



**DAEC EMERGENCY PLANNING DEPARTMENT PROCEDURE
TRANSMITTAL ACKNOWLEDGEMENT MEMO (TAM-18)**

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Please perform the following to your assigned manual. If you have any questions regarding this TAM please contact Don A. Johnson at 319-851-7872.

	REMOVE	INSERT
EPIP Table of Contents Revision	Rev. 131	Rev. 132
EPIP EAL-01 (PWR: 19690)	Rev. 2	Rev. 3
EPIP EAL-02 (PWR: 18510)	Rev. 2	Rev. 3
EPIP EAL-04 (PWR: 19383)	Rev. 2	Rev. 3

PERFORMED BY:

Print Name	Sign Name	Date

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PSC/Emergency Planning
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<i>To be completed by DAEC EP personnel only:</i>	
Date TAM returned:	_____
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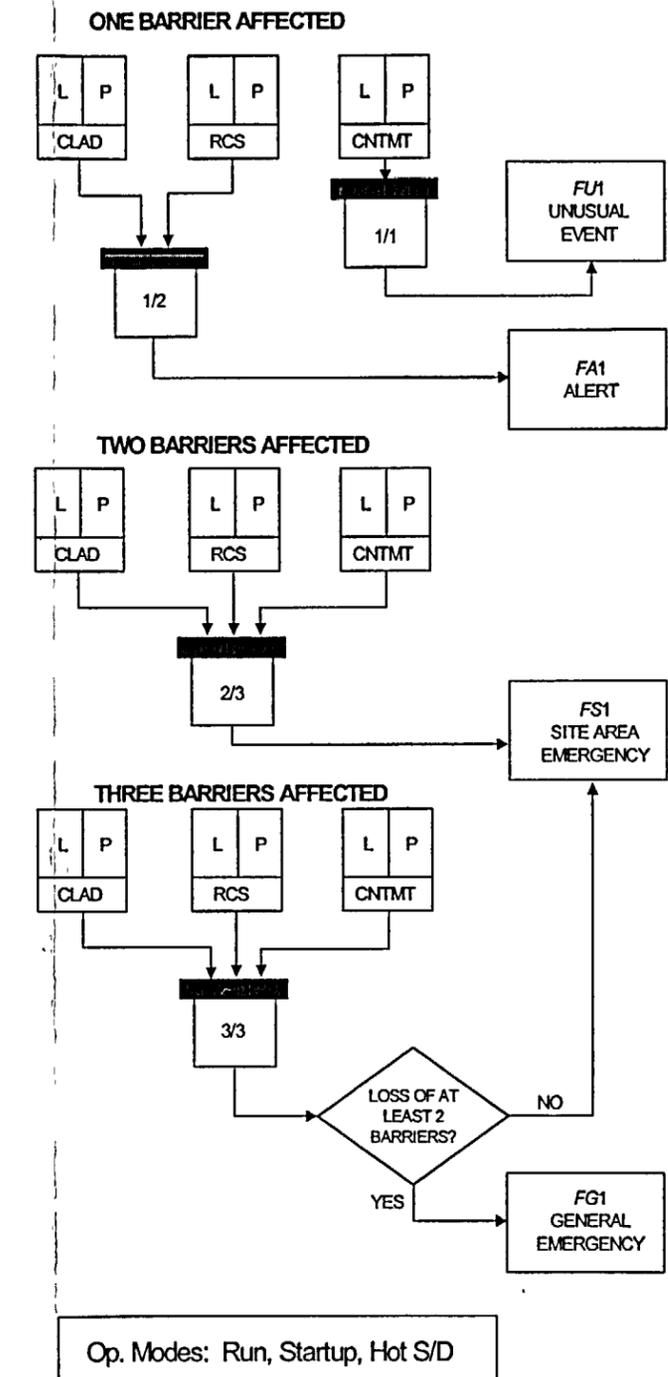
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EAL TABLE
ABNORMAL RAD LEVELS DIOACTIVE EFFLUENT

EVENT TYPE	UNUSUAL EVENT	ALERT	SITE AREA EMERGENCY	GENERAL EMERGENCY
OFFSITE RAD CONDITIONS	<p align="center">AU1</p> <p>Any Unplanned Release of Gaseous or Liquid Radioactivity to the Environment That Exceeds Two Times the Offsite Dose Assessment Manual (ODAM) Limit and is Expected to Continue For 60 Minutes or Longer</p> <p>Valid Reactor Building or Turbine Building ventilation (Kaman) rad monitor reading above 1 E-3 $\mu\text{Ci/cc}$ for more than 60 minutes.</p> <p align="center">OR</p> <p>Valid Offgas Stack (Kaman) rad monitor reading above 1 E-1 $\mu\text{Ci/cc}$ for more than 60 minutes.</p> <p align="center">OR</p> <p>Valid LLRPSF (Kaman) rad monitor reading above 5 E-4 $\mu\text{Ci/cc}$ for more than 60 minutes.</p> <p align="center">OR</p> <p>Valid GSW rad monitor reading above 3E+3 CPS for more than 60 minutes.</p> <p align="center">OR</p> <p>Valid RHRSW & ESW rad monitor reading above 8E+2 CPS for more than 60 minutes.</p> <p align="center">OR</p> <p>Valid RHRSW & ESW Discharge Canal rad monitor reading above 1E+3 CPS for more than 60 minutes.</p> <p align="center">OR</p> <p>Confirmed sample analyses for gaseous or liquid releases indicates concentrations or release rates in excess of 2 times ODAM limits for greater than 60 minutes.</p> <p align="center">OR</p> <p>Valid perimeter radiation monitor reading of greater than 0.10 mR/hr above normal background for 60 minutes.</p> <p align="center">OR</p> <p>Valid dose assessment indicating dose rates beyond the site boundary above 0.1 mR/hr TEDE for a period greater than 60 minutes.</p> <p align="center">Op. Modes: ALL</p>	<p align="center">AA1</p> <p>Any Unplanned Release of Gaseous or Liquid Radioactivity to the Environment that Exceeds 200X the Offsite Dose Assessment Manual (ODAM) Limit and is Expected to Continue for 15 Minutes or Longer</p> <p>Valid Reactor Building or Turbine Building ventilation (Kaman) rad monitor reading above 3 E-2 $\mu\text{Ci/cc}$ for more than 15 minutes.</p> <p align="center">OR</p> <p>Valid Offgas Stack (Kaman) rad monitor reading above 6 E+0 $\mu\text{Ci/cc}$ for more than 15 minutes.</p> <p align="center">OR</p> <p>Valid LLRPSF (Kaman) rad monitor reading above 1 E-1 $\mu\text{Ci/cc}$ for more than 15 minutes.</p> <p align="center">OR</p> <p>Valid GSW rad monitor reading above 3E+5 CPS for more than 15 minutes.</p> <p align="center">OR</p> <p>Valid RHRSW & ESW rad monitor reading above 8E+4 CPS for more than 15 minutes.</p> <p align="center">OR</p> <p>Valid RHRSW & ESW Discharge Canal rad monitor reading above 1E+5 CPS for more than 15 minutes.</p> <p align="center">OR</p> <p>Confirmed sample analyses for gaseous or liquid releases indicates concentrations or release rates with a release duration expected to last for 15 minutes or longer in excess of 200 times ODAM limit</p> <p align="center">OR</p> <p>Valid site boundary radiation reading of greater than 10 mR/hr above normal background and expected to last for 15 minutes or longer.</p> <p align="center">OR</p> <p>Valid indication on MIDAS of a release greater than 200 times ODAM limit and expected to last for 15 minutes or longer.</p> <p align="center">Op. Modes: ALL</p>	<p align="center">AS1</p> <p>Site Boundary Dose Resulting from an Actual or Imminent Release of Gaseous Radioactivity Exceeds 100 mrem TEDE or 500 mrem CDE Thyroid for the Actual or Projected Duration of the Release</p> <p>Valid Reactor Building or Turbine Building ventilation (Kaman) rad monitor reading above 6 E-2 $\mu\text{Ci/cc}$ for more than 15 minutes. (Dose assessment not available)</p> <p align="center">OR</p> <p>Valid Offgas Stack (Kaman) rad monitor reading above 4 E+1 $\mu\text{Ci/cc}$ for more than 15 minutes. (Dose assessment not available)</p> <p align="center">OR</p> <p>Valid field survey reading outside the site boundary >100 mR/hr or >500 mR/hr CDE Thyroid.</p> <p align="center">OR</p> <p>Dose assessment determines integrated accident dose projection outside the site boundary above 100 mrem TEDE or above 500 mrem CDE Thyroid.</p> <p align="center">Op. Modes: ALL</p>	<p align="center">AG1</p> <p>Site Boundary Dose Resulting from an Actual or Imminent Release of Gaseous Radioactivity Exceeds 1000 mrem TEDE or 5000 mrem CDE Thyroid for the Actual or Projected Duration of the Release</p> <p>Valid Reactor Building or Turbine Building ventilation (Kaman) rad monitor reading above 6 E-1 $\mu\text{Ci/cc}$ for more than 15 minutes. (Dose assessment not available)</p> <p align="center">OR</p> <p>Valid Offgas Stack (Kaman) rad monitor reading above 4 E+2 $\mu\text{Ci/cc}$ for more than 15 minutes. (Dose assessment not available)</p> <p align="center">OR</p> <p>Valid field survey reading outside the site boundary >1,000 mR/hr or >5,000mR/hr CDE Thyroid.</p> <p align="center">OR</p> <p>Dose assessment determines integrated accident dose projection outside the site boundary above 1,000 mrem TEDE or above 5,000 mrem CDE Thyroid.</p> <p align="center">Op. Modes: ALL</p>
	ONSITE RAD CONDITIONS	<p align="center">AU2</p> <p>Unexpected Increase in Plant Radiation</p> <p>Uncontrolled loss of reactor cavity or fuel pool water level with all spent fuel assemblies remaining water covered as indicated by ANY of the following:</p> <ul style="list-style-type: none"> Report to control room Valid fuel pool level indication (LI-3413) below 36 feet and lowering Valid WR GEMAC Floodup Indication (LI-4541) coming on scale. <p align="center">OR</p> <p>Unexpected ARM reading offscale high or above 1000 times normal reading.</p> <p align="center">Op. Modes: ALL</p>	<p align="center">AA2</p> <p>Major Damage to Irradiated Fuel or Loss of Water Level that Has or Will Result in the Uncovering of Irradiated Fuel Outside the Reactor Vessel</p> <p>Report of ANY of the following:</p> <ul style="list-style-type: none"> Valid ARM HI RAD alarm for the Refueling Floor North End, Refueling Floor South End, New Fuel Storage Area, or Spent Fuel Storage Area Valid Refueling Floor North End, Refueling Floor South End, or New Fuel Storage Area ARM Reading above 10 mR/hr Valid Spent Fuel Storage Area ARM Reading above 100 mR/hr <p align="center">OR</p> <p>Report of visual observation of Irradiated Fuel uncovered</p> <p align="center">OR</p> <p>Water level reading below 450" as indicated on LI4541 (floodup) for the Reactor Refueling Cavity that will result in Irradiated Fuel uncovering</p> <p align="center">OR</p> <p>Valid Fuel Pool water level indication (LI-3413) below 16 feet.</p> <p align="center">Op. Modes: ALL</p>	
		<p align="center">AA3</p> <p>Release of Radioactive Material or Increases in Radiation Levels Within the Facility That Impedes Operation of Systems Required to Maintain Safe Operations or to Establish or to Maintain Cold Shutdown</p> <p>Valid area radiation monitor (RE9162) reading greater than 15 mR/hr in the Control Room.</p> <p align="center">OR</p> <p>Valid area radiation monitor (RE9168), "North CRD Module", reading greater than 500mR/hr at the Remote Shutdown Panel, 1C388.</p> <p align="center">Op. Modes: ALL</p>		

EAL TABLE
FISSION BARRIER

INDICATORS	FUEL CLAD BARRIER	RCS BARRIER	PRIMARY CONTAINMENT BARRIER
RADIATION / CORE DAMAGE	<p>Loss</p> <p>L Fuel damage assessment (PASAP 7.2) determines at least 5% fuel clad damage OR Fuel damage is indicated by any of the following:</p> <p>L Valid drywell rad monitor reading above 7E+2 R/hr OR L Valid torus rad monitor reading above 3E+1 R/hr OR L Coolant activity above 300µCi/gm DOSE EQUIVALENT I-131</p> <hr/> <p>Potential Loss - None</p>	<p>Loss</p> <p>L Valid drywell rad monitor reading above 5 R/hr after reactor shutdown</p> <hr/> <p>Potential Loss - None</p>	<p>Loss - None</p> <hr/> <p>Potential Loss</p> <p>P Valid drywell rad monitor reading above 3E+3 R/hr OR P Valid torus rad monitor reading above 1E+2 R/hr OR P Core damage assessment determines at least 20% fuel clad damage</p>
RPV LEVEL	<p>Loss</p> <p>L RPV Level below -25 inches that cannot be restored</p> <hr/> <p>Potential Loss</p> <p>P RPV Level below 15 inches that cannot be restored</p>	<p>Loss</p> <p>L RPV Level below 15 inches</p> <hr/> <p>Potential Loss - None</p>	<p>Loss - None</p> <hr/> <p>Potential Loss</p> <p>P RPV Level below -39 inches and no injection source is available</p>
LEAKAGE	None	<p>Loss - None</p> <hr/> <p>Potential Loss</p> <p>P RCS Leakage is above 50 GPM OR P Unisolable primary system leakage outside the drywell as indicated by area temps or ARMs exceeding the Max Normal Limits per EOP 3, Table 6.</p>	<p>Loss</p> <p>L Failure of both isolation valves and a downstream pathway to the environment exists OR L Unisolable primary system leakage outside the drywell as indicated by area temps or ARMs exceeding the Max Safe Limits per EOP 3, Table 6, after Containment Isolation. OR L Primary containment venting performed per EOPs</p> <hr/> <p>Potential Loss - None</p>
PRIMARY CONTAINMENT ATMOSPHERE	None	<p>Loss</p> <p>L Drywell pressure above 2 psig and not caused by a loss of DW Cooling</p> <hr/> <p>Potential Loss - None</p>	<p>Loss</p> <p>L Rapid unexplained decrease following initial increase in pressure OR L Drywell pressure response not consistent with LOCA conditions</p> <hr/> <p>Potential Loss</p> <p>P Torus pressure reaches 53 psig OR P Drywell or torus H₂ CANNOT be determined to be below 6% AND Drywell or torus O₂ CANNOT be determined to be below 5%</p>
EC/OSM JUDGMENT	<p>Any condition which in the EC/OSM's judgment indicates loss or potential loss of the fuel clad barrier due to Imminent barrier degradation OR Degraded fission barrier monitoring capability.</p> <p>L Loss OR P Potential Loss</p>	<p>Any condition which in the EC/OSM's judgment indicates loss or potential loss of the RCS barrier due to Imminent barrier degradation OR Degraded fission barrier monitoring capability.</p> <p>L Loss OR P Potential Loss</p>	<p>Any condition which in the EC/OSM's judgment indicates loss or potential loss of the primary containment barrier due to Imminent barrier degradation OR Degraded fission barrier monitoring capability.</p> <p>L Loss OR P Potential Loss</p>



IMMINENT - No turnaround in safety system performance is expected and escalation to General Emergency conditions is expected within 2 hours.

NOTE: Step 1; for all indicators, move from left to right across table, marking all applicable "L"s and "P"s for each barrier, based on plant indications. Then, step 2, transcribe all "L"s and "P"s marked on Barrier Table to the Logic Diagram (at right). "L"s and "P"s should be marked for each affected barrier (working top to bottom) on the flowchart. Step 3, an "L" or "P" marked for each associated barrier will constitute a Logic I input. When coincidence is met, then the EAL can be declared.

L = Loss (of a fission product barrier) - A severe challenge to a fission product barrier exists such that the barrier is considered incapable of performing its safety function.

P = Potential Loss (of a fission product barrier) - A challenge to a fission product barrier exists such that the barrier is considered degraded in its ability to perform its safety function.

EAL TABLE
SYSTEM MALFUNCTION

EVENT TYPE	UNUSUAL EVENT	ALERT	SITE AREA EMERGENCY	GENERAL EMERGENCY
LOSS OF POWER	<p>SU1 Loss of All Offsite Power to Essential Busses for Greater Than 15 Minutes</p> <p>Loss of Offsite Power Lasting More Than 15 Minutes</p> <p>Op. Modes: ALL</p>	<p>SA1 Loss of All Offsite Power and Loss of All Onsite AC Power to Essential Busses During Cold Conditions</p> <p>Loss of Offsite Power and Loss of All Onsite AC Power Lasting More Than 15 Minutes</p> <p>Op. Modes: Cold S/D, Refuel, Defueled</p>	<p>SS1 Loss of All Offsite Power and Loss of All Onsite AC Power to Essential Busses</p> <p>Loss of Voltage on Buses 1A3 and 1A4 lasting more than 15 minutes</p> <p>Op. Modes: Run, Startup, Hot S/D</p>	<p>SG1 Prolonged Loss of All Offsite Power and Prolonged Loss of All Onsite AC Power</p> <p>Loss of Voltage on Buses 1A3 and 1A4 and ANY of the following:</p> <ul style="list-style-type: none"> Restoration of power to either Bus 1A3 or 1A4 is NOT likely within 4 hours. RPV level Indeterminate RPV Level below +15 inches. <p>Op. Modes: Run, Startup, Hot S/D</p>
	<p>SU7 Unplanned Loss of Required DC Power During Cold Shutdown or Refuel Mode For Greater Than 15 Minutes</p> <p>Unplanned Loss of Div 1 and Div 2 125 VDC busses based on bus voltage less than 105 VDC Indicated AND Failure to restore power to at least one required 125 VDC bus within 15 minutes from time of loss</p> <p>Op. Modes: Cold S/D, Refuel</p>	<p>SA5 AC Power Capability to Essential Busses Reduced to a Single Power Source for Greater Than 15 Minutes Such That Any Additional Single Failure Would Result in Station Blackout</p> <p>Only one AC power source remains available to supply Bus 1A3 or Bus 1A4 AND if it is lost, a Station Blackout will occur.</p> <p>Op. Modes: Run, Startup, Hot S/D</p>	<p>SS3 Loss of All Vital DC Power</p> <p>Unplanned Loss of Div 1 and Div 2 125 VDC busses Lasting More Than 15 Minutes.</p> <p>Op. Modes: Run, Startup, Hot S/D</p>	
RPS FAILURE	None	<p>SA2 Failure of Reactor Protection System Instrumentation to Complete or Initiate an Automatic Reactor Scram Once a Reactor Protection System Setpoint Has Been Exceeded and Manual Scram Was Successful</p> <p>Auto Scram Failure AND Operator actions to reduce power are SUCCESSFUL as indicated by either ALL Rods Full-In, OR Reactor Shutdown Under All Conditions Without Boron, OR Reactor power below the APRM Downscale Alarm on ALL valid APRM Instruments</p> <p>Op. Modes: Run, Startup</p>	<p>SS2 Failure of Reactor Protection System Instrumentation to Complete or Initiate an Automatic Reactor Scram Once a Reactor Protection System Setpoint Has Been Exceeded and Manual Scram Was NOT Successful</p> <p>In ATWS EOP AND Reactor power above the APRM Downscale Alarm on ANY valid APRM Instrument, OR Boron Injection Initiation Temperature (BIIT) Curve (EOP Graph 6) exceeded.</p> <p>Op. Modes: Run, Startup</p>	<p>SG2 Failure of the Reactor Protection System to Complete an Automatic Scram and Manual Scram was NOT successful and There is Indication of an Extreme Challenge to the Ability to Cool the Core</p> <p>Entry into ATWS EOP- RPV Control is required AND RPV level cannot be maintained above -25 inches. OR HCL Curve (EOP Graph 4) exceeded</p> <p>Op. Modes: Run, Startup</p>
INABILITY TO MAINTAIN SHUTDOWN CONDITIONS	<p>SU2 Inability to Reach Required Shutdown Within Technical Specification Limits</p> <p>Plant NOT brought to required mode within applicable LCO Action Statement Time Limits</p> <p>Op. Modes: Run, Startup, Hot S/D</p>	<p>SA3 Inability to Maintain Plant in Cold Shutdown</p> <p>1. Loss of decay heat removal systems required to maintain cold shutdown AND 2. With CONTAINMENT CLOSURE not established, temperature conditions exist that either</p> <p>(a) Cause reactor coolant temperature to exceed the Technical Specification limit of 212°F. OR (b) Result in uncontrolled temperature rise approaching 212°F</p> <p>Op. Modes: Cold S/D, Refuel</p>	<p>SS4 Complete Loss of Function Needed to Achieve or Maintain Hot Shutdown</p> <p>EOP Graph 4 Heat Capacity Limit is exceeded OR Reactor CANNOT be brought subcritical</p> <p>Op. Modes: Run, Startup, Hot S/D</p>	See Fission Barrier Table
			<p>SS5 Loss of Water Level in the Reactor Vessel That Has or Will Uncover Fuel in the Reactor Vessel</p> <p>NO cooling method lined up or available AND RPV Level below 15 inches</p> <p>Op. Modes: Cold S/D, Refuel</p>	
INSTRUMENTATION / COMMUNICATION	<p>SU3 Unplanned Loss of All Safety System Annunciation or Indication in the Control Room for Greater Than 15 Minutes</p> <p>Unplanned loss of most annunciators on panels 1C03, 1C04 and 1C05 lasting more than 15 minutes AND compensatory non-alarming indications are available</p> <p>Op. Modes: Run, Startup, Hot S/D</p>	<p>SA4 Unplanned Loss of Most or All Safety System Annunciation or Indication in Control Room With Either (1) a Significant Transient in Progress, or (2) Compensatory Non-Alarming Indicators are Unavailable</p> <p>Unplanned loss of most annunciators on panels 1C03, 1C04 and 1C05 lasting more than 15 minutes and EITHER:</p> <ul style="list-style-type: none"> Significant transient in progress Loss of compensatory non-alarming indications <p>Op. Modes: Run, Startup, Hot S/D</p>	<p>SS6 Inability to Monitor a Significant Transient in Progress</p> <p>Significant transient in progress and BOTH of the following</p> <ul style="list-style-type: none"> Loss of annunciators on panels 1C03, 1C04 and 1C05 AND Loss of compensatory non-alarming indications <p>Op. Modes: Run, Startup, Hot S/D</p>	See Fission Barrier Table
	<p>SU6 Unplanned Loss of All Onsite or Offsite Communications Capabilities</p> <p>Loss of ALL onsite telephone and radio communication methods (PABX, direct-ring, UHF, and radiological survey radio systems). OR Loss of ALL electronic communication methods with government agencies (PABX, direct-ring, ENS, microwave and police radio)</p> <p>Op. Modes: ALL</p>			
COOLANT ACTIVITY	<p>SU4 Fuel Clad Degradation</p> <p>Valid Pretreat RM-4104 rad monitor reading above 4E+3 mR/hr OR Coolant activity above 1.2 µCi/ml DOSE EQUIVALENT I-131</p> <p>Op. Modes: Run, Startup, Hot S/D</p>	See Fission Barrier Table	See Fission Barrier Table	See Fission Barrier Table
COOLANT LEAKAGE	<p>SU5 RCS Leakage</p> <p>Unidentified or pressure boundary leakage greater than 10 GPM OR Identified leakage greater than 25 GPM OR Main steam line break as determined from annunciators or plant personnel report.</p> <p>Op. Modes: Run, Startup, Hot S/D</p>	See Fission Barrier Table	See Fission Barrier Table	See Fission Barrier Table