5.0 Program For Effective, Useable Procedures

The objective of this section is to outline the method by which PVNGS can accomplish the following goals:

(1) Effectively protect the health and safety of the public.

(2) Provide the PVNGS operations personnel with an effective, usable tool to accomplish the first goal.

To accomplish these goals, PVNGS has developed a program to ensure that accurate, usable procedures are in place for emergency situations. This program is outlined as follows:

(1) Classifications of events

(2) The basis for classification

(3) Development of EALs/EPIPs

  (a) Interface with EOPs

  (b) Interface with Safety Functions

  (c) Correlation of EOP/SF to classification criteria

  (d) Correlation of EALs to NUREG-0654

(4) Offsite interface

(5) System for developing and maintaining effective EPIPs

The following sections expand on the specifics of this program and delineate the thought process used in developing example EALs related to ROs and safety functions (Tables 5.1-1 through 5.2-4). As iterated in Sections 5.3.3 and 5.3.5, Table 5.3-1 evolved from the synthesis of data in Tables 5.1-1 through 5.2-4 and has been incorporated into an emergency classification procedure.

5

5.1 EMERGENCY CLASSIFICATION

The first step in any anticipated operational occurrence is emergency classification. Emergency Classification is divided into four categories as noted in "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants", NUREG-0654, FEMA-REP-1, Rev. 1, Appendix 1. Emergency Action Levels (EALs) based on indications available in the control room and correlated to the emergency classifications are provided to the operator. EALs are keyed to the safety functions used in Emergency Operating Procedure as well as the event specific Recovery Operating Procedures. This method provides an effective tool to accomplish the established goals.

The four emergency classifications including appropriate licensee and state/county governmental agency emergency response actions are described in the following sections:

5.1.1 NOTIFICATION OF UNUSUAL EVENT

This classification applies to unusual events which are in progress or have occurred that 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 occur.

In these situations, time is available to take precautionary and constructive steps to prevent a more serious event and/or to

mitigate any consequences that may occur. This event status places the plant in a readiness position for augmentation of onshift resources and/or possible cessation of routine activities. Appropriate notification to NRC, state and county authorities is made.

5.1.2 ALERT

This classification consists of events which are in progress or have occurred that 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 Protective Action Guideline exposure levels.

Declaration of an ALERT will trigger prompt initial and followup notification to offsite authorities. If applicable, updated meteorological information, measurement of any radiation release by surveys, and projected radiological effects on offsite areas shall be provided to county and state authorities. State and county emergency centers shall be activated and a forward control element shall be dispatched for offsite monitoring by ARRA. The emergency response for an ALERT includes full activation of PVNGS onsite and offsite emergency centers. Assembly and accountability of personnel within the protected area is mandatory for any emergency classified as an ALERT or higher. The ALERT status is maintained until the event is declared terminated, downgraded or escalated to a higher emergency classification as warranted by plant parameters. 15

5.1.3 SITE AREA EMERGENCY

a SITE AREA EMERGENCY consists of events which are in progress or have occurred that involve actual or likely major failures of plant functions needed for protection of the public. Any releases are not expected to exceed EPA Protective Action Guideline (PAG) exposure levels except near the site boundary. Consideration of appropriate protective actions, based on actual or projected data, is warranted. Onsite and offsite emergency centers are activated. Assembly and accountability of personnel onsite are mandatory for a SITE AREA EMERGENCY.

Onsite evacuation is initiated if indicated to be necessary by actual or projected doses. APS Field Monitoring Teams are deployed by direction from the Satellite Technical Support Center (STSC) or the Technical Support Center (TSC) to ascertain actual dose rates both onsite and offsite.

The station provides prompt initial notification and status updates to offsite authorities, including meteorological information, projected doses, and relevant dose rate measurements offsite. The State of Arizona Radiation Regulatory Agency (Radiological Technical Directorate) dispatches monitoring teams to assess offsite consequences. If projected doses approach those noted in the EPA PAGs, state/county authorities shall institute appropriate actions for public protection. A decision on termination, escalation, or reduction in the SITE AREA EMERGENCY classification based on plant parameters shall be

communicated to governmental authorities. This communication shall include recommendations as to maintenance of, or changes in, protective actions.

5.1.4 GENERAL EMERGENCY

A GENERAL EMERGENCY consists of events which are in progress or have occurred that involve actual or imminent substantial core degradation or melting with potential for loss of containment integrity. Releases can be reasonably expected to exceed EPA Protective Action Guideline exposure levels offsite for more than the immediate site area. There is prompt notification of NRC and appropriate state and county authorities of the GENERAL EMERGENCY status.

During a GENERAL EMERGENCY, resources and personnel are augmented by the activation of emergency centers. APS Field Monitoring Teams are dispatched on direction from the STSC or TSC to verify projected dose rates both onsite and offsite. The station shall provide plant status updates. These updates will include data on radioactive releases, meteorological information, offsite radiological dose projections and measurements, and protective action recommendations including affected downwind sectors to offsite authorities. A decision on termination or reduction of the GENERAL EMERGENCY class shall be communicated to governmental authorities based on a thorough review of the emergency situation. Discussions with governmental authorities shall include recommendations as to maintenance of, or changes in, protective actions.

5.2 BASIS FOR PVNGS EMERGENCY CLASSIFICATION CRITERIA

The second step of the development process is defining the basis for classification. Classification for a NOTIFICATION OF UNUSUAL EVENT through a GENERAL EMERGENCY is based on the status of the three main barriers: fuel cladding, primary coolant system boundary, and containment with consideration also given to radiation doses resulting from any offsite releases. Determining the emergency classification becomes a function of a system based on the failure of, or challenge to the fission product barriers. Defining the status of these barriers defines the criteria for classification. 15

For non-reactor trip events the initial classification is based on such circumstances as (1) noncompliance with a Technical Specification such that the requirement of the LCO and/ or associated action requirements are not met within the specified time intervals or (2) external physical conditions which have the potential to damage or disable systems or structures required to maintain the three fission product barriers. These situations will be upgraded based on the safety systems impacted and the severity of impact per the Shift Supervisor's discretion. 15

5.2.1 FAILURE

"Failure" of barriers is defined in terms consistent with NUREG-0654, Appendix 1, "Example Initiating Conditions". Some examples of boundary failure are as follows: primary

coolant leak of 50 gpm constitutes "failure" of the primary coolant boundary (based on charging pump capacity for 2 pumps minus minimum letdown); 300 uCi/cc dose equivalent I-131 constitutes "failure" of the clad (based on release of 1% equilibrium gas gap equivalent I-131); loss of containment integrity as defined in Technical Specifications Section 1.7.

5.2.2 CHALLENGE

"Challenge" to a barrier is defined as one of the following conditions:

(1) Loss of a critical safety function which protects that barrier.

(2) An existing situation which will cause a barrier failure unless successful corrective actions are implemented.

(3) An initiating event which in all probability has damaged a fission product barrier but has yet to be verified.

5.2.3 CLASSIFICATION BY BARRIERS

The fission product barrier status correlated to event classification criteria in increasing order of severity provides the bases for implementing guidance provided to the operators. This correlation is as follows:

5.2.3.1 NOTIFICATION OF UNUSUAL EVENT

1. No loss of, and no challenge to, a fission product barrier. (Ref. Sect. 5.1.1)

5.2.3.2 ALERT

1. One barrier challenged; or
2. One barrier verified as failed.

5.2.3.3 SITE AREA EMERGENCY

1. Two barriers challenged; or
2. One barrier verified as failed and one barrier challenged; or
3. Two barriers verified as failed

5.2.3.4 GENERAL EMERGENCY

1. Three barriers challenged; or
2. One barrier verified as failed and remaining two barriers challenged; or
3. Two barriers verified as failed and the other barrier challenged; or
4. Three barriers verified as failed

5.2.3.5 BOUNDARY STATUS

The final loop in classification based on boundary status is the potential impact of plant systems and response on the various boundaries.

The integrity of the fission product barriers directly relates to maintaining the following corresponding Safety Functions within Technical Specification limits.

Fission Product Barrier	Related Safety Functions
Fuel Cladding	Reactivity Control RCS Heat Removal
Primary Coolant Boundary	RCS Inventory and Pressure Control
Containment	Containment Integrity

5.2.4 USE OF BOUNDARY STATUS

Using clearly defined boundary status applied to classification criteria allows the development of EALs which are independent of event sequences and can be directly correlated with PVNGS symptom/function based Emergency Operating Procedure (EOP). The correlation of classification criteria boundary status and PVNGS EOP is provided in Section 5.3. Using this method to classify events provides a direct means to quickly and accurately access the event and take the appropriate actions to protect the health and safety of the public.

5.2.5 UPGRADING OF EVENTS

Events are upgraded based on boundary status - i.e., the number of boundaries failed or challenged and projected offsite dose rates.

5.2.6 DOWNGRADING OF EVENTS

Downgrading of events is based on plant status with all safety functions satisfied and verification of boundary status.

5.2.7 TERMINATING EVENTS

An event is considered terminated at the discretion of the Emergency Coordinator taking into account the following:

A) The event has been downgraded and the anticipated plant response is such that there should be no challenge to any fission product barriers or radiation releases in excess of Technical Specifications.

B) Present plant conditions are such that there is no possibility of an adverse impact on the health and safety of the general public or plant personnel.

5.3 EMERGENCY PLAN IMPLEMENTING PROCEDURE DEVELOPMENT FOR CLASSIFICATION, NOTIFICATION AND IMPLEMENTING ACTIONS

To develop effective procedures for Emergency Classification, the overall EOP philosophy for dealing with an emergency situation must be understood. This prevents conflicting procedure guidance.

5.3.1 EMERGENCY OPERATING PROCEDURE

The Emergency Operating Procedure, designed to mitigate the consequences of a design basis event, has been developed by PVNGS based on CEN-152, CE Emergency Procedure Guidelines, Rev. 02, April 1984. The objective of this procedure is to maintain safety functions while taking the specific actions required to mitigate the consequences of the initiating event. 15

PVNGS EOP and the correlation to CEN-152 is addressed in the Plant Specific Emergency Procedure Technical Guidelines. This was submitted to the NRC as part of the EOP procedure generation package. An overview of the correlation is provided for reference.

PVNGS Recovery Operations (RO) Procedures compared to Guidelines supplied by CE CEN-152:

	PVNGS Procedures	CEN-152 Differences
1.	Reactor Trip - This procedure describes the actions required when an uncomplicated reactor trip occurs, to prepare for a normal shutdown or restart.	No difference.
2.	Excessive Steam Demand - This procedure describes the actions required to stabilize the RCS and maintain RCS heat removal following an excessive steam demand occurrence or a feed water control failure resulting in a MSIS on high SG level. An excessive steam demand could be a steam line break downsteam of the MSIVs, a failure of a Main Steam Control Valve, inadvertent opening of an Atmospheric Dump Valve, or failure of the Steam Bypass Control System.	The CEN-152 Steam Line Break Guideline has been separated into two PVNGS Documents; one for an Excessive Steam Demand and one for a Loss of Secondary Coolant since the operator's actions are significantly different for the two. The differences are addressed in the Plant Specific Emergency Procedure Technical Guidelines.
3.	Loss of Secondary Coolant - This procedure describes the actions required to stabilize the RCS and maintain heat removal following a break in the main steam line upstream of the MSIV, a break of the SG vessel, or a break of the feedwater lines downstream of the FW check valves.	See Excessive Steam Demand.

PVNGS Procedures	CEN-152 Differences
4. Loss of RCS Flow - This procedure describes actions necessary to recover the plant following a total loss of RCS flow. Emphasis will be placed on ensuring that adequate natural circulation is present.	No difference.
5. Loss of Feedwater - This procedure describes the actions to be taken for a total loss of normal feedwater. A loss of feedwater is defined as system failure upstream of the feedwater check valves or failure of the feed control system resulting in low SG level.	No difference.
6. SG Tube Rupture - This procedure describes the actions to be taken to prevent a radioactivity release to the environment and to maintain adequate core cooling for a SG tube leak of sufficient magnitude that it causes a SIAS.	No difference.
7. LOCA - This procedure describes the actions to be taken to minimize core damage and radioactivity releases during a LOCA which raises containment pressure above CIAS setpoint.	The CEN-152 LOCA Guideline has been broken down into two PVNGS documents one for a small LOCA and one for a large LOCA since the operation actions are significantly different for the two. The differences are addressed in the Plant Specific Emergency Procedure Technical Guidelines.
8. Small LOCA - This procedure describes the actions to be taken to minimize core damage and radioactivity releases during a LOCA which does not raise containment pressure above the CIAS setpoint.	Same as for LOCA.

	PVNGS Procedure	CEN-152 Differences
9.	Blackout - This procedure describes the actions to be taken to maintain core cooling and restore the plant to a normal operating mode following a loss of offsite power, a failure of both Emergency Diesel Generators and a Turbine Trip.	CEN-152 does not address a Blackout. Consideration of a Blackout is required by SER 11/81 Task A-44 Pg. C11.
10.	Functional Recovery Procedure - The Functional Recovery Procedure will be entered if one of the following exists: a) The diagnostic is unclear b) Multiple events occur and the CR staff can not mitigate the problems c) A recovery operation does not sufficiently handle the situation.	No difference.

The PVNGS RO procedures meet the overall guidance of CEN-152 and any changes in the RO procedures were made to enhance the effectiveness of the Control Room staff.

5.3.2 Safety Functions

As previously stated the overall philosophy for accident mitigation is maintaining safety functions. Safety Functions and their basis are outlined in CEN-152. The PVNGS approach to safety functions is consistant with CEN-152 with the exception that certain safety functions have been combined to enhance operator response. Safety functions are not addressed by name in the ROs. The criteria for ensuring proper safety function response is provided for the operators and maintained by procedural design. The procedure that addresses safety functions on an individual basis is the Functional Recovery

Procedure. Provided below for clarification is an overview of safety functions compared to CEN-152 and safety functions compared to EOPs (ROs).

5.3.2.1 PVNGS Safety Functions compared to CEN-152

Safety Functions	CEN-152 Differences
1) REACTIVITY CONTROL - This safety function ensures that the reactor is shutdown with sufficient shutdown margin.	1) No difference.
2) RCS INVENTORY AND PRESSURE CONTROL - This safety function ensures that a sufficient quantity of water, at a pressure above saturation surrounds the core. This sets the conditions to maintain adequate core cooling.	2) CEN-152 breaks this into two safety functions, RCS inventory and RCS pressure control. All criteria outlined in CEN-152 are met by the PVNGS Emergency Procedure. However, PVNGS has chosen to combine these safety functions into one safety function because the instrumentation in the Control Room cannot separate the two functions.
3) HEAT REMOVAL - This safety function ensures that heat is removed from the core to one of several final heat sinks.	3) CEN-152 addresses this as two safety functions, core heat removal and RCS heat removal. All the criteria outlined in CEN-152 for both functions are addressed in the PVNGS Emergency Procedure. Guidance provided by CEN-152 determines SG level, RCS Tavg and SG pressure as indications of Core Heat Removal. For ease of operator response and due to the logic of heat

Safety Functions	CEN-152 Differences
	transfer, SG level, RCS Tc, SG pressure subcooling, and core differential temperature are addressed as indications of the single PVNGS Safety Function, RCS Heat Removal. By combining the two safety functions operators are able to better evaluate the entire heat removal process as an integrated plant operation.
4) CONTAINMENT INTECRITY - This safety function ensure that the containment is maintained with internal conditions which do not threaten the structure's ability to prevent release of radioactivity.	4) CEN-152 identifies Containment Isolation, Containment Temperature and Pressure Control, and Combustable Gas Control as separate functions. For ease of operator response these safety functions have been combined into one identified as containment integrity. The emphasis is maintaining the containment structurally as a boundary for containing radioactivity. By addressing these parameters collectively, the operator is better equipped to assess containment response without overfocusing on one parameter. All criteria and immediate actions as defined in CEN-152 are performed in the Emergency Procedure. Items such as Hydrogen buildup are addressed when it is appropriate to do so, as a recovery action, later in the procedure.

Safety Functions	CEN-152 Differences
5) INDIRECT RADIOACTIVE RELEASE - This safety function ensures that radioactive material is not present outside controlled areas in order to eliminate risk to the safety of the public.	5) No difference.
6) VITAL AUXILIARIES - This safety function ensures that equipment necessary to support safe shutdown and the other five safety functions is operating as required.	6) No difference.

5.3.2.2 PVNGS Procedures Compared to Safety Functions

PVNGS Procedures	Safety Functions
1) Reactor Trip	1) Uncomplicated reactor trip compromises no safety function; however, in an Anticipated Transient Without a Scram (ATWS) situation several safety functions could be compromised.
2) Excessive Steam Demand	2) If isolated, this situation does not compromise a safety function; otherwise this situation could compromise RCS heat removal, RCS inventory and pressure control and, if the situation worsened, other safety functions could be impacted.
3) Loss of Secondary Coolant	3) This situation could compromise RCS inventory and pressure control and RCS heat removal and, if the situation worsened, other safety functions could be impacted.

PVNGS Procedures	Safety Functions
4) Loss of RCS Flow	4) This situation could compromise RCS inventory and pressure control and, if the situation worsened, RCS heat removal and other safety functions could be impacted.
5) Loss of Feedwater	5) This situation could compromise RCS heat removal and, if the situation worsened, pressure and inventory control as well as other safety functions could be impacted.
6) SG Tube Rupture	6) This situation compromises RCS pressure and inventory control and, if situation worsened, RCS heat removal as well as other safety functions could be impacted.
7) LOCA	7) This situation compromises RCS pressure and inventory control and could compromise containment integrity, indirect radioactivity release, and RCS heat removal.
8) Small LOCA	8) This situation compromises RCS pressure and inventory control and could compromise indirect radioactivity release and RCS heat removal.
9) Blackout	9) This situation could compromise all safety functions due to loss of vital auxiliaries. The extent of compromise becomes a function of time to restore one train of vital auxiliaries.

PVNGS Procedures	Safety Functions
10) Non Reactor Trip Events. These conditions are evaluated in five event categories . eg: a) Plant conditions exist which indicate a challenge/failure of a barrier but do not require a reactor trip.	10) Classification is based on the level of barrier/ safety function degradation. a) An Abnormal Operating Procedure is in use related to degraded fission product barrier such as: Excessive RCS Leak Rate OR SG Tube Leak.
b) A physical external condition exists that has the potential to damage or disable systems or structures required to maintain the three fission product barriers.	b) Security Threat, Fire, Natural Phenomena, etc. onsite (classification upgraded when situation impacts on a safety function).
c) Noncompliance with a technical specification, such that the requirement of the LCO and/or associated action requirements are not met within the specified time intervals or reliance on Technical Specification 3.0.3	c) LCO 3/4.5.2 1) One HPSI pump inoperable > 72 hrs and 2) Plant not in HOT STAND BY within next 6 hrs OR HOT SHUTDOWN within following 6 hrs. 3) No HPSI operable.
d) A situation exists during which contamination has been or will be transported from the site.	d) Transportation of a contaminated individual to an offsite medical facility.
e) Inadvertent radioactive release.	e) Anything that directly impacts integrity of this safety function; level of severity will be determined by magnitude of release.

5.3.3 EAL TABLE GUIDELINES

The following tables provide the framework for the guidance which will be provided to the operator in the Emergency Classification Implementing Procedure.

Tables 5.1-0 provide indications of barrier challenge or failure.

Tables 5.1-1 thru 5.1-4 correlate the Recovery Procedures to classification criteria and initiating conditions and provide license action guidance. Examples of typical barrier failure/challenges are listed with each specific event for upgrading the EAL.

Tables 5.2-1 thru 5.2-4 correlate safety functions to EALs and provide APS actions and state/county action guidance.

5.3.4 PVNGS EAL Tables Compared to NUREG-0654

To ensure the technical accuracy of tables 5.1-1 thru 5.2-4, which are to be used as a basis for implementing guidance, the following correlation to NUREG-0654 has been made.

5.3.4 NUREG-0654 Criteria		Tables 5.1-1 thru 5.2-4
NUE	#1	5.2-1, 2A & 3A
	#2	5.2-1, 5
	#3a	N/A
	#3b	5.2-1, 2C
	#3c	5.2-1, 2C
	#4	5.2-1, 2B, 3B & 3D
	#5	This is a boundary loss; therefore, by definition, this is an Alert; 5.1-2, 6
	#6	5.1-1, 5 & 5.2-1, 3C
	#7	5.2-1, 6
	#8	5.2-1, 4A
	#9	5 2-1, 6
	#10	5.1-1, 6A
	#11	5.1-1, 6E
	#12	5.1-1, 6B
	#13 (a-d)	5.1-1, 6D
	#14 (a-d)	5.1-1, 6D
	#14e	System design allows for loss of the turbine. Classification would be dependent on subsequent failures.
	#15	This will be ascertained by doing the safety function & diagnostic flow charts & determined by the Shift Supervisor
	#16	5.1-1, 6C
	#17	5.1-1, 2, 3 & 5

5.3.4 NUREG-0654 Criteria		Tables 5.1-1 thru 5.2-4
Alert	#1a	N/A
	#1b	5.2-2, 2D5
	#1c	5.2-2, 2D4
	#2	5.1-2, 8
	#3	5.1-2, 8
	#4	5.1-2, 5; verification criteria for S/G tube leak is given in the appropriate RO
	#5	5.1-2, 6 & 7
	#6	5.2-2, 5
	#7	5.1-2, 9 & 5.2-2, 6
	#8	5.2-2, 6
	#9	5.1-2, 4 & 5.2-2, 2
	#10	5.2-2, 2 & 5.2-2, 6
	#11	5.2-2, 1 & 5.1-2, 1-2B, 2-2B, 3-2C, 4-2B, 5-2D
	#12	5.2-2, 5
	#13	5.1-1, 6A & appropriate sections of 5.2-2
	#14	5.1-1, 6E & appropriate sections of 5.2-2
	#15	5.2-2, 5
	#16	5.1-1, 6B & appropriate sections of 5.2-2
	#17 (a-d)	5.1-1, 6D & appropriate sections of 5.2-2

5.3.4 NUREG-0654 Criteria		Tables 5.1-1 thru 5.2-4
Alert	#18 (a-e)	5.1-1, 6D & appropriate sections of 5.2-2
	#19	This will be ascertained by doing the safety function & diagnostic flow charts & determined by the Shift Supervisor.
	#20	5.1-2, 1-1 & 1-2C - ie Rx trip would be initiated prior to Control Room evacuation to the remote shutdown panel.

5.3.4 NUREG-0654 Criteria		Tables 5.1-1 thru 5.2-4
SAE	#1	5.1-2, 6 & 7 - failure of one boundary is an Alert; upgrade would depend on subsequent failure or release.
	#2	5.2-3, 2C
	#3	5.1-3, 8;
	#4	N/A
	#5	5.1-3, 5 & 8
	#6	5.1-3, 9; 5.2-3, 6
	#7	5.2-3, 6
	#8	5.2-3, 6
	#9	5.2-3, 1
	#10	5.2-3, 5
	#11	5.1-1, 6A & appropriate sections of 5.2-3 & 5.2-4
	#12	5.1-1, 6E & appropriate sections of 5.2-3 & 5.2-4
	#13	5.2-3, 5
	#14	5.1-1, 6E & appropriate sections of 5.2-3 & 5.2-4
	#15 (a-c)	5.1-1, 6D & appropriate sections of 5.2-3
	#16 (a-c)	5.1-1, 6D & appropriate sections of 5.2-3
	#17	This will be ascertained by doing the safety function & diagnostic flow charts & determined by the Shift Supervisor
	#18	5.1-2, 1-1 & 1-2C - ie Rx trip would be initiated prior to Control Room evacuation to the remote shut-down panel.

5.3.4 NUREG-0654 Criteria		Tables 5.1-1 rhru 5.2-4
GE	#1 (a & b)	5.2-4, 5
	#2	5.1-4, 5 thru 8; 5.2-4, 2C & 4A-C
	#3	5.1-1, 6B & appropriate sections of 5.2-4 - upgrade is based on a direct progression as indicated in the appropriate tables.
	#4	5.1-4, 5 thru 8; 5.2-4, 2C, 4A-C & 6
	#5a	5.1-4, 6 & 7; 5.2-4, 3 & 6
	#5b	5.2-4, 6
	#5c	ATWS is classified as an Alert & if not addressed quickly could result in the Functional Recovery Procedure being implemented
	#5d	5.1-4, 9
	#5e	5.1-4, 6 & 7
	#6	N/A
	#7	5.1-1, A, B, & D & appropriate sections of 5.2-4 - upgrade is based on safety function status.

5.3.5 Implementing Guidance and Operator Interface

Tables 5.1-1 thru 5.2-4 provide the basis for, and can be directly correlated to, Table 5.3-1 which has been developed using CEN-152 guidance. Based on this guidance, applicable indicators for a given RO/Safety Function have been developed to establish a challenge and/or failure of a given barrier. Table 5.3-1 will be incorporated into an emergency classification procedure.

The differences between the aforementioned tables are the following

(1) Table 5.3-1 provides the operator with explicity defined parameters that are indicative of a challenge/failure of the RCS vs containment vs clad vs vital auxiliaries/radioactivity release.

(2) Table 5.3-1 does not reiterate the verification parameters of a given RO procedure because they are analyzed and verified in accordance with that procedure prior to using the EAL tables. This table provides for complete assessment of fission product boundaries for all RO/SF procedures.

(3) If, per the diagnostic, the operator implements a given RO procedure, but during classification finds that the initiating conditions are not consistant

with that event as substantiated by additional guidance that delineates which parameters should not be challenged for a given RO, he then repeats the diagnostic evaluation and upgrades/downgrades the emergency classification as necessary - ie, classification is based on the diagnostic performed using the EOPs and boundary status verification performed using the EPIPs.

Table 5.3-1 has been developed from the previous tables to more clearly define barrier challenge/failure and thus expedite analysis and classification while effectively interfacing with the EOPs and other control room activities.

5.4 Offsite Accident Assessment

The PVNGS has the responsibility to perform a preliminary assessment of the offsite consequences of an incident. Upon event classification, an assessment, including a determination of the radiation exposure rate by analytical methods, use of field surveys, and estimation of projected integrated dose for different downwind sectors and distances, will be performed. Based upon the results of these assessments, notification to state/county authorities of the appropriate emergency classification and any recommended protective actions are made. These actions are directed as a function of interface guidance provided in appropriate EPIPs.

Activation of the State Emergency Operations Center (EOC) ensures proper interface between PVNGS/APS and state officials. The Arizona Radiation Regulatory Agency (ARRA)/ Radiological Technical Directorate assumes primary responsibility for confirmatory and continued offsite radiological assessment. This is accomplished by dispatching state/ county Field Monitoring Teams and by analysis of data provided by APS Field Monitoring teams. APS shall deploy Field Monitoring Teams offsite at least until ARRA has mobilized its Radiological Emergency Assistance Team (REAT). Approximately three (3) hours is estimated for REAT deployment. Long-term offsite assessments (ingestion pathway EPZ) are the responsibility of ARRA.

5.5 Program for Developing and Maintaining High Quality Emergency Planning Implementing Procedures

The accidents which might occur at the Palo Verde Nuclear Generating Station have been analyzed in Chapter 15 of the PVNGS FSAR in terms of severity of consequence. These accidents reflect the design characteristics of a Pressurized Water Reactor (PWR) and are addressed by PVNGS EOPs and EPIPs.

Development of effective Emergency Plan Implementing Procedures that interface with the EOPs has been an ongoing concern at PVNGS. Efforts to ensure the adequacy of the EPIPs and proper

interface with the EOPs has been a function of coordinated activities between Emergency Planning and Operations personnel. This has served to ensure prompt, accurate classification while preventing the operators from performing redundant action for diagnosing or directing mitigating actions during an accident situation.

The technical accuracy of the Emergency Plan Implementing Procedures will be verified as a function of an Administrative Control procedure. This verification will ensure the procedure being reviewed complies with the Emergency Plan, satisfies the requirements of NUREG-0654 and satisfies the requirements of any developmental reference or license commitments.

To ensure the utility and effectiveness of the classification procedure and the classified Event Implementing Action Procedures, a validation process will be performed. Validation will serve to verify the effectiveness of the procedure to properly classify a given event as well as implement the appropriate notification and license actions. This will also serve as a pretest of the adequacy of these procedures prior to the full system test by a site drill. The verification/validation process also provides a method to ensure that the implementing procedure is upgraded as regulations change.

Complete testing of the EPIPs and the Emergency Plan is done via drills as outlined in section 8.0.

TABLE 5.1-0

Indications of Barrier Challenge/Failure

RCS	CLAD	CONTAINMENT	VITAL AUXILIARIES/RADIATION RELEASE
(1) RVLMS < 50% (voiding upper plenum)	(1) ATWS	(1) CIAS required but not completed	(1) Loss of offsite and onsite AC power
(2) RCS pressure > 2750 psia	(2) Excessive RCS radioactivity (> 300 uCi/gm dose equivalent I-131)	(2) H2 concentration > 3.5% by volume	(2) Loss of offsite and onsite AC power for longer than 15 minutes.
(3) RCS pressure controlling on PZR safeties	(3) CET > 700° F	(3) Containment pressure > 50 psig	(3) Failure of safety systems (both trains) to actuate when required.
(4) Uncontrolled loss of inventory > 50 gpm		(4) Physical breach of containment	(4) > 10 gpm primary/secondary leakage concurrent with LOP or, > 10 gpm primary/secondary leakage concurrent with loss of secondary coolant outside containment
			(5) Violation of Tech Spec LCO or reliance on Tech Spec Section 3.0.3 for any of the following essential systems: ECCS, CNTMT Spray, Ultimate Heat Sink, SP, CST/RMWT, RWT, EC, ESS. CR HVAC, ADV, Aux Feedwater Operability (i.e., electrical power, instrumentation controls and other auxiliary equipment) shall be maintained on the above systems.

TABLE 5.1-1

Example Emergency Action Levels (EALs) & Corresponding Actions 15

NOTIFICATION OF UNUSUAL EVENT

(Sheet 1 of 6)

Palo Verde Nuclear Generating Station

Recovery Procedure Implemented	Classification Criteria	Initiating Conditions	* Licensee Action Guidance
1. Reactor Trip (uncomplicated Rx trip does not challenge a barrier and does not require activation of the E Plan; however, notification to NRC is required per 10CFR 50.72)	o No loss of AND no challenge to a fission product barrier.	1.) Rx trip verified A) Rx power decreasing B) Rx trip phase current indicates off	o Inform NRC, State and County authorities of nature of unusual conditions; no release of radioactive material requiring offsite response or monitoring is expected unless further degradation of safety systems occur. 5 o Based on the situation, recommend that no protective action is necessary or to standby for update. o Augment onshift resources o Activate STSC at the discretion of the shift supervisor. o Partially activate CHIC o Terminate with verbal summary to offsite authorities followed by written report within 24 hours. OR o Escalate to a higher classification.

* Protective action recommendations are based on plant and containment conditions and these recommendations are made to offsite officials even when no release is in progress.

TABLE 5.1-1

Example Emergency Action Levels (EALs) & Corresponding Actions 15

NOTIFICATION OF UNUSUAL EVENT

(Sheet 2 of 6)

Palo Verde Nuclear Generating Station

Recovery Procedure Implemented		Classification Criteria	Initiating Conditions
2. Excessive Steam Demand	o	No loss of AND no challenge to a fission product barrier.	1.) Excessive steam demand verified A) S/G press low prior to MSIS B) PZR level low C) PZR press low D) SIAS E) MSIS

* Protective action recommendations are based on plant and containment conditions and these recommendations are made to offsite officials even when no release is in progress.

TABLE 5.1-1

Example Emergency Action Levels (EALs) & Corresponding Actions 15

NOTIFICATION OF UNUSUAL EVENT

(Sheet 3 of 6)

Palo Verde Nuclear Generating Station

Recovery Procedure Implemented	Classification Criteria	Initiating Conditions
3. Loss of Feedwater	o No loss of AND no challenge to a fission product barrier	1.) Loss of feedwater verified A) Feed flow abnormal B) Rx trip on low S/G level or high PZR press C) S/G level abnormal

* Protective action recommendations are based on plant and containment conditions and these recommendations are made to offsite officials even when no release is in progress.

TABLE 5.1-1

Example Emergency Action Levels (EALs) & Corresponding Actions 15

NOTIFICATION OF UNUSUAL EVENT

(Sheet 4 of 6)

Palo Verde Nuclear Generating Station

Recovery Procedure Implemented	Classification Criteria	Initiating Conditions
4. Loss of Forced Flow	o No loss of AND no challenge to a fission product barrier	1.) Loss of RCS flow verified A) Core ΔP <10 psid B) RCP Δ P <10 psid C) S/G Δ P <10 psid

* Protective action recommendations are based on plant and containment conditions and these recommendations are made to offsite officials even when no release is in progress.

TABLE 5.1-1

Example Emergency Action Levels (EALs) & Corresponding Actions /5

NOTIFICATION OF UNUSUAL EVENT

Palo Verde Nuclear Generating Station

Recovery Procedure Implemented	Classification Criteria	Initiating Conditions
5. Loss of Secondary Coolant	o No loss of AND no challenge to a fission product barrier	1.) Loss of secondary coolant verified A) Pressure in at least one S/G decreasing B) RCS pressure decreasing

* Protective action recommendations are based on plant and containment conditions and these recommendations are made to offsite officials even when no release is in progress.

TABLE 5.1-1

Example Emergency Action Levels (EALs) & Corresponding Actions

NOTIFICATION OF UNUSUAL EVENT

(Sheet 6 of 6)

Palo Verde Nuclear Generating Station

6. Non-Reactor Trip Events	Classification Criteria	**Initiating Conditions
A. Fire	o No loss of AND no challenge to a fission product barrier	1.) (a) Observation of fire lasting more than 10 min. OR (b) Fire detection device alarm with confirming observation (indicating a fire lasting more than 10 minutes)
B. Security Threat		2.) In-plant attempted unauthorized entry or attempted sabotage - ie an event requiring declaration of a security emergency as defined in PVNGS Security Plan
C. Transportation of an overexposed and/or contaminated injured individual from the site to a hospital		3.) Transportation of an overexposed and/or contaminated injured individual from the site to a hospital
D. Natural phenomena and other hazards (ie: earthquake, tornado, aircraft crash, toxic or flammable gas release, etc.) on site		4.) Natural phenomena and other hazards (ie: earthquake, tornado, aircraft crash, toxic or flammable gas release, etc.) on site with the potential to impact a safety function.
E. Degraded information assessment of communication systems		5.) Substantially reduced performance or reliability on following systems: Plant Annunciator, Plant Computer, Safety Parameter Display System or Meteorological Instrumentation.
F. Non-conformance with Tech Spec LCOs		6.) Plant conditions outside LCO's requiring plant shutdown

* Protective action recommendations are based on plant and containment conditions and these recommendations are made to offsite officials even when no release is in progress.

** If upgrading of these events is necessary, the event will be reclassified based on Table 5.3-1 and the Shift Supervisor's opinion.

TABLE 5.1-2

Example Emergency Action Levels (EALs) & Corresponding Actions

ALERT

Palo Verde Nuclear Generating Station

Recovery Procedure Implemented	Classification Criteria	Initiating Conditions	* Licensee Action Guidance
1. Reactor Trip	o One fission product barrier challenged OR lost	1.) Rx Trip verified A) Rx power decreasing B) Rx trip phase current indicators off AND 2.) A) Gap activity in primary coolant verified by chemistry OR B) Failure of RPS to initiate and complete a scram placing the reactor in a sub-critical condition; manual scram successful (ATWS). OR C) Degraded system performance which could result in loss of a critical safety function or barrier failure within a given time period unless succesful corrective actions are implemented. OR D) Radioactivity release in excess of Technical Specification limits.	o Inform NRC, State and County authorities of Alert status/cause; any releases are expected to be limited to small fractions of EPA/PAG exposure levels at the site boundary unless further degradation of safety systems occur o Recommend to the State that the Public be appraised of the situation and stay tuned to EBS/KTAR radio station o Augment resources by activating STSC, TSC, OSC, EOF, JENC, CHIC and CEC. o Dispatch (onsite/offsite) Field Monitoring Teams with associated communications equpment o Provide meteorological assessments to offsite authorities; and if releases are occurring, dose estimates for actual releases o Terminate by verbal summary to offsite authorities followed by written summary within 8 hours OR o Escalate to a higher classification

* Protective action recommendations are based on plant and containment conditions and these recommendations are made to offsite officials even when no release is in progress.

TABLE 5.1-2

Example Emergency Action Levels (EALs) & Corresponding Actions

ALERT

(Sheet 2 of 9)

Palo Verde Nuclear Generating Station

Recovery Procedure Implemented	Classification Criteria	Initiating Conditions
2. Excessive Steam Demand	o One fission product barrier challenged OR lost.	1.) Excessive steam demand verified A) S/G press low prior to MSIS B) PZR level low C) PZR press low D) SIAS E) MSIS AND 2.) A) Cap activity in primary coolant verified by chemistry OR B) AIWS OR C) Degraded system performance which could result in loss of critical safety function or barrier failure within a given time period unless successful corrective actions are implemented. OR D) Radioactivity release in excess of Technical Specification limits.

* Protective action recommendations are based on plant and containment conditions and these recommendations are made to offsite officials even when no release is in progress.

TABLE 5.1-2

Example Emergency Action Levels (EALs) & Corresponding Actions 15

ALERT

(Sheet 3 of 9)

Palo Verde Nuclear Generating Station

Recovery Procedure Implemented	Classification Criteria	Initiating Conditions
3. Loss of Feedwater	o One fission product barrier challenged OR lost	1.) Loss of feedwater verified A) Feed flow abnormal B) Rx trip on low S/G level or high PZR press C) S/G level decreasing AND 2.) A) RCS pressure controlling on PZR safeties OR B) Gap activity in primary coolant verified by Chemistry OR C) ATWS OR D) RCS Pressure > 2750 psia OR E) Degraded system performance which could result in loss of critical safety function or barrier failure within a given time period unless successful corrective actions are implemented. OR F) Radioactivity release in excess of Technical Specification limits.

* Protective action recommendations are based on plant and containment conditions and these recommendations are made to offsite officials even when no release is in progress.

TABLE 5.1-2

Example Emergency Action Levels (EALs) & Corresponding Actions /

ALERT

Palo Verde Nuclear Generating Station

Recovery Procedure Implemented	Classification Criteria	Initiating Conditions
4. Loss of Forced Flow	o One fission product barrier challenged OR lost	1.) Loss of RCS flow verified A) Core ΔP <10 psid B) RCP ΔP <10 psid C) S/G ΔP <10 psid AND 2.) A) Gap activity in primary coolant verified by chemistry OR B) ATWS OR C) Degraded systems performance which could result in loss of a critical safety function or barrier failure within a given time period unless successful corrective actions are implemented OR D) Radioactivity release in excess of Technical Specification limits

* Protective action recommendations are based on plant and containment conditions and these recommendations are made to offsite officials even when no release is in progress.

TABLE 5.1-2

Example Emergency Action Levels (EALs) & Corresponding Actions /5

ALERT

(Sheet 5 of 9)

Palo Verde Nuclear Generating Station

Recovery Procedure Implemented	Classification Criteria	Initiating Conditions
5. Loss of Secondary Coolant	o One fission product barrier challenged OR lost	1.) Loss of secondary coolant A) Press in at least 1 S/G decreasing B) RCS pressure decreasing AND 2.) A) 1. Containment pressure > 50 psig OR B) Gap activity in primary coolant verified by chemistry OR C) S/G tube leak concurrent with an unisolable steam leak outside containment OR D) ATWS OR E) Degraded system performance which could result in loss of a critical safety function or barrier failure within a given time period unless successful corrective actions are implemented. OR F) Radioactivity release in excess of Technical Specification limits.

* Protective action recommendations are based on plant and containment conditions and these recommendations are made to offsite officials even when no release is in progress.

TABLE 5.1-2

Example Emergency Action Levels (EALs) & Corresponding Actions /5

ALERT

Palo Verde Nuclear Generating Station

Recovery Procedure Implemented	Classification Criteria	Initiating Conditions
6. Small LOCA	o One fission product barrier challenged OR lost	1.) Small LOCA verified A) RCS pressure decreasing, RCS leakage > 50 gpm

* Protective action recommendations are based on plant and containment conditions and these recommendations are made to offsite officials even when no release is in progress.

TABLE 5.1-2

Example Emergency Action Levels (EALs) & Corresponding Actions

ALERT

Palo Verde Nuclear Generating Station

Recovery Procedure Implemented	Classification Criteria	Initiating Conditions
7. LOCA	o One fission product barrier challenged OR lost	1.) LOCA verified 1. RCS press low 2. SIAS/CIAS actuated 3. CTMT sump levels, temp, press, humidity increasing

* Protective action recommendations are based on plant and containment conditions and these recommendations are made to offsite officials even when no release is in progress.

TABLE 5.1-2

Example Emergency Action Levels (EALs) & Corresponding Actions / 5

ALERT

Palo Verde Nuclear Generating Station

Recovery Procedure Implemented		Classification Criteria	Initiating Conditions
8. SG Tube Rupture	o	One fission product barrier challenged OR lost	1.) S/G tube rupture verified, RCS leakage > 50 gpm 1. SIAS 2. PZR press low 3. PZR level low

* Protective action recommendations are based on plant and containment conditions and these recommendations are made to offsite officials even when no release is in progress.

TABLE 5.1-2

Example Emergency Action Levels (EALs) & Corresponding Actions 15

ALERT

(Sheet 9 of 9)

Palo Verde Nuclear Generating Station

Recovery Procedure Implemented	Classification Criteria	Initiating Conditions
9. Blackout	o One fission product barrier challenged OR lost	1.) Blackout verified 1. Rx trip 2. Generator trip 3. No offsite AC power 4. Failure to diesel generators to supply class 1E buses

* Protective action recommendations are based on plant and containment conditions and these recommendations are made to offsite officials even when no release is in progress.

TABLE 5.1-3

Example Emergency Action Levels (EALs) & Corresponding Actions /5

SITE AREA EMERGENCY
(Sheet 1 of 6)

Palo Verde Nuclear Generating Station

Recovery Procedure Implemented	Classification Criteria	Initiating Conditions	* Licensee Action Guidance
3. Loss of Feedwater	o Two fission product barriers challenged OR o Two fission product barriers lost OR o One fission product barrier challenged AND another lost	1.) Loss of feedwater verified A) Feed flow abnormal B) Rx trip on low S/G level or high PZR press AND 2 of the following: 2.) A) Containment pressure > 50 psig OR B) Gap activity in primary coolant verified by Chemistry OR C) Degraded system performance which could result in loss of a critical safety function or barrier failure within a given time period unless successful corrective actions are implemented. OR D) RCS pressure > 2750 psia OR E) RCS pressure controlling on PZR safeties OR F) Radioactivity release in excess of Technical Specification limits	o Inform NRC, State and County authorities of Site Area Emergency status/cause; any releases are not expected to exceed EPA/PAG exposure levels beyond the site boundary unless further degradation of safety systems occur o Recommend to the State that consideration of appropriate protective actions based on actual or projected data is warranted per the appropriate EPIP /6 o Augment resources by activating STSC, TSC, OSC, EOF, JENC, CHIC and CEC o Dispatch (onsite/offsite) Field Monitoring Teams with associated communications equipment /5 /6 o Provide a dedicated individual for plant status updates dates to offsite authorities /5 o Provide meteorological data and dose estimates (for actual releases) to offsite authorities o Provide release and dose projections based on available plant condition information and foreseeable contingencies. o Terminate (or reduction of) emergency class verbally at EOF followed by written summary within 8 hours OR o Escalate to GENERAL EMERGENCY

* Protective action recommendations are based on plant and containment conditions and these recommendations are made to offsite officials even when no release is in progress

TABLE 5.1-3

Example Emergency Action Levels (EALs) & Corresponding Actions /6

SITE AREA EMERGENCY

(Sheet 2 of 6)

Palo Verde Nuclear Generating Station

Recovery Procedure Implemented	Classification Criteria	Initiating Conditions
5. Loss of Secondary Coolant	o Two fission product barriers challenged OR o Two fission product barriers lost OR o One fission product barrier challenged AND another lost	1.) Loss of secondary coolant verified A) Press in at least 1 S/G decreasing B) RCS press decreasing AND 2.) Two of the following A) Containment pressure > 50 psig B) SG tube leak concurrent with an unisolable steam leak outside containment OR C) Gap activity in primary coolant verified by chemistry OR D) Degraded system performance which could result in loss of a critical safety function or barrier failure within a given time period unless successful corrective actions are implemented OR E) ATWAS OR F) Radioactivity release in excess of Technical Specification limits

* Protective action recommendations are based on plant and containment conditions and these recommendations are made to offsite officials even when no release is in progress

TABLE 5.1-3

Example Emergency Action Levels (EALs) & Corresponding Actions 15

SITE AREA EMERGENCY

(Sheet 3 of 6)

Palo Verde Nuclear Generating Station

Recovery Procedure Implemented	Classification Criteria	Initiating Conditions
6. Small LOCA	o Two fission product barriers challenged OR o Two fission product barriers lost OR o One fission product barrier challenged AND another lost	1.) Small LOCA verified A) RCS pressure decreasing AND 2.) Any one of the following: A) Containment pressure > 50 psig OR B) Gap activity in primary coolant verified by chemistry OR C) ATWS OR D) Degraded system performance which could result in loss of a critical safety function or barrier failure within a given time period unless successful corrective actions are implemented OR E) Radioactivity release in excess of Technical Specification limits

* Protective action recommendations are based on plant and containment conditions and these recommendations are made to offsite officials even when no release is in progress

TABLE 5.1-3

Example Emergency Action Levels (EALs) & Corresponding Actions 15

SITE AREA EMERGENCY

(Sheet 4 of 6)

Palo Verde Nuclear Generating Station

Recovery Procedure Implemented	Classification Criteria	Initiating Conditions
7. LOCA	o Two fission product barriers challenged OR o Two fission product barriers lost OR o One fission product barrier challenged AND another lost	1.) LOCA verified 1. RCS press low 2. SIAS/CIAS actuated 3. CTMT sump levels, temp, press, humidity increasing AND 2.) A) Containment pressure > 50 psig OR B) Gap activity in primary coolant verified by chemistry OR C) Degraded system performance which could result in loss of a critical safety function or barrier failure within a given time period unless successful corrective actions are implemented OR D) Core uncovered RVLMS < 50% (voiding in upper plenum) OR E) CET > 700 degrees F OR F) Radioactivity release in excess of Technical Specification limits

* Protective action recommendations are based on plant and containment conditions and these recommendations are made to offsite officials even when no release is in progress

TABLE 5.1-3

Example Emergency Action Levels (EALs) & Corresponding Actions

SITE AREA EMERGENCY

Palo Verde Nuclear Generating Station

Recovery Procedure Implemented	Classification Criteria	Initiating Conditions
8. SG Tube Rupture	o Two fission product barriers challenged OR o Two fission product barriers lost OR o One fission product barrier challenged AND another lost	1.) S/G tube rupture verified 1. SIAS 2. PZR press low 3. PZR level low 2.) A) Steam release from damaged S/G to atmosphere 1. S/G safety 2. ADV 3. SBCS to ATM OR B) Gap activity in primary coolant verified by chemistry OR C) Degraded system performance which could result in loss of a critical safety function or barrier failure within a given time period unless successful corrective actions are implemented OR D) Radioactivity release in excess of Technical Specification limits

* Protective action recommendations are based on plant and containment conditions and these recommendations are made to offsite officials even when no release is in progress

TABLE 5.1-3

Example Emergency Action Levels (EALs) & Corresponding Actions 15

SITE AREA EMERGENCY

(Sheet 6 of 6)

Palo Verde Nuclear Generating Station

Recovery Procedure Implemented	Classification Criteria	Initiating Conditions
9. Blackout	o Two fission product barriers challenged OR o Two fission product barriers lost OR o One fission product barrier challenged AND another lost	1.) Blackout verified 1. Rx trip 2. Generator trip 3. No offsite AC power 4. Failure of diesel generators to supply class 1E buses AND 2.) A) RCS pressure controlling on PZR safeties OR B) RVLMS < 50% (voiding in Upper Plenum) OR C) Gap activity in primary coolant confirmed by chemistry OR D) Radioactivity release in excess of Technical Specification limits.

* Protective action recommendations are based on plant and containment conditions and these recommendations are made to offsite officials even when no release is in progress.

TABLE 5.1-4

Example Emergency Action Levels (EALs) & Corresponding Actions 15

GENERAL EMERGENCY

(Sheet 1 of 6)

Palo Verde Nuclear Generating Station

Recovery Procedure Implemented	Classification Criteria	Initiating Conditions	* Licensee Action Guidance
5. Loss of Secondary Coolant	o One fission product barrier challenged With two barriers lost OR o Two barriers challenged with one barrier lost OR o Three fission product barriers challenged OR o Three fission product barriers lost	1.) Loss of secondary coolant verified A) Pressure in at least one S/G decreasing B) RCS pressure decreasing AND 3 of the following: 2.) A) Containment pressure > 50 psig OR B) MSLB in MSSS upstream of MSIV with SGTL OR C) Gap activity in primary coolant verified by chemistry OR D) ATWAS OR E) Degraded system performance which could result in loss of a critical safety func- or barrier failure within a given time period unless successful corrective actions are implemented OR F) Radioactivity release in excess of Technical Specification limits	o Inform NRC, State and County authorities of General Emergency status/cause; any releases can be reasonable expected to exceed EPA/PAG exposure levels offsite for more than the immediate site area o Recommend to the State that consideration of appropriate protective actions based on actual or projected data is warranted per the appropriate EPIP 15 Augment resources by activating STSC, TSC, OSC, EOF, JENC, CHIC and CEC Dispatch (onsite/offsite) Field Monitoring Teams with associated communications equipment 15 15 o Provide a dedicated individual for plant status updates to offsite authorities o Make senior technical and management staff available for periodic consultation with NRC and State

* Protective action recommendations are based on plant and containment conditions and these recommendations are made to offsite officials even when no release is in progress. 15

TABLE 5.1-4

Example Emergency Action Levels (EALs) & Corresponding Actions 15

GENERAL EMERGENCY

(Sheet 2 of 6)

Palo Verde Nuclear Generating Station

Recovery Procedure Implemented	Classification Criteria	Initiating Conditions	* Licensee Action Guidance
5. Loss of Secondary Coolant (Cont'd)			o Provide meteorological data and dose estimates (for actual releases) to offsite authorities o Provide release and dose projections based upon available plant condition information and foreseeable contingencies o Terminate (or reduction of) emergency classification by briefing authorities at the EOF followed by written summary within 8 hours

* Protective action recommendations are based on plant and containment conditions and these recommendations are made to offsite officials even when no release is in progress.

TABLE 5.1-4

Example Emergency Action Levels (EALs) & Corresponding Actions /5

GENERAL EMERGENCY

(Sheet 3 of 6)

Palo Verde Nuclear Generating Station

Recovery Procedure Implemented	Classification Criteria	Initiating Conditions
6. Small LOCA	o One fission product barrier challenged with two barriers lost OR o Two barriers challenged with one barrier lost OR o Three fission product barriers challenged OR o Three fission product barriers lost	1.) Small LOCA verified A) RCS pressure decreasing AND 2 of the following: 2.) A) Containment pressure > 50 psig OR B) Gap activity in primary coolant verified by chemistry OR C) ATWAS OR D) Degraded system performance which could result in loss of a critical safety function or barrier failure within a given time period unless successful corrective actions are implemented OR E) RVLMS < 50% (voiding (voiding in upper plenum) OR F) CET > 700 degrees F OR G) Radioactivity release in excess of Technical Specification limits

* Protective action recommendations are based on plant and containment conditions and these recommendations are made to offsite officials even when no release is in progress.

TABLE 5.1-4

Example Emergency Action Levels (EALs) & Corresponding Actions

GENERAL EMERGENCY

(Sheet 4 of 6)

Palo Verde Nuclear Generating Station

Recovery Procedure Implemented	Classification Criteria	Initiating Conditions
7. LOCA	o One fission product barrier challenged with two barriers lost OR o Two barriers challenged with one barrier lost OR o Three fission product barriers challenged OR o Three fission product barriers lost	1.) LOCA verified 1. RCS press low 2. SIAS/CIAS actuated 3. CTMT sump levels, temp, press, humidity increasing AND 2 of the following: 2.) A) Containment pressure > 50 psig OR B) Gap activity in primary coolant verified by chemistry OR C) Core uncovered [RVLMS 50% (voiding in Upper Plenum) or CET 700°F] OR D) Degraded system performance which could result in loss of a critical safety function or barrier failure within a given time period unless successful corrective actions are implemented OR E) Radioactivity release in excess of Technical Specification limits

* Protective action recommendations are based on plant and containment conditions and these recommendations are made to offsite officials even when no release is in progress.

TABLE 5.1-4

Example Emergency Action Levels (EALs) & Corresponding Actions 15

GENERAL EMERGENCY

(Sheet 5 of 6)

Palo Verde Nuclear Generating Station

Recovery Procedure Implemented	Classification Criteria	Initiating Conditions
8. SG Tube Rupture	o One fission product barrier challenged with two barriers lost OR o Two barriers challenged with one barrier lost OR o Three fission product barriers challenged OR o Three fission product barriers lost	1.) S/G tube rupture verified 1. SIAS 2. Pressurizer pressure low 3. PZR level low 4. S/G blowdown or condenser air removal radiation high alarms AND 2 of the following: 2.) A) Steam release from damaged S/G to atmosphere 1. S/G safety 2. ADV 3. SBCS to ATM OR B) Gap activity in the primary coolant verified by chemistry OR C) Degraded system performance which could result in loss of a critical safety function or barrier failure within a given time period unless successful corrective actions are implemented OR D) RVLMS < 50% (voiding in Upper Plenum) OR E) CET < 700 degrees F OR F) Radioactivity release in excess of Technical Specification limits

* Protective action recommendations are based on plant and containment conditions and these recommendations are made to offsite officials even when no release is in progress

TABLE 5.1-4

Example Emergency Action Levels (EALs) & Corresponding Actions 15

GENERAL EMERGENCY

(Sheet 6 of 6)

Palo Verde Nuclear Generating Station

Recovery Procedure Implemented	Classification Criteria	Initiating Conditions
9. Blackout	o One fission product barrier challenged with two barriers lost OR o Two barriers challenged with one barrier lost OR o Three fission product barriers challenged OR o Three fission product barriers lost	1.) Blackout verified 1. Rx trip 2. Generator trip 3. No offsite AC power 4. Failure of diesel generators to supply class 1E buses AND 2.) Two fo the following: A) RCS pressure controlling on PZR safeties OR B) CET > 700 degrees F OR C) RVLMS < 50% (voiding in Upper Plenum) OR D) Degraded system performance which could result in loss of a critical safety function or barrier failure within a given time period unless successful corrective actions are implemented OR E) Radioactivity release in excess of Technical Specification limits

* Protective action recommendations are based on plant and containment conditions and these recommendations are made to offsite officials even when no release is in progress

TABLE 5.2-1

Example Emergency Action Levels (EALs) & Corresponding Actions 15

NOTIFICATION OF UNUSUAL EVENT

(Sheet 1 of 2)

Palo Verde Nuclear Generating Station

Safety Functions	EAL (Alarm, Instrument Reading, etc.)	APS Actions	State/County Actions
1. Reactivity Control	(1) Any compromise of reactivity control constitutes an upgrade	o Inform NRC, State and County authorities of nature of unusual condition; no release of radioactive material requiring offsite response or monitoring is expected unless further degradation of safety systems occur. 15	o ADES Duty Officer staffs State EOC.
2. RCS Heat Removal	(2) (A) Safety injection actuates with discharge to the vessel 15 OR (B) Sustained TC > 568 degrees F OR (C) Indications of failed fuel (Tech Spec Section 3/4.4.7):	o Based on the situation, recommend that no protective action is necessary or to standby for update. 15	o ARRA Duty Officer acquires follow-up information from STSC. o County EOC on standby and alert fan-out. o Provide offsite assistance if required (fire, security, medical, etc.).
3. RCS Inventory and Pressure Control	(3) (A) Safety injection actuates with discharge to the vessel 15 OR (B) Pzr relief actuates OR (C) Failure of Pressurizer Pressure Control System such that Tech Specs are violated OR (D) RCS press < 1700 psig	o Augment on-shift resources. o Activate STSC at the discretion of the Shift Supervisor o Partially Activate CHIC. o Terminate with verbal summary to offsite authorities followed by written report w/in 24 hours. OR o Escalate to a higher classification.	o Offsite notification per notification procedures. o Offsite notification per notification procedures. o Escalate to a higher classification.
4. Containment Integrity	(A) Loss of containment integrity requiring shutdown by Tech Specs OR (B) CIAS		

* Protective action recommendations are based on plant and containment conditions and these recommendations are made to offsite officials even when no release is in progress. 15

(0489M)

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August, 1984

TABLE 5.2-1 (Continued)

Example Emergency Action Levels (EALs) & Corresponding Actions | 5

NOTIFICATION OF UNUSUAL EVENT

(Sheet 2 of 2)

Safety Functions	EAL (Alarm, Instrument Reading, etc.)
5. Indirect Radioactivity Release Control	(5) Radiological effluent Tech Spec limits exceeded. Projected dose at site boundary < 1mR/hr.

Monitor	Radiation levels/ radionuclide concentrations
SQN-RU-141 Cond Vac pump	≥ 8.9 E-4 uci/cc
SQN-RU-145 Fuel Bldg Vent Exhaust	≥ 3.5 E-4 uci/cc
SQN-RU-143 Plant Vent	≥ 2.0 E-5 uci/cc
SQN-RU-148,149 Cont Area Monitor	≥ 2 R/hr
SQN-RU-150,151 Primary Coolant	≥ 2 R/hr
SQN-RU-139,140 Main Steam Line Effluent	≥ 10 mR/hr
SQN-RU-37, 38 Power Access Purge	≥ 2.5 mR/hr

6. Maintenance of Vital Auxiliaries (Aux Feedwater, Condensate Transfer, Essential Chill Water, Essential Cooling Water, Essential Spray Ponds, AC/DC power sources)	(6) LCOs for Engineered Safety Features exceeded per Tech Specs.

* Protective action recommendations are based on plant and containment conditions and these recommendations are made to offsite officials even when no release is in progress. | 5

TABLE 5.2-2

Example Emergency Action Levels (EALs) & Corresponding Actions |5

ALERT

(Sheet 1 of 4)

Palo Verde Nuclear Generating Station

Safety Functions	EAL (Alarm, Instrument Reading, etc.)	APS Actions	State/County Actions
1. Reactivity Control	(1) Failure of RPS to initiate and complete a trip, placing the Rx in a subcritical condition; manual trip successful.	o Inform NRC, State and County authorities of ALERT status/cause; any releases are expected to be limited to small fractions of EPA/PAG exposure levels at the site boundary unless further degradation of safety systems occur	o Activate County EOC. o Activate State EOC and TOC. o Partially activate REAT forward. o Provide confirmatory offsite radiation monitoring and calculate dose projections if actual releases substantially exceed Technical Specification limits.
2. RCS Heat Removal	(2) (A) Failure of both trains of any required ASFAS OR (B) Loss of subcooling margin OR (C) Indication of RCS void propagation into the core region. OR (D) Severe loss of cladding indicated by any of the following: (1) SQN-RU-148, 149 (Containment Area HI Rad Monitor): ≥ 200 R/hr for 0.5 hr OR ≥ 2000 R/hr for 2 min OR (2) SQN-RU-150, 151 (Primary Coolant Activity Monitor): ≥ 200 R/hr for 0.5 hr	o Recommend to the State that the public be appraised of the situation and stay tuned to EBS/KTAR radio o Augment resources by activating STSC, TSC, OSC, EOF, JENC, CHIC and CEC o Dispatch (onsite/offsite) Field Monitoring Teams with associated communications equipment. |5 o Provide meteorological assessments to offsite authorities and if releases are occurring dose estimates for actual releases o Terminate by verbal summary to offsite authorities followed by written summary within 8 hours OR o Escalate to a higher classification	o Implement protective actions if needed. o Maintain ALERT status until verbal termination. OR o Escalate to a higher classification.

* Protective action recommendations are based on plant and containment conditions and these recommendations are made to offsite officials even when no release is in progress. |5

(0490M)

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August, 1984

TABLE 5.2-2 (CONTINUED)

Example Emergency Action Levels (EALs) & Corresponding Actions |5

ALERT

(Sheet 2 of 4)

Palo Verde Nuclear Generating Station

Safety Functions	EAL (Alarm, Instrument Reading, etc.)
	OR
	≥ 2000 R/hr for 2 minutes
	(3) SQN-RU-37, 38 (Power Access Purge Monitor):
	≥ .25 R/hr for 0.5 hr
	OR
	≥ 2.5 R/hr for 2 minutes
	(4) Letdown Monitor: > 1% increase in failed fuel within 30 minutes
	(5) Primary coolant samples with > 300 uci/gm of equivalent I-131
3. RCS Inventory & Pressure Control	(3) (A) Failure of any ESFAS
	OR
	(B) Pzr level off scale low or high
	OR
	(C) Severe loss of cladding as indicated in item 2(d).
4. Containment Integrity	(4) CSAS
	OR
	Failure of any ESFAS

* Protective action recommendations are based on plant and containment conditions and these recommendations are made to offsite officials even when no release is in progress. |5

TABLE 5.2-2 (CONTINUED)

Example Emergency Action Levels (EALs) & Corresponding Actions |5

ALERT

(Sheet 3 of 4)

Palo Verde Nuclear Generating Station

Safety Functions	EAL (Alarm, Instrument Reading, etc.)
5. Indirect Radioactivity Release Control	(5) Radiological effluents greater than 10 times Tech Spec instantaneous limits; high radiation levels or high airborne contamination levels (1000 times above background) due to challenge/loss of RCS heat removal, RCS inventory & pressure control, and/or containment integrity. Projected dose at site boundary approximately 1 mR/hr.

Monitor	Radiation Levels/ radionuclide concentrations
SQN-RU-141 Cond Vac pump	≥ 8.9 E-3 uci/cc
SQN-RU-145 Fuel Bldg Vent Exhaust	≥ 3.5 E-3 uci/cc
SQN-RU-143 Plant Vent	≥ 2.0 E-4 uci/cc
SQN-RU-148,149 Cont Area Monitor	≥ 200 R/hr for 0.5 hr OR ≥ 2000 R/hr for 2 min
SQN-RU-150,151 Primary Coolant	≥ 200 R/hr for 0.5 hr OR ≥ 2000 R/hr for 2 min
SQN-RU-139,140 Main Steam Line Effluent	≥ 1 R/hr for 0.5 hr OR ≥ 10 R/hr for 2 min
SQN-RU-37, 38 Power Access Purge	≥ .25 R/hr for 0.5 hr OR ≥ 2.5 R/hr for 2 min

* Protective action recommendations are based on plant and containment conditions and these recommendations are made to offsite officials even when no release is in progress. |5

TABLE 5.2-2 (CONTINUED)

Example Emergency Action Levels (EALs) & Corresponding Actions [5]

ALERT

(Sheet 4 of 4)

Palo Verde Nuclear Generating Station

Safety Functions	EAL (Alarm, Instrument Reading, etc.)
6. Maintenance of Vital Auxiliaries (Aux Feedwater, Condensate Transfer, Essential Chill Water, Essential Cooling Water, Essential Spray Ponds, AC/DC power sources).	(6) Exceeding LCOs for Engineered Safety Features resulting in a challenge/loss to SF items, 2, 3, and/or 4 as cited above.

* Protective action recommendations are based on plant and containment conditions and these recommendations are made to offsite officials even when no release is in progress. [5]

TABLE 5.2-3
Emergency Action Levels (EALs) & Corresponding Actions |5
SITE AREA EMERGENCY
(Sheet 1 of 5)
Palo Verde Nuclear Generating Station

Safety Functions	EAL (Alarm, Instrument Reading, etc.)	APS Actions	State/County Actions
1. Reactivity Control	(1) Manual scram not successful; emergency boration in progress; RCS heat removal not degraded.	o Inform NRC, State and County authorities of SITE AREA EMERGENCY status/cause; any releases are not expected to exceed EPA/PAG exposure levels beyond the site boundary unless further degradation of safety systems occur	o County EOC activated. o County Response Agencies activated. o Augment resources by activating State EOC. o State and Operations Agencies on standby.
2. RCS Heat Removal	(2) (A) Loss of forced flow and natural circulation. OR (B) CET temp > 700 degrees F OR (C) Degraded core parameters: (1) Gap activity in primary coolant (> 300 uci/cc) OR (2) Core outlet plenum empty as indicated by RVLMS indicating 0%.	o Recommend to the State that consideration of appropriate protective actions based on actual or projected data is warranted per the appropriate EPIP	5 o Initiate immediate public notification of SITE AREA EMERGENCY status; provide periodic public updates. o Resource Agencies Activated. o Dispatch key emergency personnel, including monitoring teams with communications equipment. o Alert other personnel to standby status (eg, those needed for traffic control or evacuation) and dispatch personnel to near-site duty stations. o Perform dose calculations based on current release rates and implement necessary protective actions
		o Augment resources by activating STSC, TSC, OSC, EOF, JENC, CHIC and CEC o Dispatch (onsite/offsite) Field Monitoring Teams with associated communications equipment |5 o Provide a dedicated individual for plant status updates to offsite authorities |5 o Provide meteorological data and dose estimates (for actual releases) to offsite authorities o Provide release and dose projections based on available plant condition information and foreseeable contingencies o Terminate (or reduction of) emergency class verbally at EOF followed by written summary within eight hours OR o Escalate to GENERAL EMERGENCY	

* Protective action recommendations are based on plant and containment conditions and these recommendations are made to offsite officials even when no release is in progress. |5

(0490M)

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TABLE 5.2-3

Example Emergency Action Levels (EALs) & Corresponding Actions [5]

SITE AREA EMERGENCY

Palo Verde Nuclear Generating Station

Safety Functions	EAL (Alarm, Instrument Reading, etc.)	APS Actions	State/County Actions
3. RCS Inventory & Pressure Control	(3) (A) LOCA greater than CVCS capacity: (1) RCS pressure boundary failure AND (2) Imminent clad damage; if core melts, containment will be challenged. AND (3) SQN-RU-148 OR SQN-RU-149 high alarm AND (4) Gap activity in containment OR Gap activity in primary coolant AND (5) SQN-RU-1 AND SQN-RU-143 OR SQN-RU-144 high alarm OR (B) Loss of secondary coolant (1) RCS pressure boundary failure		o Provide offsite monitoring results to APS and jointly discuss them. o Continuously assess field information from APS and State/County monitoring teams with regard to initiating/modifying public protective action. o Provide assistance requested. o Evaluate data and initiate ingestion pathway protective actions as appropriate. o Provide press briefings. o Maintain SITE AREA EMERGENCY status until termination or reduction of emergency class. OR o Escalate to GENERAL EMERGENCY.

* Protective action recommendations are based on plant and containment conditions and these recommendations are made to offsite officials even when no release is in progress. [5]

TABLE 5.2-3

Example Emergency Action Levels (EALs) & Corresponding Actions [5]

SITE AREA EMERGENCY

Palo Verde Nuclear Generating Station

Safety Functions	EAL (Alarm, Instrument Reading, etc.)
3. RCS Inventory & Pressure	(3) (B) (continued) AND (2) Imminent clad damage; if core melts, containment will be challenged. AND (3) SQN-RU-4, 5 (S/G blowdown) high alarm OR SQN-RU-141 (Condenser Vacuum Pump Gland Seal) high alarm. AND (4) SQB-RU-1 (Containment atmosphere Monitor) high alarm AND (5) Very high primary coolant activity (> 300 uci/gm of I-131 dose equivalent) OR Letdown monitor indicating > 1% increase in fuel failure within 30 minutes
4. Containment Integrity	(4) Inability to manually isolate containment with high containment activity. OR Containment Pressure exceeds design basis with loss of C.S.

* Protective action recommendations are based on plant and containment conditions and these recommendations are made to offsite officials even when no release is in progress. [5]

TABLE 5.2-3

Example Emergency Action Levels (EALs) & Corresponding Actions | 5

SITE AREA EMERGENCY

Palo Verde Nuclear Generating Station

Safety Functions	EAL (Alarm, Instrument Reading, etc.)
5. Indirect Radioactivity Release Control	(5) Effluent monitors detect levels corresponding to ≥ 50 mR/hr at site boundary; high readings on ARMs/PRMs due to challenge/loss of RCS heat removal, RCS inventory and pressure control, and/or containment integrity.

Monitor	Radiation Levels/ radionuclide concentrations
SQN-RU-141 Cond Vac pump	≥ 9.7 E-1 uci/cc
SQN-RU-145 Fuel Bldg Vent Exhaust	≥ 1.43 E-1 uci/cc
SQN-RU-143 Plant Vent	≥ 1 E-2 uci/cc
SQN-RU-148, 149 Cont Area Monitor	≥ 2.1 E+5 R/hr for 0.5 hr OR ≥ 2.1 E+6 R/hr for 2 min
SQN-RU-150,151 Primary Coolant	(To be determined)**
SQN-RU-139, 140 Main Steam Line Effluent	(To be determined)**
SQN-RU-37, 38 Power Access Purge	≥ 3.9 E-1 uci/cc

* Protective action recommendations are based on plant and containment conditions and these recommendations are made to offsite officials even when no release is in progress. | 5

** To be provided later.

TABLE 5.2-3

Example Emergency Action Levels (EALs) & Corresponding Actions [5

SITE AREA EMERGENCY

(Sheet 5 of 5)

Palo Verde Nuclear Generating Station

Safety Functions	EAL (Alarm, Instrument Reading, etc.)
6. Maintenance of Vital Auxiliaries (Aux Feedwater, Condensate Transfer, Essential Chill Water, Essential Cooling Water, Essential Spray Ponds, AC/DC power sources).	(6) Exceeding LCOs for Engineered Safety Features resulting in a challenge/loss to SF items, 2, 3, and/or 4 as cited above.

* Protective action recommendations are based on plant and containment conditions and these recommendations are made to offsite officials even when no release is in progress. [5

TABLE 5.2-4

Example Emergency Action Levels (EALs) & Corresponding Actions |5

GENERAL EMERGENCY

Palo Verde Nuclear Generating Station

Safety Functions	EAL (Alarm, Instrument Reading, etc.)	APS Actions	State/County Actions
	Manual scram not successful AND		
1. Reactivity Control	(1) Emergency boration not successful OR RCS heat removal degraded	o Inform NRC, State and County authorities of GENERAL EMERGENCY status/clause; any releases can be reasonable expected to exceed EAP/PAG exposure levels offsite for more than the immediate site o Recommend to the State that consideration of appropriate protective action based on actual or projected data is warranted per the appropriate EPIP |5	o Initiate immediate public notification of GENERAL EMERGENCY status and provide periodic public updates. o Augment resources by activating State EOC and activate Op. Group Staff. o Activate State Resources Support Operations Agencies.
2. RCS Heat Removal	(2) Core melt situations: (A) Three barriers challenged. If situation continues, likely core melt followed by containment faiture. OR (B) Two barriers challenged with one barrier lost. RCS Pressure Boundary failure and imminent clad damage: PZR level Inventory Control compromised or RCS pressure boundary compromised with indications of LOCA and increasing radiation levels indicated on SQN-RU-148, 142 and/or SQN-RU-4,5 Loss of cladding results in very high radiation levels at all locations where Rx coolant exists, leaks or is processed. Letdown monitor is off scale high AND Post accident sampling verifies the existence of failed fuel. OR	o Augment resources by activating STSC, TSC, OSC, EOF, JENC, CHIC and CEC o Dispatch (onsite/offsite) Field Monitoring Teams with associated communications equipment |5 o Dispatch Field Monitoring Teams with communications equipment o Provide a dedicated individual for plant status updates of offsite authorities o Make senior technical and management staff available for periodic consultation with NRC and State o Provide meteorological data and dose estimates (for actual releases) to offsite authorities via a dedicated individual	o Provide press briefings. o Dispatch key emergency personnel, including monitoring teams with communications equipment. o Continue performing dose calculations with regard to upgrading/modifying protective actions. o Dispatch other emergency personnel to duty stations within a 10 mi radius and alert others to standby status.

* Protective action recommendations are based on plant and containment conditions and these recommendations are made to offsite officials even when no release is in progress. |5

TABLE 5.2-4

Example Emergency Action Levels (EALs) & Corresponding Actions | 5

GENERAL EMERGENCY

Palo Verde Nuclear Generating Station

Safety Functions	EAL (Alarm, Instrument Reading, etc.)	APS Actions	State/County Actions
2. RCS Heat Removal	2) Core melt situations (continued):		
	C) One barrier challenged with two barriers lost.	o Provide release and dose projections based upon available plant condition information and foreseeable contingencies	o Provide offsite monitoring results to APS and jointly discuss these. o Continuously assess field information from APS and State/County monitoring teams with regard to initiating/modifying public protective actions. o Evaluate field and lab analysis data for implementation/modification of ingestion pathway actions. o Consider/implement protective actions based on current assessment. o Provide assistance. o Maintain GENERAL EMERGENCY status until termination or reduction of emergency class
	1) RCS Pressure Boundary and cladding failed with containment challenged: a) Gap activity in containment OR Gap activity in primary coolant AND b) SQN-RU-148 or SQN-RU-149 high alarm AND c) SQN-RU-1 high alarm AND d) SQN-RU-143 high alarm OR SQN-RU-144 high alarm AND e) High ARM readings near piping systems containing recirculating fluid associated with core cooling	o Terminate (or reduction of) emergency classification by briefing authorities at the EOF followed by written summary within eight hours	

* Protective action recommendations are based on plant and containment conditions and these recommendations are made to offsite officials even when no release is in progress. | 5

TABLE 5.2-4

Example Emergency Action Levels (EALs) & Corresponding Actions | 5

GENERAL EMERGENCY

Palo Verde Nuclear Generating Station

Safety Functions	EAL (Alarm, Instrument Reading, etc.)
2. RCS Heat Removal	(2) Core melt situations (continued) AND (f) Post accident sampling verifies the existence of failed fuel. For loss through SG: SQN-RU-150, 151 high alarm OR (2) RCS Pressure Boundary and containment failure: (a) Above-normal radioactive release from the plant AND (b) Higher radiation levels throughout the facility Loss through containment: SQN-RU-37, 38 (Power access purge exhaust monitor) off scale high AND SQN-RU-143, 144 (Plant vent monitor) high alarm: ≥ 2.03 E-1 uci/cc Loss through SG:

* Protective action recommendations are based on plant and containment conditions and these recommendations are made to offsite officials even when no release is in progress. | 5

TABLE 5.2-4

Example Emergency Action Levels (EALs) & Corresponding Actions | 5

GENERAL EMERGENCY

(Sheet 4 of 9)

Palo Verde Nuclear Generating Station

Safety Functions	EAL (Alarm, Instrument Reading, etc.)
2. RCS Heat Removal	(2) Core melt situations: (continued) SQN-RU-139, 140 high alarm OR (D) Three barriers lost (eg: all the following exist: failed fuel, SGTR and a failed MSL upstream of MSIVs or stuck open SRV): (1) Indications of fuel breach and RCS Pressure Boundary breach with high radionuclide concentrations being released to the environment AND (2) Loss of containment to the auxiliary building results in ≥ 2.03 E-1 uci/cc released from the plant vent. AND (3) Indication of high radiation levels within the plant, very high radionuclide release rates from the plant, and readings at the site boundary ≥ 1 rem/hr.
3. RCS Inventory & Pressue Control	(3) Failure of necessary Redundant ECCS components AND CSAS
4. Containment Integrity	(4) (A) Failure of cladding and RCS Pressure Boundary with potential loss of containment as indicated by:

* Protective action recommendations are based on plant and containment conditions and these recommendations are made to offsite officials even when no release is in progress. | 5

TABLE 5.2-4

Example Emergency Action Levels (EALs) & Corresponding Actions [5]

GENERAL EMERGENCY

Palo Verde Nuclear Generating Station

Safety Functions	EAL (Alarm, Instrument Reading, etc.)
4. Containment Integrity	(4) (A) (continued) (1) Gap activity in containment or primary coolant AND (2) SQN-RU-148 or SQN-RU-149 high alarm AND (3) SQN-RU-1 high alarm AND (4) SQN-RU-143 or SQN-RU-144 high alarm AND (5) High ARM readings near piping systems containing recirculating fluid associated with core cooling AND (6) Post accident sampling verifies the existence of failed fuel. For loss through SG: SQN-RU-150, 151 high alarm AND Gap activity in S/G blowdown sample

* Protective action recommendations are based on plant and containment conditions and these recommendations are made to offsite officials even when no release is in progress. [5]

TABLE 5.2-4

Example Emergency Action Levels (EALs) & Corresponding Actions | 5

GENERAL EMERGENCY

Palo Verde Nuclear Generating Station

Safety Functions	EAL (Alarm, Instrument Reading, etc.)
4. Containment Integrity	(4) (A) (6) (continued) AND Gap activity in steam OR (B) (1) Failure of containment and RCS Pressure Boundary with potential loss of cladding as indicated in Site Area Emergency SF item #3 and Alert SF item #2(d). AND (2) Above-normal radioactive release from the plant AND (3) Higher rad levels throughout the facility Loss through containment: SQN-RU-37, 38 (Power access purge exhaust monitor) off-scale high AND SQN-RU-143, 144 (Plant vent monitor) high alarm: $\geq$ 2.03 E-1 uci/cc Loss through SG: SQN-RU-139, 140 high alarm

* Protective action recommendations are based on plant and containment conditions and these recommendations are made to offsite officials even when no release is in progress. | 5

TABLE 5.2-4

Example Emergency Action Levels (EALs) & Corresponding Actions 15

GENERAL EMERGENCY

Palo Verde Nuclear Generating Station

Safety Functions	EAL (Alarm, Instrument Reading, etc.)
4. Containment Integrity	(4) (continued) OR (C) Failure of cladding and containment with potential loss of RCS Pressure Boundary as indicated by: (1) Severely damaged fuel AND (2) (a) Iodine ratio indicates gap activity in primary coolant OR (b) CET temperature indicates superheat in RCS OR (c) Outlet plenum empty as indicated by RVLMS indicating 0% AND (3) Loss of ECCS AND (4) (a) Status indicates all containment penetrations not valved off or closed

* Protective action recommendations are based on plant and containment conditions and these recommendations are made to offsite officials even when no release is in progress. 15

TABLE 5.2-4

Example Emergency Action Levels (EALs) & Corresponding Actions [5]

GENERAL EMERGENCY

Palo Verde Nuclear Generating Station

Safety Functions	EAL (Alarm, Instrument Reading, etc.)
4. Containment Integrity	(4) (C) (continued) OR (b) Steam line break between containment and MSIV OR (c) Steam line break downstream of MSIV AND Open-closed indicator shows MSIV malfunction OR (d) Shift Supervisor's opinion
5. Indirect Radioactivity Release Control	(5) Effluent monitors detect levels corresponding to ≥ 1 rem/hr at site boundary; high ARM/PRM due to challenge/loss of RCS heat removal, RCS inventory and pressure control, and/or containment integrity.

Monitor	Radiation Levels/ radionuclide concentrations
SQN-RU-141 Cond Vac pump	≥ 1.93 E+1 uci/cc
SQN-RU-145 Fuel Bldg Vent Exhaust	≥ 2.86 uci/cc
SQN-RU-143 Plant Vent	≥ 2.03 E-1 uci/cc

* Protective action recommendations are based on plant and containment conditions and these recommendations are made to offsite officials even when no release is in progress. [5]

TABLE 5.2-4

Example Emergency Action Levels (EALs) & Corresponding Actions [5

GENERAL EMERGENCY

Palo Verde Nuclear Generating Station

Safety Functions	EAL (Alarm, Instrument Reading, etc.)
5. Indirect Radioactivity Release Control	(5) (continued)

Monitor	Radiation Levels/ radionuclide concentrations
SQN-RU-148, 149 Cont Area Monitor	≥ 6.75 E+6 R/hr for 0.5 hr OR ≥ 6.75 E+7 R/hr for 2 min
SQN-RU-150,151 Primary Coolant	(To be determined)**
SQN-RU-139, 140 Main Steam Line Effluent	(To be determined)**
SQN-RU-37, 38 Power Access Purge	≥ 7.8 uci/cc

6.	Maintenance of Vital Auxiliaries (Aux Feedwater, Condensate Transfer, Essential Chill Water, Essential Cooling Water, Essential Spray Ponds, AC/DC power sources).	(6) Exceeding LCOs for Engineered Safety Features resulting in a challenge/loss to SF items, 2, 3, and/or 4 as cited above.

* Protective action recommendations are based on plant and containment conditions and these recommendations are made to offsite officials even when no release is in progress. [5

** To be provided later.

Example Emergency Action Levels (EALS) & Corresponding Actions

(Sheet 1 of 10)

Palo Verde Nuclear Generating Station

Recovery Procedure Implemented	Classification	Classification Criteria	Indication of Barrier Challenge/Failure
Any event oriented Recovery Operating Procedure or Functional Recovery Procedure	General Emergency	o All 3 barriers either lost or challenged	RCS (1) RVLMS < 50% (voiding upper plenum) (2) RCS pressure > 2750 psia (3) RCS pressure controlling on PZR safeties (4) Uncontrolled loss of RCS inventory > 50 gpm CONTAINMENT (1) CIAS required but not completed (2) H2 concentration > 3.5% by volume (3) Containment pressure > 50 psig (4) Physical breach of containment CLAD (1) ATWS (2) Excessive RCS radioactivity (> 300 uCi/gm dose equivalent I-131) (3) CET > 700 degrees F VITAL AUXILIARIES/RADIATION RELEASE (1) Loss of offsite and onsite AC power (2) Loss of offsite and onsite AC power for longer than 15 minutes (3) Failure of safety systems (both trains) to actuate when required (4) > 10 gpm primary/secondary leakage concurrent with LOP or, > 10 gpm primary/secondary leakage concurrent with loss of secondary coolant outside containment (5) Violation of Tech Spec LCO or reliance on Tech Spec Section 3.0.3 for any of the following essential systems: ECCS, CNTMT Spray, Ultimate Heat Sink, SP, CST/RMWT, RWT, EC, ESS. CR HVAC, ADV, Aux Feedwater Operability (i.e., electrical power, instrumentation, controls and other auxiliary equipment) shall be maintained on the above systems.
	Site Area Emergency	o 2 of 3 barriers either lost or challenged	
	Alert	o 1 of 3 barriers either lost or challenged	
	Unusual Event	o No barriers lost or challenged	

* Protective action recommendations are based on plant and containment conditions and these recommendations are made to offsite officials even when no release is in progress.

Example Emergency Action Levels (EALs) & Corresponding actions [5]

Non RX Trip Events: Classification is based on the level of barrier/safety function degradation; however, classification for radioactivity release is based on a dose rate at the Site Boundary - i.e., a total site release rate for effluent monitors is determined by RP in accordance with their alarm setpoint procedure for Tech Spec limits.**

Initiating Event	Examples Conditions per Classification				
	NUE	Alert	Site Area Emergency	General	
1) Increase in Radiation levels or radioactive effluent release rate or situation in which contamination will be transported from the site	1) RCS sample activity requires shutdown per Tech Spec Sec 3.4.7 2) Rad Protection confirms that effluent Tech Spec limits have been exceeded (Sec. 3/4.11) corresponding to < 1 mR/hr WB at the site boundary 3. Rad monitoring system/grab sample indicates > 0.1% fuel failure within 30 minutes 4. Transportation of a contaminated person to an offsite medical facility [5]	1) RCS sample activity ≥ 300 uCi/gm dose equivalent I-131 2) Facility area radiation readings increase X 1000 3. Rad Protection confirms that effluent Tech Spec limit has been exceeded ten fold corresponding to 1mR/hr WB at site boundary. 4. SGTL > 50 gpm with loss of offsite power 5. Rad monitoring system/grab sample indicates > 1% failed fuel within 30 min or 5% total fuel failure 6. Fuel damage accident with radioactivity release	1) Rad Protection confirms that effluent Tech Spec limit has been exceeded corresponding to > 50 mR/hr WB at site boundary 2) Steam line break with > 50 gpm primary/secondary leakage and indication of failed fuel 3. Major damage to spent fuel	1) Rad protection confirms that effluent Tech Spec limit has been exceeded corresponding to > 1 rem/hr WB, 5 rem/hr thyroid at the site boundary	

Classification Criteria	
GENERAL EMERGENCY	3 of 3 barriers Lost or challenged
SITE AREA EMERGENCY	2 of 3 barriers Lost or challenged
ALERT	1 of 3 barriers Lost or challenged
UNUSUAL EVENT	No barriers lost or challenged

Indication of Barrier Challenge/Failure

RCS
(1) RVLMS < 50% (voiding upper plenum)
(2) RCS pressure > 2750 psia
(3) RCS pressure controlling on PZR safeties
(4) Uncontrolled loss of RCS inventory > 50 gpm

CONTAINMENT
(1) CIAS required but not completed
(2) H2 concentration > 3.5% by volume
(3) Containment pressure > 50 psig
(4) Physical breah of containment

CLAD
(1) ATWS
(2) Excessive RCS radioactivity (> 300 uCi/gm dose equivalent I-131)
(3) CET > 700 degrees F

VITAL AUXILIARIES/RADIATION RELEASE
(1) Loss of offsite and onsite AC power
(2) Loss of offsite and onsite AC power for longer than 15 min.
(3) Failure of safety system (both trains) to actuate when required.
(4) > 10 gpm primary/secondary leakage concurrent with loss of secondary coolant outside containment.

[5] * Protective action recommendations are based on plant and containment conditions and these recommendations are made to offsite officials even when no release is in progress.
** See Table of Alarm Setpoints on Pages 6, 7 and 8.

Example Emergency Action Levels (EALs) & Corresponding actions | 5

(Sheet 3 of 10)

Non RX Trip Events: Classification is based on the level of barrier/safety function degradation; however, classification for radioactivity release is based on a dose rate at the Site Boundary - i.e., a total site release rate for effluent monitors is determined by RP in accordance with their alarm setpoint procedure for Tech Spec limits.

	Examples Conditions per Classification					
Initiating Event	NUE	Alert	Site Area Emergency	General	Classification Criteria	Indication of Barrier Challenge/Failure
2) Noncompliance with a Technical Specification such that the requirement of the LCO and/or associated action requirements are not met within the specified time intervals	1) Tech Spec LCO noncomformance that requires Rx shutdown or prevents return to operation pending engineering evaluation 2) RCS sample activity requires shutdown per Tech Spec Section 3.4.7 3. RP confirms that effluent Tech Spec limits has been exceeded	1) RCS leak rate > 50 gpm 2) Rad monitoring system grab sample indicates > 1% failed fuel within 30 minute of total fuel failure	1) > 50 gpm primary/secondary leak rate with steam line break and indication of failed fuel	1) None		5. Violation of Tech Spec LCO or reliance on Tech Spec Section 3.0.3 for any of the following essential systems: ECCS, CNTMT Spray, Ultimate Heat Sink, SP, CST/RMWT, RWT, EC, ESS. CR HVAC, ADV, Aux Feedwater Operability (i.e., electrical power instrumentation, controls and other auxiliary equipment) shall be maintained on the above systems

* Protective action recommendations are based on plant and containment conditions and these recommendations are made to offsite officials even when no release is in progress.

Example Emergency Action Levels (EALs) & Corresponding actions

(Sheet 4 of 10)

Non RX Trip Events: Classification is based on the level of barrier/safety function degradation; however, classification for radioactivity release is based on a dose rate at the Site Boundary - i.e., a total site release rate for effluent monitors is determined by RP in accordance with their alarm setpoint procedure for Tech Spec limits.

Initiating Event	Examples Conditions per Classification: NUE	Alert	Site Area Emergency	General
3. Degraded facility control, indicators, and/or alarms	1) Degraded CR indicator/ alarms or process parameter indications such that plant shutdown is required	1) Loss of most or all annunciator 2) Evacuation of CR required or anticipated 3. Complete loss of any function needed for plant cold shutdown	1) Loss of most or all annunciators and plant transient initiated or in progress 2) Complete loss of any function needed for plant hot shutdown 3. Evacuation of CR with failure to establish local control of shutdown system within 15 minutes 4. Potential loss of physical control of the plant	1) Imminent loss of physical control of the plant (eg: intruders within vital areas)
4. Fire and/or Security compromise	1) Fire within the unit lasting more than 10 min 2) Security threat (eg: bomb threat attempted entry, attempted sabotage) 3. Civil disturbance	1) Fire potentially effecting safety systems 2) Ongoing security compromise 3. Evacuation of CR anticipated or required	1) Fire compromising the operability of safety systems 2) Potential loss of physical control of the plant	1) Imminent loss of physical control of the plant (eg: intruders within vital areas) 2) Any major internal or external events which could cause massive damage to plant systems and potentially lead to a release of radioactivity

Classification Criteria		Indication of Barrier Challenge/Failure
GENERAL EMERGENCY	3 of 3 barriers Lost or challenged	RCS (1) RVLMS < 50% (voiding upper plenum) (2) RCS pressure > 2750 psia (3) RCS pressure controlling on PZR safeties (4) Uncontrolled loss of RCS inventory > 50 gpm
SITE AREA EMERGENCY	2 of 3 barriers Lost or challenged	
ALERT	1 of 3 barriers Lost or challenged	
UNUSUAL EVENT	No barriers lost or challenged	CONTAINMENT (1) CIAS required but not completed (2) H2 concentration > 3.5% by volume (3) Containment pressure > 50 psig (4) Physical breah of containment CLAD (1) ATWS (2) Excessive RCS radioactivity (> 300 uCi/gm dose equivalent I-131) (3) CET > 700o F VITAL AUXILIARIES/RADIATION RELEASE (1) Loss of offsite and onsite AC power (2) Loss of offsite and onsite AC power for longer than 15 min. (3) Failure of safety system (both trains) to actuate when required (4) > 10 gpm primary/secondary leakage concurrent with LOP or, > 10 gpm primary/secondary leakage concurrent with loss of secondary coolant outside containment

* Protective action recommendations are based on plant and containment conditions and these recommendations are made to offsite officials even when no release is in progress.

Example Emergency Action Levels (EALs) & Corresponding actions |5

Non RX Trip Events: Classification is based on the level of barrier/safety function degradation; however, classification for radioactivity release is based on a dose rate at the Site Boundary - i.e., a total site release rate for effluent monitors is determined by RP in accordance with their alarm setpoint procedure for Tech Spec limits.

Initiating Event	Examples Conditions per Classification: NUE	Alert	Site Area Emergency	General	Classification Criteria	Indication of Barrier Challenge/Failure
	4. Security emergency	4. Plant conditions exist that warrant activation of Emergency Response Facilities and monitoring teams or a precautionary notification of the public near the site				(5) Violation of Tech Spec LCO or reliance on Tech Spec Section 3.0.3 for any of the following essential systems: ECCS, CNTMT Spray, Ultimate Heat Sinek, SP, CST/RMWT, RWT, EC, ESS. CR HVAC, ADV, Aus Feedwater Operability (i.e., electrical power instrumentation, controls and other auxiliary equipment) shall be maintained on the above systems.
5. Natural disaster/physical hazard to facility	1) Natural phenomenon beyond usual level experience or projected (eg: earthquake, flood, tornado) onsite |5|	1) Severe natural phenomena experienced or projected onsite with unit |5| in Modes 5-6 (eg: earthquake greater than OBE levels tornado striking facility)	1) Severe natural phenomena experienced or projected onsite |5| with Unit in Mode 1-4 (eg: earthquake greater than design level, flood or failure of protection of vital equipment)	1) Any major internal or external events which could cause massive damage to plant systems and potentially lead to a release of radioactivity		
	2) Other hazards experienced or projected (eg: aircraft crash, train derailment, explosion, toxic or flammable gas release near or on site)	2) Other hazard experienced or projected (eg: aircraft crash facility, explosion damage to facility affecting plant operation, toxic gas restricting entry to plant area(s)	2) Other hazards experienced or projected onsite with |5| Unit Modes 1-4 (eg: impact/fire or aircraft affecting vital structures, flammable /toxic gas permeating vital areas, severe damage to save shutdown equipment via missle/ explosion			

* Protective action recommendations are based on plant and containment conditions and these recommendations are made to offsite officials even when no release is in progress. |5

5.3-1
Example Emergency Action Levels (EALs) & Corresponding actions
(Sheet 6 of 10)
Palo Verde Nuclear Generating Station

Plant Vent Monitor Emergency Alarm Setpoints

Emergency Action Level	Unusual Event	Alert	Site Area Emergency 30 Min. @ EAL	Site Area Emergency 2 Min. @ EAL	General Emergency
Monitor/Channel	RU-143/1 High Alarm	RU-144/1 Alert Alarm	RU-144/1 High Alarm	RU-144/2 Alert Alarm	RU-144/2 High Alarm
Xe-133 equiv. $\frac{uCi}{cc}$ (Monitor)	5.20 E-3	4.55 E-2	4.55 E+0	4.55 E+1	9.1 E+1
Wash 1400 MFG $\frac{uCi}{cc}$ (Monitor)	3.2 E-3 (FSAR mix)	3.45 E-3	3.45 E-1	3.45 E+0	6.9 E+0
Monitor Count Rate (CPM-BKG)	1.57 E+5	3.47 E+2	3.47 E+4	419	826
Xe-133 equiv $\frac{uCi}{cc}$ (Site Boundary)	1.69 E-6	1.49 E-5	1.49 E-3	1.49 E-2	2.98 E-2
Wash 1400 MFG $\frac{uCi}{cc}$ (Site Boundary)	1.05 E-6 (FSAR mix)	1.13 E-6	1.13 E-4	1.13 E-3	2.26 E-3
Whole Body Gamma Dose Rate (mr/hr) (Site Boundary)	0.057	0.5	50	500	1000

Assumptions:
(1) Process System Maximum Design Flow, 107,000 SCFM
(2) X/Q = 6.49 E-6 sec/m3
(3) MFG = Mixed Fission Gases
(4) t = 20 min. after shutdown

5.3-1
Example Emergency Action Levels (EALs) & Corresponding actions
(Sheet 7 of 10)
Palo Verde Nuclear Generating Station

Condensor Evacuation Monitor Emergency Alarm Setpoints

Emergency Action Level	Unusual Event	Alert	Site Area Emergency 30 Min. @ EAL	Site Area Emergency 2 Min. @ EAL	General Emergency
Monitor/ Channel	RU-141 High Alarm	RU-142 Alert Alarm Channel 1	RU-142 Channel 1 High Alarm	RU-142 Channel 2 Alert Alarm	RU-142 Channel 2 High Alarm
Xe-133 equiv. $\frac{uCi}{cc}$ (Monitor)	1.91 E-1	1.71 E+0	1.71 E+2	1.71 E+3	3.43 E+3
Wash 1400 MFG $\frac{uCi}{cc}$ (Monitor)	1.2 E-1 (FSAR mix)	1.3 E-1	1.3 E+1	1.3 E+2	2.6 E+2
Monitor Count Rate (CPM-BKG)	5.9 E+6 or Full Scale	1.3 E+4	1.3 E+6 or Full Scale	1.56 E+4	3.11 E+4
Xe-133 equiv $\frac{uCi}{cc}$ (Site Boundary)	1.69 E-6	1.49 E-5	1.49 E-3	1.49 E-2	2.98 E-2
Wash 1400 MFG $\frac{uCi}{cc}$ (Site Boundary)	1.05 E-6	1.13 E-6	1.13 E-4	1.13 E-3	2.26 E-3
Whole Body Gamma Dose Rate (mr/hr) (Site Boundary)	0.057	0.5	50	500	1000

Assumptions:
(1) Process System Maximum Design Flow, 2,840 CFM
(2) X/Q = 6.49 E-6 sec/m3
(3) MFG = Mixed Fission Gas
(4) t = 20 min. after shutdown

5.3-1
Example Emergency Action Levels (EALs) & Corresponding actions
(Sheet 8 of 10)
Palo Verde Nuclear Generating Station

Fuel Handling Building Emergency Alarm Setpoints

Emergency Action Level	Unusual Event	Alert	Site Area Emergency 30 Min. @ EAL	Site Area Emergency 2 Min. @ EAL	General Emergency
Monitor/ Channel	RU-145/1 High Alarm	RU-146/1 Alert Alarm	RU-146/1 High Alarm	RU-146/2 Alert Alarm	RU-146/2 High Alarm
Xe-133 equiv. $\frac{uCi}{cc}$ (Monitor)	1.67 E-2	1.47 E-1	1.47 E+1	1.47 E+2	2.95 E+2
Wash 1400 MFG $\frac{uCi}{cc}$ (Monitor)	1.04 E-2 (FSAR mix)	1.12 E-1	1.12 E+0	1.12 E+1	2.24 E+1
Monitor Count Rate (CPM-BKG)	5.1 E+5 or Full Scale	1.13 E+3	1.13 E+5 or Full Scale	1340	2680
Xe-133 equiv $\frac{uCi}{cc}$ (Site Boundary)	1.69 E-6	1.49 E-5	1.49 E-3	1.49 E-2	2.98 E-2
Wash 1400 MFG $\frac{uCi}{cc}$ (Site Boundary)	1.05 E-6 (FSAR mix)	1.13 E-6	1.13 E-4	1.13 E-3	2.26 E-3
Whole Body Gamma Dose Rate (mr/hr) (Site Boundary)	0.057	0.5	50	500	1000

Assumptions:
(1) Process System Maximum Design Flow, 33,000SCFM
(2) X/Q = 6.49 E-6 sec/m3
(3) MFG = Mixed Fission Gases
(4) t = 20 min. after shutdown

LICENSEE ACTIONS

NOTE

Actions are for information only, to be carried out per applicable EPIP

Unusual Event

- Inform NRC, State & County authorities of nature of unusual conditions; no release of radioactive material requiring offsite response or monitoring is expected unless further degradation of safety systems occur
- Based on the situation, recommend that no protective action is necessary or to standby for update.
- Terminate with verbal summary to offsite authorities followed by written report within 24 hours

  OR
- Escalate to a higher classification

Alert

- Inform NRC, State & County authorities of Alert status/cause; any released are expected to be limited to small fractions of EPA/PAG exposure levels at the site boundary unless further degradation of safety systems occur
- Recommend to the State that the Public be appraised of the situation and stay tuned to EBS/KTAR radio station
- Augment resources by activating STSC, TSC, OSC, EOF, JENC, CHIC, and CEC
- Dispatch (onsite/offsite Field Monitoring Teams with associated communications equipment
- Provide meteorological assessments to offsite authorities and if releases are occurring, dose estimates for actual releases
- Terminate by verbal summary to offsite authorities followed by written summary within 8 hours

  OR
- Escalate to a higher classification

Site Area Emergency

- Inform NRC, State & County authorities of Site Area Emergency status/cause; any releases are not expected to exceed EPA/PAG exposure levels exposure levels beyond the boundary unless further degradation of safety systems occur
- Recommend to the State that consideration of appropriate protective actions based on actual or projected data is warranted per the appropriate EPIP
- Dispatch (onsite/offsite) Field Monitoring Teams with associated communications equipment
- Provide a dedicated individual for plant status updates to offsite authorities
- Provide meteorological data and dose estimates (for actual release) to offsite authorities
- Provide release and dose projections based on available plant condition information and foreseeable contingencies
- Terminate (or reduction of) emergency class verbally at EOF followed by written summary within eight hours

  OR
- Escalate to GENERAL EMERGENCY

General Emergency

- Inform NRC, State & County authorities of General Emergency status/cause; any releases can be reasonable expected to exceed EPA/PAG exposure levels offsite for more than the immediate site area
- Recommend to the State that consideration of appropriate protective actions based on actual projected data is warranted per the appropriate EPIP
- Augment resources by activating STSC, TSC, OSC, EOF, JENC, CHIC and CEC
- Dispatch (onsite/offsite) Field Monitoring Teams with associated communications equipment
- Provide a dedicated individual for plant status updates of offsite authorities
- Make senior technical and management staff available for periodic consultation with NRC and State
- Provide meteorological data and dose estimates (for actual releases) to offsite authorities via a dedicated individual
- Provide release and dose projections based upon available foreseeable contingencies
- Terminate (or reduction of) emergency classification by briefing authorities at the EOF followed by written summary within eight hours.

5.3-1
STATE/COUNTY ACTIONS
(Sheet 10 of 10)

Unusual Event

- o ADES Duty Officer staff State EOC
- o ARRA Duty Officer acquires follow-up information from STSC
- o County EOC on standby and alert fan-out
- o Provide offsite assistance if required (fire, security, medical, etc.)
- o Offsite notification per notification procedures
- o Escalate to a higher classification

Alert

- o Activate County EOC
- o Activate State EOC and TOC
- o Partially activate REAT forward
- o Provide confirmatory offsite radiation monitoring and calculate dose projections if actual releases substantially exceed Technical Specification limits
- o Provide assistance, if requested (fire, security, medical, etc.)
- o Implement protective actions if needed
- o Maintain ALERT status until verbal termination
  OR
- o Escalate to a higher classification

Site Area Emergency

- o County EOC activated
- o County response agencies activated
- o Augment resources by activating State EOC
- o State and Operations Agency on standby
- o Initiate immediate public notification of SITE AREA EMERGENCY status; provide periodic public updates
- o Resource Agencies activated
- o Dispatch key emergency personnel, including monitoring teams with communications equipment
- o Alert other personnel to standby status (eg, those needed for traffic control or evacuation) and dispatch personnel to near-site duty stations
- o Perform dose calculations based on current release rates and implement necessary protective actions
- o Provide offsite monitoring results to APS and jointly discuss them
- o Continuously assess field information from APS & State/County monitoring teams with regard to initiating/modifying public protective action
- o Provide assistance requested
- o Evaluate data and initiate ingestion pathway protective protection actions as appropriate
- o Provide press briefings
- o Maintain SITE AREA EMERGENCY status until termination or reduction of emergency class
  OR
- o Escalate to GENERAL EMERGENCY

General Emergency

- o Initiate immediate public notification of GENERAL EMERGENCY status and provide periodic public updates
- o Augment resources by activating State EOC and activate Op. Group Staff
- o Activate State Resources Support Operations Agencies
- o Deploy County Response Agencies
- o Provide press briefings
- o Dispatch key emergency personnel, including monitoring teams with communications equipment
- o Continue performing dose calculations with regard to upgrading/modifying protective actions
- o Dispatch other emergency personnel to duty stations within a 10 mi radius and alert others to standby status
- o Provide offsite monitoring result to APS and jointly discuss these
- o Continuously assess field information from APS and State/County monitoring teams with regard to initiating/modifying public protective actions
- o Evaluate field and lab analysis for implementation/modification of ingestion pathway actions
- o Consider/implement protective actions based on current assessment
- o Provide assistance
- o Maintain GENERAL EMERGENCY status until termination or reduction of emergency class