2
T.S.3.9.5
Cognitive Level Fundamental
Question Source New
A is correct, TS 3.8.2 requires immediate suspension of core alterations due to no qualified electrical circuit operable and TS 3.9.5 requires suspension of core alts due to no RH pump in operation during refuel (running RH pump would trip on LOOP and have to be manually restarted).
B is incorrect, would be correct if one DG inoperable in Mode 1-4 (TS 3.8.1).
C is incorrect, action for BDPS inoperability (TS 3.3.9). During mode 6 refueling, RCP are not in operation and RCP operation would not be affected by the loss of offsite power. BDPS LCO would apply if LOOP occurred in mode 5 w/RCPs operating.
D is incorrect, would be correct if Unit 1 was in Mode 1-4 (TS 3.8.1).

Question Number: 013
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: B
K/A: 000057 2.1.30
Question:
Given:

- A loss of Instrument Bus 114 has occurred.
- Operators have locally isolated instrument air to 1AF005E-H, AF Flow Control Valves.
- 1AF013A-H, AF Isolation Valves, are open.
- A reactor trip occurred and AF has actuated.

1B train AF flow can be controlled by…

a. throttling 1AF005E-H locally AND at the RSDP.

b. throttling 1AF005E-H locally AND throttling 1AF013E-H in the MCR.

c. throttling 1AF005E-H in the MCR AND at the RSDP.

d. throttling 1AF005E-H AND 1AF013E-H in the MCR.

Answer:
b.
REFERENCE
ILT LP I1-AF-XL-01
1BwOA ELEC-2
Cognitive Level Fundamental
Question Source New
QExplanation:
A is incorrect, 1AF005E-H cannot be throttled at RSDP with IA isolated.
B is correct, with IA failed to 1AF005E-H, valves can only be operated at local hand wheel. AF flow can also be throttled with 1AF013E-H in MCR (MOVs).
C is incorrect, 1AF05E-H cannot be throttled from MCR or RSDP with IA isolated.
D is incorrect. 1AF05E-H cannot be throttled from MCR with IA isolated.

Question Number: 014
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: B
K/A: 000058AA103
Question:
Given:

- Unit 1 is at 50% power, all systems normally aligned.
- Annunciator 1-21-E10, 125 VDC Distribution Panel 111/113 Volt Low, is in alarm.

Which of the following would indicate ONLY 125 VDC Bus 113 is de-energized?

a. 1FW510, 1A Feed Reg Valve, closed light lit at 1PM04J.

b. PMG output breaker open light lit at 1PM01J.

c. DC Bus 111 Voltage is 130V at 1PM01J.

d. PR 43 drawer is de-energized at 1PM07J.

Answer:
c.
Reference:
1BwOA ELEC-1
ILT LP I1-DC-XL-01
ILT LP I1-NI-XL-03
Cognitive Level Fundamental
Question Source New
QExplanation:
A is incorrect, failure of DC bus 113 would not cause closure of 1FW510 (DC Bus 111/112 loss only).
B is incorrect, DC bus 113 is power supply to PMG breaker, however PMG breaker is failed closed on loss
of DC.
C is correct, alarm is for DC bus 111/113 voltage. BwAR directs operators to check voltage on DC bus 111 to determining which bus has low voltage. DC bus 111 voltage is normal.
D is incorrect, PR N43 power supply is AC 113 vs. DC 113.

Question Number: 015
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: B
K/A: 000062AA206
Question:
Given:

- Unit 1 was at 100% power.
- All systems normally aligned.
- A reactor trip occurred on Unit 1 and transition to 1BwEP ES-0.1, REACTOR TRIP RESPONSE, has been made.
- 1B SX pump has TRIPPED.
- Annunciator 1-2-A2, SX Pump Discharge Header Pressure Low, is in alarm.
- 1BwOA PRI-8, ESSENTIAL SERVICE WATER MALFUNCTION, has been entered with the following conditions:
  - 1A SX pump was started.
  - Annunciator 1-2-C2, SX Strainer DP High, is in alarm.
  - Annunciator 1-2-A2 remained in alarm.
  - 1A SX pump inboard and outboard bearing temps are 150°F and rising at 2°F/min.
  - 1A AF pump is running, all bearing temps are 133°F and rising at 4°F/min.
  - 1B AF pump is running, all bearing temps are 135°F and rising at 3°F/min.
  - 1A CV pump is running, all bearing temps are 178°F and rising at 3°F/min, gear drive oil temperature is 154°F and rising at 1.5°F/min.
  - 1B CV pump is in standby.

If ALL trends continue, which of the following pumps will be the FIRST to exceed its vital equipment temperature limit?
(1BwOA PRI-8, step 3 and 1BwOA PRI-8 table A are attached)

a. 1A AF

b. 1A CV

c. 1A SX

d. 1B AF

Answer:
a.
Reference:
1BwOA PRI-8
Cognitive Level High
Question Source New
QExplanation:
A is correct, 1A AF pump will exceed limit in 8 minutes. [1A AF pump (165°F-133°F)/ 4°F/min = 8 min]

All other choices > 8 mins. [1A CV pump bearing (205°F-178°F)/ 3°F/min = 9 min], [1A CV pump gear drive (175°F-154°F)/ 1.5°F/min = 14 min], [1A SX pump (175°F-150°F)/ 2°F/min = 12.5 min], [1B AF pump (165°F-135°F)/ 3°F/min = 10 min]

Question Number: 016
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: B
K/A: 00WE04EK3.3
Question:
When performing 1BwCA-1.2, LOCA OUTSIDE CONTAINMENT, why are RH components isolated BEFORE other ECCS components?

a. To ensure RCS injection flow is maintained during leak identification.

b. This allows the CV pumps to maintain RCP support conditions.

c. To ensure RH remains available for long term cooling.

d. The leak is most likely to occur in the RH system.

Answer:
d.
Reference:
ILT LP I1-CA-XL-02
WOG background document for CA-1.2
Cognitive Level Fundamental
Question Source New
QExplanation:
D is correct, LOCA outside containment is most likely to occur in RHR piping due to low system design pressure.
A, B, & C are not correct reason for order of isolation.

Question Number: 017
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: B
K/A: 00WE11EK3.3
Question:
Given:

- Unit 1 was at 100% power, all systems normally aligned.
- A large break RCS LOCA occurred.
- While performing 1BwEP ES-1.3, TRANSFER TO COLD LEG RECIRCULATION, 1SI8811A AND 1SI8811B, Containment Sump Isolation Valves, failed to open.
- The operating crew has implemented 1BwCA-1.1, LOSS OF EMERGENCY COOLANT RECIRCULATION.

Under these conditions, which of the following states the reason 1BwCA-1.1 directs establishing only one train of SI flow?

a. To reduce the RWST depletion rate to delay stopping all pumps taking a suction from the RWST.

b. To allow initiating blended makeup flow to the suction of the charging pumps.

c. To reduce the RCS cooldown rate to less than 100°F/hr when dumping steam at maximum rate.

d. To maintain one train of ECCS pumps available for future use.

Answer:
a.
Reference:
ILT lP I1-CA-XL-02
WOG background document for CA-1.1
Cognitive Level Fundamental
Question Source Bank
QExplanation:
A is correct, loss of ECR requires establishing one train of SI flow to minimize RWST depletion.
B, C, & D are not correct reasons for establishing 1 train of SI flow.

Question Number: 018
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: B
K/A: 00WE05EK1.1
Question:
Given:

- Unit 1 was at 100% power.
- A loss of heat sink has occurred.
- NO CV pumps are available.
- The operating crew is establishing RCS 'Bleed and Feed' in accordance with 1BwFR-H.1, LOSS OF SECONDARY HEAT SINK.
- After all methods to establish a bleed path are attempted, ONLY ONE PZR PORV is open.

Which of the following describes the INITIAL consequence of having only one PZR PORV open?

a. RCS pressure will continue to rise to the PZR safety valve lift setpoint, leading to further loss of RCS inventory.

b. Insufficient natural circulation flow will inhibit mixing of SI flow in the reactor core, leading to localized PTS.

c. The RCS will NOT depressurize enough to prevent excessive primary-secondary differential pressure, leading to a SGTR.

d. The RCS will NOT depressurize enough to ensure sufficient SI flow to provide RCS heat removal, leading to an inadequate core cooling condition.

Answer:
d.
Reference:
lLT LP I1-FR-XL-03
WOG background document for FR-H.1
Cognitive level High
Question Source New
QExplanation:
relation to SI pump injection in bleed and feed mode and subsequent consequences of inadequate bleed path.
A is incorrect. RCS pressure will initially drop due to PORV opening, then may repressurize as RCS temperature rises in response to SG dry out and lower SI flow.
B is incorrect, natural circulation may be inhibited, however initial consequence is lower SI flow.
C is incorrect, RCS pressure will rise, and a SGTR may occur due to SG dryout, however initial effect is lower SI flow.
D is correct, RCS pressure will not lower sufficiently to permit adequate SI flow for core decay heat removal. The RCS will heat up and repressurize, which will lead to RCS pressure rise and further reduction in SI flow leading to ICC.

Question Number: 019
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: B
K/A: 000003 2.1.2
Question:
Given:

- Unit 1 is at 90% power.
- All systems are normally aligned.
- A power ramp to 100% power at 0.2 MW/min is in progress.
- Annunciator 1-10-E6, Rod At Bottom, alarms with the following conditions:
- DRPI for rods H-4 and D-8 indicates 0 steps.
- Control rods are withdrawing in automatic.
- Tave is lowering rapidly.

Based on the above indications, the reactor operator is required to…

a. place rod control in manual AND adjust turbine load to maintain Tave/Tref within 3°F.

b. stop the turbine load increase AND check PDMS for operability.

c. manually trip the reactor AND perform immediate actions of 1BwEP-0, REACTOR TRIP OR SAFETY INJECTION.

d. stabilize RCS temperature AND check the status of the flux rate trip alarm.

Answer:
c.
Reference:
1BwOA ROD-3
ILT LP I1-OA-XL-34
Cognitive Level High
Question Source Bank
A is incorrect, rod control would be placed in manual, however manual reactor trip would be required prior to performing turbine load adjustment.
B is incorrect, turbine load increase would be stopped, however manual reactor trip would be required prior to performing PDMS operability check.
C is correct, actions on > 1 dropped rod are to manually trip reactor and go to 1BwEP-0.
D is incorrect, manual reactor trip required prior to performing RCS temperature stabilization and flux rate check.

Question Number: 020
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: B
K/A: 000024AK101
Question:
Given:

- Unit 2 is at 30% power.
- All systems are normally aligned.
- Annunciator 2-10-C6, Rod Control Urgent Failure, alarms due to a failure in the RD logic cabinet.
- An automatic reactor trip signal occurs due to a loss of feedwater.
- The reactor does NOT trip.
- A manual reactor trip was unsuccessful.
- Operators enter 2BwFR-S.1, RESPONSE TO NUCLEAR GENERATION/ATWS, with the following conditions:
  - RTA and RTB are closed.
  - Reactor power is 28.5%.
  - The turbine is tripped.
  - AF pumps are running.
  - Steam dumps are isolated.
  - Emergency boration is in progress via 2CV8104, Emergency Boration Valve, and 2A CV pump.

Which of the following verifies negative reactivity is being inserted from the boration?

a. 35 gpm indicated on 2FT-0111, PW/Total Flow recorder.

b. Annunciator 2-10-B6, Rod Bank Low Insertion Limit, in alarm.

c. ALL PZR Backup Heaters are energized.

d. Auct High Tave lowering.

Answer:
d.
Reference:
ILT LP I1-RY-XL-01
ILT LP I1-RD-XL-01
ILT LP I1-CV-XL-02
Cognitive Level High
Question Source New
QExplanation:
A is incorrect, flow indicated on PW/Total flow recorder is not solely indicative of boric acid flow and could be indicative of PW flow or PW and BA flow if PW flow is occurring and should be indicating 0 gpm with boration flow via 2CV8104.
B is incorrect, rod bank low insertion limit is a function of RCS delta T and is not solely indicative of negative reactivity insertion from boration
C is incorrect, PZR backup heaters are function of PZR level and pressure and could be

energized due to PZR level above program level. PZR heaters energized could be indicative of negative reactivity insertion from RCS heatup (RCS heatup would cause PZR level rise and PZR heater operation), however question stem asks for indications of negative reactivity from boration.
D is correct. RCS Tave lowering is indicative of negative reactivity insertion.

Question Number: 021
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: B
K/A: 000059AK303
Question:
Given:

- Unit 1 is at 100% power.
- An alarm sounds on the RM-11 and the following indications are noted:
  - The GRID 1 display for 1PR03J, 1B/1D RCFC SX Outlet Radiation Monitor, is DARK BLUE.
  - No other cursors are lit on the STATUS DISPLAY for 1PR03J.

Based on the above indications, the NSO should inform the Unit Supervisor that 1PR03J…

a. has an operate failure. 1PR03J is NOT available to monitor the 1B/1D RCFC SX process stream from the MCR.

b. has lost communication with the RM-11. The channel can be monitored locally at the skid.

c. is undergoing a check source test. The NSO will verify check source test successfully completed.

d. had an alert alarm condition. The 1B/1D RCFCs should be manually stopped AND 1SX016B and 1SX027B should be manually closed.

Answer:
a.
Reference:
BwAR 1-1PR03J
ILT LP I1-AR-XL-01
Cognitive Level Fundamental
Question Source New
QExplanation:
A dark blue condition is indicative of a monitor operate failure condition. If an operate failure condition occurs, the monitor is inoperable.
A is correct, see explanation above.
B is incorrect, a communication failure would be indicated by a magenta cursor.
C is incorrect, a check source test would be indicated by a half-cyan cursor.
D is incorrect, an alert alarm would be indicated by a yellow cursor.

Question Number: 022
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: B
K/A: 000060AK202
Question:
Given:

- The Fuel Handling Building Ventilation system is aligned for standby operation.

0VA04CA - 0A Fuel Handling Building Charcoal Booster Fan.
0VA060Y - 0A Fuel Handling Building Charcoal Absorber Inlet Isolation Damper.
0VA051Y - 0A Fuel Handling Building Charcoal Absorber Bypass Isolation Damper.

Which of the following describes the response associated with the Fuel Handling Building Ventilation System upon receipt of a Fuel Handling Building HIGH radiation alarm on 0RT-AR055, Train A Fuel Handling Incident Monitor?

a. 0VA04CA must be started manually, 0VA060Y opens.

b. 0VA04CA automatically starts, 0VA060Y opens.

c. 0VA04CA must be started manually, 0VA051Y closes.

d. 0VA04CA automatically starts, 0VA051Y opens.

Answer:
b.
Reference:
BwAR 4-0AR055J
ILT LP I1-AR-XL-01
Cognitive level Fundamental
Question Source Bank
QExplanation:
A is incorrect, 0VA04CA automatically starts and 0VA060Y automatically opens.
B is correct, 0VA04CA automatically starts and 0VA060Y automatically opens.
C is incorrect, 0VA04CA automatically starts and 0VA051Y automatically closes.
D is incorrect, 0VA04CA automatically starts and 0VA051Y automatically closes.

Question Number: 023
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: B
K/A: 000067AA216
Question:
Given:

- Unit 1 was at 100% power.
- 1A AF pump is OOS.
- A fire occurred in the AEER.
- The crew entered 0/1BwOA PRI-5, CONTROL ROOM INACCESSIBILITY, and tripped the reactor.
- When the low-2 SG NR level was reached, the 1B AF automatically started.
- The 1B AF pump tripped shortly after starting due to low-3 suction pressure caused by fire damage to the AF pump suction pressure circuitry.

Based on the above conditions, the 1B AF pump will be started…

a. at the Unit 1 RSDP by placing its selector switch to local and the RSDP C/S to start.

b. at 364' by placing the L/C/S to start.

c. at 1AF01J by placing the selector switch to manual and depressing the start button.

d. at 364' by placing the L/C/S to start with bypass.

Answer:
d.
Reference:
BwOP AF-7
20E-1-4030AF02, 12, & 13
lLT LP I1-AF-XL-01
Cognitive Level High
Question Source New
QExplanation:
A is incorrect, fire damage to the AF pump suction pressure circuitry prevent starting AF pump from RSDP.
B is incorrect, fire damage to the AF pump suction pressure circuitry prevent starting AF pump from local control switch.
C is incorrect, fire damage to the AF pump suction pressure circuitry prevent starting AF pump from 1AF01J.
D is correct, fire damage to the AF pump suction pressure circuitry prevent starting AF pump until local control switch is taken to start with bypass, which bypasses the low suction pressure trip and allows pump

Question Number: 024
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: B
K/A: 00WE06EK3.1
Question:
Given:

- A small break RCS LOCA has occurred on Unit 1.
- Conditions have deteriorated and the crew has implemented 1BwFR-C.2, RESPONSE TO DEGRADED CORE COOLING.
- The crew is depressurizing all intact SGs to 90 psig.
- If a red path condition arises on the integrity status tree, the crew is directed to complete 1BwFR-C.2 prior to implementing 1BwFR-P.1, RESPONSE TO IMMINENT PRESSURIZED THERMAL SHOCK.

Why is the crew directed to complete 1BwFR-C.2 prior to implementing 1BwFR-P.1?

a. The RCS is NOT expected to repressurize during performance of 1BwFR-C.2, therefore PTS is NOT a concern.

b. Stopping the SG depressurization as directed in 1BwFR-P.1 would result in a COMPLETE LOSS of natural circulation and reflux cooling.

c. 1BwFR-P.1 prevents operation of the RCPs, which may be required to be operated in 1BwFR- C.2.

d. Stopping the cooldown as directed in 1BwFR-P.1 would prevent lowering RCS pressure to allow the RH pumps to inject, leading to inadequate core cooling.

Answer:
d.
Reference:
1BwFR-C.2
WOG background document for C.2
ILT LP I1-PR-XL-02
Cognitive Level Fundamental
Question Source New
QExplanation:
A is incorrect, the RCS may repressurize during performance of 1BwFP-C.2 and PTS concern exists due to rapid cooldown.
B is incorrect, stopping depressurization would limit natural circulation, however natural circulation and reflux boiling would occur as long as RCS inventory and pressure were adequate and SG PORVs available.
C is incorrect, RCPs are not operated in 1BwFR-C.2, only operated in 1BwFR-C.1.
D is correct, if temperature soak was performed and accumulator injection limited, inventory would continue to be lost from the core and ICC would occur.

Question Number: 025
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: B
K/A: 00WE16 2.1.14
Question:
Given:

- A Unit 1 core reload is in progress.
- The containment Fuel Handling Supervisor reports a twice burned fuel assembly fell from the refueling machine into the core and burst.
- 1AR011 and 1AR012, Containment Fuel Handling Incident Monitors, are in high alarm and rising rapidly.

Per 1BwOA REFUEL-1, FUEL HANDLING EMERGENCY, the operators FIRST action is to…

a. verify/close containment vent isolation valves.

b. notify the Fuel Handling Supervisors to place all fuel assemblies in secure locations.

c. notify personnel to evacuate containment.

d. dispatch an operator to close 1FH001, Fuel Transfer Tube Isolation Valve.

Answer:
c.
Reference:
1BwOA REFUEL-1
ILT LP I1-XL-29
Cognitive Level Fundamental
Question Source New
QExplanation:
C is correct, control room operators first procedurally directed action is to notify personnel to evacuate.
A, B, & D are subsequent actions to be taken in 1BwOA REFUEL-1, however question stem addresses first action to be taken.

Question Number: 026
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: B
K/A: 00WE03EA1.2
Question:
Given:

- Unit 1 was at 100% power.
- All systems are normally aligned.
- A small break RCS LOCA occurred.
- The crew is performing 1BwEP ES-1.2, POST LOCA COOLDOWN AND DEPRESSURIZATION.
- BOTH SI pumps are running.
- RCS pressure is stable.
- The crew has determined that RCS subcooling is adequate to secure ONE SI pump.

When one SI pump is stopped, RCS subcooling will…

a. lower due to break flow remaining CONSTANT while ECCS flow lowers. RCS subcooling will then stabilize at a lower value when RCS temperature stabilizes at a higher value.

b. remain the same. Flow from the remaining running SI pump will rise, reaching a balance with break flow.

c. lower as RCS pressure lowers due to reduced ECCS flow. RCS subcooling will then stabilize at a lower value when RCS break flow equals ECCS flow.

d. remain the same. RCS temperature rises in response to the reduced ECCS flow, but RCS pressure will also rise.

Answer:
c.
Reference:
WOG background document for ES-1.2
ILT LP I1-EP-XL-02
Cognitive Level High
Question Source New
QExplanation:
A is incorrect, break flow and subcooling will lower as RCS pressure lowers in response to reduced ECCS flow.
B is incorrect, subcooling will lower.
C is correct, break flow and subcooling will lower as RCS pressure lowers in response to reduced ECCS flow and will stabilize at a lower value.
D is incorrect, subcooling will lower, RCS pressure will not rise.

Question Number: 027
Exam Date: 2006/05/15
Facility: Braidwood
*RTYP PWR-WEC4
RO/SRO: B
K/A: 00WE10EK1.1
Question:
Given:

- Unit 1 is performing a natural circulation cooldown per 1BwEP ES-0.2, NATURAL CIRCULATION COOLDOWN.
- RCS temperature is 500°F.
- RCS pressure is 1875 psig.
- ALL CRDM exhaust and booster fans are tripped and CANNOT be restarted.
- RVLIS train A head AND plenum levels indicate 100%.
- RVLIS train B is de-energized.

Continuing the RCS cooldown and depressurization under these conditions will require…

a. maintaining a minimum RCS subcooling +100°F during the cooldown and depressurization.

b. immediately transitioning to 1BwEP ES-0.3, NATURAL CIRCULATION COOLDOWN WITH STEAM VOID IN VESSEL (WITH RVLIS).

c. maintaining RCS subcooling acceptable per the Iconics Display during the cooldown and depressurization.

d. immediately transitioning to 1BwEP ES-0.4, NATURAL CIRCULATION COOLDOWN WITH STEAM VOID IN VESSEL (WITHOUT RVLIS).

Answer:
a.
Reference:
1BwEP ES-0.2
lLT LP I1-EP-XL-01
Cognitive Level Fundamental
Question Source Bank
QExplanation:
A is correct, +100°F maintained with no CRDMs running.
B is incorrect, transition is made if RVLIS available and depressurization must be performed at a rate that causes steam void in vessel.
C is incorrect, +50°F would be maintained if CRDMs were running.
D is incorrect, transition is made if RVLIS unavailable and depressurization must be performed at a rate that causes steam void in vessel.

Question Number: 028
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: B
K/A: 003000K201
Question:
Given:

- Unit 2 is at 100% power.
- All systems are normally aligned for the current power level.

Which transformer provides power to the 2A Reactor Coolant Pump?

a. UA 241-1

b. UB 241-2

c. SC 242-1

d. SD 242-2

Answer:
a.
Reference:
ILT LP I1-RC-XL-02
ILT LP I1-AP-XL-01
Cognitive Level Fundamental
Question Source New
QExplanation:
A is correct, 2A RCP power supply is 6.9 KV Bus 257. During normal full power operation Bus 257 is fed from UAT 241-1.
B, C, & D are choices of feeds to other RCP buses during normal and low power operation.

Question Number: 029
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: B
K/A: 003000A406
Question:
Given:

- Unit 1 is at 100% power.
- All systems normally aligned.
- Annunciator 1-7-C3, RCP Seal Leakoff Flow Low, is in alarm.

With no operator action, which of the parameters listed below would be indicative of a failed seal leakoff instrument for the affected RCP?

a. #2 seal leakoff flow high alarm.

b. Rising seal injection flow.

c. Stable lower bearing temperature.

d. Rising seal outlet temperature.

Answer:
c.
BwOA RCP-1
ILT LP I1-OA-XL-27
Cognitive Level High
Question Source New
QExplanation:
C is correct, stable pump parameters are indicative of failed instrument causing seal leakoff flow alarm.
A, B, & D are indicative of actual RCP seal failure per 1BwOA RCP-1.

Question Number: 030
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: B
K/A: 004000
Question:
Given:

- Unit 2 is in Mode 5.
- The pressurizer is solid.
- RCS pressure is 350 psig and stable.
- RH letdown is in service.
- Normal charging is in service.

If instrument bus 214 is de-energized, with NO operator action over the next 10 minutes, RCS pressure will…

a. rise due to 2CV121, Centrifugal Charging Pump Flow Control Valve, failing OPEN.

b. rise due to 2CV128, RH to CV Letdown Flow Control Valve, failing CLOSED.

c. lower due to 2CV131, Letdown Line Pressure Control Valve, failing OPEN.

d. lower due to 2CV182, Charging Header Back Pressure Control Valve, failing CLOSED.

Answer:
b.
Reference:
2BwOA ELEC-2
20E-2-4012D
20E-2-4031CV26, 27, 33, & 36,
ILT LP I1-CV-XL-01
Cognitive Level High
Question Source New
QExplanation:
A is incorrect, 2CV121 valve controller will be unaffected by IB 214 failure.
B is correct, 2CV128 controller will lose power when IB 214 is lost and will lower to minimum demand.
2CV128 will close in response to lower demand on its controller. When 2CV128 is closed, RH letdown will be lost. Charging flow will continue and RCS pressure will rise.
C is incorrect, 2CV131 will not be affected by loss of IB 214.
D is incorrect, 2CV182 fails closed on loss of IB 213.

Question Number: 031
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: B
K/A: 004000K631
Question:
Given:

- Unit 1 is at 100% power.
- All systems are normally aligned.
- An extra NSO is performing 1BwOSR 3.5.5.1, RCS Seal Injection Flow Surveillance, with the following indications:
  - Average PZR pressure is 2235 psig.
  - Charging header pressure is 2360 psig.
  - 1CV182, Charging Header Back Pressure Control Valve, demand is at 100%.
  - 1A RCP seal injection flow is 11.8 gpm.
  - 1B RCP seal injection flow is 12.7 gpm.
  - 1C RCP seal injection flow is 12.5 gpm.
  - 1D RCP seal injection flow is 12.0 gpm.

Based on the above indications, RCP seal injection flow is…

(1BwOSR 3.5.5.1, Attachment A, is attached)

a. acceptable, NO actions are required.

b. NOT acceptable, CV pumps will NOT deliver sufficient flow to maintain seal integrity.

c. NOT acceptable, CV pumps will NOT deliver sufficient flow in the event of a LOCA.

d. NOT acceptable, CV pumps will run out if SI is actuated.

Answer:
c.
Reference:
TS 3.5.5 and Bases
1BwOSR 3.5.5.1
Cognitive Level High
Question Source New
QExplanation:
A is incorrect, seal injection flow is high (charging header - RCS press = 125 psid, seal injection flow = 49 gpm, in unacceptable region of 1BwOSR 3.5.5.1, Attachment A).
B is incorrect, would be correct for low seal injection flow.
C is correct, CV pumps will not deliver sufficient flow to RCS during LOCA.
D is incorrect, CV cold leg injection lines are equipped with flow limiting orifices to prevent pump runout.

Question Number: 032
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: B
K/A: 005000K503
Question:
Given:

- Unit 1 is in Mode 4.
- ALL RCS cold leg temperatures are 340°F.
- RCS boron concentration is 1590 ppm.
- RCS pressure is 345 psig.
- 1A RH train is aligned for cold leg injection.
- 1B RH train is being aligned for shutdown cooling.
- 1B RH train boron concentration is 1250 ppm

Placing the 1B RH train is service, with NO additional operator action, would cause…

a. boron plate out on the RH Hx.

b. an inadvertent entry into mode 3.

c. RCS temperature and pressure to rapidly lower.

d. a reduction in shutdown margin.

Answer:
d.
Reference:
BwOP-6
Cognitive Level High
Question Source Bank
QExplanation:
A is incorrect, boron dilution would occur.
B is incorrect, RCS temperature would not rise.
C is incorrect, RCS temperature and pressure may initially lower slightly due to RH pump start, but would stabilize.
D is correct, boron dilution would occur.

Question Number: 033
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: B
K/A: 005000A401
Question:
Given:

- Unit 2 is in Mode 5.
- All systems are properly aligned.
- Unit 2 is in reduced inventory condition (reactor vessel level is 396.5').
- 2A RH pump is in shutdown cooling.
- A 200 gpm leak develops in the RCS inside containment.

With no operator action, which of the indications below would be observed in the MCR?

a. Annunciator 2-6-C1, RH Pump 2A Discharge Flow Low, alarming periodically.

b. 2TI-612, 2A RH Pump Discharge Temperature, lowering.

c. 2A RH Pump Amps off scale high.

d. Annunciator 2-6-B1, RH Pump 2A Discharge Pressure High, alarming periodically.

Answer:
a.
Reference:
BwAR 2-6-B1
BwAR 2-6-C1
2BwOA PRI-10
Cognitive Level High
Question Source New
QExplanation:
A is correct, air entrainment would cause fluctuating RH suction pressure and fluctuating discharge flow.
B is incorrect, return temperature would rise as RH flow is reduced.
C is incorrect, motor current would fluctuate.
D is incorrect, alarm would not be received.

Question Number: 034
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: B
K/A: 006000K424
Question:
Given:

- A large break RCS LOCA occurred on Unit 1.
- RWST level is 32%.
- 1CV8110, CV Pump Miniflow Isolation Valve, is closed.
- No SI actuations/signals have been reset.

If the NSO momentarily places the control switch for 1CV8110 to OPEN, 1CV8110 will…

(20E-1-4030CV16 is attached)

a. open fully and immediately reclose.

b. NOT open (remain closed).

c. open fully and remain open.

d. open until dual position indication is obtained, then reclose.

Answer:
a.
Reference:
20E-1-4030CV16
Cognitive Level High
Question Source New
QExplanation:
A is correct, valve control switch spring returns to center when released. (does not maintain c/s in open). When valve is placed in open, open coil energizes and seal in maintains open coil deenergized. Open coil also prevent closing coil from energizing (open B contact above closing coil). Valve will open fully. When valve is fully open, open coil will deenergize. With valve in open, c/s in auto, RWST level < low-2 setpoint, and SI signal present, closing coil will energize and reclose valve. Closing coil will deenergize when valve is closed and no other valve travel will occur.
All other choices are incorrect.

Question Number: 035
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: B
K/A: 007000A102
Question:
Given:

- Unit 1 is at 100% power.
- All systems are normally aligned.
- Annunciator 1-12-B7, PRT Pressure High, is in alarm.
- 1PI-469, PRT pressure, is 7 psig and slowly rising.
- 1LI-470, PRT level, is 66% and slowly rising.
- 1RE1003, RCDT Pumps Discharge Containment Isolation Valve, is open at 1PM11J.

Based on the above indications, the FIRST action that will restore PRT pressure is…

a. 1RY469, PRT to GW Isolation Valve, automatically opens.

b. 1RY8031, PRT Drain Isolation Valve, automatically opens.

c. 1RY8031, PRT Drain Isolation Valve, is manually opened.

d. 1RY469, PRT to GW Isolation Valve, is manually opened.

Answer:
c.
Reference:
BwAR 1-12-B7
BwOP RY-4
BwOP RY-12
20E-1-4030RE01
20E-1-4030RY17 & 18
Cognitive Level High
Question Source New
QExplanation:
A is incorrect, 1RY-469 closes at 6 psig and cannot be opened until PRT press < 6 psig.
B is incorrect, 1RY-8031 must be manually opened.
C is correct, when 1RY-8031 is manually opened, the RCDT pumps will automatically start (w/1RE1003 open) to lower PRT pressure.
D is incorrect, 1RY-469 cannot be opened until PRT press < 6 psig.

Question Number: 036
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: B
K/A: 008000K303
Question:
Given:

- Unit 1 is at 100% power.
- All systems normally aligned.
- A LARGE BREAK RCS LOCA occurred inside containment.
- Containment Spray and Phase B have actuated.
- All systems respond as designed.

The RCPs must be tripped to…

a. prevent overheating the RCP motor bearings due to a loss of cooling.

b. prevent degradation of the RCP seal packages resulting in further loss of RCS inventory.

c. preserve RCP flywheel kinetic energy.

d. prevent forced circulation causing excessive mass loss through the RCS break.

Answer:
a.
Reference:
1BwEP-1
lLT LP I1-RC-XL-02
lLT LP I1-EP-XL-01
Cognitive Level Fundamental
Question Source New
QExplanation:
A is correct, loss of CC will cause motor damage.
B is incorrect, seal injection maintained.
C is incorrect, reason for RCP trip with bus underfrequency.
D is incorrect, applies to small break LOCA.

Question Number: 037
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: B
K/A: 010000K401
Question:
During steady state operation, pressurizer spray bypass flow provides adequate flow to…

a. prevent PZR spray nozzle thermal shock upon initiation of spray flow.

b. maintain PZR variable heater output at a minimum value.

c. maintain PZR spray valves in their optimum throttling region.

d. prevent PZR/RCS differential temperature limits from being exceeded.

Answer:
a.
Reference:
BwOP RY-11
Cognitive Level Fundamental
Question Source Bank
QExplanation:
A is correct, PZR spray bypass flow provides continuous warm-up of PZR spray lines to prevent thermal shock to the PZR spray nozzle when flow is initiated.
B is incorrect, variable heater output is maintained low by operating PZR system with variable heaters in auto and PZR spray valves closed.
C is incorrect, PZR spray valves are closed during normal operation, not throttled.
D is incorrect, small amount of flow through spray bypass valves is not sufficient enough to maintain differential temperature limits. Differential temperature limits are maintained by PZR heaters and normal spray valves.

Question Number: 038
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: B
K/A: 012000K611
Question:
Given:

- Unit 2 is at 50% power.
- All systems are normally aligned.
- The temperature portion of the loop B Over-temperature Delta T calculator has just failed as is.

If Unit 2 power is increased to 100% while maintaining PZR pressure at program value and AFD on target, what will be the plant response?

a. Loop B OTDT setpoint will generate a rod stop as power nears 100%.

b. Loop B OTDT setpoint will remain at its 50% value and other loop OTDT setpoints will lower.

c. Loop B OTDT setpoint will lower at a slower rate than the other loop OTDT setpoints but no actuations will occur.

d. An OTDT reactor trip will occur prior to Unit 2 reaching 100% power.

Answer:
b.
Reference:
TS 3.3.1 Bases
BwAR 1-10-C5
BwAR 1-11-B4
Cognitive Level High
Question Source New
QExplanation:
A is incorrect, as power is increased, the OTDT setpoint will not change as all values are at the 50% power level.
B is correct, as power is increased, the OTDT setpoint will not change as all values are at the 50% power level.
C is incorrect, loop B OTDT setpoint will not change.
D is incorrect, loop B OTDT setpoint will not change.

Question Number: 039
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: B
K/A: 012000K611
Question:
What is the purpose of the Overpower Delta T reactor trip?

a. Ensures design limit DNBR is met.

b. Prevents over pressurizing the RCS.

c. Provides protection from loss of heat sink.

d. Ensure allowable heat generation rate (kw/ft) of the fuel is NOT exceeded.

Answer:
d.
Reference:
TS 3.3.1 and bases
Cognitive Level Fundamental
Question Source New
QExplanation:
A is incorrect, reason for OTDT, PZR low pressure, RCP undervoltage, RCP underfrequency, RCP low flow, and RCP breaker position reactor trips.
B is incorrect, reason for PZR high pressure reactor trip.
C is incorrect, reason for SG low-2 level reactor trip.
D is correct, reason is for OPDT and PR high flux reactor trips.

Question Number: 040
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: B
K/A: 013000K302
Question:
Given:

- Unit 1 was at 100% power.
- The following sequence of events occurred:
  - IMD was performing a surveillance calibration on PZR pressure channel 1PT-458 when PZR pressure channel 1PT-455 spiked low, resulting in an SI.
  - The reactor tripped, however, Reactor Trip Breaker A did NOT open and CANNOT be opened locally.
- The SI signal is NO longer present.
- Both Train A and Train B SI Reset pushbuttons have been depressed.
- The following indications are present on 1PM05J Bypass Permissive Panel:
  - 1-BP-4.1, SI ACTUATED is NOT LIT.
  - 1-BP-5.1, AUTO SI BLOCKED is FAST FLASHING.
- Normal Charging and Letdown have been restored.
- All ECCS equipment has been restored to its normal alignment.

Then a 450 gpm SGTR occurs. With NO further operator action, which of the following indicates the effect on the RCS over the next ONE HOUR time period?

a. Charging and letdown flow will continue to attempt to maintain normal PZR level.

b. ECCS injection flow will result in a water-solid PZR with relief via the PZR PORVs.

c. RCS inventory will decrease until SI accumulator injection occurs.

d. RCS pressure will stabilize when ECCS injection flow equals break flow.

Answer:
d.
Reference:
ILT LP I1-EF-XL-01
System big note EF-2
BwARs 1-BP-3.1, 4.1, & 5.1
Cognitive Level High
Question Source Bank
QExplanation:
When initial SI occurs, train A auto SI is not blocked during SI reset due to failure of RTA to open. (No P4 on train A). When SI reset pushbuttons are depressed, both trains of ESF reset (due to the signal no longer being present), but only train B SI auto block is enabled. When subsequent SI occurs due to SGTR (low PZR press), train A SI automatically actuates and Train B is prevented from actuating. Train A ECCS components will provide sufficient flow to stabilize PZR level when injection flow matched break flow.

A is incorrect, break size prevents maintaining PZR level in normal charging alignment.
B is incorrect, break size and single train ECCS flow will not fill and pressurize PZR to solid condition.
C is incorrect, would be correct if both trains of ECCS were initially reset.
D is correct, see explanation above.

Question Number: 041
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: B
K/A: 022000A301
Question:
Given:

- A reactor trip and safety injection have occurred on Unit 1.
- While performing step 7 of 1BwEP-0, REACTOR TRIP OR SAFETY INJECTION, an NSO reports the Group 2 RCFC Accident Mode lights for 1A and 1C RCFCs are dark.

Which of the following indications would explain the failure of the 1A and 1C RCFC Accident Mode lights to illuminate?

a. 1SX147A, 1A CNMT Chiller Bypass Valve, CLOSED light lit at 0PM02J.

b. 1SX114A, 1A CNMT Chiller Outlet Valve, CLOSED light lit at 0PM02J.

c. 1SX027A, 1A/1C RCFC Inlet Valve, OPEN light lit at 1PM06J.

d. 1SX016A, 1A/1C RCFC Outlet Valve, OPEN light lit at 1PM06J.

Answer:
a.
Reference:
1BwEP-0
I1-VP-XL-01
Cognitive Level Fundamental
Question Source New
QExplanation:
In order for the 1A/1C RCFC accident mode lights to light, all of the following must occur-1A/1C RCFC low speed breaker closed, 1SX016A open, 1SX027A open, 1SX112A closed, 1SX114A closed, and 1SX147A open.
A is correct, 1SX147A closed would prevent the 1A/1C RCFC accident mode light from illuminating.
B is incorrect, 1SX114A closed would not prevent the 1A/1C RCFC accident mode light from illuminating (expected alignment).
C is incorrect, 1SX027A open would not prevent the 1A/1C RCFC accident mode light from illuminating (expected alignment).
D is incorrect, 1SX016A open would not prevent the 1A/1C RCFC accident mode light from illuminating (expected alignment).

Question Number: 042
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: B
K/A: 022000 2.4.50
Question:
Given:

- Unit 2 is at 100% power.
- All systems are normally aligned.
- Annunciator 2-2-E4, CC Surge Tank Auto M/U On, is in alarm.
- CC Surge Tank level is 38% and lowering at 0.5% per minute.

Based on the above indications, the FIRST action the operators will perform is to :

a. immediately place ALL Unit 2 CC Pumps in pull out, then go to 2BwOA PRI-6, COMPONENT COOLING MALFUNCTION.

b. verfy/open ONLY 2CC183, WM Makeup Valve.

c. verify/open BOTH 2CC183, WM Makeup Valve AND 2CC182, PW Makeup Valve.

d. immediately trip the reactor AND trip ALL RCPs, then go to 2BwEP-0, REACTOR TRIP OR SAFETY INJECTION.

Answer:
c.
Reference:
2BwOA PRI-6
BwARs 2-2-A5, 2-2-E4
Cognitive Level High
Question Source New
QExplanation:
CC surge tank level is below the makeup setpoint for both 2CC183 (50%) and 2CC182 (45%) but above CC pump trip setpoint (13%). Actions are to verify both makeup valves open.
A is incorrect, would be correct is CC surge tank level < 13%.
B is incorrect, would be correct if CC surge tank level <50% but > 45%.
C is correct, see explanation above.
D is incorrect, reactor trip and RCP trip would be required of CC surge tank level < 13%.

Question Number: 043
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: B
K/A: 026000A202
Question:
Given:

- A large break RCS LOCA occurred on Unit 2.
- Operators are preparing to align CS for recirculation per 2BwEP ES-1.3, TRANSFER TO COLD LEG RECIRCULATION, with the following conditions:
  - Train A ECCS has been aligned for cold leg recirculation.
  - ALL CV, SI, and CS pumps are running.
  - 2A RH pump is running.
  - 2B RH pump is in pull out.
  - 2SI8812B, RH Pump 2B Suction From RWST Isolation Valve, is closed.
  - 2SI8811B, Cnmt Sump 2B Isolation Valve, is closed and CANNOT be opened from the MCR.
  - 2CS001B, CS Pump 2B RWST Suction Valve, is open.
  - 2CS009B, CS Pump 2B Sump Suction Valve, is closed.
- RWST level is 7%.

Based on the above indications, the operators will…

a. place 2B CV, 2B SI, 2A CS, AND 2B CS pumps in pull out due to an imminent loss of suction.

b. place 2CS009B C/S to open, to align a suction source to the 2B CS Pump.

c. place ONLY 2A AND 2B CS pumps in pull out due to inadequate suction source.

d. go to 2BwCA -1.1, LOSS OF EMERGENCY COOLANT RECIRC, due to failure of one train of ECCS to transfer to cold leg recirculation.

Answer:
c.
Reference:
2BwEP ES-1.3
Cognitive Level High
Question Source New
QExplanation:
RWST level at 7% requires stopping all pumps taking a suction on the RWST unless flowpath exists from containment sump.
A is incorrect, CV and SI pumps have suction source aligned to train A RH via 2CV8804A and 2SI8804A and are not required to be shutdown.
B is incorrect, placing 2CS009B to open will not align suction source to pumps due to interlock with 2SI8811B, which prevents 2CS009B from being opened with 2SI8811B closed.
C is correct, must place 2B CS pump in PTL to prevent pump damage.
D is incorrect, emergency coolant recirc is established on train A.

Question Number: 044
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: B
K/A: 039000K405
Question:
Given:

- Unit 2 is in Mode 3, RCS cooldown is in progress per 2BwGP 100-5, PLANT SHUTDOWN AND COOLDOWN.
- RCS pressure is 1650 psig.
- RCS temperature is 505°F.
- ALL SG pressures are 690 psig.
- CNMT pressure is 0.4 psig.
- BOTH steamline isolation SI block bypass permissive lights are lit.

At time = 0 seconds a steamline break occurs inside containment.

At time = 10 seconds the following indications are noted:

- RCS pressure is 1600 psig.
- RCS temperature is 495°F.
- ALL SG pressures are 665 psig.
- Containment pressure is 0.9 psig.

If current trends continue, the MSIVs will BEGIN closing at approximately time =…

a. 20 seconds.

b. 40 seconds.

c. 60 seconds.

d. 100 seconds.

Answer:
b.
Reference:
BwAR 2-BP-3.3
BwAR 2-BP-4.2
Cognitive Level High
Question Source New
QExplanation:
RCS pressure is below the P-11 setpoint and steam line SI is blocked. The MS isolation signal is active below P-11 (100 psig drop w/in 50 seconds). 10 seconds after the steam line break, MS pressure has dropped 25 psig. If current trends continue for 30 more seconds an MS rate isolation will occur. (time = 40 seconds)
A is incorrect, would be correct if MS isolation was active (MS pressure would reach 640 psig at 20 seconds).
B is correct, see explanation above.
C is incorrect, containment high pressure SI would occur at time = 60 seconds if current trends continue, however no MS isolation would occur. (Cnmt pressure is 0.9 psig and rising at 3.0

psig/min).
D is incorrect, containment high pressure MS isolation will occur at time = 156 seconds, however MSIVs will already be closed

Question Number: 045
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: B
K/A: 039000A403
Question:
Given:

- Unit 1 is at 100% power.
- All systems are normally aligned.
- BOTH turbine driven feedwater pumps are in auto.
- The Master FW Pump Speed Controller is in auto.
- 1B FW Pump LP Governor Valve fails closed over a one minute period.

Based on the above conditions, which of the following indications will be present on 1PM04J for the 1B FW Pump TWO minutes later? (Assume no operator action)

a. The HP Governor Valve Closed light WILL NOT be lit AND HP Governor Demand WILL have increased.

b. The Left LP Stop Valve Open light WILL NOT be lit AND the Low Press Governor Valve Closed light WILL be lit.

c. The Low Press Gov Valve Closed light WILL be lit AND the Turbine Tripped light WILL be lit.

d. 1FW012B, 1B FW Pump Recirc Valve, Open light WILL be lit AND the LP Governor Demand indicator WILL indicate 0%.

Answer:
a.
Reference:
Systems big note EHC-6
Cognitive Level High
Question Source New
QExplanation:
When the LP governor valve closes, LP governor demand will lower to 0% and the low pressure governor valve closed light will be lit. FW pump speed will lower and the 1FW012B, 1B FW pump recirc valve will open. When the LP governor valve is closed, the HP governor valve will open, demand indication on the HP governor valve will raise, and the HP governor closed light will go out and the HP governor open light will light. FW pump speed will increase and the 1FW012B will reclose and the open light will go out.
A is correct, HP governor valve open light will NOT be lit and HP governor demand will have increased.
B is incorrect, the left LP stop valve open light will remain on and the LP governor valve closed light will be lit.
C is incorrect, the LP governor valve closed light will be lit, however the turbine tripped light will not light (the 1B FW pump will not trip).
D is incorrect, 1FW12B will open and subsequently reclose when FW pump speed raises. The LP governor demand will indicate 0%.

Question Number: 046
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: B
K/A: 059000A103
Question:
Given:

- Unit 1 is at 100% power.
- 1A FW pump is OOS for bearing replacement.
- 1B FW pump develops a severe vibration and subsequently trips.
- The crew implements 1BwOA SEC-1, SECONDARY PUMP TRIP.

After the crew stabilizes the plant and exits 1BwOA SEC-1, the maximum power level allowed on Unit 1 will be…
(assume PDMS remains operable throughout event)

a. 50%

b. 55%

c. 60%

d. 65%

Answer:
c.
Reference:
1BwOA SEC-1
Cognitive Level Fundamental
Question Source New
QExplanation:
A is incorrect, would be correct if PDMS was inoperable (PDMS operable stated in stem).
B is incorrect, would be correct power level for initial turbine runback to 700 MW, however single FW pump operation is not restricted to 700 MW. Single FW pump operation is bounded by operating the pump with FW flow > steam flow and FW pump NPSH and high flow alarms clear.
C is correct, turbine driven main FW pump is designed to deliver sufficient feed flow up to 60% of rated FW flow per BwOP FW-1, step E.1.
D is incorrect, power level is above FW pump design flow. Would be approximate power level restriction for single Heater Drain pump operation.

Question Number: 047
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: B
K/A: 061000K501
Question:
Given:

- Unit 1 is at 100% power.
- A SAT fault causes a loss of offsite power.
- Bus 159 does not ABT to the UAT and a reactor trip occurs.
- BOTH DGs start and energize their respective ESF buses.
- Bus 143 and 144 are deenergized.
- BOTH AF pumps are running.
- Steam dumps are in STM PRESS mode.
- SG NR levels are 14% and slowly rising.
- PZR pressure is 1950 psig and slowly lowering.
- RCS Tave is 554°F and slowly lowering.

Which of the following MCR actions will reduce the likelihood of a PZR low pressure SI occurring?

a. Place PZR heaters C/Ss to ON.

b. Throttle closed 1PK-507, MS Header Pressure Controller.

c. Throttle closed 1AF005A-H, AF Flow Controllers.

d. Place 1MS009A-D, MSR 2nd Stage Reheater Stop Valves, C/S to CLOSE.

Answer:
c.
Reference:
1BwEP-0, step 25
BwOP CW-E1, RY-E1, & MS-E1
BwAR 1-BP-5.6
20E-1-4030CW01, CW02, CW03, & AP45
Cognitive Level High
Question Source New
QExplanation:
A is incorrect, PZR heaters do not have power available due to loss of bus 143/144 and would not increase RCS pressure.
B is incorrect, steam dumps are unavailable. Bus 143/144 undervoltage relays open CW pump breakers, no CW pump breakers closed = C-9 permissive not met.
C is correct, lowering AF flow lowers RCS heat transfer rate and pressure drop, AF flow reduction is allowed (SG NR levels > 10%).
D is incorrect, MSR valves are MOVs that are failed open due to loss of power (133/1344 power supply)

Question Number: 048
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: B
K/A: 062000A211
Question:
Given:

- Unit 1 is at 100% power.
- Unit 2 is in Mode 3, preparing for a reactor startup.
- All equipment is properly aligned.
- A fault occurs on SAT 242-2.
- The crew enters 2BwOA ELEC-4, LOSS OF OFFSITE POWER.

In accordance with 2BwOA ELEC-4, which of the following loads will be aligned to the 2A DG when required to support plant operation?

a. 0A MCR Chiller

b. Unit 0 SAC

c. Unit 0 480 Volt Buses

d. 0C WS Pump

Answer:
d.
Reference:
2BwOA ELEC-4
20E-0-4030WS03
20E-0-4030WO01
20E-2-4030SA01
Cognitive Level High
Question Source New
QExplanation:
A is incorrect, 0A MCR chiller is Unit 1 power supply.
B is incorrect, Unit 0 SAC is bus 143.
C is incorrect, 2BwOA ELEC-4 directs aligning Unit 0 buses to opposite unit.
D is correct, 0C WS pump is bus 243.

Question Number: 049
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: B
K/A: 063000K201
Question:
Given:

- Unit 1 is at 100% power.
- All systems are normally aligned.
- An undervoltage condition occurs on bus 141.
- The 1A DG starts.
- 15 seconds after the bus undervoltage, 125 VDC Bus 111 is deenergized.

Once the 1A DG receives a start signal, the 1A DG will…

a. reach rated speed and voltage. ACB 1413 will remain open due to a loss of control power.

b. NOT produce voltage due to loss of field flash. ACB 1413 will remain open due to a loss of control power.

c. reach rated speed and voltage, and ACB 1413 will then close. 1A DG will stop and ACB 1413 will remain closed.

d. reach rated speed and voltage, and ACB 1413 will then close. The 1A DG will remain running with ONLY the mechanical overspeed trip available.

Answer:
c.
Reference:
20E-1-4030DG01
Cognitive Level High
Question Source New
QExplanation:
A is incorrect, would be correct if loss of DC occurred prior to ACB 1413 closing.
B is incorrect, would be correct if loss of DC occurred to field flash during startup.
C is correct, when bus undervoltage occurs, DG starts and attains rated speed and volts within 10 seconds and ACB 1413 closes.
When DC bus 111 is lost with DG running, DG will trip due to loss of power to emergency fuel control solenoids. ACB 1413 will remain closed due to a loss of control power.
D is incorrect, DG trips on loss of DC.

Question Number: 050
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: B
K/A: 064000K102
Question:
Given:

- BOTH Units are at 100% power.
- All systems are normally aligned.
- 1A and 2B SX pumps are running.
- A fault occurs on bus 142, causing a loss of bus 142.
- 1B DG starts, but ACB 1423 does NOT close due to the bus fault.

The 1B DG….

a. must be emergency stopped, 1SX169B, 1B DG Essential Service Water Valve, failed closed on the loss of power.

b. may remain running, 1A SX pump will provide adequate cooling flow.

c. may be emergency stopped, SX flow is inadequate because the 1B SX pump is NOT running.

d. may remain running, 2B SX pump will provide adequate cooling.

Answer:
b.
Reference:
System Big Notes SX-1
20E-1-4030SX17
Cognitive Level High
Question Source New
QExplanation:
A is incorrect, 1SX169B fails open on loss of power to provide cooling water to 1B DG.
B is correct, bus fault occurred on 142, causing loss of bus 142. 1A SX pump remains running (power from bus 141).
C is incorrect, SX trains A and B are cross-tied and 1A SX pump remains running.
D is incorrect, unit 1 and unit 2 SX trains are not cross tied.

Question Number: 051
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: B
K/A: 073000A202
Question:
Given:

- BOTH Units are at 100% power.
- All systems are normally aligned.
- Unit 0 CC Hx is aligned to Unit 1.
- 0/1/2PR09J, Unit 0/1/2 CC Hx SX Outlet Rad Monitors, are indicating 5.45E-07.
- 0/1/2PR09J have the following channel item settings:
  - 009 SETPOINT, HIGH ALARM = 1.89E-05.
  - 010 SETPOINT, ALERT ALARM = 9.45E-06.
- 0PR09J detector output fails to 3.00E-03.
- 1/2PR09J indications have NOT changed.
- 1/2CC017, Unit 1/2 CC Surge Tank Vent Valves, are open.

Based on the above indications, the operators will…

a. close ONLY 1CC017 due to the alignment of 0 CC Hx to Unit 1.

b. notify chemistry to sample CC system activity, NO further action is required.

c. close BOTH 1CC017 AND 2CC017 due to the failure of 0PR09J to automatically isolate BOTH CC surge tank vent paths.

a. isolate the Unit 0 CC Hx and go to 1BwOA PRI-6, COMPONENT COOLING MALFUNCTION, due to a leak in the CC system.

Answer:
c.
Reference:
BwAR 1-0PR09J
BwOP AR/PR-11T1
BwVP RM80-3-0PR09
Cognitive Level High
Question Source New
QExplanation:
0PR09J is initially below both the alert and alarm setpoints. When the detector fails, 0PR09J will go to high alarm. 0PR09J high alarm should automatically close both 1/2CC017. BwAR actions are to verify 1/2CC017 valves closed.
A is incorrect, both 1/2CC017 should have automatically closed even though Unit 0 CC Hx is aligned to Unit 1.
B is incorrect, 1/2PR09J are indicating properly, BwAR directs notifying chemistry to sample CC, however action is also required to verify automatic actions have occurred.
C is correct, BwAR directs verifying automatic actions on high alarm.
D is incorrect, would be correct actions for confirmed valid high alarm.

Question Number: 052
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: B
K/A: 073000 2.4.50
Question:
Given:

- Unit 1 is at 100% power.
- All systems are normally aligned.
- 0A VC Train is running.
- A reactor trip and safety injection occur.
- All equipment functions as designed.
- The crew implements 1BwEP-0, REACTOR TRIP OR SAFETY INJECTION.
- While verifying control room ventilation properly aligned, an NSO discovers the following conditions:
  - 0PR31J, 0A Train Control Room Outside Air Intake Radiation Monitor, cursors are RED.
  - Main control room pressure is 0.165" H2O.

Based on the above information, the NSO will…

a. reset the Control Room Vent Isolation signal, stop 0A VC Train equipment, and start 0B VC Train equipment.

b. manually start the 0A VC Makeup Fan and manually align the 0A VC Charcoal Absorber.

c. restore MCR pressure per BwOP VC-14, MAIN CONTROL ROOM PRESSURE LOW, while continuing on in 1BwEP-0.

d. dispatch operators to verify Control Room Offices, Lab HVAC, and Radwaste Building fans are tripped.

Answer:
d.
Reference:
ILT LP I1-AR-XL-01
BwAR 2-0PR31J
Cognitive Level High
Question Source New
QExplanation:
A is incorrect, actions would be required to swap to the opposite VC train if 0A VC train components did not actuate properly.Quest stem states all equipment functions as designed.
B is incorrect, actions would automatically occur due to SI signal.
C is incorrect, MCR pressure is above setpoint which requires restoration of MCR pressure (>.125").
D is correct, actions are required to locally verify fans tripped.

Question Number: 053
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: B
K/A: 076000K305
Question:
Given:

- Unit 2 is in Mode 5.
- The RCS is solid.
- 2A RH Pump is running in shutdown cooling mode.
- 2A AND 0 CC Pumps are running.
- 2CV131, Letdown Line Pressure Controller, is in AUTO.
- BOTH PZR PORVs are in ARM LOW TEMP.

If 2SX007, Unit 2 CC Hx SX Outlet Valve, failed closed, which of the following would occur FIRST?

a. 2CC130A & B, Letdown Hx Outlet Temperature Control Valves, would throttle closed.

b. 2CV131, Letdown Line Pressure Control Valve, would throttle open.

c. 2RY456, PZR PORV, would open.

d. 2B CC Pump would auto start.

Answer:
b.
Reference:
ILT LP I1-RH-XL-01
Cognitive Level High
Question Source New
QExplanation:
During solid RCS operation, the RH letdown flowpath is aligned such that 2CV128 RH letdown valve is full open and 2CV131 controls RCS pressure in automatic. When 2SX007 is closed, CCW temperature will rise due to a loss of cooling flow to the CC Hx. As CCW temperature rises, RCS temperature will rise due to a loss of cooling to the RH Hx. As RCS temperature rises, RCS pressure will rise and 2CV131 will open to attempt to lower RCS pressure.
A is incorrect, valves would throttle open to attempt to lower letdown temperature.
B is correct, see explanation above.
C is incorrect, although RCS pressure may reach PZR PORV LTOP setpoint, question asks for first action.
D is incorrect, CC pressure would rise as system temperature rises.

Question Number: 054
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: B
K/A: 078000K102
Question:
Given:

- BOTH Units are at 100% power.
- All systems are normally aligned.
- Unit 2 station air compressor (SAC) is supplying ALL instrument and service air loads.
- The remaining two SACs are in standby.
- A four inch diameter turbine building SERVICE AIR header ruptures.

Which of the following describes the plant response?

a. BOTH units will trip due to an IMMEDIATE loss of instrument air header pressure.

b. BOTH units will trip, but only after the instrument air header depressurizes due to instrument air loads.

c. ONLY unit 2 will trip due to an IMMEDIATE loss of instrument air header pressure.

d. ONLY unit 2 will trip, but only after the instrument air header depressurizes due to instrument air loads.

Answer:
b.
Reference:
Systems big note SA/IA-2
Cognitive Level High
Question Source Bank
QExplanation:
When SA system rupture occurs, SA pressure will immediately lower. When IA dryer inlet pressure (SA pressure) is 80 psig, IA dryer bypass valves will open, however, a check valve upstream of the IA pre-filter will prevent the IA header from bleeding down via the dryer bypass line. IA pressure will lower at a slower rate from IA loads and loss of supply pressure to the IA system. Components on both units will be affected and a reactor trip will be required on both units due to lowering SG level from loss of air to FRVs.
A is incorrect, IA system will not immediately depressurize, see explanation above.
B is correct, see explanation above.
C is incorrect, both units will trip, and trip will not occur until IA system depressurizes. See explanation above.
D is incorrect, both units will trip.

Question Number: 055
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: B
K/A: 103000A301
Question:
Given:

- Unit 1 is at 100% power.
- All systems are normally aligned.
- Annunciator 1-5-B7, CNMT Phase A Isolation, alarms.
- SER point 0017, CNMT Phase A Isolation Train A, is printed.

Which of the status lights listed below would be LIT as a DIRECT result of the Phase A signal?

a. Group 1 MLB 5, light 1.4 (1SI8808D closed)

b. Group 2 MLB 6, light 4.1 (1SI8801A open)

c. Group 3 MLB 4, light 5.4 (1CV8100 closed)

d. Group 6 MLB 1, light 6.3 (1CC9414 closed)

Answer:
c.
Reference:
1BwOA PRI-13
20E-1-4030CC07, CV12, EF11, SI06, & SI12
Cognitive Level Fundamental
Question Source New
QExplanation:
Inadvertent train A phase A has occurred. (Based on annunciator and SER indication).
A is incorrect, 1SI8808D is open and deenergized in Modes 1-3, RCS press > 1000 psig.
B is incorrect, 1SI8801A receives train A SI signal and would be closed.
C is correct, 1CV8100 receives train A phase A isolation signal and would be closed.
D is incorrect, 1CC9414 receives train A phase B isolation and would be open.

Question Number: 056
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: B
K/A: 011000A103
Question:
Given:

- Unit 2 is at 100% power.
- All systems are normally aligned.
- PZR level control selector switch is in 459/461 position.
- A reference leg leak develops in PZR level transmitter 2LT-459.
- No ESF actuations occur as a result of the reference leg leak.

With no operator action, VCT level will…

a. lower and be maintained at 37% - 55% throughout event.

b. rise and be maintained at 73% - 95% throughout event.

c. lower to 5% and cause CV pump suction to swap over to the RWST.

d. rise to 73% - 95%, then lower and be maintained at 37% - 55%.

Answer:
d.
Reference:
ILT LP I1-EF-XL-01
ILT LP I1-RY-XL-01
ILT LP I1-CV-XL-01
ILT LP I1-CV-XL-02
Cognitive Level High
Question Source New
QExplanation:
A reference leg break will cause 2LT-459 to fail high, causing charging flow to lower to 52 gpm. VCT level will rise due to normal letdown flow and be maintained by the VCT level control valve. Actual pressurizer level will lower until 1LT-461 causes letdown to isolate. When letdown isolates, VCT level will lower to RMCS setpoint and be maintained by RMCS at 37% to 55%.
A is incorrect, level will initially rise, then lower following letdown isolation.
B is incorrect, level will rise, but will lower once letdown isolates.
C is incorrect, level will rise and RMCS is adequate to prevent switchover to RWST.
D is correct, see explanation above.

Question Number: 057
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: B
K/A: 015000A205
Question:
Given:

- Unit 1 experienced a large break RCS LOCA.
- The operators have transitioned to 1BwEP ES-1.3, TRANSFER TO COLD LEG RECIRCULATION, and are currently aligning RH pump suctions to the containment sumps per step 3.
- Both SR channels are energized.
- Core downcomer voiding is occurring.
- The STA reports a YELLOW path on the subcriticality status tree with an end path of 1BwFR-S.2, RESPONSE TO LOSS OF CORE SHUTDOWN.

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

a. The displacement of water would increase the neutron leakage and result in a higher SR count rate; the crew will continue on in 1BwEP ES-1.3 to align RH pumps and refill the downcomer.

b. An increase in water density would reduce fission and result in a lower SR count rate; the crew will IMMEDIATELY implement 1BwFR-S.2 to add boron to compensate for lower water density.

c. The displacement of boron would increase fission and result in a higher SR count rate, the crew will IMMEDIATELY implement 1BwFR-S.2 to add boron to counteract the fission rise.

d. The location of the SR detectors effectively shields the effects of voiding and results in no change in SR count rate, the crew will continue on in 1BwEP ES-1.3 to align RH pumps for long term cooling.

Answer:
a.
Reference:
ILT LP I1-MI-XL-11
Cognitive Level Fundamental
Questions Source New
QExplanation:
A is correct, increased void fraction due to displacement of water would cause greater neutron leakage and resultant higher count rate. The crew will align RH pumps and refill the downcomer region to lower SR count rate
B is incorrect, a decrease in downcomer water density would raise fission due to less neutron attenuation and result in a higher SR count rate.
C is incorrect, displacement of boron in result would result in a positive reactivity addition, however the negative reactivity effect of reduced moderation would out weigh the positive

reactivity from boron displacement.
D is incorrect, the SR detectors are shielded from core voiding due to their location and are sensitive to downcomer voiding and would increase as downcomer voiding occurs.

Question Number: 058
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: B
K/A: 033000K403
Question:
Inadvertent draining of the spent fuel pool is prevented by . . .

a. an automatic trip of the spent fuel cooling pumps when the leak detection system alarms.

b. cooling pump discharge piping that has an anti-siphon hole below the normal water level.

c. a transfer canal gate interlock prevents opening sluice gate if spent fuel pool level is less than transfer canal level.

d. cooling pump suction piping extends to 6 feet above active fuel.

Answer:
b.
Reference:
20E-1-4030FC01
20E-2-4030FC01
Cognitive Level Fundamental
Question Source New
QExplanation:
A is incorrect, spent fuel cooling pumps have overcurrent protection trips only.
B is correct, spent fuel cooling pump discharge piping has anti-siphon hole 4" below normal water level.
C is incorrect, sluice gate does not have level interlock.
D is incorrect, spent fuel pool suction piping extends only 7 feet below normal water level (16') above fuel. Discharge piping stops 6' above fuel.

Question Number: 059
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: B
K/A: 034000K602
Question:
A loss of power to 0AR039J, Fuel Handling Building Crane Radiation Monitor, will prevent . . .

a. upward AND lateral crane motion.

b. downward AND lateral crane motion.

c. ONLY upward crane motion.

d. ONLY downward crane motion.

Answer:
c.
Reference:
20E-0-4709AS
Cognitive Level Fundamental
Question Source Bank
QExplanation:
Loss of power to 0AR39J results in interlock actuation due to deenergizing the aux relay at the monitor. (Relay is energized under normal operating conditions and deenergizes to actuate)
Only upward crane motion is inhibited by 0AR039J in interlock condition.
C is correct, all other choices are incorrect.

Question Number: 060
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: B
K/A: 041000A305
Question:
Given:

- Unit 1 is at 4% power.
- All systems are properly aligned for the current power level.
- 1PI-507, MS Header Pressure, is indicating 1092 psig.
- 1PK-507, MS Header Pressure Controller, is in Auto with a potentiometer setting of 7.28.
- 1PK-507 demand is 16%.
- 1UI-500, Steam Dump Demand, is 16%.

If the 1PK-507 potentiometer setting is raised to 7.4, what will be the INITIAL plant response?

a. 1PI-507 will rise AND demand on BOTH 1PK-507 AND 1UI-500 will rise.

b. 1PI-507 will lower, 1PK-507 demand will rise, and 1UI-500 will lower.

c. 1PI-507 will rise, 1PK-507 demand will rise, and 1UI-500 will lower.

d. 1PI-507 will rise AND demand on BOTH 1PK-507 AND 1UI-500 will lower.

Answer:
d.
Reference:
System big note MS-4
Cognitive Level High
Question Source New
QExplanation:
Question asks for initial plant response. When 1PK-507 POT setting is raised, the steam dumps will attempt to maintain MS pressure at 1110 psig (0.74 x 1500 psig). Raising the POT setting will cause demand on 1PK-507 to lower, closing steam dumps to raise MS header pressure. When demand on the steam dumps is lowered, demand indication on 1UI-500 will lower. As steam dumps close, MS header pressure will rise.
A is incorrect, MS pressure will rise, and after reaching 1110 psig the steam dump steady state demand will have risen from the original demand, however question asks for initial response.
B is incorrect, MS pressure and 1PK-507 will lower as POT setting is raised.
C is incorrect, 1PK-507 will lower when demand is raised.
D is correct, see explanation above.

Question Number: 061
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: B
K/A: 055000 2.1.30
Question:
Which of the following components is operated at 0OG01J, Off Gas Local Control Panel?

a. 1OG028B, 1B GS Condenser Exhauster Inlet Valve.

b. 2)G03P, U-2 Priming Vacuum Pump.

c. 1OG044A, Hogging Vacuum Pump 1 Inlet Valve.

d. 0OG01P, U-0 Hogging Vacuum Pump.

Answer:
c.
Reference:
20E-1-4030OG05
20E-2-4030OG02
20E-0-4030OG01
M-47-1C
Cognitive Level Fundamental
Question Source New
QExplanation:
A is incorrect, 1OG028B is manual valve operated locally at 1B GS condenser exhauster.
B is incorrect, 2OG03P operated at 0PM01J.
C is correct, 1OG044A operated at 0OG01J.
D is incorrect, 0OG01P operated at 0PM01J.

Question Number: 062
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: B
K/A: 071000A429
Question:
While performing 0BwOSR 0.1-0, UNIT COMMON ALL MODES/AT ALL TIMES SHIFTLY AND DAILY OPERATING SURVEILLANCE, the following readings are recorded:

- 0AT-GW8000, hydrogen analyzer = 4.8%.
- 0AIT-GW8003, oxygen analyzer = 6.1%.
- 0AIT-GW004, GW compressor discharge oxygen analyzer = 1.8%.

What actions, if any, are required?

a. Waste gas operation can continue provided oxygen concentration is restored within limits in 48 hours.

b. IMMEDIATELY suspend all additions of waste gas to the system and restore oxygen concentration within limits in 48 hours.

c. IMMEDIATELY suspend all additions of waste gas to the system OR take and analyze grab samples every 24 hours.

d. Waste gas operation can continue without any additional action.

Answer:
b.
Reference:
0BwOSR 0.1-0
TRM appendix L
Cognitive Level Fundamental
Question Source New
QExplanation:
A is incorrect, would be correct for $O_2 > 2\%$ but $< 4\%$ with $H_2 > 4\%$.
B is correct, TRM appendix L 1.7.b.
C is incorrect, TRM 3.3.e for inoperable instrument.
D is incorrect, would be correct if $O_2 < 2\%$ (or if student mistakes 0AIT-GW004 as required analyzer).

Question Number: 063
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: B
K/A: 016000K303
Question:
Given:

- Unit 1 is at 100% power.
- Loop 1C NR Thot instrument channel is failed as is.
- A reactor trip occurs.
- 1A reactor trip breaker (RTA) remains closed and CANNOT be opened.

Based on the above indications, RCS temperature will be maintained at…

a. 550°F

b. 557°F

c. 560°F

d. 561°F

Answer:
a.
Reference:
Cognitive Level High
Question Source New
QExplanation:
A is correct, when plant trips, A reactor trip breaker remaining closed will not arm steam dumps, however steam dumps will arm on load reject from 1PT-506. Loop 1C Thot failed high will cause steam dumps to open and lower RCS temperature until P12 permissive closes steam dumps at 550°F. Steam dumps will cycle at P12 setpoint to maintain RCS Tave at 550°F.
B is incorrect, would be correct if steam 1C Tave channel was not failed.
C is incorrect, would be correct if reactor trip breaker B did not open and 1C Tave channel was not failed.
D is incorrect, would be correct if steam dumps did not arm and 1C Tave channel was not failed.

Question Number: 064
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: B
K/A: 075000K203
Question:
Given:

- Unit 1 is at 100% power.
- All systems are normally aligned.
- 1A SX pump is running, 1B SX pump is in standby.
- A loss of DC bus 112 occurs.
- The operating crew manually trips the reactor.
- One minute after the reactor trip, an SI occurs.
- Ten seconds have elapsed since the SI actuation.

Based on the above conditions, the 1B SX pump…

a. is NOT running, but can be started in the MCR.

b. automatically started on the SI actuation.

c. will auto start in 15 seconds.

d. is NOT running and CANNOT be started in the MCR.

Answer:
d.
Reference:
20E-1-4030SX02
20E-1-4030AP39
Cognitive Level High
Question Source New
QExplanation:
With loss of DC 112, 1B SX pump breaker has lost control power and will not close either manually or automatically.
A is incorrect, see explanation above.
B is incorrect, see explanation above.
C is incorrect, see explanation above.
D is correct, see explanation above.

Question Number: 065
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: B
K/A: 086000K103
Question:
During a surveillance run of the 1A MOTOR DRIVEN Auxiliary Feedwater Pump, the following conditions are noted:

- The NLO at the scene reports electrical arcs and flames coming from the 1A AF pump motor housing.
- The 1A AF pump breaker has tripped open.

Which of the fire protections subsystems listed below will be used to extinguish the fire in the 1A AF pump motor?

a. Local Hose Station

b. Manual Foam Deluge

c. Automatic Halon

d. Automatic CO2

Answer:
a.
Reference:
BwAP 1110-1, 1110-1T3
Cognitive Level Fundamental
Question Source New
QExplanation:
A is correct, 1A AF pump area protected by local hose station 108 (387' M-18), all others are FP subsystems that do not protect 1A AF pump (CO2 protects 1B AF pump, DGs, and CSRs, foam protects DOSTs, and halon protects CSRs)

Question Number: 066
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: B
K/A: 194001 2.1.3
Question:
An NSO has been off for the past seven days and is preparing for turnover on Unit 2. Before the oncoming NSO can assume the duties of the Unit 2 NSO, the oncoming NSO must review the control room logs back through…

a. ONLY the previous shift.

b. ONLY the previous day.

c. ONLY the preceding four days.

d. the last time the NSO had Unit 2 duties.

Answer:
c.
Reference:
OP-AA-112-101
Cognitive Level Fundamental
Question Source Bank
QExplanation:
Per OP-AA-112-101, prior to completing shift turnover, the oncoming NSO must review the control room logs back through the previous time on shift or last 4 days.
A is incorrect, review would not meet requirements of procedure.
B is incorrect, review would not meet requirements of procedure.
C is correct, preceding four days is less than last time on shift.
D is incorrect, last time on shift is greater than last four days.

Question Number: 067
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: B
K/A: 194001 2.1.31
Question:
Which of the following statements correctly describes the green board concept of operating main control panesl?

Green indicates a…

a. particular component is in its correct position with reactor power above the P8 setpoint.

b. rotating component is NOT running AND is a backup or standby component.

c. particular component is NOT in its normal configuration AND should be investigated and corrected.

d. secondary function which provides the operator with miscellaneous information.

Answer:
a.
Reference:
BwAP 380-1
Cognitive Level Fundamental
Question Source New
QExplanation:
A is correct, green indicates component is in correct position and green board concept applies with reactor power > P8.
B is incorrect, explanation is for blue.
C is incorrect, explanation is for red.
D is incorrect, explanation is for white.

Question Number: 068
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: B
K/A: 194001 2.1.32
Question:
Given:

- A plant transient occurred requiring implementation of emergency procedures.
- An NSO has been directed to start a component using a BwOP as directed in the emergency procedure in progress.
- A limitation and action in the BwOP CANNOT be verified due to current plant conditions.

Based on the above information, the…

a. NSO can immediately start the component as long as the NSO verifies the limitations and actions at a later time.

b. Shift Manager shall grant permission to bypass the limitation and action prior to starting the component.

c. NCO can immediately start the component since emergency procedures take precedence over BwOPs.

d. Unit Supervisor must initiate a procedure change and the procedure change must be completed prior to starting the component.

Answer:
b.
Reference:
BwAP 340-1
HU-AA-104-101
Cognitive Level Fundamental
Question Source New
QExplanation:
In the event a BwOP is entered from a BwEP and limitations and actions cannot be verified in a timely manner, the shift manager or designee shall have discretion as to which actions may be bypassed to achieve the purpose of the procedure in an expeditious manner.
A is incorrect, the limitations and actions must be verified or the Unit Supervisor must authorize bypassing the limitation and action.
B is correct, see explanation above.
C is incorrect, the limitations and actions must be verified or the Unit Supervisor must authorize bypassing
D is incorrect, a procedure change is not required, the Unit Supervisor can authorize bypassing the limitation and action.

Question Number: 069
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: B
K/A: 194001 2.2.3
Question:
Given:
BOTH Unit 1 and Unit 2 are at 100% power, MOL.

Condition 1:
A large break RCS LOCA occurs on BOTH Units.

Condition 2:
A large steamline break occurs on BOTH Units.

Which of the following correctly describes the response of both Units' containment pressure to the conditions listed above?

a. During BOTH conditions, Unit 1 containment pressure would peak at a higher value than Unit 2.

b. During the RCS LOCA, Unit 1 containment pressure would peak at a higher value than Unit 2. During the steamline break, Unit 1 containment pressure would peak at a lower value than Unit 2.

c. During the RCS LOCA, Unit 1 containment pressure would peak at a lower value than Unit 2. During the steamline break, Unit 1 containment pressure would peak at a higher value than Unit 2.

d. During BOTH conditions, Unit 1 containment pressure would peak at a lower value than Unit 2.

Answer:
b.
Reference:
1/2BwEP ES-0.2
Systems big note SG-2
Cognitive Level High
Question Source New
QExplanation:
Unit 1 primary mass is larger than Unit 2. Unit 1 secondary mass is smaller than Unit 2. On a large break LOCA, Unit 1 containment pressure will peak at a higher value due to the larger mass in the primary. On a steamline break inside containment, Unit 1 containment pressure will peak at a lower value due to the smaller secondary mass.
B is correct, see explanation above.
A, C, & D are incorrect, see explanation above.

Question Number: 070
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: B
K/A: 194001 2.2.4
Question:
Concerning Unit differences in the MCR, which of the following controls/indications are located ONLY on the Unit 1 main control boards?

a. FW043A-D, FW Isolation Bypass Valves, control switches.

b. ACB 0451, RSH Transformer Feed to 4KV Bus 045, control switch.

c. Boric Acid Transfer Pump 0 connected indicating light.

d. 0 CC Pump amps indication.

Answer:
b.
Reference:
20E-0-4030AP15
20E-1/2-4030AB01
20E-1/2-4054A & B
20E-1/2-4050C, J, M, & Q
20E-1/2-4044B
Cognitive Level Fundamental
Question Source New
QExplanation:
A is incorrect, _FW043A-D control switches are located on 2PM04J only.
B is correct, RSH transformer control switch on 1PM01J.
C is incorrect, boric acid transfer pump connected indication on 1/2PM05J.
D is incorrect, 0 CC pump ammeters on 1/2PM06J.

Question Number: 071
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: B
K/A: 194001 2.3.1
Question:
Given:

- A male radiation worker at Braidwood Station returned 3 weeks ago from outage support at LaSalle Station.
- His Total Effective Dose Equivalent (TEDE) received at LaSalle was 150 mrem.
- As a result of an injury, the worker had an ankle x-ray one week ago estimated at 10 mrem exposure to the ankle.
- The worker's current TEDE from Braidwood for this year is 75 mrem.

Based on the above information, what is the calculated MAXIMUM annual non-emergency TEDE that he can receive at Braidwood for the remainder of this year without exceeding the Federal Exposure Limits?

a. 4765 mrem

b. 4775 mrem

c. 4850 mrem

d. 4925 mrem

Answer:
b.
Reference:
RP-AA-203
QExplanation:
Workers TEDE limit is 5000 mrem/year. Worker accumulated 150 mrem at another Exelon site, which counts toward his yearly total. Worker has accumulated 75 mrem at Braidwood. 10 mrem from X-ray is not occupational exposure and does not count towards TEDE. Total remain TEDE is 5000-[150 + 75] =
4775 mrem
A is incorrect, accounts for non-occupational exposure in addition to occupational exposure.
B is correct, accounts for total occupational exposure.
C is incorrect, only accounts for exposure at other Exelon site..
D is incorrect, only accounts for exposure at Braidwood.

Question Number: 072
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: B
K/A: 194001 2.3.9
Question:
Given:

- A Unit 1 Containment Release package is in progress per BwRP 6110-13T1, CONTAINMENT RELEASE FORM.

While performing the release package, ALL of the following are an NSO responsibility EXCEPT…

a. performing 1BwOS RETS 2.2.B-1, Radioactive Gaseous Effluent Monitoring Instrumentation Surveillance.

b. ensuring plant ventilation is properly aligned to support the release.

c. recording the affected Containment Pressure prior to initiating the release.

d. placing the Gaseous Release in Progress placard on 0PM02J.

Answer:
d.
Reference:
BwRP 6110-13T1
Cognitive Level Fundamental
Question Source New
QExplanation:
A is incorrect, RO duty.
B is incorrect, RO duty.
C is incorrect, RO duty.
D is correct, not RO duty (SRO duty).

Question Number: 073
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: B
K/A: 194001 2.3.11
Question:
Given:

- A Gas Decay Tank (GDT) in storage has been determined to contain greater than 50,000 Curies activity.

Which of the following correctly describes the method of lowering the affected GDT activity per 0BwOA RAD-3, DECAY TANK HIGH ACTIVITY?

a. Leave the affected GDT in storage until its activity level lowers via decay.

b. Transfer a portion of the affected GDT contents to another GDT.

c. Dilute the affected GDT with nitrogen to lower its activity level.

d. Immediately release the affected GDT to the environment.

Answer:
b.
Reference:
0BwOA RAD-3
0BwOA PRI-9
Cognitive Level Fundamental
Question Source New
QExplanation:
0A GDT activity is high. Per 0BwOA RAD-3, the 0A GDT activity will be lowered by transferring a portion of its contents to a different GDT.
A is incorrect, 0A GDT high activity requires alignment to another GDT.
B is correct, see explanation above.
C is incorrect, would be correct for explosive mixture per 0BwOA PRI-9.
D is incorrect, would not be released due to high activity, would be correct for explosive mixture per 0BwOA PRI-9.

Question Number: 074
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: B
K/A: 194001 2.4.31
Question:
Given:

- A major plant transient is in progress and numerous MCR annunciators are alarming.
- Plant conditions are rapidly deteriorating.

Which of the following describes the requirement for annunciator response during this transient per OP-AA-103-102, WATCHSTANDING PRACTICES.

a. The operators should take actions to stabilize the plant, then announce annunciators and reference BwARs as conditions stabilize.

b. The operators should announce alarms to the Unit Supervisor AND reference BwARs for alarms, then perform BwAR directed actions to stabilize the plant.

c. The operators should take actions to stabilize the plant. After stabilizing the plant, requirements for annunciator announcement and BwAR usage are NOT applicable.

d. The operators should announce alarms to the Unit Supervisor using three way communication prior to taking actions to stabilize the plant.

Answer:
a.
Reference:
OP-AA-103-102, step 4.3
QExplanation:
Per OP-AA-103-102, if the unit is in a transient condition where many annunciators are received, then announcing of alarms, annunciator response procedure usage, and SER usage must NOT take precedence over stabilizing the plant.
A is correct, operators should first take actions to stabilize the plant, all other choices are incorrect.

Question Number: 075
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: B
K/A: 194001 2.4.39
Question:
Given:

- Unit 2 was at 100% power.
- All systems are normally aligned.
- An ATWS occurred concurrent with a loss of heat sink.
- The SM determined the INITIAL classification of the event is a General Emergency.
- The SM instructs the Unit 1 assist NSO to perform state/local notifications.

The preferred method of contacting state/local authorities will be the…

a. ENS phone.

b. commercial line.

c. NARS phone.

d. IL State Decision-Makers Hotline.

Answer:
c.
Reference:
EP-AA-114
EP-MW-114-100
EP-MW-114-100-F-01
Cognitive Level Fundamental
Question Source Bank
QExplanation:
A is incorrect, NRC not contacted as part of NARS notification.
B is incorrect, commercial line is back-up to NARS phone in event NARS phone unavailable.
C is correct, NARS notification made via NARS phone.
D is incorrect, IL State Decision-Makers Hotline used for follow-up notifications after initial NARS transmittal.

Question Number: 076
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: S
K/A:
Question:
Given:

- Unit 1 is at 100% power.
- All systems are normally aligned.
- PZR pressure channel 1PT-456 fails high.
- The following indications exist on 1PM05J.
  - 1PI-455 is 2190 psig.
  - 1PI-456 is 2500 psig.
  - 1PI-457 is 2192 psig.
  - 1PI-458 is 2191 psig.
  - PZR PORV 1RY-455A is closed.
  - PZR PORV 1RY-456 is open.

Based on the above indications, which of the following Tech Specs must be entered?

a. 3.3.2, ESFAS Instrumentation for the P-11 interlock, to ensure orderly cooldown and depressurization can be performed without SI or MSLI actuations.

b. 3.3.4, Remote Shutdown Instrumentation, due to the inability to accurately monitor PZR pressure outside the MCR when the MCR is inaccessible.

c. 3.4.12, Low Temperature Overpressure Protection System, to ensure the reactor vessel will be protected against exceeding low temperature pressure and temperature limits.

d. 3.4.1, RCS DNB Limits, due to the increased likelihood of a fuel cladding failure in a DNB limited event.

Answer:
d.
Reference:
TS 3.3.3, 3.3.4, 3.4.11 and bases
Unit 1 COLR
1BwOSR 3.3.4.1
Cognitive Level High
Question Source New
QExplanation:
A is incorrect, correct LCO entry is TS 3.4.1, P-11 LCO only requires 2 channels operable.
B is incorrect, correct LCO entry is TS 3.4.1, PZR pressure channel 1PT-456 is not RSDP instrumentation. Would be correct for 1PT-455 failure.
C is incorrect, correct LCO entry is TS 3.4.1, PZR pressure channels are not LTOP (RCS WR pressure) and mode is incorrect for LTOP applicability.
D is correct, correct LCO entry is TS 3.4.1 due to RCS pressure < 2209 psig.

Question Number: 077
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: S
K/A: 000038EA214
Question:
Given:

- BOTH Units are at 100% power.
- All systems normally aligned.
- BOTH Unit 1/2PR30J, Wide Range Gas Monitors, are inoperable.
- A Unit 2 SGTR occurred.
- Unit 2 operators manually tripped the Unit 2 reactor and actuated safety injection.
- Unit 2 operators have initiated a cooldown with the steam dumps per 2BwEP-3, STEAM GENERATOR TUBE RUPTURE, with the following indications:
  - VA019/020, Unit 1/2 Vent Stack Effluent Flow, are inoperable.
  - 0VA01JA and 0VA01JC flow indicators are inoperable.

  - 0VA01CA, 0A Aux Building Supply Fan, is running.
  - 0VA02CA, 0A Aux Building Exhaust Fan, is running.
  - 0VL02CB, 0B Lab Exhaust Fan, is running.
  - 0VW03CB, 0B Service Building and Solid Radwaste Fan, is running.
  - 0VF01CA, 0A Aux Building Filtered Vents Fan, is running.

  - 1PB128 is reading 4.15 E-07 microCi/cc.
  - 1PD428 is reading 1.20 E-03 microCi/cc.
  - 2PB128 is reading 4.15 E-07 microCi/cc.
  - 2PD428 is reading 5.25 E-02 microCi/cc.

Using the attached copies of BwZP 200-3 and BwZP 200-3A1, calculate the station total release rate.

The station total release rate is…

a. 4.20 E +01 microCi/sec.

b. 1.21 E +05 microCi/sec.

c. 2.38 E +05 microCi/sec.

d. 3.60 E +05 microCi/sec.

Answer:
d.
Reference:
BwZP 200-3
BwZP 200-3A1
Cognitive Level High
Question Source New
QExplanation:

A is incorrect, release rate calculated using lower activity level on both units [(4.15E-07)(214230)(472) + (5.21E-09)(9630)(472)] = 4.20E+01.
B is incorrect, release rate using lower activity on Unit 2 [1.20E-03)(214230)(472) + (5.21E-09)(9630)(472)] = 1.21E+05.
C is incorrect, release rate using lower activity on Unit 1 [(4.15E-07)(214230)(472) + (5.25E-02)(9630)(472)]
D is correct, [(1.2E-03)(214230)(472) + (5.25E-02)(9630)(472)] = 3.60E+05.

Question Number: 078
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: S
K/A: 00WE12
Question:
Given:

- Unit 1 was at 100% power.
- All systems are normally aligned.
- A reactor trip and SI have occurred due to a steam break.
- ALL MSIVs failed to close.
- 1BwCA-2.1, UNCONTROLLED DEPRESSURIZATION OF ALL S/Gs, is in progress at step 5 with the following conditions:
  - AF flow rate is 45 gpm per SG due to required operator action.
  - ALL SG NR levels are 6%.
  - CNMT pressure has remained below 2 psig.
  - RCS pressure is 1350 psig.
  - High head SI flow (1FI-917) is 500 gpm.
  - CETCs are 495°F and RISING.
  - ALL RCPs are running.

The STA has just informed the Unit Supervisor that a RED path condition exists on the Heat Sink status tree. Based on the above indications, the crew will…

a. go to 1BwFR-H.1, RESPONSE TO LOSS OF SECONDARY HEAT SINK. DO NOT implement 1BwFR-H.1. Return to 1BwCA-2.1 and trip the RCPs.

b. continue on in 1BwCA-2.1 and DO NOT trip the RCPs

c. IMMEDIATELY trip the RCPs. Go to 1BwFR-H.1, RESPONSE TO LOSS OF SECONDARY HEAT SINK and implement 1BwFR-H.1.

d. go to 1BwFR-H.1, RESPONSE TO LOSS OF SECONDARY HEAT SINK. Implement 1BwFR- H.1 and operate the RCPs per 1BwFR-H.1.

Answer:
a.
Reference:
1BwCA-2.1
1BwFR-H.1
Cognitive Level High
Question Source Modified
QExplanation:
1BwCA-2.1 OAS directs tripping RCPs when all of the following conditions are met: RCS temperature stable or rising (CETCs are 495°F and rising), RCS pressure < 1425 (RCS pressure is 1350 psig), and high head SI flow > 100 gpm (1FI-917 is 500 gpm). All conditions are met for RCP trip criteria, must immediately trip all RCPs. Operators would not implement 1BwFR-H.1 due to note prior to step 1 of 1BwFR-H.1 which directs not performing procedure if total feed flow < 500 gpm due to operator action.
A is correct, see explanation above.

B is incorrect, see explanation above.
C is incorrect, see explanation above.
D is incorrect, see explanation above.

Question Number: 079
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: S
K/A: 000055EA205
Question:
Given:

- Unit 2 experienced a loss of all AC power.
- The crew has implemented 2BwCA-0.0, LOSS OF ALL AC POWER.
- The crew is unable to crosstie either Unit 2 4KV ESF bus to a Unit 1 4KV ESF bus.
- The crew is performing 2BwCA-0.0, attachment B step 20 with the following conditions:
- Non-vital DC and AC instrument loads have been shed.

    - DC Bus 211 voltage is 105V.
    - DC Bus 211 current is 1200A.

    - DC Bus 212 voltage is 125V.
    - DC Bus 212 current is 100A.

    - DC Bus 111 voltage is 131V.
    - DC Bus 111 current is 8A.

    - DC Bus 112 voltage is 130.5V.
    - DC Bus 112 current is 10A.

Based on the above indications, the Unit Supervisor will direct the crew to...

(2BwCA-0.0, BwOP DC-2T1-211, BwOP DC-2T1-212, BwOP DC-7-211 and BwOP DC-7 212 are attached.)

a. crosstie DC Bus 211 to DC Bus 111 AND crosstie DC Bus 212 to DC Bus 112.

b. shed DC Bus 211 AND DC Bus 212 discretionary loads.

c. ONLY shed DC Bus 211 discretionary loads.

d. ONLY shed DC Bus 212 discretionary loads.

Answer:
c.
Reference:
2BwCA-0.0
BwOP DC-2T1-211
BwOP DC-2T1-212
BwOP DC-7-211/212
Cognitive Level High
Question Source New
QExplanation:

From BwOP DC-2T1-211, battery 211 depletion will occur in < 15 minutes. From BwOP DC-2T1-212, battery depletion will occur in 12 hours. Battery 211 cannot be cross tied to 111 due to voltage difference 26V (>20V per BwOP DC-7-211, step D.2). Must shed discretionary loads on DC Bus 211 due to imminent battery depletion. Battery 212 depletion is not imminent.
A is incorrect, although it is desirable to crosstie DC buses, cannot crosstie 211 to 111 due to voltage difference.
B is incorrect, load shed not required on DC bus 212.
C is correc, load shed required on DC bus 211 due to imminent battery depletion.
D is incorrect, load shed not required on DC bus 212.

Question Number: 080
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: S
K/A: 000011 2.1.14
Question:
Given:

- A large break RCS LOCA occurred on Unit 1
- The SM has declared a SITE AREA EMERGENCY due to a loss of fission product barriers.

Based on the above conditions, the SM will notify personnel to staff which of the following ERO facilities?

a. ONLY the TSC

b. ONLY the TSC and OSC

c. ONLY the TSC and EOF

d. TSC, OSC, and EOF

Answer:
d.
Reference:
EP-AA-112
QExplanation:
TSC, OSC, and EOF are required to be activated at alert or higher. SM performs ERO augmentation notification as part of station emergency director duties.
D is correct, see explanation above, all other choices incorrect.

Question Number: 081
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: S
K/A: 00WE05 2.1.33
Question:
Given:

- Unit 1 was at 50% power.
- 1A AF pump has been OOS for the last 58 hours.
- Two hours, ago a reactor trip occurred.
- 1B AF pump tripped shortly after starting due to a faulty speed sensor and could NOT be restarted.
- The crew entered 1BwEP-0, REACTOR TRIP OR SI, and transitioned to 1BwEP ES-0.1, REACTOR TRIP RESPONSE.
- While performing 1BwEP ES-0.1, a red path was encountered on the heat sink status tree.
- The crew transitioned to 1BwFR-H.1, LOSS OF SECONDARY HEAT SINK, tripped the RCPs and established FW flow with the startup FW pump.
- SG NR levels were restored and 1BwFR-H.1 was exited.
- RCS Tave is currently 557°F.

What actions are required by Tech Specs?

a. IMMEDIATELY restore an RCP to operation to ensure adequate boron mixing AND IMMEDIATELY initiate action to restore one AF pump to operable status to ensure adequate core decay heat removal.

b. Within 12 hours, EITHER restore one AF pump to operable status OR be in Mode 4 to ensure adequate RCS dilution occurs in the event of a SGTR.

c. IMMEDIATELY initiate action to place rod control in a condition incapable of rod withdrawal to provide protection from a postulated power excursion from inadvertent rod withdrawal.

d. Within 12 hours, EITHER start an RCP OR be in Mode 4 to ensure adequate core decay heat removal and adequate boron mixing.

Answer:
a.
Reference:
ILT LP I1-AF-XL-01
TS 3.4.5 and bases
TS 3.7.5 and bases
Cognitive Level High
Question Source New
QExplanation:
Following trip, Unit 1 is in Mode 3 with no AF pumps operable and no RCS loops in operation. A is correct, both AF pumps are inoperable and no RCS loop is in operation in MODE 3. Rod control is incapable of rod withdrawal (reactor trip breakers open - TS 3.4.5 bases). Tech specs require immediate action to restore an AF pump and an RCP for decay heat removal and

boron mixing.
B is incorrect, action is for 1 AF pump inoperable (1A AF pump has been inoperable for 60 hours, 12 hours to restore 1A AF pump) and reason is incorrect.
C is incorrect, action is for no loops operable with rod control capable of rod withdrawal. From TS 3.4.5, rod control system is incapable of rod withdrawal with reactor trip breakers open.
D is incorrect, action is for one RCS loop inoperable with two required.

Question Number: 082
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: S
K/A: 000033AA202
Question:
Given:

- Unit 1 is at 8% power.
- Annunciator 1-10-B2, IR HI VOLT FAILURE, is lit.
- IR channel N-35 reads 2 x 10 -5 amps.
- IR channel N-36 reads 1 x 10 -11 amps.

Based on the above indications, one of the Tech Spec required actions and the reason for that action is to…

a. immediately suspend operations involving positive reactivity additions since NEITHER IR detector is capable of monitoring core power level.

b. restore the affected channel within 30 days to allow monitoring necessary to place and maintain Unit 1 in mode 3 from a location other than the MCR.

c. raise reactor power above the P-10 setpoint within 2 hours to allow PR NI detectors to perform monitoring and protection functions.

d. trip the bistables for the affected channel within 6 hours to ensure proper trip logic is established and maintained during subsequent operation.

Answer:
c.
Reference:
TS 3.3.4
ILT LP I1-NI-XL-02
1BwOA INST-1
BwAR 1-10-B2
Cognitive Level High
Question Source Bank
QExplanation:
Reactor power is above P-6 but < P-10. IR channel N-36 is failed. TS require either lower power < P6 or > P10 within 2 hours.
A is incorrect, would be correct for inoperable SR detector OR two inoperable IR detectors.
B is incorrect, RSDP instrumentation (3.3.4) requires only one IR channel operable to meet LCO.
C is correct, TS required action to either raise power > P-10 or lower < P-6 within 2 hours.
D is incorrect, would be correct for PR channel failure, IR trip logic is 1/2 and bistable tripping is not required.

Question Number: 083
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: S
K/A: 000051 2.4.30
Question:
Given:

- Unit 1 is at 100% power.
- All systems are normally aligned.
- Condenser vacuum begins degrading rapidly.
- The crew enters 1BwOA SEC-3, LOSS OF CONDENSER VACUUM, and initiates a manual reactor trip.
- All attempts to trip the reactor from the MCR fail.
- The Shift Manager has declared a SITE AREA EMERGENCY.

Based on the above information, the Shift Emergency Director must notify the state authorities within 15 minutes…

a. AND notify the NRC within 60 minutes. State updates must be performed at the top of the hour starting in the second hour following classification.

b. AND notify the NRC within 60 minutes. State updates are NOT required.

c. AND notify the NRC within 15 minutes. Updates to the state AND the NRC are required every 60 minutes.

d. AND perform state updates at the top of the hour starting in the second hour following classification. NRC notification is NOT required.

Answer:
a.
Reference:
EP-MW-114-100
ILT LP I1-ZP-XL-01
Cognitive Level High
Question Source New
QExplanation:
Site area emergency declared. State notification required within 15 minutes, NRC notification required within 60 minutes. State updates are required (required at alert or higher).
A is correct, state updates are required, see explanation above.
B is incorrect, see explanation above.
C is incorrect, NRC notification required within 60 minutes and NRC updates are required as directed by the NRC. State updates are required at the top of the hour starting in the second hours after the event.
D is incorrect, state updates are required and NRC notification is required.

Question Number: 084
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: S
K/A: 000069 2.1.14
Question:
Given:

- BOTH Units are at 100% power.

For which of the following events or conditions must the Plant Manager be notified in accordance with OP-AA-106-101, SIGNIFICANT EVENT REPORTING?

(OP-AA-106-101 is attached)

a. A scheduled IMD surveillance changes Unit 1 online risk from green to yellow.

b. A mechanic alarms the Aux Building portal monitor. Rad Protection decontaminates the mechanic's hard hat and the mechanic is allowed to exit the Aux Building.

c. A NLO cuts a finger while working in the Turbine Building. The NLO receives site medical care and is returned to duty.

d. A system engineer reports BOTH Unit 2 containment emergency hatch doors are open and CANNOT be closed.

Answer:
d.
Reference:
OP-AA-106-101
Cognitive Level Fundamental
Question Source New
QExplanation:
A is incorrect, scheduled on-line risk changes are not required to be reported, on unscheduled or > = orange.
B is incorrect, does not meet threshold for extensive on site decontamination or outside assistance.
C is incorrect, does not meet threshold of offsite medical attention or transportation via ambulance.
D is correct, the containment hatch doors open Unit 2 in LCO 3.6.2, which has a shutdown action statement <72 hours.

Question Number: 085
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: S
K/A: 00WE09EA2.2
Question:
Given:

- 1BwEP ES-0.3, NATURAL CIRCULATION COOLDOWN WITH STEAM VOID IN VESSEL (WITH RVLIS), is in progress at step 2 with the following conditions:
  - Iconics subcooling indicates 0°F.
  - RCS pressure is 1400 psig and stable.
  - CETCs are 590°F and rising slowly.
  - PZR level is 36% and stable.
  - RVLIS plenum level is 100%.
  - RVLIS head level is 31%.
  - Containment pressure is 0.3 psig.
- Normal charging and letdown are in service.
- Bus 143 and 144 are energized and the main condenser is available.
- Buses 156 - 159 are energized.
- Conditions for starting RCPs have been established per 1BwOA ESP-1, RCP STARTUP DURING ABNORMAL CONDITIONS.

Based on the above conditions, the Unit Supervisor will direct the crew to…

(1BwEP ES-0.3 is attached)

a. actuate SI and transition to 1BwEP-0, REACTOR TRIP OR SAFETY INJECTION.

b. start the 1D RCP and transition to 1BwGP 100-5, PLANT SHUTDOWN AND COOLDOWN.

c. raise PZR level by adjusting charging and/or letdown flow(s).

d. throttle open steam dumps.

Answer:
a.
Reference:
1BwEP ES-0.3
QExplanation:
A is correct, RCS subcooling is unacceptable per 1BwEP ES 0.3-1 (above saturation curve but below acceptable curve), OAS directs actuation of SI and return to 1BwEP-0.
B is incorrect, RVLIS plenum level is 100%, however RVLIS head level is 31% (unacceptable for RCP start).
C is incorrect, PZR level is below level required for RCP start and would be raised by throttling charging and letdown if SI was not required due to lack of subcooling.
D is incorrect, opening steam dumps would raise subcooling, however procedure directs actuating SI based

Question Number: 086
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: S
K/A: 00WE09EA2.2
Question:
Given:

- Unit 1 is at 20% power.
- All systems are normally aligned.
- PZR pressure is 2205 psig and lowering.
- 1RY455C, PZR Spray Valve, is open and cannot be operated in manual OR auto.
- All other PZR system components are operating as designed.

Based on the above indications, the Unit Supervisor will direct the crew to…

a. manually trip the reactor and stop the 1D RCP.

b. manually trip the reactor and stop the 1C RCP.

c. stop the 1C RCP and verify all PZR heaters energized.

d. stop the 1D RCP and verify all PZR heaters energized.

Answer:
b.
Reference:
ILT LP I1-OA-XL-11
1BwOA INST-2
Cognitive Level High
Question Source New
QExplanation:
Spray valve 1RY455C has failed open. 1BwOA INST-2 directs manually tripping reactor and tripping associated RCP.
A is incorrect, 1D RCS supplies PZR spray valve 1RY455B.
B is correct, procedurally directed response.
C is incorrect, operator must manually trip reactor prior to tripping 1C RCP due to reactor power being below the RCS single loop loss of flow reactor trip.
D is incorrect, operator must manually trip reactor prior to tripping RCP and stated RCP supplies 1RY455D.

Question Number: 087
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: S
K/A: 059000 2.4.49
Question:
Given:

- Unit 1 is at 85% power.
- All systems are normally aligned.
- An EH leak develops in the turbine building.
- The 1B FW pump trips due to the EH leak.
- Prior to any operator action being taken, the EH leak causes the 1C FW pump to trip.

The Unit Supervisor will direct the crew to….

a. manually trip the reactor.

b. start the 1A FW pump.

c. initiate a turbine runback.

d. start a standby CD/CB pump.

Answer:
a.
Reference:
1BwOA SEC-1
Cognitive Level Fundamental
Question Source New
QExplanation:
When 1B FW pump trips, crew is required to implement 1BwOA SEC-1. Following trip of 1C FW pump, no FW pumps are running. 1BwOA SEC-1 RNO immediate actions direct manual reactor trip if no FW pumps are running. A is correct. Unit supervisor would provide direction to trip the reactor. All other choices are prompt operator actions in 1BwOA SEC-1 dependent on at least one FW pumps running.

Question Number: 088
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: S
K/A: 062000 2.2.25
Question:
Given:

- Both Units are at 100% power

Source #1 - 345 KV system to buses 141 & 142 from Unit 1 SATs.
Source #2 - 345 KV system to buses 141 & 142 from Unit 2 SATs via crosstie.
Source #3 - BOTH Unit 1 DGs.

Which combination of the AC sources listed above satisfies the requirements of LCO 3.8.1 - AC Sources - Operating for Unit 1?

a. ONLY Source #1 AND Source #2.

b. ONLY Source #1 AND Source #3.

c. ONLY Source #2 AND Source #3.

d. Source #1, Source #2, AND Source #3.

Answer:
d.
Reference:
T.S. 3.8.1
QExplanation:
TS 3.8.1, AC sources - operating is consistent with the initial assumptions of the accident analyses and is based on meeting design basis of the plant. This results in maintaining at least one division of the onsite or offsite AC sources operable during accident conditions in the event or an assumed loss of all offsite power or all onsite AC power sources and a worst case single failure.
A is incorrect, accident analysis assumes loss of offsite or onsite power, not just offsite power.
B is incorrect, accident analysis assumes loss of offsite or onsite power, not just onsite power.
C is incorrect, accident analysis assumes loss of offsite or onsite power, not both.
D is correct, see explanation above.

Question Number: 089
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: S
K/A: 064000A220
Question:
Given:

- Unit 1 is in Mode 6.
- During performance of 1BwOSR 3.8.1.10-1, 1A DG FULL LOAD REJECTION AND SIMULATED SI IN CONJUNCTION WITH UV DURING LOAD TEST, the following occurred:
  - 1A DG was manually started.
  - A manual SI signal was actuated.
  - ACB 1412, SAT 142-1 Feed to 4 KV Bus 141, was manually opened.
  - ACB 1413, DG Feed to 4 KV Bus 141, automatically closed.

- The following components start times were noted:
  - 1A CV Pump 0 seconds
  - 0A VC Chiller 0 seconds
  - 1A SI Pump 5 seconds
  - 1A CC Pump 20 seconds
  - 1A SX Pump 25 seconds
  - 1A AF Pump 35 seconds
  - 1A CS Pump did NOT start.

Based on the above indications…

a. 1A CV Pump did NOT respond properly.

b. 0A VC Chiller did NOT respond properly.

c. 1A CS Pump did NOT respond properly.

d. ALL listed equipment responded properly.

Answer:
b.
Reference:
ILT LP I1-AP-XL-01
Cognitive Level High
Question Source New
QExplanation:
0A VC chiller was not properly shed during test. 0A VC chiller should have received a start signal at time 15 seconds.
A is incorrect, 1A CV pump receives start signal at 0 seconds.
B is correct, see explanation above.
C is incorrect, 1A CS pump should not have started - no CSAS present.
D is incorrect, 0A VC chiller did not shed properly.

Question Number: 090
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: S
K/A: 026000A208
Question:
Given:

- Unit 1 is at 33% power and stable.
- RCS Tave is 566°F and stable.
- Turbine power is 30% and stable.
- PZR level is 20% and lowering.
- PZR pressure is 2150 psig and lowering.
- Containment pressure is 2 psig and rising.

If containment pressure continues to rise to the CS actuation setpoint, the CS pumps may be secured…

a. once CNMT pressure lowers below 15 psig. No requirement applies for CS spray add tank level OR CS pump run time.

b. once CNMT pressure lowers below 15 psig if the CS pumps have run at least 2 hours AND the CS spray add tank LO-2 level lights are lit.

c. after the CS pumps have run at least 2 hours if the CS spray add tank LO-2 level lights are lit. No requirement applies for CNMT pressure.

d. once CNMT pressure lowers below 15 psig and the CS spray add tank LO-2 level lights are lit. No requirement applies for CS pump run time.

Answer:
b.
Reference:
ILT LP I1-CS-XL-01
Cognitive Level High
Question Source Bank
QExplanation:
Event in progress is RCS LOCA. Once CS actuates, the CS termination criteria of 1BwEP-1 apply (CS pump must run at least two hours, CNMT pressure must be below 15 psig, and the spray add tank low-2 lights are lit).
A is incorrect, would be correct if event in progress was MSLB.
B is correct, see explanation above.
C is incorrect, CS pressure must be below 15 psig.
D is incorrect, CS pumps must run at least 2 hours.

Question Number: 091
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: S
K/A: 017000 2.1.33
Question:
Given:

- The Unit 1 assist NSO has just completed the operability check of the Unit 1 Incore Temperature Monitoring System (CETCs) with the following results:

  - Train A has 19 operable CETCs.
  - Train B has 21 operable CETCs.

  - Quadrant 1 has 3 of 15 CETCs operable.
  - Quadrant 2 has 10 of 12 CETCs operable.
  - Quadrant 3 has 12 of 15 CETCs operable.
  - Quadrant 4 has 15 of 17 CETCs operable.

Based on the above indications, the Unit Supervisor will…

(LCO 3.3.3, TLCO 3.3.h, and TLCO 3.3.i are attached)

a. enter LCO 3.3.3, Post Accident Monitoring Instrumentation, because non uniform core conditions CANNOT be adequately monitored.

b. enter TLCO 3.3.h, Power Distribution Monitoring System Instrumentation, because peak linear heat rate CANNOT be continuously monitored.

c. enter TLCO 3.3.i, Post Accident Monitoring Instrumentation, because the Reactor Coolant Subcooling Margin Monitor is NOT operable.

d. NOT enter ANY LCO or TLCO concerning the CETCs.

Answer:
a.
Reference:
1BwOSR 3.3.3.1
T.S. 3.3.3 and bases
TRM 3.3.h & 3.3.I
Cognitive Level High
Question Source New
QExplanation:
40 CETCs are operable with at least 3 per quadrant operable.
A is incorrect, PDMS instrumentation would be entered if <17 CETCs operable w < 2 per quadrant.
B is incorrect, SMM uses 10 highest CETCs per train and would remain operable.
C is incorrect, RTS instrumentation uses RCS temperature instrumentation.
D is correct, PAM TS applies.

Question Number: 092
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: S
K/A: 034000K105
Question:
Given:

- Unit 1 is in Mode 6.
- A fuel load is in progress following a complete core off load.

Which of the following conditions require an IMMEDIATE suspension of core alterations?

a. The last 2 RCS boron samples were 2340 ppm and 2335 ppm respectively.

b. SR channel N-31 changes from 3 cps to 9 cps following the insertion of the 6th assembly into the core.

c. RCS temperature changes from 110°F to 106°F in 30 minutes due to an RH problem.

d. BOTH SR channels change from 12 cps to 26 cps following the insertion of the 15th fuel assembly into the core.

Answer:
d.
Reference:
1BwGP 100-6
Cognitive Level Fundamental
Question Source Bank
QExplanation:
A is incorrect, core alt suspension required if two successive RCS samples indicate a change of + or - 20 ppm. (Condition given is +5 ppm).
B is incorrect, core alt suspension required if single SR count rate increases by factor of 5 following source nucleus insertion. (Condition given is increase by factor of 3 and source nucleus not installed).
C is incorrect, core alt suspension required if RCS temperature changes + or - 10°F. (Condition given is -4°F).
D is correct, core alt suspension required if both SR count rates increase by factor of 2 following source nucleus insertion. Conditions given is increase by factor of 2.16 and source nucleus installed.

Question Number: 093
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: S
K/A: 056000A205
Question:
Given:

- Unit 1 is at 90% power.
- All systems are normally aligned.
- Chemistry has just notified the MCR that secondary chemistry is abnormal due to a condenser tube leak.
- SG sodium is exceeding the Action Level 3 limit.

Given the above information, how should the crew proceed?

a. Hold power at its current level until SG sodium is restored within Action Level 1 limit.

b. Restore SG sodium below Action Level 3 in 7 days OR place Unit 1 in mode 3 within the following 6 hours.

c. Restore SG sodium below Action Level 3 in 24 hours OR place Unit 1 in mode 3 within the following 6 hours.

d. Shut down Unit 1 to mode 3 within the next 6 hours.

Answer:
d.
Reference:
1BwOA SEC-2
ILT LP I1-OA-XL-37
Cognitive Level High
Question Source New
QExplanation:
A is incorrect, 1BwOA SEC-2 requires power hold below 30% power.
B is correct, action level 1 requires restoration of parameter within 7 days or entry into action level 2.
C is incorrect, requirement is for immediate shutdown.
D is correct, action is for action level 3.

Question Number: 094
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: S
K/A: 194001 2.1.25
Question:
Given:

- BOTH Units are at 100% power.
- All systems are normally aligned.
- 0BwOA ELEC-1, ABNORMAL GRID CONDITIONS, was entered as the result of a state estimator alarm due to a predicted condition if BRAIDWOOD UNIT 2 tripped.
- The state estimator predicted voltage is 344.4 KV for both units.
- The following indication exist:
  - Bus 143 voltage is 4350 volts.
  - Bus 143 current is 700 amps.
  - Bus 144 voltage is 4300 volts.
  - Bus 144 current is 635 amps.
  - Bus 243 voltage is 4280 volts.
  - Bus 243 current is 845 amps.
  - Bus 244 voltage is 4300 volts.
  - Bus 244 current is 700 amps.

Based on the above conditions, the crew will...

(0BwOA ELEC-1 is attached)

a. NOT enter LCO 3.8.1 for EITHER Unit 1 OR Unit 2.

b. enter LCO 3.8.1 for BOTH Unit 1 AND Unit 2.

c. enter LCO 3.8.1 for Unit 1 ONLY.

d. enter LCO 3.8.1 for Unit 2 ONLY.

Answer:
a.
Reference:
0BwOA ELEC-1
ILT LP I1-OA-XL-01A
Cognitive Level High
Question Source New
QExplanation:
Bus 143 loading is [0.00173 x 4350V x 700A] = 5267 Kva
Bus 144 loading is [0.00173 x 4300V x 635A] = 4723 Kva.
Bus 243 loading is [0.00173 x 4280V x 845 A] = 6256 Kva
Bus 244 loading is [0.00173 x 4300V x 700A] = 5207 Kva.

Unit 1 minimum switchyard voltage is 344.2 KV from figure 0BwOA ELEC-1-1.
Unit 1 and Unit 2 are below the state estimator predicted voltage (344.4 KV).
A is correct, LCO entry is not required on either Unit.
B, C, & D are incorrect, see explanation above.
If examinee applies Unit 2 values to Unit 1 portion of graph, Unit 1 would be above state estimator predicted voltage.

Question Number: 095
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: S
K/A: 194001 2.2.6
Question:
Given:

- A Temporary Change is being performed for a BwOP per AD-AA-101, PROCESSING OF PROCEDURES AND T&RMs.

The Temporary Change…

a. is valid for up to 120 days from implementation.

b. requires a full review, approval, and authorization be performed within 30 days.

c. must be approved by a Station Qualified Reviewer AND a qualified SRO prior to use.

d. must be approved by the Corporate Functional Area Manager (CFAM) prior to use.

Answer:
c.
Reference:
AD-AA-101
Cognitive Level Fundamental
Question Source New
QExplanation:
A is incorrect, temporary procedures are valid for up to 90 days.
B is incorrect, full approval required within 14 days.
C is correct, operating procedures must be approved by SQR and SRO prior to use.
D is incorrect, T&RMs require SFAM approval.

Question Number: 096
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: S
K/A: 194001 2.2.17
Question:
Which of the following activities is considered production risk per WC-AA-104, REVIEW AND SCREENING FOR PRODUCTION RISK?

(WC-AA-104 and station production risk matrix is attached)

a. EMD is repairing the 1A GC pump breaker in the EMD shop.

b. System engineer is verifying FW flow constants in the plant computer.

c. IMD is calibrating 0WX-630-1, Release Tank Effluent High Flow Recorder, in the RWCR.

d. Operations personnel are replacing 2B SSPS train ground return fuse in the AEER.

Answer:
d.
Reference:
WC-AA-104
station production risk matrix
Cognitive Level High
Question Source New
QExplanation:
A is incorrect, GC system is listed on station production risk matrix, activity is not production risk.
B is incorrect, setpoint verifications are an exception in WC-AA-104.
C is incorrect, calibration does not cause automatic actuation.
D is correct, system is listed in station production risk matrix, activity is production risk.

Question Number: 097
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: S
K/A: 194001 2.3.8
Question:
Given:

- BOTH Units are at 100% power.
- A release package has been requested for 0F GDT.
- 0PR02J, Gas Decay Tank Effluent Monitor, was declared inoperable last shift.
- All required TS/TRM/RETS have been entered.

The release…

(0BwOS RETS 2.2-1a is attached)

a. can be commenced, provided verification of sample results, valving, and release rate are performed prior to initiating the release.

b. can be commenced, provided two independent samples are gathered and analyzed during the release.

c. can be commenced, provided samples are continuously collected by auxiliary sampling equipment during the release.

d. CANNOT be commenced until 0PR02J is restored to operable status.

Answer:
a.
Reference:
BwOP GW-500T1
0BwOS RETS 2.2-1a
Cognitive Level Fundamental
Question Source New
QExplanation:
A is correct, release can continue if monitor is declared inoperable and sample results, lineup, and release rate independently verified. (0BwOS RETS 2.2-1a, PAGE 9).
B is incorrect, samples must be gathered and analyzed prior to release.
C is incorrect, sampling not required with release in progress.
D is incorrect, release can be performed (directed by procedure if 0PR02J is inoperable).

Question Number: 098
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: S
K/A: 194001 2.3.10
Question:
Given:

- Unit 1 has experienced an event requiring Emergency Plan implementation.
- Personnel are preparing to enter Unit 1 curved wall area (CWA) to rescue an injured worker.
- The rescuers are expected to receive 10 Rem exposure during the rescue.

Which of the individuals listed below must authorize the emergency exposure?

a. Corporate Emergency Director

b. Station Emergency Director

c. Rad Protection Manager

d. OSC Director

Answer:
b.
Reference:
EP-AA-112
EP-AA-113
RP-AA-203
Cognitive Level Fundamental
Question Source New
QExplanation:
A is incorrect, cannot delegate exposure authorization to corporate emergency director.
B is correct, non-delegable responsibility of station emergency director.
C is incorrect, rad protection manager approval is required during non-emergency.
D is incorrect, OSC director is work group supervisor, non-delegable responsibility of station emergency director.

Question Number: 099
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: S
K/A: 194001 2.4.9
Question:
Given:

- Unit 1 is in Mode 5, preparing for a fuel off-load.
- Unit 1 has been shutdown for 7 days.
- ALL loops are isolated.
- 1B RH pump is operating in shutdown cooling when the following occurs:
  - The 1B RH pump trips.
  - 1A RH pump will NOT start.

- The crew enters 1BwOA PRI-10, LOSS OF RH COOLING and initiates bleed and feed per Attachment C.
- The crew is preparing to commence makeup flow to the RCS per 1BwOA PRI-10, Attachment C, step 7 with the following conditions:
  - BOTH PZR PORVs are open.
  - CETCs are 130°F.
  - RVLIS is 100% on both trains' head and plenum.
  - RCS pressure is 90 psig.
  - RWST level is 91%.

Based on the above indications, the Unit Supervisor will direct the crew to establish a MINIMUM RCS makeup flow of…

(1BwOA PRI-10 is attached)

a. 60 gpm.

b. 80 gpm.

c. 520 gpm.

d. 710 gpm.

Answer:
d.
Reference:
1BwOA PRI-10
QExplanation:
With both CETCs and RVLIS are available, makeup to prevent boiling is allowed (step 7). Must then determine RWST level is appropriate for makeup to prevent boiling. (step 8) Must then determine required flow from fig BwOA PRI 10-3. (710 gpm). Must then determine if makeup flow will over pressurize RCS. Both Pzr PORVs are open (required makeup flow is < 1200 gpm).
A is incorrect, flow is makeup to match boiloff after refuel.
B is incorrect, flow is makeup to match boiloff prior to refuel.
C is incorrect, flow is makeup to prevent boiling after refuel.

D is correct, conditions are proper for initiating makeup flow to prevent boiling prior to refuel.

Question Number: 100
Exam Date: 2006/05/15
Facility: Braidwood
Reactor Type: Westinghouse 4-Loop
RO/SRO: S
K/A: 194001 2.4.44
Question:
Given:

- Unit 1 experienced a small break RCS LOCA with a total loss of ALL ECCS pumps.
- EAL FG1 was declared 2 minutes ago.
- 1BwFR-C.2, RESPONSE TO DEGRADED CORE COOLING, has been in progress for the past 20 minutes.
- The TSC is NOT staffed yet and offsite dose calculations are NOT available.
- A controlled direct CNMT vent has NOT occurred.
- No releases are occurring.
- The CNMT is intact.
- CNMT rad levels (1AR020/021) are 505 R/hr.
- CNMT pressure is 12 psig.
- CETC's are 755°F and have slowly risen over the past 20 minutes.
- RVLIS plenum level is 0%.

Based on current plant conditions, the results of determining the Protective Action Recommendations (PARs) will be…
(EP-AA-111-F-02 and EP-AA-1001 are attached)

a. no PARs currently exist.

b. shelter 2 mile radius and 5 miles downwind.

c. evacuate 5 mile radius and 10 miles downwind.

d. evacuate 2 mile radius and 5 miles downwind.

Answer:
d.
Reference:
EP-AA-111
EP-AA-111-F-02
EP-AA-1001
Cognitive Level High
Question Source Bank
QExplanation:
EAL FG1 entered, loss of two barriers and potential loss of third. Containment barrier is not lost per EP-AA-1001. From EP-AA-111-F-02, with no loss of barrier, PARS direct evacuate 2 mile radius and 5 miles down wind.
A is incorrect, would be correct if site area emergency declared vs. general emergency.
B is incorrect, would be correct if controlled CNMT vent <1 hour and release in progress.
C is incorrect, would be correct for loss of all three fission product barriers.
D is correct PAR determination.