U.S. Nuclear Regulatory Commission
Site-Specific
Written Examination

Applicant Information

Name:	
Date: 8/22/03	Facility/Unit:: Waterford III
Region: I / II / III / (IV)	Reactor Type: CE
Start Time:	Finish Time:

Instructions

Use the answer sheets provided to document your answers. Staple this cover sheet on top of the answer sheets. To pass the exam you must achieve a final grade of at least 80.00 percent overall, with a 70.00 percent or better on the SRO-only items if given in conjunction with the RO exam; SRO-only exams given alone require an 80.00 percent to pass. You have eight hours to complete the combined examination, and three hours if you are only taking the SRO portion.

Applicant Certification

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

_____
Applicant's Signature

Results

RO / SRO-Only / Total Examination Values	_____ / _25.00 / _25.00 Points
Applicant's Scores	_____ / _____ / _____ Points
Applicant's Grade	_____ / _____ / _____ Percent

NUREG-1021, Draft Revision 9

1.

The reactor was at 100% power. Two CEAs fell into the core and the reactor was manually tripped. During Standard Post Trip Actions, the following items were reported:

- Feedwater Pump A tripped on low lube oil pressure.
- Startup Feedwater Regulating Valve B had to be manually placed to 20% open.
- Startup Transformer A differential current trip was detected and EDG A failed to start.
- Pressurizer Pressure dropped to a low value of 1950 psia and all Pressurizer Backup Heaters had to be manually started.

Assuming all other indications responded as expected for an uncomplicated trip. As CRS, which Emergency Operating Procedure would you transition to and why?

A. OP-902-001, Reactor Trip Recovery, because procedure supports loss of power to one train of offsite power.

B. OP-902-003, Loss of Offsite Power/Loss of Forced Circulation Recovery, due to loss of electrical busses.

C. OP-902-006, Loss of Main Feedwater Recovery, due to loss of the feedwater pump.

D. OP-902-008, Functional Recovery, due to not meeting all safety functions in OP-902-000.

2.

The following conditions exist:

- RCS Pressure is currently 1050 psia and stable.
- 100 gpm HPSI flow to each cold leg loop indicated on CP-8.
- Containment pressure and Quench Tank pressure are 25 psia and rising together.
- T-cold, T-hot, and Representative CET temperatures indicate 545 °F.
- QSPDS levels 1 through 6 indicate voided on QSPDS 1 and 2
- Vessel Plenum level on CP-7 reads 40%
- SG 1 level is cycling between 68 and 71% WR
- SG 2 level is 57% WR and dropping slowly
- Pressurizer level is 100%.

Which course of action should you order?

A. Stop one HPSI pump and throttle flow on the other train.

B. Stop Both HPSI pumps one pump at a time.

C. Continue to allow full HPSI flow into the RCS.

D. Restore Letdown to service and attain Pzr level 33 - 60%.

3.

Given the following:

- Containment Pressure = 18.0 psia
- S/G 1 pressure = 800 psia; S/G 2 pressure = 780 psia
- S/G 1 level = 70% WR; S/G 2 Level = 68% WR
- EFAS-1 and 2 were manually initiated and controllers are in Auto
- Representative CET temperature is 380ºF
- RCS pressure = 250 psia
- RVLMS indicates 0% head level and 100% plenum level
- RAS has occurred
- LOCA occurred at 1520; Current time is 1800

Which of the following actions would be appropriate at this time?

A. Reset Containment Spray Actuation Signal to minimize corrosion of containment components and H2 generation.

B. Align one train of Shutdown Cooling for operation and commence RCS cooldown.

C. Restart one Reactor Coolant Pump in each loop to maximize heat removal capability.

D. Depressurize the S/Gs to restore them as a heat sink and cool the RCS to restore subcooled margin.

4.

Given the following;

- The plant is in Mode 5.
- Shutdown cooling is in operation.
- RCS level currently at 15 feet 1 inch and lowering.
- Containment Sump and Safety Injection Sump levels rising.

Which of the following procedures would be fully implemented at this time?

A. OP-901-111, Reactor Coolant System Leak.

B. OP-901-131, Shutdown Cooling Malfunction.

C. OP-902-002, Loss of Coolant Accident Recovery.

D. OP-902-008, Functional Recovery Procedure.

5.

Which one of the following events requires a notification to the NRC via ENS within ONE hour?

A. Exposure of .5 REM to the hands of a Radiation Technician while handling special nuclear material.

B. The reactor failed to trip automatically when TWO RC pressure instruments exceeded their reactor trip setpoint.

C. An unplanned reactor trip occurs from 100% power, due to failure of a main feedwater pump turbine.

D. One train of HPSI is inoperable for two hours due to inadvertently isolating a train while hanging clearance tags.

6.

Given the following conditions;

- A tube rupture has occurred in S/G 1
- The main condenser is not available.
- A cooldown using the Atmospheric Dump Valves is required.
- MSL 1 Radiation Monitor reads 20 mR/hr.
- Met. Tower data;
  - Wind Speed = 1.8 m/sec
  - Differential Temp = -0.75 ºC

Using the Nomogram, determine the projected TEDE dose at the exclusion area boundary for a 2 hour event duration.

A. 50 mrem

B. 100 mrem

C. 160 mrem

D. 200 mrem

7.

Given the following Conditions:

- At 0800 a Station Blackout occurred
- Restoration of AC power is not anticipated until 1130.

Which of the following describe when you as the CRS must instruct the NPO to have the steps for reducing unnecessary station Battery loads completed?

A. 0815

B. 0830

C. 0845

D. 0900

8.

While at 80% power, a shutdown bank CEA drops into the core. In accordance with the Tech Spec COLR, a downpower must be completed within _____ minutes to a maximum power level of _____, to ensure _____.

A. 60,50%, the potential effect of CEA misalignment limited to acceptable levels.

B. 45,60%, the potential effect of CEA misalignment limited to acceptable levels.

C. 60, 50%, values used in CPCs for azimuthal power tilt remain valid.

D. 45, 60%, values used in CPCs for azimuthal power tilt remain valid.

9.

The reactor is at 90% power. While performing OP-903-005, Control Element Assembly Operability Check, the following indications are noted while inserting CEA 41:

- CEAC 1 PID 041 = 144.25”
- CEAC 2 PID 041 = 143.5”
- CEA 41 Pulse Counter indication = 148.5”

All other CEA PIDs indicate 150.0” on CEAC 1 and CEAC 2 and Pulse Counter indication. Attempts to withdraw CEA 41 with I&C personnel monitoring CEA 41 at the CEDMCS panel results in the following indication:

- CEAC 1 PID 041 = 144.25”
- CEAC 2 PID 041 = 143.5”
- CEA 41 Pulse Counter indication = 150.75”
- I&C reports CEA 41 ACTM card is malfunctioning

Based on these indications, what actions are required?

A. Enter 3.1.3.1 action a only

B. Enter 3.1.3.1 action a and 3.1.3.1 action d

C. Enter 3.1.3.5 only

D. Enter 3.1.3.5 and 3.1.3.1 action d

10.

A liquid radioactive release of the Boric Acid Condensate Tank is to be performed.

Given the attached Liquid Radioactive Waste Release permit for your review, determine which of the following would give you grounds for not approving the release?

A. CWPs available are less than CWPs required.

B. Dilution Flow is less than minimum required.

C. Max waste flow exceeds maximum limit allowed by procedure.

D. Sample collected prior to minimum required recirculation time.

11.

Given the following;

- EDG B is out service for preventive maintenance
- HPSI pump B is out service for preventive maintenance
- LPSI pump B is out service for preventive maintenance
- Charging pump AB is out service for seal water replacement
- A cable spreading room fire is in progress.
- You have ordered a control room evacuation.

Which of the following components would you make the highest priority for returning to service?

A. HPSI pump B

B. EDG B

C. LPSI pump B

D. Charging pump AB

12.

Given the following:

- You are the SRO in charge of fuel handling.
- A core reload is in progress
- The phone talker informs you that the control room is being evacuated due to a fire in CP 8 and communications will be secured.
- Currently a new fuel bundle is being moved from the Spent Fuel Pool to the core and is inserted two feet into its core location.

Which of the following is the appropriate action?

A. Secure all movement of the fuel bundle and suspend core alterations.

B. Seat the fuel bundle in the core location, ungrapple the fuel bundle and reestablish communications prior to continuing.

C. Return the fuel bundle to the Rx Bldg Upender and suspend core alterations.

D. Raise the fuel bundle into the fuel mast and de-energize the Refueling Machine, reestablish communications prior to continuing.

13.

During calibrations of the Narrow Range (0-750 psia) Pressurizer Pressure loops, the following as-found values were obtained for the pressure interlocks that affect the following valves:

- SI-401 A, SDCS Loop 2 Inside Containment Upstream Isolation - 410 psia
- SI-401 B, SDCS Loop 1 Inside Containment Upstream Isolation - 425 psia
- SI-331 A, Safety Injection Tank 1A Isolation - 515 psia
- SI-332 A, Safety Injection Tank 2A Isolation - 518 psia

Which of the valves is inoperable?

A. SI-401 A

B. SI-401 B

C. SI-331 A

D. SI-332 A

14.

Given the following conditions:

- LETDOWN HX OUTLET TEMP HI (G-B1), annunciator in alarm.
- Letdown heat exchanger Temperature control CC-636 has failed closed due to a broken instrument air line.
- LD HX Tube Outlet Temperature CVC-ITI-0224, currently reads 200 ºF and steady.

All of the following actions are applicable for the conditions given **EXCEPT**:

A. Remove purification filter from service within 1 hour.

B. Verify ion exchangers bypassed.

C. Dispatch NAO to slowly open CC-636 Letdown HX TCV.

D. Isolate charging and letdown.

15.

A Main Steam Line Break has occurred. A cooldown is desired. The following conditions exist:

- The reactor tripped one hour ago
- Two RCPs are operating
- T_h is 450°F
- Condensate Storage Pool level is 72.7%
- DWST level is 45%
- EFW is supplying the intact Steam Generator

Evaluate Condensate inventory and determine the maximum time remaining to place Shutdown Cooling in service.

A. 8 hrs

B. 11 hrs

C. 15 hrs

D. 22 hrs

16.

Given the following;

- EDG A is being taken out of service for preplanned PMs to replace fuel oil and lube oil filters and replace lube oil.
- A temporary EDG is aligned for backup of EDG A.

Which of the following is **NOT** required to be performed at any time during the EDG A outage?

A. OP-903-066, Electrical Breaker Alignment Check within one (1) hour of declaring EDG A inoperable.

B. A manual start of EDG B within eight (8) hours of declaring EDG A inoperable.

C. OP-903-068, Emergency Diesel Generator and Subgroup Relay Operability Verification.

D. Restore EDG A to operable status within 10 days of taking the diesel out of service.

17.

Given the following initial conditions:

- The plant is in MODE 5 preparing for entry into MODE 6.
- An RCS drain down is in progress to install nozzle dams in each steam generator.
- PZR level is currently at 30% Cold Cal.
- Jumpers have been installed on 1 CET for QSPDS 1 and 1 CET for QSPDS 2 to facilitate the drain down, all other CETs are currently disconnected.
- The CRS notes that the dedicated CET from QSPDS 1 is no longer providing valid readings.

Which of the following would be required?

A. Stop the RCS drain down immediately and refill to ≥ 75% Cold Cal PZR level and restore at least two CETs from either QSPDS before continuing.

B. Stop the RCS drain down before lowering RCS level < 5% Cold Cal PZR level and restore at least two CETs from either QSPDS before continuing.

C. Stop the RCS drain down prior to lowering RCS level < 18 ft MSL and restore 1 CET from QSPDS channel 1 before continuing.

D. Stop drain RCS down immediately and restore 1 CET from QSPDS channel 1 before continuing.

18.

ANP 102 goes closed due to Safety Injection actuation relay circuit failure, causing Annulus Negative Pressure (ANP) fans to secure.

Which of the following describe the compensatory measures required to be implemented.

A. Establish a fire watch within 1 hour.

B. Return a ANP fan to service within 8 hours

C. After 14 days establish a fire watch within 1 hour.

D. Verify annulus temperature less than 120°F once per hour.

19.

The plant is operating at 100% power. The Shift Manager on shift plans to observe the TB Watchstander perform a task in the plant.

What minimum requirement has to be met prior to the Shift Manager leaving the Control Room for the observation?

A. Assign the STA (on shift) the Control Room Command function.

B. Assign an SRO (other than the STA) the Control Room Command function.

C. Log his beeper number and expected location in the Station Log.

D. Perform a shift turnover to another qualified Shift Manager.

20.

The plant is operating at 100% power with Dry Cooling Tower Fans 2B, 6B, 7B, and 15A out of service. The control room is monitoring dry bulb temperatures every two hours. The last set of readings were taken 5 minutes ago and indicate as follows:

Dry Bulb Temperature = 84.3°F

You are informed via the Civil Defense Radio that National Weather has issued a Severe Thunderstorm Warning and a Tornado Watch for Tangipahoa, St. Tammany, Jefferson, Orleans, St. Charles and St. John parishes. Assuming no other equipment is out of service, which of the following describes the required actions to be taken?

A. Enter TS LCO 3.7.4 Action a and perform actions within the required time frames.

B. Enter TS LCO 3.7.4 Action b and perform actions within the required time frames.

C. Enter TS LCO 3.7.4 Action c and perform actions within the required time frames.

D. Remain in TS LCO 3.7.4 Action d and continue actions within the required time frames.

21.

The plant is in Mode 6 preparing to commence core alterations. Core alterations are scheduled to start on 8/22/03 at 1400. Refueling activities are currently on schedule. TS Boration flowpath is BAM Tank A and gravity feed valves via Charging Pump A. The following surveillances were last performed at the following times:

- OP-903-002, Boration Flowpath Valve Lineup Verification – 1800, 7/23/03
- OP-903-003, Charging Pump Operability Check, Charging Pump A – 1400, 5/10/03
- OP-903-101, Startup Channel Functional Test, Startup Channel 1 – 0500, 8/22/03
- OP-903-101, Startup Channel Functional Test, Startup Channel 2 – 0700, 8/22/03

Which surveillance must be performed prior to commencing core alterations, if refueling activities remain on schedule?

A. OP-903-002

B. OP-903-003

C. OP-903-101, Channel 1

D. OP-903-101, Channel 2

22.

Which of the following personnel are authorized to suspend core alterations?

A. Shift Manager and Refueling Director

B. Refueling Director and Refueling Controller

C. Refueling Controller and Fuel Handling Supervisor

D. Fuel Handling Supervisor and Shift Manager

23.

Given the following:

- A Large Break LOCA has occurred
- HPSI Pump A has developed a 40 gpm leak on the pump suction
- Attempts to isolate HPSI Pump A from the Safeguards Valve Gallery failed due to a broken reach rod on the suction isolation valve
- All ESF Pumps are taking a suction from the SI Sump
- An Emergency Team member has volunteered to enter Safeguards Pump Room A to close HPSI Pump A suction valve locally

The maximum allowed TEDE exposure that the Emergency Coordinator can authorize the Emergency Team member to receive while performing this evolution is:

A. 10 REM

B. 25 REM

C. 75 REM

D. 100 REM

24.

Given the following conditions:

- A pipe that carried Vinyl Chloride failed at Dow Chemical
- The leak has not been isolated
- Failure time was 09:50
- Current time is 09:56
- The plume travel time is 25 minutes, based on current wind speed
- Wind direction is from 135°

What emergency classification should you declare and which Tab of EP-004-010 should be implemented?

A. Declare an Unusual Event and implement Tab A, Standby

B. Declare an Alert and implement Tab B, Site Evacuation

C. Declare an Alert and implement Tab C, Shelter

D. Declare a Site Area Emergency and implement Tab C, Shelter

25.

OP-902-008, Safety Function Recovery Procedure has been implemented. Refer to the attached Safety Function Tracking Sheet and determine the priority for addressing the safety functions.

A. 1, 2, 3, 4, 5, 6, 7, 8, 9

B. 1, 7, 5, 2, 8, 3, 4, 6, 9

C. 1, 7, 2, 3, 8, 4, 5, 6, 9

D. 1, 5, 6, 2, 7, 3, 4, 8, 9

KEY

1. A
2. C
3. D
4. B
5. B
6. B
7. B
8. B
9. C
10. D
11. B
12. C
13. B
14. D
15. C
16. B
17. C
18. A
19. B
20. C
21. C
22. D
23. A
24. C
25. B