U. S. Nuclear Regulatory Commission
Indian Point Unit 2
Written Examination

Applicant Information	
Name:	Region: I
Date:	Facility/Unit: Indian Point Unit 2
License Level:SRO	Reactor Type: Westinghouse PWR
Start Time:	Finish Time:

Instructions

Use the answer sheets provided to document your answers. Staple this cover sheet on top of the answer sheets. The passing grade requires a final grade of at least 80.00 percent. Examination papers will be collected six hours after the examination starts.

Applicant Certification

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

_____
Applicant's Signature

Results

Examination Value	_____	Points
Applicant's Score	_____	Points
Applicant's Grade	_____	Percent

U.S.N.R.C. Site-Specific Written Examination
Indian Point Unit 2
Senior Reactor Operator

1.	A	B	C	D	26.	A	B	C	D
2.	A	B	C	D	27.	A	B	C	D
3.	A	B	C	D	28.	A	B	C	D
4.	A	B	C	D	29.	A	B	C	D
5.	A	B	C	D	30.	A	B	C	D
6.	A	B	C	D	31.	A	B	C	D
7.	A	B	C	D	32.	A	B	C	D
8.	A	B	C	D	33.	A	B	C	D
9.	A	B	C	D	34.	A	B	C	D
10.	A	B	C	D	35.	A	B	C	D
11.	A	B	C	D	36.	A	B	C	D
12.	A	B	C	D	37.	A	B	C	D
13.	A	B	C	D	38.	A	B	C	D
14.	A	B	C	D	39.	A	B	C	D
15.	A	B	C	D	40.	A	B	C	D
16.	A	B	C	D	41.	A	B	C	D
17.	A	B	C	D	42.	A	B	C	D
18.	A	B	C	D	43.	A	B	C	D
19.	A	B	C	D	44.	A	B	C	D
20.	A	B	C	D	45.	A	B	C	D
21.	A	B	C	D	46.	A	B	C	D
22.	A	B	C	D	47.	A	B	C	D
23.	A	B	C	D	48.	A	B	C	D
24.	A	B	C	D	49.	A	B	C	D
25.	A	B	C	D	50.	A	B	C	D

51.	A	B	C	D	76.	A	B	C	D
52.	A	B	C	D	77.	A	B	C	D
53.	A	B	C	D	78.	A	B	C	D
54.	A	B	C	D	79.	A	B	C	D
55.	A	B	C	D	80.	A	B	C	D
56.	A	B	C	D	81.	A	B	C	D
57.	A	B	C	D	82.	A	B	C	D
58.	A	B	C	D	83.	A	B	C	D
59.	A	B	C	D	84.	A	B	C	D
60.	A	B	C	D	85.	A	B	C	D
61.	A	B	C	D	86.	A	B	C	D
62.	A	B	C	D	87.	A	B	C	D
63.	A	B	C	D	88.	A	B	C	D
64.	A	B	C	D	89.	A	B	C	D
65.	A	B	C	D	90.	A	B	C	D
66.	A	B	C	D	91.	A	B	C	D
67.	A	B	C	D	92.	A	B	C	D
68.	A	B	C	D	93.	A	B	C	D
69.	A	B	C	D	94.	A	B	C	D
70.	A	B	C	D	95.	A	B	C	D
71.	A	B	C	D	96.	A	B	C	D
72.	A	B	C	D	97.	A	B	C	D
73.	A	B	C	D	98.	A	B	C	D
74.	A	B	C	D	99.	A	B	C	D
75.	A	B	C	D	100.	A	B	C	D

U.S.N.R.C. Site-Specific Written Examination
Indian Point Unit 2
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Question 001

The following conditions exist:

- Plant is operating at 15% power
- 21 Main Boiler Feed Pump trips
- The reactor is manually tripped
- Bus 6A feeder breaker trips on fault

What is the status of the Aux Feedwater System? Assume no operator action.

A. 21 ABFP is feeding 21 and 22 SGs

B. 23 ABFP is feeding 23 and 24 SGs

C. 22 ABFP is feeding all the SGs.

D. No ABFP automatically started.

Question 002

The following plant conditions exist:

- Small Break LOCA has occurred.
- The team is performing a post LOCA cooldown and depressurization
- Containment Pressure peaked at 12 psig and is currently 5 psig
- Containment Radiation levels peaked at 3R/hr and are slowly lowering

The TSC has contacted the Control to determine the status of the Containment Iodine removal fans and has recommended that they be used to lower containment radiation levels.

Based upon their request, you would:

A. Expect the Iodine removal fans to be running because they should have automatically started due to high radiation levels on R-25/R-26, Containment Radiation Monitors.

B. Expect the Iodine removal fans to be running because they should have started automatically started on high containment pressure.

C. Expect to have manually started them when required in FR-Z.1, Response to High Containment Pressure.

D. Expect them not to be running and recommend not starting them because of adverse containment conditions

Question 003

A PORV has failed open on the pressurizer and the block valve cannot be closed. The failed open PORV causes RCS pressure to drop and stabilize at 1200 psig.

Which of the following factors will cause the leak rate from the PORV to lower:

A. Pressurizer level rises as the pressurizer goes solid.

B. PRT rupture disc ruptures while the PORV is passing steam

C. Instrument Air is isolated to containment during Phase A isolation.

D. An SI pump is stopped during the SI flow reduction in ES-1.2, Post LOCA Cooldown and Depressurization.

Question 004

The plant is performing a plant cooldown to go on RHR. The plant is at 370 F and making preparations to place RHR in service.

A large break LOCA occurs. A containment ventilation isolation signal will send a signal to close the pressure relief isolation valves if they were open, The containment ventilation isolation signal is caused by a :

A. Containment Phase A isolation Signal.

B. Containment Phase B isolation Signal.

C. Low Pressurizer Pressure SI signal

D. Containment Pressure SI signal

Question 005

Which of the following always occurs when AMSAC is actuated?

A. Turbine Trips
Both motor driven aux feed pumps start
Blowdown/ Blowdown Sampling isolates only on SGs with level less than 7.5%.

B. Turbine Trips
All 3 AFW Pumps starts
Blowdown isolates/ Blowdown Sampling isolates on all SGs.

C. Reactor Trips
All 3 AFW Pumps starts
Blowdown isolates/ Blowdown Sampling isolates on all SGs

D. Reactor Trips
Both motor driven aux feed pumps start
Blowdown/ Blowdown Sampling isolates only on SGs with level less than 7.5%.

Question 006

Given the following plant conditions:

- Reactor power is 15%.
- S/G 21 NR level is 70%.
- S/G 22 NR level is 60%.
- S/G 23 NR level is 79.5%.
- S/G 24 NR level is 58%

Which one of the following automatic action sequences will directly result from the above situation?

A. Turbine trip, Feed Pumps trip, and Feedwater Isolation closes all FRVs and MOVs.

B. Turbine Trip, Feed Pumps Trip, and Feedwater Isolation only closes 23 FRV and MOV

C. Turbine trip, Reactor trip, Feed Pump trip, and Feedwater Isolation only closes 23 FRV and MOV.

D. Turbine trip, Reactor trip, Feed Pumps trip and Feedwater Isolation closes all FRVs and MOVs.

Question 007

Which ONE of the following will cause a start of the Service Water Pump(s) selected for the Non-Essential Header?

A. Operation of the SI recirculation phase switches.

B. An SI signal with no station blackout.

C. A unit trip with blackout and no SI.

D. Low Non-Essential Header pressure.

Question 008

The plant is operating at 100% power when the control of the pressurizer level control system fails high.

As a results of this failure and assuming no operator action and all other control systems function properly, the unit will ultimately trip due to:

A. High Pressurizer Pressure

B. Low Pressurizer Pressure

C. Over Temperature Delta T

D. High Pressurizer Level.

Question 009

The plant is in MODE 1 with the following conditions:

Reactor Power	8%
Impulse Metal Temperature	175F
RCS Pressure	2235psig

Using EL-2 determine the maximum roll rate (rpm/min) for the main turbine under these conditions assuming a linear ramp of main turbine speed?

A. 60

B. 90

C. 120

D. 180

Question 010

The following plant conditions exist:

- The plant is operating at 100%.
- 21 S/G feed regulating valve is in manual.
- S/G water levels are stable.
- PT-408A main feed discharge header pressure transmitter fails low.

With no operator action, what is the effect on S/G feed pumps (SGFPs) and what automatic, protective actions will take place to protect the plant from the above failure?

A. Feed pumps slow down due to pressure mismatch. Lowering S/G water levels cause reactor to trip on S/G level low-low.

B. Feed pumps slow down due to pressure mismatch. Main turbine trips on S/G low-low level. Reactor trips on main turbine trip.

C. Feed pumps speed-up due to pressure mismatch. Reactor trips on main turbine trip due to S/G High-High level.

D. Feed pumps speed-up due to pressure mismatch. Feed pumps trip on overspeed. Main turbine trips on loss of feed. Reactor trips on turbine trip.

Question 011

The following plant conditions exist:

- A transient occurs
- The steam dumps failed to open.
- The SG atmospherics failed to open.

The plant stabilizes on the first set of safety valves at 6% power. What will MBFP discharge pressure be if the control system is in automatic and operating properly?

A. 1040 psig

B. 1065 psig.

C. 1165 psig

D. 1250 psig

Question 012

Given the following conditions:

- The plant is at 50% power.
- All control systems are in their normal automatic alignments
- 21 and 22 MBFP are both running
- 21 and 23 Condensate Pumps are running
- The Condensate AUTO start circuit has not been armed yet

Which ONE (1) of the following actions is required if 23 Condensate Pump trips?

A. If Reactor Power is greater than 4%, then trip the reactor and go to E-0, Reactor Trip or Safety Injection.

B. Manually start 22 Condensate Pump and initiate a load reduction if necessary to maintain feed flow greater than steam flow or MBFP suction greater than 280 psig.

C. Manually start 22 Condensate Pump and defeat the low pressure cutback.

D. Perform SOP-20.2, Condensate System Operation, to defeat 22 Condensate Pump Auto trip and transition back to POP-2.1, Operation at Power, to stabilize Power.

Question 013

Given the following plant conditions:

- The plant is operating at 100% power.
- Normal letdown is isolated and excess letdown is in service.
- An inadvertent automatic containment Phase A signal occurs during I&C testing.

Which one of the following statement is correct as a result of the above conditions?

A. CCW flow to the RCP bearing coolers is isolated.

B. RCP seal injection flow will be maintained.

C. Excess letdown flow to the VCT must be manually isolated.

D. # 1 RCP seal return flow aligns to the RCDT

Question 014

Which of the following properly describe the design features for the containment cooling system for a design bases LOCA event?

A. Containment Fan Coolers start on Safety Injection Signal
TCV-1104 and 1105 both open on SI Signal
Containment Purge Valves get close signal from Phase A Isolation Signal
IVSW Valves open on Phase A signal

B. Containment Fan Coolers start on the Safety Injection Signal
TCV-1104 and 1105 both open on SI signal
Containment Purge Valves get close signal from Containment Ventilation Isolation signal
IVSW Valves open on Phase A signal

C. Containment Fan Coolers start on a Phase B signal
TCV-1104 and 1105 go to a preset throttle position on a SI signal
Containment Purge Valves get close signal from Containment Ventilation Isolation signal
IVSW Valves open on a Phase B signal

D. Containment Fan Coolers start on a Blackout signal
TCV-1104 and 1105 go to a preset throttle position on a SI signal
Containment Purge Valves get close signal from Containment Ventilation Isolation signal
IVSW Valves open on a Phase B signal

Question 015

RCS pressure has lowered to less than 1940 psig during a plant cooldown. The operators BLOCK the low pressurizer pressure Safety Injection by using the block switches on CCR Panel SBF-2.

Subsequently a steamline break occurs downstream of the MSIVs on the main steam east header.

Assuming no operator action, what is the expected ESF response?

A. Steamline isolation will always occur; an SI will not occur.

B. Since all ESF action blocked per 2-POP-3.3, Plant Cooldown from Mode 3 to Mode 5, no automatic ESF functions are actuated.

C. Steamline isolation and SI may occur dependent on break size.

D. Steamline isolation may occur dependent on break size; an SI will occur when a high steamline delta P signal is generated.

Question 016

A plant startup is in progress and the team is preparing to synch the generator to the grid. The following conditions exist:

- Power Level is 12%
- Rod Control is in manual
- Steam dumps are in the pressure mode of control

Assume no other operator action, what is the plant response to a Main Steam Header Pressure Transmitter failure (PT-404) failing high.

A. All 12 Steam Dump valves will go wide open, Tave will lower, and the plant will stabilize at a higher power level.

B. All 12 steam dump valves will modulate open, the plant will cool down, and the unit will trip on NIS overpower trip at 20%.

C. All 12 steam dump valves will modulate open, Tave will lower, and the unit will trip on high SG level when the level swells.

D. All 12 steam dump valves will go wide open, plant will cooldown, unit will trip and safety injection will actuate.

Question 017

Given the following conditions:

Unit 2 has just synched on line and is ramping past 15 % power.
"22" reactor coolant pump trips.

Assuming no operator actions, "22 " SG steam flow will _____and "22 " SG level will _____. (Consider the immediate effects).

A. rise; rise

B. lower, lower

C. rise, lower

D. lower, rise

Question 018

A reactor trip occurs from 100% power due to a loss of main feedwater.

The following conditions exist:

- All RCPs are running.
- The turbine driven AFW pump is in service feeding all the SGs.
- Both motor driven AFW pumps tripped upon startup and remain unavailable.
- The turbine driven AFW pump speed has begun to slowly lower due to a malfunctioning governor.

Which one of the following describes the impact on Pressurizer level if the turbine driven AFW pump speed CONTINUES to lower?

A. Lowers due to less primary to secondary heat transfer.

B. Lowers due to more primary to secondary heat transfer.

C. Rises due to less primary to secondary heat transfer.

D. Rises due to more primary to secondary heat transfer.

Question 019

The following plant conditions exist:

- A reactor trip has occurred coincident with a loss of off-site power
- 22 EDG failed to auto start
- 22 ABFP was tagged out for maintenance
- NPO has been dispatched to investigate the failure of 22 EDG
- 21 and 22 SG WR levels are 54% and lowering slowly
- 23 and 24 SG NR levels are 12% and rising slowly

The FSS and the NPO are ready to start 22 EDG. When the EDG is started and the bus is energized, the ABFP will:

A. Not automatically start because the pump 86 relay must be reset.

B. Automatically start without any time delay because SG levels are less than 10% in 2/4 SGs.

C. Not automatically start because the pump was placed in trip pull out.

D. Automatically starts after a time delay when blackout loads are sequenced on.

Question 020

The Station Service Transformer No 5 high side breaker trips open. A Diesel trouble alarm is received in the control room.

Upon investigation the following local alarms and parameters are reported by the NPO:

- Over crank Alarm
- Low Starting Air Pressure Alarm
- Engine Air starting Pressure is 60 psig and lowering
- Starting Air Receiver Pressure is 250 psig and lowering.
- The air start compressor is not running

The starting air compressors should have been started by:

A. The Non-SI Blackout signal

B. Low Engine Starting Air Pressure Switch at 90 psig.

C. Low Starting Air Receiver pressure at 275 psig.

D. The Undervoltage signal on Bus 5A

Question 021

Given the following conditions:

- The Unit is at 100% power.
- Bus 5A normal feeder breaker opens
- No faults exist on the 5A bus.
- 21 EDG tripped after it attempted to auto start.

The cause of the start failure was due to low oil pressure.

Oil has been added and the diesel is now ready for restart. In order to restart the EDG, the NPO must:

A. Reset the low pressure alarm and then manually restart the EDG.

B. Cycle the 21 EDG manual start switch to 'STOP' and back to 'AUTO'.

C. Place the control switch for breaker "5A" in the 'OPEN' position.

D. Reset the 21 EDG lockout relay, the EDG will automatically restart when the 86 relay is reset.

Question 022

Pressurizer Pressure Channel One (PT455) has failed low at 8% power. The operator has taken action per 2-AOP-INST-1, Instrument/Controller Failures, to establish pressure control.

Which bistables will already be tripped when the operators goes to trip bistables?

A. Low Pressurizer Pressure and OTDT for Loop 21

B. Low Pressurizer Pressure and OPDT for Loop 21

C. Low Pressurizer Pressure SI and SI Block Permissive

D. Low Pressurizer Pressure and Low Pressurizer Pressure SI.

Question 023

Given the following plant conditions:

- The plant is at 100% Power
- The instrument Air and Station Air systems are in their normal, automatic alignments
- An instrument Air header leak occurs, and Instrument Air header pressure has lowered to 105 psig.

Assuming NO manual actions have been taken, which ONE(1) of the following describes the air compressors that will be running:

A. Unit 2 Instrument Air Compressors, Unit 2 Station Air Compressor

B. Unit 1 CENTAC, Unit 2 Instrument Air Compressors.

C. Unit 1 CENTAC only.

D. Unit 1 CENTAC ,Unit 2 Station Air Compressor

Question 024

During the night shift the OTC notices that a loss of control power is indicated to 6900kv breakers (UT3/UT4/ST6) for Buses 3, 4, 6.

Alarm Panel checks indicate the annunicators are lost to sections FAF and FDF.

Based upon these indications the team should investigate circuit breaker problems on:

A. DC Panel 21

B. DC Panel 22

C. Instrument bus 23

D. Instrument Bus 24

Question 025

The reactor was manually tripped from 100% power when 21 MBFP tripped and the turbine failed to run back.

All equipment operated as designed, with the exception of "A" reactor trip breaker, which failed to open.

Ten minutes after the reactor trip, the following conditions exist

- Tave is stable at 542F
- All SG levels have just entered into the Narrow range.

What is the correct status of the Main Feed Water system when the control room team carries out ES-0.1, Reactor Trip Response?

	22 MBFP	Feed Reg Valves	Feedline MOVs
A.	Tripped	Open	Open
B	Running	Closed	Closed
C.	Running	Closed	Open
D.	Tripped	Open	Closed

Question 026

The following plant conditions exist:

- Letdown flow is 75 gpm
- Letdown Temperature on TE-130 is rising
- Charging Flow has risen from 54 gpm to 68 gpm
- Seal Injection Flow has lowered from 8gpm to 6 gpm per pump
- Charging Pump speed is at 100%
- VCT level is lowering
- Pressurizer Level is lowering
- Gaseous particulate radiation recorders (R-41and R-42) are normal

Based upon the above indications, a leak exists on:

A. Letdown line inside containment

B. Charging line inside containment

C. Charging line outside containment

D. Seal Injection Line outside containment

Question 027

Which of the following will result in automatic actuation with IMMEDIATE discharge of its associated fire protection medium (i.e., water, halon, carbon dioxide)?

A. 53 ft computer room is protected by a pre-actuation deluge system actuated by one ionization smoke detectors.

B. Control Room Charcoal Filter deluge system is actuated by thermistor wires in zones.

C. Main Boiler Feed Pumps are protected by foam actuated by a smoke detector.

D. Station Aux Transformer protected by water system actuated by high temperature using a thermistor wire.

Question 028

The following plant conditions exist:

- The Reactor Coolant System (RCS) is being maintained at 325F and 350 psig by steam dumps.
- The Residual Heat Removal (RHR) System is being placed in service for normal cooldown mode.
- The RHR pump 21 has been running for 12 minutes
- Service water temperature is 75F
- Chemistry Lab has reported:
  - RCS Boron concentration is - 2010 PPM
  - RCS Required Boron is ------ 2000 PPM
  - RHR Boron concentration is - 1990 PPM

Should the RHR system be placed in service to the RCS?

A. NO, RHR boron must be raised by starting the RHR pump aligned to the RWST and allowing minimum flow through the Mini-flow test lines.

B. NO, RHR boron must be raised by starting a RHR pump and allowing flow from HCV-133 to be diverted to the CVCS HUT.

C. YES, RHR may be placed in service as the difference in boron concentration for the small volume of the RHR system would not dilute the RCS to less than 2000 PPM.

D. YES, RHR may be placed in service since the boron concentration is within 25 PPM and this reactivity effect will be minimal.

Question 029

The control room has determined that the boric acid filter is clogged.

While the boric acid filter is being replaced the team should:

A. Place 22 BAST in service to allow a boration flow path to the RCS using 2-SOP-3.2,RCS Boron Concentration Control.

B. Use MOV-333 as necessary to borate the RCS using 2-AOP-CVCS-1, Chemical and Volume Control System Malfunctions.

C. Shift suction to the RWST and borate using LCV-112B using 2-AOP-CVCS-1 Chemical and Volume Control System Malfunctions.

D. Align 21 BA Transfer Pump to bypass the BA filter per 2-SOP-3.2, RCS Boron Concentration Control

Question 030

Which ONE (1) of the following describes the purpose of an asterisk (* within a circle) next to a procedure step in the EOP network?

A. Identifies steps that are on the foldout page.

B. Identifies steps with subtasks that may be performed in any order

C. Identifies steps that are continuous action steps applicable throughout the specific procedure

D. Identifies steps that are continuous actions steps throughout all the procedures

Question 031

All of the following are the responsibility of the Reactor Operator in the control room during fuel handling **EXCEPT**:

A. Apply and remove protection per tag outs.

B. Coordinate the refueling activities during core alteration.

C. Prepare work requests and radiation waste release permits.

D. Initiate holds to ensure the required plant evolutions do not violate administrative controls (procedures and Tech Specs)

Question 032

The following plant conditions exist:

- Plant is at Hot Zero Power
- Initial pressurizer pressure was 2235 psig
- PORV Block Valve 535 was inadvertently left open
- Pressurizer PORV 455C has just opened
- The operator closed the block valve
- Current pressurizer pressure is 2190 psig

Pressurizer relief tank parameters:

- Level 75%
- Pressure 6.5 psig
- Temperature 123F

What is the expected temperature indication for TE-463, PORV outlet temperature?

A. 200 F

B. 230 F

C. 260 F

D. 290 F

Question 033

Which of the following conditions below represent Saturation Conditions in the Pressurizer?

A. Pressure is 585 psig and Vapor Space Temperature is 491 F.

B. Pressure is 2185 psig and Liquid Space Temperature is 649 F

C. Pressure is 1685 psig and Liquid Space Temperature is 609 F

D. Pressure is 485psig and Vapor Space Temperature is 472 F

Question 034

Given that a 22 year old NPO is working in a radiation field under the following conditions:

The operator's cumulative dose for the year is 940 mrem.
Job is in a 20 mrem/hr radiation area
No dose extension has been authorized.

How many hours may the operator work in the radiation area without exceeding the administrative limit for the year?

A. 3 hrs

B. 53 hrs

C. 103 hrs

D. 203 hrs

Question 035

The following conditions exist for a job performed on a system:

- The general area radiation levels are 10 mrem/hr
- The hot spot in the room is a pipe elbow that has radiation levels of 100 mrem/hr
- The job will be performed near the hot spot area

Assuming transit time is the same for each case and all shielding placement is done at 100 mrem/hr, which ONE (1) of the following results in the LEAST amount of personnel exposure?

A. The job is performed by 2 operators for 3 hours each on the job at the hot spot

B. The job is performed by 2 operators for 2 hours each on the job at the hot spot and a third operator reading instructions in the general room area for 2 hours

C. Two Radiation Control personnel hang and remove 1 tenth thickness of lead shielding on the hot spot in 1.5 hours on the job. The job is performed after the lead shielding is in place by using 2 operators for 3 hours each.

D. The job is performed by 3 operators for 1 hour each on the job at the hot spot and a fourth operator reading instructions in the general area room for 1 hour.

Question 036

The following plant conditions exist:

- The plant is operating at 70% power.
- 23 EDG is OOS for a bearing replacement
- It has 24 hours remaining on its TS required action time.
- No other safeguards equipment is out of service.
- 21 MBFP trips
- 21 ABFP failed to auto start as required.

Based upon these plant conditions, and using the Technical Specifications provided, determine your required action:

A. A 3.03 shutdown because of two inoperable Aux feed Trains. You have one hour to restore one ABFP train to operable or be in Mode 3 in an additional 6 hours.

B. You declare only 21 ABFP inoperable and you now have 4 hour to restore the 23 EDG or 21 ABFP otherwise you must be Mode 3 in 6 hours.

C. You do a safety function determination to see if a shutdown is required.

D. You must declare both 21 and 23 ABFPs inoperable and you have to be in Mode 3 in 6 hours and in Mode 4 in 18 hours.

Question 037

How can the operators be assured that the Heat Flux Hot Channel Factor is being maintained within limits on a continuous basis?

A. The Heat Flux Hot Channel Factor is not measurable, but inferred from a power distribution map using the incore detectors. The map is done every 31 days and if within limits it can be inferred that it has been within limits since last performed.

B. The Heat Flux Hot Channel Factor is part of the core design and Westinghouse patterns the core design to ensure Heat Flux Hot Channel Factor will not be violated.

C. Maintaining the core within the limits of AFD, QPTR, and control rod insertion limits controls the Heat Flux Hot Channel Factor.

D. The NIS Channel Deviation will alarm if it goes above the setpoint limits and the operators will need to reduce power 1% for every percent above limits.

Question 038

The limits on RCS activity provided in Technical Specifications are based on the dose that would be received at the site boundary in a SGTR accident. Maintaining these RCS activity limits ensures that the 2-hour dose at the site boundary during a SGTR will NOT exceed:

A. 10 CFR 20 "Standards for Protection Against Radiation," limits

B. 10 CFR 100, "Reactor Site Criteria," limits

C. EPA Protective Action Guideline thresholds

D. 5 Rem TEDE for the general public

Question 039

Unit 2 is in Mode 6 and has commenced core off-load. The following conditions exist:

- 21 EDG is OOS for overhaul
- A FSB Exhaust Fan is in service
- Containment purge system is in service
- Fuel Handling Building Radiation Monitor, R-5 is OOS.

Which of the following describes the required ACTION, if any, to be taken?

A. Fuel movement in the spent fuel storage area must be suspended until an appropriate portable monitor is provided

B. Core off-load can NOT be conducted until R-5 is repaired.

C. Fuel movement may continue for up to 7 days while restoring R-5 to operable status provided a portable monitor is provided.

D. No ACTION is required, fuel movements may continue uninterrupted

Question 040

The following plant conditions exist:

- The plant is at 100% Power
- 21, 22, 23, 25 FCU are in operation
- 24FCU is OOS because of a bearing failure.
- CNTMT BLDG FAN COOLER CNDSR HIGH LEVEL alarm occurs on CCR Safety Injection Alarm Panel
- 22 FCU is the affected FCU and has a service water leak.

Based upon the above indications, the team should enter the ARP and

A. Shutdown the affected FCU, isolate SW to containment and shutdown the unit because all trains of Containment Cooling are inoperable.

B. Shutdown the affected FCU, isolate SW to the affected unit and restore one train of Containment Cooling to operable with 72 hours

C. Shutdown the affected FCU, isolate SW to the affected unit and restore one train of Containment Cooling to operable within one hour or be in Mode 3 in 7 hours .

D. Shutdown the affected FCU, isolate SW to containment reduce power to ensure containment temperature does not heat up and exceed 130F.

Question 041

The liquid release is in progress. R-54, Liquid radiation Radiation Monitor alarms.

The following actions did not occur as a result of the above condition:

- The Waste Distillate Transfer Pump remains in operation
- The WDTP discharge valves remains open

Based upon the above you must:

A. Terminate the release by locally isolating the discharge valve.

B. Locally trip the WDTP and isolate the WDTP dicharge valve.

C. Prepare a new release permit for the ongoing unplanned release.

D. Classify of the event and implement the Emergency Plan..

Question 042

Which of the following must be satisfied to cross-connect Service Air to Instrument Air inside the VC?

A. Unit must be in hot shutdown.

B. Control Room Supervisor Permission is required for connection of the temporary hoses for cross-connecting Service Air to Instrument Air.

C. Must station an operator to be available to manually close the valve.

D. Unit must be in cold shutdown.

Question 043

R-45, AIR EJECTOR RADIOGAS HI RAD/TROUBLE has just alarmed. DRMS confirms alarm is for Hi RAD.

Based on these conditions, you should do which of the following:

A. Verify MS-1132, Main Steam to Auxiliary Steam Reducer (Hogger Supply) Auto Closes.

B. Isolate SG Blowdown

C. Raise R-45 High Setpoint by ½ deceases above present R-45 reading.

D. Wait until R-49, STEAM GEN HI RAD/TROUBLE alarms, then implement 2-AOP-SG-1, SG Tube Leakage.

Question 044

The plant is operating at 15% power, when 21 RCP trips on overcurrent.

Based on these plant conditions, the following action is required?

A. Conduct an orderly shutdown using POP-3.1, Plant Shutdown Mode 1 to Mode 3, because power level is below P-8.

B. Conduct an orderly shutdown using POP-3.1, Plant Shutdown Mode 1 to Mode 3, because a manual trip is only required if we are less than 10% power.

C. Trip the reactor and enter E-0, Reactor Trip and Safety Injection, because an automatic reactor trip should have occurred.

D. Trip the reactor and enter E-0, Reactor Trip or safety Injection, because three loop operations are not procedurally allowed.

Question 045

The following plant conditions exist:

- Plant is operating at 100% Power
- Radiation alarms and chemistry samples confirm that the RCS activity has exceeded the Technical Specification limits.
- The team has commenced a plant shutdown

In addition to the plant shutdown, which of the following actions are taken in accordance with 2-AOP-HIACT-1 to minimize the likelihood of a radiological release to the environment if a SGTR were to occur at this elevated activity?

A. All the MSIV are closed after the reactor is shutdown.

B. Minimize letdown flow to the ion exchangers.

C. SG blowdown is secured.

D. The RCS is cooled down to less than 500 F after the reactor is shutdown.

Question 046

One of the key factors in calculating or estimating the off-site dose released due a waste gas decay tank rupture is the curie content of the tank.

The licensing limit for the curie content in a waste gas decay tank in accordance with the ODCM is :

A. 6,000 Curies equivalent to Xe-133.

B. 6,000 Curies equivalent to Kr-85.

C. 29,761 Curies equivalent to Kr-85

D. 29,761 Curies equivalent to Xe-133

Question 047

Which one of the following combinations of condenser vacuum conditions require an immediate reactor trip and turbine trip when operating greater than P-8?

	Condenser 21	Condenser 22	Condenser 23	Exhaust Hood Temp
A	25.6 in Hg	27.5 in Hg	26.5 in Hg	200 F for 5 minutes
B	26.0 in Hg	26.5in Hg	29.7 in Hg	180 F for 3 minutes
C	27.2 in Hg	29.5 in Hg	29.8 in Hg	245 F for 12 minutes
D	26.2 in Hg	25.7 in Hg	28.2 in Hg	180F for 6 minutes

Question 048

The following plant conditions exist:

- Plant is at 100% Power
- CCW Radiation Monitor, R-47, alarms
- CCW Surge Tank High Level Alarms
- RCV-017 (CCW Surge tank Vent) is open

The control team enters 2-AOP-LICCW, Leakage into CCW System, to mitigate the event.

Based upon the indications above, which of the following actions should be taken:

A. Manually close RCV-017 because it has no automatic action associated with it to isolate the leaking Seal Water Heat Exchanger.

B. Manually close RCV-017 because it failed to automatically close to isolate the leaking Spent Fuel Pool Heat Exchanger.

C. Manually close RCV-017 because it has no automatic actions associated with it to isolate the leaking Waste Gas Compressor Heat Exchangers.

D. Manually close RCV-017 because it failed to automatically close to isolate the leaking Non-Regenerative Heat Exchanger.

Question 049

The plant is operating at 100% power, when a Loss of 21 DC bus occurs. This results in:

- A reactor trip
- Loss of DC control power to 6.9KV breakers 5,1,2

As a result of the above event, the following will occur:

A. 21 EDG and 22 EDG will auto start and energize Bus 5A and 2A

B. Only 23 EDG will start but it will not energize Bus 6A

C. No EDGs will start and only Bus 6 A will remain energized.

D. No EDGs will start and Bus 5A and 6A will remain energized.

Question 050

125VDC Bus 22 has been lost due to a fault on the bus. Channel 2 Pressurizer Level bistables were in a tripped condition for an I&C Surveillance. All other equipment has functioned as expected. What is the effect on continued plant operation?

A. A reactor trip occurs due to a shunt trip on the "B" reactor trip breaker.

B. A reactor trip occurs due to an undervoltage trip on the "B" reactor trip breaker.

C. A reactor trip occurs due to a 2 of 4 logic met for High Pressurizer Level trip.

D. No immediate reactor trip occurs, however a 2 Hour Shutdown T.S. is entered.

Question 051

PRT temperature has slowly risen to 200F following the PORVs cycling due to a load rejection. The plant is now stable.

What is the initial method used to clear the PRT high temperature alarm in accordance with 2-ARP-SAF for (Window 1-6), Pressurizer Relief Tank Liquid High Temperature?

A. Commence pumping down PRT with the RCDT pump and refilling using makeup water.

B. Allow the PRT to cool to ambient in approximately one hour.

C. Commence spraying the PRT until temperature is less than 130F.

D. Commence pumping the PRT using the RCDT pump while concurrently spraying the PRT.

Question 052

The following plant conditions exist:

- The unit is at 100% Power
- All systems are properly aligned
- WINDOW SEF-4-7 (22 MAIN XFMR TROUBLE) is alarming
- The NPO sent to investigate reports smoke and fire coming from the transformer.
- Hot Spot temperature on the transformer is 135C.

Which one of the following actions should be taken?

A. Dispatch the fire brigade to cool the transformer using water spray.

B. Start all emergency diesel generators in anticipation of a loss of all AC.

C. Commence a rapid unit shutdown using POP-3.1,"Plant Shutdown, Mode 1 to Mode 3"

D. Trip the reactor and turbine, Enter E-0," Reactor Trip or Safety Injection."

Question 053

The following plant conditions exist:

- The Control Room has been evacuated
- The reactor was tripped from the Control Room prior to evacuation.
- You have been dispatched as the second RO and are directed to maintain SG levels.
- 21 ABFP was tagged out for maintenance yesterday for bearing replacement.
- 22 and 23 ABFPs are operating.

Which of the following actions should you take to control feed to the SGs in accordance with 2-AOP-SSD-1, Control Room Inaccessibility –Safe Shutdown Control?

A. Feed all four SGs to ensure even cooling of the RCS.

B. Feed 22 and 23 SGs to ensure steam is available to run 22 ABFP.

C. Feed 23 and 24 SGs using 23 ABFP to ensure a heat sink on the reactor.

D. Feed 21 and 22 SGs by using the control handjacks on FCV-405A/B (22 ABFP Discharge valve to 21 and 22 SGs)

Question 054

The following plant conditions exist:

- The plant is on RHR at 330psig and 300F.
- 21 RHR pump is running.
- 24 RCP is running.
- All SI pumps are available and in PULLOUT.
- 21 and 22 Charging pumps are available.

A small break LOCA occurs on the RHR pump suction line. The RHR pump was cavitating and has been stopped. Letdown has been isolated. The pressurizer is empty and RCS level is lowering rapidly. The RCS is at saturation.

Based upon these conditions, the control room team should:

A. Manually Safety Injection and enter E-0, reactor trip or Safety Injection.

B. Enter 2-AOP-RHR-1 and manually start all available Charging and SI pumps.

C. Enter AOI-4.2.2, LOCA when RCS Temperature at least 200F and less than350F, and manually start all charging pumps aligned to the RWST at maximum speed.

D. Enter AOI-4.2.2, LOCA when RCS Temperature at least 200F and less than350F, and manually start 21 SI pump

Question 055

The following plant conditions exist:

- Vital Instrument Bus 21/21A has been lost due to inverter failure.
- Pressurizer Level Channel 1 is in defeat.
- Makeup Mode Selector switch is in AUTO

The major impact in the CVCS system due to the loss of Instrument Bus 21/21A is:

A. Letdown isolation will occur and automatic makeup will not occur and valve position indications (LCV-112A/B) will be available.

B. Charging pump suction will shift to the RWST, boration from the RWST will occur, and valve position indications (LCV-112A/B) will be lost.

C. VCT level transmitter will lose power and automatic makeup will not occur and valve position indications (LCV-112A/B) will be lost.

D. Charging pump suction will shift to the RWST, boration will not occur from the RWST, and valve position indications (LCV-112A/B) will be available.

Question 056

The following conditions exist after an abnormal condition occurred:

Temperature	21 RCP	22 RCP	23 RCP	24 RCP
Highest Motor Bearing Temperature	204 F	178 F	189 F	173 F
Seal Inlet Temperature	187 F	176 F	201 F	179 F
Stator Winding Temperature	195 F	184 F	210 F	189 F

Which ONE of the following set of actions must be taken?

A. Immediately Trip the Reactor, then trip 23 RCP.

B. Perform a rapid Plant Shutdown and stop 23 RCP prior to leakoff temperature reaching 225 F.

C. Perform a rapid Plant Shutdown and stop 21 RCP prior to motor bearing temperature reaching 225 F.

D. Immediately Trip the Reactor, then trip 21 RCP.

Question 057

The following plant conditions exist:

- Unit 2 experienced a large break LOCA forty-five minutes ago.
- Containment Radiation levels are 1 R/hr on R-25/R-26.
- The team is lining up for cold leg recirc.
- Both Recirc trains are in service
- All five FCUs are in service
- 22 Containment Spray Pump was just secured at 2 feet in the RWST

Based upon the above plant conditions:

A. Spray flow is not required because adequate containment cooling exists.

B. Spray flow is not required because Tri-Sodium Phosphate will maintain the iodine in solution in the containment sump.

C. Recirc spray of 960 gpm should be established using MOV-889A or 889B and remain in service until containment spray has been in service for 3.5 hours.

D. Recirc spray of 960 gpm should be established using MOV-889A or 889B and remain in service until recirc spray has been in service for 3.5 hours.

Question 058

The following plant conditions exist:

- A SGTR exists on 21 SG
- A loss of off-site power occurred when the unit tripped.
- All EDGs started
- All ESF equipment functioned as designed.

The team has identified, isolated and has cooled down the ruptured SG to the target point. During the depressurization using the PORVs, a red path on Integrity occurs based on 21 Tcold.

Based upon these changing plant conditions, the control room team should:

A. Immediately transition to FR-P.1 to respond to the imminent challenge to Reactor Vessel Integrity.

B. Continue on in E-3 to mitigate the SGTR. If the red path still exists for twenty-five minutes when E-3 is complete, then the crew should transition to FR-P.1.

C. Continue in E-3 to mitigate the SGTR because the Tcold indication is not an accurate reading and PTS is not being challenged.FR-P.1 does not have to be implemented at this time.

D. Continue on in E-3 to mitigate the SGTR while concurrently implementing FR-P.1.

Question 059

The following plant conditions exist:

- A SGTR is in progress on 21 SG.
- The team has transitioned to E-3 to mitigate the SGTR.
- Feedwater flow was isolated to the 21 SG when NR level rose above 10% .

The OTC attempted to shut the MSIV on 21 SG. The 21 MSIV failed to close. The remaining MSIVs for 22,23,24 SGs were successfully closed from the control room. The control room team should direct the NPO to:

A. Shut the 21 MSIV locally per 2-AOP-SSD-1, Control Room Inaccessibility Safe Shutdown Control.

B. Close 21 and 22 MBFP stop valves, Air ejector stop valve, and Gland seal regulator stop valves.

C. Locally isolate the condenser steam dump valves.

D. Locally isolate 21 SG atmospheric.

Question 060

The 21 EDG is running following a recovery from a loss of all AC in ECA-0.0. The BOP reports current EDG loading is 2250 KW.

What is the minimum amount of load that would have to be shed from 21 EDG to be below the two-hour operational limit?

A. 100 KW

B. 250 KW

C. 450 KW

D. 600 KW

Question 061

FR-Z.2, Response to Containment Flooding, addresses flooding in Containment as an Orange path. Which one of the following statements describes why this condition is considered a severe challenge to a critical safety function?

A. Cold water surrounding the reactor vessel may pose a vessel integrity problem.

B. Critical components necessary for plant recovery may fail if submerged.

C. pH in the sump may be too high to ensure effective iodine removal and minimize corrosion.

D. RCS activity in the sump may cause the off-site dose limits to be exceeded if the water is transferred outside containment,

Question 062

Given the following plant conditions:

- A LOCA has occurred
- Containment Radiation Levels are 5R/hr.

Which one of the following describes the purpose of the actions provided in FR-Z.3, Response to High Containment Radiation Level?

A. Maximizes Containment cooling to prevent a loss of containment integrity with high radiation levels present.

B. Ensures all Containment Phase A and Phase B valves are closed.

C. Maximizes Containment Spray to reduce the iodine levels inside containment.

D. Reduces radioactive contaminants in the containment atmosphere by filtering.

Question 063

The following plant conditions exist:

- 22 SG is faulted outside containment
- Reactor Trip and Safety Injection have occurred.
- 22 SG was isolated using E-2, Faulted SG Isolation
- Team entered E-1, Loss of Reactor or Secondary Coolant
- Crew determined the following parameters existed at step 11 in E-1.
  - RCS Subcooling is 120F
  - RCS Pressure is 1950 psig and slowly rising
  - PZR Level is 21% and rising slowly
  - SG NR levels are greater than 15% on 22, 23, and 24 SGs.

The control room transitioned to ES-1.1, SI Termination and placed the SI and RHR pumps in Auto.

What parameters must the operators monitor to ensure SI flow is not required?

A. RCS Pressure and Pressurizer Level.

B. Core Exit Thermocouples (CET's) trends and RCS Pressure

C. RCS Subcooling and Pressurizer Level

D. Core Exit Thermocouple (CET's) trends and RCS Subcooling

Question 064

The following plant conditions exist:

- A small break LOCA occurred four hours ago.
- No high head SI pumps are available.
- No Charging Pumps are available.
- The team was proceeding through E-1 when CETs went above 700F.
- Team transitioned to FR-C.2, Response to Degraded Core Cooling
- Team commenced a cooldown at 100F/hr to inject the accumulators
- The team got a Condensate Storage Low Level Alarm on Panel SCF after transitioning to FR-C.2.
- The team transitioned to FR-C-1 when a Red Path occurred.

While the team is addressing the Red Path on Core Cooling, the CST level drops below 2 feet. The team should

A. Ensure LCV-1158, COND STORAGE TANK LCV, is closed.

B. Commence Making Up to the CST using the Dump Pump while monitoring CST level every 15 minutes.

C. Commence shifting auxiliary feedwater pump suction to city water when level lowers below 2 feet.

D. Commence shifting auxiliary feedwater pump suction to the fire main when level lowers below 2 feet.

Question 065

Which one of the following component failures is addressed by ECA-1.2,"LOCA Outside Containment"?

A. Failure of Tubing in the RHR Heat Exchanger

B. Leak upstream of the RHR Pump discharge isolation valve.

C. RCP thermal barrier rupture

D. SGTR filling the main steam lines

Question 066

The following plant conditions exists two hours following a loss of coolant accident:

- Both Spray Pumps running
- All five FCU are running
- Three SI pumps are running
- RCS Cooldown rate is 150F/hr
- No RCPs are running
- RWST level is 14 feet
- Containment Pressure is 18 psig
- Adequate subcooling does not exist to terminate SI.
- Cold Leg Recirc capability was not available
- Control Room Transitioned to ECA-1.1, "Loss of Emergency Coolant Recirculation."

Identify the strategy that is **NOT** used in ECA-1.1,"Loss of Emergency Coolant Recirculation" to cope with the plant conditions above?

A. Reducing ECCS injection flow to one train and then to a minimum to remove decay heat.

B. Stopping both Containment Spray Pumps

C. Dumping steam using the steam dumps to reduce the amount of break flow.

D. Commencing a makeup to the RWST

Question 067

Given the following plant conditions:

- Following a series of malfunctions, the operators are currently implementing ECA-0.0, Loss of All AC Power
- The safeguards equipment switches have been placed in trip pullout.
- The operators have commenced depressurizing the SGs.

Which of the following condition requires stopping the depressurization?

A. A void is drawn in the head that causes pressurizer level to rise.

B. SG NR level cannot be maintained greater than 10% in at least one SG.

C. A cooldown rate of 100F/hr is exceeded.

D. SG pressure lowers to 710 psig and the cooldown is stopped to do a controlled injection of the accumulators.

Question 068

During the performance of ECA-2.1, Uncontrolled Depressurization of All Steam generators, the following plant conditions exist:

- All four MSIVs have failed to close
- A steam break exists downstream of the MSIVs in the turbine building.
- A NPO has been directed to attempt to close the MSIVs locally.
- All SGs are 45-50% in the Wide Range
- Total AFW flow is 400 gpm. Flow was throttled to 100 gpm to each SG in E-0 because of the cooldown.
- The cooldown rate of the RCS has been 150 F in the past 15 minutes

How is the team directed to feed the SGs?

A. Feedwater flow is terminated to all but a single S/G which is fed at 85 gpm.

B. Feedwater flow is maintained at 400gpm until any SG narrow range level rises above 10%.

C. Feedwater flow is maximized to all SGs until any S/G narrow range level rises above 10% NR level.

D. Feedwater flow is reduced to 85 gpm to each S/G.

Question 069

A Steam Generator Tube Rupture (SGTR) has occurred on 21 SG. The team has completed E-0, and has just identified and isolated 21 SG in accordance with E-3.

The control room team is cooling down by dumping steam from the intact SGs to the target point. A second SGTR occurs on 22 SG. The SGTR on 22 SG can be diagnosed by a rising narrow range SG level and an rising indication on

A. Condenser Air Ejector Radiation Monitor recorder (R-45)

B. SG Blowdown Radiation Monitor recorder (R-49)

C. Main steam Line Radiation Monitor recorder (R-29)

D. N-16 Radiation Monitor (R-61B)

Question 070

A Loss of Feedwater ATWS has just occurred. The control room team is driving rods in. Under which condition below will reactivity be added at the quickest rate to return the reactor subcritical?

A. Adding boron from the RWST at Beginning of Life using LCV-112B, Charging Pump suction from the RWST.

B. Adding boron from the BAST at Beginning of Life using MOV-333, Emergency Boration Valve.

C. Adding boron from the RWST at End of Life using LCV-112B, Charging Pump Suction from the RWST.

D. Adding Boron from the BAST at End of Life using MOV-333, Emergency Boration Valve.

Question 071

A LOCA occurred 25 minutes ago and the following plant conditions exist:

- RCS Pressure is 310 psig
- RCS Tcold on loop 21 is 220 F
- RCS Tcold on loops 22-24 is 210 F
- Containment Pressure is 10 psig
- RCPs are secured.
- All SI System Pumps are running
- No RHR Flow is indicated
- RWST level is 20 feet
- E-0 Attachment 1 is complete.

Using the attached Critical Safety Function, determine if integrity is being challenged?

A. Integrity is challenged and an Orange Path exists. Enter and complete FR-P.1

B. Integrity is not being challenged because RCS Pressure is low.FR-P.1 does not have to be entered.

C. Integrity is challenged and a Red Path exists. Enter and complete FR-P.1.

D. Integrity not being challenged because both RHR pumps are running.FR-P.1 does not have to be entered.

Question 072

The following plant conditions exists at the time the control room team transitions out of E-0 to ES-0.1:

- RCS Pressure is 2100 psig and rising slowly
- Pressurizer Level is 23% and stable
- Avg Tave is 542F and stable
- Aux Feedwater Flow is 100 gpm to each SG.
- IRPIs for two control rods indicate they are greater than 7.5 inches
- PICS indicate that both rods are at 20 steps
- RCS boron is 1000 ppm

Based upon the above indications, the operators should emergency borate approximately:

A. 150-175 gallons

B. 300-325 gallons

C. 450-475 gallons

D. 900-925 gallons

Question 073

The following plant conditions exist following a small break LOCA:

- RCS Pressure is 1200 psig
- RCS is Saturated
- Off-site power is not available
- 21 and 22 EDGs have energized their respective busses.
- 23 EDG was OOS for maintenance
- Containment Pressure is 4.2 psig
- Team has transitioned to ES-1.2, Post LOCA Cooldown and Depressurization.

Based upon the above plant condition the NPOs will energize the following MCCs:

A. MCC 27A and MCC-28

B. MCC-29A and MCC-28A

C. MCC-24A and MCC-29A

D. MCC-24A and MCC-27A

Question 074

The following plant conditions exist:

- Maximum VC Pressure in the transient was 8 psig.
- RCS Pressure is 1200 psig
- RCS is saturated
- Pressurizer level is empty

What is the proper sequence to Reset Phase A/Phase B in the EOPs?

A. Reset SI by depressing simultaneously the SI reset pushbuttons, simultaneously depress Reset Phase A pushbuttons. Phase B doesn't have to be reset.

B. Reset SI by depressing pushbuttons one at a time, Reset Phase A by pushing reset pushbuttons one at a time, reset Phase B by pushing reset pushbuttons one at a time.

C. Reset SI by depressing pushbuttons one at a time, and reset Phase A by pushing reset pushbuttons one at a time. Phase B doesn't have to be reset.

D. Reset SI by simultaneously depressing the SI reset pushbuttons, simultaneously depress Reset Phase A pushbuttons, then simultaneously depress Reset Phase B pushbuttons

Question 075

Given the following plant conditions:

- A small break LOCA has occurred on Unit 2.
- Actions in ES-1.2, "Post LOCA Cooldown and Depressurization" are being performed.
- One SI Pump and three Charging Pumps are running.
- Control Room Team is maintaining a 90 F/hr cooldown rate.
- Pressurizer Level is stable and RCS Pressure is 900 psig.
- "RWST Low-Low " level alarms are received.
- RWST level is 9.2 feet

Which one of the following describes the action required?

A. Stop two charging pumps and establish normal charging and letdown and transfer suction to the VCT.

B. Ensure adequate subcooling and stop the remaining SI pump.

C. Transition to ES-1.3, Transfer to Cold Leg Recirculation

D. Transition to ES-1.3, Transfer to Cold Leg Recirculation as long as no red or orange paths exist.

Question 076

The following conditions exist on Unit 2:

- A spurious closure of 21 MSIV occurred while operating at 100% power
- The reactor tripped and immediate actions of E-0, Reactor Trip and Safety Injection were performed.
- NPO reports that the 21 MSIV was tampered with.
- The SG safeties and Pressurizer PORVs functioned as designed.
- Tave peaked at 570F and pressure peaked at 2285 psig
- Two rods failed to insert on unit trip.
- Recovery operations are in progress utilizing ES-0.1, "Reactor Trip Response"
- Team is emergency borating to offset the two stuck rods.

The NRC must be notified within one hour because:

A. the plant exceeded a safety limit

B. of the unplanned trip of the unit.

C. of the tampering with 21 MSIV causing a plant trip.

D. of emergency boration being required for shutdown margin

Question 77

The plant is operating at 100% power when the following events occur.

- Both MBFPs trip and efforts to trip the reactor were unsuccessful.
- The PORVs opened on the ATWS event as expected.
- PCV455C failed to close.
- Tailpipe temperatures are stable.
- Pressurizer relief line high temperature annunciator is illuminated.

Based upon the conditions above, when should the operator initially attempt to close the PORV and block valve to isolate the leak path?

A. Only when directed in E-0, Reactor Trip or Safety Injection.

B. The first four steps of E-0, Reactor Trip or Safety Injection, are complete by taking prudent operator action.

C. Only when directed in E-1, Loss of Reactor or Secondary Coolant.

D. When the first two step of FR-S.1, Response to Nuclear Power generation ATWS, are complete by taking prudent operator action.

Question 078

The plant is operating at 100% power with:

- Makeup control is in automatic
- VCT level is 21%
- BAST Concentration is 12%
- RCS Boron is 1100 ppm.
- Primary Makeup Controller is set for 90 gpm.
- Boric acid flow controller is set for 6.5 gpm
- Boric Acid flow deviation alarm occurs.
- VCT level low alarm is not alarming
- Valve demand indication for FCV-110A indicates closed.

Based upon the above indications, the operator should:

A. Lower the primary makeup control setpoint to stop the dilution.

B. Transfer FCV-110A to manual and lower the flow.

C. Transfer FCV-110A to manual and raise the flow.

D. Alternately borate and dilute to achieve the required boron concentration.

Question 079

Operators are attempting to restore water level in the steam generators in accordance with FR-H-1, "Response to Loss of Secondary Heat Sink" following a loss of all feedwater event.

The following conditions exist in FR-H.1:

- AFW flow has not yet been initiated.
- Bleed and Feed was initiated and only one PORV opened
- CETs are lowering.
- All SG wide range levels are 8%.
- Adverse conditions inside containment do not exist.

22 ABFP has just been restarted. Which ONE of the following statements describes the basis for maximum AFW flow rate the operators should establish, in accordance with Attachment 3 of FR-H.1, for feeding the SGs under these conditions?

A. Feed one SG at maximum rate to restore narrow range level greater than 10% to establish a heat sink to protect the core.

B. Feed all SGs at less than 100 gpm until level is narrow range level is greater than 10% to prevent a PTS challenge to the reactor vessel.

C. Feed one SG at less than 100 gpm to raise Wide range level to greater than 14% and minimize stresses to the SG, then feed flow may be raised as desired.

D. Feed all SGs at maximum rate until wide range level is greater than 14%, then check SGs intact, then feed at 100 gpm .to minimize stresses to the SG.

Question 080

The following plant conditions exist on Unit 2:

- A reactor startup is in progress
- Source range channels N31 and N32 indicate 1E4 CPS
- Intermediate range channels N35 and N36 indicate 1 X10-10 AMPS
- P-6 permissive has just come in
- Operators have just blocked the source range high flux trip

What actions are required if 21 Instrument Bus is lost?

A. Verify reactor trip due to loss of N-35 and enter E-0, Reactor Trip or Safety Injection.

B. Verify reactor trip due to a loss of N-36 and enter E-0, Reactor Trip or Safety Injection.

C. Commence a reactor shutdown by inserting all control and shutdown banks in accordance with POP-3.1, Plant Shutdown Mode 1 to Mode 3.

D. Commence a plant shutdown by inserting the control banks, and reduce power level to less than 10% power in accordance with POP-3.1, Plant Shutdown Mode 1 to Mode 3.

Question 081

The following plant conditions exist:

- 22 ABFP is tagged out for maintenance.
- 22 SI pump is OOS for bearing replacement.
- Plant was operating at 100% power when both MBFPs tripped.
- 21 and 23 ABFP tripped on overcurrent when started.
- All SG narrow range levels are off scale low.
- CETs are at 593 F and slowly rising
- The PORVs are cycling.
- NC RVLIS is 98% and lowering slowly.

While attempting to establish a heat sink on the reactor, all SG levels decrease to less than 40% on the wide ranges. The team recognizes that bleed and feed is necessary.

The team manually safety injects and both 21 and 23 SI pumps trip on overcurrent. The team should:

A. Continue on in FR-H.1 and depressurize the RCS using the PORVs to inject the accumulators.

B. Continue efforts to start a SI pump and return to step 2 in FR-H.1 to establish feedwater to the SGs.

C. Transition to FR-C.2 to establish core cooling by opening both PORVs to depressurize the primary to establish RHR flow.

D. Transition to FR-C.2 to establish core cooling by opening one PORV and starting all available charging pumps at maximum speed

Question 082

Unit 2 is performing a load reduction.

- Plant is at 97% power.
- PICS indicates that QPTR is 1.04.
- Bank D demand position is 190 steps
- A Bank D rod is at 200 steps.

Based only upon QPTR restrictions, the team must reduce power within 2 hours to:

A. 96%

B. 94%

C. 88%

D. 80%

Question 083

Given the following plant conditions:

- The Reactor is shutdown, reactor trip breakers are open
- RCS is borated to the hot shutdown, Xenon free boron concentration.
- RCS pressure is 2235 psig
- Source Range Channel N-31 is out of service for repairs
- Tavg is 542 degrees F
- Source range channel N-32 fails low

Which ONE of the following ACTIONS does 2-AOP-NI-1 require?

A. Place the Alternate Safe Shutdown Source Range Monitor in service.

B. Initiate a cooldown to cold shutdown conditions within one hour.

C. Commence monitoring the Intermediate Range Channels to determine if shutdown margin is lost.

D. Borate to cold shutdown conditions within one hour.

Question 084

In accordance with the Indian Point Unit 2 FSAR Accident Analysis, which of the following Fuel Handling Accidents conditions result in a HIGHER thyroid dose received at the Exclusion Area Boundary (EAB) than assumed in the accident analysis.

A. The decay time to fuel movement was 140 hours after shutdown.

B. The fuel handling accident was limited to one half the fuel rods in one fuel assembly.

C. The decontamination factor for iodine in the spent fuel pool or the reactor cavity was twice that assumed in the accident analysis.

D. The fuel handling accident occurred during a period with a low atmospheric dilution factor due to a temperature inversion.

Question 085

The following plant conditions exist

- A natural circulation RCS cooldown is in progress
- RCS hot leg temperatures are at 540 F
- RCS pressure is at 1880 psig and Automatic SI has been blocked
- All CRDM fans are available
- The TSC wants to cooldown at maximum rate because of limited CST availability
- RVLIS is available

What limitations are placed on the RCS cooldown rate to limit reactor vessel upper head void formation?

A. Cooldown Rate limited to 100F/ hr using a stepwise cooldown and depressurization. using ES-0.3, Natural Circulation Cooldown with Steam Void in Vessel (With RVLIS)

B. Cooldown rate limited to 100F/hr during the simultaneous cooldown and depressurization. using ES-0.3. Natural Circulation Cooldown with Steam Void in Vessel (With RVLIS)

C. Cooldown Rate limited to 100F/hr using a simulataneous cooldown and depressurization using ES-0.4, Natural Circulation Cooldown with Steam Void in Vessel (Without RVLIS)

D. Cooldown Rate limited to 100F/hr using a step wise cooldown and depressurization using ES-0.4, Natural Circulation Cooldown with Steam Void in Vessel (Without RVLIS)

Question 086

The following plant conditions exist:

- The unit is in Mode 5 with RCS temperature stable at 130 F.
- RHR pump #22 is in service.
- Temperatures in all SGs are 110 F.
- Actual Pressurizer Level is 75%

Which one of the following is **NOT** in the correct alignment to comply with the limiting condition of operation, Technical Specification 3.4.12, for the LTOP system such that a cold overpressure transient does not occur?

A. All Accumulator Outlet isolation Valves are closed and de-energized.

B. #23 High Head SI pump breaker is racked in and the pump is aligned for testing.

C. #23 Charging pump breaker is racked in and aligned for start-up for seal injection to start a RCP.

D. PZR PORV Isolation Valve MOV-535 is closed and de-energized.

Question 087

The following plant conditions exist:

- The plant is operating at 100% power
- Leakage exists past a pressurizer safety valve to the PRT.
- Safety Valve Tailpipe temperature is 210F
- The level in the PRT has trended up from 70% to 75% over the last hour.

Based upon the above conditions and using the supplied graphs, calculate and classify the leak rate to the PRT?

A. 10-11 gpm and is classified as pressure boundary leakage.

B. 10-11 gpm and is classified as identified leakage

C. 1.0-1.1 gpm and is classified as identified leakage

D. 1.0-1.1 gpm and is classified as pressure boundary leakage.

Question 088

The following plant conditions exists:

- The plant is operating at 100% power when the 21 Main Boiler Feed Pump Trips.
- The plant runs back to 70% power.
- Rods drive Delta I outside the target band but within the safe operating envelope..
- The team has commenced boration to restore Delta I.

The above transient or event is:

A. A one-hour report to the Public Services Commission due to power being reduced greater than 15%

B. A one-hour report to the NRC due to power being reduced greater than 15%.

C. A one-hour report must be because the event is classified as an Alert due to a loss of feedwater event.

D. A one-hour report must be made because of entry into Technical Specification Action statement on Delta I.

Question 089

The following plant conditions exist after a trip from full power due to a turbine trip in coincidence with a loss of off-site power.

- 23 EDG failed to start
- All rods inserted
- RCS Pressure drop to 2100 psig and is recovering
- 21 and 22 ABFPs are running
- Flows to 21 and 22 SGs are 200 gpm each.
- All NR levels are off-scale low.

The team is performing their immediate actions of E-0. What actions are required based upon plant conditions above?

A. No additional action required in E-0 because adequate heat sink is being maintained.

B. Must transition to FR-H.1 because adequate heat sink is not being maintained.

C. Must manually open 405 C/D to feed 23 and 24 SGs at 200 gpm each after raising speed of 22 ABFP.

D. Must manually open 405 C/D to feed 23 and 24 SGs at 85 gpm each after raising speed of 22 ABFP

Question 090

The 22EDG has been loaded to 1725KW and has been running for the last 60 minutes. The surveillance run is complete, how is the 22EDG shutdown in accordance with 2-SOP-27.3.2.1, 22 Emergency Diesel Generator Manual Operation?

A. Reduce load to 95-105 KW
Adjust Auto Voltage Regulator to 45-55 KVAR
Open 22 EDG Output Breaker
Place Voltage Regulator Unit Parallel Switch to UNIT
Adjust voltage to 480v using Automatic Voltage Control rheostat
Place Engine Control switch in Off

B. Reduce load to 95-105 KW
Press EMERGENCY STOP (push button)
Place the Voltage Regulator Unit Parallel Switch to UNIT
Place Engine Control Switch in off

C. Reduce load to 95-105KW
Adjust Auto Voltage Regulator to 45-55 KVAR
Open 22 EDG Output breaker
Place Voltage Regulator Unit Parallel Switch to PARALLEL
Adjust voltage to 480v using Automatic Voltage rheostat
Place Engine Control Switch to Off.

D. Reduce load to 95-105 KW
Place the overspeed trip lever to trip
Place Voltage Regulator Unit Parallel Switch to UNIT
Adjust voltage to 480v using Automatic Voltage rheostat
Place Engine Control switch to Off

Question 091

The following Unit 2 conditions exist:

- Reactor and turbine power are at 40%.
- Rod control is in manual
- All other systems are normally aligned in AUTOMATIC

If Loop 21 Thot RTD were to fail HIGH, causing indicated Tave to rise to 571F and assuming NO operator action to control charging flow, the pressurizer level will:

A. Maintain its present value because Tref did not change.

B. lower to 18% because of the Tave failure.

C. lower to 43% because NIS power did not change.

D. raise to 52.3% because of the Tave failure.

Question 092

The following Unit 2 conditions exist:

- A Steam Line Break occurred inside containment on 22 SG
- The team manually tripped the unit, Safety Injected, and entered E-0
- On the trip one of the tubes failed in 22 SG

In order to mitigate the above accident sequence, the control room team should transition in the EOP in the following manner:

A. E-0⇒E-2⇒E-3⇒ES-3.1

B. E-0⇒E-3⇒E-2⇒E-3⇒ECA-3.1

C. E-0⇒E-2⇒E-3⇒ECA-3.1

D. E-0⇒E-3⇒ECA-3.1⇒ECA-3.2

Question 093

The plant was operating at 100% power when a trip of the Main Boiler Feed Pump caused a turbine runback. When the plant stabilizes Delta I is negative outside the target band. In order to restore Delta I to the target band the operators should:

A. Withdraw control rods while raising turbine load to maintain temperature.

B. Borate while withdrawing rods to maintain temperature.

C. Borate while withdrawing rods and increasing turbine load to maintain temperature.

D. Withdraw control rods while reducing turbine load to maintain temperature.

Question 094

Which of the following situations require immediate operator action to satisfy the completion time in accordance with Technical Specifications?

A. RCS Pressure Drops below 2190 psig.

B. Individual Rod Position indication is lost due to a loss of Bus 2A during a load reduction with rods in automatic.

C. Delta I is outside the target band at 95% power.

D. The operating charging pump trips.

Question 095

You are assuming the night shift on Unit 2. Rod control is in MANUAL due to a failed TAVE/TREF comparator. Shortly after assuming the watch, you observe the following abnormal plant indications:

- Reactor coolant system temperature has rapidly lowered approximately 2F.
- S/G level deviation annunciators are illuminated.
- Automatic charging pump speed is rising.
- Overpower Delta-T Channel Trip or Rod Stop annuciator has illuminated.

Which one of the following events is the most likely cause of these indications and what procedure should be entered?

A. Dropped control rod and enter 2-AOP-ROD-1,Rod Control and Indication System Failure

B. Loss of normal feedwater and enter 2-AOP-FW-1, Loss of Main Feedwater

C. Excessive load rise and enter 2-AOP-LOAD-1, Excessive Load Increase or Decrease

D. Loss of external electrical load and enter 2-AOP-138KV,Loss of Power to 6.9KV Bus5 and/or Bus6

Question 096

The 22 steam jet air ejector (SJAE) is experiencing backfiring, and must be swapped for troubleshooting and possible repair during plant operations. How is appropriate plant configuration control maintained?

A. The Maintenance Work Package must include steps to realign valves to place 22 SJAE back into service after maintenance since there is no other means to control system status.

B. The 22 SJAE is swapped to a standby SJAE utilizing a System Operating Procedure, and as such is controlled such that configuration control is maintained.

C. The 22 SJAE must be swapped to the standby SJAE and the 22 SJAE must be tagged out for the purpose of configuration control.

D. The 22 SJAE is swapped to a standby SJAE and configuration control is maintained with a "check off list" in accordance with OAP-19, "Component Verification and System Status Control".

Question 097

You are the refueling SRO. Fuel movement is in progress. Approximately one third of the core has been off-loaded.

Which of the situations below is **NOT** within your roles and responsibilities in accordance with OAP-1, Conduct of Operations.

A. Authority to bypass interlocks on the manipulator crane.

B. Approving each step of SOP-17.31, "Refueling Operation Surveillance" to indicate the conditions of Checklists 1 and 2 are satisfied.

C. Suspend fuel movement if the audio count rate is lost in containment.

D. Report a slowly decreasing refueling cavity level

Question 098

Select the individual, which is the LOWEST level of authority, who may authorize an AIRBORNE RADIOACTIVE RELEASE PERMIT in excess of the Instantaneous Release Limit?

A. Shift Manager

B. Chemistry Supervisor

C. Operations Manager

D. General Manager Plant Operations

Question 099

The following plant conditions exist:

- A reactor trip and safety injection occurred
- All ESF equipment operated properly
- RCS pressure is 1200 psig and stable
- All SG pressures are 1000 psig and stable
- Main Steam Line Rad Monitors are normal
- Blowdown and Air Ejector Exhaust are normal
- RCS subcooling is zero
- RCPs have been tripped
- Containment Pressure is 0.2 psig
- Containment temperature is 100F.
- Pressurizer Level is 0%
- Charging Pump Rad Monitor and Plant Vent monitors are increasing

Using the supplied EAL Table , you should classify this event as a(n):

A. Unusual Event

B. Alert

C. Site Area Emergency

D. General Emergency

Question 100

Unit 2 is operating at 100% power. Security has just notified the Unit 2 control room that terrorists have just entered the protected area. In accordance with 0-AOP-SEC-1, Response to Security Compromise, you should:

A. Start 22 ABFP
Commence a Shutdown at 200Mwe/min
Declare Code Orange
Evacuate the Site

B. Start all ABFPs
Manually trip the reactor
Declare Code Red
Evacuate the Site

C. Start all ABFPs
Manually trip the reactor
Declare Code Red
Have all personnel conceal themselves

D. Start 22 ABFP
Commence a shutdown at 200Mwe/min
Declare Code Orange
Have all personnel conceal themselves.