Draft Submittal
(Pink Paper)

1. Senior Reactor Operator Written Exam

WATTS BAR EXAM 2003-301
50-390/2003-301

MAY 15, 2003

WATTS BAR NUCLEAR PLANT
SENIOR REACTOR OPERATOR NRC EXAMINATION
MAY 12, 2003

1. Given the following plant conditions:

   - Control rods are moving at 8 steps per minute.
   - Control Rods are in AUTO.
   - Reactor power was initially 75% and stable, but is now rising slowly.
   - Tavg was 580°F and stable but is now rising slowly.
   - Tref was 579°F and is currently stable at that value.
   - Turbine load is 560 MWe and stable.

   Which ONE of the following describes the event responsible for these plant conditions and the appropriate operator response?

	Event	Operator Action
A.	Continuous rod withdrawal	Place rod control in MANUAL
B.	Continous rod insertion	Place rod control in MANUAL
C.	Continuous rod withdrawal	Trip reactor and go to E-0
D.	Continuous rod insertion	Trip reactor and go to E-0

2. Given the following plant conditions:

   - The Unit was at 100% RTP.
   - A runback has occurred due to a #3 HDTP trip and the plant is stable.
   - Control Bank D Rod H-12 dropped into the core as rods stepped in to control Tavg.
   - The operators are preparing to recover Rod H-12.

   Which ONE of the following describes the status of Control Rod H-12 at this time?

   A. The rod is considered operable since it can be moved by the control rod drive mechanism.

   B. The rod is considered operable since it meets the required rod drop time by being on the bottom.

   C. The rod is considered inoperable because it is more than 12 steps out of alignment with it's bank.

   D. The rod is considered inoperable because it can not perform it's required function of controlling axial flux difference (AFD).

3. What actions are performed in ES-0.1, Reactor Trip Response, if 3 control rods are not fully inserted (rod bottom lights NOT lit and the the RPIs are NOT at bottom of scale) and why?

   A. Borate 6300 gallons of boric acid from the BAT, ensures adequate shutdown margin.

   B. Borate 9750 gallons of boric acid from the RWST, ensures adequate shutdown margin.

   C. Borate 9750 gallons of boric acid from the BAT, ensures adequate shutdown margin.

   D. Borate 9750 gallons of boric acid from the BAT, ensures sufficent boron concentration to allow the RCS to cool down to 551 degrees.

4. Which ONE of the following is the basis for tripping the Reactor Coolant Pumps (RCPs) when RCS pressure is <1500 psig following a large break LOCA?

   A. Preclude core uncovery from RCPs tripped later in the event.

   B. Prevents unnecessary loss of forced circulation during a steam line break.

   C. Prevents sudden uncovery of the core after inventory depletion during a small break LOCA.

   D. Ensures core heat removal to help prevent peak clad temperatures from exceeding 2200 degrees F during a LOCA.

5. Given the following plant conditions:

   - Reactor power is stable at 15%.
   - Control rods in MANUAL.
   - Crew is in process of transferring station service from alternate to normal.
   - Loop 4 RCP trips while transferring from alternate power to normal.

   Which ONE of the following identifies the correct response of core exit temperature and loop 4 Tavg immediately following Trip of loop 4 RCP?

	Core Exit Temp	Loop 4 Tavg
A.	Rises	Rises
B.	Rises	Drops
C.	Drops	Drops
D.	Drops	Rises

6. Given the following plant conditions:

   - While at 100% power a control problem caused Bank D control rods to insert.
   - The operator placed rod control in MANUAL and stopped the rod insertion.
   - ROD INSERTION LIMIT LO-LO annunciator is lit.
   - Rods cannot be moved until trouble shooting is complete.
   - The operator began immediate boration in accordance with AOI-34, Immediate Boration.
   - 1-FCV-62-138, Emergency Borate Flow Control Valve is mechanically bound and cannot be opened.

   Which ONE of the following actions would the operator be directed to take next in accordance with AOI-34?

   A. Align RWST to the CCP suction by opening 1-FCV-62-135 and -136 and closing 1-FCV-62-132 and -133.

   B. Bypass CVCS mixed bed to eliminate potential for deboration.

   C. Place normal boration in service to the CCP suction.

   D. Locally open manual boration valve 1-ISV-62-929.

7. Given the following conditions:

- The plant is at 100% power and BOL conditions.
- The crew implemented AOI-15, Loss of Component Cooling Water (CCS).
- The U1 CCS surge tank level is rising and the crew has determined that A CCS Hx has a tube leak.

How should the crew respond to the above?

A. Trip the reactor then stop the RCPs then enter E-0, shutdown the A train CCS and pull to lock all A train ECCS pumps.

B. Adjust ERCW pressure to be slightly to less than CCS pressure and shut the unit down.

C. Crosstie A train CCS header to B train CCS header and place additional B train ERCW pumps inservice and shutdown the unit.

D. Adjust ERCW pressure to be slightly greater than CCS pressure and check if CCS Hx can remain inservice.

8. Given the following conditions:

   - Plant is operating at 100% power with all systems normal.
   - A primary transient results in RCS pressure dropping to 1750 psig and subsequently stabilizing at 1810 psig.
   - The operating crew manually initiated Safety Injection and Reactor Trip.
   - Both reactor trip breakers RTB "A" and "B" fail to open.
   - The Operating crew implements FR-S.1, ATWS.
   - The Turbine Bldg AUO trips both CRD M-G Sets at the 480V Unit Boards.
   - All rods insert into the core after CRD M-G-Set output voltage decays.
   - The OAC depressess both SI RESET TRAIN A(B) reset pusbuttons and both RESET PHASE A TRAIN A(B) CNTMT ISOL pushbuttons.

   Under these conditions, which ONE of the following describes the status of the block/reset circuitry?

   A. NEITHER Train "A" or "B" SI will reset; NEITHER Train "A" and "B" Phase A will reset.

   B. BOTH "A" and "B" SI will reset; BOTH Train "A" and "B" Phase A will reset.

   C. NEITHER Train "A" or "B" SI will reset; BOTH Train "A" and "B" Phase A will reset.

   D. BOTH "A" and "B" SI will reset; NEITHER Train "A" and "B" Phase A will reset.

9. Given the following conditions:

   - #2 S/G PORV has failed open and is unable to be isolated.
   - #2 S/G pressure is 0 psig.
   - #1 RCS Thot = 450°F
   - #3 RCS Thot = 440°F
   - #4 RCS Thot = 460°F.
   - All Core Exit Thermocouples are 460°F
   - All Tcolds are 435 °F
   - RCS temperatures are slowly rising.
   - E-2, Faulted Steam Generator Isolation, is being performed.

   Using Steam Tables determine which ONE of the following pressures the PORVs on the intact steam generators should be set for to stabilize RCS temperature?

   A. 362 psig

   B. 482 psig

   C. 452 psig

   D. 467 psig

10. Which ONE of the following combinations requires BOTH the reactor and the turbine to be tripped per AOI-11, " Loss of Condenser Vacuum"?

A. Generator Load 640 MWe; Condenser Back Pressure 3.9 in Hga.

B. Generator Load 620 MWe; Condenser Back Pressure 5.6 in Hga.

C. Generator Load 560 MWe; Condenser Back Pressure 4.8 in Hga.

D. Generator Load 540 MWe; Condenser Back Pressure 5.9 in Hga.

11. Given the following conditions:

- The plant is in Mode 6 with refueling in progress.
- 1A RHR pump is in service.
- A total loss of offsite power occurs resulting in a loss of onsite power.
- All of the Emergency DGs start and reenergize the shutdown boards.
- 1A-A RHR pump fails to restart due to a mechanical breaker problem.

How should the crew respond?

A. Perform AOI-14 Loss of RHR Shutdown Cooling.

B. Notify the Fuel Handling Supervisor to evacuate containment.

C. Begin a feed and bleed on the refuel cavity to maintain RCS temperature.

D. Place the B RHR pump in service per SOI 74.01 Residual Heat Removal System.

12. Given the following plant conditions:

    - Unit 1 at 100% power
    - Alarms received indicate a failed electrical board
    - Other indications are:
        - All trip status lights out on 1-XX-55-5 Panel (1-M-5).
        - Low seal flow to RCP's due to FCV-62-89 failing open.
        - High charging flow due to FCV-62-93 failing open.

    Which ONE of the following identifies which electrical board that was lost?

    A. 120 VAC Vital Instrument Power Board 1-I.

    B. 120 VAC Vital Instrument Power Board 1-II.

    C. 125 VDC Vital Battery Board I.

    D. 125 VDC Vital Battery Board II.

13. Given the following:

- WBN Unit 1 at 100%
- Relay testing in progress for "A" phase Main Bank transformer.
- All other conditions normal
- A Customer Group technician accidentally shorts the differential relay on "A" phase Main transformer.
- The unit trips and the crew enters E-0, Reactor Trip or Safety Injection, then transitions to ES-0.1, Reactor Trip Response.
- While performing ES-0.1 the Unit Operator announces alarm 180-B, ERCW Disch Hdr A 0-RM-133/140 Liq Rad Hi, in alarm.
- The Chemistry lab and Radcon are notified.

What other actions should the crew take?

A. Continue with ES-0.1 until the transition to the GO-5, Unit Shutdown from 30% Reactor Power to Hot Standby.

B. Continue with ES-0.1 while concurrently referring to AOI-31, Abnormal Release of Radioactive Material.

C. Discontinue ES-0.1 and perform AOI-31, Abnormal Release of Radioactive Material, to completion.

D. Discontinue ES-0.1 at step 12 and transition to AOI-31, Abnormal Release of Radioactive Material.

14. Which ONE of the following ERCW supply headers can be aligned to CCS heat exchanger "A" if the normal supply of ERCW is unavailable?

    A. 1A

    B. 1B

    C. 2A

    D. 2B

15. Which ONE of the following describes why some ventilation systems may have to be shut down per Appendix A of AOI-30.1, Plant Fires, when a fire occurs in their area?

    A. Fire dampers may not fully close under normal ventilation flow conditions.

    B. Enable Fire Ops to ventilate as needed for fire suppression.

    C. Prevents overloading the electrical boards feeding these ventilation systems.

    D. Allows the Tornado Dampers to open if required.

16. Given the following plant conditions:

    - MCR evacuation is required due to the presence of hazardous gases.
    - Manual Reactor trip has been performed.
    - Operators are performing AOI-27, "MCR Inaccessibility".

    Which ONE of the following actions will be performed by the Control Room operators PRIOR to MCR evacuation?

    A. Manually actuate Safety Injection.

    B. Stop all RCPs and verify natural circulation.

    C. Adjust SG PORVs and close all MSIVs.

    D. Adjust Steam Dumps to control RCS temperature at 557°F.

17. Per Tech Spec Basis regarding high containment pressure, which ONE of the following events could lead to the highest pressure/leakage out of containment?

    A. Design Basis LOCA.

    B. Design Basis Steam Line Break inside Containment.

    C. Rod Ejection Accident.

    D. Pressurizer vapor space LOCA.

18. Given the following conditions:

    - Performing FR-C.1, Inadequate Core Cooling
    - Operators were successful at restoring ECCS flow.
    - The RCS indicates 348°F and 131 psig on RVLIS.

    Which one of the following describes the state of the RCS?

    A. Subcooled Liquid.

    B. Saturated Liquid.

    C. Super Heated Vapor.

    D. Saturated Vapor.

19. Which ONE of the following correctly describes the indication on the main steam line radiation monitors when the MR/HR AUTO pushbutton is lit on the RM-23 readout module?

    A. Indicates low range output only.

    B. Indicates high range output only.

    C. Automatically switches between the low and high range outputs every 45 seconds.

    D. Automatically switches between low and high range output based upon activity level in order to maintain accurate indication.

20. Given the following conditions:

- Plant automatic trip and safety injection occurred due to containment high pressure.
- Lower Cntmt Radiation Monitor, 1-RM-90-106, is in alarm.
- The operating crew transistioned to E-2 Faulted Steam Generator Isolation due to the CRO misreading the #1 SG pressure.

Upon realizing the CRO's error, which ONE of the following identifies the correct transition that the Unit supervior should make from E-2, Faulted Steam Generator Isolation?

A. Transition back to E-0, Reactor Trip or Safety Injection.

B. Transition to E-1, Loss of Reactor or Secondary Coolant.

C. Continue in E-2, Faulted Steam Generator Isolation, until completion.

D. Transition to ES-0.0, Rediagnosis.

21. Given the following conditions:

    - A LOCA outside containment has occurred.
    - SI was manually actuated.
    - The crew has completed ECA-1.2, LOCA Outside Containment, and transistioned to ECA-1.1, Loss of RHR Sump Recirculation.

    What is the basis for resetting the SI interlock to RHR sump suction Auto-swapover, 1-HS-63-72D and 73D?

    A. To prepare the plant for cooldown to cold shutdown.

    B. To prevent damage to the SI pumps.

    C. To prepare the RWST for refill from the containment sump.

    D. To prevent inadvertent loss of RWST inventory due to automatic switchover.

22.
Given the following plant conditions:

- Unit 1 has experienced a Small Break LOCA.
- RCS pressure is stable at 1535 psig.
- RCP's are shutdown
- RVLIS indicates 30%.
- Highest Core Exit T/C reading 601°F.
- Annunciatior window 91A PZR PORV/SAFETY OPEN is in alarm.
- The crew is performing FR-C.2, Response to Degraded Core Cooling.

Which ONE of the following is the response to the ARI?

A. Determine if PORV should be open per COMS setpoint and close block valve if the PORV should be shut.

B. Determine if PORV should be open per normal setpoint and close block valve if the PORV should be shut.

C. Determine if PORV should be open per COMS setpoint and remove the fuses which provide power to the PORV.

D. Determine if PORV should be open per normal setpoint and remove the fuses which provide power to the PORV.

23. During the performance of FR-P.1, "Pressurized Thermal Shock", operators are allowed to terminate SI using less restrictive criteria than in other Emergency Operating Instructions.

    Which ONE of the following describes why it is desirable to terminate SI during the performance of this procedure?

    A. Minimizes temperature stratification in the loops allowing a more accurate indication of RCS temperature.

    B. Minimizes RCS temperature drop and pressure rise due to excessive ECCS flow.

    C. Allows RCS pressure to drop to saturation conditions to relieve pressure stresses on the reactor vessel.

    D. Allows voids to form in the SG U-tubes to stop Natural Circulation and subsequent RCS cooldown.

24. After a reactor trip from 100% power and a Loss of Offsite Power the following conditions exist:

- ES-0.3, Natural Circulation Cooldown With Steam Void In Vessel is in progress.
- Pressurizer level is stable at 50%
- Letdown is established
- Charging is in manual
- Pressurizer pressure is appoximately 800 psig
- Pressure control is with the Aux Spray
- Core exit thermocouples indicate 520°F
- RVLIS indicates 80%

The Aux spray valve inadvertently strokes open causing a reduction in RCS pressure. RVLIS indication ____ (1) ____ and Pressurizer level indication _____(2)_____.

A. (1) rises (2) rises

B. (1) lowers (2) rises

C. (1) rises (2) lowers

D. (1) lowers (2) lowers

25. Given the following conditions:

- The Unit was operating at 100% power.
- A reactor trip and SI have occurred on low pressurizer pressure.
- RCS pressure dropped rapidly to 1250 psig and is now rising slowly.
- Pressurizer level initially dropped to 15%, then rose rapidly to 100%.
- Containment radiation, moisture, and pressure are high.
- PRT conditions are normal.

Which ONE of the following describes the loss of primary coolant event that has taken place?

A. Pressurizer safety valve failed open.

B. Pressurizer surge line rupture.

C. Pressurizer spray line failure at the penetration weld.

D. Reactor head vent line rupture.

26. Given the following conditions:

    - The plant was operating near the end of the fuel cycle when a small LOCA occurred.
    - The crew implemented the EOPs and are performing E-1, Loss of Reactor or Secondary Coolant.
    - E-1 directs the operators to maintain intact SG levels at 10% - 50% NR.

    Which ONE of the following describes why maintaining SGs as an available heat sink is important to the mitigation of small LOCAs?

    A. Limits steam formation in the SG tubes.

    B. Prevents RCS pressure from dropping to saturation pressure.

    C. Limits RCS pressure rise if break flow is not sufficient to remove heat.

    D. Prevents thermal shock to the SG tubes due to ECCS injection of cold water.

27. Given the following plant conditions:

    - Unit is operating steady state at 93% power.
    - VCT LEVELHI/LO annunciator alarms on M-6.
    - LI-62-129, VCT level, indicates 35% and is dropping (M-6).
    - LI-62-130, VCT level, indicates 100% (ICS).

    Which ONE of the following describes the expected plant response?

    A. PZR level will drop to 17% resulting in letdown isolation and recovery of VCT level.

    B. VCT level will continue to drop until the operator manually aligns Divert Valve, LCV-62-118, to the VCT position.

    C. Auto makeup will initiate to the VCT when LI-62-129 drops to 20% and raise VCT level to 41%.

    D. Suction to the operating CCP will automatically align to the RWST when VCT level drops to 7%.

28. Given the following plant conditions:

- Unit is in Mode 5 with a cooldown in progress.
- A train RHR is in service.
- B train RHR is available.

Which ONE of the following procedures should be entered if CCS cannot be established to either train of RHR heat exchangers?

A. ECA-1.1, "Loss of RHR Sump Recirculation."

B. AOI-14, "Loss of Shutdown Cooling", Alternate Cooling Method

C. AOI-7 "Maximum Probable Flood" for implementation of SFP Cooling/RHR cooling.

D. SOI-70.01, "Component Cooling Water (CCS)".

29. Given the following plant conditions:

 - Unit was at 100% power.
 - All systems operating in automatic and all plant parameters at their normal values.
 - A safety valve is leaking.

 Which ONE of the following identifies the approximate maximum expected temperature of the steam entering the PRT if the PRT pressure does not exceed 55 psig?

 A. 228°F.

 B. 267°F.

 C. 287°F

 D. 303°F

30. Given the following:

- Unit 1 in mode 3 with startup in progress.
- The voltage output failed high to source range monitor N132 detector causing multiple avalanches along the collecting wire.

Which ONE of the following regions of the gas-filled detector curve will N132 be operating in?

A. Continuous discharge.

B. Ionization.

C. Proportional.

D. Geiger-Mueller.

31. During the performance of ECA-3.1, "SGTR and LOCA-Subcooled Recovery", operators are directed to transition to ECA-3.2, "SGTR and LOCA-Saturated Recovery", if ruptured SG NR level reaches 85% (with TSC concurrence).

    Which ONE of the following is the basis for the transition to ECA-3.2 on high SG level?

    A. At 85% NR SG level the SG is about to go solid which will cause pressure control problems with the SG and the RCS.

    B. Allows crew to utilize the less restrictive RCS depressurization limits of ECA-3.2 in an effort to prevent a SG overfill condition.

    C. At this level, the steam bubble in the SG has been collapsed which will result in rapid depressurization of the ruptured SG if ECA-3.1 is continued.

    D. ECA-3.2 contains guidance to allow the operators to backfill from the ruptured SG in parallel with the RCS cooldown to lower ruptured SG level.

32. Given the following plant conditions:

- Steam Generator Tube Rupture has occurred.
- Crew has implemented E-3, "Steam Generator Tube Rupture".
- The operators have completed cooldown to target incore temperature observed on the core cooling monitor of 432°F.
- The MSIV's are closed.

Which ONE of the following identifies the pressure that PORVs on the SGs which are not ruptured will be set to control RCS temperature at 432°F?

A. 365 - 370 psig.

B. 335 - 340 psig.

C. 365 - 370 psia.

D. 335 - 340 psia.

33. Given the following conditions:

- The unit is at 78% power.
- #3 SG level is dropping.
- The unit operator notes that feed flow to # 3 SG is dropping.
- It's also noted that hotwell level is dropping.

Per AOI-38, a reactor trip is required if the hotwell level makeup is greater than which ONE of the following?

A. 650 gpm.

B. 850 gpm.

C. 950 gpm.

D. 1150 gpm.

34. Given the following conditions at a work site:

- Airborne activity - 3 DAC
- Radiation level - 40 mrem/hr.
- Radiation level with shielding - 10 mrem/hr.
- Time to place shielding - 15 minutes.
- Time to conduct task WITH respirator - 1 hour.
- Time to conduct task WITHOUT respirator - 30 minutes.

Assumptions:

- The airborne dose with a respirator will be zero.
- A dose rate of 40 mrem/hr will be received while placing the shielding.
- All tasks will performed by one worker.
- Sheilding can be placed in 15 minutes with or without a respirator.

Which ONE of the following would result in the lowest whole body dose?

A. Conduct task WITHOUT respirator or shielding.

B. Conduct task WITH respirator and WITHOUT shielding.

C. Place shielding while wearing respirator and conduct task WITH respirator.

D. Place shielding while wearing respirator and conduct task WITHOUT respirator.

35. Given the following conditions:

- Reactor is critical at 1% power.
- Fuel assemblies and inserts are being shuffled in the Spent Fuel Pit (SFP).
- The following alarms are received and validated in the MCR:
  - SFP 0-RM-90-102/103 RAD HI
  - 1-RR-90-1 AREA RAD HI
- The operator verified ABGTS in service and the area has been evacuated.

Which ONE of the following describes additional verification of Auxiliary Building ventilation equipment that the operator should perform?

A. Aux. Bldg. General Supply and Exhaust Fans running, Fuel Handling Exhaust Fans running.

B. Aux. Bldg. General Supply and Exhaust Fans running, Fuel Handling Exhaust Fans off.

C. Aux. Bldg. General Supply and Exhaust Fans off, Fuel Handling Exhaust Fans running.

D. Aux. Bldg. General Supply and Exhaust Fans off, Fuel Handling Exhaust Fans off.

36.
Given the following conditions:

- Unit 1 was operating at 85% power.
- A small break LOCA has occurred the BIT tank room.
- The crew has entered ECA-1.2, "LOCA OUTSIDE CONTAINMENT" and is attempting to isolate the leak.
- The crew is unable to close RHR Train A cold leg injection valve 1-FCV-63-93 from the main control room.
- The Auxiliary Building AUO has volunteered to locally close 1-FCV-63-93.
- Radcon has estimated dose in the area to be 76 R/hr.
- Estimated time to close the valve is 20 minutes.
- The Site VP has assumed the position of SED.

Who can authorize the Auxiliary Building AUO to shut the valve?

A. Plant Manager.

B. Rad Con Manager.

C. Site Emergency Director.

D. No one, evolution not permitted.

37. Which ONE of the following will cause an instrument malfunction alarm on MCR Area radiaition monitor 0-RM-90-135?

    A. Sample vacuum abnormal.

    B. Loss of voltage to the ratemeter.

    C. Filter trouble.

    D. Monitor exceeds high alarm setpoint.

38. Given the following:

- Reactor trip and SI occurred due to a small break LOCA.
- Crew progressed through the EOPs to the point of resetting SI and stopping the RHR pumps.
- RCS pressure is 1600 psig and stable.
- RCS saturated.
- Pzr level offscale low.

Which ONE of the following identifies when the RHR pumps would be required to be restarted during this event?

A. Foldout page SI reinitiation criteria is met.

B. RCS pressure drops to 370 psig.

C. RCS pressure drops to 150 psig.

D. Offsite power is lost and shutdown boards energized by DG.

39. Given the following conditions:

- The 1A AFWP is tagged for seal replacement.
- The plant tripped due to an electrical fault on the main generator.
- The crew has has completed E-0, Reactor Trip or Safety Injection and transistioned to ES-0.1 Reactor Trip Response.
- 5 minutes later 1B AFW pump trips on over current due to an electrical cord from the 1A AFW pump work wrapping around the shaft.
- The TD AFW pump fails to start due to a short in the trip and throttle valve.
- The following steam generator narrow range levels are noted:
  SG 1 at 5%
  SG 2 at 9%
  SG 3 at 8%
  SG 4 at 7%

Using EPIP-1 which one of the following will be the correct REP classification?

A. Unusual Event.

B. Alert.

C. Site Area Emergency.

D. General Emergency.

40. Given the following plant conditions:

- Unit 1 tripped due to a Large Break LOCA.
- Containment pressure =1.5 psid.
- RWST level = 20%.
- Containment Emergency Sump level = 15%.
- RHR Swapover to the Containment Sump could not be performed.
- The operating crew has transitioned to ECA - 1.1, "Loss of RHR Sump Recirculation."
- The crew is performing step 3 of ECA - 1.1, "Loss of RHR Sump Recirculation", to determine the proper Containment Spray pump alignment and operation.

Which ONE of the following actions will result in the Containment Spray pumps being in the proper alignment under the existing plant conditions?

A. Leave both Containment Spray pumps running until RWST level ≤ 8%.

B. Stop both Containment Spray pumps and place handswitches in "pull-to-lock."

C. Stop one Containment Spray pump and allow the remaining pump to take suction from the RWST.

D. Stop both Containment Spray pumps, until suction can be aligned to the Containment Sump, then restart one pump.

41. Given the following:

- Unit 1 is steady-state at 100% power, with all controls in automatic
- Pressurizer level control channel selector switch is in the LT-68-339 & 335 position.
- LT-68-320 failed low and ALL required actions of AOI-20 were completed prior to shift turnover.
- The sealed reference leg for LT-68-335 ruptures.

Which ONE of the following describes the plant response? (Assume NO operator actions)

A. Backup Heaters energize.

B. Charging flow reduces to minimum.

C. Letdown isolation valve FCV-62-70 closes.

D. Reactor trip signal is initiated.

42. Given the following conditions:

- The plant was operating at 96% power.
- A loss of offsite power occurred.
- 1A-A and 1B-B diesel generators are NOT running.
- Both the 1A-A and 1B-B 6.9 KV Shutdown Boards are deenergized.
- B reactor trip breaker failed to open and remains closed.
- Reactor power is about 1.5% on all Power Range channels, dropping.
- Both Intermediate Range channels indicate negative (-0.5 dpm) SUR.

Which ONE of the following states the actions required in response to these conditions?

A. Enter E-0, "Reactor Trip or Safety Injection", attempt to manually trip the reactor, and transition to FR-S.1, "Nuclear Power Generation/ATWS".

B. Enter FR-S.1 and dispatch an AUO to start an Emergency Diesel Generator locally.

C. Enter ECA-0.0,"Loss of Shutdown Power", and dispatch an AUO to open B reactor trip breaker locally.

D. Enter ECA-0.0, attempt to manually trip the reactor, and then transition to FR-S.1.

43. Which ONE of the following correctly describes the failure mode of a Steam Generator PORV if 125V DC to the solenoids was lost?

A. The valve would fail OPEN and would require closing the manual isolation valve to stop steam flow.

B. The valve would fail CLOSED and could only be opened locally if plant conditions required.

C. The valve would respond to the pressure controller output and open if plant conditions required.

D. The valve would NOT respond to the pressure controller output, but it would fully open if the pressure switch setpoint was reached.

44. Given the following:

- Near EOL, the reactor is initially at 100% of rated thermal power, all rods out, equilibrium conditions.
- While performing 1-SI-85-2, REACTIVITY SYSTEMS MOVABLE CONTROL ASSEMBLIES, TWO (2) rods in Bank D group 2 were declared Inoperable due to being immoveable.
- The SM has directed the crew to commence a unit shutdown without rods in order to meet ACTION requirements of T.S. 3.1.5.A.

What actions will be required while shutting down?

A. Borate to maintain programmed Tavg.

B. Dilute to control axial flux difference.

C. Borate to control axial flux difference.

D. Dilute to maintain programmed Tavg.

45. The plant is operating at 100% power when operators observe the following:

- #1 Seal leakoff for RCP #2 is .5 gpm.
- The RCP lower bearing temperature is rising.
- Standpipe level alarm is DARK.
- The RCP is tripped at 0300.

Which ONE of the following lists the latest time allowed before seal return from the RCP should be isolated and which procedure is the crew currently implementing?

A. 0303, AOI-24 RCP Seal Abnormalities During Pump Operation.

B. 0305, AOI-24 RCP Seal Abnormalities During Pump Operation.

C. 0303, AOI-5 Unscheduled Removal Of One RCP.

D. 0305, AOI-5 Unscheduled Removal Of One RCP.

46. Which ONE of the following explains why 1-PCV-62-120, Volume Control Tank H2 Supply Press Control, is adjusted to maintain Volume Control Tank (VCT) hydrogen pressure between 15 psig and 30 psig when the plant is at power?

A. Ensures adequate NPSH for the CCPs if both start simultaneously.

B. Provides backpressure in CCP miniflow line to prevent excessive flow.

C. Provides backpressure to the #2 RCP seal to ensure adequate flow to #3 seal.

D. Ensures Hydrogen concentration in the RCS controlled at 25-50 cc/kg for oxygen scavenging.

47. Given the following plant conditions:

- The operating crew is responding to a reactor trip due to a loss of 120V AC Vital Instrument Power Bd I.
- PZR pressure transmitter 68-334 (Channel II) failed LOW.

Which ONE of the following describes the plant response?

A. Both trains of SSPS SI master relays would actuate AND both trains of ECCS equipment auto start.

B. Both trains of SSPS SI master relays would actuate BUT only "B" train ECCS equipment auto start.

C. Only the "B" train SSPS SI master relays would actuate BUT both trains of ECCS equipment auto start.

D. Only the "B" train SSPS SI master relays would actuate AND only "B" train ECCS equipment auto start.

48. Which ONE of the following accurately compares/contrasts the Rod Position Indication (RPI) System with the Bank Demand Position Indication System (step counters)?

A. The step counters are considered to be very accurate but not reliable. By comparison the RPIs are considered to be very reliable but not accurate.

B. The step counters are considered to be very reliable but not accurate. By comparison the RPIs are considered to be very accurate but not reliable.

C. The reliability of the RPIs and step counters are comparable but the step counters are more accurate than the RPIs.

D. The accuracy of the RPIs and step counters are comparable but the RPIs are more reliable than the step counters.

49. The following readings were taken from the Power Range NIS Detectors:

	N41	N42	N43	N44
Det. A (upper)	375.0	340.0	365.0	350.0
Det. B (lower)	345.0	345.0	330.0	360.0

All readings are in microamperes. The Rt and Rb constants from the detector calibration data for all the detectors are all 1.0. Select the detector with the most limiting Quadrant Power Tilt Ratio (QPTR).

A. N41 upper.

B. N42 upper.

C. N43 lower.

D. N44 lower.

50. The maximum output of the ICTC, Incore Thermocouple Plasma Display is:

A. 593 degrees F

B. 727 degrees F

C. 1200 degrees F

D. 2300 degrees F

51. Which one of the following Containment Cooling System fans will trip as a DIRECT result of a ØA Containment Isolation signal?

    A. Lower compartment coolers.

    B. Upper compartment coolers.

    C. CRDM cooler.

    D. Incore Instrument room cooler.

52. During the removal of a clearance on an ice condenser air handling unit, the AUO must use a ladder to unisolate the glycol near the top of the air handling unit, (about 10 feet from the floor).

Who must be notified before accessing the valve.

A. Operations

B. Rad Con

C. Chem Lab

D. Mechanical Maintenance

53. Given the following plant condition:

- Unit 1 at 100% power.
- Glycol cooling system to Unit 1 is lined up normal.
- Gycol temperature is normal.
- Ice condenser air handlling units are lined up normal.
- Ice condenser temperature is normal.
- The 125v DC supply fuse for 1-FCV-61-193, "Glycol Return Containment Isolation Valve" opened due to a short circuit.
- One of the Glycol Circ pumps failed to trip on low suction pressure.

Which ONE of the following most accurately describes the effect this would have on the glycol system?

A. No effect to the system.

B. The glycol flow controller would sense low flow to the system and close the Glycol Inlet Containment Isolation Valves 1-FCV-61-191 and 192.

C. The glycol expansion tank high level control switch would sense a high level in the tank and close the Glycol Inlet Containment Isolation Valves 1-FCV-61-191 and 192.

D. The glycol would heatup causing the glycol expansion tank to fill and eventually overflow into the upper compartment to the Containment.

54. Given the following plant conditions:

- The Unit is at 100% power.
- 1-SI-72-901-A, CS Pump 1A-A Quarterly Performance Test is being performed.
- CSS flow transmitter 1-FT-72-34 failed high

In response to the failure, which ONE of the following will most likely require a safety evaluation?

A. A non-intent procedure change to 1-SI-72-901-A is submitted to clarify a step.

B. A temporary alteration is required to replace the transmitter which will be in place until the next refueling outage, scheduled for 6 months from now.

C. The 1-SI-72-901-A acceptance criteria is not met.

D. Post maintenance test is required to be performed on 1-FT-72-13 prior to returning channel to service.

55. Given the following conditions:

- The plant is operating at 100% power.
- 1A #3 heater drain tank pump (HDTP), trips.

Immediately after the trip how will the secondary flows respond and what procedure is appropriate?

A. # 7 HDTP flow drops, # 3 HDTP flow drops, Condensate flow rises (FE-2-35), use AOI-16, Loss of Normal Feedwater.

B. # 7 HDTP flow rises, # 3 HDTP flow drops, Condensate flow rises (FE-2-35), use AOI-37, Turbine runback response.

C. # 7 HDTP flow drops, # 3 HDTP flow rises, Condensate flow drops (FE-2-35), use AOI-37, Turbine runback response.

D. # 7 HDTP flow rises, # 3 HDTP flow rises, Condensate flow drops (FE-2-35), use AOI-16, Loss of Normal Feedwater.

56. Given the following plant conditions:

- The unit is operating at 75% power
- The controlling #1 S/G pressure transmitter fails HIGH.

Which ONE of the following describes the effect this will have on indicated steam flow and the response of the Main Feed Pump governor valves?

	Indicated Steam Flow	Governor Valve Response
A.	Drop	Governor Valve will open
B.	Drop	Governor Valve will close
C.	Rise	Governor Valve will open
D.	Rise	Governor Valve will close

57. 1-FCV-3-116A, ERCW Hdr A AFW Pmp 1A-A suction, is powered from which board?

A. 480 v Turbine MOV 1A

B. 480v Aux Bldg Common Board Bus A

C. 480v Shutdown Board 1A2-A

D. 480v Rx MOV Board 1A2-A

58. If the 125V DC bus 1 voltage drops to 105V as read on 1-M-1 meter 1-EI-5-96, then which one of the following describes the UV Relay on the Battery feed to Battery Board 1 response?

A. It trips the charger to separate the battery from the faulted supply.

B. It actuates the 125 DC VITAL CHGR/BATT 1 ABNORMAL annunciator

C. It actuates the 125 DC VITAL BATT BD 1 ABNORMAL CKTS ISOLATED annunciator.

D. It trips the 125V DC Battery 1 supply breaker to Battery Board 1 to separate the battery from the faulted supply.

59. Given the following conditions:

- The plant tripped due to an inadvertent safety injection.
- The operator is responding to a PRT LEVEL HI/LO 88-B alarm.

What is the possible cause of this alarm?

A. Containment temperature rise due to loss of lower compartment coolers.

B. Normal leak-off from the #3 RCP seal.

C. Seal return via a relief valve.

D. Isolation of the PRT to the wasted gas header.

60. Given the following plant conditions:

    - A Gas Decay Tank release in progress with ABGTS running for dilution air flow.
    - A leak occurs on the waste gas compressor which results in a gas release to the Auxiliary Building.
    - 0-RE-90-101, Auxiliary Building Vent Monitor, is in alarm.

    Which ONE of the following indicates the effect this leak will have on the plant? (Assume no operator action)

    A. Gas Decay Tank release will be terminated; ABGTS will be stopped.

    B. Gas Decay Tank release will be terminated; ABGTS will continue to run.

    C. Gas Decay Tank release will continue; ABGTS will be stopped.

    D. Gas Decay Tank release will continue; ABGTS will continue to run.

61. Given the following plant conditions:

- Unit is steady state at 75% power with the control rods in Automatic.
- The Auxiliary Building NAUO has placed a fresh CVCS Mixed bed in service.
- The Reactor Operator notices an rising trend in Tavg and notes rods stepping in.

Which ONE of the the following actions should be taken by the operator to mitigate THIS event in accordance with AOI-3, "Malfunction of Reactor Makeup Control"?

A. Direct the NAUO to manually isolate flow through the CVCS Mixed Bed.

B. Isolate letdown and charging.

C. Place TCV-62-79, Ltdn Hi Temp Divert to VCT position.

D. Initiate normal boration to hold current rod position.

62. 1-RM-90-1, Spent Fuel Pit Area, has just gone into HIGH alarm.

Which one of the following describes the effect on plant ventilation?

A. No effect.

B. Only the Auxiliary Building Supply Fans stop.

C. Only the Auxiliary Building Exhaust Fans stop.

D. Both Auxiliary Building Supply and Exhaust Fans stop.

63. Following a loss of RHR while in Mid-Loop operations, the operating crew restarted an RHR pump without properly venting it.

Which ONE of the following sets of conditions indicates that the RHR pump is AIR BOUND?

A. Pump Current - HIGH
Pump Flow - LOW

B. Pump Current - LOW
Pump Flow - HIGH

C. Pump Current - LOW
Pump Flow - LOW

D. Pump Current - FLUCTUATING
Pump Flow - HIGH

64. In accordance with GO-10, Reactor Coolant System Drain and Fill Operations, an elevated temperature will cause Cold Cal Pressurizer level, 1-LT-68-321 to read _____(1)_____ as compared to actual Pressurizer level, due to the density of the water in the varible leg being _____(2)_____.

A. (1) Lower, (2) Lower

B. (1) Lower, (2) Higher

C. (1) Higher, (2) Higher

D. (1) Higher, (2) Lower

65. As a part of the Trip Reduction Program, Westinghouse has incorporated Median Signal Select circuitry into the Eagle 21 protection system. Which ONE of the following correctly describes the operation of the Median Signal Select (MSS) circuitry?

   A. The (MSS) averages three channels from each S/G and assigns all control and protection functions to the average values.

   B. The (MSS) looks at all three channels of each S/G, selects the median channel and assigns the protection and control functions to that channel.

   C. The (MSS) looks at the Median value of all S/Gs, averages this and modifies the S/G level program to the mean valve.

   D. The (MSS) looks at all three channels of each S/G and selects the median channel for control. All channels retain their separation as protection channels.

66. Given the following conditions:

- Unit at 7% power with startup in progress all bistables are in normal configuration.
- A failure of Pressurizer pressure transmitter 1-PT-68-340 resulted in the actual pressurizer pressure dropping to 1945 psig before the operating crew manually stabilized the plant with Pressurizer Master Controller in MANUAL.
- Pressurizer pressure is currently 1960 psig and rising.
- The following alarms are currently LIT due to the transient:
  - 90A - PZR Press Hi (1-M-5)
  - 124C - PZR Press Lo (1-M-6)
- The following status lights are LIT due to the transient:
  - PZR Press Hi Rx trip PS-68-340A
  - PZR Press Lo Rx trip PS-68-334E
  - PZR Press Lo Rx trip PS-68-323E
  - PZR Press Lo Rx trip PS-68-322E

Which ONE of the following is required for the above conditions?

A. Trip the reactor and Initiate Safety Injection

B. Trip the reactor but a Safety Injection is not required

C. Transfer auto control of pressure to 1-PT-68-323 (Channel III) and restore pressure to normal.

D. Restore pressure to normal using MANUAL control of the Master Controller and leave in manual until 1-PT-68-340 is repaired.

67. Which of the following supply power to the 1A-A Elec H2 Recombiner Heater?

    A. 480v Aux Bldg Common Board Bus A

    B. 480v Shutdown Board 1A

    C. 480v C&A Vent Board 1A1-A

    D. 480v Reactor Vent Board 1A-A

68. Which ONE of the following correctly identifies the stop signal for the Containment purge supply and exhaust fans during an accident condition?

    A. Containment Phase A Isolation.

    B. Containment Phase B Isolation.

    C. Containment Vent Isolation.

    D. Safety Injection Signal.

69.

Two managers, one of which must be an SRO, may perform an urgent procedure change to a Fuel Handling Instruction. Which ONE of the following statements is correct regarding temporary approval of changes to plant procedures?

A. The change may be approved only if it does not impact critical plant schedules.

B. The change may be approved only if it is an intent change required to maintain plant safety.

C. The change may be approved only if it has no impact on plant safety or reliability.

D. The change may be approved only if it is a non-intent change needed to maintain plant safety, operability, or critical plant schedules.

70. According to FR-0 "Status Trees", determine which one of the following conditions has the highest priority?

A. ECCS is not in service, NO RCP's are running, and RVLIS is 96%.

B. RCS subcooling is 35°F, Core Exit Thermocouples's are at 650°F, one RCP is running, and RVLIS is 40%.

C. All S/G NR levels are between 5% and 8% and total feed flow to the S/Gs is 400 gpm.

D. Containment pressure is 15 psig.

71. Given the following:
    - Unit in service at 100% RTP
    - A S/G #1 safety valve begins leaking and power rises to 104% RTP.
    - The crew enters AOI-38 and reduces turbine load to 90% with the valve position limiter.
    - This load reduction caused reactor power to drop to 95% RTP.

    Which ONE of the following would be the correct crew response per AOI-38 if the flow has risen through the leaking safety valve causing the reactor power to return to 101%?

    A. Trip Reactor, Close MSIVs and bypasses, & Go To E-0.

    B. Use Valve Postion Limiter to MAINTAIN power level at ≤100% RTP and continue with AOI-38.

    C. Use EHC Controls to drop Turbine Load at 5%/min to reduce reactor power to less than 100% and continue with AOI-38.

    D. Trip Reactor, Verify Reactor Trip, Initiate SI, Close MSIVs and bypasses, & Go To E-0.

72. If SG #1 had a tube leak of 5 gallons per day, what would be the most probable first indication that the MCR would have of the problem, disregard the possibility of a sample by Chemistry.

A. The steam generator blowdown radiation monitor, 1-RM-90-120 or 1-RM-90-121 reading rising.

B. The Vacuum Exhaust Monitor RM-90-119 reading rising.

C. A mismatch in steam generator steam flow verses feed flow for #1 SG

D. The Main Steam LIne Radiation Monitors, 1-RM-90-421 reading rising.

73. Given the following plant conditions:

- The Unit is in Mode 1, at 100% load.
- Common Station Service Transformer "C" has just tripped on Sudden Pressure.

Which ONE of the following is the status of the Unit 1 6.9 kV Shutdown Boards and its loads?

A. Both Shutdown Boards fed from "D" CSST and no effect on loads.

B. Both Shutdown Boards fed from "C" CSST and black out load sequencing inprogress.

C. Shutdown Board 1A-A fed from D/G and Shutdown Board 1B-B from "D" CSST and no effect on loads.

D. Shutdown Board 1B-B fed from D/G and Shutdown Board 1A-A from "C" CSST and black out load sequencing inprogress.

74. An Operator at the 1A-A DG local panel has verified that the DG has lost it's 125V DC control power supply from Diesel Battery Distribution Panel. If the DG is currently NOT running which ONE of the following describes how this loss of DC power would affect DG operation?

A. The DG would start in response to an automatic or manual start signal.

B. The DG cannot be started by automatic signals or manual action.

C. The DG can only be started in manual at the local panel.

D. The DG can only be started in manual at the MCR panel.

75. The following plant conditions exist:

- A waste gas decay tank release was in progress.
- 0-RM-90-118, Waste Gas Effuent Monitor, is in service.
- 184-A "WGDT Rel Line 0-RM-118 Rad Hi" annunciator received.
- 0-FCV-7-119, Plant Vent Flow Control, has tripped closed.
- The Count Room has performed a backup sample analysis on the waste gas decay tank.
- A new release permit has been issued, and approval has been granted to resume the release.

Which ONE (1) of the following is (are) the MINIMUM action(s) to take for 0-FCV-7-119, Plant Vent Flow Control, in order to continue the waste gas release?

A. Reset the valve locally and allow it to automatically re-open.

B. Take the valve controller to ZERO (0), then re-open the valve.

C. Purge the release line with nitrogen until 0-RM-90-118 returns to background, reset the valve locally, then re-open the valve.

D. Place the 0-RM-90-118-INTERLOCK Switch in ON, and then take the controller to ZERO (0), then re-open the valve.

76. Given the following conditions:

- Unit 1 is at 60% power.
- 3 CCW pumps are running.
- East Waterbox is isolated to plug a leaking tube.
- West Waterbox inlet isolation valve fails CLOSED.

Which ONE of the following describes the plant response? (Assume NO operator actions)

A. The CCW inlet conduit ruptures due to overpressure.

B. CCW pumps trip resulting in rising condenser pressure which remains below the trip setpoint.

C. CCW flow to the condenser drops by ~50% resulting in rising water box discharge temperatures.

D. Condenser pressure will rapidly rise resulting in a turbine and reactor trip.

77. Given the following plant conditions:

- A service air isolation has occurred.
- Control air has been restored to normal.

Which ONE of the following must be done FIRST in order to reopen service air isolation valve, 0-PCV-33-4?

A. Stop any additional C&SS compressors not needed.

B. Reset 0-PS-33-4 Service Air Supply Isolation Pressure.

C. Throttle open 0-ISV-33-502, Service Air 0-PCV-33-4 Bypass.

D. Place 0-HS-33-4 Service Air Supply Isolation to the AUTO position.

78. Which one of the following detectors is designed to detect fire before significant heat and visible smoke are detected?

A. Rate of rise detectors

B. Fixed temperature detectors

C. smoke detectors

D. Ionization detectors

79. Given the following plant conditions:

- Plant is in MODE 6 with refueling in progress.
- During movement of an irradiated fuel assembly from the core it is dropped and severely damaged.

Which ONE of the following ESF actuations is most likely to occur?

A. Phase A Containment Isolation.

B. Phase B Containment Isolation.

C. Auxiliary building Vent Isolation.

D. Containment Ventilation Isolation.

80. Given the following conditions:

    - Plant operating at 100% RTP
    - All systems in a normal alignment.
    - C-S CCS pump trips due to a problem with it's supply breaker.

    Which ONE of the following will meet the Tech Spec LCO requirements due to the CCS pump trip?

    A. Restore the C-S CCS pump to OPERABLE status within 7 days.

    B. Aligning the 1B-B CCS pump to supply Unit 1 Train B CCS within 72 hours.

    C. Place the 2B-B CCS pump in service to restore flows and pressure to normal.

    D. Align C-S pump to its alternate power supply through the manual transfer switch within 72 hours.

81. Given the following plant conditions:

    - Unit is in HOT STANDBY at 557°F.
    - Steam Dump is in Steam Pressure Mode.
    - Impulse pressure transmitter, PT-1-73 fails HIGH.

    Which ONE of the following describes the Steam Dump System response?

    A. "D" Solenoid will be energized but no valves will open.

    B. "D" Solenoid will be energized and 12 valves will open.

    C. "D" Solenoid will NOT be energized and no valves will open.

    D. "D" Solenoid will NOT be energized but 12 valves will open.

82. Given the following plant conditions:

- The plant suffered a LOCA while operating at 100% RTP.
- Safety Injection was actuated and ECCS systems have functioned as required.
- Containment pressure is 4.4 psig and dropping due to Containment spray action.
- 6.9KV Shutdown Board 1A-A tripped on bus differential immediately following the reactor trip.

Which ONE of the following explains why both Thermal Barrier Booster Pumps are OFF.

A. Blackout relays trip both pumps if handswitches in A-AUTO OR A-P AUTO.

B. Phase A Signal trips both pumps if handswitches in A-AUTO OR A-P AUTO.

C. Phase B Signal trips both pumps if handswitches in A-AUTO OR A-P AUTO.

D. High differential flow across the Thermal Barrier due the loss of 1A CCS pump.

83. Given the following plant conditions:

- The plant is at 100% power.
- The control air header has been breached such that all header pressures are dropping at a steady rate.
- C and SS Air Compressors A & B have started automatically.

Which ONE of the following describes the impact of the steady loss of air pressure on the compressed air systems?

A. Service Air Supply Valve 0-PCV-33-4 will CLOSE at 80 psig, Auxiliary Air Compressors START at 80 psig, and Auxiliary Air is ISOLATED from Control Air at 79.5 psig when 0-FCV-32-82 & 85 CLOSE .

B. Service Air Supply Valve 0-PCV-33-4 will CLOSE at 80 psig, Auxiliary Air Compressors START at 78 psig, and Auxiliary Air is ISOLATED from Control Air at 79.5 psig when 0-FCV-32-82 & 85 CLOSE.

C. Service Air Supply Valve 0-PCV-33-4 will CLOSE at 80 psig, Auxiliary Air Compressors START at 78 psig, annd Auxiliary Air is ISOLATED from Control Air at 77.5 psig when 0-FCV-32-82 & 85 CLOSE.

D. Service Air Supply Valve 0-PCV-33-4 will CLOSE at 80 psig, Auxiliary Air Compressors START at 80 psig, and Auxiliary Air is ISOLATED from Control Air at 77.5 psig when 0-FCV-32-82 & 85 CLOSE.

84. You are assuming the US duties after a one week absence.
Which ONE of the following is required?

A. Review the narrative log and checklists for all stations.

B. Immediately after shift relief is completed individual position checklists are forwarded to Document Control through the Unit Supervisor.

C. Review the narrative log. The review shall include all narrative logs since the last shift worked.

D. Review the narrative log. The review shall include all narrative logs for the previous three days.

85. The unit had been operating at 100% power when the following occurred:

- A loss of both 161KV lines due to a fire at the hydro plant.
- The 1A-A and 1B-B D/Gs did not start.
- RCS depressurization has been initiated per the appropriate procedure.
- The STA reports that the IR SUR is +.30 dpm.

Which ONE of the following should be performed?

A. Reduce RCS pressure with pressurizer PORVs to ensure CLA injection of borated water.

B. Control S/G PORV's to stop RCS depressurization and allow the RCS to heat up.

C. Continue cooldown to allow CLA injection of borated water at 600 psig RCS pressure.

D. Stop PORV flow and transition to FR-S.1, Response to Nuclear Power Generation / ATWS.

86. Given the following plant conditions:

- The Unit is in Mode 5, following a Refueling outage.
- The RCS is in Mid Loop operation at 105° F.
- 1A RHR pump is in service at 2300 gpm.
- Preparations are in progress to begin RCS Vacuum Refill.

Using Appendices AD and AE of GO-10 (provided), "Reactor Coolant System Drain and Fill Operations", which ONE of the following describes the expected time to raise RCS vacuum from 5 in Hg. to the maximum allowable value ?

A. 35 minutes.

B. 60minutes.

C. 100 minutes.

D. 145 minutes.

87. Which ONE of the following identifies chemicals injected into the condensate cycle and the purpose of each?

A. Ethanolamine (ETA) for pH control
Hydrazine for oxygen scavenging

B. Ethanolamine (ETA) for oxygen scavenging
Hydrazine for pH control

C. Sodium for pH control
Hydrazine for oxygen scavenging

D. Sodium for oxygen scavenging
Hydrazine for pH control

88. Given the following plant conditions:

- Plant is in Mode 3 with startup in progress.
- The breaker for "C" hotwell pump will not close.
- The Shift Manager and Work Week Manager determined that trouble shooting could be conducted as "minor work" if the pump is tagged out.

Which ONE of the following describes how this trouble shooting activity should be documented?

A. WO is NOT required since only trouble shooting is planned and will have no operational impact, no detailed planning or documentation is required.

B. WO is NOT required since a PER will be written to address the condition adverse to quality and trouble shooting may be documented in the PER.

C. WO is required, the WO may be sent directly to the craft after OPS approval and the work may be documented on the WO form.

D. WO is required, the WO must be routed to planning after OPS approval and the work will be conducted and documented in the work package developed by the planner.

89. You are the Refueling SRO. During fuel off-load you notice refueling cavity level dropping:.

    - A fuel assembly is being moved by the refueling machine.
    - The Rx Bldg Upender is in the UP position.
    - The fuel transfer cart is in the Rx Bldg.

    In accordance with AOI-29, Dropped or Damaged Fuel or Refueling Cavity Seal Failure, where are you directed to store the fuel assembly?

    A. In the Rx Bldg. Upender

    B. In the RCCA Change Fixture.

    C. In the Reactor Vessel Core.

    D. In the Spent Fuel Pit.

90. Refueling is in progress and the refueling machine operator is inserting a fuel assembly into the core.

    Which ONE of the following cautions should be observed while lowering the fuel assembly into the core region?

    A. Monitor the weight indicator continuously for an unexpected drop of 50 pounds which would require operators to stop lowering the fuel assembly.

    B. Monitor the Z-axis tape continuously to ensure the mast is not lowered below the mast disengagement position.

    C. Use slow speed when inserting fuel-bottom nozzle approximately 10 inches above and 10 inches below the top of the seated fuel assemblies and within 10 inches of full down.

    D. Use the gripper mast down (red) light to determine the assembly is fully lowered and can be disengaged.

91. Which ONE of the following explains why rod insertion limits rise as reactor power is raised from 0% to 100% power?

    A. As power rises moderator temperature coefficient drops.

    B. As power rises flux shifts more to the top of the core.

    C. As power rises control rod worth drops.

    D. As power rises the power defect rises.

92. Which ONE of the following describes the purpose of establishing limits for radiation protection?

A. Protects plant workers and the general public from the harmful effects of radiation as well as maintaining personnel exposure ALARA.

B. Protects plant equipment and structures from damaging effects of radiation exposure during accident conditions.

C. Provides a basis on which all nuclear utilities can work together in the event of a radiological accident.

D. Prevents the the unapproved distribution of radiation dose throughout the nuclear population.

93. The Reactor Coolant Drain Tank pump's discharge can be lined up to several places in the auxiliary building. Which ONE of the following is the normal discharge path for the RCDT pumps?

A. Tritiated Drain Collector Tank.

B. CVCS Holdup Tanks.

C. Refueling Water Storage Tank.

D. Flood Mode boration system.

94. Given the following:

    - Unit is at 100% power.
    - A containment purge is required to be performed on this shift to allow containment entry.

    Which ONE of the following is applicable to the Containment Purge system at this time?

    A. Lower containment radiation monitors must be inservice.

    B. Containment pressure must be greater than atmospheric pressure.

    C. Only one set of purge supply and exhaust lines can be used for the purge.

    D. An operator must be available to manually shutdown the purge in the event of an ABI.

95. 2.3.10Given the following conditions:

- Unit 1 at 100% RTP.
- Several Auxiliary Building Area Radiation Monitors rise to the alarm setpoint.

Which ONE of the following actions should be taken first?

A. Initiate an ABI.

B. Use the PA to evacuate the Auxiliary Building.

C. Activate the plant emergency alarm and initiate plant assembly.

D. Initiate a Containment Vent Isolation (CVI).

96. E-3, Steam Generator Tube Rupture, contains the CAUTION "If any Ruptured S/G is also faulted, feed flow should remain isolated in subsequent steps UNLESS needed for RCS cooldown.

Which one of the following would be the consequence of violating this caution by continuing AFW flow?

A. Aggravate an uncontrolled cooldown of the RCS and increase the possibilty of SG overfill.

B. Extend the time required for a ruptured/faulted SG depressurization.

C. Cooldown the ruptured/faulted SG, thus exteding the time required to refill the pressurizer.

D. Dilute the RCS and lead to a loss of shutdown margin.

97. Given the following plant conditions:

- E-1 is being performed
- Unit 1 was at 73% power.
- A Reactor trip and SI on low steam line pressure occurred 21 minutes ago.
- Average Core Exit T/C temperature is 400°F.
- Pressurizer pressure is 1350 psig.
- All S/G pressures are DROPPING slowly.
- S/G #2, and #3 levels are 15% NR and DROPPING slowly.
- S/G's #1, level is 16% NR, and RISING slowly.
- S/G's #4, level is STEADY at 2% NR.
- Total feedwater flow is 440 gpm.
- PZR level is 10% and RISING.
- RCS T-cold temperature is 265°F and DROPPING slowly.
- Containment pressure is 5 psig and RISING slowly.

At this point, which ONE of the following Critical Safety Functions is the MOST degraded?

A. Heat Sink

B. Core Cooling

C. Containment

D. Pressurized Thermal Shock

98. Which ONE of the following describes the minimum information that should be obtained from a person reporting a fire to the MCR?

A. Name of person reporting, location, type and severity of fire.

B. Name of person reporting, support personnel required, type and location of fire.

C. Name of person reporting, Safety related equipment affected and location of fire.

D. Type, location and severity of the fire.

99. EPIP-1 states that the acceptable time frame for notification to the ODS following an emergency is considered to be five (5) minutes.

Which ONE of the following identifies the time period of this 5 minutes?

A. Between the declaration of the emergency and notifying the ODS.

B. Between beginning of the emergency and notifying the ODS.

C. Between the identification of the event and notifying the ODS.

D. Between the transition from E-0 and notifying the ODS.

100. Given the following plant conditions:

- Unit 1 is at 100% power.
- Control rods are in AUTO and NOT moving.
- TAVG-TREF DEVIATION annunciator is lit.
- No rod stop annunciators are lit.
- Urgent failure annunciator is NOT lit.

Which ONE of the following actions should be taken?

A. Place rod control in MANUAL and verify control rod operability by moving rods 10 steps per 1-SI-85-2.

B. Place rod control in MANUAL and borate / dilute to match Tavg and Tref.

C. Place rod control in MANUAL and match Tavg and Tref using rods.

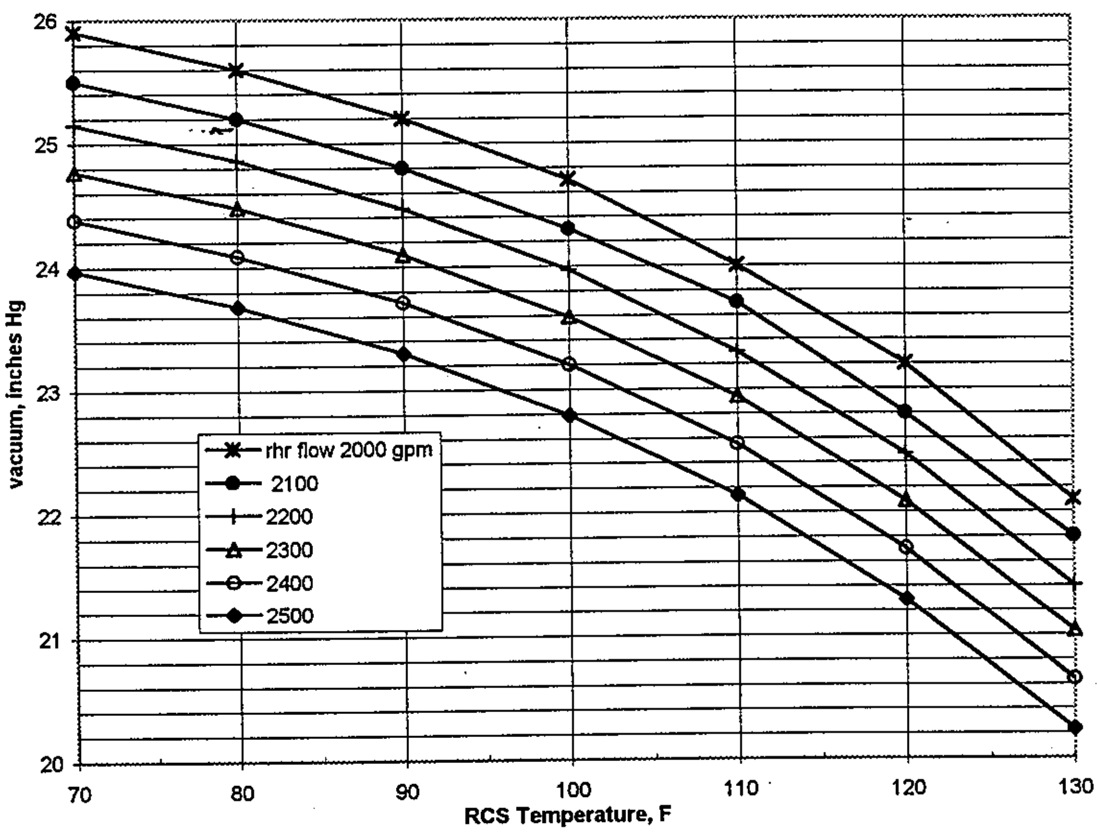
D. Trip the reactor and enter E-0, Reactor Trip or Safety Injection.

Date ________ **INITIALS**

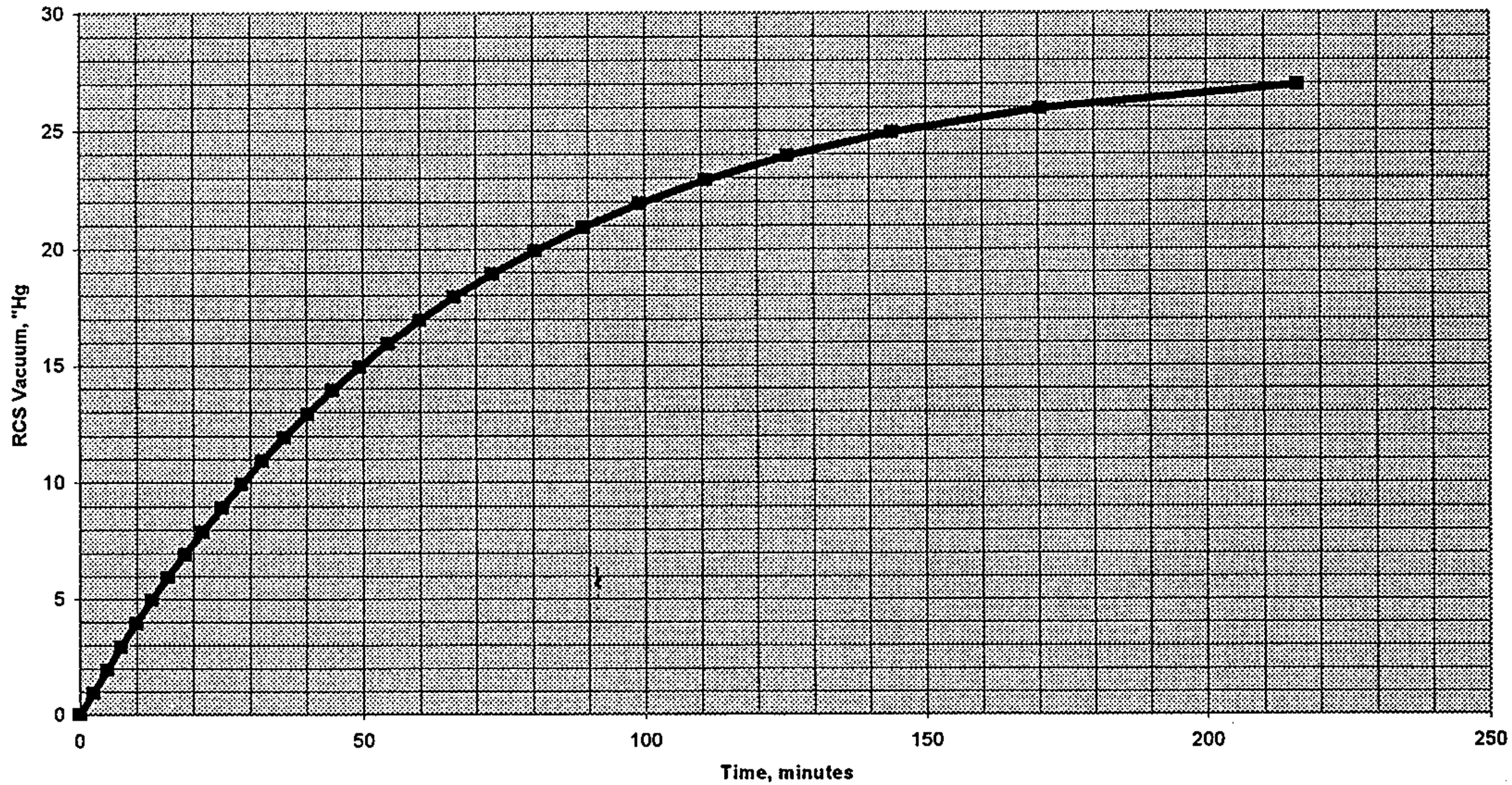
APPENDIX AD
Page 1 of 1

VACUUM vs. RCS TEMPERATURE / RHR FLOWRATE

Allowable Vacuum vs RHR Flow and RCS Temperature
Allowable Region Is Below And To The Left Of The Appliccable RHR Flow Curve



APPENDIX AE
Page 1 of 1
EVACUATION TIME



TENNESSEE VALLEY AUTHORITY

WATTS BAR NUCLEAR PLANT

EMERGENCY PLAN IMPLEMENTATING PROCEDURES

EPIP-1

EMERGENCY PLAN CLASSIFICATION FLOWCHART

Revision 21

Unit 0

NON-QUALITY RELATED

PREPARED BY: James F. Hagy
(Type Name)

SPONSORING ORGANIZATION: Emergency Planning

APPROVED BY: Frank L. Pavlechko

EFFECTIVE DATE: 03/03/2003

LEVEL OF USE: REFERENCE

REVISION LOG

Revision Number	Implementation Date	Description of Revision
0	04/13/90	New WBN-EPIP. Supersedes IP-1.
1	02/04/91	Revised to separate RCS leak and identified S/G tube leak initiating conditions. Clarified initiating condition in fire. Updated ODS telephone numbers.
2	11/28/91	Add initiation conditions. Clarify reference to Attachment 1 Definitions. Define Protected Area, Owner Controlled Area, and Vital Areas throughout procedures. Clarify NOUE declaration for Uncontrolled Shutdown.
3	03/04/92	Change all Technical Specification references to reflect new "Merit" Tech Specs and ODCM references.
4	02/10/93	Procedure revised to reflect the new methodology for development of Emergency Action Levels per: NUMARC/NESP-007, Rev. 3, 1/92, endorsed by REG GUIDE 1.101 Emergency Planning and Preparedness For Nuclear Power Reactors Rev. 3, 8/92.
5	09/15/93	Editorial (non-intent) and formal changes. Text changes made to EALs to meet review comments identified by the NRC.
6	01/01/94	Procedure revised to reflect new 10 CFR 20 changes.
7	05/27/94	Procedure revised to reflect changes to System 90 (Radmonitoring) and establish site perimeter monitoring points.
8	01/10/95	FPBM, EAL 1.3.4, CNTMT, Bypass, Loss (1), revised to eliminate potential for misclassification. Maps revised to reference north and wind direction. Table 7-2, Alert, Radiation Levels enhanced to provide Operators additional information.
9	4/28/98	Revised Revision Log to include page numbers. References added to the document. Fission Product Barrier Matrix revised to reflect information found in the EOP Set Point Verification Document (WBN-OS64-188). Reference to AOI-27 revised to AOI-30.2. Phone numbers to the National Weather Service changed due to their reorganization. Annunciator window references for the earthquake corrected to match Main Control Room alignment. All references to RM were changed to RE to make it consistent with site description documents. Tables in section seven revised to reflect the following: System 90 changes, monitor efficiencies, default flow rates, release time durations, and annual meteorological data enhancements.

Revision Number	Implementation Date	Pages Affected	Description of Revision
CN-1	09/28/95	10, 14, 26	The following non-intent enhancements were made: (CCP) Acronym added to the Fission Product Barrier Matrix in 1.2 RCS Barrier, (2. RCS Leakage LOCA), to enhance description. New SI reference number for Reactor Coolant System Water Inventory Balance identified in event 2.5 (RCS Unidentified Leakage) and 2.6 (RCS Identified Leakage). Area code and phone number in event 5.2 (Tornado) revised to new number.
CN-2	11/10/95	3, 6, 34	The following non-intent enhancements were made: Corresponding ERFDS system identifiers were added next to the rad monitors on Table 7-1; Table 7-1 was realigned to improve its usability; an enhanced description for RE-404 was provided in Note 3 of Table 7-1; the ERFDS Operators Manual was added to the Reference section.

REVISION LOG(Continued)

Revision Number	Implementation Date	Pages Affected	Description of Revision
CN-3	05/24/96	8, 11, 16, 19, 23, 24, 26, 29, 32, 34	The following non-intent enhancements were made: Due to revisions made to AOI-27, it was added back to the EALs in event 4.5 "Control Room Evacuation"; The Assessment Method on Table 7-1 was enhanced to correspond with the note at the top of the table. In addition, the reference to TI-30 was removed since this procedure will be terminated due to the enhancements being made to EPIP-16 and ERFDS. The word Projectile was added to the index and title reference to event 5.3 "Aircraft/Projectile Crash", to make it consistent with the EALs within it's classification.
10	3/15/99	All	The following non-intent enhancement were made: Software revised to Microsoft Word which re-formatted pages along with other enhancements; minor typographical errors corrected; two references revised - one added; SOS/ASOS replaced with SM/US; index page, effluent added to gaseous; vital area definition enhanced; spent fuel pit revised to pool on Table 7-2; SP revised to EAB in Event 7.1; TVA Load Dispatcher/Water Resources revised to River Systems Operations and revised ERFDS/P-2500 to ICS.
11	4/15/99	2, 34	Non intent change. Typo corrected. Changed >1.0 to >0.1.
11A	7/1/99	3,26	Corrected typo on phone number The remaining pages of this procedure are Rev 11 only page 3, and the fold out page for 26 have been changed.
12	9/30/99	All	Non intent change. Minor editorial\format changes made. Typographical errors corrected. Seismic windows revised to reflect DCN-50007 per ERPI Report 6695. (LTL) Lower toxicity limit replaced with (PEL) Permissible Exposure Limit. This revision is also part of the resolution to PER 99-009326-000.
13	12/08/99	All	Non-intent change. Revised page 33 for resolution of PER 99-015478-000. Minor editorial change to Event 5.1 step 1 of the Alert classification.
14	04/10/00	All (Pg.4 & 45)	Non-intend change. Revised page 45 for DCN 50484, stage 1 which moved 0-RE-90-101B, & -132B from ICS Screen 4RM2 to 4RM1. DCN also moved 1-RE-90-421B thru -424B and 0-RE-90-120 & -121 from ICS Screen 4RM1 to 4RM2. This revision allows all liquid radiation monitors to be observable on one ICS screen and all gaseous radiation monitors to be observed on a separate ICS screen.
15	08/17/00	All (Pg. 4, 11A & B)	Intent change. Revised CNTMT Rad Monitors (1-RE-90-271, 272, 273, & 274) readings to correspond with the new TI-RPS-162, "Response of the Primary Containment High Range Monitors" readings (Reference EDC-50600). This analysis resulted in a revision to the EALs 1.1.5 on the Barrier matrix page, 11b. This revision resolves action items from CORP PER 99-000038-000. This revision was also determined not to reduce the level of effectiveness of the procedure or REP.

REVISION LOG (Continued)

Revision Number	Implementation Date	Pages Affected	Description of Revision
16	3/30/01	All (Pg. 11 &14)	Plan effectiveness determinations reviews indicate the following revisions do not reduce the level of effectiveness of the procedure or REP: Intent change. Revised CNTMT Rad Monitors readings in the Barrier Matrix (1.3) to support new dose assessment methodology. Non intent change. Revised reference from annunciator alarm printer to annunciator monitor per DCN D-50301.
17	09/25//01	All Page 6, 11B	Plan effectiveness determinations reviews indicate the following revisions do not reduce the level of effectiveness of the procedure or REP: Intent change. Procedure revised to Non-Quality related per requirements of NQAP & pending revision to SPP-2.2. The coversheet and records section of the procedure was revised to reflect this change. Non-Intent change. Corrected typo on Barrier Matrix.
18	02/15/02	All 2, 11B, 44	Plan effectiveness determinations reviews indicate the following revisions do not reduce the level of effectiveness of the procedure or REP: Non-Intent change. Changes to the EALs in this revision consist of changing β-γ to gamma in Section 7.0 to ensure consistency with NUMARC/NESP-007, Reg Guide 1.101, and NEI 99-01 rev 4. Clarification to EAL 1.3.3 (containment isolation status also made per this reference.) This standardizes these issues with the other TVAN sites. These changes were approved by the State of Tennessee.
19	06/05/02	All 4, 7 &30	Plan effectiveness determinations on these change(s) indicate the following revisions do not reduce the level of effectiveness of the procedure or REP. Intent change(s): A revision to the Security Event (4.6) was made to incorporate change(s) resulting from the NEI to NRC (Mr. Bruce Boger) letter dated 12/18/01 requesting conformation for an EAL basis change to include response to a Credible Site Specific Threat. Table 4-3 was revised to incorporate this additional EAL. This meets the compliance of the NRC's 10/6/01 Safeguards Advisory on this matter. This represents an additional EAL and does not change existing criteria in the Security Event Basis. Revised 5.1 Interfacing documents by noting the termination of EPIP 9 with reference to EPIP 16.
20	07/09/02	ALL, pg. 2, 10, 13, 15, 20, 24, 30, 32, 39, 43	Plan effectiveness determinations on these change(s) indicate the following revisions do not reduce the level of effectiveness of the procedure or REP. Intent change(s): Reference to T/S 3.4.16 in Event 2.4 EAL 1(a) revised to correspond to levels in AOI-28. Credible Site-Specific was added to the definition pages. Removed reference to the definition in Table 4-3 SECURITY EVENTS to standardize with other TVAN sites.
21	03/03/2003	2, 15	Plan effectiveness determinations on these change(s) indicate the following revisions do not reduce the level of effectiveness of the procedure or REP. Non-intent change: Deleted reference to table which was deleted from AOI-28, Ref. WBPER 03-004004-000.

1.0 PURPOSE[4]

This Procedure provides guidance in determining the classification and declaration of an emergency based on plant conditions.

2.0 RESPONSIBILITY[2,4]

The responsibility of declaring an Emergency based on the guidance within this procedure belongs to the Shift Manager/Site Emergency Director (SM/SED) or designated Unit Supervisor (US) when acting as the SM or the TSC Site Emergency Director (SED). These duties CAN NOT be delegated.

3.0 INSTRUCTIONS[4]

3.1 The criteria in WBN EPIP-1 are given for GUIDANCE ONLY: knowledge of actual plant conditions or the extent of the emergency may require that additional steps be taken. In all cases, this logic procedure should be combined with the sound judgment of the SM/SED and/or the TSC SED to arrive at a classification for a particular set of circumstances.

3.2 The Nuclear Power (NP) Radiological Emergency Plan (REP) will be activated when any one of the conditions listed in this logic is detected.

3.3 Classification Determination

3.3.1 To determine the classification of the emergency, review the Initiating Conditions of the Events described in this procedure with the known or suspected conditions and CARRY OUT the notifications and actions referenced.

3.3.2 If a Critical Safety Function (CSF) is listed as an Initiating Condition: the respective status tree criteria will be monitored and used to determine the Event classification for the modes listed on the classification flowchart.

3.3.3 The highest classification for which an Emergency Action level (EAL) currently exists shall be declared.

3.0 INSTRUCTIONS (continued)

3.3.4 After an Event classification, if the following investigation shows that Initiating Conditions were met that dictate a higher Event classification, the new event classification shall be declared at the clock time of the determination.

3.3.5 **IF** an EAL for a higher classification was exceeded but the present situation indicates a lower classification, the fact that the higher classification occurred SHALL be reported to the NRC and Central Emergency Control Center (CECC), but should not be declared.

3.3.6 **IF** the Parameter is indeterminate due to instrument malfunction and the existence of the condition **CAN NOT** be reasonably discounted (i.e., spurious or false alarm that can be substantiated within 15 minutes) the condition is considered **MET** and the SM/SED SHALL follow the indications provided until such time as the alarm is verified to be false.

3.3.7 **IF** an EAL was exceeded, but the emergency has been totally resolved (prior to declaration), the emergency condition that was appropriate **shall not** be declared but reported to the NRC and Operations Duty Specialist (ODS) at the same clock time.

3.3.8 The **ACCEPTABLE** time frame for notification to the Operation Duty Specialist (ODS) is considered to be five (5) minutes. This is the time period between declaration of the emergency and notifying the ODS.

4.0 RECORDS

4.1 Non-QA Records

None

5.0 REFERENCES

5.1 Interfacing References

BP-236, *Event Critique and Root Cause Analysis*

SPP 3.5, *Regulatory Reporting Requirements*

WBN-EPIP-2, *Unusual Event*

WBN-EPIP-3, *Alert*

WBN-EPIP-4, *Site Area Emergency*

WBN-EPIP-5, *General Emergency*

WBN-EPIP-9, *Loss of Meteorological Data (Canceled see EPIP-16)*

WBN-EPIP-13, *Termination of the Emergency and Recovery*

WBN-EPIP-14, *Radiological Control Response*

WBN-EPIP-16, *Initial Dose Assessment For Radiological Emergencies*

CECC-EPIP-9, *Emergency Environmental Radiological Monitoring Procedures*

SI-4.04, *Measurement of Identified and Unidentified Leakage of the Reactor Coolant System*

5.2 Other Documents

10 CFR 50, *Domestic Licensing of Production and Utilization Facilities*

10 CFR 20, *Standards for Protection From Radiation*

REG GUIDE-1.101, *Emergency Planning and Preparedness For Nuclear Power Reactors endorsing NUMARC NESP-007 Methodology for Development of Emergency Action Levels.*

Site Technical Specifications (Tech Specs), Abnormal Operating Instructions (AOIs), Emergency Operating Procedures (EOPs), Set Point Verification documents, Chemistry Technical documents (CTDs), and the Final Safety Analysis Report (FSAR) are also referenced in Appendix C of the Radiological Emergency Plan.

ICS Operator's Manual

EPPOS #2, "NRC EP Position on Timeliness of Classification of Emergency Conditions

EPRI Report 6695 Guidelines for Nuclear Power Plant Response to Earthquakes.

EMERGENCY

PLAN

CLASSIFICATION

FLOWCHART [1,3,4,5]

FISSION PRODUCT BARRIER MATRIX (Modes 1-4)

1.1 Fuel Clad
1.2 RCS
1.3 Containment

1

SYSTEM DEGRADATION

2.1 Loss of Instrumentation
2.2 Loss of Function/Communication
2.3 Failure of Reactor Protection
2.4 Fuel Clad Degradation
2.5 RCS Unidentified Leakage
2.6 RCS Identified Leakage
2.7 Uncontrolled Cool Down
2.8 Turbine Failure
2.9 Technical Specification
2.10 Safety Limit

2

LOSS OF POWER

3.1 Loss of AC (Power Ops)
3.2 Loss of AC (Shutdown)
3.3 Loss of DC

3

HAZARDS and SED JUDGMENT

4.1 Fire
4.2 Explosion
Table 4-1
Figure 4-A
4.3 Flammable Gas
4.4 Toxic Gas
Table 4-2
Figure 4-B
4.5 Control Room Evacuation
4.6 Security
4.7 SED Judgment
Table 4-3

4

DESTRUCTIVE PHENOMENON

5.1 Earthquake
5.2 Tornado
5.3 Aircraft/Projectile Crash
Table 5-1
5.4 River Level High
5.5 River Level Low
5.6 Watercraft Crash
Figure 5-A

5

SHUTDOWN SYSTEM DEGRADATION

6.1 Loss of Shutdown Systems
6.2 Loss of AC (Shutdown)
6.3 Loss of DC (Shutdown)
6.4 Fuel Handling

6

RADIOLOGICAL

7.1 Gaseous Effluent
7.2 Liquid Effluent
Table 7-1
Figure 7-A
7.3 Radiation Levels
7.4 Fuel Handling
Table 7-2

7

DEFINITIONS/ACRONYMS

UNUSUAL EVENT, ALERT, SITE AREA EMERGENCY and GENERAL EMERGENCY: (see SED Judgment 4.7).

BOMB: An explosive device (See EXPLOSION).

CIVIL DISTURBANCE: A group of twenty (20) or more persons violently protesting station operations or activities at the site.

CREDIBLE SITE-SPECIFIC -The determination is made by WBN senior plant management through use of information found in the Safeguards Contingency Plan.

CRITICAL-SAFETY FUNCTION (CSFs): A plant safety function required to prevent significant release of core radioactivity to the environment. There are six CSFs: Sub-criticality, Core Cooling, Heat Sink, Pressurized Thermal Shock, Integrity (Containment) and Inventory (RCS).

EVENT: Assessment of an **EVENT** commences when recognition is made that one or more of the conditions associated with the event exist. Implicit in this definition is the need for timely assessment, i.e. within 15 minutes.

EXCLUSION AREA BOUNDARY (EAB): The demarcation of the area surrounding the WBN units in which postulated FSAR accidents will not result in population doses exceeding the criteria of 10 CFR Part 100. Refer to Figure 7-A.

EXPLOSION: A rapid, violent, unconfined combustion, or a catastrophic failure of pressurized equipment that imparts energy of sufficient force to potentially damage permanent structures required for safe operation.

EXTORTION: An attempt to cause an action at the station by threat of force.

FAULTED: (Steam Generator) Existence of secondary side leakage (i.e., steam or feed line break) that results in an uncontrolled decrease in steam generator pressure or the steam generator being completely depressurized.

FIRE: Combustion characterized by heat and light. Source of smoke such as slipping drive belts or overheated electrical components do not constitute fires. Observation of flame is preferred but is NOT required if large quantities of smoke and heat are observed.

FLAMMABLE GAS: Combustible gases maintained at concentrations less than the **LOWER EXPLOSIVE LIMIT (LEL)** will not explode due to ignition.

HOSTAGE: A person(s) held as leverage against the station to ensure that demands will be met by the station.

INEFFECTIVE: The specified restoration action(s) does not result in a reduction in the level of severity of the RED PATH condition within 15 minutes from identification of the Core Cooling CSF Status Tree RED PATH. A reduction in the level of severity is an improvement in the applicable parameters, e.g., Increasing Trend in Reactor Vessel Water Level (Full RVLIS) and/or Decreasing Trend on Core Thermocouple Temperatures.

INITIATING CONDITIONS: Plant Parameters, radiation monitor readings or personnel observations that identify an Event for purposes of Emergency Plan Classification.

INTRUSION/INTRUDER: Suspected hostile individual present in a protected area without authorization.

ODCM: Offsite Dose Calculation Manual.

ORANGE PATH: Monitoring of one or more CSFs by FR-0 which indicates that the CSF(s) is under severe challenge.

PROJECTILE: An object ejected, thrown, or launched towards a plant structure. The source of the projectile may be onsite or offsite. Damage is sufficient to cause concern regarding the integrity of the affected structure or the operability or reliability of safety equipment contained therein.

PROTECTED AREA: Encompasses all owner controlled areas within the security protected area fence as shown on Figure 4-A.

RED PATH: Monitoring of one or more CSFs by the FR-0 which indicates that the CSF(s) is under extreme challenge; prompt operator action is required.

RUPTURED: (Steam Generator) Existence of primary to secondary leakage of a magnitude greater than charging pump capacity.

SABOTAGE: Deliberate damage, misalignment, or mis-operation of plant equipment with the intent to render the equipment inoperable.

SIGNIFICANT TRANSIENT: An UNPLANNED event involving one or more of the following: (1) An automatic turbine runback > 15% thermal reactor power; (2) Electrical load rejection > 25% full electrical load; (3) Reactor Trip or (4) Safety Injection System Activation.

SITE PERIMETER (SP): Encompasses all owner controlled areas in the immediate site environs as shown on Figures 4-Aand 7-A.

STRIKE ACTION: A work stoppage within the PROTECTED AREA by a body of workers to enforce compliance with demands made on TVA. The STRIKE ACTION must threaten to interrupt normal plant operations.

TOXIC GAS: A gas that is dangerous to life or limb by reason of inhalation or skin contact (e.g., chlorine).

UNPLANNED: An event or action that is not the expected result of normal operations, testing, or maintenance. Events that result in corrective or mitigative actions being taken in accordance with abnormal or emergency procedures are UNPLANNED.

UNPLANNED: (With specific regard to radioactivity releases) A release of radioactivity is UNPLANNED if the release has not been authorized by a Discharge Permit (DP). Implicit in this definition are unintentional releases, unmonitored releases, or planned releases that exceed a condition specified on the DP, e.g., alarm setpoints, minimum dilution flow, minimum release times, maximum release rates, and/or discharge of incorrect tank.

VALID: An indication or report or condition is considered to be VALID when it is conclusively verified by (1) an instrument channel check, or (2) indications on related or redundant indicators, or (3) by direct observation by plant personnel. Implicit in this definition is the need for timely assessment, i.e., within 15 minutes.

VISIBLE DAMAGE: Damage to equipment that is readily observable without measurements, testing, or analyses. Damage is sufficient enough to cause concern regarding the continued operability or reliability of affected safety structure, system, or component. Example damage includes: deformation due to heat or impact, denting, penetration, rupture, cracking, and/or paint blistering. Surface blemishes (e.g., paint chipping, scratches) should NOT be included.

VITAL AREA: Is any area within the PROTECTED AREA which contains equipment, systems, devices, or material, the failure, destruction, or release of which could directly or indirectly endanger the public health and safety by exposure to radiation.

1.1 Fuel Clad Barrier

1. Critical Safety Function Status

LOSS	Potential LOSS
Core Cooling Red	Core Cooling Orange **OR** Heat Sink Red (RHR Not in Service)

-OR-

2. Primary Coolant Activity Level

LOSS	Potential LOSS
RCS sample activity is Greater Than 300 µCi/gm dose equivalent iodine-131	Not applicable

-OR-

3. Incore TCs Hi Quad Average

LOSS	Potential LOSS
Greater Than 1200°F	Greater Than 727°F

-OR-

4. Reactor Vessel Water Level

LOSS	Potential LOSS
Not Applicable	VALID RVLIS level <33% (No RCP running)

-OR-

5. Containment Radiation Monitors

LOSS	Potential LOSS
VALID reading increase of Greater Than: 74 R/hr On 1-RE-90-271 and 272 **OR** 59 R/hr On 1-RE-90-273 and 274	Not Applicable

-OR-

6. Site Emergency Director Judgment

Any condition that, in the Judgment of the SM/SED, Indicates Loss or Potential Loss of the Fuel Clad Barrier Comparable to the Conditions Listed Above.

1.2 RCS Barrier

1. Critical Safety Function Status

LOSS	Potential LOSS
Not Applicable	Pressurized Thermal Shock Red **OR** Heat Sink Red (RHR Not in Service)

-OR-

2. RCS Leakage/LOCA

LOSS	Potential LOSS
RCS Leak results in Loss of subcooling (<65°F Indicated), [85°F ADV]	Non Isolatable RCS Leak Exceeding The Capacity of One Charging Pump (CCP) In the Normal Charging Alignment. **OR** RCS Leakage Results In Entry Into E-1

-OR-

3. Steam Generator Tube Rupture

LOSS	Potential LOSS
SGTR that results in a safety injection actuation **OR** Entry into E-3	Not Applicable

-OR-

4. Reactor Vessel Water Level

LOSS	Potential LOSS
VALID RVLIS level <33% (No RCP Running)	Not Applicable

-OR-

5. Site Emergency Director Judgment

Any condition that, in the Judgment of the SM/SED, Indicates Loss or Potential Loss of the RCS Barrier Comparable to the Conditions Listed Above.

1.3 CNTMT Barrier

1. Critical Safety Function Status

LOSS	Potential LOSS
Not Applicable	Containment (FR-Z.1) Red **OR** Actions of FR-C.1 (Red Path) are INEFFECTIVE

-OR-

2. Containment Pressure/Hydrogen

LOSS	Potential LOSS
Rapid unexplained decrease following initial increase **OR** Containment pressure or Sump level Not increasing (with LOCA in progress)	Containment Hydrogen Increases to >4% by volume **OR** Pressure >2.8 PSIG (Phase B) with < One full train of Containment spray

-OR-

3. Containment Isolation Status

LOSS	Potential LOSS
Containment Isolation is Incomplete (when required) AND a Release Path to the Environment Exists	Not Applicable

-OR-

4. Containment Bypass

LOSS	Potential LOSS
RUPTURED S/G is also FAULTED outside CNTMT **OR** Prolonged (>4 Hours) Secondary Side release outside CNTMT from a S/G with a SGTL > T/S Limits	Unexplained VALID increase in area or ventilation RAD monitors in areas adjacent to CNTMT (with LOCA in progress)

-OR-

5. Significant Radioactivity in Containment

LOSS	Potential LOSS
Not Applicable	VALID Reading increase of Greater Than: 108 R/hr on 1-RE-90-271 and 1-RE-90-272 **OR** 86 R/hr on 1-RE-90-273 and 1-RE-90-274

-OR-

6. Site Emergency Director Judgment

Any condition that, in the Judgment of the SM/SED, Indicates Loss or Potential Loss of the CNTMT Barrier Comparable to the Conditions Listed Above.

Modes: 1, 2, 3, 4

INSTRUCTIONS

NOTE: A condition is considered to be MET if, in the judgment of the Site Emergency Director, the condition will be MET imminently (i.e., within 1 to 2 hours, in the absence of a viable success path). The classification shall be made a soon as this determination is made.

1. In the matrix to the left, review the **INITIATING CONDITIONS** in all columns and identify which, if any, **INITIATING CONDITIONS** are MET. Circle these **CONDITIONS**.
2. For each of the three barriers, identify if any **LOSS** or Potential **LOSS INITIATING CONDITIONS** have been MET.
3. If a CSF is listed as an **INITIATING CONDITION**; the respective status tree criteria will be monitored and used to determine the **EVENT** classification for the Modes listed on the classification flowchart.
4. Compare the barrier losses and potential losses to the **EVENTS** below and make the appropriate declaration.

FISSION PRODUCT BARRIER MATRIX U1

EVENTS

UNUSUAL EVENT	ALERT
Loss or Potential LOSS of Containment Barrier	Any LOSS or Potential LOSS of Fuel Clad barrier OR Any LOSS or Potential LOSS of RCS barrier
SITE AREA EMERGENCY	**GENERAL EMERGENCY**
LOSS or Potential LOSS of any two barriers	LOSS of any two barriers and Potential LOSS of third barrier

FISSION PRODUCT BARRIER MATRIX (Modes 1-4)

1.1 Fuel Clad
1.2 RCS
1.3 Containment

1

SYSTEM DEGRADATION

2.1 Loss of Instrumentation
2.2 Loss of Function/Communication
2.3 Failure of Reactor Protection
2.4 Fuel Clad Degradation
2.5 RCS Unidentified Leakage
2.6 RCS Identified Leakage
2.7 Uncontrolled Cool Down
2.8 Turbine Failure
2.9 Technical Specification
2.10 Safety Limit

2

LOSS OF POWER

3.1 Loss of AC (Power Ops)
3.2 Loss of AC (Shutdown)
3.3 Loss of DC

3

HAZARDS and SED JUDGMENT

4.1 Fire
4.2 Explosion
Table 4-1
Figure 4-A
4.3 Flammable Gas
4.4 Toxic Gas
Table 4-2
Figure 4-B
4.5 Control Room Evacuation
4.6 Security
4.7 SED Judgment
Table 4-3

4

DESTRUCTIVE PHENOMENON

5.1 Earthquake
5.2 Tornado
5.3 Aircraft/Projectile Crash
Table 5-1
5.4 River Level High
5.5 River Level Low
5.6 Watercraft Crash
Figure 5-A

5

SHUTDOWN SYSTEM DEGRADATION

6.1 Loss of Shutdown Systems
6.2 Loss of AC (Shutdown)
6.3 Loss of DC (Shutdown)
6.4 Fuel Handling

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RADIOLOGICAL

7.1 Gaseous Effluent
7.2 Liquid Effluent
Table 7-1
Figure 7-A
7.3 Radiation Levels
7.4 Fuel Handling
Table 7-2

7

DEFINITIONS/ACRONYMS

UNUSUAL EVENT, ALERT, SITE AREA EMERGENCY and GENERAL EMERGENCY: (see SED Judgment 4.7).

BOMB: An explosive device (See EXPLOSION).

CIVIL DISTURBANCE: A group of twenty (20) or more persons violently protesting station operations or activities at the site.

CREDIBLE SITE-SPECIFIC -The determination is made by WBN senior plant management through use of information found in the Safeguards Contingency Plan.

CRITICAL-SAFETY FUNCTION (CSFs): A plant safety function required to prevent significant release of core radioactivity to the environment. There are six **CSFs**: Sub-criticality, Core Cooling, Heat Sink, Pressurized Thermal Shock, Integrity (Containment) and Inventory (RCS).

EVENT: Assessment of an **EVENT** commences when recognition is made that one or more of the conditions associated with the event exist. Implicit in this definition is the need for timely assessment, i.e. within 15 minutes.

EXCLUSION AREA BOUNDARY (EAB): The demarcation of the area surrounding the WBN units in which postulated FSAR accidents will not result in population doses exceeding the criteria of 10 CFR Part 100. Refer to Figure 7-A.

EXPLOSION: A rapid, violent, unconfined combustion, or a catastrophic failure of pressurized equipment that imparts energy of sufficient force to potentially damage permanent structures required for safe operation.

EXTORTION: An attempt to cause an action at the station by threat of force.

FAULTED: (Steam Generator) Existence of secondary side leakage (i.e., steam or feed line break) that results in an uncontrolled decrease in steam generator pressure or the steam generator being completely depressurized.

FIRE: Combustion characterized by heat and light. Source of smoke such as slipping drive belts or overheated electrical components do not constitute fires. Observation of flame is preferred but is NOT required if large quantities of smoke and heat are observed.

FLAMMABLE GAS: Combustible gases maintained at concentrations less than the **LOWER EXPLOSIVE LIMIT (LEL)** will not explode due to ignition.

HOSTAGE: A person(s) held as leverage against the station to ensure that demands will be met by the station.

INEFFECTIVE: The specified restoration action(s) does not result in a reduction in the level of severity of the RED PATH condition within 15 minutes from identification of the Core Cooling CSF Status Tree RED PATH. A reduction in the level of severity is an improvement in the applicable parameters, e.g., Increasing Trend in Reactor Vessel Water Level (Full RVLIS) and/or Decreasing Trend on Core Thermocouple Temperatures.

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PROJECTILE: An object ejected, thrown, or launched towards a plant structure. The source of the projectile may be onsite or offsite. Damage is sufficient to cause concern regarding the integrity of the affected structure or the operability or reliability of safety equipment contained therein.

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RED PATH: Monitoring of one or more CSFs by the FR-0 which indicates that the CSF(s) is under extreme challenge; prompt operator action is required.

RUPTURED: (Steam Generator) Existence of primary to secondary leakage of a magnitude greater than charging pump capacity.

SABOTAGE: Deliberate damage, misalignment, or mis-operation of plant equipment with the intent to render the equipment inoperable.

SIGNIFICANT TRANSIENT: An UNPLANNED event involving one or more of the following: (1) An automatic turbine runback > 15% thermal reactor power; (2) Electrical load rejection > 25% full electrical load; (3) Reactor Trip or (4) Safety Injection System Activation.

SITE PERIMETER (SP): Encompasses all owner controlled areas in the immediate site environs as shown on Figures 4-Aand 7-A.

STRIKE ACTION: A work stoppage within the PROTECTED AREA by a body of workers to enforce compliance with demands made on TVA. The STRIKE ACTION must threaten to interrupt normal plant operations.

TOXIC GAS: A gas that is dangerous to life or limb by reason of inhalation or skin contact (e.g., chlorine).

UNPLANNED: An event or action that is not the expected result of normal operations, testing, or maintenance. Events that result in corrective or mitigative actions being taken in accordance with abnormal or emergency procedures are UNPLANNED.

UNPLANNED: (With specific regard to radioactivity releases) A release of radioactivity is UNPLANNED if the release has not been authorized by a Discharge Permit (DP). Implicit in this definition are unintentional releases, unmonitored releases, or planned releases that exceed a condition specified on the DP, e.g., alarm setpoints, minimum dilution flow, minimum release times, maximum release rates, and/or discharge of incorrect tank.

VALID: An indication or report or condition is considered to be VALID when it is conclusively verified by (1) an instrument channel check, or (2) indications on related or redundant indicators, or (3) by direct observation by plant personnel. Implicit in this definition is the need for timely assessment, i.e., within 15 minutes.

VISIBLE DAMAGE: Damage to equipment that is readily observable without measurements, testing, or analyses. Damage is sufficient enough to cause concern regarding the continued operability or reliability of affected safety structure, system, or component. Example damage includes: deformation due to heat or impact, denting, penetration, rupture, cracking, and/or paint blistering. Surface blemishes (e.g., paint chipping, scratches) should NOT be included.

VITAL AREA: Is any area within the PROTECTED AREA which contains equipment, systems, devices, or material, the failure, destruction, or release of which could directly or indirectly endanger the public health and safety by exposure to radiation.

2.1 Loss of Instrumentation

	Mode	Initiating/Condition
GENERAL		*Refer to "Fission Product Barrier Matrix" and "Radiological Effluents" (Section 7)*
SITE	1,2 3,4	**Inability to monitor a SIGNIFICANT TRANSIENT in progress** *(1 and 2 and 3 and 4)* 1. Loss of most (>75%) of MCR annunciators (<u>and</u> Annunciator Monitor) <u>or</u> indications 2. **SIGNIFICANT TRANSIENT** in progress 3. Loss of ICS Computer <u>and</u> SPDS 4. Inability to directly monitor any of the following CSFs: Sub-criticality — PTS Core Cooling — Containment Heat Sink — Inventory
ALERT	1,2 3,4	**UNPLANNED loss of most (>75%) MCR annunciators (<u>and</u> Annunciator Printer) or indications for >15 minutes <u>with either</u> a SIGNIFICANT TRANSIENT in progress <u>or</u> ICS computer and SPDS Unavailable** (1 and 2 and 3) 1. **UNPLANNED** loss of most (>75%) MCR annunciators (<u>and</u> Annunciator Monitor) <u>or</u> indications for >15 minutes. 2. SM/SED Judgment that increased surveillance is required to Safely operate the unit (beyond Shift compliment) 3. *(a or b)* a. **SIGNIFICANT TRANSIENT** in Progress b. Loss of ICS Computer <u>and</u> SPDS
UNUSUAL EVENT	1,2 3,4	**UNPLANNED loss of most <u>or</u> All Safety System annunciators <u>or</u> indications in the Control Room for >15 Minutes** *(1 and 2 and 3)* 1. **UNPLANNED** loss of most (>75%) MCR annunciators (<u>and</u> Annunciator Monitor) <u>or</u> indications for >15 minutes. 2. SM/SED Judgment that increased surveillance is required to Safely operate the unit (beyond Shift compliment) 3. ICS Computer <u>or</u> SPDS is in service and capable of displaying data requested.

2.2 Loss of Function

	Mode	Initiating/Condition
GENERAL		*Refer to "Fission Product Barrier Matrix"*
SITE	1,2 3,4	**Complete loss of function needed to achieve <u>or</u> maintain Hot Shutdown** *(1 or 2)* 1. CSF status tree indicates Core Cooling Red 2. CSF status tree indicates Heat Sink Red (RHR <u>not</u> in service) *Note: Also Refer to "Failure of Rx Protection" (2.3) and "Fission Product Barrier Matrix"*
ALERT	4	**Complete loss of function needed to achieve Cold Shutdown when Shutdown required by Tech Specs** *(1 and 2 and 3)* 1. Shutdown is required 2. Loss of RHR capability 3. Loss of secondary heat sink and condenser
UNUSUAL EVENT	ALL	A. **Unplanned loss of all In-Plant Communication capability** *(1 and 2 and 3)* 1. **UNPLANNED** loss of EPABX (PAX) phones 2. **UNPLANNED** loss of all sound powered phones 3. **UNPLANNED** loss of all radios or B. **UNPLANNED loss of all Offsite Communication capability** *(1 and 2 and 3 and 4 and 5)* 1. **UNPLANNED** loss of all EPABX (PAX) phones 2. **UNPLANNED** loss of all Radio frequencies 3. **UNPLANNED** loss of all OPX (Microwave) system 4. **UNPLANNED** loss of all 1 FB-Bell lines 5. **UNPLANNED** loss of all FTS 2000 (NRC) system

GENERAL SITE ALERT UNUSUAL EVENT

2.3 Failure of Rx Protection

Mode	Initiating/Condition
1,2	**Loss of Core cooling capability and VALID Trip Signals did <u>not</u> result in a reduction of Rx power to <5% and decreasing** *(1 and 2)* 1. *(a or b)* a. CSF status tree indicates Core Cooling Red b. CSF status tree indicates Heat Sink Red 2. FR-S.1 entered <u>and</u> subsequent actions <u>Did Not</u> result in a Rx Power of <5% and decreasing
1,2	**Rx power <u>Not</u> <5% and decreasing after VALID Auto and Manual trip signals** *(1 and 2 and 3)* 1. **VALID** Rx Auto Trip signal received or required 2. Manual Rx Trip from the MCR was <u>Not</u> successful. 3. FR-S.1 has been entered.
1,2	**Automatic Rx trip did not occur after VALID Trip signal and manual trip from MCR was successful** *(1 and 2)* 1. **VALID** Rx Auto Trip signal received or required 2. Manual Rx Trip from the MCR <u>was</u> successful and power is <5% and decreasing.
	Not Applicable

2.4 Fuel Clad Degradation

Mode	Initiating/Condition
	Refer to "Fission Product Barrier Matrix"
	Refer to "Fission Product Barrier Matrix"
	Refer to "Fission Product Barrier Matrix"
1,2, 3,4, 5	**Reactor Coolant System specific activity exceeds LCO (Refer to WBN Tech. Spec. 3.4.16)** 1. Radiochemistry analysis indicates *(a or b)* a. Dose equivalent Iodine (I-131) >0.265 μCi/gm for >48 Hours <u>or</u> >21 μCi/gm. b. Specific activity >100/E μCi/gm

SYSTEM DEGRADATION U1

2.5 RCS Unidentified Leakage

	Mode	Initiating/Condition
GENERAL		*Refer to "Fission Product Barrier Matrix"*
SITE		*Refer to "Fission Product Barrier Matrix"*
ALERT		*Refer to "Fission Product Barrier Matrix"*
UNUSUAL EVENT	1,2 3,4, *5	**Unidentified <u>or</u> pressure boundary RCS leakage >10 GPM** 1. Unidentified or pressure boundary leakage (as defined by Tech. Spec.) >10 GPM as indicated below *(a or b)* a. 1-SI-68-32 results b. With RCS Temperature <u>and</u> PZR Level Stable, VCT Level Dropping at a Rate >10 GPM **Note: <u>Applies to Mode 5 if RCS Pressurized</u>*

2.6 RCS Identified Leakage

	Mode	Initiating/Condition
GENERAL		*Refer to "Fission Product Barrier Matrix"*
SITE		*Refer to "Fission Product Barrier Matrix"*
ALERT		*Refer to "Fission Product Barrier Matrix"*
UNUSUAL EVENT	1,2, 3,4, *5	**Identified RCS leakage >25 GPM** 1. Identified RCS leakage (as defined by Tech. Spec.) >25 GPM *(a or b)* a. 1-SI-68-32 results b. Level rise in excess of 25 GPM total into PRT, RCDT or CVCS Holdup Tank **Note: <u>Applies to Mode 5 if RCS Pressurized</u>*

GENERAL SITE ALERT UNUSUAL EVENT

SYSTEM DEGRADATION U1

2.7 Uncontrolled Cooldown

Mode	Initiating/Condition
	Refer to "Fission Product Barrier Matrix"
	Refer to "Fission Product Barrier Matrix"
	Refer to "Fission Product Barrier Matrix"
1,2,3	**UNPLANNED rapid depressurization of the Main Steam System resulting in a rapid RCS cooldown <u>and</u> Safety Injection Initiation** *(1 and 2)* 1. Rapid depressurization of Main Steam System (<675 psig) 2. Safety Injection has initiated <u>or</u> is required

2.8 Turbine Failure

Mode	Initiating/Condition
	Refer to "Fission Product Barrier Matrix"
	Refer to "Fission Product Barrier Matrix"
1,2,3	**Turbine Failure has generated PROJECTILES that cause VISIBLE DAMAGE to any area containing Safety Related equipment** 1. Turbine **PROJECTILES** has resulted in **VISIBLE DAMAGE** in any of the following areas: Control Building Auxiliary Building Unit #1 Containment Diesel Generator Bldg. RWST Intake Pumping Station CST
1,2,3	**Turbine Failure results in Casing penetration** 1. Turbine Failure which results in penetration of the Turbine Casing <u>or</u> Damage to Main Generator Seals

2.9 Technical Specification

	Mode	Initiating/Condition
GENERAL		*Not Applicable*
SITE		*Not Applicable*
ALERT		*Not Applicable*
UNUSUAL EVENT	1,2 3,4	**Inability to reach required Shutdown within Tech. Spec. limits** *(1 and 2)* 1. Any Tech. Spec. LCO Statement, requiring a Mode reduction, has been entered 2. The Unit has not been placed in the required Mode within the time prescribed by the LCO Action Statement

2.10 Safety Limit

	Mode	Initiating/Condition
GENERAL		*Not Applicable*
SITE		*Not Applicable*
ALERT		*Not Applicable*
UNUSUAL EVENT	1,2, 3,4, 5	**Safety Limits have been Exceeded** *(1 or 2)* 1. The combination of thermal power, RCS temperature, and RCS pressure > safety limits as indicated by WBN Tech. Spec. Figure 2.1.1-1 "Reactor Core Safety Limits" 2. RCS/Pressurizer pressure exceeds safety limit (>2735 psig)

DEFINITIONS/ACRONYMS

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STRIKE ACTION: A work stoppage within the PROTECTED AREA by a body of workers to enforce compliance with demands made on TVA. The STRIKE ACTION must threaten to interrupt normal plant operations.

TOXIC GAS: A gas that is dangerous to life or limb by reason of inhalation or skin contact (e.g., chlorine).

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	3.1 Loss of AC (Power Ops)		3.2 Loss of AC (Shutdown)	
	Mode	Initiating/Condition	Mode	Initiating/Condition
GENERAL	1,2, 3,4	**Prolonged loss of Offsite and Onsite AC power** *(1 and 2)* 1. 1A and 1B 6.9KV Shutdown Bds de-energized for >15 minutes 2. *(a or b)* a. Core Cooling Red or Orange b. Restoration of Either 1A or 1B 6.9KV Shutdown Bds is not likely within 4 hours of loss.		*Not Applicable*
SITE	1,2, 3,4	**Loss of Offsite and Onsite AC Power > 15 minutes** 1. 1A and 1B 6.9KV Shutdown Bds de-energized for >15 minutes		*Not Applicable*
ALERT	1,2, 3,4	**Loss of Offsite Power for >15 minutes** *(1 and 2)* 1. C and D CSSTs not available for >15 minutes 2. 1A or 1B Diesel Generator not available	5,6, or De- fuel	**UNPLANNED loss of Offsite and Onsite AC power for >15 minutes** 1. 1A and 1B 6.9KV Shutdown Bds de-energized for >15 minutes *Also Refer to "Loss of Shutdown Systems" (6.1)*
UNUSUAL EVENT	1,2 3,4	**Loss of Offsite Power for >15 minutes** *(1 and 2)* 1. C and D CSSTs not available for >15 minutes 2. Each Diesel Generator is supplying power to its respective Shutdown Board	5,6, or De- fuel	**UNPLANNED loss of Offsite Power for >15 minutes** *(1 and 2)* 1. C and D CSSTs not available for >15 minutes 2. Either Diesel Generator is supplying power to its respective Shutdown Board

LOSS OF POWER U1

3.3 Loss of DC Power

	Mode	Initiating/Condition
GENERAL		*Refer to "Fission Product Barrier Matrix" and "Loss of Function" (2.2)*
SITE	1,2, 3,4	**Loss of All Vital DC Power for >15 minutes** 1. Voltage <105V DC on 125V DC Vital Battery Buses 1-I and 1-II and 1-III and 1-IV for >15 minutes *Also Refer to "Fission Product Barrier Matrix", "Loss of Function" (2.2), and "Loss of Instrumentation" (2.1)*
ALERT		*Also Refer to "Fission Product Barrier Matrix", "Loss of Function" (2.2), and "Loss of Instrumentation" (2.1)*
UNUSUAL EVENT	5,6, or De-fuel	**UNPLANNED Loss of the Required Train of DC power for >15 minutes** *(1 or 2)* 1. Voltage <105V DC on 125V DC Vital Battery Buses 1-I and 1-III for >15 minutes 2. Voltage <105V DC on 125V DC Vital Battery Buses 1-II and 1-IV for >15 minutes

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VITAL AREA: Is any area within the PROTECTED AREA which contains equipment, systems, devices, or material, the failure, destruction, or release of which could directly or indirectly endanger the public health and safety by exposure to radiation.

4.1 FIRE

	Mode	Initiating/Condition
GENERAL		*Refer to "Fission Product Barrier Matrix"*
SITE		*Refer to "Control Room Evacuation," (4.5) or Fission Product Barrier Matrix"*
ALERT	All	**FIRE in any of the areas listed in Table 4-1 that is affecting Safety Related equipment** *(1 and 2)* 1. **FIRE** in any of the areas listed in Table 4-1 2. (a or b) a. **VISIBLE DAMAGE** to permanent structure <u>or</u> Safety Related equipment in the specified area is observed due to the **FIRE** b. Control Room indication of degraded Safety System <u>or</u> component response due to the **FIRE**
UNUSUAL EVENT	All	**FIRE in the PROTECTED AREA threatening any of the areas listed in Table 4-1 that is <u>Not</u> extinguished within 15 minutes from the Time of Control Room notification <u>or</u> verification of Control Room Alarm (Figure 4-A)**

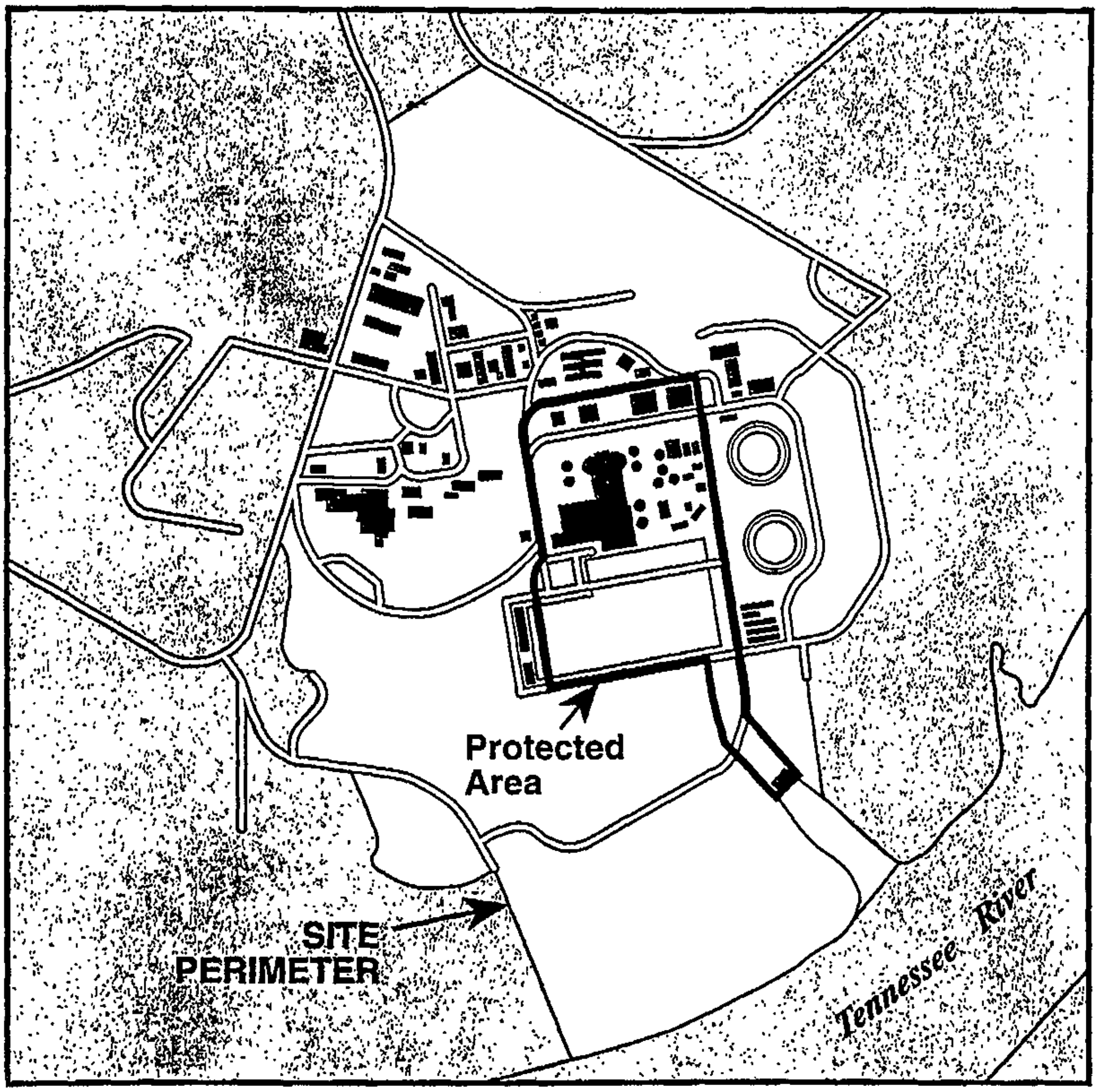
4.2 Explosions

	Mode	Initiating/Condition
GENERAL		*Refer to "Fission Product Barrier Matrix"*
SITE		*Refer to "Fission Product Barrier Matrix"*
ALERT	All	**EXPLOSION in any of the areas listed in Table 4-1 that is affecting Safety Related equipment** *(1 and 2)* 1. **EXPLOSION** in any of the areas listed in Table 4-1 2. (a or b) a. An **EXPLOSION** has caused **VISIBLE DAMAGE** to Safety Related equipment b. Control Room indication of degraded Safety System <u>or</u> component response due to the **EXPLOSION** *Refer to "Security" (4.6)*
UNUSUAL EVENT	All	**UNPLANNED EXPLOSION within the PROTECTED AREA resulting in VISIBLE DAMAGE to any permanent structure <u>or</u> equipment (Figure 4-A)** *Refer to "Security" (4.6)*

TABLE 4-1
PLANT AREAS ASSOCIATED WITH FIRE AND EXPLOSION EALS

Unit #1 Reactor Building	Additional Diesel Generator Building
Auxiliary Building	Intake Pumping Station
Control Building	Additional Equipment Buildings (Unit 1&2)
Diesel Generator Building	RWST
CST	

Figure 4-A
PROTECTED AREA/SITE PERIMETER



4.3 Flammable Gas

	Mode	Initiating/Condition
GENERAL		*Refer to "Fission Product Barrier Matrix"*
SITE		*Refer to "Fission Product Barrier Matrix"*
ALERT	All	**UNPLANNED release of Flammable Gas within a facility structure containing Safety Related equipment <u>or</u> associated with Power production** 1. Plant personnel report the average of three readings taken in a ~10ft triangular Area is >25% (**LEL**) Lower Explosive Limit, as indicated on the monitoring instrument within any building listed in Table 4-2.
UNUSUAL EVENT	All	**A. UNPLANNED release of Flammable Gas within the SITE PERIMETER** 1. Plant personnel report the average of three readings taken in a ~10ft Triangular Area is >25% (**LEL**) Lower Explosive Limit, as indicated on the monitoring instrument within the **SITE PERIMETER** (Refer to Figure 4-B) <u>OR</u> **B. Confirmed report by Local, County, <u>or</u> State Officials that a Large Offsite Flammable Gas release has occurred within One Mile of the Site with potential to enter the SITE PERIMETER in concentrations >25% of LEL Lower Explosive Limit (Refer to Figure 4-B)**

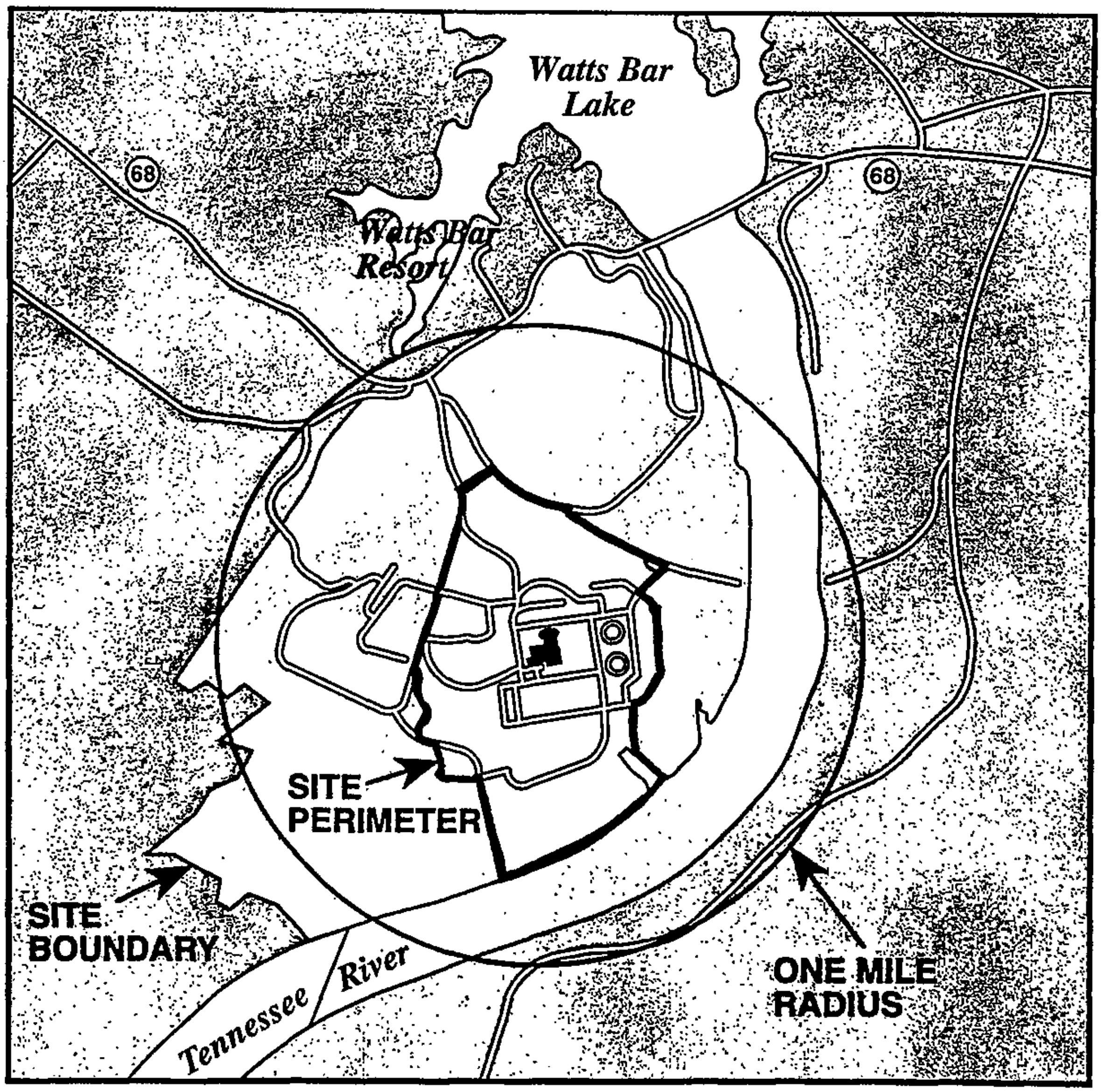
4.4 Toxic Gas

	Mode	Initiating/Condition
GENERAL		*Refer to "Fission Product Barrier Matrix"*
SITE		*Refer to "Fission Product Barrier Matrix"*
ALERT	All	**Release of TOXIC GAS within a facility structure which Prohibits Safe Operation of systems required to establish <u>or</u> maintain Cold S/D** *(1 and 2 and 3)* 1. Plant personnel report **TOXIC GAS** within any building listed in Table 4-2 2. *(a or b)* a. Plant personnel report Severe Adverse Health Reactions due to **TOXIC GAS** (i.e., burning eyes, nose, throat, dizziness) b. Sampling indications > **(PEL)** Permissible Exposure Limit 3. Plant personnel would be unable to perform actions necessary to establish and maintain Cold Shutdown while utilizing appropriate personnel protection equipment.
UNUSUAL EVENT	All	**A. Normal Operations impeded due to access restrictions caused by TOXIC GAS concentrations within a Facility Structure listed in Table 4-2** <u>OR</u> **B. Confirmed report by Local, County, <u>or</u> State Officials that a Large Offsite TOXIC GAS release has occurred within One Mile of the Site with potential to enter the Site Perimeter in concentrations >than the (PEL) Permissible Exposure Limit thus causing an Evacuation (Figure 4-B)**

TABLE 4-2
Plant Structures Associated With TOXIC or Flammable Gas EALs

Unit #1 & 2 Reactor Buildings
Auxiliary Building
Control Building
Diesel Generator Building
Additional Diesel Generator Building
Intake Pumping Station
Additional Equipment Bldgs (Unit 1&2)
CDWE Building
Turbine Building

Figure 4-B
ONE MILE RADIUS/SITE PERIMETER



4.5 Control Room Evacuation

	Mode	Initiating/Condition
ENERAL		*Refer to "Fission Product Barrier Matrix"*
SITE	All	**Evacuation of the Control Room has been initiated <u>and</u> Control of all necessary equipment <u>Has Not</u> been established within 15 minutes of manning the Auxiliary Control Room** *(1 and 2 and 3)* 1. (a or b) a. AOI-30.2 "Fire Safety Shutdown" entered b. AOI-27 "Main Control Room Inaccessibility" entered 2. SM/SED Orders Control Room evacuation 3. Control has <u>Not</u> been established at the Remote Shutdown Panel within 15 minutes of manning the Auxiliary Control Room and transfer of switches on Panels L11A and L11B
ERT	All	**Evacuation of the Control Room is Required** *(1 and 2)* 1. (a or b) a. AOI-30.2 "Fire Safe Shutdown" entered b. AOI-27 "Main Control Room Inaccessibility" entered 2. SM/SED Orders Control Room evacuation
UNUSUAL EVE		*Not Applicable*

4.6 Security

Mode	Initiating/Condition
All	**Security Event resulting in loss of Control of the Plant** 1. Hostile Armed Force has taken Control of the Plant, Control Room, <u>or</u> Remote shutdown capability
All	**Security Event has <u>or</u> is occurring which results in Actual <u>or</u> Likely Failures of Plant Functions needed to Protect the Public** 1. **VITAL AREA**, other than the Control Room, has been penetrated by a Hostile Armed Force
All	**Confirmed Security Event which indicates an Actual <u>or</u> Potential Substantial Degradation in the level of Safety of the Plant** *(1 or 2 or 3)* 1. **BOMB** discovered within a **VITAL AREA** 2. **CIVIL DISTURBANCE** ongoing within the **PROTECTED AREA** 3. **PROTECTED AREA** has been penetrated by a Hostile Armed Force *Refer to Figure 4-A For a Drawing of **Protected Area** and **Site Perimeter***
All	**Confirmed Security Event which indicates a Potential Degradation in the level of Safety of the Plant** *(1 or 2)* 1. **BOMB** discovered within the **PROTECTED AREA** 2. Security Shift Supervisor reports one <u>or</u> more of the events listed in Table 4-3

4.7 Emergency Director Judgment

	Mode	Initiating/Condition
GENERAL	All	Events are in progress or have occurred which involve Actual or Imminent Substantial Core Degradation or Melting With Potential for Loss of Containment Integrity. Releases can be reasonable expected to exceed EPA Plume Protective Action Guidelines Exposure Levels outside the EXCLUSION AREA BOUNDARY, Refer to Figure 7-A.
SITE	All	Events are in progress or have occurred which involve Actual or Likely Major Failures of Plant Functions needed for the Protection of the Public. Any releases are not expected to result in Exposure Levels which Exceed EPA Plume Protective Action Guidelines Exposure Levels outside the EXCLUSION AREA BOUNDARY, Refer to Figure 7-A.
ALERT	All	Events are in progress or have occurred which involve Actual or Potential Substantial Degradation of the Level of Safety of the Plant. Any releases are expected to be limited to small fractions of the EPA Plume Protective Action Guidelines Exposure Levels.
UNUSUAL EVENT	All	Unusual Events are in Progress or have occurred which indicate a Potential Degradation of the Level of Safety of the Plant. No releases of Radioactive Material requiring Offsite Response or Monitoring are expected unless further degradation of Safety Systems occurs.

Table 4-3
SECURITY EVENTS

a. **SABOTAGE/INTRUSION** has occurred or is occurring within the **PROTECTED AREA**

b. **HOSTAGE/EXTORTION** Situation that Threatens to interrupt Plant Operations

c. **CIVIL DISTURBANCE** ongoing between the **SITE PERIMETER** and **PROTECTED AREA**

d. Hostile **STRIKE ACTION** within the **PROTECTED AREA** which threatens to interrupt Normal Plant Operations (Judgment Based on behavior of Strikers and/or Intelligence received)

e. A **CREDIBLE SITE-SPECIFIC** security threat notification.

HAZARDS / SED JUDGMENT U1

FISSION PRODUCT BARRIER MATRIX (Modes 1-4)

1.1 Fuel Clad
1.2 RCS
1.3 Containment

1

SYSTEM DEGRADATION

2.1 Loss of Instrumentation
2.2 Loss of Function/Communication
2.3 Failure of Reactor Protection
2.4 Fuel Clad Degradation
2.5 RCS Unidentified Leakage
2.6 RCS Identified Leakage
2.7 Uncontrolled Cool Down
2.8 Turbine Failure
2.9 Technical Specification
2.10 Safety Limit

2

LOSS OF POWER

3.1 Loss of AC (Power Ops)
3.2 Loss of AC (Shutdown)
3.3 Loss of DC

3

HAZARDS and SED JUDGMENT

4.1 Fire
4.2 Explosion
Table 4-1
Figure 4-A
4.3 Flammable Gas
4.4 Toxic Gas
Table 4-2
Figure 4-B
4.5 Control Room Evacuation
4.6 Security
4.7 SED Judgment
Table 4-3

4

DESTRUCTIVE PHENOMENON

5.1 Earthquake
5.2 Tornado
5.3 Aircraft/Projectile Crash
Table 5-1
5.4 River Level High
5.5 River Level Low
5.6 Watercraft Crash
Figure 5-A

5

SHUTDOWN SYSTEM DEGRADATION

6.1 Loss of Shutdown Systems
6.2 Loss of AC (Shutdown)
6.3 Loss of DC (Shutdown)
6.4 Fuel Handling

6

RADIOLOGICAL

7.1 Gaseous Effluent
7.2 Liquid Effluent
Table 7-1
Figure 7-A
7.3 Radiation Levels
7.4 Fuel Handling
Table 7-2

7

DEFINITIONS/ACRONYMS

UNUSUAL EVENT, ALERT, SITE AREA EMERGENCY and GENERAL EMERGENCY: (see SED Judgment 4.7).

BOMB: An explosive device (See EXPLOSION).

CIVIL DISTURBANCE: A group of twenty (20) or more persons violently protesting station operations or activities at the site.

CREDIBLE SITE-SPECIFIC -The determination is made by WBN senior plant management through use of information found in the Safeguards Contingency Plan.

CRITICAL-SAFETY FUNCTION (CSFs): A plant safety function required to prevent significant release of core radioactivity to the environment. There are six CSFs: Sub-criticality, Core Cooling, Heat Sink, Pressurized Thermal Shock, Integrity (Containment) and Inventory (RCS).

EVENT: Assessment of an **EVENT** commences when recognition is made that one or more of the conditions associated with the event exist. Implicit in this definition is the need for timely assessment, i.e. within 15 minutes.

EXCLUSION AREA BOUNDARY (EAB): The demarcation of the area surrounding the WBN units in which postulated FSAR accidents will not result in population doses exceeding the criteria of 10 CFR Part 100. Refer to Figure 7-A.

EXPLOSION: A rapid, violent, unconfined combustion, or a catastrophic failure of pressurized equipment that imparts energy of sufficient force to potentially damage permanent structures required for safe operation.

EXTORTION: An attempt to cause an action at the station by threat of force.

FAULTED: (Steam Generator) Existence of secondary side leakage (i.e., steam or feed line break) that results in an uncontrolled decrease in steam generator pressure or the steam generator being completely depressurized.

FIRE: Combustion characterized by heat and light. Source of smoke such as slipping drive belts or overheated electrical components do not constitute fires. Observation of flame is preferred but is NOT required if large quantities of smoke and heat are observed.

FLAMMABLE GAS: Combustible gases maintained at concentrations less than the **LOWER EXPLOSIVE LIMIT (LEL)** will not explode due to ignition.

HOSTAGE: A person(s) held as leverage against the station to ensure that demands will be met by the station.

INEFFECTIVE: The specified restoration action(s) does not result in a reduction in the level of severity of the RED PATH condition within 15 minutes from identification of the Core Cooling CSF Status Tree RED PATH. A reduction in the level of severity is an improvement in the applicable parameters, e.g., Increasing Trend in Reactor Vessel Water Level (Full RVLIS) and/or Decreasing Trend on Core Thermocouple Temperatures.

INITIATING CONDITIONS: Plant Parameters, radiation monitor readings or personnel observations that identify an Event for purposes of Emergency Plan Classification.

INTRUSION/INTRUDER: Suspected hostile individual present in a protected area without authorization.

ODCM: Offsite Dose Calculation Manual.

ORANGE PATH: Monitoring of one or more CSFs by FR-0 which indicates that the CSF(s) is under severe challenge.

PROJECTILE: An object ejected, thrown, or launched towards a plant structure. The source of the projectile may be onsite or offsite. Damage is sufficient to cause concern regarding the integrity of the affected structure or the operability or reliability of safety equipment contained therein.

PROTECTED AREA: Encompasses all owner controlled areas within the security protected area fence as shown on Figure 4-A.

RED PATH: Monitoring of one or more CSFs by the FR-0 which indicates that the CSF(s) is under extreme challenge; prompt operator action is required.

RUPTURED: (Steam Generator) Existence of primary to secondary leakage of a magnitude greater than charging pump capacity.

SABOTAGE: Deliberate damage, misalignment, or mis-operation of plant equipment with the intent to render the equipment inoperable.

SIGNIFICANT TRANSIENT: An UNPLANNED event involving one or more of the following: (1) An automatic turbine runback > 15% thermal reactor power; (2) Electrical load rejection > 25% full electrical load; (3) Reactor Trip or (4) Safety Injection System Activation.

SITE PERIMETER (SP): Encompasses all owner controlled areas in the immediate site environs as shown on Figures 4-Aand 7-A.

STRIKE ACTION: A work stoppage within the PROTECTED AREA by a body of workers to enforce compliance with demands made on TVA. The STRIKE ACTION must threaten to interrupt normal plant operations.

TOXIC GAS: A gas that is dangerous to life or limb by reason of inhalation or skin contact (e.g., chlorine).

UNPLANNED: An event or action that is not the expected result of normal operations, testing, or maintenance. Events that result in corrective or mitigative actions being taken in accordance with abnormal or emergency procedures are UNPLANNED.

UNPLANNED: (With specific regard to radioactivity releases) A release of radioactivity is UNPLANNED if the release has not been authorized by a Discharge Permit (DP). Implicit in this definition are unintentional releases, unmonitored releases, or planned releases that exceed a condition specified on the DP, e.g., alarm setpoints, minimum dilution flow, minimum release times, maximum release rates, and/or discharge of incorrect tank.

VALID: An indication or report or condition is considered to be VALID when it is conclusively verified by (1) an instrument channel check, or (2) indications on related or redundant indicators, or (3) by direct observation by plant personnel. Implicit in this definition is the need for timely assessment, i.e., within 15 minutes.

VISIBLE DAMAGE: Damage to equipment that is readily observable without measurements, testing, or analyses. Damage is sufficient enough to cause concern regarding the continued operability or reliability of affected safety structure, system, or component. Example damage includes: deformation due to heat or impact, denting, penetration, rupture, cracking, and/or paint blistering. Surface blemishes (e.g., paint chipping, scratches) should NOT be included.

VITAL AREA: Is any area within the PROTECTED AREA which contains equipment, systems, devices, or material, the failure, destruction, or release of which could directly or indirectly endanger the public health and safety by exposure to radiation.

5.1 Earthquake

	Mode	Initiating/Condition
GENERAL		*Refer to "Fission Product Barrier Matrix"*
SITE		*Refer to "Fission Product Barrier Matrix"*
ALERT	All	**Earthquake detected by site seismic instrumentation** *(1 and 2)* 1. *(a and b)* a. Ann.166 D indicates "OBE Spectra Exceeded" b. Ann.166 E indicates "Seismic Recording Initiated" 2. *(a or b)* a. Ground motion sensed by Plant personnel b. National Earthquake Information Center at 1-(303) 273-8500 can confirm the event.
UNUSUAL EVENT	All	**Earthquake detected by site seismic instrumentation** *(1 and 2)* 1. Ann. 166 E indicator "Seismic Recording Initiated" 2. (a or b) a. Ground motion sensed by Plant personnel b. National Earthquake Information Center at 1-(303) 273-8500 can confirm the event.

5.2 Tornado

	Mode	Initiating/Condition
GENERAL		*Refer to "Fission Product Barrier Matrix"*
SITE		*Refer to "Fission Product Barrier Matrix"*
ALERT	All	**Tornado <u>or</u> High Winds strikes any structure listed in Table 5-1 and results in VISIBLE DAMAGE** *(1 and 2)* 1. Tornado or High Winds (Sustained >80 mph > one minute) strikes any structure listed in Table 5-1 2. *(a or b)* a. Confirmed report of any **VISIBLE DAMAGE** b. Control Room indications of degraded Safety System <u>or</u> component response due to event *Note: Site Met Data Instrumentation fails to 0 at >100 mph. National Weather Service Morristown 1-(423) 586-8400 can provide additional information if needed.*
UNUSUAL EVENT	All	**Tornado within the SITE PERIMETER** 1. Plant personnel report a Tornado has been sighted within the **SITE PERIMETER** (Refer to Figure 5-A)

5.3 Aircraft/Projectile Crash

	Mode	Initiating/Condition
GENERAL		*Refer to "Fission Product Barrier Matrix"*
SITE		*Refer to "Fission Product Barrier Matrix"*
ALERT	All	**Aircraft or PROJECTILE impacts (Strikes) any Plant structure listed in Table 5-1 resulting in VISIBLE DAMAGE** *(1 and 2)* 1. Plant personnel report aircraft or PROJECTILE has impacted any structure listed in Table 5-1 2. *(a or b)* a. Confirmed report of any **VISIBLE DAMAGE** b. Control Room indications of degraded Safety System or component response due to the event within the specified areas
UNUSUAL EVENT	All	**Aircraft crash or PROJECTILE impact within the SITE PERIMETER** 1. Plant personnel report a Aircraft Crash or **PROJECTILE** impact within the **SITE PERIMETER** (Refer to Figure 5-A)

Table 5-1
Plant Structures Associated With Tornado/Hi Wind and Aircraft EALs

Unit #1 and 2 Reactor Buildings
Auxiliary Building
Control Building
Diesel Generator Building
Additional Diesel Generator Building
Intake Pumping Station
Additional Equipment Buildings (Units 1 & 2)
CDWE Building
Turbine Building
RWST
CST

5.4 River Level HIGH

	Mode	Initiating/Condition
GENERAL		*Refer to "Fission Product Barrier Matrix"*
SITE		*Refer to "Fission Product Barrier Matrix"*
ALERT	All	**River Reservoir level is at Stage II Flood Warning** *(1 or 2)* 1. River Reservoir level >727 Ft 2. Stage II Flood Warning (AOI-7) has been issued by River Systems Operations
UNUSUAL EVENT	All	**River Reservoir level is at Stage I Flood Warning** *(1 or 2 or 3)* 1. River Reservoir level >726.5 Ft from April 16 thru September 30 2. River Reservoir level >714.5 Ft from October 1 thru April 15 3. Stage I Flood Warning (AOI-7) has been issued by River Systems Operations

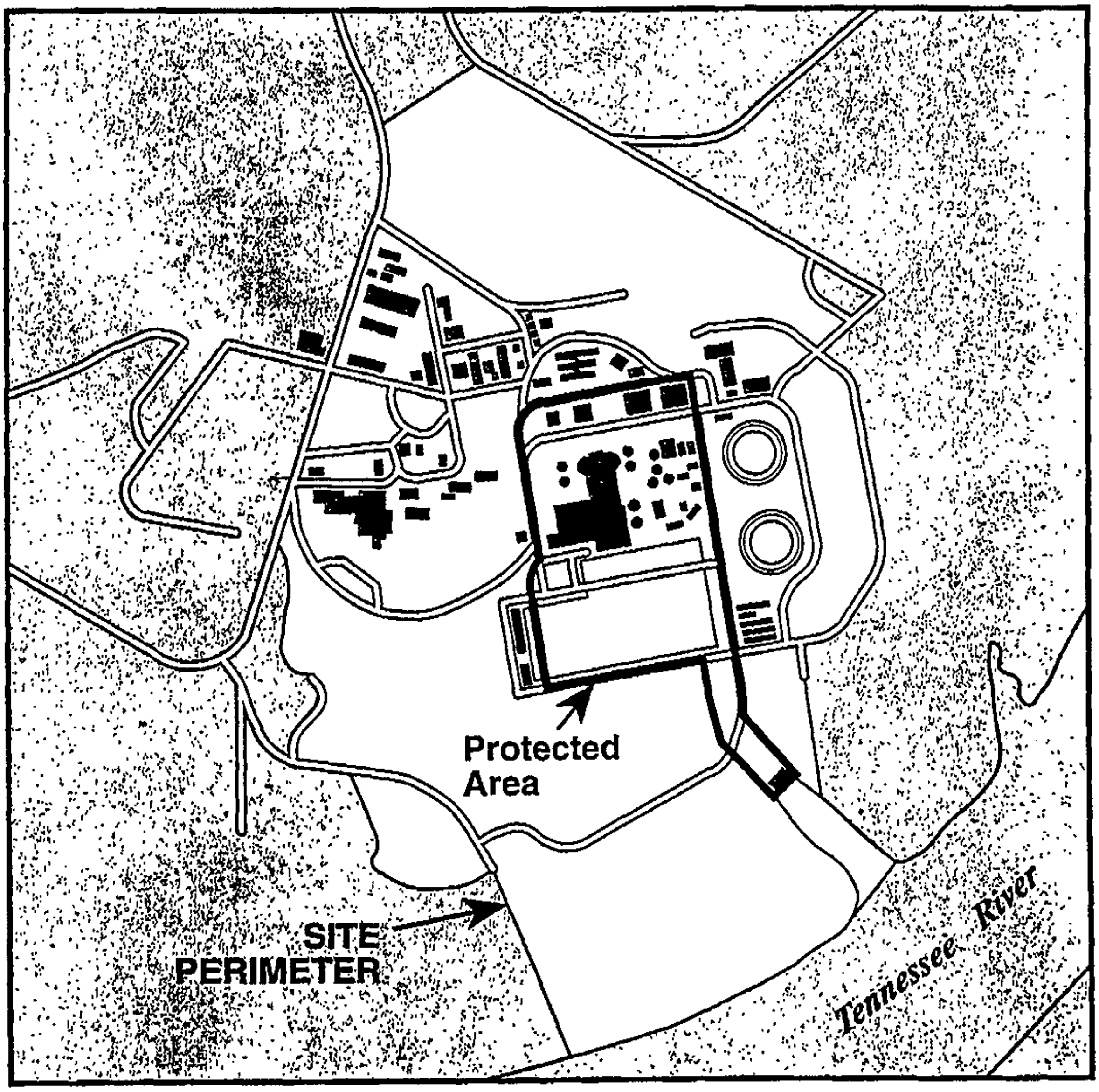
5.5 River Level LOW

	Mode	Initiating/Condition
GENERAL		*Refer to "Fission Product Barrier Matrix"*
SITE		*Refer to "Fission Product Barrier Matrix"*
ALERT	All	**River Reservoir level is <668 Ft (AOI-22) as reported by River Systems Operations**
UNUSUAL EVENT	All	**River Reservoir level is ≤673 Ft (AOI-22) as reported by River Systems Operations**

5.6 Watercraft Crash

	Mode	Initiating/Condition
GENERAL		*Refer to "Fission Product Barrier Matrix"*
SITE		*Refer to "Fission Product Barrier Matrix"*
ALERT		*Refer to "Fission Product Barrier Matrix"*
UNUSUAL EVEN	All	**Watercraft Strikes the Intake Pumping Station resulting in a reduction of Essential Raw Cooling Water (ERCW) or Raw Cooling Water (RCW)** *(1 and 2)* 1. Plant personnel report a Watercraft has struck the Intake Pumping Station 2. (a or b or c) a. ERCW Supply Header Pressure Train A O-PI-67-18A is <15 psig b. ERCW Supply Header Pressure Train B O-PI-67-17A is <15 psig c. RCW Supply Header Pressure O-PI-24-22 is <15 psig

Figure 5-A
PROTECTED AREA/SITE PERIMETER



DEFINITIONS/ACRONYMS

UNUSUAL EVENT, ALERT, SITE AREA EMERGENCY and GENERAL EMERGENCY: (see SED Judgment 4.7).

BOMB: An explosive device (See EXPLOSION).

CIVIL DISTURBANCE: A group of twenty (20) or more persons violently protesting station operations or activities at the site.

CREDIBLE SITE-SPECIFIC -The determination is made by WBN senior plant management through use of information found in the Safeguards Contingency Plan.

CRITICAL-SAFETY FUNCTION (CSFs): A plant safety function required to prevent significant release of core radioactivity to the environment. There are six CSFs: Sub-criticality, Core Cooling, Heat Sink, Pressurized Thermal Shock, Integrity (Containment) and Inventory (RCS).

EVENT: Assessment of an EVENT commences when recognition is made that one or more of the conditions associated with the event exist. Implicit in this definition is the need for timely assessment, i.e. within 15 minutes.

EXCLUSION AREA BOUNDARY (EAB): The demarcation of the area surrounding the WBN units in which postulated FSAR accidents will not result in population doses exceeding the criteria of 10 CFR Part 100. Refer to Figure 7-A.

EXPLOSION: A rapid, violent, unconfined combustion, or a catastrophic failure of pressurized equipment that imparts energy of sufficient force to potentially damage permanent structures required for safe operation.

EXTORTION: An attempt to cause an action at the station by threat of force.

FAULTED: (Steam Generator) Existence of secondary side leakage (i.e., steam or feed line break) that results in an uncontrolled decrease in steam generator pressure or the steam generator being completely depressurized.

FIRE: Combustion characterized by heat and light. Source of smoke such as slipping drive belts or overheated electrical components do not constitute fires. Observation of flame is preferred but is NOT required if large quantities of smoke and heat are observed.

FLAMMABLE GAS: Combustible gases maintained at concentrations less than the **LOWER EXPLOSIVE LIMIT (LEL)** will not explode due to ignition.

HOSTAGE: A person(s) held as leverage against the station to ensure that demands will be met by the station.

INEFFECTIVE: The specified restoration action(s) does not result in a reduction in the level of severity of the RED PATH condition within 15 minutes from identification of the Core Cooling CSF Status Tree RED PATH. A reduction in the level of severity is an improvement in the applicable parameters, e.g., Increasing Trend in Reactor Vessel Water Level (Full RVLIS) and/or Decreasing Trend on Core Thermocouple Temperatures.

INITIATING CONDITIONS: Plant Parameters, radiation monitor readings or personnel observations that identify an Event for purposes of Emergency Plan Classification.

INTRUSION/INTRUDER: Suspected hostile individual present in a protected area without authorization.

ODCM: Offsite Dose Calculation Manual.

ORANGE PATH: Monitoring of one or more CSFs by FR-0 which indicates that the CSF(s) is under severe challenge.

PROJECTILE: An object ejected, thrown, or launched towards a plant structure. The source of the projectile may be onsite or offsite. Damage is sufficient to cause concern regarding the integrity of the affected structure or the operability or reliability of safety equipment contained therein.

PROTECTED AREA: Encompasses all owner controlled areas within the security protected area fence as shown on Figure 4-A.

RED PATH: Monitoring of one or more CSFs by the FR-0 which indicates that the CSF(s) is under extreme challenge; prompt operator action is required.

RUPTURED: (Steam Generator) Existence of primary to secondary leakage of a magnitude greater than charging pump capacity.

SABOTAGE: Deliberate damage, misalignment, or mis-operation of plant equipment with the intent to render the equipment inoperable.

SIGNIFICANT TRANSIENT: An UNPLANNED event involving one or more of the following: (1) An automatic turbine runback > 15% thermal reactor power; (2) Electrical load rejection > 25% full electrical load; (3) Reactor Trip or (4) Safety Injection System Activation.

SITE PERIMETER (SP): Encompasses all owner controlled areas in the immediate site environs as shown on Figures 4-Aand 7-A.

STRIKE ACTION: A work stoppage within the PROTECTED AREA by a body of workers to enforce compliance with demands made on TVA. The STRIKE ACTION must threaten to interrupt normal plant operations.

TOXIC GAS: A gas that is dangerous to life or limb by reason of inhalation or skin contact (e.g., chlorine).

UNPLANNED: An event or action that is not the expected result of normal operations, testing, or maintenance. Events that result in corrective or mitigative actions being taken in accordance with abnormal or emergency procedures are UNPLANNED.

UNPLANNED: (With specific regard to radioactivity releases) A release of radioactivity is UNPLANNED if the release has not been authorized by a Discharge Permit (DP). Implicit in this definition are unintentional releases, unmonitored releases, or planned releases that exceed a condition specified on the DP, e.g., alarm setpoints, minimum dilution flow, minimum release times, maximum release rates, and/or discharge of incorrect tank.

VALID: An indication or report or condition is considered to be VALID when it is conclusively verified by (1) an instrument channel check, or (2) indications on related or redundant indicators, or (3) by direct observation by plant personnel. Implicit in this definition is the need for timely assessment, i.e., within 15 minutes.

VISIBLE DAMAGE: Damage to equipment that is readily observable without measurements, testing, or analyses. Damage is sufficient enough to cause concern regarding the continued operability or reliability of affected safety structure, system, or component. Example damage includes: deformation due to heat or impact, denting, penetration, rupture, cracking, and/or paint blistering. Surface blemishes (e.g., paint chipping, scratches) should NOT be included.

VITAL AREA: Is any area within the PROTECTED AREA which contains equipment, systems, devices, or material, the failure, destruction, or release of which could directly or indirectly endanger the public health and safety by exposure to radiation.

6.1 Loss of Shutdown Systems

	Mode	Initiating/Condition
GENERAL	5,6	Note: Additional information will be provided later pending NRC Guidance on Shutdown EALs *Refer to "Gaseous Effluents" (7.1)*
SITE	5,6	**Loss of water level in the Rx vessel that has or will uncover fuel in the Rx vessel with CNTMT closure established** *(1 and 2 and 3 and 4 and 5)* 1. Loss of RHR capability 2. Rx vessel water level < el. 718' 3. Incore TCs (if available) indicate RCS temp. >200° F 4. RCS is vented/open to CNTMT 5. CNTMT closure is established *Note: If CNTMT open, refer to "Gaseous Effluents" (7.1)*
ALERT	5,6	**Inability to maintain Unit in Cold Shutdown** *(1 and 2 and 3)* 1. RHR capability is not available for RCS Cooling 2. Incore TCs (if available) indicate RCS temp. >200° F 3. CNTMT closure is established
UNUSUAL EVENT	5,6	Note: Additional information will be provided later pending NRC Guidance on Shutdown EALs

6.2 Loss of AC (Shutdown)

	Mode	Initiating/Condition
GENERAL		*Not Applicable*
SITE		*Not Applicable*
ALERT	5,6 or De-Fuel	**UNPLANNED loss of Offsite and Onsite AC Power for >15 minutes** 1. 1A and 1B 6.9 KV Shutdown Bds de-energized for >15 minutes
UNUSUAL EVENT	5,6 or De-Fuel	**UNPLANNED loss of All Offsite Power for >15 minutes** *(1 and 2)* 1. C and D CSSTS not available For >15 minutes. 2. Either Diesel Generator is supplying power to its respective Shutdown Board

6.3 Loss of DC (Shutdown)

	Mode	Initiating/Condition
GENERAL		Not Applicable
SITE		Not Applicable
ALERT		Not Applicable
UNUSUAL EVENT	5,6 or De-fuel	**UNPLANNED loss of the required Train of DC Power for >15 minutes** *(1 or 2)* 1. Voltage <105V DC on 125V DC Vital Battery Buses 1-I <u>and</u> 1-III for >15 minutes 2. Voltage <105V DC on 125V DC Vital Battery Buses 1-II <u>and</u> 1-IV for >15 minutes.

6.4 Fuel Handling

	Mode	Initiating/Condition
GENERAL		*Refer to "Gaseous Effluents" (7.1)*
SITE		*Refer to "Gaseous Effluents" (7.1)*
ALERT	All	**Major damage to Irradiated Fuel, <u>or</u> Loss of water level that has <u>or</u> will uncover Irradiated Fuel outside the Reactor Vessel** *(1 and 2)* 1. **VALID** alarm on O-RE-90-101 <u>or</u> O-RE-90-102 <u>or</u> O-RE-90-103 <u>or</u> 1-RE-90-130/131 <u>or</u> 1-RE-90-112 <u>or</u> 1-RE-90-400 <u>or</u> 2-RE-90-400 2. *(a or b)* a. Plant personnel report damage of Irradiated Fuel sufficient to rupture Fuel Rods b. Plant personnel report water level drop has <u>or</u> will exceed makeup capability such that Irradiated Fuel will be uncovered
UNUSUAL EVENT	All	**UNPLANNED loss of water level in Spent Fuel Pool <u>or</u> Reactor Cavity <u>or</u> Transfer Canal with fuel remaining covered** *(1 and 2 and 3)* 1. Plant personnel report water level drop in Spent Fuel Pool <u>or</u> Reactor Cavity, <u>or</u> Transfer Canal 2. VALID alarm on O-RE-90-102 <u>or</u> O-RE-90-103 <u>or</u> 1-RE-90-59 <u>or</u> 1-RE-90-60 3. Fuel remains covered with water

SHUTDOWN SYSTEMS DEGRADATION U1

FISSION PRODUCT BARRIER MATRIX (Modes 1-4) — 1

1.1 Fuel Clad
1.2 RCS
1.3 Containment

SYSTEM DEGRADATION — 2

2.1 Loss of Instrumentation
2.2 Loss of Function/Communication
2.3 Failure of Reactor Protection
2.4 Fuel Clad Degradation
2.5 RCS Unidentified Leakage
2.6 RCS Identified Leakage
2.7 Uncontrolled Cool Down
2.8 Turbine Failure
2.9 Technical Specification
2.10 Safety Limit

LOSS OF POWER — 3

3.1 Loss of AC (Power Ops)
3.2 Loss of AC (Shutdown)
3.3 Loss of DC

HAZARDS and SED JUDGMENT — 4

4.1 Fire
4.2 Explosion
Table 4-1
Figure 4-A
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DEFINITIONS/ACRONYMS

UNUSUAL EVENT, ALERT, SITE AREA EMERGENCY and GENERAL EMERGENCY: (see SED Judgment 4.7).

BOMB: An explosive device (See EXPLOSION).

CIVIL DISTURBANCE: A group of twenty (20) or more persons violently protesting station operations or activities at the site.

CREDIBLE SITE-SPECIFIC -The determination is made by WBN senior plant management through use of information found in the Safeguards Contingency Plan.

CRITICAL-SAFETY FUNCTION (CSFs): A plant safety function required to prevent significant release of core radioactivity to the environment. There are six CSFs: Sub-criticality, Core Cooling, Heat Sink, Pressurized Thermal Shock, Integrity (Containment) and Inventory (RCS).

EVENT: Assessment of an EVENT commences when recognition is made that one or more of the conditions associated with the event exist. Implicit in this definition is the need for timely assessment, i.e. within 15 minutes.

EXCLUSION AREA BOUNDARY (EAB): The demarcation of the area surrounding the WBN units in which postulated FSAR accidents will not result in population doses exceeding the criteria of 10 CFR Part 100. Refer to Figure 7-A.

EXPLOSION: A rapid, violent, unconfined combustion, or a catastrophic failure of pressurized equipment that imparts energy of sufficient force to potentially damage permanent structures required for safe operation.

EXTORTION: An attempt to cause an action at the station by threat of force.

FAULTED: (Steam Generator) Existence of secondary side leakage (i.e., steam or feed line break) that results in an uncontrolled decrease in steam generator pressure or the steam generator being completely depressurized.

FIRE: Combustion characterized by heat and light. Source of smoke such as slipping drive belts or overheated electrical components do not constitute fires. Observation of flame is preferred but is NOT required if large quantities of smoke and heat are observed.

FLAMMABLE GAS: Combustible gases maintained at concentrations less than the **LOWER EXPLOSIVE LIMIT (LEL)** will not explode due to ignition.

HOSTAGE: A person(s) held as leverage against the station to ensure that demands will be met by the station.

INEFFECTIVE: The specified restoration action(s) does not result in a reduction in the level of severity of the RED PATH condition within 15 minutes from identification of the Core Cooling CSF Status Tree RED PATH. A reduction in the level of severity is an improvement in the applicable parameters, e.g., Increasing Trend in Reactor Vessel Water Level (Full RVLIS) and/or Decreasing Trend on Core Thermocouple Temperatures.

INITIATING CONDITIONS: Plant Parameters, radiation monitor readings or personnel observations that identify an Event for purposes of Emergency Plan Classification.

INTRUSION/INTRUDER: Suspected hostile individual present in a protected area without authorization.

ODCM: Offsite Dose Calculation Manual.

ORANGE PATH: Monitoring of one or more CSFs by FR-0 which indicates that the CSF(s) is under severe challenge.

PROJECTILE: An object ejected, thrown, or launched towards a plant structure. The source of the projectile may be onsite or offsite. Damage is sufficient to cause concern regarding the integrity of the affected structure or the operability or reliability of safety equipment contained therein.

PROTECTED AREA: Encompasses all owner controlled areas within the security protected area fence as shown on Figure 4-A.

RED PATH: Monitoring of one or more CSFs by the FR-0 which indicates that the CSF(s) is under extreme challenge; prompt operator action is required.

RUPTURED: (Steam Generator) Existence of primary to secondary leakage of a magnitude greater than charging pump capacity.

SABOTAGE: Deliberate damage, misalignment, or mis-operation of plant equipment with the intent to render the equipment inoperable.

SIGNIFICANT TRANSIENT: An UNPLANNED event involving one or more of the following: (1) An automatic turbine runback > 15% thermal reactor power; (2) Electrical load rejection > 25% full electrical load; (3) Reactor Trip or (4) Safety Injection System Activation.

SITE PERIMETER (SP): Encompasses all owner controlled areas in the immediate site environs as shown on Figures 4-Aand 7-A.

STRIKE ACTION: A work stoppage within the PROTECTED AREA by a body of workers to enforce compliance with demands made on TVA. The STRIKE ACTION must threaten to interrupt normal plant operations.

TOXIC GAS: A gas that is dangerous to life or limb by reason of inhalation or skin contact (e.g., chlorine).

UNPLANNED: An event or action that is not the expected result of normal operations, testing, or maintenance. Events that result in corrective or mitigative actions being taken in accordance with abnormal or emergency procedures are UNPLANNED.

UNPLANNED: (With specific regard to radioactivity releases) A release of radioactivity is UNPLANNED if the release has not been authorized by a Discharge Permit (DP). Implicit in this definition are unintentional releases, unmonitored releases, or planned releases that exceed a condition specified on the DP, e.g., alarm setpoints, minimum dilution flow, minimum release times, maximum release rates, and/or discharge of incorrect tank.

VALID: An indication or report or condition is considered to be VALID when it is conclusively verified by (1) an instrument channel check, or (2) indications on related or redundant indicators, or (3) by direct observation by plant personnel. Implicit in this definition is the need for timely assessment, i.e., within 15 minutes.

VISIBLE DAMAGE: Damage to equipment that is readily observable without measurements, testing, or analyses. Damage is sufficient enough to cause concern regarding the continued operability or reliability of affected safety structure, system, or component. Example damage includes: deformation due to heat or impact, denting, penetration, rupture, cracking, and/or paint blistering. Surface blemishes (e.g., paint chipping, scratches) should NOT be included.

VITAL AREA: Is any area within the PROTECTED AREA which contains equipment, systems, devices, or material, the failure, destruction, or release of which could directly or indirectly endanger the public health and safety by exposure to radiation.

7.1 Gaseous Effluents

	Mode	Initiating/Condition
GENERAL	All	**EAB dose resulting from an actual <u>or</u> imminent release of Gaseous Radioactivity that exceeds 1000 mrem TEDE <u>or</u> 5000 mrem Thyroid CDE for the actual <u>or</u> projected duration of the release** *(1 or 2 or 3)* 1. A **VALID** rad monitor reading exceeds the values under General in Table 7-1 for >15 minutes, unless assessment within this time period confirms that the **Criterion** is <u>Not</u> exceeded. 2. Field survey results indicate >1000 mrem/hr gamma <u>or</u> an I-131 concentration of 3.9E-6 µ Ci/cc at SP 3. EP dose assessment results indicate EAB dose >1000 mrem TEDE <u>or</u> >5000 mrem Thyroid CDE for the actual <u>or</u> projected duration of the release (Figure 7-A)
SITE	All	**EAB dose resulting from an actual <u>or</u> imminent release of Gaseous Radioactivity that exceeds 100 mrem TEDE <u>or</u> 500 mrem Thyroid CDE for the actual <u>or</u> projected duration of the release** *(1 or 2 or 3)* 1. A **VALID** rad monitor reading exceeds the values under Site in Table 7-1 for >15 minutes, unless assessment within this time period confirms that the **Criterion** is <u>Not</u> exceeded 2. Field survey results indicate >100 mrem/hr gamma <u>or</u> an I-131 concentration of 3.9E-7 µ Ci/cc at SP 3. EP dose assessment results indicate EAB dose >100 mrem TEDE <u>or</u> >500 mrem Thyroid CDE for the actual <u>or</u> projected duration of the release (Figure 7-A)
ALERT	All	**Any UNPLANNED release of Gaseous Radioactivity that exceeds 200 times the ODCM Limit for >15 minutes** *(1 or 2 or 3)* 1. A **VALID** rad monitor reading exceeds the values under Alert in Table 7-1 for >15 minutes, unless assessment within this time period confirms that the **Criterion** is <u>Not</u> exceeded 2. Field survey results indicate >10 mrem/hr gamma at SP >15 minutes 3. EP dose assessment results indicate EAB dose >10 mrem TEDE for the duration of the release (Figure 7-A)
UNUSUAL EVENT	All	**Any UNPLANNED release of Gaseous Radioactivity that exceeds 2 times the ODCM Limit for >60 minutes** *(1 or 2 or 3)* 1. A **VALID** rad monitor reading exceeds the values under **UE** in Table 7-1 for >60 minutes, unless assessment within this time period confirms that the **Criterion** is <u>Not</u> exceeded 2. Field survey results indicate >0.1 mrem/hr gamma at SP for >60 minutes 3. EP dose assessment results indicate EAB dose >0.1 mrem TEDE for the duration of the release (Figure 7-A)

7.2 Liquid Effluents

Mode	Initiating/Condition
	Not Applicable
	Not Applicable
All	**Any UNPLANNED release of Liquid Radioactivity that exceeds 200 times the ODCM Limit for >15 minutes** *(1 or 2)* 1. A **VALID** rad monitor reading exceeds the values under Alert in Table 7-1 for >15 minutes, unless assessment within this time period confirms that the **Criterion** is <u>Not</u> exceeded. 2. Sample results exceed 200 times the ODCM limit value for an unmonitored release of liquid radioactivity >15 minutes in duration
All	**Any UNPLANNED release of Liquid Radioactivity to the Environment that exceeds 2 times the ODCM Limit for >60 minutes** *(1 or 2)* 1. A **VALID** rad monitor reading exceeds the values under **UE** in Table 7-1 for >60 minutes, unless assessment within this time period confirms that the **Criterion** is <u>Not</u> exceeded. 2. Sample results exceed 2 times the ODCM limit value for an unmonitored release of liquid radioactivity >60 minutes in duration

TABLE 7-1
EFFLUENT RADIATION MONITOR EALS(1)

NOTE: The values below, **if exceeded**, indicate the need to perform the specified assessment. If the assessment can not be completed within 15 minutes (60 minutes for UE), the declaration shall be made based on the **VALID** reading. As used here, the radiation monitor indications as displayed on **ICS** are the primary indicators. If **ICS** is unavailable, utilize the radiation monitor readings in the control room or local indication as necessary.

Monitor	ICS Screen	Units	UE	Alert	Site	General
Total Site	EFF1	μCi/s (2)	1.5E+05	1.5E+07	2.5E+08	2.5E+09
U1 Shield Building 1-RE-90-400	EFF1	μCi/s	6.7E+04	6.7E+06	1.0E+08	1.0E+09
U2 Shield Building 2-RE-90-400	EFF1	μCi/s	1.5E+04	1.5E+06	2.5E+07	2.6E+08
Auxiliary Building 0-RE-90-101B	4RM1	cpm	1.2E+04	1.2E+06	*****(1)	*****(1)
Service Building 0-RE-90-132B	4RM1	cpm	4.3E+03	4.3E+05	9.8E+06	*****(1)
U1 Condenser Vacuum Exhaust						
1-RE-90-404A	3PAM	μCi/cc(3)	5.5E-02	5.5E+00	8.83E+01	8.83E+02
1-RE-90-404B	3PAM	μCi/cc	5.5E-02	5.5E+00	8.83E+01	8.83E+02
S/G Discharge Monitors 1-RE-90-421 thru 424 (B)	4RM2	mR/hr(4)	NA	3.5E+02	3.5E+03	3.5E+04
Liquid Monitors	n/a	μCi/ml(2)	1.8E-05	1.8E-03	N/A	N/A
0-RE-90-122	4RM2	cpm	1.1E+06	*****(1)	N/A	N/A
1-RE-90-120,121	4RM2	cpm	1.0E+06	*****(1)	N/A	N/A
0-RE-90-225	4RM2	cpm	9.2E+05	*****(1)	N/A	N/A
0-RE-90-212	4RM2	cpm	1.5E+04	1.5E+06	N/A	N/A
RELEASE DURATION		minutes	60	15	15	15
ASSESSMENT METHOD: ICS or radiation monitor (RM) readings in the MCR or local indication as necessary						

Note: (1) Table values are calculated values. The ***** indicates the monitor is off scale.

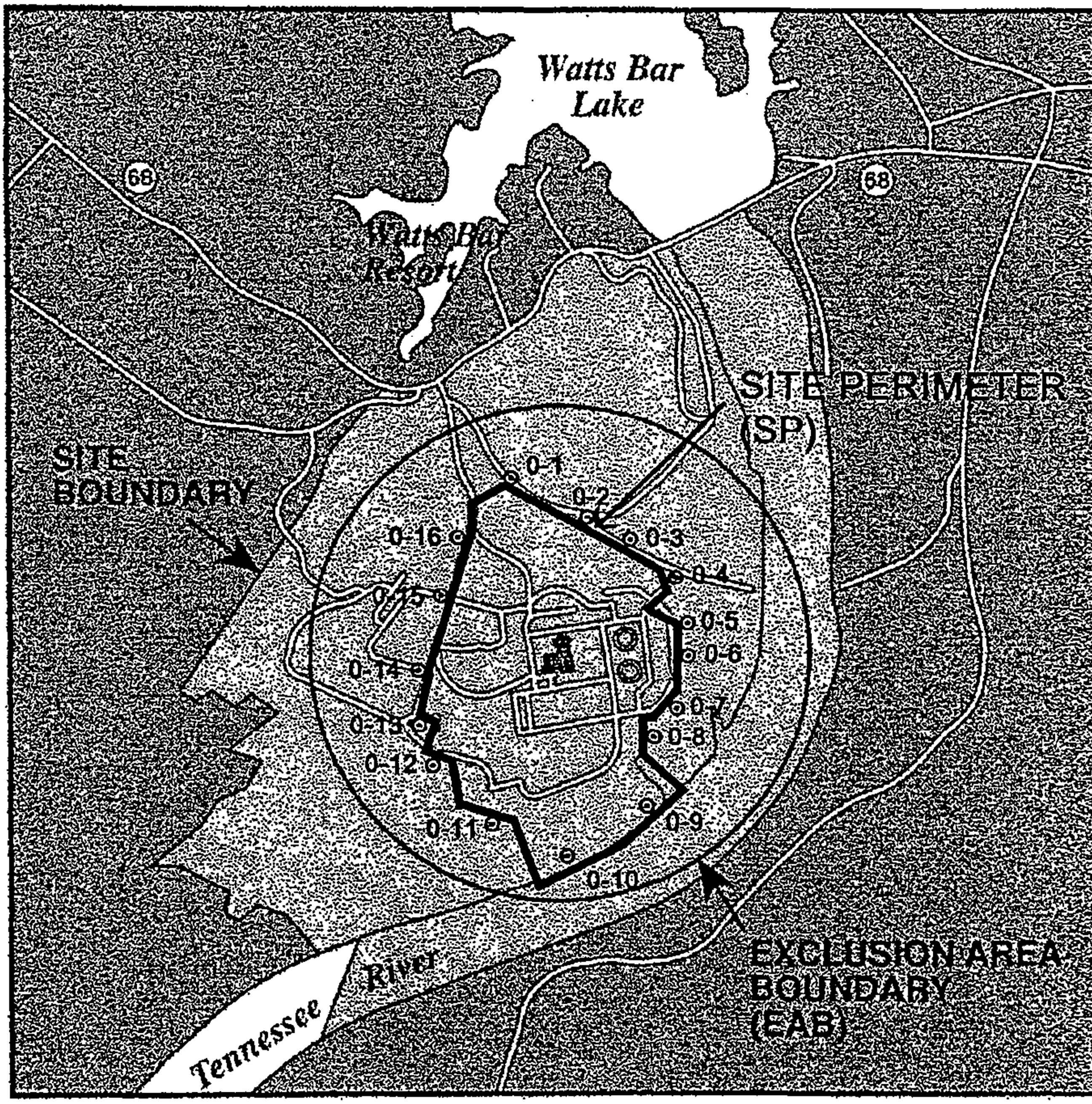
(2) These releases rate values in μCi/s and μCi/ml are provided on the gaseous and liquid release points for Information Only. Actual monitor readings are given in the table corresponding to the monitor for the **four** emergency classifications.

(3) This eberline channel reads out in cpm in the **MCR**. Indications of a radioactivity release via this pathway would be S/G blowdown monitors or other indications of primary-to-secondary leakage such as S/G level increase or pressurizer level decrease. ICS calculates μCi/cc and has a visual indication of an alarm condition when the indications exceeds 5.5E-02μCi/cc. This channel was included in the table to provide a means to further assess a release detected by other indications and to provide a path for possible escalation.

(4) These unit values are based on flow rates through one [1] PORV of 970,000 lb/hr at 1,185 psig, 600°F. Before using these values, ensure a release to the environment is ongoing (e.g. PORV).

Figure 7-A
EXCLUSION AREA, SITE BOUNDARY and SITE PERIMETER

NOTE: The Site Boundary used here is consistent with the definition in the Offsite Dose Calculation Manual. Do Not confuse this boundary with the SITE PERIMETER defined in these EALs, or with other definitions of "Site Boundary."



Note: Numbered points are [SP] radiological survey point for all sectors.

7.3 Radiation Levels

	Mode	Initiating/Condition
GENERAL		*Refer to "Fission Product Barrier Matrix" or "Gaseous Effluents" (7.1)*
SITE		*Refer to "Fission Product Barrier Matrix" or "Gaseous Effluents" (7.1)*
ALERT	All	**UNPLANNED increases in Radiation levels within the Facility that impedes Safe Operations or establishment or maintenance of Cold Shutdown** *(1 or 2)* 1. **VALID** area Radiation Monitor readings or survey results exceed 15 mrem/hr in the Control Room or CAS 2. *(a and b)* a. **VALID** area radiation monitor readings exceed values listed in Table 7-2 b. Access restrictions impede operation of systems necessary for Safe Operation or the ability to establish Cold Shutdown *See UNUSUAL EVENT Note Below*
UNUSUAL EVENT	All	**UNPLANNED increase in Radiation levels within the Facility** 1. **VALID** area Radiation Monitor readings increase by a factor 1000 over normal levels *Note: In Either the **UE** or **ALERT** EAL, the SED must determine the cause of Increase in Radiation Levels and Review Other **INITIATING/CONDITIONS** for Applicability (e.g., a dose rate of 15 mrem/hr in the Control Room could be caused by a release associated with a DBA).*

7.4 Fuel Handling

	Mode	Initiating/Condition
GENERAL		*Refer to "Gaseous Effluents" (7.1)*
SITE		*Refer to "Gaseous Effluents" (7.1)*
ALERT	All	**Major damage to Irradiated Fuel, or Loss of water level that has or will uncover Irradiated Fuel outside the Reactor Vessel** *(1 and 2)* 1. VALID alarm on 0-RE-90-101 or 0-RE-90-102 or 0-RE-90-103 or 1-RE-90-130/131 or 1-RE-90-112 or 1-RE-90-400 or 2-RE-90-400 2. *(a or b)* a. Plant personnel report damage of Irradiated Fuel sufficient to rupture Fuel Rods b. Plant personnel report water level drop has or will exceed makeup capacity such that Irradiated Fuel will be uncovered
UNUSUAL EVENT	All	**UNPLANNED loss of water level in Spent Fuel Pool or Reactor Cavity or Transfer Canal with fuel remaining covered** *(1 and 2 and 3)* 1. Plant personnel report water level drop in Spent Fuel Pool, or Reactor Cavity, or Transfer Canal 2. **VALID** alarm on 0-RE-90-102 or 0-RE-90-103 or 1-RE-90-59 or 1-RE-90-60 3. Fuel remains covered with water.

Table 7-2

ALERT - RADIATION LEVELS

Monitor No.	Location Building and Elevation	Monitor Reading *
1&2 RE-90-1	Auxiliary El. 757.0 (spent fuel pool)	2.5×10^3 mR/hr
1-RE-90-2	Auxiliary El. 757.0 (personnel air lock)	2.5×10^0 R/hr
0-RE-90-3	Auxiliary El. 729.0 (waste pac. area)	2.5×10^3 mR/hr
0-RE-90-4	Auxiliary El. 713.0 (decon room)	1.5×10^3 mR/hr
0-RE-90-5	Auxiliary El. 737.0 (spt. fuel pool pmp. ar.)	1.5×10^3 mR/hr
1&2-RE-90-6	Auxiliary El. 737.0 (comp. cl. wtr. ht. ex. ar.)	1.5×10^3 mR/hr
1&2-RE-90-7	Auxiliary El. 713.0 (sample room)	2×10^3 mR/hr
1&2-RE-90-8	Auxiliary El. 713.0 (aux. feed pump area)	1.5×10^3 mR/hr
0-RE-90-9	Auxiliary El. 692.0 (wst. cond. evap. tk. ar.)	1.5×10^3 mR/hr
1&2-RE-90-10	Auxiliary El. 692.0 (cvcs area)	1.5×10^3 mR/hr
0-RE-90-11	Auxiliary El. 676.0 (ctmt. spry. & rhr pmp ar.)	1.5×10^3 mR/hr
1-RE-90-61	Auxiliary El. 736.0 (RB low. cmpt. inst. rm.)	2.5×10^3 mR/hr
0-RE-90-230	Turbine El. 685.0 (conden. demin.)	1.5×10^3 mR/hr
0-RE-90-231	Turbine El. 685.0 (conden. demin.)	1.5×10^3 mR/hr

Note: *These monitors read out in mR/hr.. It is assumed that this is equivalent to mrem/hr.

SOURCE NOTES

Page 1 of 1

1. NIR-0551, DV-847100 F00012, and MC-850321 809004, MSC-00956, NCO 920030366.	Monitor readings and challenges to barriers are provided in EPIP-1, Section 1 in (1.1 Fuel Clad 1.1.5 and 1.3 CNTMT Barrier 1.3.5), Section 7 (7.1 Gaseous Effluents, 7.2 Liquid Effluents, Table 7-1, 7.3 Radiation Levels, 7.4 Fuel Handling and Table 7-2). Barriers are covered in Section 1, Fission Product Barrier Matrix. Monitor readings are also provided in EPIP-5, App. B, Note 3.
2. MC-84 0827 005 035A, MCS-2400	SED duties that can not be delegated. Section 2.0 Responsibility.
3. MC-8407 1900 3003, MSC-00701, NCO-920030222 CNTMT	Rad Monitors used in conjunction with a plant parameter to determine emergency classifications. Monitor readings are included with plant parameters for the purposes of emergency classifications. Section 1, Fission Product Barrier Matrix (1.1 Fuel Clad, 1.2 RCS, 1.3 Containment), Section 7 (7.1 Gaseous Effluent, 7.2 Liquid Effluent and 7.3 Radiation Levels and 7.4 Fuel Handling).
4. ANSI Standard N.18.7-1976 Subsection 5.3.9.3: 01 POI	EPIPs will contain the following elements.
5. MSC-02401, NCO-920030998	Chemistry detection of failed fuel.
6. EPPOS #2	Emergency Preparedness Position (EPPOS) on timeliness of classification of emergency conditions.