

Palo Verde Nuclear Generating Station
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102-07228-JF/WDP
April 6, 2016

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Dear Sirs:

**Subject: Palo Verde Nuclear Generating Station (PVNGS)
Units 1, 2, and 3 and Independent Spent Fuel Storage
Installation
Docket Nos. 50-528, 50-529, 50-530 and 72-44
License Nos. NPF-41, NPF-51 and NPF-74
PVNGS Emergency Plan, Revision 56**

Pursuant to 10 CFR 50.54(q) and 10 CFR 50 Appendix E, Section V, Arizona Public Service Company (APS) is forwarding a copy of Revision 56 to the *PVNGS Emergency Plan*, effective March 17, 2016, and a summary of the 10 CFR 50.54(q) analysis for this plan revision. APS has evaluated the changes incorporated in this revision, and determined the changes do not reduce the effectiveness of the Emergency Plan and the Plan continues to comply with the standards of 10 CFR 50.47(b) and the requirements of Appendix E to 10 CFR 50.

In accordance with 10 CFR 50.4(b), copies are being forwarded to the NRC Region IV Administrator and the Resident Inspector. No commitments are being made to the NRC by this letter. Should you have any question regarding this submittal, please contact me at (623) 393-5045.

Sincerely,

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U.S. Nuclear Regulatory Commission
Revision 56 to *PVNGS Emergency Plan*
Page 2

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Enclosure 1 – *PVNGS Emergency Plan*, Revision 56
Enclosure 2 - Summary of the 10 CFR 50.54(q) Analysis on Emergency Plan
Revision 56

Enclosure 1

PVNGS Emergency Plan, Revision 56

PVNGS EMERGENCY PLAN

REVISION 56

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EFFECTIVE DATE: March 17, 2016

PVNGS EMERGENCY PLAN

REVISION 56

DESCRIPTION OF CHANGE

The last sentence in Section 8.2 was revised from “Changes to the Emergency Plan or Implementing Procedures shall be submitted to the NRC within 30 days of such changes” to the new wording, “Changes to the Emergency Plan shall be submitted to the NRC within 30 days of such changes.”

Change rational: With the revision to 10CFR50 Appendix E. V, NRC submittals of the Emergency Plan Implementing Procedures are no longer required.

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INTRODUCTION

Palo Verde Nuclear Generating Station (PVNGS) is a jointly-owned three-unit Pressurized Water Reactor (PWR) power station operated by Arizona Public Service (APS). The station is located in Maricopa County, South of Wintersburg, Arizona.

THE PVNGS EMERGENCY PLAN:

- Describes the organization formed and facilities available to manage emergency situations;
- Classifies emergencies according to severity of consequences;
- Defines and assigns responsibilities for emergency response actions;
- Outlines courses of action and protective measures to mitigate the consequences of an accident and to safeguard station personnel and the public;
- Presents a general post-emergency plan and organization to restore the plant to a normal operating status;
- Defines methods and processes to inform the public.

The accidents which might occur at PVNGS are analyzed in Chapter 15 of the PVNGS UFSAR in terms of severity of consequence. The Independent Spent Fuel Storage Installation (ISFSI), which is stationary and centrally located within the PVNGS exclusion area boundary, is analyzed in the Cask UFSAR and satisfies the requirements for off-normal radiological dose. The PVNGS UFSAR analyzed accidents reflect the design characteristics of a Pressurized Water Reactor (PWR) and are addressed by PVNGS Emergency Operating Procedures (EOPs) and Emergency Plan Implementing Procedures (EPIPs). Postulated events concerning the ISFSI are encompassed by the scheme of EALs designated for PVNGS.

1.0 DEFINITIONS AND ABBREVIATIONS

1.1 DEFINITIONS

The following are definitions of terms commonly used in this Emergency Plan.

Area Radiation Monitoring System (ARMS)

An instrumentation system designed to detect abnormal area radiation levels and activate corresponding station alarms.

Assessment Actions

Are actions performed during or after an incident, to obtain and process information necessary to determine the character and magnitude of the incident and to implement specific emergency measures.

Committed Dose Equivalent (CDE)

CDE is the dose equivalent to organs or tissues of reference that will be received from an intake of radioactive material by an individual during the 50-year period following the intake.

Committed Effective Dose Equivalent (CEDE)

CEDE is the sum of the products of the weighting factors applicable to each of the body organs or tissues that are irradiated and the CDE to these organs or tissues.

Controlled Area

An area outside of the **Restricted Area** but inside the **Site Boundary** access that can be limited by the licensee for any reason.

Corrective Actions

Measures taken to terminate an emergency situation at or near the source of the problem.

County Emergency Operations Center (County EOC)

The County EOC is located at the Maricopa County Department of Emergency Management (MCDEM) Headquarters at 5630 E. McDowell Road, Phoenix, Arizona, and is the primary point through which the Chairman, Maricopa County Board of Supervisors/designee exercises coordination over county emergency response actions conducted within the EPZ.

Deep-Dose Equivalent (DDE)

DDE is the dose equivalent at a tissue depth of 1 cm (1000 mg/cm²), which applies to external whole- body exposure.

Dose Equivalent (DE)

DE is the product of the absorbed dose in tissue, quality factor and all other necessary modifying factors at the location of interest. The units of dose equivalent are the rem and sievert (Sv).

Effective Dose Equivalent (EDE)

EDE is the sum of the products of the dose equivalent to each organ or tissue and a weighting factor applicable to each of the body organs or tissues that are irradiated.

Emergency Action Levels (EALs)

Parameters used to designate a particular classification of emergency. These parameters may include radiological dose rates, levels of airborne or waterborne activity, or instrument indications/plant parameter values.

Emergency Response Organization (ERO)

The individuals within the PVNGS organization designated to respond to an emergency.

Exclusion Area Boundary

An area surrounding the reactor in which the reactor licensee has the authority to determine all activities, including exclusion or removal of personnel and property from the area.

Full Participation

Full participation when used in conjunction with emergency preparedness exercises for a particular site means appropriate offsite local and State authorities and licensee personnel physically and actively take part in testing their integrated capability to adequately assess and respond to an accident at a commercial nuclear power plant. Full participation includes testing major observable portions of the onsite and offsite emergency plans and mobilization of State, local and licensee personnel and other resources in sufficient numbers to verify the capability to respond to the accident scenario.

Hostile Action

An act towards a nuclear power plant or its personnel that includes the use of violent force to destroy equipment, take hostages, and/or intimidates the licensee to achieve an end. This includes attack by air, land, or water using guns, explosives, projectiles, vehicles, or other devices used to deliver destructive force. Other acts that satisfy the overall intent may be included. Hostile action should not be construed to include acts of civil disobedience or felonious acts that are not part of a concerted attack on the nuclear power plant. Non-terrorist-based EALs should be used to address such activities, (e.g., violent acts between individuals in the owner controlled area).

Independent Spent Fuel Storage Installation (ISFSI)

A complex designed and constructed for the interim storage of spent nuclear fuel and other radioactive materials associated with spent fuel storage. The PVNGS ISFSI is located approximately 605 feet northeast of the PVNGS Power Plant Protected Area.

Ingestion Exposure Pathway Emergency Planning Zone (IPZ)

The IPZ is the fifty-mile radius area (Figure 13), centered on the vertical axis of the Unit 2 Containment Building for which protective actions for the general population, farmers, dairy farmers, ranchers, food processors and distributors are planned.

Inplant

The area located within the confines of the PVNGS Power Plant **Protected Area**.

Joint Information Center (JIC)

Combined PVNGS/state/county function; located at 600 North Airport Road, Building A, Buckeye, Arizona. The JIC is responsible for issuing news information during an Alert or higher level emergency classification.

Nuclear Administrative and Technical Manual (NATM)

The collection of onsite programs and procedures which prescribes how PVNGS is controlled, operated, maintained, and tested to meet the requirements of applicable licenses, standards, codes, and guides. It establishes effective management practices.

Offsite

Any position or area not located within the confines of the **Site Boundary**.

Offsite Emergency Response Organization

The Emergency Response Organization for State and local governments described in the Offsite Emergency Response Plan for the Palo Verde Nuclear Generating Station.

Offsite Emergency Response Plan for Palo Verde Nuclear Generating Station

Is the State of Arizona/ Maricopa County Plan for governmental response to emergencies at PVNGS? The Plan sets forth specific responsibilities and procedures for state, local and volunteer agencies responsible for offsite emergency operations and protection of the affected population.

On-Shift Emergency Response Organization

The emergency response positions on shift as designated in Table 1, Minimum Shift Staffing for Emergencies. Typically positions required by plant technical specifications, fire protection program, security plan and the radiological emergency plan designated to respond in the initial phase of an emergency.

Onsite

Any position or area located within the confines of the **Site Boundary**.

Onsite Emergency Response Organization

The augmented PVNGS emergency response organization used to staff the Technical Support Center, Operations Support Center, Emergency Operations Facility, Joint Information Center, etc.. Table 1, Minimum Shift Staffing for Emergencies denotes the required augmented positions.

Owner Controlled Area

The area owned by the licensee and located within the confines of the **Site Boundary** as shown in Figure 12.

Partial Participation

Partial participation when used in conjunction with emergency preparedness exercises for a particular site means appropriate offsite authorities shall actively take part in the exercise sufficient to test direction and control functions; i.e., (a) protective action decision making related to emergency action levels, and (b) communication capabilities among affected State and local authorities and the licensee.

Plant Property Line

The boundary enclosing the area owned by the licensee and corresponding to the **Site Boundary**, with the addition of purchased property located immediately north of the northwest corner of the **Site Boundary** and extending to the Buckeye-Salome Highway.

Plume Exposure Pathway Emergency Planning Zone (EPZ)

The Plume Exposure Pathway EPZ is the ten-mile radius area, centered on the vertical axis of the Unit 2 Containment Building, for which protective actions are planned.

Population-at-Risk

Persons for whom protective actions are being, or would be, implemented.

Process Radiation Monitoring System (PRMS)

An instrumentation system designed to detect abnormal radiation levels in process and effluent pathways, and to activate appropriate alarms.

Protective Actions

Emergency measures taken to avoid or reduce radiation dose. These commonly include sheltering, evacuation, and prophylaxis.

Protective Action Guides (PAGs)

Is the projected dose to individuals that would warrant consideration of protective action against an accidental release of radioactive material.

Protected Area(s) (PA)

An area, located within the PVNGS **Exclusion Area Boundary**, encompassed by physical barriers and to which access is controlled per 10 CFR 73.55. The PVNGS Power Plant Protected Area and the ISFSI Protected Area are two Protected Areas located within the PVNGS **Owner Controlled Area**.

Recovery Actions

Are post-emergency actions to restore the station to a normal operating condition.

Restricted Area

An area access to which is limited by the licensee for the purpose of protecting individuals against undue risks from exposure to radiation and radioactive materials.

Site Boundary

The boundary of a reactor site beyond which the land or property is not owned, leased, or otherwise controlled by the licensee.

State Emergency Operations Center (State EOC)

The State EOC is located at the ADEM Headquarters and is the primary point through which the Governor/designee exercises overall control and coordination of governmental offsite emergency response operations.

Technical Operations Center (TOC)

The TOC is co-located with the State EOC. The TOC is the offsite location that provides for overall control of radiological technical operations.

Total Effective Dose Equivalent (TEDE)

TEDE is the sum of the Deep-Dose Equivalent (for external exposures) and the CEDE (for internal exposures).

Unrestricted Area

An area access to which, is neither limited nor controlled by the licensee.

Vital Area

An area within the PVNGS Power Plant **Protected Area** encompassed by additional physical barriers and to which access is controlled per 10 CFR 73.55. Vital areas contain equipment considered vital to the operation of the plant.

1.2 ABBREVIATIONS

The following are abbreviations of terms commonly used at PVNGS.

ADEM	-	Arizona Division of Emergency Management
ADV	-	Atmospheric Dump Valve
APS	-	Arizona Public Service Company
ARRA	-	Arizona Radiation Regulatory Agency
ASU	-	Arizona State University
BOP	-	Balance of Plant
BPD	-	Buckeye Police Department
CDE	-	Committed Dose Equivalent
CEDE	-	Committed Effective Dose Equivalent
CEDMCS	-	Control Element Drive Mechanism Control System
CEO	-	Chief Executive Officer
CET	-	Core Exit Thermocouple
CFR	-	Code of Federal Regulations
CR	-	Control Room
CRDR	-	Condition Report Disposition Request
CRS	-	Control Room Supervisor
CTMT	-	Containment
DDE	-	Deep Dose Equivalent
DE	-	Dose Equivalent
DHS	-	Department of Homeland Security
DOE	-	Department of Energy
DPS	-	(Arizona) Department of Public Safety
EAL	-	Emergency Action Level
EAS	-	Emergency Alert System
EC	-	Emergency Coordinator
EDE	-	Effective Dose Equivalent
EDG	-	Emergency Diesel Generator
EMT	-	Emergency Medical Technician
ENS	-	Emergency Notification System
EOC	-	Emergency Operations Center
EOD	-	Emergency Operations Director
EOF	-	Emergency Operations Facility
EOP	-	Emergency Operating Procedure
EPA	-	Environmental Protection Agency
EPABX	-	Electronic Private Automatic Branch Exchange
EPD	-	Electronic Personal Dosimeter
EPIP	-	Emergency Plan Implementing Procedure
EPZ	-	Emergency Planning Zone
ERDS	-	Emergency Response Data System
ERFDADS	-	Emergency Response Facility Data Acquisition & Display System
ERF	-	Emergency Response Facility
ERO	-	Emergency Response Organization
ESF	-	Engineered Safety Features
FEMA	-	Federal Emergency Management Agency
FPS	-	Fire Protection System
FSS	-	Fire Suppression System

1.2 ABBREVIATIONS (CONTINUED)

FTS	-	Federal Telecommunications System
FWLB	-	Feed-water Line Break
GPM	-	Gallons per Minute
HP	-	Health Physics
HPN	-	Health Physics Network
HPSI	-	High Pressure Safety Injection
I & C	-	Instrumentation and Control
INPO	-	Institute of Nuclear Power Operations
IPZ	-	Ingestion Pathway Zone
ISFSI	-	Independent Spent Fuel Storage Installation
JIC	-	Joint Information Center
JPIP	-	Joint Public Information Procedure
KI	-	Potassium Iodide
LAN	-	Local Area Network
LCO	-	Limiting Condition for Operation
LOAF	-	Loss of All Feed
LOCA	-	Loss of Coolant Accident
LPSI	-	Low Pressure Safety Injection
LWR	-	Light Water Reactor
MCDEM	-	Maricopa County Department of Emergency Management
MCPL	-	Management Counterpart Link
MCSO	-	Maricopa County Sheriff's Office
MSLB	-	Main Steam Line Break
NAN	-	Notification Alert Network
NATM	-	Nuclear Administrative and Technical Manual
NOAA	-	National Oceanic and Atmospheric Administration
NRC	-	Nuclear Regulatory Commission
NSSS	-	Nuclear Steam Supply System
NWS	-	National Weather Service
OBE	-	Operating Basis Earthquake
ODCM	-	Offsite Dose Calculation Manual
OSC	-	Operations Support Center
PAD	-	Protective Action Decision
PAG	-	Protective Action Guide
PAR	-	Protective Action Recommendation
PASP	-	Preplanned Alternate Sampling Program
PBX	-	Private Branch Exchange
PI	-	Plant Information
PIO	-	Public Information Officer
PMCL	-	Protective Measures Counterpart Link
PSIG	-	Pounds Per Square Inch Gauge
PVAR	-	Palo Verde Action Request
PVNGS	-	Palo Verde Nuclear Generating Station
PWR	-	Pressurized Water Reactor
QSPDS	-	Qualified Safety Parameter Display System
RAC	-	Radiological Assessment Coordinator
RACOMM	-	Radiological Assessment Communicator
RCS	-	Reactor Coolant System
REAT	-	Radiological Emergency Assistance Team

1.2 ABBREVIATIONS (CONTINUED)

RFAT	-	Radiological Field Assessment Team
RMS	-	Radiation Monitoring System
RP	-	Radiation Protection
RPC	-	Radiological Protection Coordinator
RPM	-	Radiation Protection Monitor
RPS	-	Reactor Protection System
RSCL	-	Reactor Safety Counterpart Link
RSP	-	Remote Shutdown Panel
RVLMS	-	Reactor Vessel Level Monitoring System
SGTR	-	Steam Generator Tube Rupture
SIM	-	(Control Room) Simulator
SPDS	-	Safety Parameter Display System
SM	-	Shift Manager
STA	-	Shift Technical Advisor
STSC	-	Satellite Technical Support Center
SWMS	-	Site Work Management System
TEDE	-	Total Effective Dose Equivalent
TLD	-	Thermoluminescent Dosimeter
TOC	-	Technical Operations Center
TSC	-	Technical Support Center
UFSAR	-	Updated Final Safety Analysis Report
UPS	-	Uninterruptible Power Supply

2.0 SCOPE AND APPLICABILITY

This Emergency Plan is applicable to PVNGS. Specific procedures to implement the Emergency Plan are listed in Section 13.0, Emergency Plan Implementing Procedures.

There are also various supporting and complementing emergency plans, including those of Federal Agencies, the State of Arizona and Maricopa County.

3.0 SUMMARY OF THE PVNGS EMERGENCY PLAN

The Emergency Plan is designed to adhere to Nuclear Regulatory Commission (NRC) emergency planning regulations and guidelines applicable to commercial nuclear power stations. The Emergency Plan is based upon NRC and Federal Emergency Management Agency (FEMA) guidance as contained in NUREG-0654/FEMA-REP-1, Revision 1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants", and EPA guidance as contained in EPA 400-R-92-001, "Manual of Protective Action Guides and Protective Actions for Nuclear Incidents" October, 1991. Radiological emergency planning for the PVNGS has been coordinated with state and local emergency response agencies.

The State of Arizona and local government agencies who may be involved in emergency response operations are aware of the emergency response measures described in the

PVNGS Emergency Plan and are advised of changes or modifications to these measures resulting from plan reviews, audits, drills and/or exercises along with changes to Regulatory guidance.

Both the Offsite Emergency Response Plan for PVNGS and the PVNGS Emergency Plan contain clear-cut definitions of areas of authority and responsibility. The ADEM, acting under the direction and authority of the Governor, is responsible for overall coordination of offsite governmental emergency operations. The PVNGS Emergency Organization is responsible for onsite emergency operations and for providing timely and accurate plant status information to offsite emergency authorities. The ARRA has been assigned technical (radiological) responsibility for governmental response within Arizona. Emergency operations within the Plume Exposure Pathway EPZ is the responsibility of Maricopa County.

4.0 ORGANIZATIONAL CONTROL OF EMERGENCIES

In the event of an emergency, the normal station operational organization is supplemented with an organization specifically designed to respond to emergency situations. Depending on the severity of the emergency, the Emergency Organization may consist of an on-shift emergency response organization, or of an augmented emergency response organization comprised of station, corporate and contract personnel. This section describes the On-shift, On-site and Off-site Emergency Organizations.

4.1 NORMAL ORGANIZATIONS

The Executive Vice President & Chief Nuclear Officer, reports to the APS President & Chief Executive Officer. The Executive Vice President & Chief Nuclear Officer has the overall responsibility and authority for the operation and technical support of PVNGS. The Executive Vice President & Chief Nuclear Officer and the nuclear organization have the overall responsibility and authority to ensure that all activities associated with APS' nuclear facilities are carried out with the highest standards of safety and ensuring the station is operated in accordance with (IAW) the licenses granted by the NRC, the Technical Specifications, and the requirements and commitments stated in the UFSAR.

The onsite station organization is divided into four main groups which report to the Executive Vice President & Chief Nuclear Officer.

Each group is divided into subordinate departments and sections. The four groups are as follows:

- Nuclear Site Operations
- Regulatory Affairs Oversight and Performance Improvement
- Operations Support
- Engineering

4.2 THE EMERGENCY RESPONSE ORGANIZATION

[Ref. INPO IER L1 13-10, Recommendation 5g]

The Emergency Response Organization (ERO) consists of personnel staffing in the Control Room/STSC, Operations Support Center (OSC), Technical Support Center (TSC), Emergency Operations Facility (EOF) and the Joint Information Center (JIC).

The PVNGS ERO is supported by designated facilities as described in Section 7.0, Emergency Facilities and Equipment. The on-shift emergency response organization is augmented at declaration of an Alert or higher emergency classification level.

In the event a member of the ERO minimum staff becomes incapacitated or is otherwise unavailable, they shall be replaced as soon as reasonably possible. Operating unit staff who are ERO members are governed by PVNGS Technical Specification 5.2 and its exceptions.

During normal station work hours, notification of on-site ERO may occur via PA announcement, emergency evacuation system and/or mobile devices.

During off-hours, notification of ERO is accomplished by activating the automated callout system. A manual system is also available if the automated system is not available.

For an Unusual Event classification, on-shift personnel respond to the emergency and the event is directed from the affected unit Control Room/ STSC. Command of the situation remains there with the on-shift Emergency Coordinator (EC) until termination/recovery or reclassification to a higher level emergency occurs. For events affecting all three units, command and control is in Unit 1. Palo Verde Communications provides media interface during an Unusual Event.

In the event of an Alert or higher classification level, the on-shift EC orders the activation of the TSC, OSC, EOF, and JIC. The on-site ERO is directed by the EC-TSC. The EOD in the EOF provides overall coordination of the event and direction of the ERO.

4.2.1 ON-SHIFT EMERGENCY ORGANIZATION

Palo Verde Nuclear Generating Station on shift emergency organization is sufficient to permit the required mitigation response and effectively implement the Emergency Plan as required in 10CFR50 Appendix E.

Table 1 of the Emergency Plan reflects the results of the Palo Verde On-Shift Emergency Response Organization Staffing and Capabilities analysis as required by 10 CFR 50, Appendix E. The Palo Verde On-Shift Emergency Response Organization Staffing and Capabilities analysis is retained as Correspondence # 090-05063 (RCTSAI 4164598).

The On-shift Emergency Organization (Figure 1) consists of the following positions:

4.2.1.1 Emergency Coordinator (EC)

[Ref. INPO IER L1 13-10, Recommendation 5i]

The affected unit Shift Manager (SM) or designee initially assumes the responsibilities of the EC and is responsible for direction and coordination of the response. Members of the normal shift organization assume emergency positions to carry out actions as described below.

The EC has the responsibility and authority to immediately and unilaterally initiate emergency actions, including providing notification and Protective Action (PAR) Recommendations to governmental agencies responsible for implementing off-site emergency measures. The EC is also responsible for communication of plant status and radiological conditions including dose projection results as appropriate.

Procedures provide for accelerated calls and verbal notification to the NRC using the Emergency Notification System (ENS) of Security-based events considered to be a credible imminent threat or Hostile Action.

The affected unit Shift Manager may choose to be relieved as EC by another individual qualified as an EC.

At an Alert or higher emergency classification level, the EC directs the Security Director to initiate callouts to the ERO in accordance with the associated implementing procedure. Upon arrival of the designated EC-TSC, the EC-STSC conducts a briefing and is relieved as the Emergency Coordinator.

At the onset of an incident, the EC has the following responsibilities:

- Notification of offsite emergency response agencies and off-site emergency organizations (non delegable duty until relieved by EOD)
- Provision of PARs as necessary to off-site emergency management agencies (non delegable duty until relieved by EOD)
- Subsequent reclassification of emergency events (non delegable)
- Determination of the necessity for site evacuation authorization for emergency workers to exceed 10CFR20 exposure limits
- Initiate activation of on-site and off-site ERO organizations for an alert or higher emergency classification level

4.2.1.2 Control Room Supervisor

The Control Room Supervisor (CRS) located in the unit control rooms, reports to the EC. The CRS performs initial assessment and evaluation of any abnormal or emergency conditions. After the EC declares an emergency, the CRS maintains the normal duties of directing the Nuclear Operators and assisting the EC.

4.2.1.3 Fire Team

The Fire Team (minimum of 5 individuals) reports to the CRS and is maintained on-site at all times. The Leader of Fire Protection Department is responsible for ensuring sufficient members of the Fire Team are Emergency Medical Technician (EMT) qualified and available at all times.

4.2.1.4 Fire Team Advisor

The Fire Team Advisor is a Reactor Operator/Auxiliary Operator that supports the Fire Team during a fire. The Fire Team Advisor should have no collateral duties that interfere with the ability to support the Fire Team.

4.2.1.5 Control Room Operators

The Control Room Operators report to the CRS and conduct the safe and proper operation of the unit at all times, and respond to emergency conditions, as necessary.

4.2.1.6 Radiation Monitoring Technician

The Radiation Monitoring Technician reports to the Radiation Protection Monitor (RPM) and establishes a response area in the Radiation Monitoring office and conducts in-plant area surveys as necessary.

4.2.1.7 Radiation Protection Monitor (RPM)

The Radiation Protection Monitor (RPM) an ANSI 3.1 Senior Radiation Protection Technician responds to the STSC and reports to the EC. The RPM conducts offsite dose calculations until relieved. The RPM authorizes exposures up to 10CFR20 Limits, recommends potassium iodide administration to the EC and directs in-plant, onsite and offsite Radiation Monitoring Teams.

4.2.1.8 STSC Communicator

The STSC Communicator is filled by an Auxiliary Operator. Upon direction from the EC, the STSC Communicator makes the initial notifications to state and local agencies and the ERO.

4.2.1.9 Emergency Notification System (ENS) Communicator

The ENS Communicator is filled by an individual knowledgeable of the plant (e.g., RO, SRO, STA, previously licensed individual, etc.) and keeps an open line of communications with the NRC, as requested. This communicator should not have any other E-Plan collateral duties (or other duties that interfere with the communicator function).

4.2.1.10 Security Director

The Security Director initially responds to the Shift Manager/EC and then reports to the EC in the TSC. The Security Director (assumed by the on-shift Security Section Leader) provides for continued personnel accountability, site access control and requests offsite emergency assistance, upon direction from the EC.

4.2.1.11 Security Force

The Security Force reports to locations as directed by the Security Director and assists in performing assigned duties.

4.2.1.12 Shift Manager

The Shift Manager is also the EC-STSC until relieved by the EC-TSC. Following turnover the Shift Manager reports to the EC. The Shift Manager performs initial classification and declaration of an emergency, maintains control of unit operations, and mitigates accident conditions.

4.2.1.13 Shift Technical Advisor

The Shift Technical Advisors (STA) responds to the Control Room or STSC of the affected unit and reports to the EC. The affected unit STA advises the EC on activities that impact the safe operation of the unit, and independently verifies emergency classifications, as time permits. For events classified as an Alert or higher emergency classification level, the affected unit STA activates ERDS.

4.2.1.14 Shift Technical Advisor (Unaffected Unit)

The unaffected unit STA assesses core damage, and provides electrical and mechanical technical support until relieved by the TSC. The STA also monitors various data displays throughout the course of the emergency and provides assistance to the Control Room personnel.

4.2.1.15 Technicians

Technicians report to the EC and if necessary, may be assigned to Emergency Repair or Survey teams. The Chemistry Technicians, Maintenance Technicians (Mechanics, Electrical, Instrument and Control) respond to the OSC for assignment.

4.2.1.16 Operations Advisor

The Operations Advisor responds to the STSC and reports to the EC. The Operations Advisor provides technical and operational advice to the EC-STSC. Following TSC activation, the Operations Advisor maintains the flow of information between the EC-TSC and Control Room.

4.2.1.17 Survey/Environmental Teams

A Survey/Environmental Team is formed and responds to the OSC, upon request from the Radiation Protection Monitor (RPM). The team performs radiological monitoring activities and at least one member of the team is a Radiation Protection Technician.

4.2.1.18 Emergency Repair Teams

The Emergency Repair Team conducts repairs and may consist of Chemistry and Maintenance Technicians, Plant Operators and a Radiation Protection Technician, and reports to the EC.

4.2.2 TECHNICAL SUPPORT CENTER (TSC) ORGANIZATION (ONSITE)

The TSC Organization is located on-site and is illustrated in Figure 2 and consists of the following positions.

4.2.2.1 Emergency Coordinator TSC (EC-TSC)

The EC-TSC responds to the TSC and is responsible for direction and coordination of the onsite Emergency Organization.

4.2.2.2 Emergency Coordinator (EC) Technical Assistant

The EC Technical Assistant responds to the TSC and reports to the EC. The EC Technical Assistant follows procedures that the Control Room is using, and keeps the EC informed of the operational impact of events in progress. The EC Technical Assistant has no counterpart in the on-shift Emergency Organization.

4.2.2.3 Maintenance Manager

The Maintenance Manager responds to the TSC and reports to the EC. The Maintenance Manager coordinates the repair and damage control for all plant systems and directs the emergency response activities of the Emergency Repair Teams (4.2.1.17). The Maintenance Manager directs the OSC Manager to form and dispatch any team that is required and maintains communication with the OSC concerning repair team efforts.

4.2.2.4 Engineering Manager

The Engineering Manager responds to the TSC and reports to the EC. The Engineering Manager directs systems analysis, engineering and any procedure development as required by the emergency and maintains liaison with the Engineering Director in the EOF.

4.2.2.5 Mechanical Engineer

The Mechanical Engineer responds to the TSC and reports to the Engineering Manager. The Mechanical Engineer assumes the duties of Technical Support Mechanical from the STA in the STSC and provides mechanical engineering analyses.

4.2.2.6 Operations Manager

The Operations Manager responds to the TSC and reports to the EC. The Operations Manager receives technical and operational input from the Operations Advisor and maintains the flow of information between the TSC and Control Room.

4.2.2.7 Radiation Protection Coordinator

The Radiation Protection Coordinator responds to the TSC and reports to the EC-TSC. The Radiation Protection Coordinator receives and evaluates dose projection information from the TSC Staff and provides Protective Action Recommendations to the EC-TSC. Once the EOF is activated, the Radiation Protection Coordinator coordinates efforts with the Radiological Assessment Coordinator in the EOF.

4.2.2.8 Security Director

The Security Director responds to the TSC once activated and reports to the EC-TSC. The on-shift Security Section Leader assumes the duties and responsibilities as the Security Director. The Security Director requests emergency off-site assistance upon direction of the EC-TSC and directs the onsite security force in the areas of personnel accountability, access control, site security, evacuation, medical transportation, and personnel and equipment security control.

4.2.2.9 Reactor Analyst

The Reactor Analyst responds to the TSC and reports to the Engineering Manager. The Reactor Analyst assumes responsibilities from the STA. The Reactor Analyst performs detailed analyses of core physics and heat transfer parameters to assess reactor core status and to evaluate the integrity of fuel cladding.

4.2.2.10 Radiation Protection Support Technician

The Radiation Protection Support Technician responds to the TSC and reports to the Radiation Protection Coordinator. The Radiation Protection Support Technician performs habitability surveys of the TSC.

4.2.2.11 Safety Analysis Engineer

The Safety Analysis Engineer responds to the TSC and reports to the Engineering Manager. The Safety Analysis Engineer performs calculations and analyses that are used in the effort to reduce or minimize offsite releases.

4.2.2.12 Administrative Staff

The Administrative Staff responds to the TSC and assists the TSC Emergency Organization in all matters requiring clerical support.

4.2.2.13 Chemistry Coordinator

The Chemistry Coordinator responds to the TSC and reports to the Engineering Manager. The Chemistry Coordinator provides analysis and evaluation of coolant samples and air samples to aid in determination of reactor core conditions and release potentials, and provides chemical analyses for evaluation of plant systems.

4.2.2.14 Electrical Engineer

The Electrical Engineer responds to the TSC and reports to the Engineering Manager. The Electrical Engineer provides electrical engineering analyses and assumes the duties of Technical Support Electrical from the STA in the STSC.

4.2.2.15 ERF Communicator

The ERF Communicator responds to the TSC and reports to the Emergency Coordinator Technical Assistant. The ERF Communicator maintains communications with the ERF Communicators in the OSC, EOF and JIC, and provides information to the Emergency Coordinator Technical Assistant regarding the overall emergency activities and maintains Plant Status electronic media display and/or status boards.

4.2.2.16 Shift Technical Advisor

An augmented Shift Technical Advisor responds to the TSC and reports to the Operations Manager. The Shift Technical Advisor monitors plant system data via ERFDADS, maintains liaison with the NSSS vendor, architect engineer concerning technical status and proposes recommendations to the Operations Manager.

4.2.2.17 ENS Communicator

The ENS Communicator responds to the TSC and reports to the Operations Manager. The ENS Communicator maintains continuous phone communications with the NRC, when requested, concerning operational events and reactor plant status.

4.2.3 OSC ORGANIZATION

The OSC Emergency Organization is illustrated in Figure 3.

4.2.3.1 OSC Manager

The OSC Manager responds to the STSC for a briefing and reports to the EC. Following the briefing, the OSC Manager responds to the OSC, coordinates available resources and upon direction from the Maintenance Manager in the TSC, assembles and dispatches emergency teams.

4.2.3.2 Radiation Protection Group Lead

The Radiation Protection Group Lead reports to the OSC Manager and provides overall control and direction of in-plant monitoring teams and radiological controls.

4.2.3.3 Repairs Coordinator

The Repairs Coordinator ensures that Maintenance Technicians and Repair Teams are dispatched at the direction of the OSC Manager. The Repairs Coordinator reports to the OSC Manager.

4.2.3.4 Repair Teams

Teams are formed if emergency repair operations are necessary. The teams may consist of Chemistry Technicians, Maintenance Technicians (Mechanical, Electrical, Instrumentation and Control), or Radiation Protection Technician as required to address conditions and Plant Operators.

4.2.3.5 RFAT Driver

The RFAT Driver responds to the RFAT vehicle parking area and serves as a driver for the RFAT vehicle.

4.2.3.6 Radiation Protection Technicians

Radiation Protection Technicians respond to the OSC and report to the Radiation Protection Group Lead. As required, the RP Technicians may be assigned to Repair or Survey/Environmental Teams.

4.2.3.7 Chemistry Technicians

Chemistry Technicians respond to the OSC and report to the Radiation Protection Group Lead. As required, Chemistry Technicians may be assigned to Repair or Survey Teams, or to conduct sampling activities.

4.2.3.8 Mechanics

Mechanics respond to the OSC and report to the Repairs Coordinator. Mechanics may be assigned to repair teams as needed.

4.2.3.9 Electricians

Electricians respond to the OSC and report to the Repairs Coordinator. Electricians may be assigned to repair teams as needed.

4.2.3.10 I&C Technicians

I&C Technicians respond to the OSC and report to the Repairs Coordinator. I&C Technicians may be assigned to repair teams as needed.

4.2.3.11 ERF Communicator

The ERF Communicator responds to the OSC and reports to the OSC Manager. The ERF Communicator maintains communications with his counterparts in the TSC, EOF, and JIC, and provides information to the OSC Manager regarding the overall emergency activities.

4.2.3.12 Administrative Staff

The Administrative Staff responds to the OSC and assists the OSC Emergency Organization in all matters requiring clerical support.

4.2.4 EOF ORGANIZATION

The EOF Emergency Organization is illustrated in Figure 4. The interfaces between the Onsite and Offsite Emergency Organizations are shown in Figure 6.

4.2.4.1 Emergency Operations Director

The Emergency Operations Director (EOD) is in command of emergency operations and is responsible for:

- Overall coordination of onsite and offsite emergency functions.
- Interfacing with federal/state/county emergency response agencies.
- Communication of plant status updates and radiological release data including dose projection results as appropriate to NRC, State/County EOCs, TOC, and JIC personnel.
- Notification of state and county agencies concerning recommended protective actions.
- Directs administrative, technical, and logistical support to station emergency operations.
- Ensuring continuity of emergency organization resources.
- Establishing a recovery organization when appropriate.

Upon the assumption of this position the EOD accepts from the EC-STSC, the following non-delegable offsite organizational responsibilities:

- Notification of offsite emergency management agencies.
- Making protective action recommendations as necessary to offsite emergency management agencies.

4.2.4.2 Assistant Emergency Operations Director

The Assistant Emergency Operations Director (AEOD) responds to the EOF and reports to the EOD to assist with duties and responsibilities as assigned.

4.2.4.3 Radiological Assessment Coordinator

The Radiological Assessment Coordinator responds to the EOF and reports to the EOD. The Radiological Assessment Coordinator is the principal liaison of the emergency response organization with the ARRA. The Radiological Assessment Coordinator receives and evaluates dose projection information from the EOF Staff and provides protective action recommendations to the EOD.

4.2.4.4 Engineering Director

The Engineering Director responds to the EOF, reports to the EOD and provides evaluation of projected occurrences and corrective actions.

4.2.4.5 Security Manager

The Security Manager responds to the EOF and reports to the EOD. The Security Manager provides overall security support and coordinates closely with the Security Director in the TSC. The Security Manager also coordinates with the Administrative/Logistics Coordinator in providing site support to facilitate arrivals of offsite personnel.

4.2.4.6 ERF Communicator

The ERF Communicator responds to the EOF and reports to the Engineering Director. The ERF Communicator maintains communications with his counterparts in the TSC, OSC, and JIC. This position also monitors ERFDADS data displayed through PI, provides information to the Engineering Director regarding the overall emergency activities and maintains Plant Status boards.

4.2.4.7 Information Coordinator

The Information Coordinator responds to the EOF and reports to the AEOD. The Information Coordinator will gather information and prepare plant-related press materials for EOD/AEOD approval, and provide approved information to the JIC ERF Communicator and Spokesperson Coordinator.

4.2.4.8 Radiological Assessment Communicator

The Radiological Assessment Communicator responds to the EOF and reports to the Radiological Assessment Coordinator. The Radiological Assessment Communicator communicates with radiological assessment personnel at the TSC and directs the activities of the onsite/offsite Survey/Environmental Teams.

4.2.4.9 Administrative / Logistics Coordinator

The Administrative / Logistics Coordinator responds to the EOF and reports to the AEOD. The Administrative/Logistics Coordinator mobilizes offsite resources and obtains logistical support for the Emergency Organization.

4.2.4.10 Dose Assessment Health Physicist

The Dose Assessment Health Physicist responds to the EOF and reports to the Radiological Assessment Coordinator to perform radiological dose projections and other calculations or evaluations as directed.

4.2.4.11 Systems Engineering

Systems Engineering responds to the EOF and reports to the Engineering Director. Systems Engineering performs engineering analyses, as required, and maintains the equipment status board.

4.2.4.12 Administrative Staff

The Administrative Staff reports to the Administrative/Logistics Coordinator in the EOF and assists the Emergency Organization in all matters requiring clerical support.

4.2.4.13 HPN Communicator

The HPN Communicator responds to the EOF and reports to the Radiological Assessment Coordinator. The HPN Communicator will maintain an open line with the NRC upon request.

4.2.4.14 NAN Communicator

The NAN Communicator responds to the EOF and reports to the AEOD. The NAN Communicator makes offsite notifications once the EOF is activated and relieves the STSC Communicator of this responsibility.

4.2.4.15 Information Services (IS) Manager

The Information Services Manager responds to the EOF and reports to the AEOD. The Information Services Manager ensures that IT equipment located in the EOF remains in good working order and provides assistance to EOF personnel with IT equipment operation when needed.

4.2.4.16 RFAT Team

The RFAT Teams respond to the RFAT vehicle parking area and report to the Radiological Assessment Communicator in the EOF.

4.2.4.17 Offsite Technical Representative

The Offsite Technical Representative interfaces with state response agency personnel at the State EOC/TOC, provides up-to-date information on plant status, and clarifies how plant systems operate, via briefings and face-to-face contact with EOC staff, the TOC Shift Supervisor, and the TOC Technical Director. The Offsite Technical Representative is located at the TOC in Phoenix and reports to the AEOD.

4.2.5 JOINT INFORMATION CENTER (JIC) ORGANIZATION

The JIC Organization is illustrated in Figure 5.

4.2.5.1 JIC Manager

The JIC Manager is the PVNGS representative that coordinates public information activities at the JIC including preparation of media statements, media briefings and the flow of information to the Rumor Control Unit. The JIC Manager reviews the technical content of media statements.

4.2.5.2 Spokesperson Coordinator

The Spokesperson Coordinator is the PVNGS representative stationed in the JIC who coordinates the Spokespersons and advises the Palo Verde Spokesperson in the preparation of media statements and materials for media briefings.

4.2.5.3 Palo Verde Spokesperson

The Palo Verde Spokesperson is the representative within the JIC organization authorized to speak about actual emergency conditions at PVNGS.

4.2.5.4 ERF Communicator

The ERF Communicator is the JIC Palo Verde representative that provides any necessary technical explanations to the JIC Manager and the Palo Verde Spokesperson. The JIC ERF Communicator interfaces with the ERF Communicator in the EOF. The ERF Communicator, maintains communications with his counterparts in the TSC, OSC, and EOF, and provides information to the JIC Spokesperson Coordinator and the Palo Verde Spokesperson regarding the overall emergency activities.

4.2.5.5 Distribution Services Coordinator

The Distribution Services Coordinator coordinates the timely dissemination of accurate incident information to the media through electronic communication pathways (e.g., e-mail or fax) and the public via the Arizona Emergency Information Network Web site; and provides translation and other services for special needs and multilingual populations.

4.2.5.6 Rumor Control/Public Inquiry

The Rumor Control/Public Inquiry is operated by the Arizona Public Service Customer Care Center (CCC) Operators and augments State Public Inquiry and Rumor Control initiatives. CCC Operators provide information from approved media statements transmitted to the CCC from the JIC.

4.2.5.7 Video/Photo Coordinator

The Video/Photo Coordinator operates audio/video equipment at the JIC, including the EEC Auditorium. The Video/Photo Coordinator maintains copies of media briefings for archives.

4.2.5.8 Research/Writing Coordinator

The Research/Writing Coordinator writes materials such as media statements, fact sheets, flyers, and talking points for use by the JIC staff as needed.

4.3 NON-LICENSEE SUPPORT

Support from outside PVNGS consists of local service companies, institutions, agencies, INPO, and contractor support.

4.3.1 LOCAL SERVICES SUPPORT

In emergency situations, PVNGS may need supplementary assistance from outside companies and service agencies. Such assistance may include transportation of injured and/or contaminated personnel, medical treatment and hospital facilities for station personnel, and fire suppression assistance.

4.3.2 CONTRACT SUPPORT

Contract support may include the Nuclear Steam Supply System (NSSS) supplier, the Architect Engineer, dosimetry, laboratory contractors, and decontamination and radwaste disposal firms. PVNGS has arranged for selected contract support firms to provide this assistance upon request.

4.4 COORDINATION WITH PARTICIPATING GOVERNMENT AGENCIES

For a complete discussion of authority, assigned responsibilities, capabilities, and activation and communication arrangements refer to the Offsite Emergency Response Plan for Palo Verde Nuclear Generating Station. PVNGS personnel coordinate emergency operations with state/ county government Emergency Operations Centers. The state, county, and city Emergency Operations Center Organization is shown in Figure 7. Safeguards and security team response are described in the PVNGS Security Plan and its implementing procedures.

4.4.1 STATE OF ARIZONA

The Governor of the State of Arizona is responsible for state government operations. The governor's decision authority is assumed by a successor in his/her absence in accordance with the succession stipulated in the Arizona Revised Statutes, Title 26, Chapter 2, Article 1. Heads of state departments and agencies are responsible for the accomplishment of emergency and recovery tasks assigned by the governor or his/her authorized representative.

In addition to the support outlined in the Letters of Agreement, the Offsite Emergency Response Plan for Palo Verde Nuclear Generating Station provides for the following support functions for PVNGS in the event of an emergency from the indicated agencies. Also, mutual aid compacts and agreements between the State and other government and private entities defined in the Offsite Emergency Response Plan multiply the resources available to PVNGS in an emergency.

4.4.1.1 Arizona Division of Emergency Management

The Director, Arizona Division of Emergency Management (ADEM) provides advice and assistance to the governor concerning emergency preparedness, operations and recovery. The director is responsible for coordinating the emergency planning, operations and recovery efforts of state agencies and political subdivisions on the governor's behalf. The director is the designated Incident Commander (IC) for offsite government response to a radiological incident at Palo Verde Nuclear Generating Station (PVNGS).

The division of the Arizona Department of Emergency and Military Affairs assigned to coordinate the cooperative effort of all non-technical governmental agencies, including the Federal government, Arizona State government and its political subdivisions, and provides the necessary direction and control of state personnel and equipment for offsite response actions during radiological emergencies. It is referred to in the Offsite Emergency Response Plan for PVNGS as the Operations Directorate. ADEM is located on the Papago Military Reservation at 5636 East McDowell Road, Phoenix, Arizona.

The Arizona Division of Emergency Management (ADEM) receives initial and follow up notifications from PVNGS and coordinates the collection, analysis and dissemination of information during an incident at the Palo Verde Nuclear Generating Station (PVNGS). This process is conducted in consort with the PVNGS, Maricopa County Dept. of Emergency Management (MCDEM), Arizona Radiation Regulatory Agency (ARRA) and other federal, state, local, Tribal Nation and volunteer agencies.

Monitoring of evacuees for possible radioactive contamination and supervision and monitoring of any decontamination effort, requests for and coordination of federal technical support and exchanges of field data and accident assessment information with PVNGS.

Any classification or notification may require governmental or private sector emergency organizations to commit resources onsite at the request of the facility. Emergency resources may include, but are not limited to, law enforcement, firefighting, medical support and ground or air services. Assistance may be requested from other state governments and private sector resources in states adjoining Arizona. These resources may include medical capabilities, emergency response equipment, and emergency response personnel. The State Emergency Operations Center Policy Chief (EOC PC) or Technical Director (TD) will initiate requests.

4.4.1.2 Arizona Radiation Regulatory Agency

The Director, Arizona Radiation Regulatory Agency (ARRA) is responsible for providing technical support in response to a radiological incident and provides Protective Action Recommendations to the governor and IC. Arizona statutes require that the Emergency Response Plan be binding on other governmental agencies and therefore, Section 10.0 does not list separate letters of agreement with all agencies.

ARRA is the agency with primary offsite responsibility for carrying out radiological emergency assessment actions, coordinating the technical offsite agency response and providing protective action recommendations to the Governor/designee. It is referred to in the Offsite Emergency Response Plan for PVNGS as the Technical Operations Center, the Radiological Emergency Assistance Team Center, and the Radiological Emergency Assistance Team Lab.

The Arizona Radiation Regulatory Agency (ARRA) receives initial and follow up notifications from PVNGS and provides for collection and analysis of data from the plant, field radiation surveys and sample collection. ARRA representatives share information with EOF staff regarding field team locations, field data and protective action decisions and collects data to assess the accident, project dose and project plume.

ARRA field monitors conduct radiation surveys to determine ambient radiation levels, track the plume and collect environmental and foodstuff samples for analysis and dispatches a mobile laboratory to Buckeye Airport during the emergency (plume) phase for rapid evaluation of air samples.

ARRA conducts “just-in-time” radiological training and provides equipment for alternate personnel prior to being deployed in response to a HAB incident.

4.4.1.3 Arizona Department of Public Safety

The Department of Public Safety (DPS) provides law enforcement support for ADEM and MCSO. DPS also serves as the 24 hour point of contact for the State of Arizona in the event of an emergency at the PVNGS.

4.4.2 MARICOPA COUNTY

Maricopa County is the only county within the 10-mile Plume Exposure Pathway Emergency Planning Zone. Portions of four other counties (La Paz, Pinal, Yuma, and Yavapai) are included in the 50-mile Ingestion Exposure Pathway EPZ.

The Chairman of the Maricopa County Board of Supervisors is responsible for decision making at the county level. Maricopa County Department and Agency directors are responsible for the accomplishments of emergency and recovery tasks assigned by the Director of MCDEM.

4.4.2.1 Maricopa County Department of Emergency Management

The Director, Maricopa County Department of Emergency Management (MCDEM) provides technical and professional input to the Maricopa County Administrative Officer concerning planning, response and recovery activities in the event of an emergency.

The director is also responsible for the coordination of emergency planning, response and recovery activities with other Maricopa County agencies as well as municipal entities.

Maricopa County Department of Emergency Management receives initial and follow up notifications from PVNGS and provides for the implementation of emergency measures, public warning, reception and care center operation

4.4.2.2 Maricopa County Sheriff's Office

The MCSO receives initial and follow up notifications from PVNGS on a 24 hour basis. The Maricopa County Sheriff's Office (MCSO) performs the Emergency Public Warning (alerting and public information), evacuation control and reentry, public protective action implementation, reception and care center security and support (KI transport and impound security), just in time radiological training, support control of food embargos

MCSO provides coordinated on-site/offsite direction and control in accordance with the Maricopa County Peacetime Disaster Plan (PDP). The PDP authorizes the Sheriff to request assistance when an incident is beyond the ability of the Office to resolve and works under the Incident Command System (ICS) when responding to PVNGS Hostile Action Based (HAB) incidents.

MCSO is responsible for the initial and on-going assessment of the situation to determine if terrorism is involved or responsible for the HAB incident. If and when this determination is made, the Federal Bureau of Investigation (FBI) will be notified.

4.4.3 FEDERAL GOVERNMENT

4.4.3.1 Nuclear Regulatory Commission (NRC)

The NRC is responsible for licensing and regulating nuclear facilities and materials. These responsibilities include protecting the public health and safety, protecting the environment, and protecting and safeguarding materials and nuclear plants in the interest of national security. The NRC Incident Response Plan objectives are to provide for protection from the effects of radiological incidents that may occur at licensed facilities or which involve licensed materials. In addition to fulfilling its regulatory responsibilities, it is expected that the NRC will provide technical assistance and recommendations.

The NRC acts as the lead federal agency regarding technical matters during a nuclear incident, with the Chairman of the Commission as the senior NRC authority for all response aspects. The Chairman can transfer control of emergency response activities when deemed appropriate.

Incident Response Centers have been established at each of the four NRC regional offices and at NRC Headquarters to centralize and coordinate NRC's emergency response. Each NRC Region is prepared to send a team of qualified specialists to an accident scene. For Site Area and General Emergencies, a NRC Region IV site team is expected to be dispatched to PVNGS with arrival in four to eight hours following notification. Office space, telephones, and other equipment is provided for NRC personnel at the TSC, EOF and JIC.

4.4.3.2 Federal Emergency Management Agency (FEMA)

By the National Response Framework, FEMA is responsible for the overall coordination of a multi-agency Federal response to a significant radiological incident. The primary role of FEMA is to support the states by coordinating the delivery of federal non-technical assistance. FEMA coordinates state and tribal requests for federal assistance, identifying which federal agency can best address specific needs. If deemed necessary, FEMA will establish a nearby Federal Response Center from which it will manage its assistance activities.

4.4.3.3 U.S. Department of Energy (DOE)

The DOE has agreed to provide radiological assistance upon request, and has radiological monitoring equipment and personnel resources that it can assemble and dispatch to the scene of a radiological incident. Following a radiological incident, DOE operates as outlined in the Federal Radiological Monitoring and Assessment Plan (FRMAP). DOE has the responsibility to establish the Federal Radiological Monitoring and Assessment Center (FRMAC), which would provide comprehensive post-accident radiological monitoring and assessment.

4.4.3.4 Federal Bureau of Investigation (FBI)

Support from the FBI is available through its statutory responsibility, based in Public Law and the US code, and through a memorandum of understanding for cooperation with the NRC. Notification to the FBI of emergencies in which they would have an interest will be through the provisions of the PVNGS Security Plan, or by the NRC.

4.4.3.5 National Weather Service (NWS)

NWS provides meteorological information during emergency situations, if required. Data available will include existing and forecasted wind directions, wind speeds, and ambient air temperatures.

4.4.3.6 Environmental Protection Agency (EPA)

The EPA can assist with field radiological monitoring, sampling, and non-plant related recovery and reentry guidance.

4.5 INSTITUTE OF NUCLEAR POWER OPERATIONS (INPO)

INPO aids nuclear utilities in obtaining resources beyond their usual capabilities during recovery from an emergency. As one of its roles, INPO will assist affected utilities by applying the resources of the nuclear industry to meet the needs of an emergency.

4.6 LETTERS OF AGREEMENT (LOAs)

Letters of Agreement (LOAs) are not necessary with federal and state agencies that are legally required to respond to an emergency; however, agreements are necessary if an agency is expected to provide assistance not required by law. Written agreements have been developed which establish the extent of operations between PVNGS and other support organizations which have an emergency response role consistent with this plan. These agreements identify the emergency measures to be provided, the mutually accepted criteria for implementation, and the arrangements for exchange of information. PVNGS has obtained LOAs with private contractors and others who provide emergency support services. LOAs, as a minimum, state that the cooperating organization will provide their normal services in support of an emergency at PVNGS. Letters of Agreement are referenced in Section 10 and the actual letters are maintained on file.

SHIFT STAFFING (Immediate Response)

MAJOR FUNCTIONAL AREA	POSITION/FUNCTION TITLE	Staffing/Unit	Shared Site Staffing	Site Staffing Totals
Plant Operations and Assessment of Operational Aspects	Shift Manager / Emergency Coordinator	1		3
	Control Room Supervisor	1		3
	Control Room Operators	2		6
	Fire Team Advisor		1	1
	Auxiliary Operators	4		12
	Radiation Protection Monitor		1	1
	Shift Technical Advisor		2	2
Notification/ Communications	STSC Communicator (Covered by Affected Unit)	See AO above		
	ENS Communicator		1	1
Support Staff	Chemistry Technician (OSC)		2	2
	Electrical Technician (OSC)		3	3
	Mechanical Technician (OSC)		2	2
	I&C Technician (OSC)		1	1
	RFAT Driver (Water Rec Facility)		1	1
	Radiation Protection Technician (OSC)		3	3
	Radiation Monitoring Technician		1	1
	RM or RP Technician (OSC)		1	1
	Survey Qualified Position (OSC)		1	1
	Security Section Leader/Director (TSC) (not committed to armed response)		1	1
Fire Suppression / Rescue Operations and First Aid	Plant Fire Department / Emergency Medical Technicians (At least 2 Fire Team Members are EMT qualified)		5	5
Site Access Control and Personnel Accountability	Plant Security		Staffing per Security Plan	Staffing per Security Plan
TOTALS		8/Unit =24	26 Shared	Total 50

AUGMENTATION STAFFING

MAJOR FUNCTIONAL AREA	POSITION TITLE	ON SHIFT	Normal Hours 60 MINUTES	Off Hours 120 MINUTES
Emergency Direction and Control	Emergency Coordinator (TSC)		1	1
	Emergency Operations Dir (EOF)		1	1
Plant System Engineering /	Technical Support Electrical (TSC)		1	1
	Technical Support Mechanical (TSC)		1	1
	Reactor Analyst (TSC)		1	1
Repair and Corrective Actions	Radiation Protection Technicians (OSC)		6 - Immediate During Normal Hours	6
Protective Actions	Engineering Director (EOF)		1	1
Communications	NAN Communicator (EOF)		1	1
Fire Suppression	Offsite Fire Department		Offsite Support 45 Minutes from time of request	
Rescue Operations and First Aid	Offsite Ambulance		Offsite Support 45 Minutes from time of request	
TOTALS			13	13

Note: These numbers reflect the results of the Onshift Staffing Analysis required by 10CFR50, Appendix E.

TABLE 1 MINIMUM SHIFT STAFFING FOR EMERGENCIES

CONTROL ROOM / STSC

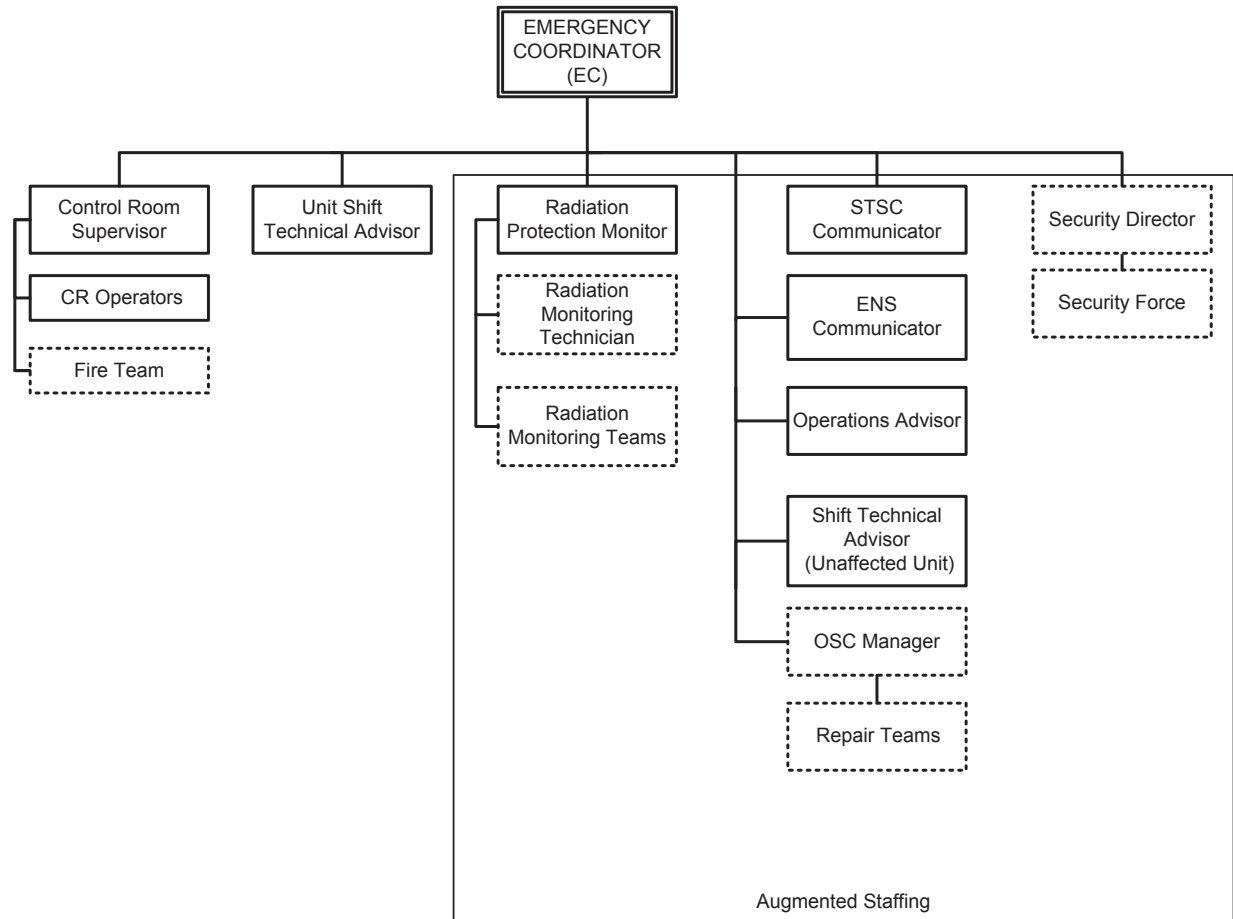


FIGURE 1 – ONSHIFT EMERGENCY ORGANIZATION

TECHNICAL SUPPORT CENTER (TSC)

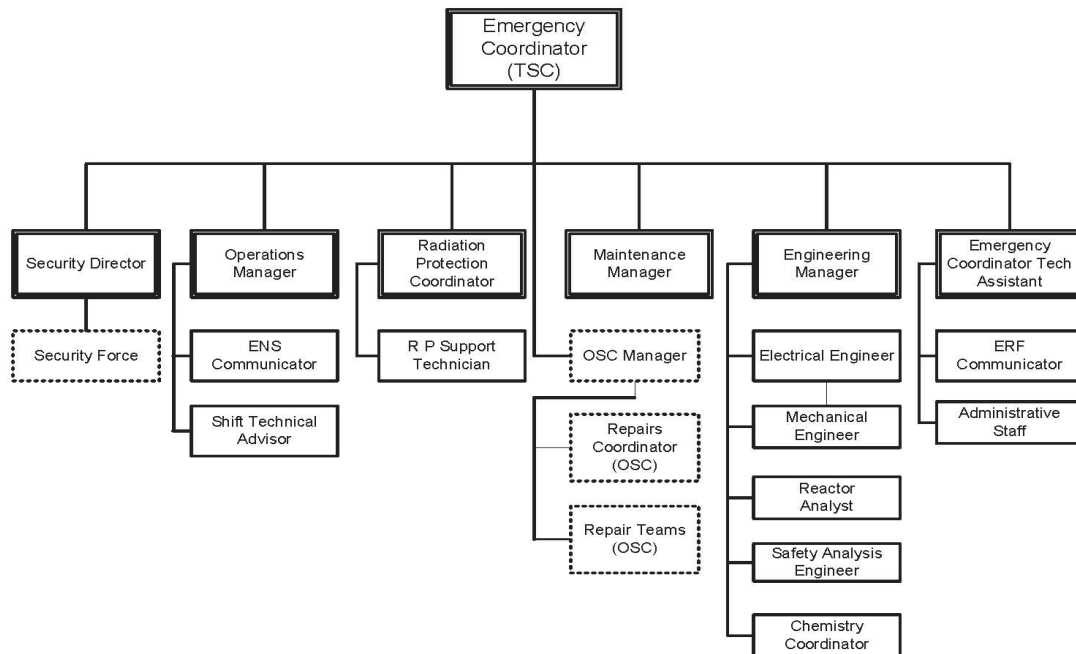


FIGURE 2 – TECHNICAL SUPPORT CENTER ORGANIZATION

OPERATIONS SUPPORT CENTER (OSC)

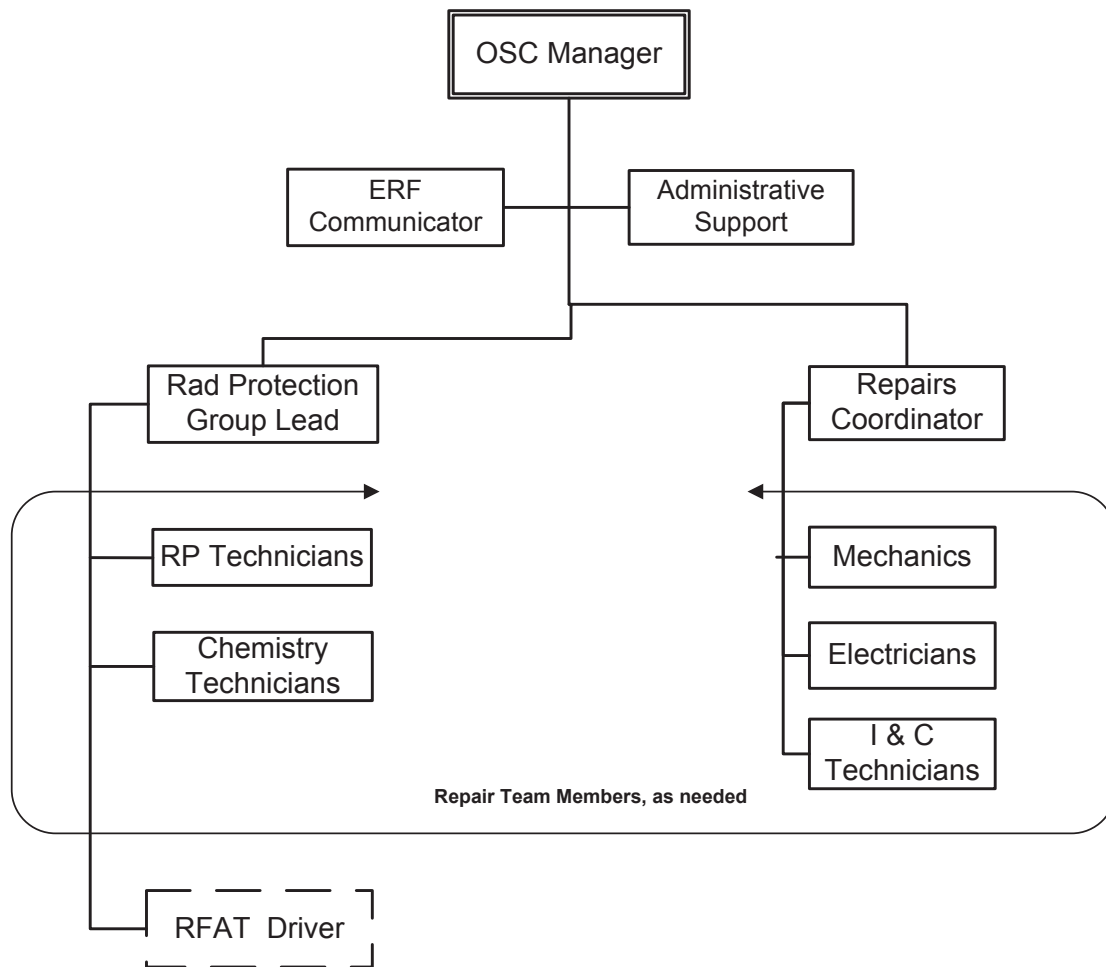


FIGURE 3 – OPERATIONS SUPPORT CENTER ORGANIZATION

EMERGENCY OPERATIONS FACILITY (EOF)

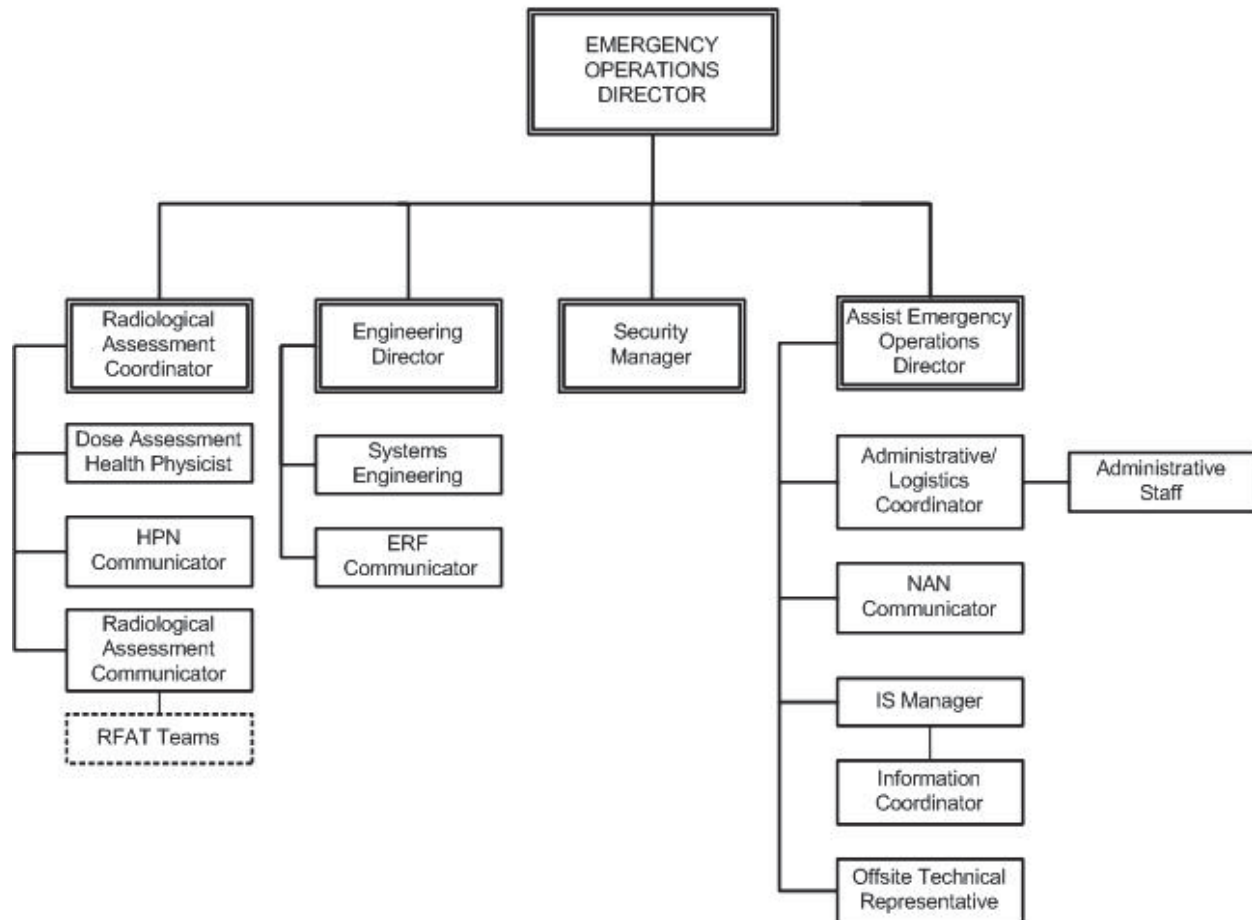


FIGURE 4 – EMERGENCY OPERATIONS FACILITY ORGANIZATION

JOINT INFORMATION CENTER (JIC)

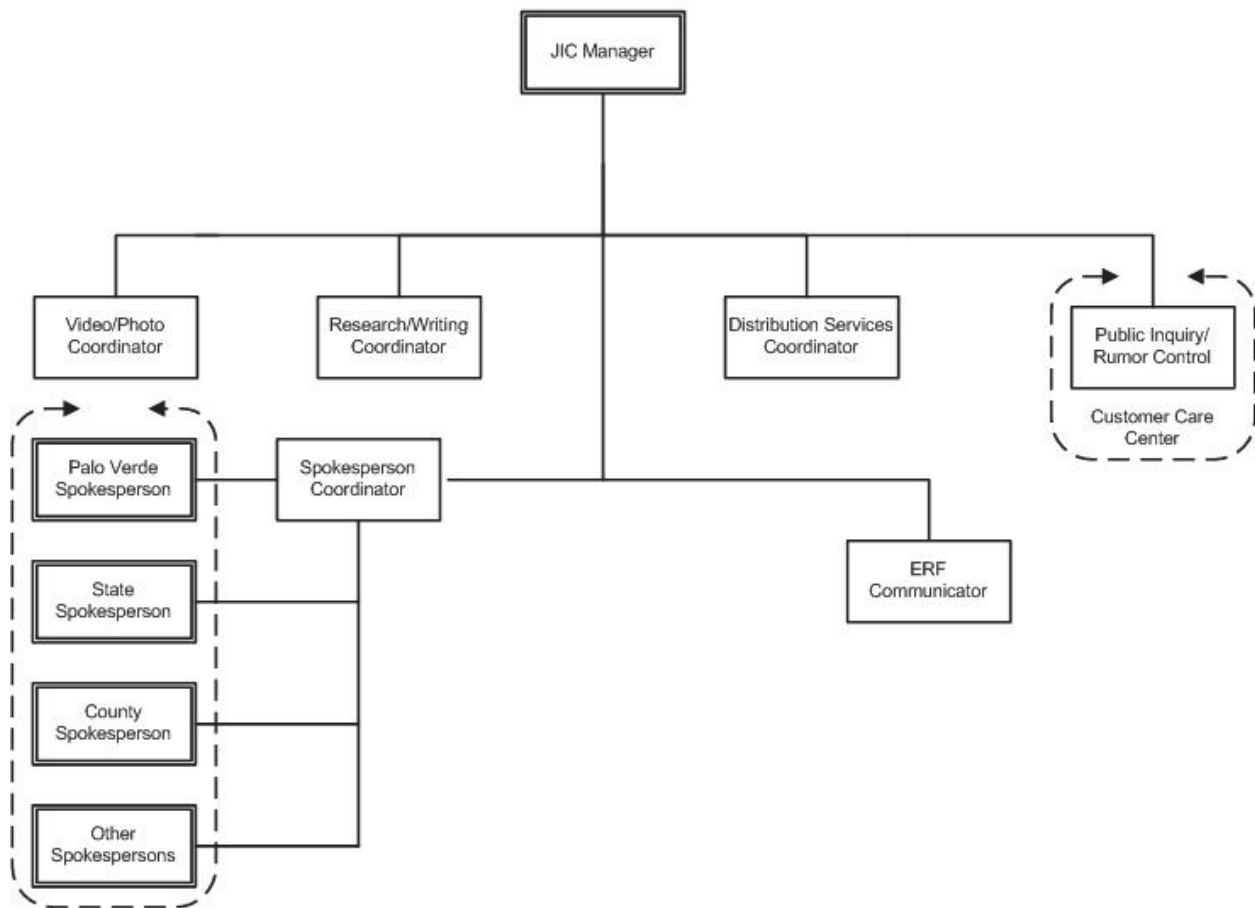
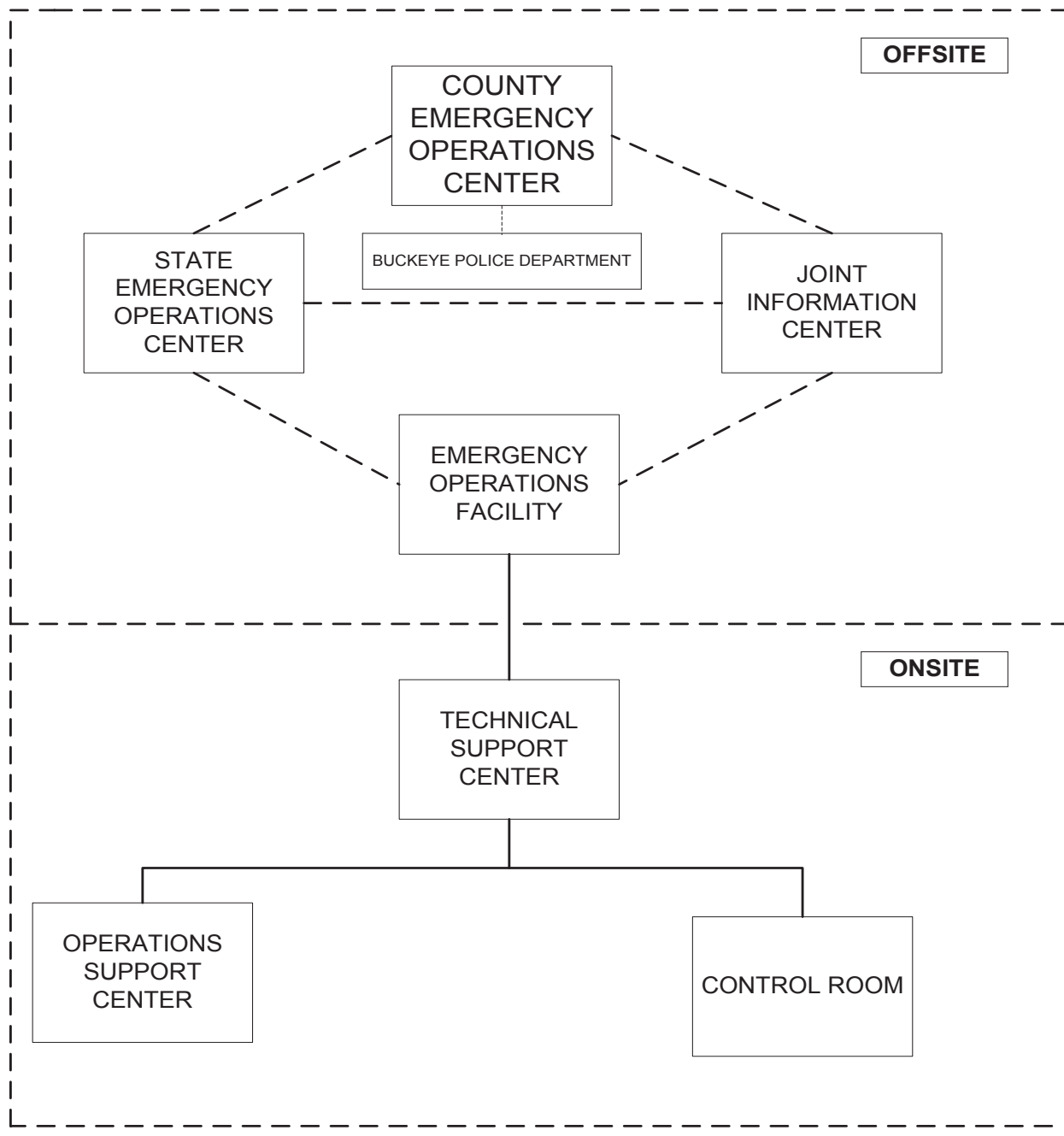
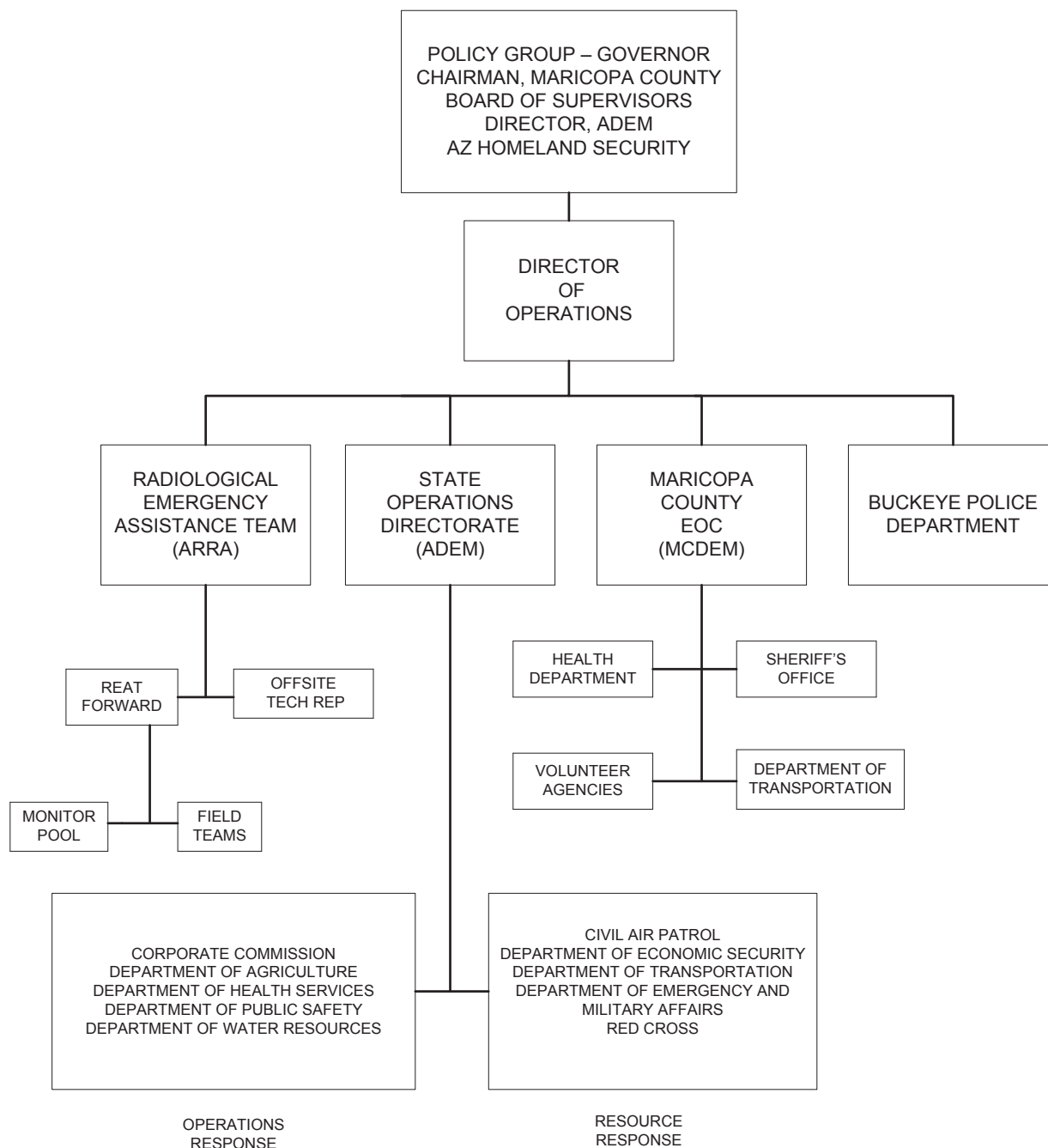


FIGURE 5 – JOINT INFORMATION CENTER ORGANIZATION

**FIGURE 6 – ONSITE/OFFSITE EMERGENCY ORGANIZATION INTERFACE**



**FIGURE 7 – STATE, COUNTY & LOCAL EMERGENCY OPERATIONS
CENTER ORGANIZATION**

5.0 EMERGENCY CONDITIONS AND CLASSIFICATIONS

5.1 EMERGENCY CONDITIONS

Emergency classification is divided into four classification levels. Emergency Action Levels (EALs), based on indications available in the control room and correlated to the emergency classifications, are provided to the operator.

The EALs were discussed and agreed upon by Palo Verde and state and county governmental authorities, and approved by the NRC. EALs are reviewed with the State and local governmental authorities on an annual basis.

PVNGS has and maintains the capability to assess, classify, and declare an emergency condition within 15 minutes after the availability of indications to plant operators that an EAL has been exceeded. Upon identification of the appropriate emergency classification level the emergency condition will be promptly declared.

The four emergency classification levels are described in the following sections:

EMERGENCY CLASSIFICATION LEVEL DESCRIPTIONS

There are three considerations related to emergency classification levels. These are:

- (1) The potential impact on radiological safety, either as known now or as can be reasonably projected;
- (2) How far the plant is beyond its predefined design, safety, and operating envelopes; and
- (3) Whether or not conditions that threaten health are expected to be confined to within the site boundary.

The ICs deal explicitly with radiological safety impact by escalating from levels corresponding to releases within regulatory limits to releases beyond EPA Protective Action Guideline (PAG) plume exposure levels.

UNUSUAL EVENT (UE):

Events are in progress or have occurred which indicate a potential degradation of the level of safety of the plant or indicate a security threat to facility protection has been initiated. No releases of radioactive material requiring off-site response or monitoring are expected unless further degradation of safety systems occurs.

ALERT:

Events are in progress or have occurred which involve an actual or potential substantial degradation of the level of safety of the plant or a security event that involves probable life threatening risk to site personnel or damage to site equipment because of HOSTILE ACTION. Any releases are expected to be limited to small fractions of the EPA PAG exposure levels.

SITE AREA EMERGENCY (SAE):

Events are in progress or have occurred which involve actual or likely major failures of plant functions needed for protection of the public or HOSTILE ACTION that results in intentional damage or malicious acts; 1) toward site personnel or equipment that could lead to the likely failure of or; 2) that prevent effective access to, equipment needed for the protection of the public. Any releases are not expected to result in exposure levels which exceed EPA PAG exposure levels beyond the site boundary.

GENERAL EMERGENCY (GE):

Events are in progress or have occurred which involve actual or IMMINENT substantial core degradation or melting with potential for loss of containment integrity or HOSTILE ACTION that results in an actual loss of physical control of the facility. Releases can be reasonably expected to exceed EPA PAG exposure levels off-site for more than the immediate site area.

5.2 BASIS FOR PALO VERDE NUCLEAR GENERATING STATION (PVNGS) CLASSIFICATION CRITERIA**EMERGENCY ACTION LEVELS (EALs)**

Palo Verde Nuclear Generating Station's Emergency Classification and Emergency Action Level(EAL) scheme is based on the NRC endorsed guidance NRC Regulatory Guide (RG) 1.101, "Emergency Planning and Preparedness for Nuclear Power Reactors" Revision 3, dated August 31,1992 (ADAMS Accession No. ML003740302), and Revision 4, dated July 31, 2003 (ADAMS Accession No. ML032020276) (Ref. 7), which endorses NEI 99-01 EAL guidance, as acceptable alternatives to the guidance provided in NUREG-0654/FEMA-REP-1 for development of EALs to comply with 10 CFR 50.47 and with Appendix E to 10 CFR Part 50. PVNGS used NEI 99-01 Rev. 5, *Methodology for Development of Emergency Action Levels* for developing the site specific EALs. The site specific implementation of the guidance was approved by the NRC in a safety evaluation dated September 4, 2009 and incorporated into the PVNGS Emergency Plan and Implementing Procedures.

Classifications are based on evaluation of each Unit. All classifications are to be based upon valid indications, reports or conditions. Indications, reports or conditions are considered valid when they are verified by (1) an instrument channel check, or (2) indications on related or redundant indications, or (3) by direct observation by plant personnel, such that doubt related to the indication's operability, the condition's existence, or the report's accuracy is removed. Implicit in this definition is the need for timely assessment.

Although the majority of the EALs provide very specific thresholds, the Emergency Coordinator must remain alert to events or conditions that lead to the conclusion that exceeding the EAL is imminent. If, in the judgment of the Emergency Coordinator, an imminent situation is at hand, the classification should be made as if the threshold has been exceeded. While this is particularly prudent at the higher emergency classification levels (as the early classification may provide for more effective implementation of protective measures), it is nonetheless applicable to all emergency classification levels.

Activities which cause the plant to operate beyond that allowed by Technical Specifications, planned or unplanned, may result in an EAL threshold being met or exceeded. Planned evolutions to test, manipulate, repair, perform maintenance or modifications to systems and equipment that result in an EAL value being met or exceeded are not subject to classification as long as the evolution proceeds as planned and is within the operational limitations imposed by the operating license.

EMERGENCY ACTION LEVEL THRESHOLDS

The most common bases for establishing Threshold Values are the Technical Specifications, Operating Procedures, the ODCM, and set points that have been developed in the design basis calculations for the FSAR.

Another critical element of the analysis to arrive at Threshold Value conditions is the time that the plant might stay in that condition before moving to a higher emergency classification level. The time dimension is critical to the EAL since the purpose of the emergency classification level for state and local officials is to notify them of the level of mobilization that may be necessary to address the emergency. This is particularly true when a SAE or GE is imminent. A time variable is used to allow for correction of the condition before a classification is made.

TREATMENT OF MULTIPLE EVENTS AND CLASSIFICATION LEVEL UPGRADING

When multiple simultaneous events occur, the emergency classification level is based on the highest EAL reached.

EMERGENCY CLASSIFICATION LEVEL DOWNGRADING

A UE can be downgraded to termination if the EAL used for classification is no longer applicable. An Alert can be downgraded to an UE if an UE EAL is applicable or to termination if no EAL is applicable. A SAE or GE cannot be downgraded. Transition from a SAE or GE to termination must go through a Recovery. Recovery is the transition from an ERO to an Outage organization.

Entering into recovery will not necessarily result in de-escalation of the emergency classification in that, the loss of a fission product barrier may not be recoverable until recovery is complete. Entering into recovery denotes the plant is stable and further degradation is unlikely. Repair and restoration of plant systems will be needed to fully exit the recovery phase.

CLASSIFYING TRANSIENT EVENTS

For some events, the condition may be corrected before a declaration has been made. The key consideration in this situation is to determine whether or not further plant damage occurred while the corrective actions were being taken. Classification of the event as indicated and terminates the emergency once assessment shows that there were not consequences from the event and other termination criteria were met.

There may be cases in which a plant condition that exceeded an EAL was not recognized at the time of occurrence but is identified well after the condition has occurred (e.g., as a result of routine log or record review), and the condition no longer exists. In these cases, an emergency should not be declared.

Reporting requirements of 10 CFR 50.72 are applicable and the guidance of NUREG-1022, Event Reporting Guidelines 10 CFR 50.72 and 50.73, should be applied.

OPERATING MODE APPLICABILITY

The plant operating mode that existed at the time that the event occurred, prior to any protective system or operator action initiated in response to the condition, is compared to the mode applicability of the EALs.

An Emergency Action Level has two distinct parts. The Initiating Condition (IC) is a brief description of conditions that are compared to existing abnormal plant conditions. The ICs are segregated into Recognition Categories. The Recognition Categories are:

- R - Abnormal Rad Levels/Radiological Effluent
- C - Cold Shutdown / Refueling System Malfunction
- E - Independent Spent Fuel Storage Installations (ISFSI)
- F - Fission Product Barrier
- H - Hazards and Other Conditions Affecting Plant Safety
- M - System Malfunction

With each IC are Threshold Values (TV) that provide criteria for classification associated with the appropriate classification level. When the IC is observed to exist, the TV must also be met, exceeded or in some cases imminent to become a classifiable Emergency Action Level.

The Fission Product Barrier and System Malfunction criteria are only applicable when in the hot operating modes 1 through 4. The Cold Shutdown / Refueling System malfunctions are only applicable in modes 5, 6 and Defueled or as specifically designated in each EAL. The EALs associated with the Radiological, ISFSI and Hazards categories are applicable in all modes of operation.

Initiating Conditions have symptom-based, event-based, or barrier-based criteria.

The symptom based ICs refers to those indicators that are measurable over some continuous spectrum, such as core temperature, coolant levels, containment pressure, etc. When one or more of these indicators begin to show off-normal readings, reactor operators are trained to identify the probable causes and potential consequences of these "symptoms" and take corrective action. The level of seriousness these symptoms indicate depends on the degree to which they have exceeded technical specifications, the other symptoms or events that are occurring contemporaneously, and the capability of the licensed operators to gain control and bring the indicator back to safe levels.

Event based ICs refer to occurrences with potential safety significance, such as the failure of a safety valve failure or a loss of electric power to some part of the plant. The range of seriousness of these "events" is dependent on the location, number of contemporaneous events, remaining plant safety margin, etc.

Barrier based ICs refer to the level of challenge to principal barriers used to assure containment of radioactive materials contained within a nuclear power plant. For radioactive materials that are contained within the reactor core, these barriers are: fuel cladding, reactor coolant system pressure boundary, and containment. The level of challenge to these barriers encompasses the extent of damage (loss or potential loss) and the number of barriers concurrently under challenge. Challenge to one or more barriers generally is initially identified through instrument readings and periodic sampling.

If an event occurs, and a lower or higher plant operating mode is reached before the emergency classification level can be declared, the emergency classification level shall be based on the mode that existed at the time the event occurred. For events that occur in Cold Shutdown or Refueling, escalation is via EALs that have Cold Shutdown or Refueling for mode applicability, even if Hot Shutdown (or a higher mode) is entered during any subsequent heat-up. In particular, the fission product barrier EALs are applicable only to events that initiate in Hot Shutdown or higher.

DEFINITIONS

In the IC/EALs, selected words have been set in all capital letters. These words are defined terms having specific meanings as they relate to this procedure. Definitions of these terms are provided below.

AFFECTING SAFE SHUTDOWN: Event in progress has adversely affected functions that are necessary to bring the plant to and maintain it in the applicable HOT or COLD SHUTDOWN condition. Plant condition applicability is determined by Technical Specification LCOs in effect.

- Example 1: Event causes damage that result in entry into an LCO that requires the plant to be placed in HOT SHUTDOWN. HOT SHUTDOWN is achievable, but COLD SHUTDOWN is not. This event is not "AFFECTING SAFE SHUTDOWN."
- Example 2: Event causes damage that result in entry into an LCO that requires the plant to be placed in COLD SHUTDOWN. HOT SHUTDOWN is achievable, but COLD SHUTDOWN is not. This event is "AFFECTING SAFE SHUTDOWN."

BOMB: Refers to an explosive device suspected of having sufficient force to damage plant systems or structures.

CIVIL DISTURBANCE: A group of persons violently protesting station operations or activities at the site.

CONFINEMENT BOUNDARY: The dry storage cask barrier (Transportable Storage Canister) between areas containing radioactive substances and the environment.

CONTAINMENT CLOSURE: The procedurally defined actions taken to secure containment and its associated structures, systems and components as a functional barrier to fission product release in Modes 5 and 6.

EXPLOSION: A rapid, violent and catastrophic failure of a piece of equipment due to combustion, chemical reaction or over pressurization that imparts energy of sufficient force to potentially damage permanent structures, systems, or components.

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

FAULTED: In a steam generator, the existence of secondary side leakage that results in an uncontrolled drop in steam generator pressure or the steam generator being completely depressurized.

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

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

HOSTILE ACTION: An act toward a NPP or its personnel that includes the use of violent force to destroy equipment, take HOSTAGES, and/or intimidate the licensee to achieve an end. This includes attack by air, land, or water using guns, explosives, PROJECTILE(s), vehicles, or other devices used to deliver destructive force. Other acts that satisfy the overall intent may be included. HOSTILE ACTION should not be construed to include acts of civil disobedience or felonious acts that are not part of a concerted attack on the NPP. Non-terrorism-based EALs should be used to address such activities (i.e., this may include violent acts between individuals in the owner controlled area).

HOSTILE FORCE: One or more individuals who are engaged in a determined assault, overtly or by stealth and deception, equipped with suitable weapons capable of killing, maiming, or causing destruction.

IMMINENT: Mitigation actions have been ineffective, additional actions are not expected to be successful, and trended information indicates that the event or condition will occur.

INTRUSION: A person(s) present in a specified area without authorization. Discovery of a BOMB in a specified area is indication of INTRUSION into that area by a HOSTILE FORCE.

INDEPENDENT SPENT FUEL STORAGE INSTALLATION (ISFSI): A complex that is designed and constructed for the interim storage of spent nuclear fuel and other radioactive materials associated with spent fuel storage.

LEAKAGE SHALL BE:

a. Identified LEAKAGE

1. LEAKAGE, such as that from pump seals or valve packing (except reactor coolant pump (RCP) seal water injection or leak off), that is captured and conducted to collection systems or a sump or collecting tank;

2. LEAKAGE into the containment atmosphere from sources that are both specifically located and known either not to interfere with the operation of leakage detection systems or not to be pressure boundary LEAKAGE; or
 3. Reactor Coolant System (RCS) LEAKAGE through a steam generator (SG) to the Secondary System (primary to secondary LEAKAGE).
- b. Unidentified LEAKAGE
All LEAKAGE that is not identified LEAKAGE;
- c. Pressure Boundary LEAKAGE
LEAKAGE (except primary to secondary LEAKAGE) through a non-isolable fault in an RCS component body, pipe wall, or vessel wall.

NORMAL PLANT OPERATIONS: Activities at the plant site, excluding the Water Reclamation Facility, associated with routine testing, maintenance, or equipment operations, in accordance with normal operating or administrative procedures. Entry into abnormal or emergency operating procedures, or deviation from normal security or radiological controls posture, is a departure from NORMAL PLANT OPERATIONS.

POWER BLOCK: Structures, systems or components listed below that contain equipment necessary for safe operation and/or shutdown of the reactor.

- A. Containment
- B. Auxiliary Building
- C. Refueling Water Tank (RWT)
- D. Diesel Generator Building
- E. Diesel Generator Fuel Oil Storage Tanks
- F. Fuel Building
- G. Spray Pond
- H. Condensate Storage Tank (CST)
- I. Control Building
- J. Corridor Building
- K. MSSS

PROJECTILE: An object directed toward a NPP that could cause concern for its continued operability, reliability, or personnel safety.

PROTECTED AREA: The site specific area which encompasses all controlled areas within the security PROTECTED AREA fence.

RUPTURED: In a steam generator, existence of primary-to-secondary leakage of a magnitude sufficient to require or cause a reactor trip and safety injection.

SABOTAGE: Deliberate damage, misalignment, or mis-operation of plant equipment with the intent to render the equipment inoperable. Equipment found tampered with or damaged due to malicious mischief may not meet the definition of SABOTAGE until this determination is made by security supervision.

SECURITY CONDITION: Any Security Event as listed in the approved security contingency plan that constitutes a threat/compromise to site security, threat/risk to site personnel, or a potential degradation to the level of safety of the plant. A SECURITY CONDITION does not involve a HOSTILE ACTION.

STRIKE ACTION: A work stoppage within the PROTECTED AREA by a body of workers to enforce compliance with demands made on PVNGS. The STRIKE ACTION must threaten to interrupt NORMAL PLANT OPERATIONS.

UNISOLABLE: A breach or leak that cannot be isolated from the Control Room.

UNPLANNED: A parameter change or an event that is not the result of an intended evolution and requires corrective or mitigative actions.

VALID: An indication, report, or condition, is considered to be VALID when it is verified by (1) an instrument channel check, (2) indications on related or redundant indicators, or (3) by direct observation by plant personnel, such that doubt related to the indicator's operability, the condition's existence, or the report's accuracy is removed.

VISIBLE DAMAGE: Damage to equipment or structure that is readily observable without measurements, testing, or analysis. Damage is sufficient to cause concern regarding the continued operability or reliability of the affected structure, system, or component.

VITAL AREAS: Areas within the PROTECTED AREA that contain equipment vital to the operations of the plant.

RECOGNITION CATEGORY R – ABNORMAL RAD LEVELS / RADIOLOGICAL EFFLUENT

GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
<p>IC RG1 Off-site dose resulting from an actual or IMMINENT release of gaseous radioactivity greater than 1000 mrem TEDE or 5000 mrem Thyroid CDE for the actual or projected duration of the release using actual meteorology.</p> <p>Operating Mode Applicability: All</p> <p>Emergency Action Level Thresholds: <i>Note: The EC should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition will likely exceed the applicable time. If dose assessment results are available, declaration should be based on dose assessment instead of radiation monitor values. Do not delay declaration awaiting dose assessment results.</i></p> <p>1. VALID reading on ANY of the following radiation monitors greater than the value for 15 minutes or longer:</p> <ul style="list-style-type: none"> Plant Vent RU-144 CH-1 >1.04E+00 uCi/cc Fuel Building RU-146 CH-2 >3.50E+01 uCi/cc <p>OR</p> <p>2. Dose assessment using actual meteorology indicates doses greater than 1000 mrem TEDE or 5000 mrem thyroid CDE at or beyond the site boundary.</p> <p>OR</p> <p>3. Field survey results indicate closed window dose rates greater than 1000 mR/hr expected to continue for 60 minutes or longer; or analyses of field survey samples indicate thyroid CDE greater than 5000 mrem for one hour of inhalation, at or beyond site boundary.</p>	<p>IC RS1 Off-site dose resulting from an actual or IMMINENT release of gaseous radioactivity greater than 100 mrem TEDE or 500 mrem Thyroid CDE for the actual or projected duration of the release.</p> <p>Operating Mode Applicability: All</p> <p>Emergency Action Level Thresholds: <i>Note: The EC should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition will likely exceed the applicable time. If dose assessment results are available, declaration should be based on dose assessment instead of radiation monitor values. Do not delay declaration awaiting dose assessment results.</i></p> <p>1. VALID reading on ANY of the following radiation monitors greater than the value for 15 minutes or longer:</p> <ul style="list-style-type: none"> Plant Vent RU-144 CH-1 >1.04E-01 uCi/cc Fuel Building RU-146 CH-1 >3.50E+00 uCi/cc <p>OR</p> <p>2. Dose assessment using actual meteorology indicates doses greater than 100 mrem TEDE or 500 mrem thyroid CDE at or beyond the site boundary.</p> <p>OR</p> <p>3. Field survey results indicate closed window dose rates greater than 100 mR/hr expected to continue for 60 minutes or longer; or analyses of field survey samples indicate thyroid CDE greater than 500 mrem for one hour of inhalation, at or beyond the site boundary.</p>	<p>IC RA1 Any release of gaseous radioactivity to the environment greater than 20 times the ODCM for 15 minutes or longer.</p> <p>Operating Mode Applicability: All</p> <p>Emergency Action Level Thresholds: <i>Note: The EC should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the release duration has exceeded, or will likely exceed, the applicable time. In the absence of data to the contrary, assume that the release duration has exceeded the applicable time if an ongoing release is detected and the release start time is unknown.</i></p> <p>1. VALID reading on ANY of the following radiation monitors greater than the value for 15 minutes or longer:</p> <ul style="list-style-type: none"> Plant Vent RU-143 CH-1 >1.22E-02 uCi/cc Fuel Building RU-146 CH-1 >1.13E-01 uCi/cc <p>OR</p> <p>2. Confirmed sample analyses for gaseous releases indicates concentrations or release rates greater than 20 times the ODCM Section 3.0 limits for 15 minutes or longer.</p>	<p>IC RU1 Any release of gaseous radioactivity to the environment greater than 2 times the ODCM for 60 minutes or longer.</p> <p>Operating Mode Applicability: All</p> <p>Emergency Action Level Thresholds: <i>Note: The EC should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the release duration has exceeded, or will likely exceed, the applicable time. In the absence of data to the contrary, assume that the release duration has exceeded the applicable time if an ongoing release is detected and the release start time is unknown.</i></p> <p>1. VALID reading on ANY of the following radiation monitors greater than the value for 60 minutes or longer:</p> <ul style="list-style-type: none"> Plant Vent RU-143 CH-1 >1.22E-03 uCi/cc Fuel Building RU-145 CH-1 >1.13E-02 uCi/cc <p>OR</p> <p>2. Confirmed sample analyses for gaseous releases indicates concentrations or release rates greater than 2 times the ODCM Section 3 limits for 60 minutes or longer.</p>

TABLE 2 – INITIATING CONDITIONS AND EAL THRESHOLDS

RECOGNITION CATEGORY R – ABNORMAL RAD LEVELS / RADIOLOGICAL EFFLUENT

GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
		<p>IC RA2 Damage to irradiated fuel or loss of water level that has resulted or will result in the uncovering of irradiated fuel outside the reactor vessel.</p> <p>Operating Mode Applicability: All</p> <p>Emergency Action Level Thresholds: <i>Note This EAL does not apply to the cask loading pit during cask loading operations.</i></p> <ol style="list-style-type: none"> 1. A water level drop in the reactor refueling cavity, spent fuel pool, cask loading pit, or fuel transfer canal that will result in uncovering irradiated fuel. <p>OR</p> <ol style="list-style-type: none"> 2. A VALID High Alarm on ANY of the following due to damage to irradiated fuel or loss of water level: <ul style="list-style-type: none"> • RU-16 Containment Operating Level Area • RU-17 Incore Instrument Area • RU-19 New Fuel Area • RU-31 Spent Fuel Pool Area • RU-33 Refueling Machine Area • RU-143 Plant Vent • RU-145 Fuel Building Vent 	<p>IC RU2 UNPLANNED rise in plant radiation levels.</p> <p>Operating Mode Applicability: All</p> <p>Emergency Action Level Thresholds:</p> <ol style="list-style-type: none"> 1. a. A VALID Alert Alarm on ANY of the following: <ul style="list-style-type: none"> • RU-16 Containment Operating Level Area • RU-17 Incore Instrument Area • RU-19 New Fuel Area • RU-31 Spent Fuel Pool Area • RU-33 Refueling Machine Area <p>AND</p> <ol style="list-style-type: none"> b. UNPLANNED water level drop in the reactor refueling cavity, fuel transfer canal, cask loading pit, or spent fuel pool as indicated by ANY of the following: <ul style="list-style-type: none"> • Visual observation • SFP LEVEL HI – LOW (EO204A) on PCN-E02 • RWLIS • Pressurizer level <p>OR</p> <ol style="list-style-type: none"> 2. UNPLANNED VALID Area Radiation Monitor readings or survey results indicate a rise by a factor of 1000 over normal* levels. <p>*Normal can be considered as the highest reading in the past twenty-four hours excluding the current peak value.</p>

TABLE 2 – INITIATING CONDITIONS AND EAL THRESHOLDS

RECOGNITION CATEGORY R – ABNORMAL RAD LEVELS / RADIOLOGICAL EFFLUENT

GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
		<p>IC</p> <p><u>RA3</u> Rise in radiation levels within the facility that impedes operation of systems required to maintain plant safety functions.</p> <p>Operating Mode Applicability: All</p> <p>Emergency Action Level Thresholds:</p> <p>1. Dose rate greater than 15 mR/hr in the Control Room Area OR Secondary Alarm Station.</p>	

TABLE 2 – INITIATING CONDITIONS AND EAL THRESHOLDS

GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
<p>IC</p> <p>CGI Loss of RCS inventory affecting fuel clad integrity with containment challenged.</p> <p>Operating Mode Applicability: 5, 6</p> <p>Emergency Action Level Threshold: <i>Note: The EC should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition will likely exceed the applicable time.</i></p> <p>1. a. RCS level less than 99 ft. 7 in. for 30 minutes or longer.</p> <p>AND</p> <p>b. ANY of the following</p> <ul style="list-style-type: none"> CONTAINMENT CLOSURE not established. 4.5% H₂ inside containment. UNPLANNED rise in containment pressure. <p>OR</p> <p>2. a. RCS level cannot be monitored with core uncover indicated by ANY of the following for 30 minutes or longer.</p> <ul style="list-style-type: none"> Erratic source range monitor indication RU-33 greater than 10,000 mR/hr UNPLANNED level rise in ANY of the following: <ul style="list-style-type: none"> Containment Sumps Reactor Cavity Sump Refueling Water Tank CVCS Holdup Tank Reactor Drain Tank ESF Sump <p>AND</p> <p>b. ANY of the following</p> <ul style="list-style-type: none"> CONTAINMENT CLOSURE not established. 4.5% H₂ inside containment. UNPLANNED rise in containment pressure. 	<p>IC</p> <p>CS1 Loss of RCS inventory affecting core decay heat removal capability.</p> <p>Operating Mode Applicability: 5, 6</p> <p>Emergency Action Level Thresholds: <i>Note: The EC should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition will likely exceed the applicable time.</i></p> <p>1. With CONTAINMENT CLOSURE not established, RCS level less than 101 ft 4 in. resulting in a loss of SDC.</p> <p>OR</p> <p>2. With CONTAINMENT CLOSURE established, RCS level less than 99 ft. 7 in.</p> <p>OR</p> <p>3. RCS level cannot be monitored for 30 minutes or longer with a loss of inventory as indicated by ANY of the following:</p> <ul style="list-style-type: none"> Erratic Source Range Monitor Indication. RU-33 greater than 10,000 mR/hr UNPLANNED level rise in ANY of the following: <ul style="list-style-type: none"> Containment Sumps Reactor Cavity Sump Refueling Water Tank CVCS Holdup Tank Reactor Drain Tank ESF Sump 	<p>IC</p> <p>CA1 Loss of RCS inventory.</p> <p>Operating Mode Applicability: 5, 6</p> <p>Emergency Action Level Thresholds: <i>Note: The EC should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition will likely exceed the applicable time.</i></p> <p>1. Inability to restore and maintain RCS level greater than 101 ft 4 in.</p> <p>OR</p> <p>2. RCS level cannot be monitored for 15 minutes or longer with a loss of inventory as indicated by an unexplained level rise in ANY of the following:</p> <ul style="list-style-type: none"> Containment Sumps Reactor Cavity Sump Refueling Water Tank CVCS Holdup Tank Reactor Drain Tank ESF Sump 	<p>IC</p> <p>CUI RCS leakage.</p> <p>Operating Mode Applicability: 5</p> <p>Emergency Action Level Thresholds: <i>Note: The EC should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition will likely exceed the applicable time.</i></p> <p>1. RCS leakage results in Lower Mode Safety Function Status Check Acceptance Criteria for Inventory Control not Satisfied for 15 minutes or longer.</p>

TABLE 2 – INITIATING CONDITIONS AND EAL THRESHOLDS

RECOGNITION CATEGORY C – COLD SHUTDOWN / REFUELING SYSTEM MALFUNCTION

GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
			<p>IC CU2 UNPLANNED loss of RCS inventory.</p> <p>Operating Mode Applicability: 6</p> <p>Emergency Action Level Thresholds: <i>Note: The EC should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition will likely exceed the applicable time.</i></p> <p>1. UNPLANNED RCS level drop as indicated by either of the following:</p> <ul style="list-style-type: none">• RCS water level drop below the Reactor Vessel flange for 15 minutes or longer when the RCS level band is established above the Reactor Vessel flange.• RCS water level drop below the RCS level band for 15 minutes or longer when operating in Reduced Inventory per 400P-9ZZ16. <p>OR</p> <p>2. RCS level cannot be monitored concurrent with a loss of RCS inventory as indicated by an unexplained level rise in any of the following:</p> <ul style="list-style-type: none">• Containment Sumps• Reactor Cavity Sump• Refueling Water Tank• CVCS Holdup Tank• Reactor Drain Tank• ESF Sump

TABLE 2 – INITIATING CONDITIONS AND EAL THRESHOLDS

RECOGNITION CATEGORY C – COLD SHUTDOWN / REFUELING SYSTEM MALFUNCTION

GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
		<p>IC <u>CA3</u> Loss of all Off-site and all On-Site AC power to emergency busses for 15 minutes or longer.</p> <p>Operating Mode Applicability: 5, 6, Defueled</p> <p>Emergency Action Level Threshold: <i>Note: The EC should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition will likely exceed the applicable time.</i></p> <p>1. Loss of <u>all</u> Off-Site and <u>all</u> On-Site AC Power to PBA-S03 and PBB-S04 for 15 minutes or longer.</p>	<p>IC <u>CU3</u> AC power capability to emergency busses reduced to a single power source for 15 minutes or longer such that any additional single failure would result in station blackout.</p> <p>Operating Mode Applicability: 5, 6</p> <p>Emergency Action Level Threshold: <i>Note: The EC should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition will likely exceed the applicable time.</i></p> <p>1. a. AC power capability to PBA-S03 and PBB-S04 reduced to a single power source for 15 minutes or longer.</p> <p>b. AND Any additional single power source failure will result in station blackout.</p>

TABLE 2 – INITIATING CONDITIONS AND EAL THRESHOLDS

RECOGNITION CATEGORY C – COLD SHUTDOWN / REFUELING SYSTEM MALFUNCTION

GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT																	
		<div>IC</div> <div>CA4 Inability to maintain plant in cold shutdown.</div> <div>Operating Mode Applicability: 5, 6</div> <div>Emergency Action Level Thresholds: (1 or 2)</div> <div><i>Note: The EC must remain alert to events or conditions that lead to the conclusion that exceeding the Threshold is IMMINENT. If, in the judgment of the EC, an IMMINENT situation is at hand, the classification should be made as if the threshold has been exceeded.</i></div> <div>1. An UNPLANNED event results in RCS temperature greater than 210 °F for greater than the specified duration on table.</div> <div><table><tr><th colspan="3">Table: RCS Reheat Duration Thresholds</th></tr><tr><th>RCS</th><th>Containment Closure</th><th>Duration</th></tr><tr><td rowspan="2">Not intact or RCS Reduced Inventory (< 111 ft.)</td><td>Not Established</td><td>0 Minutes</td></tr><tr><td>Established</td><td>20 Minutes*</td></tr><tr><td>Intact and not in RCS Reduced Inventory</td><td>N/A</td><td>60 minutes*</td></tr><tr><td colspan="3">* If SDC is in operation within this time frame and RCS temperature is being reduced, the Threshold is not applicable.</td></tr></table></div>	Table: RCS Reheat Duration Thresholds			RCS	Containment Closure	Duration	Not intact or RCS Reduced Inventory (< 111 ft.)	Not Established	0 Minutes	Established	20 Minutes*	Intact and not in RCS Reduced Inventory	N/A	60 minutes*	* If SDC is in operation within this time frame and RCS temperature is being reduced, the Threshold is not applicable.			<div>IC</div> <div>CU4 UNPLANNED loss of decay heat removal capability with irradiated fuel in the reactor vessel.</div> <div>Operating Mode Applicability: 5, 6</div> <div>Emergency Action Level Thresholds:</div> <div><i>Note: The EC should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition will likely exceed the applicable time.</i></div> <div>1. UNPLANNED event results in RCS temperature exceeding 210 °F.</div> <div>OR</div> <div>2. Loss of all RCS temperature and RCS level indication for 15 minutes or longer.</div>
Table: RCS Reheat Duration Thresholds																				
RCS	Containment Closure	Duration																		
Not intact or RCS Reduced Inventory (< 111 ft.)	Not Established	0 Minutes																		
	Established	20 Minutes*																		
Intact and not in RCS Reduced Inventory	N/A	60 minutes*																		
* If SDC is in operation within this time frame and RCS temperature is being reduced, the Threshold is not applicable.																				
		<div>2. An UNPLANNED event results in RCS pressure rise greater than 10 psi due to a loss of SDC. (This Threshold does <u>not</u> apply in Solid Plant conditions.)</div> <div>OR</div>																		

TABLE 2 – INITIATING CONDITIONS AND EAL THRESHOLDS

RECOGNITION CATEGORY C – COLD SHUTDOWN / REFUELING SYSTEM MALFUNCTION

GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
			<p>IC <u>CU6</u> Loss of <u>all</u> On-site or Off-site communications capabilities.</p> <p>Operating Mode Applicability: 5, 6, Defueled</p> <p>Emergency Action Level Thresholds:</p> <p>1. Loss of <u>all</u> of the following on-site communication methods affecting the ability to perform routine operations:</p> <p>a) PBX b) Plant Page System c) Two-Way Radio</p> <p>OR</p> <p>2. Loss of <u>all</u> of the following off-site communication methods affecting the ability to perform offsite notifications:</p> <p>a) PBX b) FTS c) Cellular Phones</p>
			<p>IC <u>CU7</u> Loss of required DC power for 15 minutes or longer.</p> <p>Operating Mode Applicability: 5, 6</p> <p>Emergency Action Level Threshold:</p> <p>Note: <i>The EC should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition will likely exceed the applicable time.</i></p> <p>1. Less than 112 VDC for 15 minutes or longer on Train A (PKA-M41 and PKC-M43) or Train B (PKB-M42 and PKD-M44) as required by Technical Specifications for monitoring and control of decay heat removal.</p>

TABLE 2 – INITIATING CONDITIONS AND EAL THRESHOLDS

RECOGNITION CATEGORY C – COLD SHUTDOWN / REFUELING SYSTEM MALFUNCTION

GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
			IC <u>CU8</u> Inadvertent criticality. Operating Mode Applicability: 5, 6 Emergency Action Level Thresholds: 1. UNPLANNED sustained source range count rise observed on nuclear instrumentation.

TABLE 2 – INITIATING CONDITIONS AND EAL THRESHOLDS

RECOGNITION CATEGORY E. INDEPENDENT SPENT FUEL STORAGE INSTALLATION (ISFSI)

GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
			<p>IC <u>E-HU1</u> Damage to a loaded cask CONFINEMENT BOUNDARY.</p> <p>Operating Mode: Not applicable</p> <p>Emergency Action Level Threshold: 1. Damage to a loaded cask CONFINEMENT BOUNDARY.</p>

TABLE 2 – INITIATING CONDITIONS AND EAL THRESHOLDS

Fission Product Barrier Table Thresholds for LOSS or POTENTIAL LOSS of Barriers*

*Determine which combination of the three barriers are lost or have a potential loss and use the following key to classify the event. Also, multiple events could occur which result in the conclusion that exceeding the loss or potential loss thresholds is IMMINENT. In this IMMINENT loss situation use judgment and classify as if the thresholds are exceeded. (Operating Mode Applicability: 1, 2, 3, 4)

GENERAL EMERGENCY		SITE AREA EMERGENCY		ALERT		UNUSUAL EVENT	
Loss of ANY two barriers AND Loss or Potential Loss of third barrier.		Loss or Potential Loss of ANY two barriers.		ANY Loss or ANY Potential Loss of EITHER Fuel Clad or RCS.		ANY Loss or ANY Potential Loss of Containment.	
Fuel Clad Barrier Thresholds		RCS Barrier Thresholds		Containment Barrier Thresholds			
LOSS	POTENTIAL LOSS	LOSS	POTENTIAL LOSS	LOSS	POTENTIAL LOSS		
1. Primary Coolant Activity Level		1. RCS Leak Rate		1. Containment Pressure			
A. Coolant activity greater than 300 µCi/gm Dose Equivalent I-131.	Not Applicable	A. RCS leak rate greater than available makeup capacity as indicated by a loss of RCS subcooling to saturation (0 °F).	A. RCS leak rate greater than charging capacity with Letdown isolated. OR B. RCS Pressure Control Safety Function Status Not Satisfied OR C. RCS and Core Heat Removal Safety Function Status Not Satisfied.	A. A containment pressure rise followed by a rapid unexplained drop in containment pressure. OR B. Containment pressure or sump level response not consistent with LOCA or MSLB conditions.	A. Containment pressure greater than 60 psig and rising OR B. 4.5% H ₂ inside containment. OR C. a. Pressure greater than 8.5 psig. AND b. Less than one full train of Containment Spray operating.		
2. Core Exit Thermocouple Readings		2. Not Applicable		2. Core Exit Thermocouple Readings			
A. Rep CET reading currently or previously greater than 1200 °F	A. Rep CET currently or previously greater than 700 °F	Not Applicable	Not Applicable	Not Applicable	A. a. Rep CET greater than 1200 ° F. AND b. Restoration not effective within 15 minutes. OR B. a. Rep CET greater than 700 °F. AND b. RVLMS less than 21% plenum. AND c. Restoration not effective within 15 minutes.		
3. Reactor Vessel Water Level		3. SG Tube Rupture		3. SG Secondary Side Release with P-to-S Leakage			
Not Applicable	A. RVLMS level currently or previously less than 21% plenum.	A. RUPTURED SG results in an SIAS.	Not Applicable	A. RUPTURED SG is also FAULTED outside of containment. OR B. a. Primary-to-Secondary leakrate greater than 10 gpm. AND b. UNISOLABLE steam release from the affected SG to the environment.	Not Applicable		

TABLE 2 – INITIATING CONDITIONS AND EAL THRESHOLDS

Fission Product Barrier Table Thresholds for LOSS or POTENTIAL LOSS of Barriers*

*Determine which combination of the three barriers are lost or have a potential loss and use the following key to classify the event. Also, multiple events could occur which result in the conclusion that exceeding the loss or potential loss thresholds is IMMINENT. In this IMMINENT loss situation use judgment and classify as if the thresholds are exceeded. (Operating Mode Applicability: 1, 2, 3, 4)

GENERAL EMERGENCY		SITE AREA EMERGENCY		ALERT		UNUSUAL EVENT	
Loss of ANY two barriers AND Loss or Potential Loss of third barrier.		Loss or Potential Loss of ANY two barriers.		ANY Loss or ANY Potential Loss of EITHER Fuel Clad or RCS.		ANY Loss or ANY Potential Loss of Containment.	
Fuel/Clad Barrier Thresholds		RCS Barrier Thresholds		Containment Barrier Thresholds			
LOSS	POTENTIAL LOSS	LOSS	POTENTIAL LOSS	LOSS	POTENTIAL LOSS		
4. Not Applicable		4. Not Applicable		4. Containment Isolation Failure or Bypass			
Not Applicable	Not Applicable	Not Applicable	Not Applicable	A. a. Failure of <u>all</u> valves in any one line to close AND b. Direct downstream pathway to the environment exists after containment isolation signal.	Not Applicable		
5. Containment Radiation Monitoring		5. Containment Radiation Monitoring		5. Containment Radiation Monitoring			
A. Containment radiation monitor <u>RU-148 > 2.1E+05 mR/hr</u> or <u>RU-149 > 2.4E+05 mR/hr</u>	Not Applicable	A. Containment radiation monitor <u>RU-148 > 5.0E+04 mR/hr</u> or <u>RU-149 > 5.6E+04 mR/hr</u> .	Not Applicable	Not Applicable	A. Containment radiation monitor <u>RU-148 > 6.8E+06 mR/hr</u> or <u>RU-149 > 7.8E+06 mR/hr</u>		
6. EC Judgment		6. EC Judgment		6. EC Judgment			
A. Any condition in the opinion of the EC that indicates Loss or Potential Loss of the Fuel Clad Barrier.		A. Any condition in the opinion of the EC that indicates Loss or Potential Loss of the RCS Barrier.		A. Any condition in the opinion of the EC that indicates Loss or Potential Loss of the Containment Barrier.			

TABLE 2 – INITIATING CONDITIONS AND EAL THRESHOLDS

RECOGNITION CATEGORY H - HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY

GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
<p>IC HG1 HOSTILE ACTION resulting in loss of physical control of the facility.</p> <p>Operating Mode Applicability: All</p> <p>Emergency Action Level Thresholds:</p> <p>1. A HOSTILE ACTION has occurred such that plant personnel are unable, either remotely or locally, to operate equipment required to maintain safety functions.</p> <p>OR</p> <p>2. A HOSTILE ACTION has caused failure of Spent Fuel Cooling Systems and IMMINENT fuel damage is likely for a freshly off-loaded reactor core in pool.</p>		<p>IC HAI Natural or destructive phenomena affecting VITAL AREAS.</p> <p>Operating Mode Applicability: All</p> <p>Emergency Action Level Thresholds:</p> <p>1.a. Seismic event greater than Operating Basis Earthquake (OBE) as indicated by any Force Balance Accelerometer reading greater than 0.10g.</p> <p>AND</p> <p>b. Earthquake confirmed by ANY of the following:</p> <ul style="list-style-type: none"> • Earthquake felt in plant • National Earthquake Center • Control Room indication of degraded performance of systems required for the safe shutdown of the plant. <p>OR</p> <p>2. Tornado touching down or high winds reaching 100 mph resulting in VISIBLE DAMAGE to any POWER BLOCK structure OR Control Room indication of degraded performance of safety systems.</p> <p>OR</p> <p>3. Internal flooding in any POWER BLOCK structure resulting in an electrical shock hazard that precludes access to operate or monitor safety equipment OR Control Room indication of degraded performance of those safety systems.</p> <p>OR</p> <p>4. Vehicle crash resulting in VISIBLE DAMAGE to any POWER BLOCK structure OR Control Room indication of degraded performance of safety systems.</p>	<p>IC HUI Natural or destructive phenomena affecting the PROTECTED AREA.</p> <p>Operating Mode Applicability: All</p> <p>Emergency Action Level Threshold:</p> <p>1. Seismic event identified by ANY 2 of the following:</p> <ul style="list-style-type: none"> • VALID Seismic Event alarm • Earthquake felt in plant • National Earthquake Center <p>OR</p> <p>2. Tornado touching down within the PROTECTED AREA or high winds reaching 100 mph.</p> <p>OR</p> <p>3. Internal flooding in the POWER BLOCK that has the potential to affect safety related equipment required by Technical Specifications for the current operating mode.</p> <p>OR</p> <p>4. Main Turbine failure resulting in casing penetration or damage to turbine or Main Generator seals.</p>

TABLE 2 – INITIATING CONDITIONS AND EAL THRESHOLDS

RECOGNITION CATEGORY H - HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY

GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
<p>IC HG2 Other conditions exist which in the judgment of the EC warrant declaration of a General Emergency.</p> <p>Operating Mode Applicability: All</p> <p>Emergency Action Level Threshold:</p> <p>1. Other conditions exist which in the judgment of the EC indicate that events are in progress or have occurred which involve actual or IMMINENT substantial core degradation or melting with potential for loss of containment integrity or HOSTILE ACTION that results in an actual loss of physical control of the facility. Releases can be reasonably expected to exceed EPA Protective Action Guideline exposure levels off-site for more than the immediate site area.</p>	<p>IC HS2 Control room evacuation has been initiated and plant control cannot be established.</p> <p>Operating Mode Applicability: All</p> <p>Emergency Action Level Threshold:</p> <p>1. a. Control Room evacuation has been initiated.</p> <p>b. Control of the plant cannot be established at the Remote Shutdown Panel within 15 minutes.</p> <p>AND</p>	<p>IC HA2 FIRE or EXPLOSION affecting the operability of plant safety systems required to establish or maintain safe shutdown.</p> <p>Operating Mode Applicability: All</p> <p>Emergency Action Level Threshold:</p> <p>1. FIRE or EXPLOSION resulting in VISIBLE DAMAGE to any POWER BLOCK structure or Control Room indication of degraded performance of safety systems.</p>	<p>IC HU2 FIRE within the PROTECTED AREA not extinguished within 15 minutes of detection or EXPLOSION within the PROTECTED AREA.</p> <p>Operating Mode Applicability: All</p> <p>Emergency Action Level Threshold:</p> <p><i>Note: The EC should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the duration has exceeded, or will likely exceed, the applicable time.</i></p> <p>1. FIRE in the POWER BLOCK or Turbine Building not extinguished within 15 minutes of a FIRE alarm or Control Room notification.</p> <p>OR</p> <p>2. EXPLOSION within the PROTECTED AREA.</p>

TABLE 2 – INITIATING CONDITIONS AND EAL THRESHOLDS

RECOGNITION CATEGORY H - HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY

GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
	<p>IC HS3 Other conditions exist which in the judgment of the EC warrant declaration of a Site Area Emergency.</p> <p>Operating Mode Applicability: All</p> <p>Emergency Action Level Threshold:</p> <p>1. Other conditions exist which in the judgment of the EC indicate that events are in progress or have occurred which involve actual or likely major failures of plant functions needed for protection of the public or HOSTILE ACTION that results in intentional damage or malicious acts; (1) toward site personnel or equipment that could lead to the likely failure of or; (2) that prevent effective access to equipment needed for the protection of the public. Any releases are not expected to result in exposure levels which exceed EPA Protective Action Guideline exposure levels beyond the site boundary.</p>	<p>IC HA3 Access to a VITAL AREA is prohibited due to release of toxic, corrosive, asphyxiant or flammable gases which jeopardize operation of systems required to maintain safe operations or safely shutdown the reactor.</p> <p>Operating Mode Applicability: All</p> <p>Emergency Action Level Thresholds:</p> <p><i>Note: If the equipment in the stated area was already inoperable, or out of service, before the event occurred, then this EAL should not be declared as it will have no adverse impact on the ability of the plant to safely operate or safely shutdown beyond that already allowed by Technical Specifications at the time of the event.</i></p> <p>1. Access to a VITAL AREA is prohibited due to toxic, corrosive, asphyxiant or flammable gases which jeopardize operation of systems required to maintain safe operations or safely shutdown the reactor.</p>	<p>IC HU3 Release of toxic, corrosive, asphyxiant, or flammable gases deemed detrimental to NORMAL PLANT OPERATIONS.</p> <p>Operating Mode Applicability: All</p> <p>Emergency Action Level Thresholds:</p> <p>1. Toxic, corrosive, asphyxiant or flammable gases in amounts that have or could adversely affect NORMAL PLANT OPERATIONS.</p> <p>OR</p> <p>2. Report by local, county or state officials for evacuation or sheltering of site personnel based on an off-site event.</p>
	<p>IC HS4 HOSTILE ACTION within the PROTECTED AREA.</p> <p>Operating Mode Applicability: All</p> <p>Emergency Action Level Threshold:</p> <p>1. A HOSTILE ACTION is occurring or has occurred within the PROTECTED AREA as reported by the Security Team.</p>	<p>IC HA4 HOSTILE ACTION within the Owner Controlled Area or airborne attack threat.</p> <p>Operating Mode Applicability: All</p> <p>Emergency Action Level Threshold:</p> <p>1. A HOSTILE ACTION is occurring or has occurred within the Owner Controlled Area as reported by the Security Team.</p> <p>OR</p> <p>2. A validated notification from NRC of an airliner attack threat within 30 minutes of the site.</p> <p>OR</p> <p>3. A HOSTILE ACTION directed toward the ISFSI</p>	<p>IC HU4 Confirmed SECURITY CONDITION or threat which indicates a potential degradation in the level of safety of the plant.</p> <p>Operating Mode Applicability: All</p> <p>Emergency Action Level Thresholds:</p> <p>1. A SECURITY CONDITION that does NOT involve a HOSTILE ACTION as reported by the Security Team.</p> <p>OR</p> <p>2. A credible PVNGS security threat notification.</p> <p>OR</p> <p>3. A validated notification from NRC providing information of an aircraft threat.</p>

TABLE 2 – INITIATING CONDITIONS AND EAL THRESHOLDS

RECOGNITION CATEGORY H - HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY

GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
		<p>IC HA5 Control room evacuation has been initiated.</p> <p>Operating Mode Applicability: All</p> <p>Emergency Action Level Threshold:</p> <p>1. Control Room evacuation is required by:</p> <p>40AO-9ZZ18, Shutdown Outside Control Room</p> <p>OR</p> <p>40AO-9ZZ19, Control Room Fire.</p>	<p>IC HU5 Other conditions exist which in the judgment of the EC warrant declaration of a UE.</p> <p>Operating Mode Applicability: All</p> <p>Emergency Action Level Threshold:</p> <p>1. Other conditions exist which in the judgment of the EC indicate that events are in progress or have occurred which indicate a potential degradation of the level of safety of the plant or indicate a security threat to facility protection has been initiated. No releases of radioactive material requiring off-site response or monitoring are expected unless further degradation of safety systems occurs.</p>
		<p>IC HA6 Other conditions exist which in the judgment of the EC warrant declaration of an Alert.</p> <p>Operating Mode Applicability: All</p> <p>Emergency Action Level Threshold:</p> <p>1. Other conditions exist which in the judgment of the EC indicate that events are in progress or have occurred which involve an actual or potential substantial degradation of the level of safety of the plant or a security event that involves probable life threatening risk to site personnel or damage to site equipment because of HOSTILE ACTION. Any releases are expected to be limited to small fractions of the EPA Protective Action Guideline exposure levels.</p>	

TABLE 2 – INITIATING CONDITIONS AND EAL THRESHOLDS

RECOGNITION CATEGORY M - SYSTEM MALFUNCTION

GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
<p>IC</p> <p>MGI Prolonged loss of all Off-site and all On-Site AC power to emergency busses.</p> <p>Operating Mode Applicability: 1, 2, 3, 4</p> <p>Emergency Action Level Threshold:</p> <p>1. a. Loss of all off-site and all on-site AC power to PBA-S03 and PBB-S04.</p> <p>AND</p> <p>b. EITHER of the following:</p> <ul style="list-style-type: none"> Restoration of at least one emergency bus in less than 4 hours is not likely. RCS and Core Heat Removal Safety Function Acceptance Criteria NOT Satisfied per 40EP-9EO08, BLACKOUT. 	<p>IC</p> <p>MSI Loss of all Off-site and all On-Site AC power to emergency busses for 15 minutes or longer.</p> <p>Operating Mode Applicability: 1, 2, 3, 4</p> <p>Emergency Action Level Threshold:</p> <p>Note: <i>The EC should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition has exceeded, or will likely exceed, the applicable time.</i></p> <p>1. Loss of all Off-Site and all On-Site AC power to PBA-S03 and PBB-S04 for 15 minutes or longer.</p>		<p>IC</p> <p>MUI Loss of all Off-site AC power to emergency busses for 15 minutes or longer.</p> <p>Operating Mode Applicability: 1, 2, 3, 4</p> <p>Emergency Action Level Threshold:</p> <p>Note: <i>The EC should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition has exceeded, or will likely exceed, the applicable time.</i></p> <p>1. Loss of all off-site AC power to PBA-S03 and PBB-S04 for 15 minutes or longer.</p>

TABLE 2 – INITIATING CONDITIONS AND EAL THRESHOLDS

RECOGNITION CATEGORY M - SYSTEM MALFUNCTION

GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
<p>IC MG2 Automatic Trip and <u>all</u> manual actions fail to shutdown the reactor and indication of an extreme challenge to the ability to cool the core exists.</p> <p>Operating Mode Applicability: 1, 2</p> <p>Emergency Action Level Threshold:</p> <p>1. a. Plant Protection System failed to shutdown the reactor.</p> <p>AND</p> <p>b. <u>All</u> Manual actions do NOT shutdown the reactor as indicated by:</p> <ul style="list-style-type: none"> • Reactor power is NOT dropping to less than 5% power • <u>All</u> full strength CEAs are NOT inserted <p>AND</p> <p>c. Rep CET greater than 1200 °F.</p>	<p>IC MS2 Automatic Trip fails to shutdown the reactor and manual actions taken at the reactor control console are not successful in shutting down the reactor.</p> <p>Operating Mode Applicability: 1, 2</p> <p>Emergency Action Level Threshold:</p> <p>1. a. Plant Protection System failed to shutdown the reactor.</p> <p>AND</p> <p>b. Manual actions taken on Panels B05 and B01 do NOT shut down the reactor as indicated by:</p> <ul style="list-style-type: none"> • Reactor power is NOT dropping to less than 5% power • <u>All</u> full strength CEAs are NOT inserted 	<p>IC MA2 Automatic Trip fails to shutdown the reactor and the manual actions taken from the reactor control console are successful in shutting down the reactor.</p> <p>Operating Mode Applicability: 1, 2</p> <p>Emergency Action Level Threshold:</p> <p>1. a. Plant Protection System failed to shutdown the reactor.</p> <p>AND</p> <p>b. Manual shutdown actions taken on Panels B05 or B01 are successful as indicated by all of the following:</p> <ul style="list-style-type: none"> • Reactor power is dropping to less than 5% power • Negative Start-up rate • <u>All</u> full strength CEAs are inserted or Boration in progress 	<p>IC MU2 Inability to reach required shutdown within Technical Specification limits.</p> <p>Operating Mode Applicability: 1, 2, 3, 4</p> <p>Emergency Action Level Threshold:</p> <p>1. Plant is not brought to required operating mode within Technical Specifications LCO Action Statement Time.</p>

TABLE 2 – INITIATING CONDITIONS AND EAL THRESHOLDS

RECOGNITION CATEGORY M - SYSTEM MALFUNCTION

GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
	<p>IC MS3 Loss of <u>all</u> vital DC power for 15 minutes or longer.</p> <p>Operating Mode Applicability: 1, 2, 3, 4</p> <p>Emergency Action Level Threshold: <i>Note: The EC should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition has exceeded, or will likely exceed, the applicable time.</i></p> <p>1. Less than 112 VDC on <u>all</u> PKA-M41, PKB-M42, PKC-M43, and PKD-M44 for 15 minutes or longer.</p>		<p>IC MU3 UNPLANNED loss of safety system annunciation or indication in the Control Room for 15 minutes or longer.</p> <p>Operating Mode Applicability: 1, 2, 3, 4</p> <p>Emergency Action Level Threshold: <i>Note: The EC should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition has exceeded, or will likely exceed, the applicable time.</i></p> <p>1. UNPLANNED Loss of annunciators on any 4 of the following B01, B02, B04, B05, B06 or SESS for 15 minutes or longer.</p> <p>OR</p> <p>UNPLANNED Loss of either PNA-D25 or PNB-D26 for 15 minutes or longer.</p>

TABLE 2 – INITIATING CONDITIONS AND EAL THRESHOLDS

RECOGNITION CATEGORY M - SYSTEM MALFUNCTION

GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
		<p>IC MA4 UNPLANNED Loss of safety system annunciation or indication in the Control Room with EITHER (1) a significant transient in progress, or (2) compensatory indicators are unavailable.</p> <p>Operating Mode Applicability: 1, 2, 3, 4</p> <p>Emergency Action Level Threshold: <i>Note: The EC should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition has exceeded, or will likely exceed, the applicable time.</i></p> <p>1. a. UNPLANNED Loss of annunciators on any 4 of the following B01, B02, B04, B05, B06 or SESS for 15 minutes or longer.</p> <p style="text-align: center;">OR</p> <p>UNPLANNED Loss of either PNA-D25 or PNB-D26 for 15 minutes or longer.</p> <p style="text-align: center;">AND</p> <p>b. ANY of the following:</p> <ul style="list-style-type: none"> • Automatic turbine setback/runback greater than 25% thermal reactor power • Reactor Trip • VALID ESFAS Actuation • Plant computer unavailable 	<p>IC MU4 Fuel Clad degradation.</p> <p>Operating Mode Applicability: 1, 2, 3, 4</p> <p>Emergency Action Level Thresholds:</p> <p>1. RU-155D High Alarm.</p> <p style="text-align: center;">OR</p> <p>2.a. DOSE EQUIVALENT I-131 greater than 1.0 $\mu\text{Ci/gm}$ for 48 hours.</p> <p style="text-align: center;">OR</p> <p>b. Reactor Coolant DOSE EQUIVALENT Xe-133 specific activity greater than 550 $\mu\text{Ci/gm}$ for 48 hours.</p>

TABLE 2 – INITIATING CONDITIONS AND EAL THRESHOLDS

RECOGNITION CATEGORY M - SYSTEM MALFUNCTION

GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
		<p>IC <u>MA5</u> AC power capability to emergency busses reduced to a single power source for 15 minutes or longer such that any additional single failure would result in station blackout.</p> <p>Operating Mode Applicability: 1, 2, 3, 4</p> <p>Emergency Action Level Threshold: <i>Note: The EC should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition has exceeded, or will likely exceed, the applicable time.</i></p> <p>1. a. AC power capability to PBA-S03 and PBB-S04 reduced to a single power source for 15 minutes or longer.</p> <p>AND</p> <p>b. Any additional single power source failure will result in station blackout.</p>	<p>IC <u>MU5</u> RCS leakage.</p> <p>Operating Mode Applicability: 1, 2, 3, 4</p> <p>Emergency Action Level Thresholds:</p> <p>1. Unidentified or pressure boundary LEAKAGE greater than 10 gpm.</p> <p>OR</p> <p>2. Identified LEAKAGE greater than 25 gpm.</p>

TABLE 2 – INITIATING CONDITIONS AND EAL THRESHOLDS

RECOGNITION CATEGORY M - SYSTEM MALFUNCTION

GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
	<p>IC MS6 Inability to monitor a significant transient in progress.</p> <p>Operating Mode Applicability: 1, 2, 3, 4</p> <p>Emergency Action Level Threshold:</p> <p><i>Note: The EC should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition has exceeded, or will likely exceed, the applicable time.</i></p> <p>1. a. Loss of annunciators on any 4 of the following B01, B02, B04, B05, B06 or SESS for 15 minutes or longer.</p> <p style="text-align: center;">OR</p> <p>Loss of either PNA-D25 or PNB-D26 for 15 minutes or longer.</p> <p style="text-align: center;">AND</p> <p>b. Any of the following:</p> <ul style="list-style-type: none"> • Automatic turbine setback/runback greater than 25% thermal reactor power • Reactor Trip • VALID ESFAS Actuation <p style="text-align: center;">AND</p> <p>c. Plant computer indications are unavailable.</p>		<p>IC MU6 Loss of <u>all</u> On-site or Off-site communications capabilities.</p> <p>Operating Mode Applicability: 1, 2, 3, 4</p> <p>Emergency Action Level Thresholds:</p> <p>1. Loss of <u>all</u> of the following on-site communication methods affecting the ability to perform routine operations.</p> <ul style="list-style-type: none"> • PBX • Plant Page System • Two-Way Radio <p style="text-align: center;">OR</p> <p>2. Loss of <u>all</u> of the following off-site communication methods affecting the ability to perform off-site notifications.</p> <ul style="list-style-type: none"> • PBX • FTS • Cellular Phones
			<p>IC MU8 Inadvertent criticality.</p> <p>Operating Mode Applicability: 3, 4</p> <p>Emergency Action Level Threshold:</p> <p>1. UNPLANNED sustained source range count rise observed on nuclear instrumentation.</p>

TABLE 2 – INITIATING CONDITIONS AND EAL THRESHOLDS

6.0 EMERGENCY MEASURES

This section establishes the methodology of emergency response and is the basis for the EPIPs which define the emergency actions to be taken during an emergency.

Emergency measures follow a sequential process which contains the following definable elements:

- Event Assessment
- Classification and Declaration
- Notification
- Mobilization
- Consequence Assessment
- Protective Actions
- Corrective Actions

6.1 EVENT ASSESSMENT

Initial recognition of emergency conditions should normally occur in the Control Room. Emergency conditions may be indicated by alarms, instrument readings or reports to the Control Room. The Control Room Supervisor (CRS) should provide initial evaluation of the indicators and notify the Shift Manager (SM). The SM evaluates the conditions against the established EALs to determine if an EAL has been reached or exceeded.

6.2 CLASSIFICATION AND DECLARATION

An emergency shall be classified and declared if the SM finds that a specific EAL has been reached, exceeded, or if the SM determines that it is imminent that the specific EAL set-point will be reached or exceeded.

When the SM declares an emergency to the Control Room personnel, an announcement will be made over the unit public address system, and the other Control Rooms and Security will be notified.

For those abnormal situations potentially involving more than one unit, the Unit 1 SM is responsible for initially classifying and declaring the emergency and assuming the position of EC. Exceptions are considered for selected security events.

6.3 NOTIFICATION

Initial notifications are made to state and county warning points and the NRC in accordance with established procedures. The procedures include a means of message verification. The initial notifications to state and county warning points are made within 15 minutes of the declaration of the emergency. The Notification Alert Network (NAN) is the dedicated telephone circuit designed for this purpose (Figures 7 and 8).

The NRC is notified immediately after State and County notification and within one hour. This notification occurs via the ENS line or the designated alternative if not available .

6.4 MOBILIZATION

The emergency organization for an Unusual Event consists of normal shift personnel. Augmentation of this organization may occur at the discretion of the EC. At an Alert or higher level emergency classification, the ERO is augmented. ERO personnel will be notified via an automated callout system, Group Paging System, and site PA system.

6.5 CONSEQUENCE ASSESSMENT

Assessment actions will continue throughout the emergency. Continued assessment may result in reclassification of the emergency and alteration of emergency response actions.

Priority will be given to continuing assessment actions that result in:

- Protective Action Recommendations for the health and safety of the general public
- Protective Actions for onsite personnel
- Maintaining control of the plant
- Resolving an emergency situation
- Corrective actions to reduce the consequences of an emergency

6.5.1 Assessment Action for Control of Plant Operations

The existence of any emergency condition causes increased monitoring of Control Room instrumentation to monitor trends of appropriate parameters, particularly the indicated values that triggered the emergency and those that may be related. Additional monitoring equipment may be used to assess the nature of the emergency condition. A Safety Parameter Display System (SPDS) display console is in the Control Room and is accessible to Control Room personnel.

6.5.2 Environmental Assessment for Protection of the Health & Safety of the Public

PVNGS has the responsibility to perform a preliminary assessment of the offsite consequences of an incident. Environmental Assessment for Protection of the Health and Safety of the Public is performed by Palo Verde NGS using two methods:

- Dose Assessment
- Environmental Surveys

Dose Assessment is performed by trained personnel using computer generated dose projections based on plant parameters and/or site effluent release data. The initial assessment will be performed within 30 minutes of the declaration of any emergency classification. The dose assessment program and EPIP's provide recommendations for protective action recommendations when indicated by dose assessment results.

Environmental Surveys will be initiated as a minimum following the declaration of Alert or higher. An Environmental Team will be deployed within 30 minutes to support these surveys. Environmental Teams measure dose rate readings and noble gas and iodine concentrations.

PVNGS maintains fully equipped and dedicated vehicles to support Environmental Teams. Air monitoring equipment has the capability to detect under field conditions, radioiodine concentrations in air as low as E-7 microcuries per cubic centimeter.

PVNGS deploys Survey 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 and dose to the public (ingestion pathway EPZ) are the responsibility of ARRA and supported by Federal resources.

Radiological data developed by either of these techniques is used to assess appropriateness of Classification and Protective Action Recommendations.

Environmental assessment is supported by a permanent meteorological installation which continuously indicates and records wind speed, direction and temperature differentials. Meteorological data may be obtained from the National Weather Service. This system is described in section 7.3.1.1

6.5.3 In-plant Radiological Controls

During the course of an emergency, elevated radiation or contamination levels may be experienced. It may then be necessary to impose additional radiological controls beyond the controls established by the normal in-plant radiological controls program.

In-plant radiological controls in an emergency situation may differ from normal radiological control activities in the following aspects:

- Maintaining strict access control into affected plant areas
- Availability and use of augmented dosimetry
- Additional use of portable radiation monitoring devices, particularly high range monitoring devices, for monitoring contamination and area radiation levels
- Increased availability and use of protective clothing and respiratory devices
- Increased air sampling for the purpose of limiting the number of persons subject to exposure
- Increased whole body counting and other bio-assays

Initial assessment of the need for in-plant radiological controls may be based on plant readings, RMS readings, in-plant EPD readings and system status reports. Additional information concerning in-plant radiological conditions may be gained during the debriefing of personnel deployed with Emergency Repair and Survey Teams.

6.5.4 Reactor Core Damage Assessment

Initial assessment of the status of the reactor core is performed by the STA. Initial assessment of core conditions is based on readings of Control Room instrumentation and assessment of SPDS data.

Prior to TSC activation, the STA in the STSC provides additional capability for assessment of reactor core damage.

When the TSC is activated, the Reactor Analyst assesses core conditions under the direction of the Engineering Manager. Information is obtained from the SPDS and critical parameter values from ERFDADS.

Palo Verde's Core Damage Assessment program was developed based on the Combustion Engineering Owners Group Task 467, Development of the Comprehensive Procedure Guidelines for Core Damage Assessment.

6.6 CORRECTIVE ACTIONS

PVNGS procedures contain steps for preventive and/or corrective actions to avoid or mitigate serious consequences of an incident. These steps are contained in AOP, EOP, and other plant procedures.

6.7 PROTECTIVE ACTIONS

A range of protective actions has been developed for emergency workers and the public. The guidelines for emergency workers are consistent with EPA emergency worker and lifesaving activity protective action guides.

Protective actions are emergency measures taken during and after an emergency so that onsite personnel and the general public are alerted and actions are initiated for the protection of their health and safety. Protective actions are initiated if radiation or airborne radioactivity levels exceed predetermined values or when situations threaten the health and safety of onsite personnel or the general public.

The responsibility for the determination of Protective Actions for Workers and the General Public is implemented as follows:

- Protective actions for onsite personnel and visitors are the responsibility of the PVNGS Emergency Coordinator.
- Protective Actions for Emergency Workers operating under the State or County Emergency Plan are the responsibility of the ARRA. Measures for the protection of these Emergency Workers are detailed in the Offsite Emergency Response Plan for PVNGS.
- Protective Measures for the General Public are directed by the Governor of Arizona and implemented by Maricopa County. It is the responsibility of PVNGS to provide Protective Action Recommendations for the Evacuation and/or Shelter of the General Public within the 10 Mile EPZ in addition to a recommendation for Potassium Iodide when appropriate. PVNGS in coordination with the State of Arizona (ADEM and ARRA) along with Maricopa County have formulated a protective action strategy consistent with the guidance contained within "*NUREG 0654, Supplement 3, Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants, Guidance for Protective Action Strategies, November 2011.*"

The current evacuation time estimate (and annual updates as necessary) is used to assist in formulating protective actions by the offsite authorities. Measures for the protection of the general public are detailed in the Offsite Emergency Response Plan for PVNGS. The communications flow path associated with Protective Action Recommendations is illustrated in Figure 10.

6.7.1 PROTECTIVE ACTION FOR ONSITE PERSONNEL

Protective actions for onsite personnel may include alerting, personnel assembly, accountability, and evacuation as well as security procedures, access control, monitoring and decontamination. Protective actions may also be taken for onsite personnel for emergencies such as fires or natural disasters where personnel safety is threatened.

6.7.1.1 Hostile Action

Onsite protective of employees during a hostile action involves a combination of restricted movement, movement to safe locations, and site evacuation depending on the nature of the hostile event and advance warning. Site procedures provide specific actions to take during hostile action based events.

6.7.1.2 Alerting

Unit personnel are alerted by an audible signal and an announcement over the unit public address system. Site personnel are alerted by activation of an audible signal followed by public address system announcements. Evacuation/accountability is assured in high noise work areas by the use of audible alarms, flashing lights, and/or administrative measures.

The PVNGS Site Warning Siren/Public Address System consists of electronic sirens with four distinct sounds: (1) assembly signal, (2) evacuation signal, (3) fire signal, and (4) all-clear signal. These signals are introduced in Site Access Training and are available on a phone recording. The emergency signal can be activated from the Control Room, the TSC, or Simulator "A".

6.7.1.3 Assembly

Personnel assembly is mandatory at the Site Area Emergency or higher level classification. Assembly of site personnel outside of the Protected Areas is accomplished by all personnel reporting to designated assembly areas. Assembly may be initiated at any time site management deems it appropriate for personnel safety reasons. In the case of a hostile action threat or event, designated assembly points will be announced via the Public Address System. The designated assembly points may include on-site assembly points or offsite mustering points. Assembly may also be used as a tool to initiate the Two-Man Rule during Security events.

6.7.1.4 Accountability

Personnel accountability within the Protected Area is mandatory at the Site Area Emergency. Accountability may be initiated at other times at the discretion of the EC to support worker safety.

Accountability of personnel within the Protected Areas is accomplished within 30 minutes of the declaration of Site Area Emergency or higher, and maintained continuously thereafter, using Protected Area(s) boundary access control as described in the PVNGS Security Plan. If there are station personnel who are unaccounted for, the Unit Evacuation System and site-wide page are used to locate them, or, in extreme cases (fire, toxic gas release, explosions, structural damage, etc.), trained search and rescue personnel are deployed to search for and assist the missing personnel.

6.7.1.5 Evacuation

The decision to evacuate non-essential personnel is made by the EC. Non-essential personnel must be evacuated in the event of a Site Area Emergency or General Emergency. However, in certain situations it may be desirable to evacuate earlier to enhance worker protection.

6.7.1.6 Security and Access Control

PVNGS Security personnel at Security Access Control Points are instructed to admit only emergency personnel and designated County, State and NRC personnel. Special onsite security measures have been developed to facilitate rapid access by emergency response personnel. In case of a Security contingency event such as a direct armed attack, Security's response actions may be primarily focused on the Security event and take precedence over emergency response duties.

6.7.1.7 Monitoring and Decontamination

Personnel are monitored for contamination at the Security Access Points as they depart the Power Plant Protected Area by portal monitors. Personnel located outside the Power Plant Protected Area are monitored as required by radiological conditions. If decontamination of personnel is required, they are decontaminated by trained personnel.

Onsite emergency personnel are monitored for contamination at their respective emergency stations. Decontamination of onsite emergency personnel is conducted at onsite decontamination facilities.

6.7.1.8 Protective Equipment and Supplies

A variety of protective equipment is available onsite to minimize radiological exposures, contamination problems and fire fighting hazards.

6.7.1.8.1 Respiratory Protection Equipment

Respiratory protection equipment includes full face canister respirators, self-contained breathing apparatus and air-fed respirators. Radiation Protection personnel determine when the use of respiratory protection equipment is appropriate and select the correct type of equipment for conditions expected to be encountered.

6.7.1.8.2 Protective Clothing

Protective clothing is maintained onsite for routine use and is available for use during emergencies.

6.7.1.8.3 Thyroid Blocking Agent

The EC is the only individual who may authorize the voluntary use of potassium iodide (KI) for emergency personnel. The EC-TSC authorizes the use of KI with the advice of the Radiation Protection Coordinator. The use of KI is based on the potential for release, or on the magnitude of an actual release, of iodine. KI is distributed to emergency workers when its use is authorized.

6.7.1.8.4 Emergency Dosimetry

Dosimetry is located in close proximity to all emergency centers and available for issue to emergency personnel as necessary by Radiation Protection personnel.

6.7.2 OFFSITE PROTECTIVE ACTIONS

Protective Actions for the General Public in response to radiological emergencies include sheltering or evacuation of the public and the issuance of Potassium Iodide based on consideration of the relative benefits of each action. The action which affords the higher level of dose avoidance, when offsite doses are expected to exceed Protective Action Guides, is preferred. However, other factors such as release duration, mobilization time or adverse weather are important considerations affecting offsite protective action recommendations. Evacuation route sections and evacuation routing are shown in Figure 11. It is the responsibility of PVNGS to make Protective Action Recommendations, the Governor of the State of Arizona to make Protective Action Decisions and Maricopa County to implement the Protective Action Decision.

PVNGS has performed an Evacuation Time Estimate as required by 10CFR50, Appendix E. PVNGS will estimate EPZ permanent resident population changes at least annually during the years between decennial censuses using U. S. Census Bureau data. These estimates shall occur no more than 365 days apart. State/local government population data may also be used, if available. Licensees shall maintain these estimates available for NRC inspection during the period between censuses and shall submit these estimates to the NRC with any updated ETEs. If at any time during the decennial period, the population increases so that the ETE for the 2-mile zone or 5-mile zone, including all affected ERPAs, or for the entire EPZ, increases by 25 percent or 30 minutes, whichever is less, for the scenario with the longest ETE, the ETE analysis will be updated to reflect the impact of that population increase.

6.7.2.1 Protective Actions for the General Public

The basis for developing and providing Protective Action Recommendations is EPA-400, "Manual of Protective Action Guides and Protective Actions For Nuclear Incidents." Protective action recommendations for the general public consider the time required for notification of offsite authorities, for public alerting and for implementation of protective actions. In the case of a core melt situation, evacuation of at least a two-mile radius around the plant site and at least five miles downwind for affected sectors is recommended. A Shelter recommendation may be made if known impediments to evacuation exist or the release conditions dictate. Governmental officials will also be advised to consider the use of Potassium Iodide (KI) as a protective measure. When evacuation is ordered, the Offsite Emergency Response Plan for Palo Verde Nuclear Generating Station provides, as a minimum, for evacuation by 22.5 degree sectors considering first the sector in which the central axis of the plume is located and then the adjacent sector on each side. Implementation of protective actions for the general public is described in the Offsite Emergency Response Plan for Palo Verde Nuclear Generating Station. Time estimates for evacuation within the Plume Exposure Pathway Emergency Planning Zone are maintained in the files of Emergency Preparedness Department. The demography within the Plume Exposure Pathway is shown in Figure 12.

Offsite authorities receive an immediate notification for:

- Change in emergency classification
- Change in the release status
- Change in Protective Action Recommendations
- Change in the Protective Action zone

6.7.3 CONTAMINATION CONTROL MEASURES**6.7.3.1 Plant Site**

Specific area limits have been established for control of contamination within the PVNGS facility. The basis for these limits is that contamination shall be controlled so that hazards to personnel are minimized and compliance with personnel exposure limits (internal and external) is assured. As necessary, Contamination Areas are established and posted. Details of contamination control measures for onsite personnel and equipment are contained in the PVNGS Radiation Protection Program.

6.7.3.2 Offsite

Criteria and measures for contamination control in offsite areas are detailed in the Offsite Emergency Response Plan for Palo Verde Nuclear Generating Station.

6.8 AID TO AFFECTED PERSONNEL**6.8.1 EMERGENCY PERSONNEL DOSE CRITERIA**

Emergency workers carry dosimeters in addition to Thermoluminescent Dosimeters (TLDs). Dosimeters are read at intervals dependent upon radiation levels in accordance with PVNGS Nuclear Administrative and Technical Manual Procedures.

Emergency dosimetry is provided on a 24-hour basis by Radiation Protection personnel. Every effort is made to minimize emergency worker doses through the use of protective equipment and supplies and by minimizing exposure time. Emergency exposures above administrative guidelines are authorized by the Radiation Protection Coordinator or the EC-TSC. The Radiation Protection Monitor (RPM) or Radiation Protection Coordinator authorizes exposures up to the 10 CFR 20 limits, and the EC-TSC authorizes exposures above 10 CFR 20 limits, in accordance with procedures.

Emergency worker dose criteria are based on three categories of actions: sampling under accident conditions, lifesaving actions, and corrective/protective actions.

The EC-TSC is notified of accidental or emergency dose in excess of occupational limits. Affected individuals are not assigned to further emergency team operations with the possibility of exposure. Decisions to accept doses in excess of occupational limits in life-saving situations are on a volunteer basis. In no case, are planned doses permitted to exceed 25 Rem Total Effective Dose Equivalent (TEDE).

6.8.2 DECONTAMINATION AND FIRST AID

Provisions exist to assist personnel who are injured and who have received high radiation doses, or who have been contaminated. Decontamination materials and portable first aid kits are available at strategic locations throughout the station and offsite. There are personnel trained in first aid and decontamination procedures. In addition, onsite decontamination areas equipped with decontamination facilities, supplies, and other specialized equipment are located near the access control point on the 140 ft. elevation in the Auxiliary Building of each unit. Personnel found to be externally contaminated are decontaminated. Where contamination of large, open wounds is involved, personnel are transported to Banner Good Samaritan Medical Center or Banner Estrella Medical Center. Contaminated PVNGS evacuees are decontaminated at the offsite relocation area. Waste fluids and wastes from decontamination of personnel or material are collected and handled as radioactive wastes in accordance with the PVNGS Nuclear Administrative and Technical Manual, except at the offsite relocation area, where radioactive wastes are handled under the guidance of ARRA.

6.8.3 MEDICAL TRANSPORTATION

Injured/externally contaminated personnel who require medical attention are transported to Banner Good Samaritan Medical Center or Banner Estrella Medical Center by an available onsite or offsite ambulance.

6.8.4 MEDICAL TREATMENT

Letters of agreement for treating externally contaminated patients exist for Banner Good Samaritan Medical Center and Banner Estrella Medical Center.

Treatment of individuals injured may occur at the onsite medical facility during normal working hours or by EMT qualified personnel on weekends or backshift. Serious injuries may require the patient to be transferred to the nearest offsite treatment facility appropriate to the injury.

6.9 MEDIA RELATIONS

Provisions for media relations during the course of an emergency are detailed in the Joint Public Information Procedure. When an Unusual Event is declared, news media relations are conducted from Palo Verde Communications. At the Alert or higher classification level, the Joint Information Center is activated at 600 North Airport Road, Building A, Buckeye, Arizona in accordance with the guidelines of the Joint Public Information Procedure. The Public Inquiry Center at the State EOC and the Rumor Control Center at Customer Care Center responds to public inquiries.

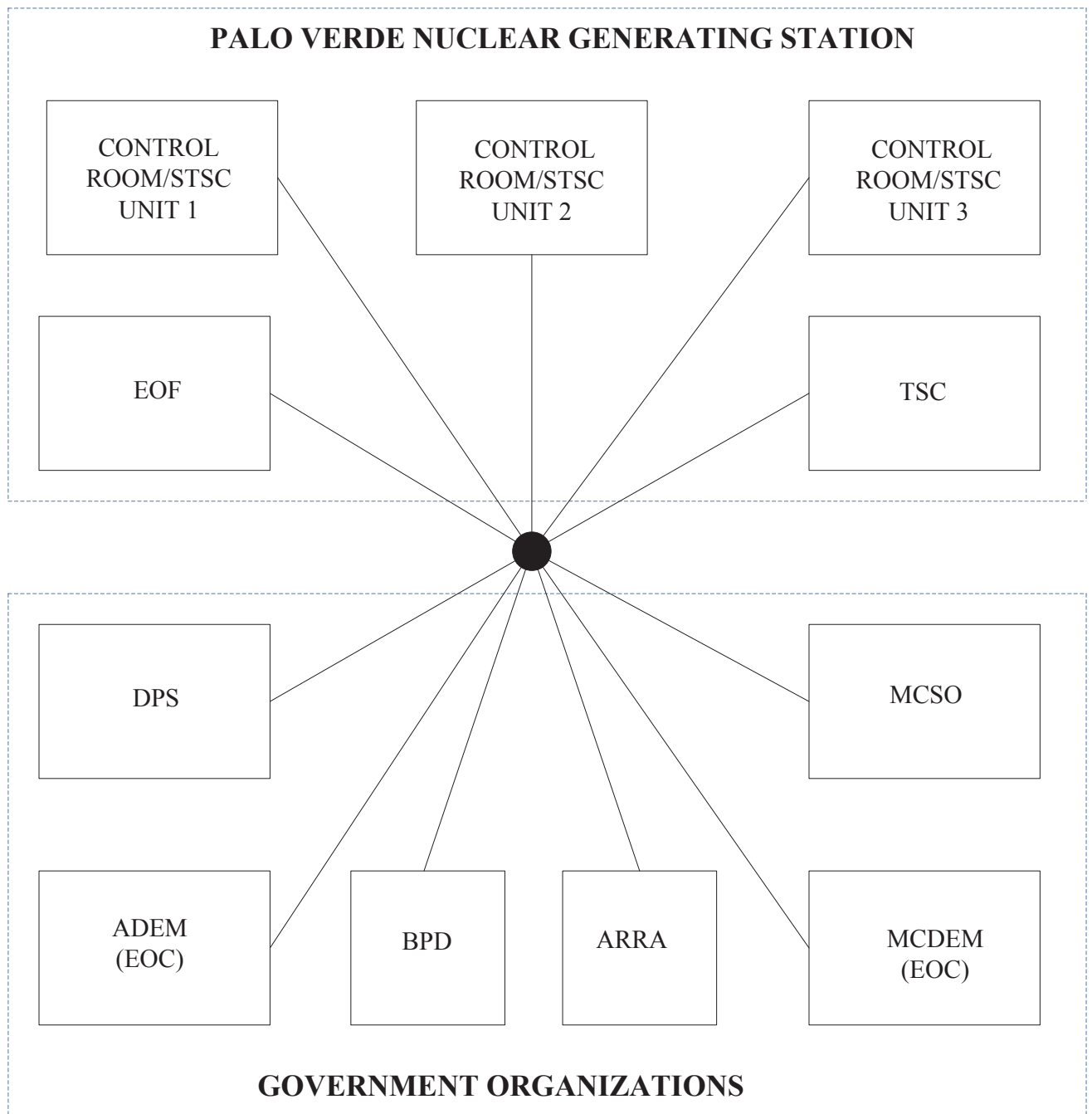
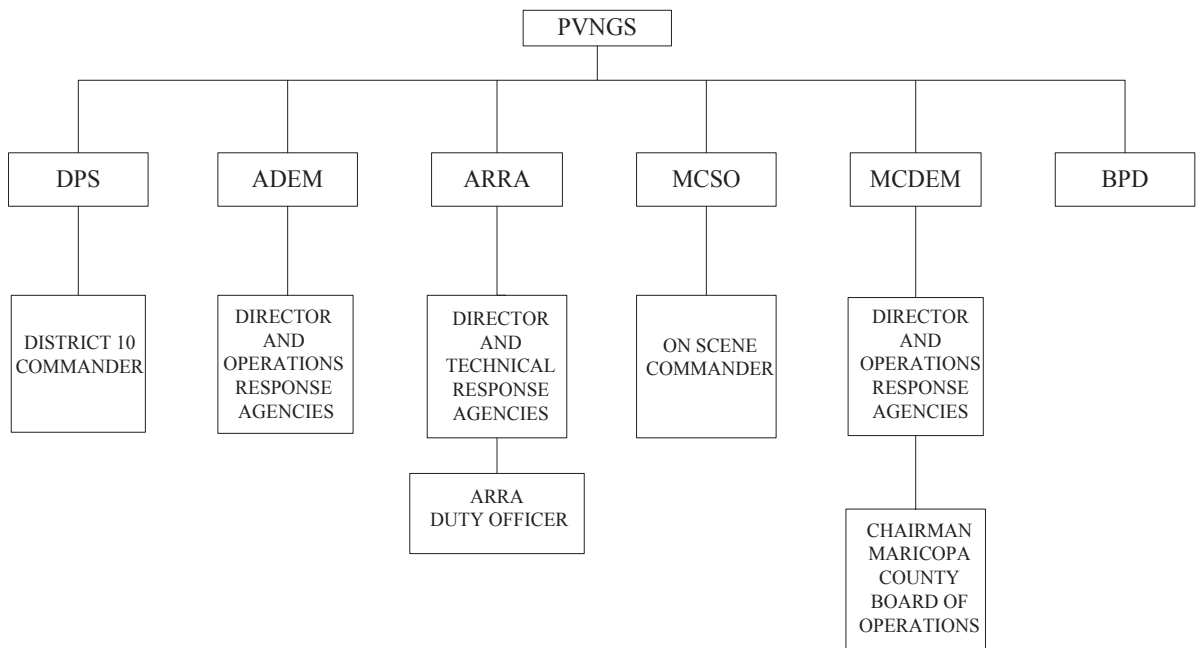


FIGURE 8 – NOTIFICATION ALERT NETWORK (NAN)

NORMAL WORKING HOURS



OFF-DUTY HOURS

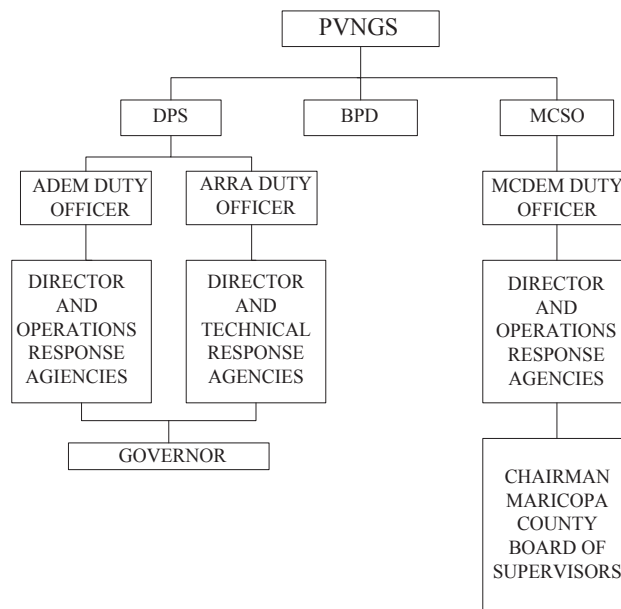


FIGURE 9 – NAN NOTIFICATION FLOW

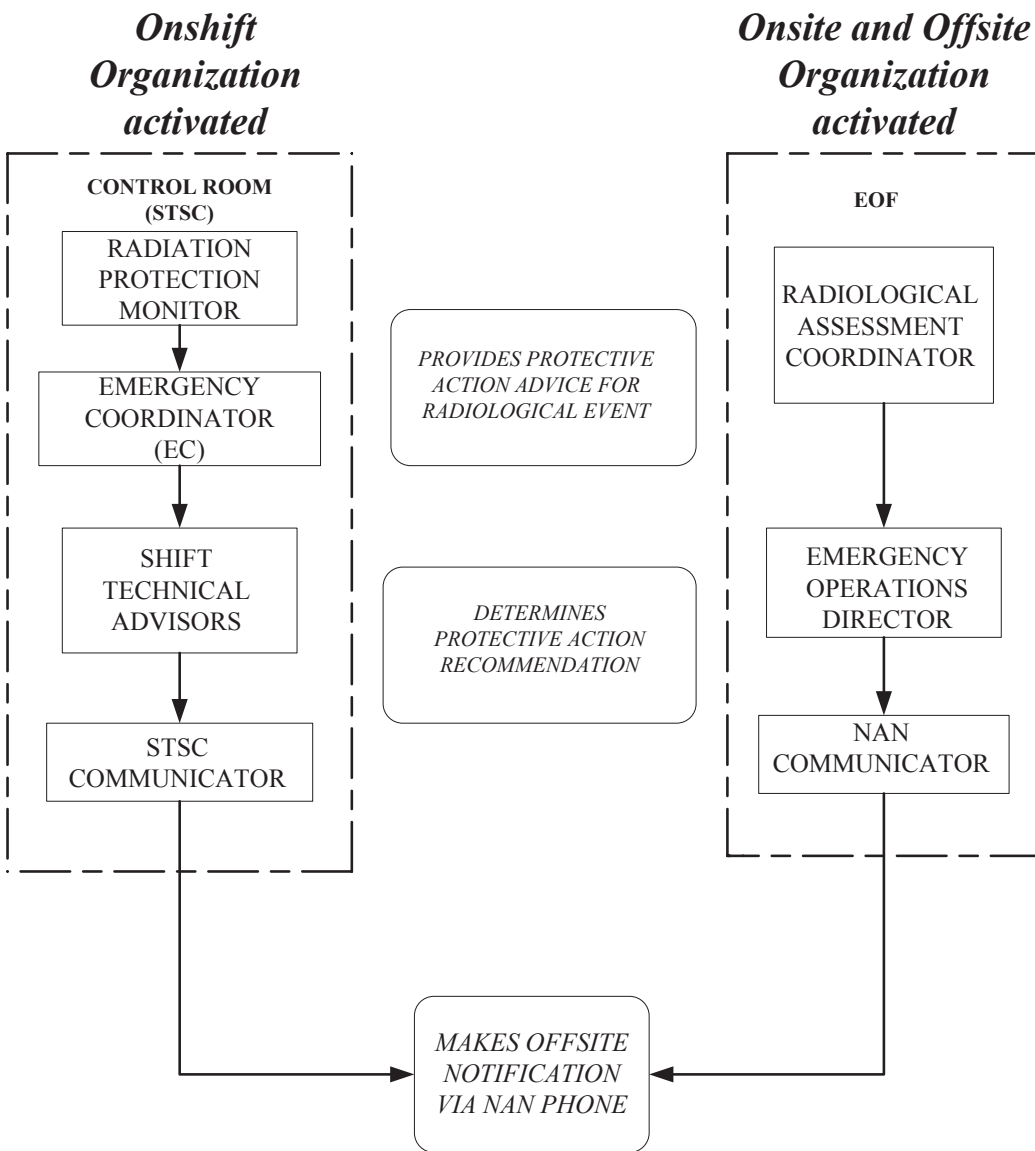


FIGURE 10 – COMMUNICATIONS LEADING TO PROTECTIVE ACTION RECOMMENDATION (PAR)

7.0 EMERGENCY FACILITIES AND EQUIPMENT

This section describes emergency response facilities, onsite and offsite communications system links, assessment equipment and facilities, first aid and medical facilities, and damage control equipment.

7.1 EMERGENCY CENTERS

7.1.1 CONTROL ROOM (CR)

The CR is in the Control Building on the 140-foot level and is designed to be habitable during Design Basis Accidents. The CR, which includes the Shift Manager's office, contains full plant instrumentation, ERFDADS/SPDS, a Qualified SPDS display, communication links as described in Table 3 and Section 7.2, and technical drawings. Protective breathing apparatus, emergency radiological monitoring equipment, and protective clothing are stored in the emergency kit outside the CR.

7.1.2 REMOTE SHUTDOWN PANEL ROOM (RSP)

An emergency requiring the evacuation of the CR results in shutdown control from the RSP. The RSP has two redundant and independent sets of plant controls. Each redundant control area has its own Radio Console and administratively dedicated phone line, as well as EPABX telephone and sound-powered phone as described in Table 3 and Section 7.2.

7.1.3 SATELLITE TECHNICAL SUPPORT CENTER (STSC)

It provides direct technical support to the CR personnel in the areas of:

- Engineering and technical analytical support
- Reactor analytical support
- Radiological analytical support

An ERFDADS/SPDS display and various communications equipment, as described in Table 3 and Section 7.2, are available in the STSC.

7.1.4 OPERATIONS SUPPORT CENTER (OSC)

The OSC is the entire 140' level of the Auxiliary Building and Operations Support Building of each unit. Emergency equipment required is stored in emergency kits in the OSC. The OSC also includes the Radiation Protection area which provides a decontamination facility, a fixed radiological counting facility, and access to the station's radiation protection records and forms. The OSC serves as the point of origin for Environmental Teams and Repair Teams. Various communications links, as described in Table 3 and Section 7.2, are available in the OSC.

In the event the OSC becomes uninhabitable, an unaffected unit OSC may be used as an alternate OSC.

7.1.5 TECHNICAL SUPPORT CENTER (TSC)

The TSC is the focal point for onsite emergency operations and for directing and assisting the Control Room during unit emergency conditions. Key station management and technical personnel are stationed at the TSC during the emergency to provide the guidance required for accident termination and mitigation.

The TSC is staffed and activated during an Alert, Site Area Emergency, or General Emergency and is located below grade immediately southwest of Bldg. "D" inside the Protected Area.

The TSC is centrally located within ten minutes walking time from the CR of each of the three Palo Verde units. The functions performed in the TSC include:

- Manage onsite emergency response
- Direct in-plant radiological protection activities
- Direct emergency maintenance
- Direct personnel accountability and site security
- Coordinate safety and hazards control through the Control Room and the Onsite Fire Dept.
- Perform engineering and technical analyses for control room support
- Perform reactor analyses for control room support
- Provide I & C technical support
- Coordinate computer technical support
- Provide chemistry technical support

The TSC has ERFDADS/SPDS computer terminals, which display CR parameters for each unit, the Radiation Monitoring System (RMS), the station meteorological system, and other parameters. Capability exists in the TSC to rapidly retrieve plant documents, drawings, procedures and plans. The TSC (when activated) is the central location for the receipt and analysis of in-plant radiological monitoring data. The TSC has various communications links available as described in Table 3 and Section 7.2. The TSC has shielding and ventilation to ensure habitability following design basis accidents.

The TSC contains an area with a microwave and refrigerator, conference room, an emergency supply storage area, and an area reserved for NRC personnel. The TSC contains equipment required for emergency response. The TSC is also equipped with an airborne radiation monitor.

In the event the TSC becomes uninhabitable, the TSC command function will operate out of the affected unit's STSC (Unit 1, if multiple units are impacted) and the support staff will be relocated to an OSC.

7.1.6 EMERGENCY OPERATIONS FACILITY (EOF)

The EOF is located approximately 20 miles east of PVNGS at 600 North Airport Road, Building A, Buckeye, Arizona.

The EOF is the focal point for coordination of onsite and offsite emergency response activities. Management and technical personnel assigned to the EOF are responsible for protective action recommendations, liaison with offsite governmental organizations and response facilities, and overall coordination of the Emergency Organization.

The EOF has space allocated for housing emergency personnel and space for NRC, FEMA and state/county emergency personnel. The EOF has various communications links available as described in Table 3 and Section 7.2. The EOF is staffed and activated for an Alert or higher level emergency classification. The EOF also has ERFDADS data displayed through PI computer capability. The capability exists in the EOF to rapidly retrieve plant documents, drawings, procedures and plans.

7.1.7 ALTERNATIVE FACILITY

The EEC-EOF is designated as the Alternative Facility for staging of ERO personnel. In the event of a Security or Hostile Action threat or event, the EEC-EOF may also serve as an evacuation location for TSC and OSC personnel. The Alternative Facility has the capability to communicate with the Control Room, Security and the EOF. The EOF may also be used for any event where site access is not possible (BDBEE/FLEX event).

7.1.8 JOINT INFORMATION CENTER (JIC)

The JIC, located at 600 North Airport Road, Building A, Buckeye, Arizona., serves as the primary point for dissemination of information to the news media representatives for an Alert or higher emergency classification level.

Provision is made at the JIC to allow media personnel to communicate with their base facilities. State, county and federal agency officials share office space with the staff at the JIC.

The communications links available at the JIC are described in Table 3 and Section 7.2.

7.1.9 PALO VERDE AND APS EXTERNAL COMMUNICATIONS DEPARTMENTS

Palo Verde Communications and APS External Communications are responsible for developing media statements and coordinating media briefings during Unusual Event classifications. At Alert and higher classification level, the JIC assumes the responsibility for this function. At Alert or Site Area Emergency classifications involving non-radiological events, Palo Verde Communications will work with the JIC to coordinate plant visits and briefings. Palo Verde Communications is equipped with EPABX telephones and fax machines for onsite and offsite communications.

7.1.10 STATE EMERGENCY OPERATIONS CENTER (STATE EOC)

The State EOC is the primary point from which the Governor/designee exercises overall coordination of offsite emergency response operations through the ADEM. The State EOC is located at ADEM Headquarters in Phoenix at 5636 East McDowell Road.

Staffing of the State EOC consists of authorized representatives of:

- Office of the Governor
- Arizona Division of Emergency Management (ADEM)
- Arizona Radiation Regulatory Agency (ARRA)
- Arizona Department of Public Safety (DPS)
- Arizona Department of Transportation
- Arizona Department of Economic Security
- Maricopa County Department of Emergency Management (MCDEM)
- PVNGS (Utility Technical Representative)
- Others (as notified/required).

PVNGS communications links with ADEM are described in Table 3.

7.1.11 THE MARICOPA COUNTY EMERGENCY OPERATIONS CENTER (EOC)

The Maricopa County EOC is the focal point of the local government emergency response activity. It is located at 5630 E. McDowell Road, Phoenix. Emergency response actions of the Maricopa County Sheriff's Office, Health Department and Department of Transportation, together with emergency response actions of volunteer agencies, are coordinated by the MCDEM at the County EOC.

7.2 COMMUNICATIONS SYSTEMS

The PVNGS communications system is designed to ensure the reliable, timely flow of information and action directives between all parties designated and empowered to mitigate emergencies. To ensure the reliability of the communications systems, the following provisions have been designed into these systems:

- Redundancy
- Alternative radio communications
- Telephone ring down circuits (voice and data) to offsite emergency organizations, to preclude delays due to system overload
- Routine use of many of the systems, which lowers the probability of undetected system failures

Communication systems are tested at the frequency specified by 10 CFR 50 Appendix E, as a minimum. Onsite emergency telephone lines are divided among three onsite EPABX switches. Each EPABX switch is provided with a backup battery for reliability.

This system will function during emergencies as it does during normal operations. Telephones have the capability of trunk access (via local provider) and the APS owned private communications system which provides direct dial capabilities to the entire APS voice system via the company owned private communications system. The PVNGS telephone EPABX Systems through which all PVNGS telephone calls pass, are equipped with uninterruptible power supplies (battery chargers and batteries) and dedicated priority switching to ensure the reliability of the telephone system. The PVNGS EPABXs are the primary links for PVNGS phones. There are also administratively dedicated lines for the CR, STSC, TSC, EOF, and OSC.

The CR, TSC, and OSC each have dedicated phone lines that can be used to connect between any two of the facilities. In addition, each of these facilities can use these dedicated lines to connect to the following dedicated phones for the listed EOF positions:

- | | |
|--|-------------------------------|
| • Radiological Assessment Coordinator | Environmental Assessment Line |
| • Radiological Assessment Coordinator | Control Room Line |
| • Engineering Director | Technical Line |
| • Admin and Logistics Coordinator | OSC Line |
| • Radiological Assessment Communicator | TSC Line |

Each of the phones on the dedicated lines also functions as a normal in-plant PVNGS phone. These lines are discussed in more detail in the applicable subsections that follow.

The EC/EOD Line, Maintenance Line, and Radiological Line are administratively dedicated lines that are also available for use in an emergency and are discussed in the subsections that follow. The phones listed below consist of single line and multi-line phones. The multi-line phones are equipped with a power fail line and a PBX line.

7.2.1 CONTROL ROOM LINE

The Control Room Line has a dedicated primary line providing communications links with conference capability between the Control Room, the TSC, the Unit STSC, the EOF, the OSC, and the RSP.

7.2.2 ENVIRONMENTAL ASSESSMENT LINE

The Environmental Assessment Line has a dedicated primary and backup line providing communications links with conference capability between the TSC, EOF, the Unit and the RSP.

7.2.3 EC/EOD LINE

The EC/EOD line has a separate dedicated primary line with conference capability among the EOF, TSC, the Unit, and the RSP.

This line provides a communications link between the ECs. It also permits three-way conversations between the EC-TSC, EOD and the Shift Manager.

7.2.4 EOF LINE

The EOF Line has a dedicated primary line providing communications links with conference capability between the EOF, the Control Room, the TSC, the Unit STSC, the OSC, and the RSP.

7.2.5 MAINTENANCE CONTROL LINE

The Maintenance Control Line has a dedicated primary line providing a communications link with conference capability between the TSC, OSC, Control Room, and RSP.

7.2.6 OSC LINE

The OSC Line has an administratively dedicated primary line providing communications links with conference capability between the OSC, the Control Room, the TSC, the Unit STSC, the EOF, and the RSP.

7.2.7 RADIOLOGICAL LINE

The Radiological Line has a dedicated primary line providing communications links with conference capability between the RP Office, TSC, the Unit, the OSC, and the RSP.

7.2.8 STSC LINE

The STSC Line has a dedicated primary line providing communication links with conference capability between the Unit STSC, the Control Room, the TSC, the EOF, the OSC, and the RSP.

7.2.9 TECHNICAL LINE

The Technical Line has a dedicated primary line providing communications links with conference capability between the TSC, the Unit STSC, the EOF, the RSP, and the Control Room.

7.2.10 TSC LINE

The TSC Line has an administratively dedicated primary line providing communications links with conference capability between the TSC, the EOF, the Control Room, the Unit STSC, the OSC, and the RSP.

7.2.11 REMOTE SHUTDOWN PANEL (RSP) LINE

The RSP Line has an administratively dedicated primary line providing communications links with conference capability between the TSC, the EOF, the Control Room, the Unit STSC, and the OSC.

7.2.12 NRC EMERGENCY NOTIFICATION SYSTEM (ENS)

The NRC ENS is a Federal Telecommunications System (FTS) telephone that connects PVNGS with the NRC Headquarters Operations Center. NRC Headquarters has the capability to patch in the Region IV office on this line. It is to be used for reporting emergencies. Commercial telephone lines are available as backup communications. Transmittal of operations related data should be on this system. The purpose of this line is to provide reliable communications with the NRC. The ENS phones are located at each Unit STSC, the TSC, and the EOF.

7.2.13 NRC HEALTH PHYSICS NETWORK (HPN)

The NRC HPN is a Federal Telecommunications System (FTS) telephone that connects PVNGS with the NRC Headquarters Operations Center. The HPN is designed to provide health physics and environmental information to the NRC in the event of an emergency. Other commercial telephone lines are available as backup communications. The HPN phones are located in both the TSC and EOF.

7.2.14 NRC LOCAL AREA NETWORK (LAN)

The NRC has a data link available as part of the FTS network in the EOF and TSC. The lines are tested by PVNGS and maintained by the NRC.

7.2.15 NRC MANAGEMENT COUNTERPART LINK (MCPL)

The MCPL is a dedicated NRC communication link between the NRC in the EOF, TSC and NRC Headquarters personnel. The lines are tested by PVNGS and maintained by the NRC.

7.2.16 NRC PROTECTIVE MEASURES COUNTERPART LINK (PMCL)

The PMCL is a dedicated NRC communication link between the NRC in the EOF, TSC, and NRC Headquarters personnel. The lines are tested by PVNGS and maintained by the NRC.

7.2.17 NRC REACTOR SAFETY COUNTERPART LINK (RSCL)

The RSCL is a dedicated NRC communication link between the NRC in the EOF, TSC, and NRC Headquarters personnel. The lines are tested by PVNGS and maintained by the NRC.

7.2.18 EOD/CEO (FIBER OPTIC)

The EOD/CEO circuit is a fiber optic link between the EOF/JIC and the APS Executive Floor Corporate.

7.2.19 NOTIFICATION ALERT NETWORK (NAN)

NAN is a dedicated telephone/radio system that provides a communications link among the Unit STSCs, TSC, EOF, ADEM, ARRA, MCDEM, MCSO, DPS, and Buckeye Police Dept.

NAN's primary function is to provide a communications link for notifications to offsite agencies. In the event of NAN failure, a channel on the APS Corporate radio system or the commercial phone lines is used to make initial notifications.

7.2.20 OPERATIONS #1 (HARDWIRED)

The Operations #1 circuit is a hardwired ring-down line with connections to the ADEM, ARRA, EOF, Unit STSC and the TSC.

7.2.21 OPERATIONS #2 (HARDWIRED)

The Operations #2 circuit is a hardwired ring-down line with connections to the ADEM, the EOF, and the TSC.

7.2.22 OPERATIONS #3 (FIBER OPTIC)

The Operations #3 circuit is a fiber optic ring-down line with connections to the ADEM, the EOF, and the TSC.

7.2.23 OPERATIONS #4 (FIBER OPTIC)

The Operations #4 circuit is a fiber optic ring-down line with connections to the ADEM, the ARRA, the EOF, and the TSC.

7.2.24 PUBLIC INFORMATION RING-DOWN CIRCUIT #1

The PI #1 circuit is an intercom link from the EOF to the JIC.

7.2.25 PUBLIC INFORMATION RING DOWN CIRCUIT #2

The PI #2 circuit is an intercom link between the EOF to the JIC.

7.2.26 CELLULAR PHONE

Each STSC, the TSC, and the EOF have a cellular phone to provide an additional independent line of communication.

7.2.27 FACSIMILE TRANSMISSION

Facsimile transmission provides "hard copy" communications to:

- TSC (through PVNGS EPABX)
- EOF
- Ring-down Facsimile Machine Circuits #1 (Fiber Optic) and #2 (Hardwire) link the EOF, TSC, STSCs, JIC, ADEM, ARRA and APS Corporate Offices.

7.2.28 PVNGS RADIO SYSTEM

PVNGS operates a trunked radio system, with separate talk groups available for departments such as Operations, Security, Fire Protection, Radiation Protection, Emergency Preparedness, the Water Reclamation Facility, etc. This system includes base station consoles at various locations and emergency facilities throughout the site. Some of the radios used during emergencies are portable radios at various site locations, mobile radios in the RFAT vehicles, and base station consoles at the TSC, EOF, Unit OSCs, Unit, and Unit Control Rooms. PVNGS Fire Protection also maintains radios that are used to contact the air ambulance service to provide landing instructions.

7.2.29 TELEPHONE RINGDOWN CIRCUITS

These voice circuits serve as a primary communications link for providing technical information to offsite agencies, public information communications, and the communication of protective action recommendations to offsite authorities.

7.2.30 RADIOLOGICAL EMERGENCY ASSISTANCE TEAM (REAT) RADIO SYSTEM

The APS Corporate 800 MHZ Radio system provides a communications link between the State and State deployed field monitoring teams. Field monitoring information will be transmitted over the radio system. The State's EOF representative has access to the 800 MHZ radio system from the EOF. Hard copy of data is transmitted via FAX from the EOF to REAT Forward.

7.2.31 MOBILE DEVICES

Mobile devices are provided to key members of the emergency response organization. This provides a reliable means of contact with key members 24 hours a day, 7 days a week.

7.2.32 AREA PAGING SYSTEM

The area paging system provides a reliable means of notifying and providing instructions to personnel. Access to this system is through the EPABX system telephones by use of dedicated numbers.

7.2.33 ALARMS

Audible alarms are a quick and effective means of communicating emergency warnings. The alarm systems are described in the following sections.

7.2.33.1 Site Warning Siren/Public Address System

The Site Warning Siren/Public Address System consists of electronic sirens to sound over the entire PVNGS site. The sirens are initiated from a push-button in the Control Room, and TSC, and have distinctive signals for assembly, evacuation, fire and all-clear. The Public Address System also has voice capability using the microphone of the control unit, and is cross-connected to the Area Paging System to permit site-wide announcements.

7.2.33.2 Unit Area Alarm System

The Unit Area Alarm System consists of electronic sirens located throughout each unit area to alert all personnel within a unit area. The electronic sirens are activated from the Control Room. The Unit Area Alarm System also has voice capability using the microphone of the control unit to provide backup to the Area Paging System, and is cross-connected to the Area Paging System to permit site-wide announcements. The sirens have distinctive signals for assembly, evacuation, fire and all-clear.

7.2.34 NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA) WEATHER BROADCASTS

Weather broadcasts can be monitored for "weather alert" information at CR, TSC and EOF.

7.2.35 AUTOMATED CALLOUT

An automated callout system is used to call out emergency response personnel. The system can also be activated from any touch tone telephone with offsite access capability. The servers are located offsite at two different remote locations and can place multiple calls simultaneously. Telephone numbers to be contacted and notification messages are pre-programmed on the system. If proper acknowledgment does not occur, the system periodically redials the number.

7.2.36 ADDITIONAL OFFSITE COMMUNICATION LINKS**Communication Links in Addition to Those Described Above Include:**

- Public Information Unlisted Dial-up Telephone Circuit - ADEM to JIC
- High speed internet connections – JIC
- Public Information Unlisted Dedicated Dial-up Facsimile Machine Circuit #2 - ADEM to JIC
- PVNGS Emergency Alert System (EAS) Ring-down Telephone Circuit - hardwire from MCDEM and MCSO to AM Broadcast Station KTAR and to FM Broadcast Station KPKX
- Public Information Unlisted Dedicated Dial-up Telephones - JIC (4 general circuits)
- Public Information Unlisted, Receive-only Telephone Circuits - JIC (6 circuits)
- Public Information Media Dial-up Telephone Circuits - JIC (30 circuits)
- Unlisted Dedicated Dial-up Facsimile - ADEM (EOC) to MCDEM
- Public Information Unlisted Dial-up Telephone Circuit - JIC to MCDEM
- ADEM Business Dial-up Telephone - ADEM general use (24 circuits), ADEM Public Inquiry (3 circuits)
- Public Information Unlisted Dial-Up Facsimile Machine Circuit - MCDEM to JIC

Facility	Communication and Data Links			
Control Room	EOF Line	Maintenance Line	OSC Line	RSP Line
	STSC Line		Technical Line	TSC Line
	Radio Base Station	ENS	ERFADS	Fax
STSC	Control Room Line	Environmental Line	EC Line	EOF Line
	OSC Line	Radiological Line	Technical Line	TSC Line
	RSP Line	NAN Line	Ops #1	Ops #3
	Cellular Phone	ERFDADS	Fax	Radio Base Station
Technical Support Center	Control Room Line	Environmental Line	STSC Line	EOF Line
	Maintenance Line	OSC Line	Radiological Line	EC/EOD Line
		Technical Line	RSP Line	ENS
	NAN Line	Ops #1	Ops #2	Ops #3
	Ops #4	Radio Base Station	HPN	LAN (NRC)
	MCPL (NRC)	PMCL (NRC)	RSCL (NRC)	ERFDADS
	Fax	Cellular Phone		
Operations Support Center	Control Room Line	EOF Line	Maintenance Line	STSC Line
	Radiological Line		TSC Line	RPS Line
Emergency Operation Facility	Control Room Line	Environmental Line	EC/EOD Line	OSC Line
	STSC Line		Technical Line	TSC Line
	RSP Line (NRC)	HPN (NRC)	ENS (NRC)	LAN
	MCPL (NRC)	PMCL (NRC)	RSCL (NRC)	EOD/CEO Line
	NAN Line	Ops #1	Ops #2	Ops #3
	Ops #4	Public Info #1	Public Info #2	Cellular Phone
	ERFDADS via PI	Fax	Radio Base Station	REAT Radio
Joint Information Center	EOD/CEO Line	Public Info #1	Public Info #2	Fax
SIM A	Control Room Line	Environmental Line	EC/EOD Line	EOF Line
	Maintenance Line	OSC Line	Radiological Line	Technical Line
	TSC Line	RSP Line	NAN Line	Ops #2
	Ops #4	ERFDADS via PI	Fax	Radio Base Station
	ENS			
Remote Shutdown Panel (RSP)	Control Room Line	Environmental Line	EC/EOD Line	EOF Line Sound-powered phone
	Maintenance Line	OSC Line	Radiological Line	STSC Line
		Technical Line	TSC Line	Radio Base Station
ADEM	NAN Line	Ops #1	Ops #2	Ops #3
	Ops #4	Fax	REAT Radio	Radio Base Station
ARRA	NAN Line	Ops #1	Ops #4	Fax
	REAT Radio	Radio Base Station		
DPS	NAN Line	Radio Base Station		
MCDEM	NAN Line	Radio Base Station		
MCSO	NAN Line	Radio Base Station		
Buckeye PD	NAN Line	Radio Base Station		

TABLE 3 – EMERGENCY RESPONSE FACILITY COMMUNICATIONS

7.3 ASSESSMENT EQUIPMENT

This section describes onsite and offsite facilities and monitoring equipment used for initial and continuing assessment.

7.3.1 ONSITE SYSTEMS AND EQUIPMENT

Onsite equipment is described below.

7.3.1.1 GEOPHYSICAL DATA

(1) Meteorology Program

The PVNGS meteorology atmospheric transport and diffusion assessment program has been established using the guidance of NUREG-0654 and Regulatory Guide 1.23, Rev. 0. The PVNGS meteorological tower has the following instrumentation: temperature, differential temperature (between top and bottom sensors), precipitation, dew point, wind speed, and wind direction. Display of meteorological indications is available in the Control Room on ERFDADS. Additionally, this data is available in the TSC, the Units STSC, and the EOF. In the event the PVNGS meteorological monitoring system is unavailable, National Weather Service broadcasts can be monitored from the Control Rooms, EOF, and TSC. Meteorological data can be obtained from the National Weather Service in the event that PVNGS instrumentation is insufficient or out of service during an emergency.

(2) Seismic Instruments

Information is obtained from passive and active instruments giving absolute peak ground acceleration in three mutually orthogonal directions. The system determines whether operating basis or safe shutdown maximum accelerations are exceeded in any of three directions. Recorded information is available in the Unit 1 Control Room.

7.3.1.2 RADIATION MONITORING SYSTEM (RMS)

The Radiation Monitoring System is divided into three basic groups of detector systems.

(1) Process Monitoring System

Process monitors provide information to Control Room operators to assure proper functional performance of the monitored system, provide for the early detection of radioactive leakage into non-radioactive systems, provide continuous remote indication and recording of airborne radioactivity levels in areas where personnel have routine access, and provide a means of process sample collection.

(2) Effluent Monitoring System

The Effluent Monitoring System provides continuous sampling, recording and indications of gaseous activity levels and, as a minimum, provides continuous representative sampling of particulate and radioiodine activity levels at principal effluent discharge points, provides for monitoring, alarm annunciation, and automatic closure of the gaseous waste discharge valve to maintain releases from the waste gas decay tanks below ODCM limits, provides radiation level indication and alarm annunciation to Control Room operators whenever Technical Specification limits are approached or exceeded, and provides a means for collection of samples for laboratory analyses at effluent points.

(3) Area Monitoring System

The area monitoring system immediately notifies plant personnel entering or working in non-radiation or low-radiation areas of abnormally high or increasing radiation levels to prevent inadvertent overexposure, and informs Control Room Operators of the occurrence and location of abnormal radiation level increases in non-radiation or low-radiation areas.

7.3.1.3 SYSTEM MONITORS

These monitors detect and/or control problems within plant systems and include pressure detectors, heat detectors, heat rise detectors, or similar devices designed to monitor plant parameters. Many of these detectors are capable of initiating control actions to prevent and mitigate damage or release of radioactive material.

7.3.1.4 FIRE PROTECTION SYSTEM

The Fire Protection System (FPS) and Fire Suppression System (FSS) detect, contain, and extinguish fires in the unit. The FPS for each unit has monitoring, detection, alarm, suppression, and extinguishing facilities specifically selected to protect the area or equipment from damage by fire. A computer terminal is provided in the Control Room of each unit for incoming FPS/FSS alarms (including identification of affected areas and suppression actions initiated by the FSS system).

7.3.1.5 RADIOACTIVITY ANALYSIS

Liquid samples are drawn in the individual Units via the Nuclear Sampling System. A built in sample bomb is in each primary sample sink. Containment air samples are taken via Containment Air Monitor JSQBRU1.

Grab samples are drawn and diluted as necessary, utilizing procedural direction to minimize operator dose. The grab samples are analyzed in the radiochemistry laboratory via a gamma energy analytical detector system.

In the event the affected unit cannot perform the analysis, backup analysis is done in one of the unaffected units. The Arizona Radiation Regulatory Agency is equipped to do isotopic analysis as an offsite backup to PVNGS capabilities.

7.3.1.6 PORTABLE SURVEY INSTRUMENTS

These instruments provide flexibility and backup capability for radiation measurements in areas not served by installed monitors, or where installed monitors may be inoperative.

7.3.1.7 EMERGENCY RESPONSE FACILITY DATA ACQUISITION AND DISPLAY SYSTEM (ERFDADS)

The ERFDADS provides a centralized location within the CR for display of plant parameters from which the safety status of operations can be assessed.

Displays of data, including graphical displays, available on demand include plant temperatures, pressures, and flow rates; equipment and valve status, i.e., on, off, open, closed; process and area RMS readings; meteorology system data; and in-core parameters.

In addition to the above parameters, the SPDS portion of ERFDADS contains a graphical display which provides immediate indication of deviation from safe operating values. From this display, additional specific data concerning the system in question is accessed on demand. The ERFDADS is designed to include the data acquisition system requirements of NUREG-0696. ERFDADS displays are available at each Unit Control Room, each Unit STSC and the TSC. ERFDADS displays are available in the EOF via PI displays.

7.3.1.8 QUALIFIED SAFETY PARAMETER DISPLAY SYSTEM (QSPDS)

The QSPDS is designed to provide indications to detect the approach to, the existence of, and the recovery from inadequate core cooling. It also provides a minimum set of seismically qualified parameters from which abnormal plant operating conditions may be quickly assessed.

7.3.1.9 EMERGENCY RESPONSE DATA SYSTEM (ERDS)

The ERDS is a direct electronic transmission system to NRC Operations Center. The system is intended to provide to the NRC, on a near real-time basis, selected parameters from plant computer systems whose values indicate the condition of the plant during an emergency condition of Alert or higher. ERDS is tested quarterly to verify system availability and operability.

Any hardware or software changes that affect the transmitted data points identified in the ERDS data point library, must be submitted to the NRC within 30 days after changes are completed. Hardware or software changes that could affect the transmission format and computer communication protocol to the ERDS must be provided to the NRC as soon as practicable and at least 30 days prior to the modification.

7.3.2 OFFSITE SYSTEMS AND EQUIPMENT

The Offsite Dose Calculation Manual (ODCM) refers to the location of the environmental radiological monitoring sampling stations, as well as Thermoluminescent Dosimeter (TLD) stations. Environmental samples routinely collected and analyzed include: water, vegetation, food products and milk. Backup and cross-check environmental surveillance are performed by ARRA.

7.4 PROTECTIVE FACILITIES AND EQUIPMENT

Control Room shielding and ventilation allow personnel habitability during Design Basis Accident conditions. The TSC has shielding and ventilation similar to the CR for habitability during an incident. Communications equipment, respiratory protection equipment and protective clothing are available in, or near the CR, STSC, TSC, and OSC. Portable radiation monitoring instrumentation is located near the unit RP Islands.

7.5 FIRST AID AND MEDICAL FACILITIES

A first aid treatment center is maintained onsite. In addition, a first aid room is located in each unit at the 140-foot level of the Auxiliary Building. First aid treatment of injured individuals is administered by trained personnel. Advanced medical care, if required, is obtained by transporting the individuals to an offsite medical facility.

7.6 DAMAGE CONTROL EQUIPMENT AND SUPPLIES

Fire hose stations, extinguishers and hydrants are strategically located throughout the station for use in fire. PVNGS maintains self-contained breathing apparatus storage areas throughout station to be used for firefighting, entry into airborne radioactivity areas, or entry into toxic gas areas.

7.7 PROMPT NOTIFICATION SIREN SYSTEM

PVNGS maintains the Prompt Alert and Notification Systems as approved by FEMA in the *PVNGS Alert and Notification System (ANS) FEMA 350 Report* dated July 2014.

The Prompt Notification Siren System consists of high sound output sirens located throughout the 10-mile Plume Exposure Pathway Emergency Planning Zone. Its operation is at the discretion of the state and county governmental agencies responsible for notification and alerting of the public. This system alerts the people within the 10-mile EPZ to monitor radio or TV emergency broadcasts for specific information regarding the situation at PVNGS and/or protective actions. This system is operated from any of the four control point locations:

- Maricopa County Emergency Operations Center
- Arizona Department of Public Safety
- Maricopa County Sheriff's Office
- Building "E"

Normally the sirens are activated from the Maricopa County Emergency Operations Center or from the Maricopa County Sheriff's Office. The system is tested periodically to ensure its readiness.

In the event of a failure of the Prompt Notification System, a FEMA approved backup notification method is available and is implemented by Offsite Response Organizations.

8.0 MAINTAINING EMERGENCY PREPAREDNESS

8.1 ORGANIZATIONAL PREPAREDNESS

The emergency preparedness program consists of (1) ERO training, (2) drills and exercises, and (3) regular emergency plan review and evaluation by personnel and management.

8.1.1 TRAINING

The Emergency Response Training Program ensures that personnel who are in the emergency response organization are familiar with the contents and responses in the Emergency Plan and associated implementing procedures. The Emergency Preparedness Manager is responsible for ensuring that the Emergency Response Training Program meets the requirements of the Plan. Non-ERO employees receive general information on emergency preparedness annually.

Personnel assigned key duties in the Emergency Response Organization receive initial training and annual continuing training.

New personnel or existing ERO members assigned to fill an ERO position in which they have not previously qualified, complete initial and continuing training for that position.

Emergency Preparedness Training is developed using a process similar to that described within the Nuclear Training Department Administrative Procedures or other approved training program guidance.

As necessary, additional continuing training of individuals should be conducted when significant changes to the Emergency Preparedness Program occurs as determined by the Emergency Preparedness Manager and the Nuclear Training Department Leader.

The Emergency Response Training Program includes specific training and indicates, where applicable, qualification requirements for key members of the Emergency Organization.

Evaluated training drills and evolutions provide for critiques in order to identify weak or deficient areas. Weaknesses or deficiencies that are identified are corrected.

Training for the Emergency Preparedness Staff is completed in accordance with Emergency Preparedness Department processes.

8.1.1.1 Site Access Training for Emergency Preparedness

Personnel requiring unescorted access into the Protected Area(s) receive general instructions on the Emergency Plan as part of Site Access Training. Continuing training is conducted annually.

8.1.1.2 Specialized Training for Key Emergency Organization Personnel

Specialized training is provided annually to key personnel involved in emergency response actions. This special training includes instruction and review in the technical and practical aspects of emergency response actions.

In addition to training, drills and exercises are conducted to develop and maintain emergency response skills. Specialized training for designated ERO position categories is listed below.

Directors and/or Coordinators of the Plant Emergency Organization

Initial training to provide for classification and notification processes and requirements. Continuing training to provide program/procedure/equipment change and industry events updates.

Personnel Responsible for Accident Assessment, Including CR Shift Personnel

Initial training to provide accident identification, appropriate procedural responses and support organization activity on criteria. Continuing training provides program/procedure/equipment change and industry events updates.

Radiological Monitoring Teams

Initial training to provide for emergency radiological monitoring procedures, techniques and emergency communications. Continuing training to provide program/procedure/equipment change and industry events updates.

Fire Control Teams (Fire Brigades)

PVNGS utilizes a full time onsite Fire Department. Fire personnel are trained in fire and medical emergency response in accordance with the Fire Protection Program. Additionally they are provided training in basic radiological control concepts. Continuing training to provide program/procedure/equipment change and industry events updates.

Repair and Damage Control Teams

Initial training provides for emergency radiological and industrial safety, communications. Continuing training to provide program/procedure/equipment change and industry events updates.

First Aid and Rescue Teams

PVNGS utilizes a full time onsite Fire Department. Fire personnel are trained in fire and medical emergency response in accordance with the Fire Protection Program. Additionally they are provided training in basic radiological control concepts. Continuing Training to provide program/procedure/equipment change and industry events updates.

Medical Support Personnel

Initial training of medical support personnel in addition to Fire Department personnel provided with basic radiological control concepts. Onsite medical staff, excluding administrative support personnel, receive training similar in content to that which is provided to offsite hospitals. Continuing Training to provide program/procedure/equipment change and industry events updates.

Licensee's Headquarter Support Personnel

Some headquarters support personnel respond to the Joint Information Center. These personnel receive initial training prior to qualification. Continuing training is provided on an annual basis.

Security Personnel

Emergency response training is incorporated into the initial Member of the Security Force training received by new security force members during initial qualifications. Additional initial training is provided to Security members assigned to staff positions within the Emergency Response Facilities in support of Emergency Preparedness. The additional training includes lines of communication with offsite support organizations as well as logistics support. Continuing training to provide program/procedure/equipment change and industry events updates

Offsite Organization Training

As appropriate, training for the members of selected offsite support organizations shall occur on an annual basis.

Briefings are specific to the agencies response assignment(s) and, at a minimum, include the following:

- Basic radiation protection
- Emergency response procedures
- Interface with the PVNGS Emergency Response Organization

Lesson Plans and examinations are not required for offsite support organization training. PVNGS maintains records associated with offsite support organization training. A radiological orientation training program is made available to local services personnel; e.g., local emergency services/MCDEM, local law enforcement personnel, local news media persons.

8.1.1.3 Training for Participating Agencies

Training for participating agencies is provided by the individual agencies. Training personnel are available to describe the special conditions and constraints involved in dealing with PVNGS emergency radiological release situations. Radiological orientation continuing training is available annually for local services personnel, including local news media personnel.

8.1.1.4 Public Education

PVNGS, ADEM, ARRA, and MCDEM jointly prepare an educational calendar for distribution to the public within the Plume Exposure Pathway EPZ. The calendar is mailed annually to residents within a 10-mile radius of the station, using postal procedures that ensure maximum distribution. The calendar outlines, in lay language, the station's operational concept, lists the various classifications of emergencies, summarizes the emergency plan developed to safeguard the general public, reviews appropriate protective actions including Potassium Iodide (KI), and indicates public warning signals. The calendar also contains material on radiation, contacts for additional information and means for advising governmental authorities about special needs of EPZ residents.

In addition to this written material, PVNGS conducts public information seminars and meetings as needed or requested with local groups within the 10-mile EPZ. Local groups may be invited to participate in drills and exercises to maintain emergency preparedness and to test specific segments of emergency plans and procedures that are affected by, or may affect, 10-mile EPZ residents.

Methods are also established to provide emergency and protective information to the transient population within the PVNGS 10-mile EPZ. Inserts are placed in telephone books. Information is posted in local stores, businesses, schools, churches, post offices, truck stops, and recreational vehicle parks.

8.1.1.5 Media Familiarization

Annual programs are provided to acquaint media personnel with the PVNGS Emergency Plan, information concerning basic nuclear plant operation and radiation, and the locations and means employed to disseminate public emergency information.

8.1.1.6 Documentation

All emergency preparedness training is documented and training records are maintained in accordance with established procedures.

8.1.2 EXERCISES

PVNGS conducts drills and exercises over a wide range of accident conditions that tests a major portion of the basic elements existing within the emergency plan and supporting organizations. Exercises shall test the adequacy of timing and content of implementing procedures and methods, test emergency equipment and communications networks, test the public notification system, and ensure that emergency organization personnel are familiar with their duties.

The scenarios for the drills and exercises are diverse and include a wide spectrum of radiological conditions and events including hostile actions. The scenarios used over the eight year cycle will be sufficiently varied to ensure that essentially all of the emergency action levels are included in performance enhancing drills or exercises. To the extent practical, initiating conditions and failed equipment should be varied to minimize preconditioning of the emergency response organization.

No more than one EAL should be shared with the previous exercise or any practice drill or exercise leading up to the biennial exercise. Drill scenarios should not be used for any biennial exercise within two years. To the extent practical, scenario should be held in confidence from the participating ERO team members until after the exercise. While an ERO team may be aware of the nature of the upcoming drills (i.e. hostile action based exercise), the specific elements of the drill should be held in confidence and the initiating event varied so the same conditions are not used from the practice to evaluated exercise.

Joint participation exercises between PVNGS and the offsite response agencies are conducted to ensure the appropriate integration of the emergency plans and identify areas of weakness and opportunities for improvement. A post drill or exercise critique is conducted to aid in the identification of weaknesses and improvement opportunities. Consistent with NRC and FEMA regulation, a full participation exercise is conducted once every two years, PVNGS, the State of Arizona (ADEM and ARRA) and Maricopa County will jointly exercise their emergency plans. The full participation biennial exercise is evaluated by the NRC and FEMA and is used in determining reasonable assurance that PVNGS and the supporting offsite emergency plans can protect the health and safety of the public, plant staff and emergency workers. The biennial exercises are varied over the eight year period (starting with the year of the first hostile action exercise in 2015) to include the following:

- Hostile action directed at the plant site involving the integration of offsite resources with onsite response; (See RCTSAI 2831902 and contact Reg. Affairs for any change to this commitment.)
- An initial classification of, or rapid escalation to, a Site Area Emergency or General Emergency;
- No radiological release or an unplanned minimal radiological release that requires the site to declare a Site Area Emergency, but does not require declaration of a General Emergency.
- Ingestion Pathway Exercise

PVNGS will submit the scenario used for the biennial exercise to the NRC in accordance with 10CFR50.4 sixty days before its use in a full scale biennial exercise. The scenario will be held in confidence until after the exercise is completed. PVNGS will maintain adequate records to demonstrate the exercises and scenarios used over the eight year exercise cycle.

Each biennial exercise conducted by PVNGS will include the opportunity to demonstrate the following key skills:

- Timely classification of events;
- Timely notification of offsite authorities;
- Assessment of radiological releases onsite and offsite;
- Development of protective action recommendations;
- Dissemination of information to the public via media channels;
- Engineering assessment, repair plan development, and repair of critical equipment under emergency conditions;

- Mitigative action implementation;
- Protection of workers during emergency response, including medical care;
- Response to operational transients while implementing the emergency plan;
- Coordination with offsite response organizations.

Each biennial exercise at PVNGS will include the following elements at a minimum:

- Event classification.
- Timely notification of offsite authorities.
- PAR development (development of PARs involving public evacuation or sheltering is required only in exercises that include a General Emergency).
- Radiological assessment.
- Shift staff response to accident transients or other events that meet EAL criteria while implementing the emergency plan.
- ERO response and ERF activation following declared emergencies.
- Integration of licensee response with OROs to include briefings, coordination of worker protection, and, as appropriate to the scenario, coordination of public protective actions, radiological release monitoring, and offsite response to the site.
- Communications that support response between onsite and offsite ERFs.
- Dissemination of information to the public via media channels and press briefings.
- Development and implementation of radiological or physical protection (i.e., in response to hostile action) protective actions for onsite workers as appropriate to the scenario.
- Operational and engineering assessment of accident sequences.
- Accident mitigation through the simulated repair of equipment.
 - This must include mechanical, electrical, and/or instrumentation and control activities.
 - The scenario should be designed to allow some repairs to be successful, but must provide the opportunity to demonstrate mitigation planning and repair execution.
 - Radiological control activities must support some repair teams.

In addition to the biennial exercise, PVNGS conducts a partial scale off year exercise that involves an integrated testing of the key emergency response facilities. The off year exercise may also be a full scale exercise not evaluated by FEMA or NRC. During the off year exercise, the offsite response organization will be encouraged to participate in order to maintain key ERO skills between the onsite and offsite organization.

The principal functional areas of emergency response include activities such as management and coordination of emergency response, accident assessment, event classification, notification of offsite authorities, assessment of onsite and offsite impact of radiological releases, protective action recommendation development, protective action decision making, plant system repair and mitigative action implementation.

During routine drills, activation of all of the PVNGS emergency response facilities (Technical Support Center (TSC), Operations Support Center (OSC), and the Emergency Operations Facility (EOF)) would not be necessary, PVNGS may use these drills for the opportunity to consider accident management strategies, supervised instruction, operating staff in all participating facilities would have the opportunity to resolve problems (success paths) rather than have controllers intervene, and the drills may focus on the onsite exercise training objectives in lieu of a broader set.

The PVNGS ERO shall be provided the opportunity to develop and maintain key emergency response skills in response to the following scenario elements during the conduct of biennial exercises over the course of the eight year exercise cycle:

- Response to hostile action, including interface with LLEAs.
 - Hostile action scenarios should realistically include collateral damage that may occur (e.g., loss of offsite power and loss of use of certain onsite facilities and areas).
 - Engineering assessment, repair plan development, and simulated repair of critical equipment damaged by hostile action after the active attack, but before the site is fully secured by LLEAs.
 - Prioritization of repair team dispatch and protection in the aftermath of hostile action through coordination with site security and LLEAs to determine when the site is secure enough to allow limited movement of personnel.
- Response to one scenario with no radiological release or an unplanned minimal radiological release that does not require evacuation or sheltering of the public.
- Response to scenarios with radiological releases that require evacuation and/or sheltering of the public.
- Response to a scenario that begins with a Site Area Emergency or General Emergency, or escalates rapidly (within 30 minutes) to a Site Area Emergency or General Emergency.
- The successful simulated repair of simulated damaged equipment to prevent or mitigate core damage, reactor pressure boundary loss, and/or containment loss.
- Demonstration of the ability to mitigate an accident caused by hostile action or other initiators, through the simulated use of equipment, procedures, and strategies developed in compliance with 10 CFR 50.54(hh)(2).

All PVNGS ERO teams (not necessarily each individual) shall be provided the opportunity to develop and maintain key emergency response skills within the scope of their duties during each exercise cycle. Additionally, the ERO (not necessarily each ERO team) shall be provided the opportunity to demonstrate key skills in response to the following scenario elements in drills or exercises during each exercise cycle. Drills are considered to be performance-enhancing experiences (exercises, drills, functional drills, tabletop drills, mini-drills, etc.) that reasonably simulate the interactions between appropriate ERFs and/or individuals that would be expected to occur during emergencies.

- All functions in each ERF (e.g., all ERFs that are responsible for dose assessment perform those duties in response to a radiological release).
- Use of alternative facilities to stage the ERO for rapid activation during hostile action.
- Real-time staffing of facilities during off-hours (i.e., 6:00 p.m. to 4:00 a.m.). Some drills or exercises should be unannounced.
- Providing medical care for injured, contaminated personnel (every two years).
- Response to essentially 100 percent of initiating conditions identified in the site emergency plan implementing procedure for classification of emergencies.
- Response to actual industry event sequences appropriate for the nuclear plant technology (e.g., BWR or PWR).
- All licensee ERO teams must be provided the opportunity to demonstrate key skills within the scope of their duties.
- Use of procedures developed in response to an aircraft threat and in compliance with 10 CFR 50.54(hh)(1).
- Use of the strategies associated with 10 CFR 50.54(hh)(2) to mitigate spent fuel pool damage scenarios (all strategies, such as makeup, spray, and leakage control, but not every variation of a given strategy).
- Use of the strategies associated with 10 CFR 50.54(hh)(2) to mitigate reactor accidents and maintain containment (7 strategies for pressurized water reactors, but not every variation of a given strategy).

Certain drills (i.e., fire, and medical emergency), and tests (i.e., communications and notification), are coordinated with offsite participating agencies. The Emergency Preparedness Manager has overall responsibility for meeting all drill requirements. Specific tasks may be delegated to operating departments.

Communications links and notification procedures with offsite state and county agencies are tested periodically using a simulated emergency message transmitted offsite for subsequent fan-out alerting by state/county authorities. NRC communications links are tested in accordance with 10CFR50, Appendix E. Communications tests also evaluate the understanding of the content of the messages.

PVNGS conducts the following drills:

- Fire drills are conducted in accordance with the PVNGS Updated Final Safety Analysis Report (UFSAR) and Fire Protection Program.
- Health Physics (HP) Drills are conducted semi-annually, and may be in connection with exercises or Environmental Monitoring Drills. These drills involve response to, and analysis of, simulated elevated radioactivity in airborne samples and direct radiation measurements in the plant.
- Medical Emergency Drills with Offsite Medical Facilities involving treatment of a simulated externally contaminated person are conducted annually with provision for participation by an offsite ground or air ambulance.
- Environmental Monitoring Drills are conducted annually for both onsite and offsite Environmental Team personnel. These drills include collection and analysis of appropriate sample media, e.g., vegetation, soil, and air, communications, and record keeping. Since PVNGS is located in a desert area and there are no nearby bodies of water, liquid environmental samples are not collected or analyzed during Radiological Monitoring or Health Physics drills. These drills are coordinated with offsite organizations where appropriate.

Following drills and exercise, a critique is held to identify deficiencies, weakness, and improvement opportunities. Deficiencies and weaknesses will be corrected and improvement opportunities will be incorporated as deemed appropriate by the Emergency Preparedness Manager. Critiques shall use the Palo Verde Action Request process for capturing items identified during drills and exercises.

Remedial exercises will be required if the emergency plan is not satisfactorily tested during the biennial exercise, such that NRC, in consultation with FEMA, cannot find reasonable assurance that adequate protective measures can be taken in the event of a radiological emergency. The extent of state and county participation in remedial exercises must be sufficient to show that appropriate corrective measures have been taken regarding the elements of the plan not properly tested in the previous exercise.

8.1.3 DRILLS

Drills for the emergency organization are conducted periodically to test response and familiarity with implementing procedures and methods, to test emergency equipment, and to ensure that members of the emergency organization are familiar with their duties and develop and maintain key skills.

Instructional emergency drills are conducted as scheduled, with emphasis placed upon orderly implementation of activities prescribed within the Emergency Plan and its implementing procedures.

Drill performance is critiqued by personnel acting as drill controllers who may offer on-the-spot corrections to erroneous performance. Each controller is assigned a specific area for evaluation and receives written drill instructions. Written evaluations of drill performance are provided to appropriate management personnel. Follow-up action is then taken by the responsible Department Leaders to upgrade areas where shortcomings are noted; they report their progress to the Emergency Preparedness Manager.

Following all drills, a drill controller critique is held and all aspects of drill performance are discussed. All significant deficiencies are incorporated into action items and tasked to the affected department.

Certain drills (i.e., fire, and medical emergency), and tests (i.e., communications and notification), are coordinated with offsite participating agencies. The Emergency Preparedness Manager has overall responsibility for meeting all drill requirements. Specific tasks may be delegated to operating departments.

Communications links and notification procedures with offsite state and county agencies are tested periodically using a simulated emergency message transmitted offsite for subsequent fan-out alerting by state/county authorities. NRC communications links are tested in accordance with 10CFR50, Appendix E. Communications tests also evaluate the understanding of the content of the messages.

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Medical Emergency Drills with Offsite Medical Facilities involving treatment of a simulated externally contaminated person are conducted annually with provision for participation by an offsite ground or air ambulance.

Environmental Monitoring Drills are conducted annually for both onsite and offsite Environmental Team personnel. These drills include collection and analysis of appropriate sample media, e.g., vegetation, soil, and air, communications, and record keeping. Since PVNGS is located in a desert area and there are no nearby bodies of water, liquid environmental samples are not collected or analyzed during Radiological Monitoring or Health Physics drills. These drills are coordinated with offsite organizations where appropriate.

8.1.4 SCENARIOS

Drill and exercise scenarios are written to allow a certain amount of free play for decision making. Controllers are instructed at pre-drill and pre-exercise briefings as to which portions of the scenario permit free play and which portions require strong controller management. The Emergency Preparedness Manager is responsible for overall drill and exercise control.

8.1.5 ORGANIZATION FOR MAINTAINING EMERGENCY PREPAREDNESS

The Executive Vice President Nuclear & Chief Nuclear Officer has overall responsibility and authority for all nuclear activities, including emergency response planning. The Emergency Preparedness Manager has been assigned the responsibility to develop and maintain a coordinated PVNGS, Federal, State, and local government emergency preparedness program.

The Emergency Preparedness Manager participates in meetings, seminars, and conferences that are aimed at maintaining a current and accurate Emergency Plan, and current knowledge of regulations and guidelines. The Emergency Preparedness Manager is responsible for the Emergency Plan, and implements Plan revisions and updates.

8.2 REVIEW AND UPDATING OF THE EMERGENCY PLAN

The Emergency Plan is reviewed annually and updated as needed. The update takes into account changes identified by drills and exercises. The Emergency Preparedness Manager maintains documentation substantiating the annual review. Special attention is devoted to reviewing PVNGS/governmental agency interfaces, updating offsite response agreements, maintaining effective communication channels, and, on a quarterly basis, ensuring up-to-date contact and notification lists. Liaison with state and local agencies ensures uniform updating. Independent audits/reviews by individuals who have no direct responsibility for the implementation of the Emergency Preparedness Program are conducted at least once every 24 months using the performance-based option permitted by 10 CFR 50, Appendix E and 10 CFR 50.54(t), or more frequently when necessary to meet these regulations.

The Emergency Preparedness Manager is responsible for ensuring that EPIPs are updated and revised as necessary.

Emergency Plan revisions and changes are conducted IAW PVNGS Administrative Policies and Procedures. Plan changes will be reviewed for any decrease of effectiveness per 10CFR50.54(q).

The revised Emergency Plan and procedures are handled IAW document control procedures. Changes to the Emergency Plan and procedures are approved by the Emergency Preparedness Manager, or designated alternate, and transmitted to the Executive Vice President Nuclear and Chief Nuclear Officer, and to the Offsite Safety Review Committee. Changes to the Emergency Plan shall be submitted to the NRC within 30 days of such changes.

8.3 MAINTENANCE AND INVENTORY OF EMERGENCY EQUIPMENT AND SUPPLIES

Quarterly inspections of the operational readiness of emergency equipment and supplies are conducted by the Emergency Preparedness Department. Deficiencies noted during inspections are corrected. The use of inspection procedures with checklists and follow-up actions ensures that equipment is ready for use. Sufficient reserves of instruments/equipment are maintained to replace those undergoing calibration or repair. Calibration of equipment is conducted at intervals set forth in the UFSAR. In addition, planned use of communications, first aid, firefighting, and radiation measuring equipment during scheduled drills further ensures the availability and operability of emergency equipment.

9.0 RECOVERY

Recovery operations include long term post-emergency efforts that follow a major incident. These operations are performed by station personnel, contract experts and specialists, and qualified engineers under the direction of the recovery organization.

Post-accident recovery actions are designed to identify the extent of plant damage, prepare specific plans and programs for station repair and restoration, implement recovery plans and programs, and return the plant to a normal operating status.

The following plant status conditions serve as general guidelines for decisions on the initiation of post-emergency recovery efforts:

- Radiation levels are stable or decreasing with time
- Releases of radioactive materials to the environment have ceased or are controlled within permissible license limits
- Fire or similar emergency conditions no longer constitute a hazard to the plant or station personnel
- Measures have been successfully instituted to correct or compensate for malfunctioning equipment.

Based on consideration of these criteria, as well as other pertinent items, the EOD determines when to activate the recovery organization. Manpower and equipment resources supporting the individual functional segments of the recovery organization may vary according to the severity of damage and specific situational needs.

Entering into recovery will not necessarily result in de-escalation of the emergency classification in that, the loss of a fission product barrier may not be recoverable until recovery is complete. Entering into recovery denotes the plant is stable and further degradation is unlikely. Repair and restoration of plant systems will be needed to fully exit the recovery phase.

9.1 RECOVERY ORGANIZATION

The responsibilities and functions of the Recovery Organization Managers are summarized as follows:

- The Recovery Manager has overall corporate responsibility for restoring the station to a normal operating configuration.
- The Station Operations Manager manages day-to-day inplant operations and, during recovery, is responsible for ensuring that repairs and modifications optimize post-recovery plant operational effectiveness and safety.
- The Nuclear Support Manager focuses necessary engineering, design, and construction resources on those aspects of plant recovery requiring redesign, modification, or new construction; directs and coordinates NSSS and Balance-of-Plant (BOP) engineering and construction/repair work.
- The Radiological Services Manager develops plans and procedures to process and control liquid, gaseous, and solid wastes to minimize adverse effects on the health and safety of the public and station recovery personnel. In addition, the Radiological Services Manager coordinates the activities of staff Radiological Engineers and radiation protection personnel engaged in waste treatment operations.

- The Technical Support Manager provides analyses, plans, schedules, and procedures in direct support of plant operations.
- The Quality Assurance Manager assures that the overall conduct of recovery operations is performed in accordance with corporate policy and rules and regulations governing activities which affect public health and safety.
- The Planning/Scheduling Manager prepares plans and schedules, and tracks/expedites recovery operations.
- The Administrative/Logistics Manager supplies administrative, logistic, communications, and personnel support for the recovery operation.
- PVNGS Communications coordinates the flow of media information concerning recovery operations.

9.2 RECOVERY EXPOSURE CONTROL

The Recovery Manager, via the Recovery Organization, is responsible for evaluating the advisability of initiating recovery and reentry. Information on existing conditions, interviews with employees evacuated during the emergency, regulatory exposure guidelines, and counsel from recognized experts are used to formulate decisions on reentry and recovery.

During recovery operations, actions are preplanned to limit exposures. Access to areas is controlled and exposure to personnel documented.

Estimates of total population dose are available if any releases are required or occur during recovery operations.

9.3 RE-ENTRY

If a site evacuation is ordered, re-entry to the site is controlled in accordance with established procedures. Respiratory protection equipment, protective clothing, and thyroid blocking agent are maintained onsite for the use of individuals remaining or arriving onsite before, during, or after the emergency.

10.0 AGREEMENT LETTERS

This section lists written agreements referring to the concept of operations developed between Federal, State, and local agencies and other support organizations having an emergency response role within the EPZ. Original copies of agreements are maintained in the files of Emergency Preparedness Department.

The agreements are listed below.

- **Letter of Agreement from National Weather Service (NWS), Weather Forecast Office(WFO)**

The NWS provides general weather forecasts, severe weather and flood warnings, transport and dispersion plume forecasts, and localized weather forecasts. The NWS also provides broadcasts of tone alarmed and encoded public emergency messages on NOAA Weather Radio. If available, a meteorologist will be detailed to the Arizona Emergency Operations Center (EOC) or Maricopa County EOC or the PV EOF and WFO Phoenix will coordinate with Department of Energy meteorologists assigned to the Federal Radiological Monitoring Assessment Center (FRMAC) to support the state, county and PVNGS emergency efforts.

- **Letter of Agreement from Institute of Nuclear Power Operations (INPO)**
Coordinates technical information from PV to the nuclear industry and government agencies, coordinates the procurement and shipping of equipment and supplies, locates personnel with technical expertise, facilitates industry vendor and commercial supplier support, obtains technical information and operating experience on plant components and systems, and provides an INPO liaison to facilitate interface.
- **Combustion Engineering Contract (#PV81-4765)**
Combustion Engineering furnishes technical assistance as requested in the event of an emergency arising from a nuclear incident at PVNGS.
- **Letter of Agreement from Banner Good Samaritan Medical Center (GSMC)**
Banner GS MC provides hospital treatment for victims of radiological and hazardous materials incidents including contaminated individuals from PVNGS, maintains response capacity as a support facility, and makes appropriate personnel available for training and participation in medical drills and exercises.
- **Letter of Agreement from Banner Estrella Medical Center**
Banner Estrella Medical Center provides hospital treatment for victims of radiological and hazardous materials incidents including contaminated individuals from PVNGS, maintains response capacity as a support facility, and makes appropriate personnel available for training and participation in medical drills and exercises.
- **Letter of Agreement from City of Phoenix Fire Department**
Provides fire suppression, Emergency Medical Services (EMS), Hazardous Materials (HAZMAT) and other technical services when requested at their discretion and maintains a contingency in place to provide services for >24 hours if necessary. Phoenix Fire Department coordinates the valley-wide Fire Department Automatic Aid Agreement.
- **Letter of Agreement from Air Evac air ambulance service**
Air Evac provides transportation for victims of radiological materials accidents including contaminated individuals and makes appropriate personnel available for training and participation in medical drills and exercises.
- **Letter of Agreement from Native American Air Ambulance Dispatch**
Native American Air Ambulance provides transportation for victims of radiological materials accidents including contaminated individuals and makes appropriate personnel available for training and participation in medical drills and exercises.
- **Letter of Agreement from Tonopah Valley Fire District**
Tonopah Valley Fire District provides back-up fire protection, haz-mat decontamination assistance, mass casualty Emergency Medical System (EMS), wildland fire suppression and technical rescue assistance to PVNGS. The initial response includes a Basic Life Support (BLS) fire engine and/or a BLS squad with at least 2 persons. Tonopah also allows storage of PVNGS firefighting resources at Tonopah fire station 341.

- **Letter of Understanding from Salt River Project (SRP)**
SRP agrees to have SRP personnel assigned to the PV switchyard for >5 days site access training and provide SRP employees with site evacuation and emergency planning info.

10.1 Offsite Emergency Response Plan for Palo Verde Nuclear Generating Station

In addition to the support outlined in the Letters of Agreement, the Offsite Emergency Response Plan for Palo Verde Nuclear Generating Station provides for the following support functions for PVNGS in the event of an emergency from the indicated agencies. Also, mutual aid compacts and agreements between the State and other government and private entities defined in the Offsite Emergency Response Plan multiply the resources available to PVNGS in an emergency.

10.1.1 The Phoenix Police Department's Remote Mobile Investigation Unit (RMU) can work in contaminated areas and is available for 24-hour use.

10.1.2 The Maricopa County Sheriff's Office (MCSO) performs the following:

Emergency Public Warning

- a. Back-up warning by patrol units for progressively developing emergencies

When initial notification is a Site Area Emergency or General Emergency:

- (1) Warning message preparation
- (2) Activation of siren system
- (3) Dissemination of warning using the EAS and/or Media Alert System
- (4) Implementation of plant recommended protective actions if required

Denial of entry into evacuated areas and patrol evacuated areas to determine effectiveness.

Control of evacuee and access traffic on county and farm roads is the responsibility of MCSO, which coordinates with Arizona Department of Public Safety (DPS) for traffic movement from county/farm roads to state highways and to Interstate-10. MCSO will provide security within the evacuated area.

Based on the location of the Reception and Care Center(s) (RCC), MCSO, AZ DPS or local jurisdiction law enforcement will provide RCC security and crowd control as necessary.

MCSO or local law enforcement will provide temporary impound security for contaminated vehicles and personal effects while the RCC is operational.

MCSO will transport KI to designated Reception and Care Centers.

MCSO and AZ DPS may assist the AZ Department of Agriculture in enforcing produce and food project check points and embargos.

MCSO conducts “just-in-time” radiological training and provides equipment for alternate personnel prior to being deployed in response to a Hostile Action Based event.

The MCSO provides coordinated on-site/offsite direction and control in accordance with the Maricopa County Peacetime Disaster Plan (PDP). The PDP authorizes the Sheriff to request assistance when an incident is beyond the ability of the Office to resolve and works under the Incident Command System (ICS) when responding to PVNGS Hostile Action Based (HAB) incidents.

MCSO is responsible for the initial and on-going assessment of the situation to determine if terrorism is involved or responsible for the HAB incident. If and when this determination is made, the Federal Bureau of Investigation (FBI) will be notified.

10.1.3 DPS provides traffic control on portions of evacuation routes comprising state highways and maintains denial of reentry into evacuated areas.

MCSO and AZ DPS will jointly coordinate access to the boundaries of the evacuated area based on whether the access points are on county/farm roads or state highways or Interstate-10.

The Department of Public Safety (DPS) Remote Mobile Investigation Unit (RMU) can work in contaminated areas and is available for 24-hour use.

10.1.4 The State of Arizona provides the following support to PVNGS in an emergency:

Monitoring of evacuees for possible radioactive contamination and supervision and monitoring of any decontamination effort.

Requests for and coordination of federal technical support.

Exchanges field data and accident assessment information with PVNGS from Field Monitors.

Any classification or notification may require governmental or private sector emergency organizations to commit resources onsite at the request of the facility. Emergency resources may include, but are not limited to, law enforcement, firefighting, medical support and ground or air services. Assistance may be requested from other state governments and private sector resources in states adjoining Arizona. These resources may include medical capabilities, emergency response equipment, and emergency response personnel. The State Emergency Operations Center Policy Chief (EOC PC) or Technical Director (TD) will initiate requests.

The Arizona Radiation Regulatory Agency (ARRA) provides for collection and analysis of data from the plant, field radiation surveys and sample collection. ARRA representatives share information with EOF staff regarding field team

locations, field data and protective action decisions and collects data to assess the accident, project dose and project plume.

ARRA field monitors conduct radiation surveys to determine ambient radiation levels, track the plume and collect environmental and foodstuff samples for analysis and dispatches a mobile laboratory to Buckeye Airport during the emergency (plume) phase for rapid evaluation of air samples.

The Arizona Division of Emergency Management (ADEM) coordinates the collection, analysis and dissemination of information during an incident at the Palo Verde Nuclear Generating Station (PVNGS). This process is conducted in consort with the PVNGS, Maricopa County Dept. of Emergency Management (MCDEM), Arizona Radiation Regulatory Agency (ARRA) and other federal, state, local, Tribal Nation and volunteer agencies.

For HAB incidents where Offsite Response Organizations (ORO) receive pre-incident intelligence information, applicable OROs will contact the PVNGS Security Central Alarm Station or Security Director.

General response capabilities for a HAB incident are as follows:

- PVNGS: Armory; pre-established unit locations; personnel
- MCSO: SWAT Teams; armored vehicles; personnel
- AZ DPS: SWAT Teams; armament as necessary; helicopter and fixed wing aircraft
- National Guard/ Military: ground forces and aircraft as necessary

ARRA conducts “just-in-time” radiological training and provides equipment for alternate personnel prior to being deployed in response to a HAB incident.

10.1.5 Maricopa County provides the following support:

- Emergency Public Warning
- Warning message preparation
- Activation of siren systems
- Dissemination of EAS warning messages
- Provides direction and control for county level activities
- Installation of evacuation route signs on county and farm roads and installation of barricades and signs for entry control of evacuated areas.
- Coordinates RCC operations and registers evacuees.
- The county directs thyroid protection operations for county emergency workers.

11.0 REFERENCED INTERFACING EMERGENCY PLANS

- State of Arizona/Maricopa County Offsite Emergency Response Plan - PVNGS
- National Response Framework, July 2013

12.0 MAPS

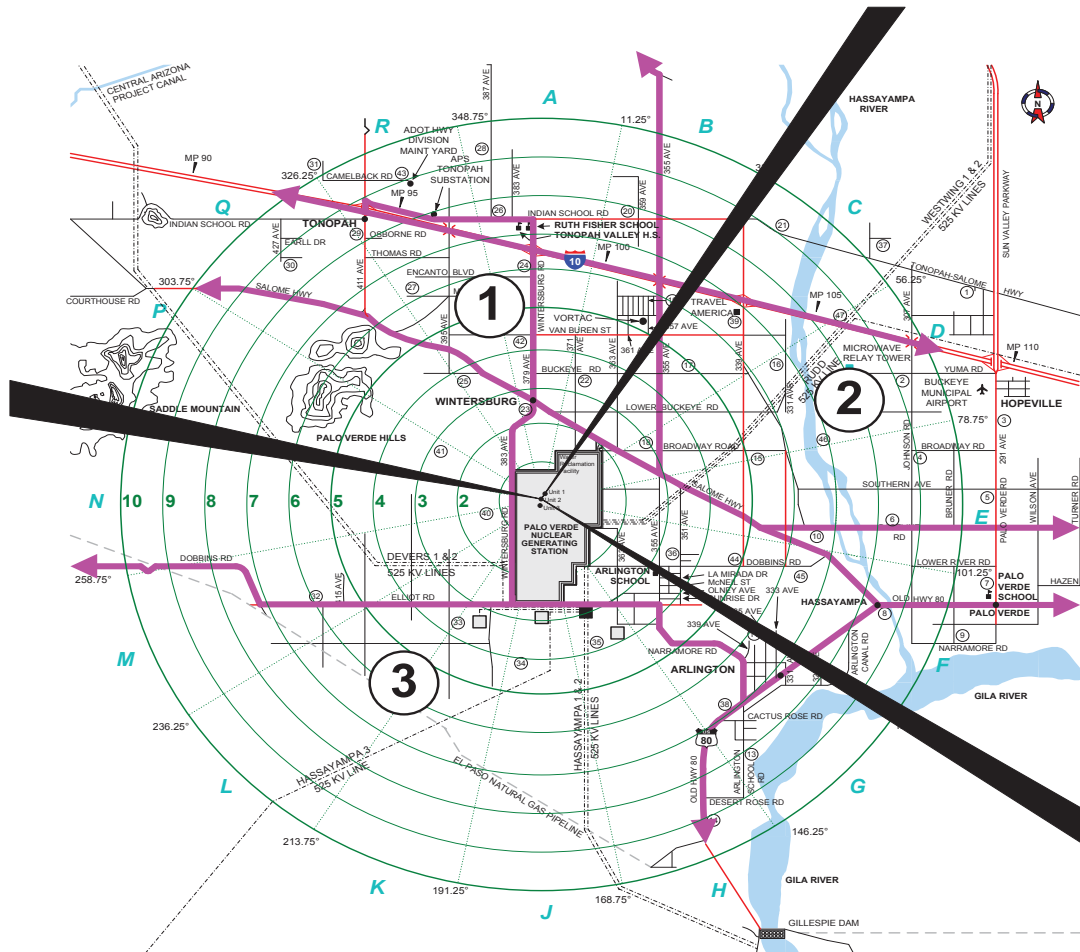
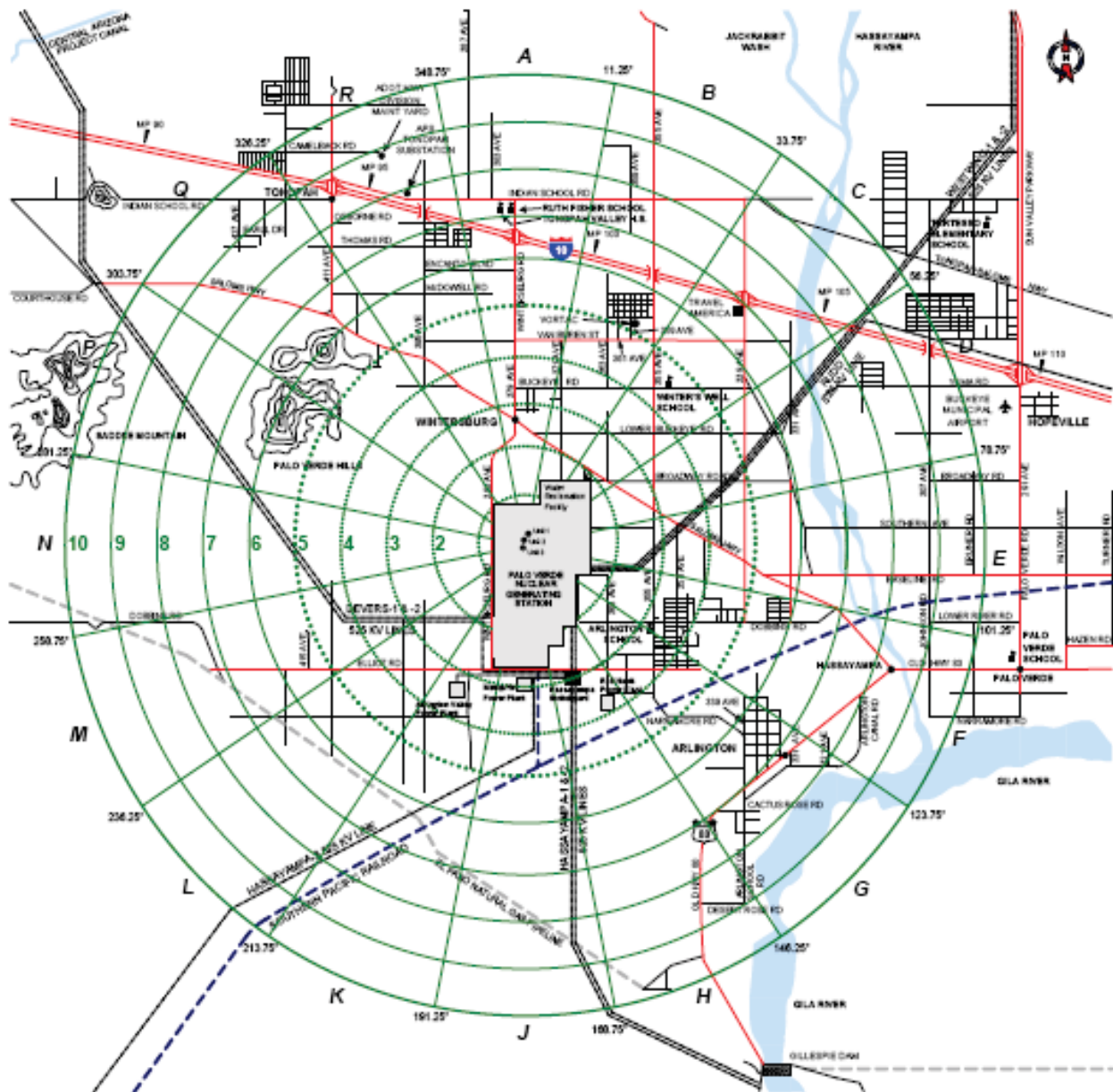


FIGURE 11 – POPULATION EVACUATION ROUTE SECTIONS AND EVACUATION ROUTING



**FIGURE 12 – DEMOGRAPHY WITHIN THE PLUME EXPOSURE
PATHWAY EMERGENCY PLANNING ZONE**

Palo Verde Population Survey

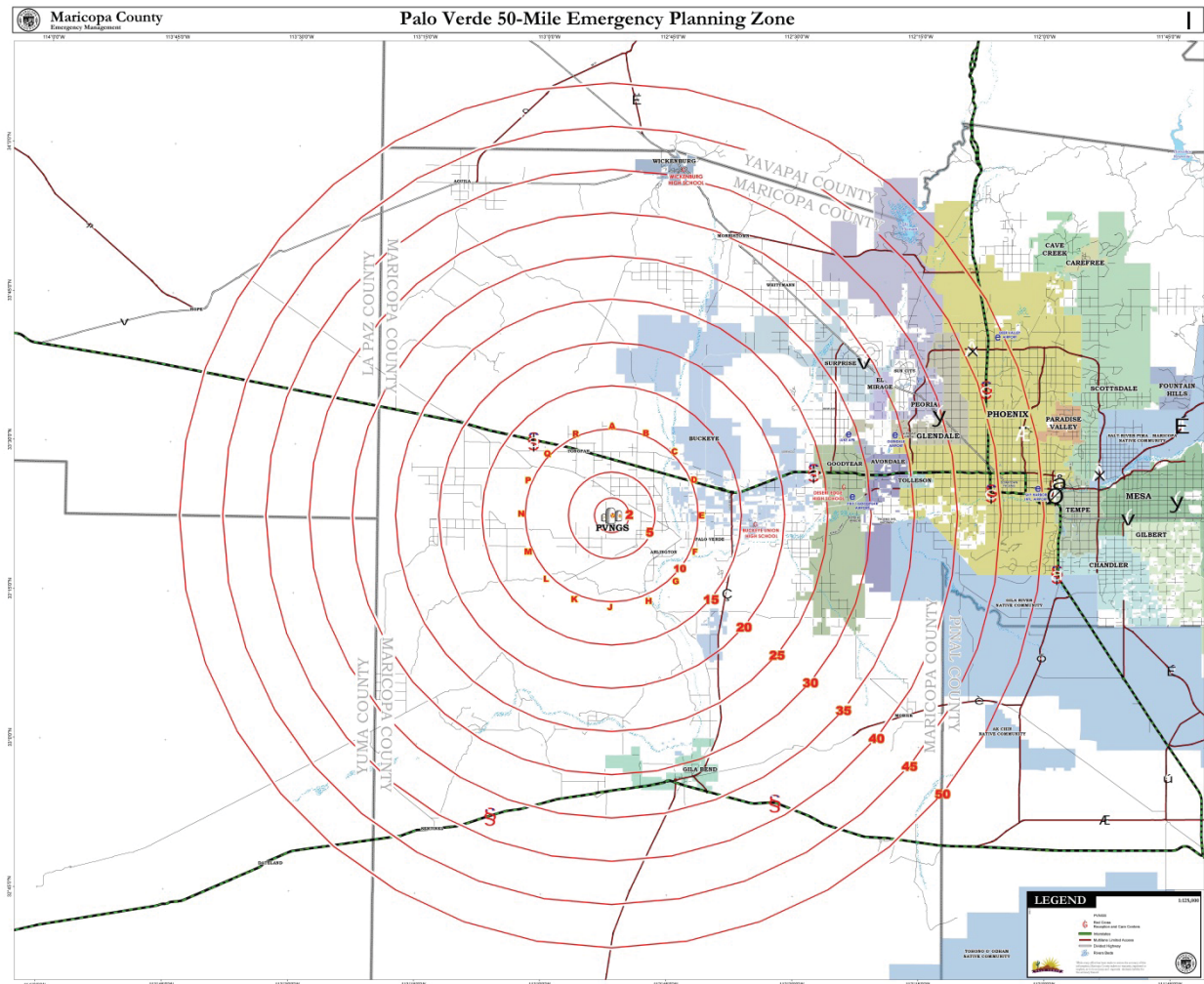
December 2014

Sector	1 Mile	2 Mile	2 Mile Total	3 Mile	4 Mile	5 Mile	5 Mile Total	6 Mile	7 Mile	8 Mile	9 Mile	10 Mile	10 Mile Total
A	0	98	98	732	95	238	1163	149	81	133	95	68	1689
B	0	41	41	122	390	138	691	95	43	217	89	14	1149
C	0	0	0	97	136	379	612	304	41	30	57	33	1077
D	0	3	3	65	140	276	484	371	154	3	46	279	1337
E	0	0	0	30	46	151	227	222	60	22	146	35	712
F	0	0	0	0	195	98	293	73	57	14	30	33	500
G	0	0	0	0	49	51	100	0	170	92	0	0	362
H	0	0	0	3	3	0	6	0	0	0	30	30	66
J	0	0	0	0	0	0	0	0	0	0	0	0	0
K	0	0	0	3	14	3	20	0	3	0	0	0	23
L	0	8	8	3	8	14	33	0	3	0	0	0	36
M	5	22	27	0	0	14	41	33	8	0	0	0	82
N	3	3	6	3	0	0	9	0	0	0	0	0	9
P	1	0	1	0	0	0	1	0	0	0	0	0	1
Q	1	16	17	0	0	8	25	16	19	16	41	206	323
R	0	19	19	11	192	119	341	16	33	24	528	49	991
Mile Ring Total	10	210	220	1069	1268	1489	4046	1279	672	551	1062	747	8357

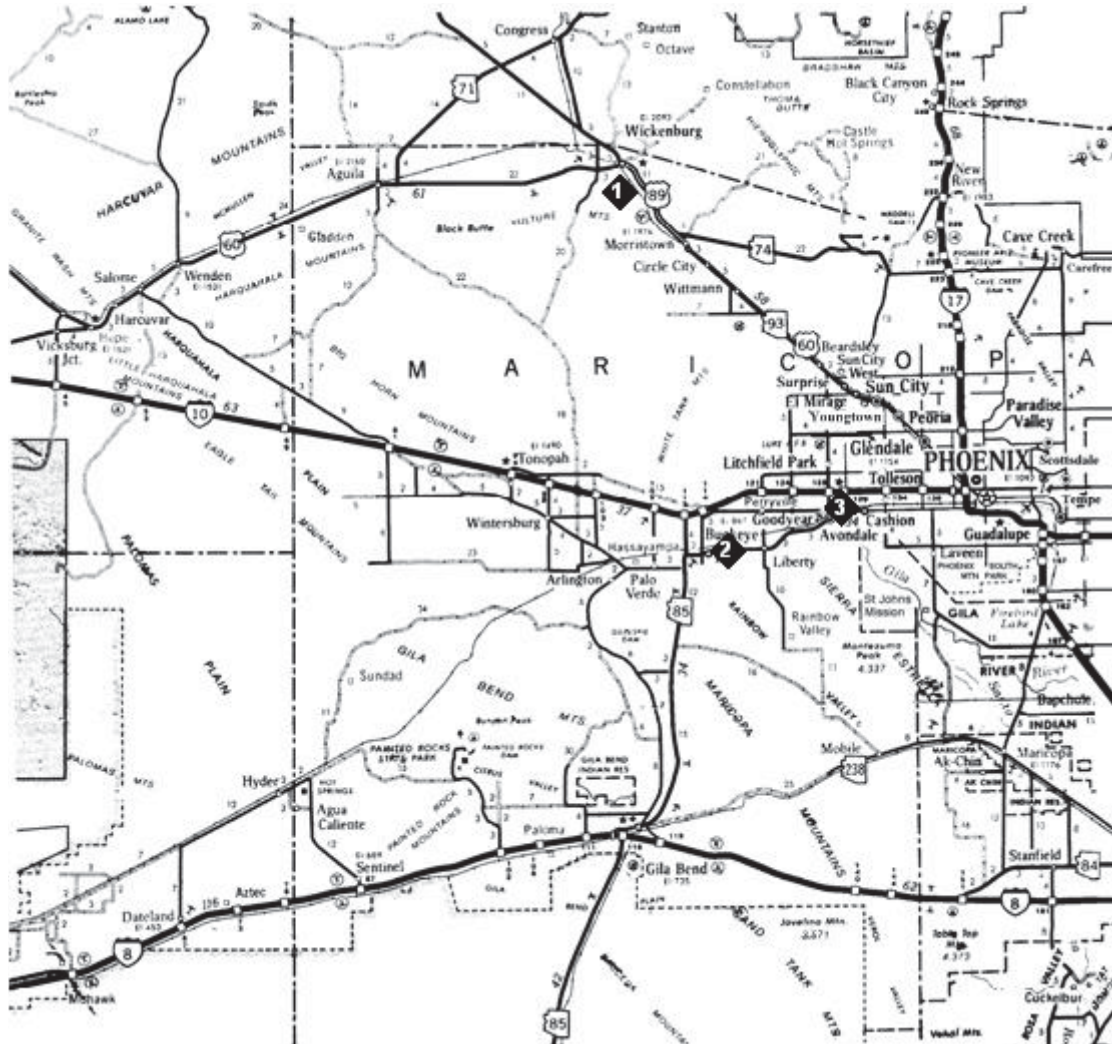
	Students	Staff	Total
Arlington School	254	38	292
Palo Verde School	463	75	538
Ruth Fisher School	679	50	729
Tonopah High School	383	40	423
Total	1779	203	1978

**FIGURE 12 – DEMOGRAPHY WITHIN THE PLUME EXPOSURE
PATHWAY EMERGENCY PLANNING ZONE**



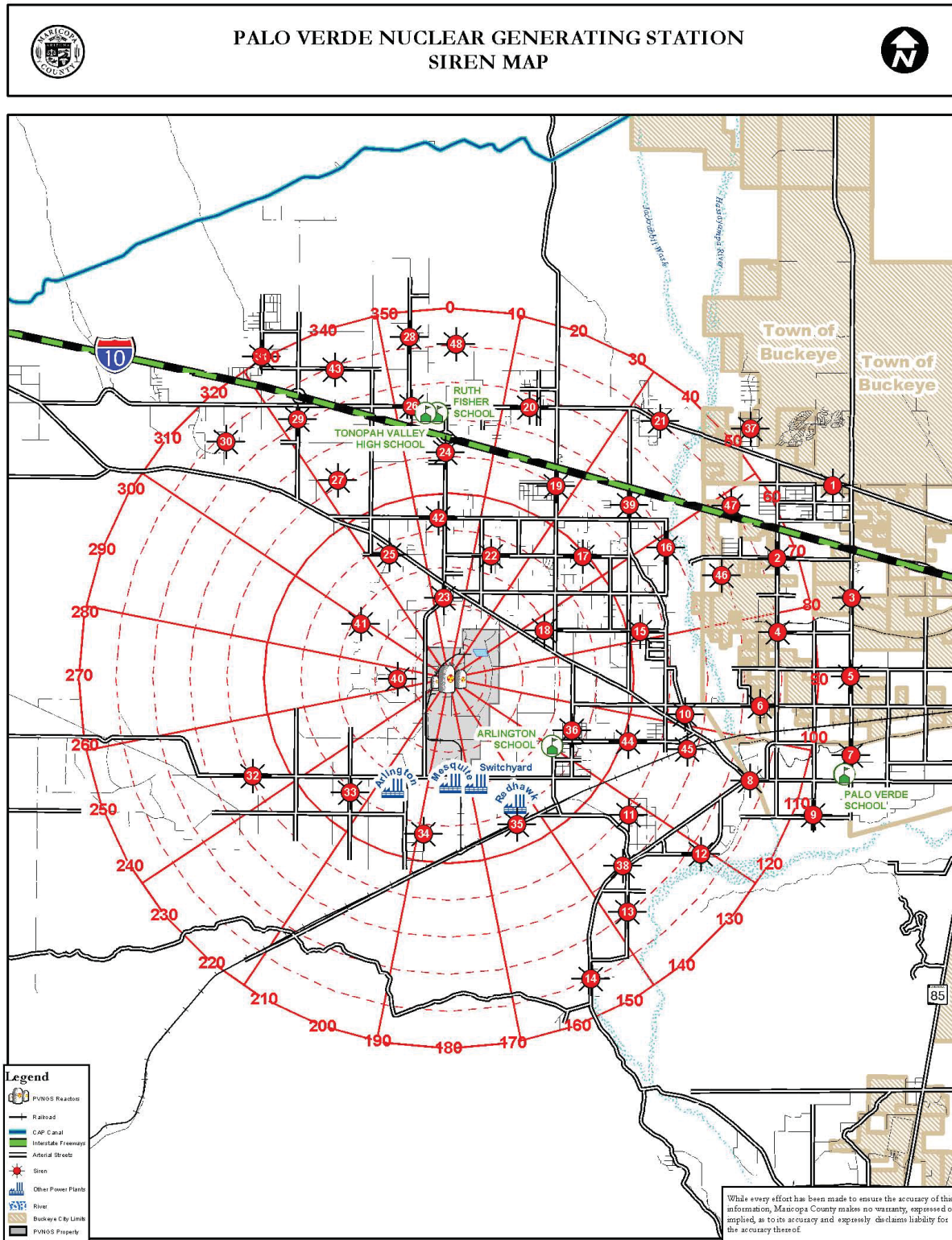


**FIGURE 14 – INGESTION EXPOSURE PATHWAY
EMERGENCY PLANNING ZONE**



- | | | |
|--|--|--|
| 1. Wickenburg High School
1090 S. Vulture Mine Road
Wickenburg, AZ. 85390 | 2. Youngker High School
3000 S. Apache Road
Buckeye, AZ 85326 | 3. Desert Edge High School
15778 W. Yuma Road
Goodyear, AZ. 85338 |
|--|--|--|

FIGURE 15 – RECEPTION AND CARE CENTERS

**FIGURE 16 - PROMPT NOTIFICATION SYSTEM SIREN LOCATIONS**

13.0 EMERGENCY PLAN IMPLEMENTING PROCEDURES

Designator	Title	Plan Section
EP-0900	ERO Position Checklists	4
EP-0901	Emergency Classification	5,6
EP-0902	Notification	6,7
EP-0903	Accident Assessment	6,7
EP-0904	ERO / ERF Activation and Operation	4,7
EP-0905	Protective Actions	6,15
EP-0906	Termination and Recovery	5,9
40AO-9ZZ24	Deliberate Acts Against PVNGS	6

14.0 IDENTIFICATION OF EMERGENCY KITS BY GENERAL CATEGORY

Kit Equipment	TSC OSC	STSC	Offsite RFAT	Ambulance	EOF	Medical Facility, Evacuation Decon.	Hospitals	Units (1-3) Near RP Island
Protective Equipment	X	X		X		X		
Communications Equipment	X	X	X	X	X			
Radiological Monitoring Equipment							X	X
Emergency Supplies	X	X	X	X		X	X	

15.0 ACCIDENT DOSE PROJECTION AND SOURCE TERM ESTIMATION

The method used for dose projection at PVNGS is the Raddose computer software program, which runs on several computers throughout the plant.

15.1 DOSE ASSESSMENT MODEL

PVNGS uses a site-specific version of the Raddose dose assessment computer software. The Raddose software meets the requirements of NUREG 0654, Appendix 2, and uses a variable trajectory, puff advection model. Calculations can be performed using multiple release points or accident types from multiple units.

Based on EPA 400; *MANUAL OF PROTECTIVE ACTION GUIDES AND PROTECTIVE ACTIONS FOR NUCLEAR INCIDENTS* dated 1991 dose conversion factors and the source term provided in the PVNGS Updated Final Safety Analysis Report (based on TID-14844, "Calculation of Distance Factors for Power and Test Reactors").

The Raddose dose assessment software is designed to:

- Estimate source terms based on high range Containment radiation monitors, effluent process radiation monitors, and steam line radiation monitors under anticipated accident conditions.

- Estimate source terms using alternate monitors or default values when the primary instruments are off-scale or inoperable.
- Estimate source terms based on grab sample results and back-calculation using field monitoring team data.
- Estimate atmospheric effluent transport and diffusion during and immediately following an accidental airborne radioactive release using actual or estimated meteorology.
- Adjust atmospheric diffusion rates based on atmospheric stability.
- Report plume dimensions, position, and expected arrival time at various downwind distances.
- Calculate TEDE, Thyroid Committed Dose Equivalent, committed EDE from inhalation, external EDE due to plume exposure, and exposure to ground deposition at various downwind locations.
- Calculate deposition estimates at various downwind locations.
- Report maximum integrated values and rates at the Site Boundary, 2 miles, 5 miles, and
10 miles for TEDE, Thyroid Committed Dose Equivalent, external EDE, and ground deposition.
- Report effluent release rate data and plume ground level airborne concentration.
- Raddose provides Protective Action Recommendations based on radiological data. Actual Protective Action Recommendations are derived from Emergency Plan Implementing Procedures.

16.0 CROSS REFERENCE TO NUREG 0654

Cross reference between NUREG-0654 and the Palo Verde Nuclear Generating Station Emergency Plan.

A. Assignment of Responsibility (Organizational Control)

- A.1.a Section 4.2, 4.3
- A.1.b Section 4
- A.1.c Figures 1 through 6
- A.1.d Section 4.2.1.1, 4.2.2.1, 4.2.4.1
- A.1.e Section 4.2.1
- A.2.a NA
- A.2.b NA
- A.3 Section 10
- A.4 Section 4.2.4

B. Onsite Emergency Organization

- B.1 Section 4.1, 4.2
- B.2 Section 4.2.1.1
- B.3 Section 4.2.1.1, 4.2.2.1, 4.2.4.1
- B.4 Section 4.2.1.1, 4.2.2.1, 4.2.4.1
- B.5 Section 4.2, Figures 1 through 6, Table 1
- B.6 Section 4.2, 4.3, Figures 1 through 6

- B.7 Section 4.2
- B.7.a Section 4.2.4
- B.7.b Section 9
- B.7.c Section 4.2.4
- B.7.d Section 4.2.4, 18
- B.8 Section 4.3.2
- B.9 Section 4.3, 6.8.3, 6.8.4, 10
- C. Emergency Response Support and Resources**
- C.1.a Section 4.2.1.1, 4.2.2.1, 4.2.4.1
- C.1.b Section 4.4.3
- C.1.c Section 7.1, 7.2, Table 3
- C.2.a NA
- C.2.b Section 4.2.5.5
- C.3 Section 7.3.1.5
- C.4 Section 4.2.4, 10
- D. Emergency Classification System**
- D.1 Table 2
- D.2 Section 5.2, Table 2
- D.3 NA
- D.4 NA
- E. Notification Methods and Procedures**
- E.1 Section 6.3
- E.2 Section 6.4
- E.3 Section 6.3
- E.4.a Section 6.3
- E.4.b Section 6.3
- E.4.c Section 6.3
- E.4.d Section 6.3
- E.4.e Section 6.3
- E.4.f Section 6.3
- E.4.g Section 6.3
- E.4.h Section 6.3
- E.4.i Section 6.3
- E.4.j Section 6.3
- E.4.k Section 6.3
- E.4.l Section 6.3
- E.4.m Section 6.3
- E.4.n Section 6.3
- E.5 NA
- E.6 Section 6.3, 6.7.2, 7.7, Figure 16
- E.7 Section 6.3, 6.7.2
- F. Emergency Communications**
- F.1.a Section 6.3, 7.2.21, Figures 7 & 8
- F.1.b Section 6.3, 7.2.21, Figures 7 & 8
- F.1.c Section 4.2.4, 4.3, 6.3, 7.2.14
- F.1.d Section 7.2, Table 3
- F.1.e Section 6.3
- F.1.f Section 7.2

F.2 Section 7.2

F.3 Section 8.1.3, 8.3

G. Public Education and Information

G.1 Section 8.1.1.4

G.2 Section 8.1.1.4

G.3.a Section 7.1.8

G.3.b Section 7.1.8

G.4.a Section 4.2.5, 18

G.4.b Section 18

G.4.c Section 6.9

G.5 Section 8.1.1.5

H. Emergency Facilities and Equipment

H.1 Section 7.1.3, 7.1.4, 7.1.5

H.2 Section 7.1.6

H.3 NA

H.4 Section 6.3, 6.4

H.5.a Section 7.3.1.1

H.5.b Section 7.3.1.2, 7.3.1.6

H.5.c Section 7.3.1.3

H.5.d Section 7.3.1.4

H.6.a Section 7.3.1.1

H.6.b Section 7.3.2

H.6.c Section 7.3.1.5

H.7 Section 7.3.2

H.8 Section 6.5.2, 7.3.1.1

H.9 Section 7.1.4

H.10 Section 8.3

H.11 Section 14

H.12 Section 7.1.6

I. Accident Assessment

I.1 Table 2

I.2 Section 7.3.1.2, 7.3.1.5

I.3.a Section 15

I.3.b Section 15

I.4. Section 15

I.5 Section 6.5.2, 7.1.3, 7.1.5, 7.1.6, 7.3.1.1, 7.3.1.9

I.6 Section 15

I.7 Section 6.5.2

I.8 Section 6.5.2

Note: PVNGS is a dry site and has no monitored liquid release pathways

I.9 Section 6.5.2

I.10 Section 6.5.2, 15

I.11 NA

J. Protective Response

J.1.a Section 6.7.1.1

J.1.b Section 6.7.1.1

J.1.c Section 6.7.1.1

- J.1.d Section 6.7.1.1
- J.2 Section 6.7.1.4
- J.3 Section 6.8.2
- J.4 Section 6.7.1.4, 6.8.2
- J.5 Section 6.7.1.3
- J.6.a Section 6.7.1.7.1, 9.2
- J.6.b Section 6.7.1.7.2, 9.2
- J.6.c Section 6.7.1.7.3, 9.2
- J.7 Section 6.7.2.1, Figure 9
- J.8 Section 6.7.2.1
- J.9 NA
- J.10.a Figures 11 & 15
- J.10.b Figure 12
- J.10.c Section 6.7.2.1, 7.7, Figure 16
- J.10.d Section NA
- J.10.e Section NA
- J.10.f Section NA
- J.10.g Section NA
- J.10.h Section NA
- J.10.i Section NA
- J.10.j Section NA
- J.10.k Section NA
- J.10.l Section NA
- J.10.m Section 6.7.2, 6.7.2.1
- J.11 Section NA
- J.12 Section NA

K. Radiological Exposure Control

- K.1.a Section 6.8.2, 6.8.3, 6.8.4
- K.1.b Section 6.8.2, 6.8.3, 6.8.4
- K.1.c Section 6.8.2, 6.8.4, 6.8.4
- K.1.d Section 6.8.2, 7.5
- K.1 e Section 6.8.2
- K.1.f Section 6.8.3
- K.1.g Section 6.8.4, 7.5
- K.2 Section 6.8.1
- K.3.a Section 6.7.3.1, 6.7.3.2, 6.8.1
- K.3.b Section 6.8.1
- K.4 NA
- K.5.a Section 6.8.1, 6.8.2
- K.5.b Section 6.8.1, 6.8.2
- K.6.a Section 6.7.3
- K.6.b Section 6.7.3,
- K.6.c Section 6.7.3, 9.0
- K.7 Section 6.8.2, 6.8.4

L. Medical and Public Health

- L.1 Section 6.8.2, 6.8.3, 6.8.4
- L.2 Section 6.8.2, 7.5
- L.3 NA

L.4 Section 6.8.3

M. Recovery and Reentry Planning and Post Accident Operations

M.1 Section 9.0 Through 9.3

M.2 Section 9.1

M.3 Section 9.0 Through 9.3

M.4 Section 9.2

N. Exercises and Drills

N.1.a Section 8.1.2

N.1.b Section 8.1.2

N.2.a Section 8.1.3

N.2.b Section 8.1.3

N.2.c Section 8.1.3

N.2.d Section 8.1.3

N.2.e.1 Section 8.1.3

N.2.e.2 Section 8.1.3

N.3.a Section 8.1.2, 8.1.3

N.3.b Section 8.1.2, 8.1.3

N.3.c Section 8.1.2, 8.1.3

N.3.d Section 8.1.2, 8.1.3

N.3.e Section 8.1.2, 8.1.3

N.3.f Section 8.1.2, 8.1.3

N.4 Section 8.1.2, 8.1.3

N.5 Section 8.1.2, 8.1.3

O. Radiological Emergency Response Training

O.1 Section 8.1.1

O.1.a Section 8.1.1, 10

O.1.b NA

O.2 Section 8.1.1.2, 8.1.3

O.3 Section 4.2.1.3, 6.8.2

O.4.a Section 8.1.1

O.4.b Section 8.1.1

O.4.c Section 8.1.1

O.4.d Section 8.1.1

O.4.e Section 8.1.1

O.4.f Section 8.1.1

O.4.g Section 8.1.1.3

O.4.h Section 8.1.1

O.4.i Section 8.1.1

O.4.j Section 8.1.1

O.5 Section 8.1.1.2

P. Responsibility for the Planning Effort: Development, Periodic review and Distribution of Emergency Plans

P.1 Section 8.1.1

P.2 Section 8.1.5

P.3 Section 8.1.5

P.4 Section 8.2

P.5 Section 8.2

P.6 Section 11.0

- P.7 Section 13.0
- P.8 Table of Contents, Section 16
- P.9 Section 8.2
- P.10 Section 8.2

17.0 CORPORATE EMERGENCY SUPPORT

The EOD will request and coordinate required support.

18.0 PUBLIC INFORMATION

18.1 INTRODUCTION

The purpose of this section is to briefly summarize the responsibilities, operation and staffing of the Palo Verde Communications, APS External Communications Department and the Joint Information Center (JIC). A detailed Joint Public Information Procedure is provided.

18.2 ACTIVATION AND OPERATION

The purpose of the Palo Verde Communications, APS External Communications Department and the JIC is to provide information about an emergency at PVNGS to the news media and the general public.

At an Unusual Event, Palo Verde Communications and APS External Communications Department provide the media interface for the site.

At an Alert or higher classification level, the JIC is activated and assumes responsibility for the public information function.

18.3 STAFFING AND LOCATION

Palo Verde Communications Department personnel are located at PVNGS and the APS External Communications Department personnel are located at the APS Corporate Headquarters, 400 N. 5th Street, Phoenix, AZ.

The JIC is located at 600 North Verrado Way, Buckeye, AZ. The JIC staff consists of APS/PVNGS and government public information and support personnel. PVNGS coordinates and releases information with government authorities. Each principal organization represented at the JIC has a designated spokesperson that has access to all necessary information. JIC procedures are designed to allow the timely exchange of information among spokespersons.

Enclosure 2

Summary of the 10 CFR 50.54(q) Analysis on Emergency Plan Revision 56

Summary of the 10 CFR 50.54(q) Analysis on Emergency Plan Revision 56

Summary of Analysis

Revision 56 to the *PVNGS Emergency Plan* is associated with the rulemaking change to 10 CFR 50 Appendix E, Section V, which removed the requirements to submit revisions to emergency plan implementing procedures (EPIPs). This is a conforming change based on the change to 10 CFR 50 Appendix E, Section V. There is no corresponding EP function associated with submitting the EPIPs to the NRC staff.

Change

The last sentence in Section 8.2 of the *PVNGS Emergency Plan* was revised from "Changes to the Emergency Plan or Implementing Procedures shall be submitted to the NRC within 30 days of such changes" to new wording, "Changes to the Emergency Plan shall be submitted to the NRC within 30 days of such changes."

Conclusion

APS has evaluated the changes incorporated in this revision, and determined the changes do not reduce the effectiveness of the Emergency Plan and the Plan continues to comply with the standards of 10 CFR 50.47(b) and the requirements of Appendix E to 10 CFR 50.