Tennessee Valley Authority, Post Office Box 2000, Soddy-Daisy, Tennessee 37379

July 7, 2000

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555

Gentlemen:

In the Matter of) Docket Nos. 50-327
Tennessee Valley Authority) 50-328

SEQUOYAH NUCLEAR PLANT (SQN) - UNITS 1 AND 2 - EMERGENCY PLAN IMPLEMENTING PROCEDURE (EPIP) REVISION

In accordance with the requirements of 10 CFR 50, Appendix E, Section V, the enclosure provides the following EPIP:

EPIP	Revision	Title
EPIP-1	30	Emergency Plan Classification Matrix

If you have any questions concerning this matter, please telephone me at (423) 843-7170 or J. D. Smith at (423) 843-6672.

Sincerely,

Pedro Salas
Licensing and Industry Affairs Manager

Enclosure
cc: See page 2

A045

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ENCLOSURE

EMERGENCY PLAN IMPLEMENTING PROCEDURE REVISION

TENNESSEE VALLEY AUTHORITY

SEQUOYAH NUCLEAR PLANT

EMERGENCY PLAN IMPLEMENTING PROCEDURE

EPIP-1

EMERGENCY PLAN CLASSIFICATION MATRIX

Revision 30

QUALITY RELATED

PREPARED BY: W. P. BROOKS

RESPONSIBLE ORGANIZATION: Emergency Preparedness

APPROVED BY: D. L. Koehl

EFFECTIVE DATE: 06/30/2000

LEVEL OF USE: REFERENCE

REVISION
DESCRIPTION: INTENT REVISION. Revised to incorporate changes from NP-REP, Appendix B, Revisions 54 and 56.

1.0 PURPOSE

This procedure provides criteria to the Shift Manager (SM) or Site Emergency Director (SED) to be used in classifying and declaring an emergency based on plant conditions. The responsibility for declaring an emergency, based on the criteria in this procedure, belongs to the SM or SED, the designated Unit Supervisor when acting as the SM, or the TSC SED. This responsibility **cannot** be delegated.

2.0 REFERENCES

2.1 Developmental Documents

A. 10 CFR 50, Domestic Licensing Of Production And Utilization Facilities

B. Reg Guide-1.101, Emergency Planning And Preparedness For Nuclear Power Reactors endorsing Numarc Nesp-007, Revision 2, 1/1992 Methodology For Development Of Emergency Action Levels.

C. Sequoyah Technical Specifications (Tech Specs), Abnormal Operating Procedures (AOPS), Emergency Operating Procedures (EOPS), Functional Restoration Guidelines (FRG), Technical Instructions (TI), Surveillance Instructions (SI), and the Updated Final Safety Analysis Report (UFSAR) are also referenced in Appendix B of the Radiological Emergency Plan.

3.0 INSTRUCTIONS

3.1 The Nuclear Power (NP) Radiological Emergency Plan (REP) will be activated when any one of the conditions listed in this matrix is detected. This procedure will be used in conjunction with the Nuclear Power Radiological Emergency Plan, Appendix B.

If the event is determined to be one of the four emergency classifications then implement one of the following procedures as applicable:

EPIP-2	Notification of Unusual Event
EPIP-3	Alert
EPIP-4	Site Area Emergency
EPIP-5	General Emergency

3.0 INSTRUCTIONS (Continued)

3.2 The criteria in SQN EPIP-1 are given for reference: 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 or SED and/or the TSC SED to arrive at an appropriate classification for a particular set of circumstances. These criteria apply to both Unit 1 and Unit 2. The SED must be aware of the affects of simultaneous events on both units.

3.3 If there is a reason to doubt if a given initiating condition has actually occurred, the SM or SED shall follow indications provided. Unless a suspected spurious or otherwise false alarm can be substantiated within an acceptable time frame (based on potential severity of the event), the SM or SED is to proceed with actions as required by this procedure until such time as the alarm is verified to be false.

3.4 Classification Determination

3.4.1 To determine the classification of the emergency, review the Initiating Conditions of the respective status tree criteria that will be monitored and used to determine the event classification for the modes listed on the classification matrix.

3.4.2 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 matrix.

3.4.3 Declare the highest emergency class based on **events that are in progress** at the time that the classification is made. If follow-up investigation shows that a higher classification was met, then report that as information only, to the Operation Duty Specialist (ODS) and the NRC. Do not declare or upgrade to a higher emergency class if the conditions do not exist unless it is a noted exception.

3.4.4 **Following termination of an emergency declaration,** if follow-up investigations show that a higher classification was met then report that, as information only, to the ODS and the NRC. Do not declare or upgrade to a higher emergency class if the conditions do not exist.

3.4.5 During an event when plant conditions have returned to a **non-emergency state** before any emergency can be classified, then the highest emergency class that was appropriate shall be reported and shall not be declared unless it is a noted exception. If follow up investigations show that a higher classification was met then report that, as information only, to the ODS and the NRC. Do not declare or upgrade to a higher emergency class if the conditions do not exist.

3.4 Classification Determination (Continued)

3.4.6 The NRC shall be notified within one hour of all classifications. Once made and reported, a declaration cannot be canceled or rescinded even if it is later determined to be invalid. If there is reason to doubt that a given condition has occurred, the SM or SED shall follow indications and proceed with classification, as required by this procedure, until otherwise proven false. The State shall be notified within 15 minutes of the classification. If the State is notified of a declaration that is **invalidated before the NRC is notified**, terminate the classification, if not already done, and report the declaration to the NRC.

3.4.7 The **ACCEPTABLE** time frame for notification to the 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 QA Records

None.

4.2 Non-QA Records

None.

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DEFINITIONS/ACRONYMS

BOMB: An explosive device. (See EXPLOSION)

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

CRITICAL-SAFETY FUNCTION (CSFs): A plant safety function required to prevent significant release of core radioactivity to the environment. There are six CSFs; Subcriticality, 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 initiating conditions associated with the event exist. Implicit in this definition is the need for timely assessment within 15 minutes.

EXCLUSION AREA BOUNDARY (EAB): That area surrounding the reactor, in which the reactor licenses has the authority to determine all activities including exclusion or removal of personnel and property from the area. For purposes of Emergency Action Levels, based on radiological field measurements and dose assessments, and for design calculations, the Site Boundary shall be defined as the EAB.

EXPLOSION: Rapid, violent, unconfined combustion, or a catastrophic failure of pressurized or electrical equipment that imparts energy of sufficient force to potentially damage permanent structures or equipment.

EXTORTION: An attempt to cause an action at the site by threat or force.

FAULTED: (Steam Generator) Existence of secondary side leakage (e.g., 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. Sources of smoke such as slipping drive belts or overheated electrical components do not constitute a fire. Observation of flame is preferred but is NOT required if large quantities of smoke and/or heat are observed.

FLAMMABLE GAS: Combustible gases at concentrations > than the LOWER EXPLOSIVE LIMIT (LEL).

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

IMMINENT: Within two hours.

INEFFECTIVE: When the specified restoration action(s) does not result in a reduction in the level of severity of the RED or ORANGE PATH condition within 15 minutes from identification of the CSF Status Tree RED or ORANGE PATH.

INITIATION 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 the protected area without authorization.

ODCM: Offsite Dose Calculation Manual is a supporting document to the Tech Specs. that contain Rad Effluent Controls, Environs Monitoring controls, and methodology for calculating gaseous and liquid effluent offsite doses and monitor alarm/trip setpoints.

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

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

PROTECTED AREA: The area encompassed by the security fence and to which access is controlled.

RCS: The **RCS** primary side and its connections up to and including the pressurizer safety and relief valves, and other connections up to and including the primary and secondary isolation valves.

RED PATH: Monitoring of one or more CSFs by 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 the capacity one charging pump.

SABOTAGE: Deliberate damage, misalignment, or misoperation 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; (4) Safety Injection System Activation; (5) Thermal Power Oscillations ≥10%.

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, CO_2 , etc.)

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

VISIBLE DAMAGE: Damage to equipment that is readily observable without measurements, testing, or analysis. Damage is sufficient 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, or paint blistering. Surface blemishes (e.g., paint chipping, scratches, etc.) should NOT be included as visible damage.

VITAL AREA: Any area within the PROTECTED AREA which contains equipment, systems, devices, or material which the failure, destruction, or release of, 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 (FR-C.1)	Core Cooling Orange (FR-C.2) **OR** Heat Sink Red (RHR SD cooling not in service) (FR-H.1).

-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 on XI-94-101 OR 102 (EXOSENSOR).	Greater than or equal to 700 °F on XI-94-101 or 102 (EXOSENSOR).

-OR-

4. Reactor Vessel Water Level

LOSS	Potential LOSS
Not Applicable.	VALID RVLIS level < 40% on LI-68-368 or 371 with no RCP running.

-OR-

5. Containment Radiation Monitors

LOSS	Potential LOSS
VALID reading of Greater Than: 2.8E + 01 Rem/hr On RM-90-271 and 272. **OR** 2.9E + 01 Rem/hr On RM-90-273 and 274.	Not Applicable.

-OR-

6. Site Emergency Director Judgment

Any condition that, in the judgment of the SM or 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 (FR-P.1). **OR** Heat Sink Red (RHR SD cooling not in service) (FR-H.1).

-OR-

2. RCS Leakage/LOCA

LOSS	Potential LOSS
RCS leak results in subcooling < 40 °F as indicated on XI-94-101 OR 102 (EXOSENSOR).	Non isolatable **RCS** leak exceeding the capacity of one charging pump 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 < 40% on LI-68-368 or 371 with no RCP running.	Not Applicable.

-OR-

5. Site Emergency Director Judgment

Any condition that, in the judgment of the SM or SED, indicates loss or potential loss of the **RCS** Barrier comparable to the conditions listed above.

1.3 Containment Barrier

1. Critical Safety Function Status

LOSS	Potential LOSS
Not Applicable.	Containment Red (FR-Z.1) **OR** Actions of FR-C.1 (Red Path) are **INEFFECTIVE** (i.e.: core TC's trending up).

-OR-

2. Containment Pressure/Hydrogen

LOSS	Potential LOSS
Rapid unexplained pressure decrease following initial increase on Pdl-30-44 or 45 **OR** Containment pressure or sump level not increasing on LI-63-178 or 179 with a LOCA in progress.	Containment hydrogen increases to > 4% by volume on H_2I-43-200 and 210. **OR** Pressure > 2.81 PSID (Phase B) with no containment spray operating when required (FR-Z.1).

-OR-

3. Containment Isolation Status

LOSS	Potential LOSS
Containment isolation, when required, is incomplete and a release path to the environment exists.	Not Applicable.

-OR-

4. Containment Bypass

LOSS	Potential LOSS
Secondary side release outside containment from a **RUPTURED** S/G that cannot be terminated in < 15 minutes (E-2 and E-3). **OR** > 4 hours secondary side release outside containment from a S/G with a S/G tube leak > T/S limits (AOP-R.01, App A).	Unexpected **VALID** increase in area or ventilation RAD monitors adjacent to containment (with LOCA in progress).

-OR-

5. Significant Radioactivity in Containment

LOSS	Potential LOSS
Not Applicable.	**VALID** Reading of greater than: 3.6 E + 02 Rem/hr on RM-90-271 and RM-90-272. **OR** 2.8 E + 02 Rem/hr on RM-90-273 and RM-90-274.

-OR-

6. Site Emergency Director Judgment

Any condition that, in the judgment of the SM or SED, indicates loss or potential loss of the CNTMT Barrier comparable to the conditions listed above.

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 2 hours). The classification shall be made as soon as this determination is made.

1. In the matrix to the left, **REVIEW** the Initiating Conditions in all three barrier columns and **CIRCLE** the Conditions that are Met.
2. In each of the three barriers columns, **IDENTIFY** if any Loss or Potential Loss Initiating Conditions have been Met.
3. **COMPARE** the number of barrier Losses and Potential Losses to the Criteria below and make the appropriate declaration.

*NOTE: **MONITOR** the respective status tree criteria if a CSF is listed as an Initiating Condition.*

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

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END OF SECTION 1.

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

	2.1 Loss of Instrumentation	
	Mode	Initiating / Condition
GENERAL EMER		*Refer to "Fission Product Barrier Matrix" (Section 1) and "Radiological Effluents" (Section7) and Continue in This Column.*
SITE AREA EMER	1, 2, 3, 4	**On either unit an inability to monitor a SIGNIFICANT TRANSIENT in progress *(1 and 2 and 3 and 4):*** 1.Loss of > 75% of MCR annunciators and the annunciator printer or > 75% of safety system indications. 2. Loss of Plant Computer. 3. Inability to directly monitor any of the following CSFs: Subcriticality PTS Core Cooling Containment Heat Sink Inventory 4. **SIGNIFICANT TRANSIENT** in progress.
ALERT	1, 2, 3, 4	**On either unit an UNPLANNED loss of >75% MCR annunciators and annunciator printer or > 75% of safety system indications for > 15 minutes with a SIGNIFICANT TRANSIENT in progress or plant computer unavailable. *(1 and 2 and 3):*** 1. **UNPLANNED** loss of >75% MCR annunciators and the annunciator printer for >15 minutes or > 75% of safety system indications for > 15 minutes. 2. SM/SED judgment that increased surveillance is required (> shift compliment) to safely operate the unit. 3. (a or b) a. **SIGNIFICANT TRANSIENT** in progress. **OR** b. Loss of plant computer.
UNUSUAL EVENT	1, 2, 3, 4	**On either unit an UNPLANNED loss > 75% MCR annunciators and annunciator printer or > 75% of safety system indications for > 15 minutes and plant computer available. *(1 and 2 and 3):*** 1. **UNPLANNED** loss of >75% of MCR annunciators and the annunciator printer for > 15 minutes or > 75% of safety system indicators for > 15 minutes. 2. SM/SED judgment that increased surveillance is required (> shift compliment) to safely operate the unit. 3. The plant computer is capable of displaying requested data.

	2.2 Loss of Communication	
	Mode	Initiating / Condition
GENERAL EMER		*Not Applicable.*
SITE AREA EMER		*Not Applicable.*
ALERT		*Not Applicable.*
UNUSUAL EVENT	ALL	**A. UNPLANNED loss of all in-plant communication capability *(1 and 2 and 3):*** 1. **UNPLANNED** loss of EPABX 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 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

2.3 Failure of Rx Protection

	Mode	Initiating / Condition
GENERAL EMER	1	**Reactor power > 5% and not decreasing after VALID trip signals and loss of core cooling capability.** ***(1 and 2):*** 1. FR-S.1 entered and immediate operator actions did not result in a reactor power of ≤ 5% and decreasing. 2. (a or b) a. CSF status tree indicates Core Cooling Red (FR-C.1). <u>OR</u> b. CSF status tree indicates Heat Sink Red (FR-H.1)
SITE AREA EMER	1	**Reactor power > 5% and not decreasing after VALID auto and manual trip signals.** *NOTE: Although a mode change may occur before classification this event will still be classified and declared as SAE.*
ALERT	1, 2,	**Reactor power > 5% and not decreasing after VALID auto trip signal but a manual trip from the Control Room is successful.** ***(1 or 2)*** 1. Reactor power > 5% and not decreasing following auto trip signal. 2. Manual trip in the Main Control Room successfully reduces reactor power ≤ 5%. NOTE: Although a mode change will occur this event will still be classified and declared as an ALERT.
UNUSUAL EVENT		*Refer to "Fission Product Barrier Matrix" (Section 1).*

2.4 Fuel Clad Degradation

Mode	Initiating / Condition
	Refer to "Fission Product Barrier Matrix" (Section 1) and Continue in This Column.
	Refer to "Fission Product Barrier Matrix" (Section 1) and Continue in This Column.
	Refer to "Fission Product Barrier Matrix" (Section 1) and Continue in This Column.
1, 2, 3	**Reactor coolant system specific activity exceeds LCO (Refer to SQN Tech. Spec. 3.4.8):** 1. Radiochemistry analysis indicates *(a or b):* a. Dose equivalent Iodine (I-131) >0.35 µCi/gm for > 48 hours or in excess of T/S Figure 3.4-1 with Tave ≥ 500 °F. <u>OR</u> b. Specific activity > 100/Ē µCi/gm with Tave ≥ 500 °F.

2.5 RCS Unidentified Leakage

	Mode	Initiating / Condition
GENERAL EMER		*Refer to "Fission Product Barrier Matrix" (Section 1) and Continue in This Column.*
SITE AREA EMER		*Refer to "Fission Product Barrier Matrix" (Section 1) and Continue in This Column.*
ALERT		*Refer to "Fission Product Barrier Matrix" (Section 1) and Continue in This Column.*
UNUSUAL EVENT	1, 2, 3, 4	**RCS unidentified or pressure boundary leakage > 10 GPM.** 1. Unidentified or pressure boundary leakage (as defined by Tech. Spec.) > 10 GPM as indicated by *(a or b):* a. SI-OPS-068-137.0 results. **OR** b. With **RCS** temperature and PZR level stable, the VCT level on LI-62-129 or LI-62-130 is dropping at a rate > 10 GPM. *Refer to "Shutdown Systems Degradation" (Section 6.3).*

2.6 RCS Identified Leakage

Mode	Initiating / Condition
	Refer to "Fission Product Barrier Matrix" (Section 1) and Continue in This Column.
	Refer to "Fission Product Barrier Matrix" (Section 1) and Continue in This Column.
	Refer to "Fission Product Barrier Matrix" (Section 1) and Continue in This Column.
1, 2, 3, 4	**RCS Identified leakage > 25 GPM.** 1. Identified **RCS** leakage (as defined by Tech. Spec.) > 25 GPM as indicated by *(a or b):* a. SI-OPS-068-137.0 results. **OR** b. Level rise in excess of 25 GPM into PRT, RCDT or CVCS holdup tank (Refer to TI-28). *Refer to "Shutdown Systems Degradation" (Section 6.3).*

2.7 Uncontrolled Cooldown

	Mode	Initiating / Condition
GENERAL EMER		*Refer to "Fission Product Barrier Matrix" (Section 1) and Continue in This Column.*
SITE AREA EMER		*Refer to "Fission Product Barrier Matrix" (Section 1) and Continue in This Column.*
ALERT		*Refer to "Fission Product Barrier Matrix" (Section 1) and Continue in This Column.*
UNUSUAL EVENT	1, 2, 3	**UNPLANNED rapid depressurization of the main steam system resulting in a rapid RCS cooldown and safety injection initiation.** ***(1 and 2):*** 1. Rapid depressurization of any or all steam generators or the main steam system to < 600 psig on PI-1-2A, 2B or 9A ,9B or 20A, 20B or 27A, 27B. 2. Safety injection has initiated or is required.

2.8 Turbine Failure

Mode	Initiating / Condition
	Refer to "Fission Product Barrier Matrix" (Section 1) and Continue in This Column.
	Refer to "Fission Product Barrier Matrix" (Section 1) and Continue in This Column.
1, 2, 3	**Turbine failure has generated projectiles that cause visible damage to any area containing safety related equipment.** 1. Turbine generated **PROJECTILES** have resulted in **VISIBLE DAMAGE** to any of the following areas: Control Building; Auxiliary Building; Unit #1 Containment; Unit #2 Containment; ERCW Pumping Station; Additional Equipment Bldgs.; Diesel Generator Bldg.; RWST; Intake Pumping Station; Common Sta. Ser. Xfmr's; Condensate Storage Tanks
1, 2, 3	**Turbine failure results in casing penetration or main generator seal damage.** 1. Turbine failure which results in penetration of the turbine casing or damage to main generator seals. *Refer to "Hazards and SED Judgement" (Section 4.3)*

2.9 Safety Limit

	Mode	
GENERAL EMER		*Not Applicable.*
SITE AREA EMER		*Not Applicable.*
ALERT		*Not Applicable.*
UNUSUAL EVENT	1, 2, 3, 4	**Safety Limits have been exceeded.** ***(1 or 2):*** 1. The combination of thermal power, RCS temperature and RCS pressure > safety limit indicated by SQN Tech. Spec. Figure 2.1-1 "Reactor Core Safety Limit". **OR** 2. RCS/Pressurizer pressure exceeds safety limit (> 2735 psig).

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END OF SECTION 2.

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DEFINITIONS/ACRONYMS

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EXTORTION: An attempt to cause an action at the site by threat or force.

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

FLAMMABLE GAS: Combustible gases at concentrations > than the LOWER EXPLOSIVE LIMIT (LEL).

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

IMMINENT: Within two hours.

INEFFECTIVE: When the specified restoration action(s) does not result in a reduction in the level of severity of the RED or ORANGE PATH condition within 15 minutes from identification of the CSF Status Tree RED or ORANGE PATH.

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

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

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

3.1 Loss of AC (Power Ops)

	Mode	Initiating / Condition
GENERAL EMER	1, 2, 3, 4	**Prolonged loss of all offsite and all onsite AC power to either unit.** ***(1 and 2):*** 1. Both unit related 6.9 KV shutdown boards de-energized for > 15 minutes. 2. (a or b) a. Core Cooling Status Tree Red or Orange Path. OR b. Restoration of either a 6.9 KV shutdown board or a 6.9 KV unit board is not likely within 4 hours of the loss.
SITE AREA EMER	1, 2, 3, 4	**Loss of all offsite and all onsite AC power to either unit for > 15 Minutes.** 1. Both unit related 6.9 KV shutdown boards de-energized for > 15 minutes.
ALERT	1, 2, 3, 4	**Loss of offsite power to either unit with degraded onsite AC power for > 15 minutes.** ***(1a and b or 2):*** 1a. All four (4) 6.9KV unit boards de-energized for > 15 minutes. b. One (1) unit related 6.9 KV shutdown board de-energized for > 15 minutes. OR 2. Any AC power condition lasting > 15 minutes where a single additional failure will result in a unit blackout.
UNUSUAL EVENT	1, 2, 3, 4	**Loss of offsite power to either unit for > 15 minutes.** ***(1 and 2):*** 1. All four (4) 6.9KV unit boards de-energized for > 15 minutes. 2. Both unit related 6.9KV shutdown boards are energized.

3.2 Loss of AC (Shutdown)

Mode	Initiating / Condition
	Not Applicable.
	Not Applicable.
5, 6, DEFUELED	**UNPLANNED loss of all offsite and all onsite AC power to either unit for > 15 minutes.** 1. Both unit related 6.9KV shutdown boards de-energized for > 15 minutes. *Also Refer to "Loss of Shutdown Systems" (6.1) and continue in this column.*
5, 6, DEFUELED	**UNPLANNED loss of all offsite power to either unit for > 15 minutes.** ***(1 and 2):*** 1. All four (4) 6.9KV unit boards de-energized for > 15 minutes. 2. One (1) unit related 6.9KV shutdown board de-energized for > 15 minutes.

3.3 Loss of DC Power

	Mode	
GENERAL EMER		*Refer to "Fission Product Barrier Matrix" (Section 1) and "Loss of Communication" (2.2) and Continue in This Column.*
SITE AREA EMER	1,	**Loss of all vital DC power for > 15 minutes.**
	2,	1. Voltage < 105 V DC on 125V DC vital battery board buses I and II and III and IV for > 15 minutes.
	3,	
	4	*Also Refer to "Fission Product Barrier Matrix" (Section 1), "Loss of Communication" (2.2) and, "Loss of Instrumentation" (2.1) and Continue in This Column.*
ALERT		*Refer to "Fission Product Barrier Matrix" (Section 1), "Loss of Communication" (2.2), and "Loss of Instrumentation" (2.1).*
UNUSUAL EVENT	5,	**UNPLANNED loss of a required train of DC power for > 15 minutes: (1 or 2).** 1. Voltage < 105 V DC on 125V dc vital battery board buses I and III for > 15 minutes.
	6	OR 2. Voltage < 105 V DC on 125V dc vital battery board busses II and IV for > 15 minutes.

END OF SECTION 3.

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FISSION PRODUCT BARRIER MATRIX (Modes 1-4)

SYSTEM DEGRADATION

LOSS OF POWER

HAZARDS and SED JUDGEMENT

4

DESTRUCTIVE PHENOMENON

SHUTDOWN SYSTEM DEGRADATION

RADIOLOGICAL EFFLUENTS

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SABOTAGE: Deliberate damage, misalignment, or misoperation 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; (4) Safety Injection System Activation; (5) Thermal Power Oscillations ≥10%.

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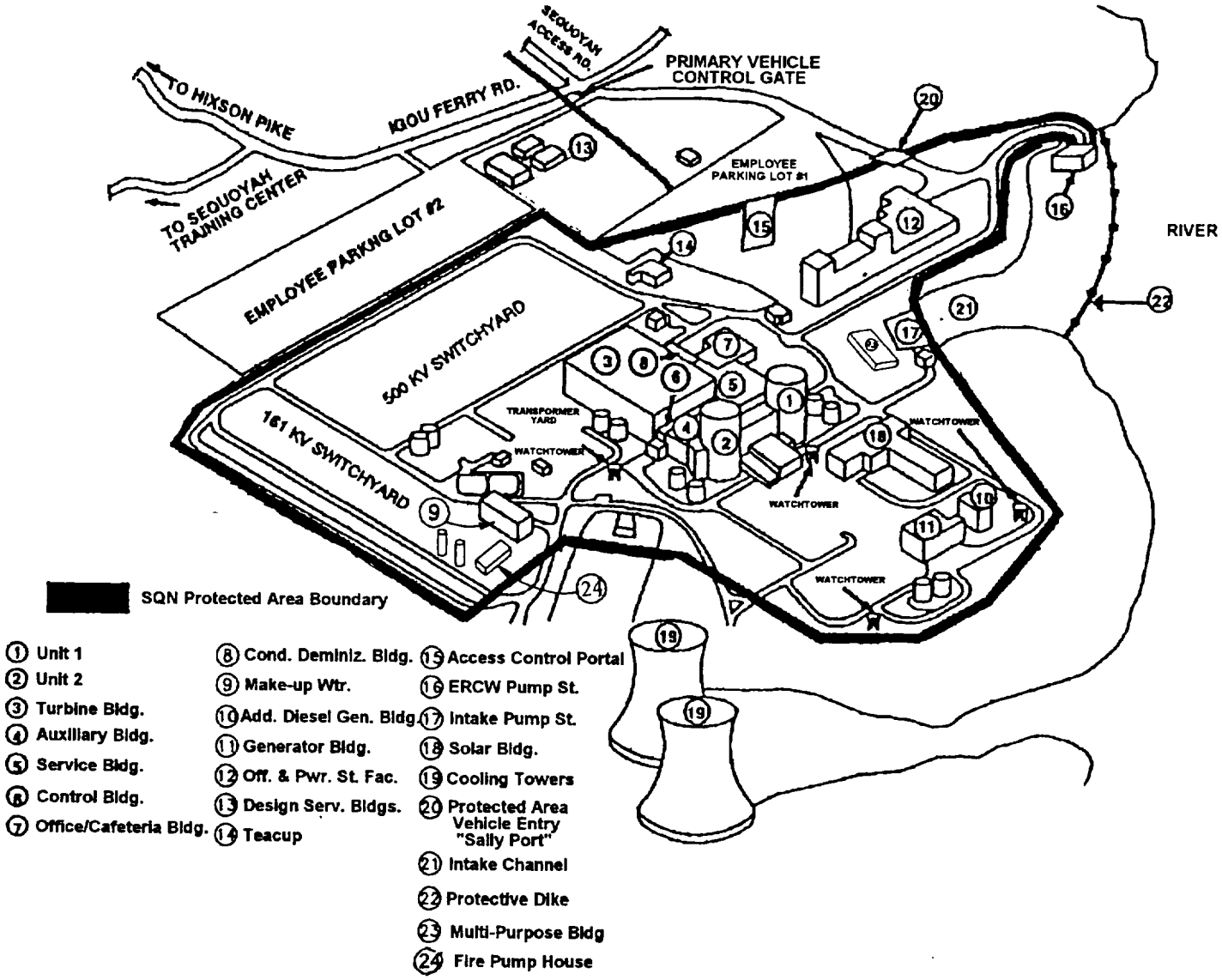
VITAL AREA: Any area within the PROTECTED AREA which contains equipment, systems, devices, or material which the failure, destruction, or release of, could directly or indirectly endanger the public health and safety by exposure to radiation.

	4.1 Fire		4.2 Explosions	
	Mode	Initiating / Condition	Mode	Initiating / Condition
GENERAL EMER		*Refer to "Fission Product Barrier Matrix" (Section 1) and Continue in This Column.*		*Refer to "Fission Product Barrier Matrix" (Section 1) and Continue in This Column.*
SITE AREA EMER		*Refer to "Control Room Evacuation," (4.5) and Fission Product Barrier Matrix" (Section 1) and Continue in This Column.*		*Refer to "Fission Product Barrier Matrix" (Section 1) and Continue in This Column.*
ALERT	ALL	**FIRE in any of the areas listed in Table 4-1 that is affecting safety related equipment required to establish or maintain safe shutdown.** ***(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 or safety related equipment in the specified area is observed due to the **FIRE**. **OR** b. Control room indication of degraded safety system or component response due to the **FIRE**.	ALL	**EXPLOSION in any of the areas listed in Table 4-1 that is affecting safety related equipment required to establish or maintain safe shutdown.** ***(1 and 2)*****:** 1. **EXPLOSION** in any of the areas listed in Table 4-1. 2. (a or b) a. **VISIBLE DAMAGE** to permanent structures or to safety related equipment in the specified area is due to the **EXPLOSION**. **OR** b. Control room indication of degraded safety system or component response due to the **EXPLOSION**. *Refer to "Security" (Section 4.6).*
UNUSUAL EVENT	ALL	**FIRE within the PROTECTED AREA (Figure 4-A) threatening any of the areas listed in Table 4-1 that is not extinguished within 15 minutes from the time of control room notification or verification of control room alarm.**	ALL	**UNPLANNED EXPLOSION within the PROTECTED AREA (Figure 4-A) resulting in VISIBLE DAMAGE to any permanent structure or equipment.** *Refer to "Security" (Section 4.6).*

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

Unit #1 Containment
Unit #2 Containment
Auxiliary Building
Control Building
RWST
Additional Equipment Buildings
Diesel Generator Building
Intake Pumping Station
ERCW Pumping Station
CSST's
Condensate Storage Tanks

Figure 4-A
SEQUOYAH PROTECTED AREA



4.3 Flammable Gas

	Mode	Initiating / Condition
GENERAL EMER		*Refer to "Fission Product Barrier Matrix" (Section 1) and Continue in This Column.*
SITE AREA EMER		*Refer to "Fission Product Barrier Matrix" (Section 1) and Continue in This Column.*
ALERT	ALL	**UNPLANNED release of FLAMMABLE GAS within a facility structure containing safety related equipment or associated with safe operation of the plant.** 1. Plant personnel report the average of three (3) readings taken in an ~10 ft. Triangular Area is > 25% Lower Explosive Limit, as indicated on the monitoring instrument within any building listed in Table 4-2. *Refer to the MSDS for the LEL.*
UNUSUAL EVENT	ALL	**A. UNPLANNED release of FLAMMABLE GAS within the EXCLUSION AREA BOUNDARY that may affect normal operations.** 1. Plant personnel report the average of three readings taken in an ~10 ft. Triangular Area is > 25% of the Lower Explosive Limit, as indicated on the monitoring instrument within the **EXCLUSION AREA BOUNDARY** (Figure 4-B). **OR** **B. Confirmed report by Local, County, or State officials that a large offsite FLAMMABLE GAS release has occurred within one (1) mile of the site (Figure 4-C) with potential to enter the EXCLUSION AREA BOUNDARY (Figure 4-B) in concentrations > 25% of Lower Explosive Limit.** *(Refer to the MSDS for the LEL).*

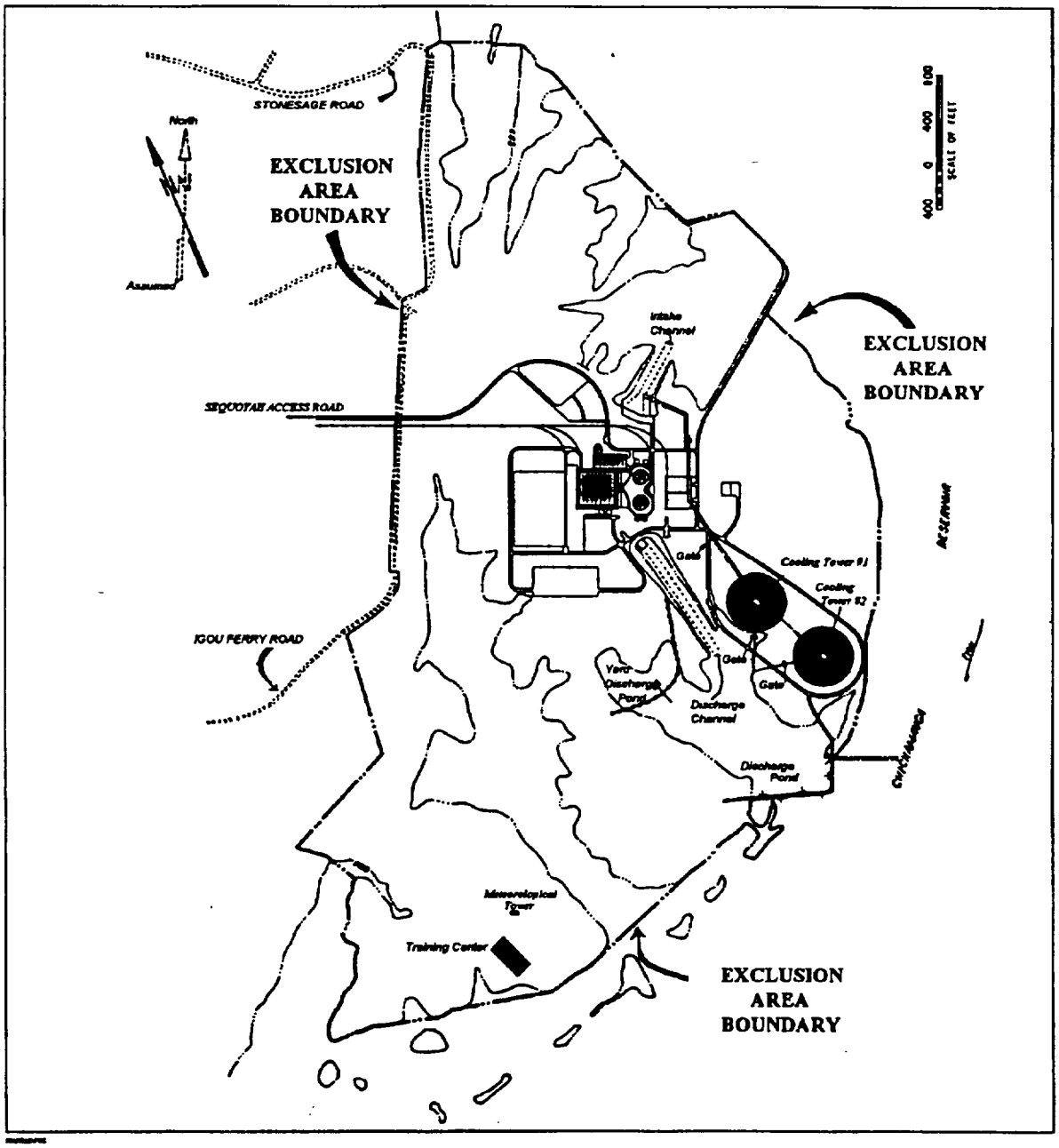
4.4 Toxic Gas or Smoke

Mode	Initiating / Condition
	Refer to "Fission Product Barrier Matrix" (Section 1) and Continue in This Column.
	Refer to "Fission Product Barrier Matrix" (Section 1) and Continue in This Column.
ALL	**Release of TOXIC GAS or smoke within a facility structure which prohibits safe operation of systems required to establish or maintain Cold S/D.** ***(1 and 2 and 3):*** 1. Plant personnel report **TOXIC GAS** or smoke within any building listed in Table 4-2. 2. (a or b) a. Plant personnel report severe adverse health reactions due to **TOXIC GAS** or smoke (i.e., burning eyes, nose, throat, dizziness). **OR** b. Sampling indication > Permissible Exposure Limit (PEL). 3. Plant personnel unable to perform actions to establish and maintain Cold Shutdown while utilizing appropriate personnel protection equipment. *Refer to the MSDS for the PEL.*
ALL	**A. Safe operations impeded due to access restrictions caused by TOXIC GAS or smoke concentrations within a facility structure listed in Table 4-2.** **OR** **B. Confirmed report by Local, County, or State officials that an offsite TOXIC GAS release has occurred within one (1) mile of the site (Figure 4-C) with potential to enter the EXCLUSION AREA BOUNDARY (Figure 4-B) in concentrations > the Permissible Exposure Limit (PEL) causing a site evacuation.** *(Refer to the MSDS for the PEL).*

TABLE 4-2
PLANT AREAS ASSOCIATED WITH TOXIC OR FLAMMABLE GAS OR SMOKE EALs

Unit #1 Containment	Diesel Generator Building
Unit #2 Containment	Intake Pumping Station
Auxiliary Building	CDWE Building
Control Building	ERCW Pumping Station
Turbine Building	Additional Equipment Buildings

Figure 4-B
SEQUOYAH EXCLUSION AREA BOUNDARY



4.5 Control Room Evacuation

	Mode	Initiating / Condition
GENERAL EMER		*Refer to "Fission Product Barrier Matrix" (Section 1) and Continue in This Column.*
SITE AREA EMER	ALL	**Evacuation of the control room has been initiated and control of all necessary equipment has not been established within 15 minutes of staffing the auxiliary control room. *(1 and 2):*** 1. AOP-C.04 "Control Room Inaccessibility" entered. 2. Control has not been established within 15 minutes of staffing the auxiliary control room and completing transfer of switches, listed on checklist AOP-C.04-1, on panels L11A and L11B to the AUX position.
ALERT	ALL	**Evacuation of the Control Room is Required.** 1. AOP-C.04 "Control Room Inaccessibility" has been entered.
UNUSUAL EVENT		*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 or control room or remote shutdown capacity.
ALL	**Security event has or is occurring which results in actual or 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 or potential substantial degradation in the level of safety of the plant. *(1 or 2 or 3):*** 1. **BOMB** discovered within a **VITAL AREA**. **OR** 2. **CIVIL DISTURBANCE** ongoing within the **PROTECTED AREA** (Figure 4-A). **OR** 3. **PROTECTED AREA** (Figure 4-A) has been penetrated by a hostile armed force.
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** (Figure 4-A). **OR** 2. Security Shift Supervisor reports any of the events listed in Table 4-3.

4.7 Emergency Director Judgement

	Mode	
GENERAL EMER	ALL	**Events are in process or have occurred which involve Actual or Imminent Substantial Core Degradation or Melting With Potential for Loss of Containment Integrity. Releases can be reasonably expected to exceed EPA Plume Protective Action Guidelines Exposure Levels outside the EXCLUSION AREA BOUNDARY (Figure 4-B)**
SITE AREA EMER	ALL	**Events are in process 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 Guideline Exposure Levels outside the EXCLUSION AREA BOUNDARY (Figure 4-B)**
ALERT	ALL	**Events are in process or have occurred which involve an 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 Guideline Exposure Levels.**
UNUSUAL EVENT	ALL	**Events are in Process 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 System occurs.**

TABLE 4-3
SECURITY EVENT EXAMPLES

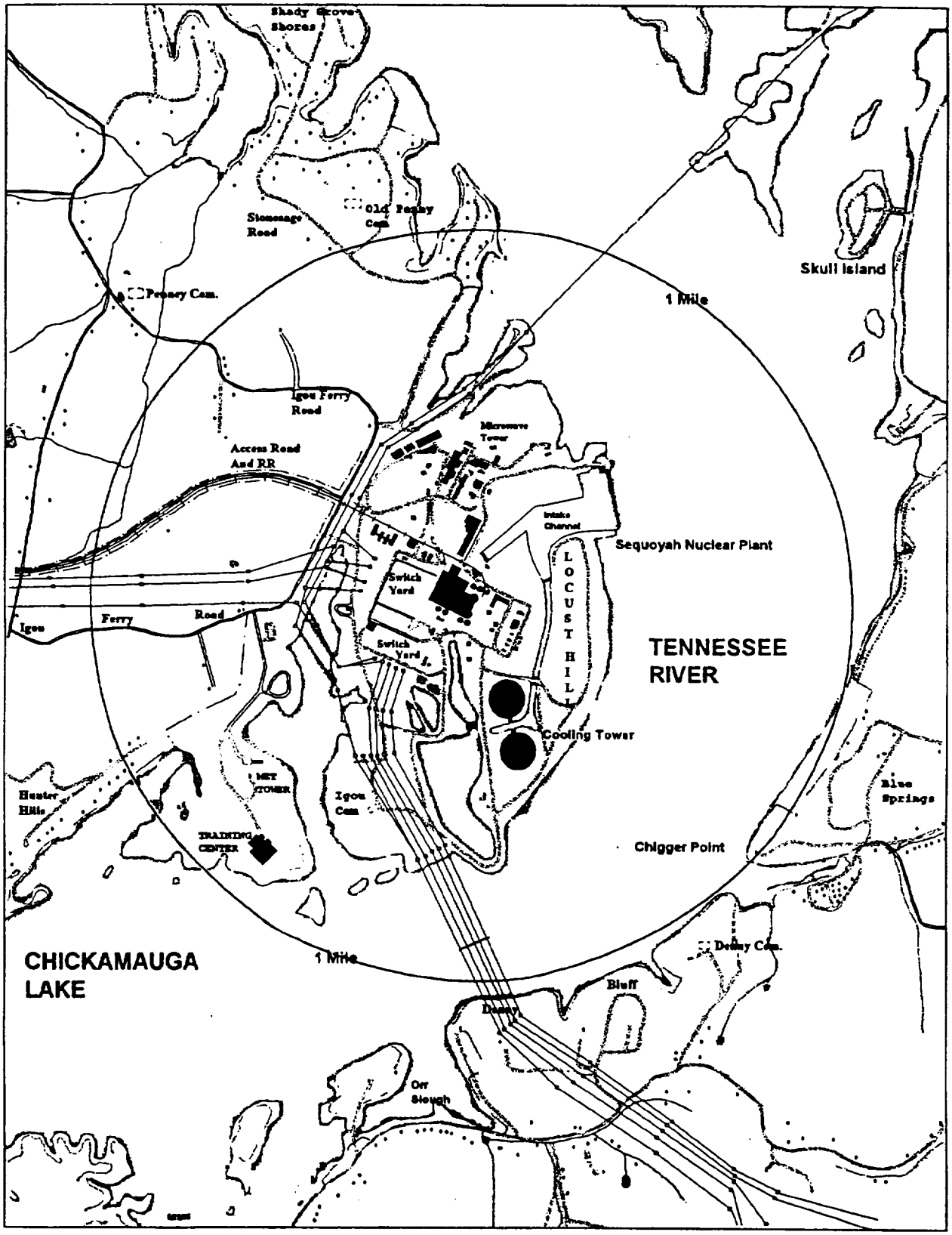
a. **SABOTAGE/INTRUSION** has occurred or is occurring within the **PROTECTED AREA** (Figure 4-A).

b. **HOSTAGE/EXTORTION** situation that threatens to interrupt plant operations.

c. **CIVIL DISTURBANCE** ongoing between the **EXCLUSION AREA BOUNDARY** (Figure 4-B) and the **PROTECTED AREA** (Figure 4-A).

d. Hostile **STRIKE ACTION** within the **PROTECTED AREA** which threatens to interrupt normal plant operations (judgement based on behavior of strikers and/or intelligence received).

Figure 4-C
SEQUOYAH ONE MILE RADIUS



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END OF SECTION 4.

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

VISIBLE DAMAGE: Damage to equipment that is readily observable without measurements, testing, or analysis. Damage is sufficient 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, or paint blistering. Surface blemishes (e.g., paint chipping, scratches, etc.) should NOT be included as visible damage.

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

	5.1 Earthquake	
	Mode	**Initiating / Condition**
GENERAL EMER		*Refer to "Fission Product Barrier Matrix" (Section 1) and Continue in This Column.*
SITE AREA EMER		*Refer to "Fission Product Barrier Matrix" (Section 1) and Continue in This Column.*
ALERT	ALL	**Earthquake detected by site seismic instrumentation.** ***(1 and 2):*** 1. Panel XA-55-15B alarm window 30 (E-2) plus window 22 (D-1) activated. 2. *(a or b)* a. Ground motion sensed by plant personnel. OR b. National Earthquake Information Center at 1-(303) 273-8500 can confirm the event.
UNUSUAL EVENT	ALL	**Earthquake detected by site seismic instruments.** ***(1 and 2):*** 1. Panel XA-55-15B alarm window 22 (D-1) activated. 2. *(a or b)* a. Ground motion sensed by plant personnel. OR b. National Earthquake Information Center at 1-(303) 273-8500 can confirm the event.

5.2 Tornado		
	Mode	**Initiating / Condition**
		Refer to "Fission Product Barrier Matrix" (Section 1) and Continue in This Column.
		Refer to "Fission Product Barrier Matrix" (Section 1) and Continue in This Column.
	ALL	**Tornado or 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 m.p.h. > one minute on the plant computer) strikes any structure listed in Table 5-1. 2. *(a or b)* a. Confirmed report of any **VISIBLE DAMAGE.** OR b. Control room indications of degraded safety system or component response due to event. *Note: National Weather Service Morristown 1-(423)-586-8400, can provide additional info.*
	ALL	**Tornado within the EXCLUSION AREA BOUNDARY.** 1. Plant personnel report a tornado has been sighted within the **EXCLUSION AREA BOUNDARY** (Figure 5-A)

5.3 Aircraft/Projectile Impact

	Mode	
GENERAL EMER		*Refer to the "Fission Product Barrier Matrix" (Section 1).*
SITE AREA EMER		*Refer to the "Fission Product Barrier Matrix" (Section 1).*
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 **VISIBLE DAMAGE.** **OR** b. Control Room indications of degraded safety system or component response due to the event within any structure listed in Table 5-1.
UNUSUAL EVENT	ALL	**Aircraft crash or projectile impact (strikes) within the EXCLUSION AREA BOUNDARY.** 1. Plant personnel report aircraft crash or **PROJECTILE** impact within the **EXCLUSION AREA BOUNDARY** (Figure 5-A).

TABLE 5-1
Plant Structure Associated With Tornado/High Wind and Aircraft EALs

Unit #1 Containment	Auxiliary Building
Unit #2 Containment	Diesel Generator Bldg.
Control Building	ERCW Pumping Station
Intake Pumping Station	Turbine Building
CDWE Building	Common Station Service Transformer's
RWST	Condensate Storage Tanks
Additional Equipment Bldgs.	

5.4 River Level HIGH

	Mode	Initiating / Condition
GENERAL EMER		*Refer to "Fission Product Barrier Matrix" (Section 1) and Continue in This Column.*
SITE AREA EMER		*Refer to "Fission Product Barrier Matrix" (Section 1) and Continue in This Column.*
ALERT	ALL	**River reservoir level is at Stage II Flood Warning as reported by River Operations.**
UNUSUAL EVENT	ALL	**River reservoir level is at Stage I Flood Warning as reported by River Operations.**

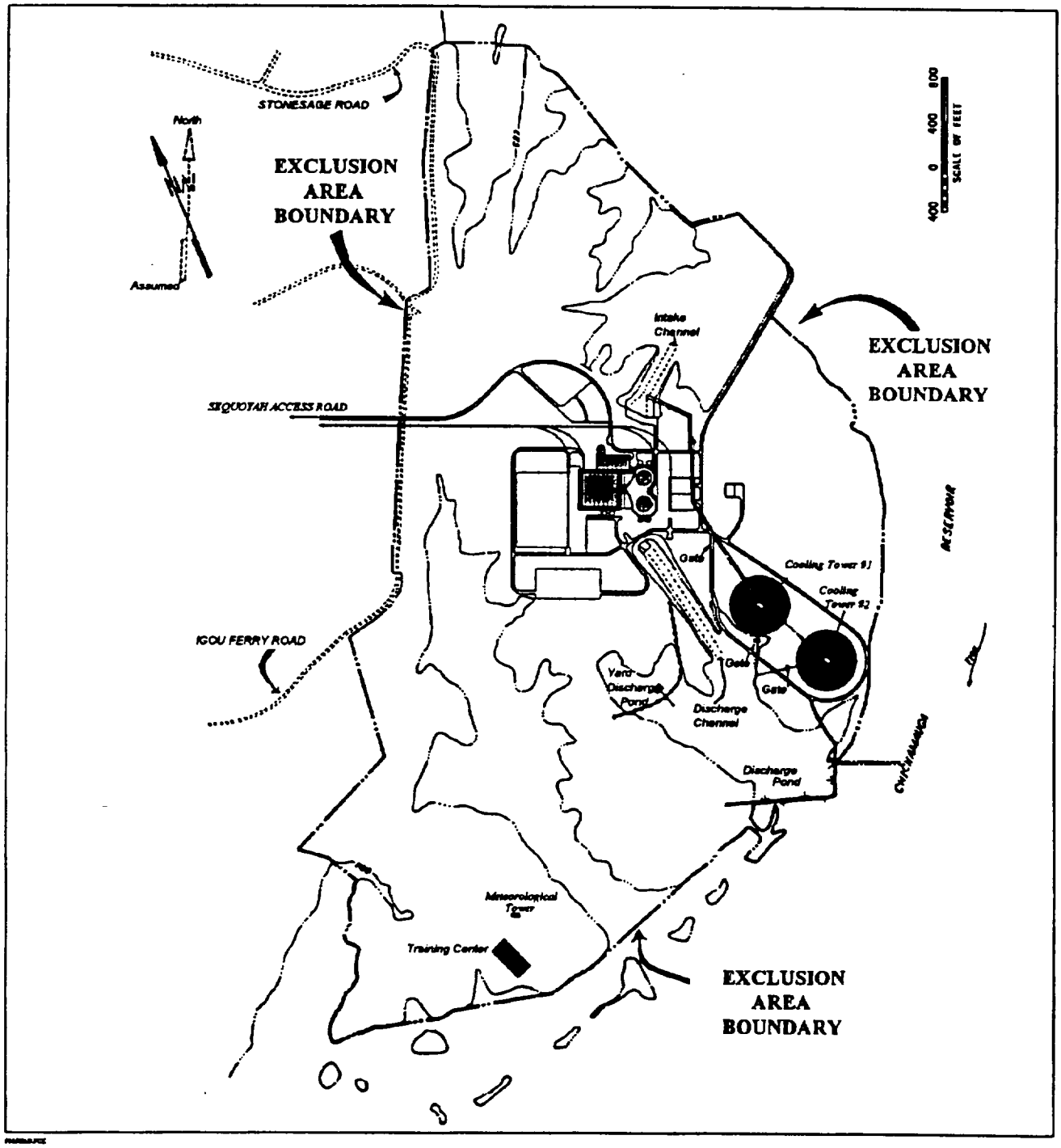
5.5 River Level LOW

Mode	Initiating / Condition
	Refer to "Fission Product Barrier Matrix" (Section 1) and Continue in This Column.
	Refer to "Fission Product Barrier Matrix" (Section 1) and Continue in This Column.
ALL	**River reservoir level is < 670 Feet as reported by River Operations.**
ALL	**River reservoir level is < 673 Feet as reported by River Operations.**

5.6 Watercraft Crash

	Mode	
GENERAL EMER		*Refer to "Fission Product Barrier Matrix" (Section 1) and Continue in This Column.*
SITE AREA EMER		*Refer to "Fission Product Barrier Matrix" (Section 1) and Continue in This Column.*
ALERT		*Refer to "Fission Product Barrier Matrix" (Section 1) and Continue in This Column.*
UNUSUAL EVENT	ALL	**Watercraft strikes the ERCW pumping station resulting in a reduction of Essential Raw Cooling Water (ERCW).** ***(1 and 2):*** 1. Plant personnel report a watercraft has struck the ERCW pumping station. 2. *(a or b)* a. ERCW supply header pressure Train A 1(2)-PI-67-493A is < 15 psig. **OR** b. ERCW supply header pressure Train B 1(2)-PI-67-488A is < 15 psig.

Figure 5-A
SEQUOYAH EXCLUSION AREA BOUNDARY



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END OF SECTION 5

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DEFINITIONS/ACRONYMS

BOMB: An explosive device. (See EXPLOSION)

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

CRITICAL-SAFETY FUNCTION (CSFs): A plant safety function required to prevent significant release of core radioactivity to the environment. There are six CSFs; Subcriticality, 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 initiating conditions associated with the event exist. Implicit in this definition is the need for timely assessment within 15 minutes.

EXCLUSION AREA BOUNDARY (EAB): That area surrounding the reactor, in which the reactor licenses has the authority to determine all activities including exclusion or removal of personnel and property from the area. For purposes of Emergency Action Levels, based on radiological field measurements and dose assessments, and for design calculations, the Site Boundary shall be defined as the EAB.

EXPLOSION: Rapid, violent, unconfined combustion, or a catastrophic failure of pressurized or electrical equipment that imparts energy of sufficient force to potentially damage permanent structures or equipment.

EXTORTION: An attempt to cause an action at the site by threat or force.

FAULTED: (Steam Generator) Existence of secondary side leakage (e.g., 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. Sources of smoke such as slipping drive belts or overheated electrical components do not constitute a fire. Observation of flame is preferred but is NOT required if large quantities of smoke and/or heat are observed.

FLAMMABLE GAS: Combustible gases at concentrations > than the LOWER EXPLOSIVE LIMIT (LEL).

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

IMMINENT: Within two hours.

INEFFECTIVE: When the specified restoration action(s) does not result in a reduction in the level of severity of the RED or ORANGE PATH condition within 15 minutes from identification of the CSF Status Tree RED or ORANGE PATH.

INITIATION 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 the protected area without authorization.

ODCM: Offsite Dose Calculation Manual is a supporting document to the Tech Specs. that contain Rad Effluent Controls, Environs Monitoring controls, and methodology for calculating gaseous and liquid effluent offsite doses and monitor alarm/trip setpoints.

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

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

PROTECTED AREA: The area encompassed by the security fence and to which access is controlled.

RCS: The **RCS** primary side and its connections up to and including the pressurizer safety and relief valves, and other connections up to and including the primary and secondary isolation valves.

RED PATH: Monitoring of one or more CSFs by 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 the capacity one charging pump.

SABOTAGE: Deliberate damage, misalignment, or misoperation 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; (4) Safety Injection System Activation; (5) Thermal Power Oscillations ≥10%.

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.

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

	6.1 Loss of Shutdown Systems	
	Mode	Initiating / Condition
GENERAL EMER		*Refer to "Gaseous Effluents" (Section 7.1) and Continue in This Column.*
SITE AREA EMER	5, 6	**Loss of water level in the reactor vessel that has or will uncover active fuel in the reactor vessel with containment closure established.** ***(1 and 2 and 3 and 4):*** 1. Loss of RHR capability. 2. **VALID** indication that reactor vessel water level < el. 695'. 3. Incore TCs (if available) indicate **RCS** temperature > 200 °F. 4. Containment closure is established. *Note: If containment is open refer to "Gaseous Effluents" (Section 7.1) and continue in this column.*
ALERT	5, 6	**Inability to maintain unit in cold shutdown when required with containment closure established.** ***(1 and 2 and 3):*** 1. Cold shutdown required by Technical Specs. 2. Incore TCs (if available) indicate core exit temperature > 200 °F. 3. Containment closure is established. *Note: If containment is open refer to "Gaseous Effluents" (Section 7.1) and continue in this column.*
UNUSUAL EVENT		*Not Applicable.*

	6.2 Loss of S/D Capability	
	Mode	Initiating / Condition
		Not Applicable.
	1, 2, 3, 4	**Complete loss of function needed to achieve or maintain hot shutdown.** ***(1 and 2a or 2b):*** 1. Hot shutdown required. 2a. CSF status tree indicated Core Cooling Red (FR-C.1). **OR** 2b. CSF status tree indicates Heat Sink Red (FR-H.1) (RHR shutdown cooling not in service). *Note: Refer to "Reactor Protection System Failure" (Section 2.3) and Continue in This Column.*
	1, 2, 3, 4	**Complete loss of function needed to achieve cold shutdown when cold shutdown required by Tech. Specs.** ***(1 and 2 and 3):*** 1. Cold shutdown required by Tech. Specs. 2. Loss of RHR shutdown cooling capability. 3. Loss of secondary heat sink and main condenser *Note: Also refer to "Failure of Rx Protection" (Section 2.3) and Continue in This Column.*
	1, 2, 3, 4	**Inability to reach required shutdown within Tech. Spec. limits.** 1. The unit has not been placed in the required mode within the time prescribed by the LCO action statement.

6.3 Loss of RCS Inventory

	Mode	
GENERAL EMER		*Refer to "Gaseous Effluents" (Section 7.1) and Continue in This Column.*
SITE AREA EMER		*Refer to "Gaseous Effluents" (Section 7.1) and Continue in This Column.*
ALERT		*Refer to "Gaseous Effluents" (Section 7.1) and Continue in This Column.*
UNUSUAL EVENT	5, 6	**Loss of REACTOR COOLANT SYSTEM inventory with inadequate makeup.** ***(1 and 2 and 3):*** 1. **Reactor coolant system** is pressurized above atmospheric pressure. 2. Unplanned decrease in **RCS** or pressurizer level requiring initiation of makeup to the **RCS**. 3. With reactor coolant system temperature stable, the pressurizer level continues to decrease following initiation of **RCS** makeup.

END OF SECTION 6

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FISSION PRODUCT BARRIER MATRIX (Modes 1-4)

SYSTEM DEGRADATION

LOSS OF POWER

HAZARDS and SED JUDGEMENT

DESTRUCTIVE PHENOMENON

SHUTDOWN SYSTEM DEGRADATION

RADIOLOGICAL EFFLUENTS

DEFINITIONS/ACRONYMS

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GENERIC ATTACHMENT 1

7.1 Gaseous Effluents		7.2 Liquid Effluents	
Mode	Initiating / Condition	Mode	Initiating / Condition
ALL	**EAB dose, resulting from an actual or imminent release of gaseous radioactivity > 1 Rem TEDE or > 5 Rem thyroid CDE for the actual or projected duration of the release.** ***(1 or 2 or 3):*** 1. A **VALID** rad monitor reading exceeds the values under General Emergency in Table 7-1 for >15 minutes, unless assessment within that 15 minutes confirms that the criterion is not exceeded. **OR** 2. Field surveys indicate >1Rem/hr β-γ or an I-131 concentration of 3.9E-06 μCi/cm^3 at the **EAB** (Fig. 7-A) **OR** 3. Dose assessment results indicate **EAB** dose >1 Rem TEDE or >5 Rem thyroid CDE for the actual or projected duration of the release (Fig. 7-A).		*Not Applicable.*
ALL	**EAB β-γ dose resulting from an actual or imminent release of gaseous radioactivity >100 mrem TEDE or >500 mrem thyroid CDE for actual or projected duration of the release.** ***(1 or 2 or 3):*** 1. A **VALID** rad monitor reading > Table 7-1 values under Site Area for >15 minutes, unless assessment within that 15 minutes confirms that the criterion is not exceeded. **OR** 2. Field surveys indicate >100 mrem/hr β-γ or an I-131 concentration of 3.9E-07 μCi/cm^3 at the **EAB** (Fig. 7-A). **OR** 3. Dose assessment results indicate **EAB** dose >100 mrem TEDE or >500 mrem thyroid CDE for actual or projected duration of the release (Fig. 7-A).		*Not Applicable*
ALL	**Any UNPLANNED release of gaseous radioactivity that exceeds 200 times the ODCM Section 1.2.2.1 Limit for >15 minutes.** ***(1 or 2 or 3 or 4)*** 1. A **VALID** rad monitor reading > Table 7-1 values under Alert for >15 minutes, unless assessment within that 15 minutes confirms that the criterion is not exceeded. **OR** 2. Field surveys indicate >10 mrem/hr β-γ at the **EAB** for >15 minutes (Fig 7-A). **OR** 3. Dose assessment results indicate **EAB** dose >10 mrem TEDE for the duration of the release (Fig. 7-A). **OR** 4. Sample results exceed 200 times the **ODCM** limit value for an unmonitored release of gaseous radioactivity >15 minutes in duration.	ALL	**Any UNPLANNED release of liquid radioactivity that exceeds 200 times the ODCM Section 1.2.1.1 Limit for >15 minutes.** ***(1 or 2)*** 1. A **VALID** rad monitor reading > Table 7-1 values under Alert for >15 minutes, unless assessment within this time period confirms that the criterion is not exceeded. **OR** 2. Sample results indicate an ECL (I-131) exceed 200 times the **ODCM** limit value for an unmonitored release of liquid radioactivity >15 minutes in duration
ALL	**Any UNPLANNED release of gaseous radioactivity that exceeds 2 times the ODCM Section 1.2.2.1 Limit for >60 minutes.** ***(1 or 2 or 3 or 4)*** 1. A **VALID** rad monitor reading > Table 7-1 values under UE for >60 minutes, unless assessment within that 60 minutes confirms that the criterion is not exceeded. **OR** 2. Field surveys indicate >0.1 mrem/hr β-γ at the **EAB** for >60 minutes (Fig 7-A) **OR** 3. Dose assessment results indicate **EAB** dose >0.1 mrem TEDE for the duration of the release (Fig. 7-A). **OR** 4. Sample results exceed 2 times the **ODCM** limit value for an unmonitored release of gaseous radioactivity >60 minutes in duration.	ALL	**Any UNPLANNED release of liquid radioactivity to the environment that exceeds 2 times the ODCM Section 1.2.1.1 Limit for >60 minutes.** ***(1 or 2)*** 1. A **VALID** rad monitor reading > Table 7-1 values under UE for >60 minutes, assessment within this time period confirms that the criterion is not exceeded. **OR** 2. Sample results indicate an ECL (I-131) >2 times the **ODCM** limit value for an unmonitored release of liquid radioactivity >60 minutes in duration.

TABLE 7-1
EFFLUENT RADIATION MONITOR EALS

NOTE: The monitor values below, if met or exceeded, indicate the need to perform the required assessment. If the assessment can not be completed within 15 minutes (60 minutes for UE), the appropriate emergency classification shall be made based on the **VALID** reading.

GASEOUS MONITORS	Units[2]	UE	Alert	SAE	General Emer
Site Total Release Limit	µCi/s	*4.90E+05*	*4.90E+07*	*1.31E+08*	*1.31E+09*
U-1 Shield Building 1-RI-90-400 (EFF LEVEL)	µCi/s	4.90E+05	4.90E+07	1.31E+08	1.31E+09
U-2 Shield Building 2-RI-90-400 (EFF LEVEL)	µCi/s	4.90E+05	4.90E+07	1.31E+08	1.31E+09
Auxiliary Building 0-RM-90-101B Limit	cpm	1.03E+05	*Offscale*[1]	*Offscale*[1]	*Offscale*[1]
Service Building 0-RM-90-132B Limit	cpm	*2.62E+06*	*Offscale*[1]	*Offscale*[1]	*Offscale*[1]
U-1 Main Steam Line Monitors[2] 1-RI-90-421 thru 424	µCi/cc	1.49E-01	1.49E+01	3.98E+01	3.98E+02
U-2 Main Steam Line Monitors[2] 2-RI-90-421 thru 424	µCi/cc	1.49E-01	1.49E+01	3.98E+01	3.98E+02
U-1 Condenser Vac Exh 1-RM-90-255 or 256 Limit	mR/h	*4.10E+02*	4.10E+04	1.09E+05	1.09E+06
U-2 Condenser Vac Exh 2-RM-90-255 or 256 Limit	mR/h	*4.10E+02*	4.10E+04	1.09E+05	1.09E+06
RELEASE DURATION	*minutes*	*>60*	*>15*	*>15*	*>15*
LIQUID MONITORS	**Units**	**UE**	**Alert**	**Site Area**	**General Emer**
Site Total Release Limit	µCi/ml	8.33E-04	8.33E-02	*N/A*	*N/A*
RM-90-122-RadWaste	cpm	1.95E+05	Offscale[1]	*N/A*	*N/A*
RM-90-120,121-S/G Bldn	cpm	1.46E+05	Offscale[1]	*N/A*	*N/A*
RM-90-225-Cond Demin	cpm	2.59E+05	Offscale[1]	*N/A*	*N/A*
RM-90-212-TB Sump	cpm	4.10E+03	4.10E+05	*N/A*	*N/A*
RELEASE DURATION	minutes	>60	>15	>15	>15

ASSESSMENT METHOD: SQN EPIP-14 Appendix D, "Methodology For Projecting TEDE."

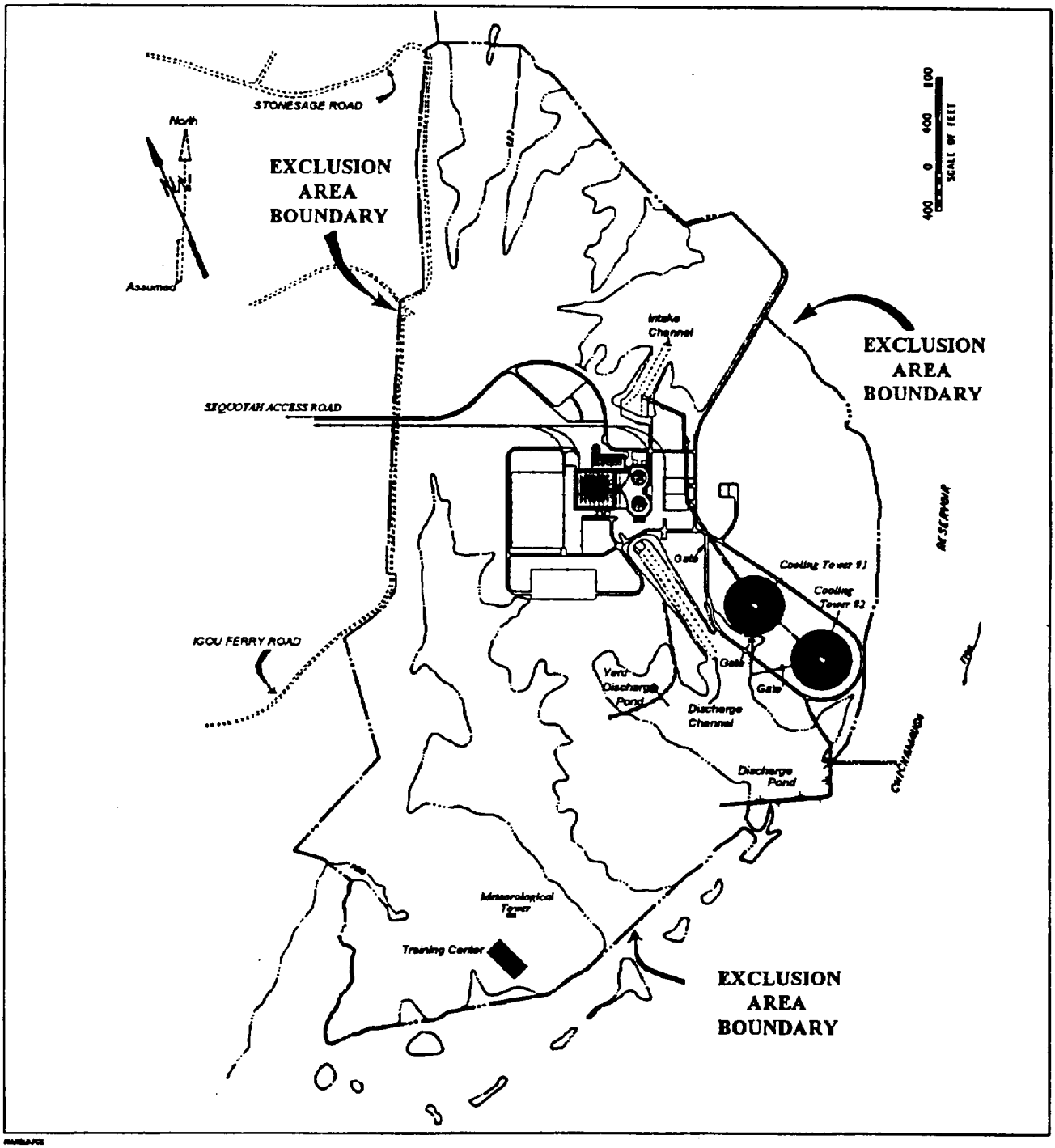
(1) The calculated value is outside of the upper range for this detector. The maximum monitor output which can be read is 1.0E+07 cpm.

(2) These unit values are based on flow rates through one PORV of 890,000 lb/hr at 1085 psig 600 degrees F. Before using these values, ensure a release to the environment is ongoing, (e.g., PORV).

NOTE 1: These EALs are based on the assumption that an emergency release is restricted to one pathway from the plant. In all cases, the total site EAL is the limiting value. Therefore, in the case where there are multiple release paths from the plant, it is the total release EAL (obtained from ICS and/or SQN 0-TI-CEM-030-030, "Manual Calculation of Plant Gas, Iodine, and Particulate Release Rates for Offsite Dose Calculation Manual (ODCM) Compliance"TI-30) that will determine whether an emergency classification is warranted.

NOTE 2: In the case when there is no CECC dose assessment available, the length and relative magnitude of the release is the key in determining the classification. For example, in the case of the NOUE EAL of 2 times the Tech Spec limit, the classification is based more on the fact that a release above the limit has continued unabated for more than 60 minutes, than on the projected offsite dose.

Figure 7-A
EXCLUSION AREA BOUNDARY



7.3 Radiation Levels

	Mode	Initiating / Condition
GENERAL EMER		*Refer to "Fission Product Barrier Matrix" (Section 1) or "Gaseous Effluents" (Section 7.1) and Continue in This Section.*
SITE AREA EMER		*Refer to "Fission Product Barrier Matrix" (Section 1) or "Gaseous Effluents" (Section 7.1) and Continue in This Section.*
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 SAS. **OR** 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 Note Below).*
UNUSUAL EVENT	ALL	**UNPLANNED increase in radiation levels within the facility.** 1. A **VALID** area radiation monitor reading increases by 1000 mrem/hr over the highest reading in the past 24 hours excluding the current peak value. *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
	Refer to "Gaseous Effluents" (Section 7.1) and Continue in This Section.
	Refer to "Gaseous Effluents" (Section 7.1) and Continue in This Section.
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 RM-90-101 or RM-90-102 or RM-90-103 or RM-90-130/131 or RM-90-112. **AND** 2. *(a or b):* a. Plant personnel report damage to irradiated fuel sufficient to rupture fuel rods. **OR** b. Plant personnel report water level drop has or will exceed makeup capacity such that irradiated fuel will be uncovered in the spent fuel pool or transfer canal.
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 RM-90-101 or RM-90-102 or RM-90-103. 3. Fuel remains covered with water.

Table 7-2

ALERT - RADIATION LEVELS

Monitor No.	Location Area and Elevation	Meter Reading
For purposes of comparing the meter/monitor reading values to this table, it can be assumed that mR is equivalent to mrem.		
1,2-RM-90-1	Spent Fuel Pit ARM El. 734.0	1.5E+03 mR/hr
0-RM-90-3	Waste Packaging ARM El. 706.0	1.5E+03 mR/hr
0-RM-90-4	Decontamination Room ARM El. 690.0	1.5E+03 mR/hr
0-RM-90-5	SFP Pumps ARM El. 714.0	1.5E+03 mR/hr
1,2-RM-90-6	CCS HXS ARM El. 714.0	1.5E+03 mR/hr
1,2-RM-90-7	Sample Rm ARM El. 690.0	1.5E+03 mR/hr
1,2-RM-90-8	AFW Pumps ARM El. 690.0	1.5E+03 mR/hr
0-RM-90-9	Waste Cnds Tks ARM El. 669.0	1.5E+03 mR/hr
1,2-RM-90-10	CVCS Bd ARM El. 669.0	1.5E+03 mR/hr
0-RM-90-11	Cntmt Spray and RHR Pumps Radmon El. 653.0	1.5E+03 mR/hr
0-RM-90-102	Spent Fuel Pit Radmon El. 734.0	1.5E+03 mR/hr
0-RM-90-103	Spent Fuel Pit Radmon El. 734.0	1.5E+03 mR/hr
0-RM-90-230	CNDS Demineralizer ARM El. 685.0	1.5E+03 mR/hr
0-RM-90-231	Cnds Demineralizer ARM El. 706.0	1.5E+03 mR/hr

Note: All of the above monitors have a range of 0.1 to 1E+4 mrem/hr.

END OF SECTION 7.

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