EMERGENCY PLAN IMPLEMENTING PROCEDURE TRANSMITTAL
LIST I

EPIP NO. INDEX/05/17/85 (EPIP #12 Rev. 3, #23 Rev. 3) DATE 05/17/85

A	
V. Elish	6-8
G. Fiorelli	8-1
R. Selman	5-37
M. A. Cates	5-103
Compliance	5-17
Leon Brown	5-33
J. G. Sarver	5-102
V. Rhodes	1-1
Thomas P. Hillmer	5-15
T. Exum	5-40
DDC Library	1-2
M. W. Lantz	5-35
Penny Egebrecht	5-91
Kerry Bieling	17-9
E. J. Hayes	5-34
J. Cederquist	5-20
T. Shriver	5-8
T. Barsuk	5-86
D. Best	5-88
R. Johnson	5-42
Sec Cpt	15-1
Michael Deblo	5-41
EOF	17-1A
EOF	17-1B
EOF	17-1C
EOF	17-1D
EOF (Room 12)	17-1E
EOF	17-1F
Unit 2 Rad Protection	5-95
Jack Sims	17-2
Mike Crusa	17-4
Bob Page	17-5
Jerry Self	5-79
Dennis Yows	5-36
Bill Knighton	15-2
Russ Papworth	5-7
Bruce Rash	13-18
Dan Phillips	13-16

B	
J. M. Allen	5-31
W. Fernow	5-14
C. Anderson	6-7
Sim Obs Rm	5-89
C. R. Dunaway	5-9
D. Nelson	5-18
M. Whitaker	5-38
J. Tench	5-19
A. Perouthka	6-6
J. R. Bynum	5-22
B. Simmons	6-10
F. Hicks	6-9

C	
Unit 1 Control Room	5-2B
Kris Oberdorf	5-6
G. Olson	3-2
Unit 1 Radwaste	5-43
OSC Coordinator	3-15
A. Porter	3-3
T. Warren	5-21

D	
B. Rogers/TSC	5-94
John Cole	3-10
TSC	3-5
Les Barlow	3-8
Steve Grove	3-4
Greg Roettger	5-99
Maintenance Manager	3-11
TSC E Plan Anal	3-5A
John Kirby	2-4
Unit 2 Control Room	5-25
Bob Adney	5-93

E	
D. Fasnacht	19-1
M. Zimmerman	20-1
Jim St. John	14-47

F	
WRF/DDC	1-7

G	
Unit III Control Rm.	5-39
Unit III I&C	5-33

FOR NRC	
TAKE TO KARL GROSS ON R/A	
Jack Martin/Adm.	8-8
Document Cont. Desk	8-9A
Document Cont. Desk	8-9B
Gail M. Temple	8-5
Falk Kantor	8-6

PROCEDURE GROUP	
Dennis Yows	5-36A thru 5-36I
Emergency Kits coordinate w/ J. Sims	

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EMERGENCY PLAN IMPLEMENTING
PROCEDURES INDEX
05-17-85

PROCEDURE NUMBER	PROCEDURE TITLE	PROCEDURE REVISION	PROCEDURE EFFECTIVE DATE	CHANGE NOTICE NUMBER	CHANGE NOTICE DATE	NUCLEAR SAFETY REVIEW REQUIRED	PERIODIC REVIEW DATE	
EPIP-01	NOW COVERED BY ANPP PROCEDURE NUMBER 7N409.02.00		850118					Z
EPIP-02	EMERGENCY CLASSIFICATION	03	850417			Y	860417	Z
EPIP-03	NOTIFICATION OF UNUSUAL EVENT IMPLEMENTING ACTIONS	07	850510			Y	860510	Z
EPIP-04	ALERT IMPLEMENTING ACTIONS	06	850510			Y	860510	Z
EPIP-05	SITE AREA EMERGENCY IMPLEMENTING ACTIONS	06	850501			Y	860501	Z
EPIP-06	GENERAL EMERGENCY IMPLEMENTING ACTIONS	06	850501			Y	860501	Z
EPIP-11	TECHNICAL SUPPORT CENTER/SATELLITE TSC ACTIVATION	03	850510			Y	860510	Z
EPIP-12	OPERATIONS SUPPORT CENTER ACTIVATION	03	850517			Y	860517	Z
EPIP-13	EMERGENCY OPERATIONS FACILITY ACTIVATION	03	850501			Y	860501	Z
EPIP-14A	RELEASE RATE DETERMINATION	06	850410			Y	860410	Z
EPIP-14B	INITIAL DOSE ASSESSMENT	03	850409			Y	860409	Z
EPIP-14C	CONTINUING DOSE ASSESSMENT	01	850409			Y	860409	Z
EPIP-15	PROTECTIVE ACTION GUIDELINES	02	840713			Y	850713	Z
EPIP-16	INPLANT SURVEYS AND SAMPLING	03	850510			Y	860510	Z
EPIP-17	ONSITE/OFFSITE SURVEYS AND SAMPLING	02	840801			Y	850801	Z
EPIP-18	EMERGENCY EXPOSURE GUIDELINES	03	850510			Y	860510	Z
EPIP-19	ONSITE EVACUATION	03	850510			Y	860510	Z
EPIP-20	PERSONNEL ASSEMBLY AND ACCOUNTABILITY	03	850308			Y	860308	Z
EPIP-21	SEARCH AND RESCUE	02	840716			Y	850716	Z
EPIP-22	PERSONNEL INJURY	03	850308			Y	860308	Z
EPIP-23	FIRE FIGHTING	03	850517			Y	860517	Z
EPIP-24	SECURITY	02	840716			Y	850716	Z
EPIP-25	REENTRY FOR EMERGENCY OPERATIONS	02	840716			Y	850716	Z
EPIP-26	POTASSIUM IODINE (KI) ADMINISTRATION	02	840716			Y	850716	Z
EPIP-27	POST ACCIDENT SAMPLING AND ANALYSIS	03	841217	01		Y	851217	Z
EPIP-28	PERSONNEL MONITORING AND DECONTAMINATION	02	840716			Y	850716	Z
EPIP-29	AREA/EQUIPMENT MONITORING AND DECONTAMINATION	02	840716			Y	850716	Z
EPIP-30	RADIOLOGICAL EMERGENCY RESPONSE VEHICLE OPERATIONS	00	840716			Y	850716	Z
EPIP-31	RECOVERY	03	850418			Y	860418	Z
EPIP-33	OFFSITE ASSISTANCE	02	840716	01		Y	850716	Z
EPIP-35	NOW COVERED BY ANPP PROCEDURE NUMBER 7N409.03.00 AND 7N409.07.00		850325					Z
EPIP-36	EMERGENCY PREPAREDNESS TRAINING	01	830325			Y	840325	Z

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EMERGENCY PLAN IMPLEMENTING
PROCEDURES INDEX
05-17-85

PROCEDURE NUMBER	PROCEDURE TITLE	PROCEDURE REVISION	PROCEDURE EFFECTIVE DATE	CHANGE NOTICE NUMBER	CHANGE NOTICE DATE	NUCLEAR SAFETY REVIEW REQUIRED	PERIODIC REVIEW DATE	
EPIP-37A	NOW COVERED BY ANPP PROCEDURE NUMBER 7N407.08.00		850322					Z
EPIP-37B	NOW COVERED BY ANPP PROCEDURE NUMBER 7N407.09.00		850322					Z
EPIP-38	EMERGENCY EQUIPMENT AND SUPPLY INVENTORY	05	850311			Y	860311	Z
EPIP-53	GOVERNMENT STAFFING AT TSC	02	840530			Y	850530	Z
EPIP-54	GOVERNMENT STAFFING AT EOF	02	840530			Y	850530	Z
EPIP-55	TSC/EOF PERSONNEL IDENTIFICATION	02	840530			Y	850530	Z
EPIP-56	ULTIMATE HEAT SINK EMERGENCY WATER SUPPLY	01	840924	01		Y	850924	Z
EPIP-57	CORPORATE EMERGENCY RESPONSE	00	840716			Y	860716	Z

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PVNGS EMERGENCY PLAN IMPLEMENTING PROCEDURE	PROCEDURE NO. EPIP-02	
EMERGENCY CLASSIFICATION	REVISION 3	Page 1 of 27

DEPT. HEAD [signature] DATE 4/15/85

PRB/PRG/TRRG REVIEW [signature] DATE 4/16/85

APPROVED BY [signature] DATE 4/16/85

EFFECTIVE DATE 04.17.85

DN-1519A/0407A

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PVNGS EMERGENCY PLAN IMPLEMENTING PROCEDURE	PROCEDURE NO. EPIP-02	
EMERGENCY CLASSIFICATION	REVISION 3	Page 2 of 27

REVISION HISTORY

Rev. No.	Date	Revised Pages	Comments
3	04-11-95	4, 7, 9, 15, 17, 19	To incorporate PCN #01 of Rev. 2 and to correct references and minor editorial changes

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TABLE OF CONTENTS

SECTION		PAGE NUMBER
1.0	OBJECTIVE	4
2.0	REFERENCES	4
3.0	LIMITATIONS AND PRECAUTIONS	5
4.0	DETAILED PROCEDURE	7
4.1	Personnel Indoctrinations/Responsibilities	7
4.2	Prerequisites	9
4.3	Instructions	9

APPENDICES

Appendix A -	Offsite Dose and Barrier Challenge/Failure Event Classification	10
Appendix B -	Non Rx Trip Event Classification	14
Appendix C -	Classification Criteria	22

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1.0 OBJECTIVE

To provide a means of classifying off-normal events into one of the four emergency classifications described in the PVNGS Emergency Plan.

2.0 REFERENCES

2.1 Implementing References

2.1.1 EPIP-03, "Notification of Unusual Event Implementing Actions"

2.1.2 EPIP-04, "Alert Implementing Actions"

2.1.3 EPIP-05, "Site Area Emergency Implementing Actions"

2.1.4 EPIP-06, "General Emergency Implementing Actions"

2.1.5 EPIP-15, "Protective Action Guidelines".

2.1.6 EPIP-20, "Personnel Assembly and Accountability".

2.1.7 PVNGS Technical Specifications

2.1.8 41EP-1ZZ01, "Emergency Procedure"

2.1.9 71AC-9ZZ01, "Event Related Reporting" 3

2.1.10 41RO-1ZZ10, "Functional Recovery Procedure"

2.1.11 PVNGS Security Plan

2.1.12 41RO-1ZZ01, "Reactor Trip Recovery Procedure" 3

2.2 Developmental References

2.2.1 NUREG-0654 Rev. 1 "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants"

2.2.2 PVNGS Emergency Plan, Rev. 5

2.2.3 PVNGS Final Safety Analysis Report (FSAR), Amendment 14, February 1985

2.2.4 CEOG EOP Technical Guidelines, CEN-152, Rev. 02, April 1984

2.2.5 EPA-520/1-75-00, "Manual of Protective Actions Guides and Protective Actions for Nuclear Incidents," Revised June 1980.

2.2.6 10 CFR 50, "Domestic Licensing of Production and Utilization Facilities," 1983.

2.2.7 CEOG Task 467, May 1983, "Guideline for Core Damage Assessment".

3.0 LIMITATIONS AND PRECAUTIONS

3.1 Surveillance and assessment of plant and containment conditions are necessary to ensure appropriate classification of an event and appropriate Protective Action Recommendations (PAR) made to offsite officials. These PARs are made to offsite officials even when no release is in progress.

3.2 Definitions and Abbreviations

3.2.1 Notification of Unusual Event - This classification applies to unusual events which are in progress or have occurred which indicate a potential degradation of the level of safety of the plant. No releases of radioactive material requiring offsite response or monitoring are expected unless further degradation of safety systems occur.

3.2.2 Alert - This classification consists of events which are in progress or have occurred which involve an actual or potential substantial degradation of the level of safety of the plant. Any releases are expected to be limited to small fractions of the Environmental Protection Agency Protective Action Guideline exposure levels.

3.2.3 Site Area Emergency - Consists of events which are in progress or have occurred which involve actual or likely major failures of plant functions needed for the protection of the public. Any releases are not expected to exceed Environmental Protection Agency Guideline exposure levels beyond the site boundary.

3.2.4 General Emergency - Consists of events which are in progress or have occurred which involve actual or imminent substantial core degradation or melting with potential for loss of containment integrity. Releases can be reasonably expected to exceed EPA Protective Action Guideline exposure levels offsite for more than the immediate site area.

3.2.5 ARM - Area Radiation Monitor

3.2.6 PRM - Process Radiation Monitor

3.2.7 PAG - Protective Action Guidelines: Guidelines used in establishing recommendations given to and acted upon by offsite authorities to ensure the safety of the public.

3.2.8 MSLB - Main Steam Line Break

3.2.9 MSSS - Main Steam Support Structure

3.2.10 SBCS - Steam Bypass Control System

3.2.11 ADV - Atmospheric Dump Valves

3.2.12 ESFAS - Engineered Safety Features Actuation System

3.2.13 PAR - Protective Action Recommendation

3.2.14 RPS - Reactor Protection System

3.2.15 RO - Recovery Operating Procedures

3.2.16 CHIC - Corporate Headquarters Information Center

3.2.17 CEC - Corporate Emergency Center

3.2.18 JENC - Joint Emergency News Center

3.2.19 SS - Shift Supervisor

3.2.20 EC - Emergency Coordinator

3.2.21 RMS - Radiation Monitoring System

3.2.22 WB - Whole Body

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4.0 DETAILED PROCEDURE

4.1 Personnel Indoctrination/Responsibilities

NOTE

The rationale and criteria used to derive Appendices A and B is given in Appendix C. Appendix C describes the criteria used in the development of the emergency classifications. It is intended for information only, not for event classification.

EPIP-02 is not implemented for the notification of significant events unless a situation degrades to the point of impacting on a fission product barrier and compromising a safety function. Notification of significant events is made per 71AC-9ZZ01, "Event Related Reporting". 3

4.1.1 If a conflict or uncertainty exists, the more conservative, higher numbered, Implementing Action EPIP should be initiated when classifying the event.

4.1.2 For Emergency Classifications of ALERT or higher, the Shift Supervisor of the designated unaffected unit shall relieve the Shift Supervisor of the affected unit as the Emergency Coordinator. For Notification of Unusual Events it will be the discretion of the Shift Supervisor of the affected unit, if he is to be relieved as Emergency Coordinator by the Shift Supervisor of the designated unaffected unit.

4.1.3 The normal assignments of designated unaffected unit Shift Supervisors are listed. If conditions exist which make the use of the listed Shift Supervisor undesirable, another qualified individual may relieve as the Emergency Coordinator at the discretion of the affected unit Shift Supervisor.

4.1.4 If an indication of barrier challenge or failure exists which is inconsistent with the recovery procedure in use, initiate the Emergency Classification indicated and rediagnose plant conditions to identify any additional procedure which may be necessary to address existing conditions.

4.1.5 The rationale used to develop the classification of events based on indications of barrier challenge or failure is provided in Appendix C. This information describes the relationship between safety function and barrier integrity.

4.1.6 Responsibilities of the affected unit shift supervisor are:

4.1.6.1 Initial classification of the event per this procedure.

NOTE

Designated Unaffected Unit Shift Supervisor to assume the role to the Emergency Coordinator in the Onshift Emergency Organization are:

Affected Unit SS	Unaffected Unit SS
Unit 1	Unit 2
Unit 2	Unit 1
Unit 3	Unit 2
Entire Site	Unit 1

4.1.6.2 Notification of the Shift Supervisor of the designated unaffected unit or other individual selected as Emergency Coordinator.

4.1.6.3 Organization of the onshift staff to place the plant in a safe condition.

4.1.6.4 Assumption of the Emergency Coordinator's position until relieved.

4.1.7 Responsibilities of the Emergency Coordinator are:

4.1.7.1 Overall responsibility for directing the onshift emergency response organization.

4.1.7.2 Implement EPIP's based on initial classification.

4.1.7.3 Verification/reclassification of the event after initial licensee actions are completed.

4.1.7.4 Monitoring plant conditions and reclassifying the event as necessary until the event is terminated.

4.1.7.5 Downgrade the event based on plant status with all safety functions satisfied and boundary status verified.

4.1.7.6 Terminate the event taking into account that the event has been downgraded and the anticipated plant response is such that there should be no challenge to any fission product barriers or radiation releases in excess of Tech Specs; and present plant conditions are such that there is no possibility of an adverse impact on the health or safety of the general public or plant personnel.

4.2 Prerequisites

4.2.1 A situation has occurred which requires the implementation of the PVNGS Emergency Plan to protect the health and safety of the public.

4.3 Instructions

4.3.1 When plant conditions are such that Emergency Plan implementation may be required, the Shift Supervisor/Emergency Coordinator shall perform the following:

4.3.2 Classify the event using the appropriate appendix:

Appendix A - If an event oriented Recovery Procedure or the functional Recovery Procedure is in use.

Appendix B - If a non-Rx trip event has occurred.

4.3.3 If 41RO-1ZZ01, "Reactor Trip Recovery Procedure", is in use and effectively directing the maintenance of Critical Safety Functions and plant recovery, the CRS/EC may elect to NOT classify an uncomplicated Reactor Trip as NUE. Plant parameters must be trending as expected in order to NOT classify a Reactor Trip as a NUE. Appropriate notifications should be made per 71AC-9ZZ01, "Event Related Reporting". 3

4.3.4 Record the date/time/events of initial classification. Upon verification/reclassification of the event, record the date and time and supporting information.

4.3.5 Initiate and complete the implementing actions given in the appropriate classified-event implementing procedure (i.e., EPIP-03, 04, 05 or 06).

Offsite Dose and Barrier Challenge/Failure Event Classification

1.0 Determine the event classification as follows:

1.1 Evaluate any barrier challenges/failure per Appendix A, Table 1.

1.2 Evaluate any current offsite radioactive release per Appendix A, Table 2.

NOTE

Emergency classifications based on plant and containment conditions can be made to offsite officials even when no release is in progress.

2.0 Select the most restrictive, higher classification, from the Table 1 and Table 2 evaluations as the event classification.

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Appendix A

Table 1 - Barrier Challenge/Failure Classification Criteria

1.0 Make Checks by any of the following conditions that currently exist.

RCS	CLAD	CONTAINMENT
____ RVLMS indicates voiding in upper plenum	____ ATWS	____ Physical breach of containment
	OR	
____ RCS pressure > 2750 psia	Excessive RCS Activity (> 300 uc/gm dose equivalent I-131)	OR
____ Uncontrolled loss of RCS inventory > 50 gpm	____ CET > 700 F	CIAS required but not completed (i.e. both automatic valves in a penetration fail to close)
		____ H_2 concentration > 3.5% by volume
		____ Containment pressure > 50 psig

Vital Auxiliaries/Radiation Release

____ Loss of offsite and onsite AC power

____ Loss of offsite and onsite AC power for longer than 60 minutes

____ Loss of all Class IE DC power.

____ Loss of all Class IE DC power for longer than 15 minutes.

____ Failure of ESF Safety Systems (both trains) to actuate when required

____ > 10gpm primary/secondary leakage concurrent with LOP

OR

> 10 gpm primary/secondary leakage concurrent with loss of secondary coolant outside containment

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Appendix A

Table 1 - Barrier Challenge/Failure Classification Criteria (Cont'd.)

2.0 Determine the emergency classification level for barrier challenge/failure per the following guidelines:

Number of Checks made in 1.0	Barrier Status	Classification
0	No barriers lost or challenged	Unusual Event (EPIP-03)
1	One barrier lost or challenged	Alert (EPIP-04)
2	Two barriers lost or challenged	Site Area Emergency (EPIP-05)
3 or more	Three barriers lost or challenged	General Emergency (EPIP-06)

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Appendix A

Table 2 - Offsite Dose Projection Classification Criteria

Based upon information provided by the Radiation Protection Group and/or RMS, determine the emergency classification level according to the following:

___ Notification of Unusual Event (EPIP-03)

Plant Vent Monitor	RU-143 Chn. 1	> 3.2 E-3 uci/cc
Fuel Bldg. Exh. Monitor	RU-145 Chn. 1	> 1.04 E-2 uci/cc
Condenser Exh. Monitor	RU-141	> 1.2 E-1 uci/cc

___ Alert (EPIP-04)

Plant Vent Monitor	RU-144 Chn. 1	> 3.45 E-3 uci/cc
Fuel Bldg Exh. Monitor	RU-146 Chn. 1	> 1.12 E-1 uci/cc
Condenser Exh. Monitor	RU-142 Chn. 1	> 1.3 E-1 uci/cc

___ Site Area Emergency (EPIP-05)

Plant Vent Monitor	RU-144 Chn. 1	30 min. @ > 3.45 E-1 uci/cc
	RU-144 Chn. 2	2 min. @ > 3.45 uci/cc
Fuel Bldg. Exh. Monitor	RU-146 Chn. 1	30 min. @ > 1.12 uci/cc
	RU-146 Chn. 2	2 min. @ > 1.12 E + 1 uci/cc
Condenser Exh. Monitor	RU-142 Chn. 1	30 min. @ > 1.3 E + 1 uci/cc
	RU-142 Chn. 2	2 min @ > 1.3 E + 2 uci/cc

___ General Emergency (EPIP-06)

Plant Vent Monitor	RU-144 Chn. 2	> 6.9 uci/cc
Fuel Bldg. Exh. Monitor	RU-146 Chn. 2	> 2.24 E + 1 uci/cc
Condenser Exh. Monitor	RU-142 Chn. 2	> 2.6 E + 2 uci/cc

Appendix B

Non Rx Trip Event Classification Criteria

1.0 Classify non Rx trip events as follows:

1.1 Based on existing plant conditions select the most appropriate event category from below:

Event Category	Tab
Increase in Radiation Levels or Radioactive Effluent Release Rate	1
Technical Specification LCO Nonconformance	2
Degraded Facility Control, Indication, or Alarm	3
Fire and/or Security Compromise	4
Natural Disaster/Physical Hazard to Facility	5

1.2 Refer to the indicated tab for the event category chosen and select the classification appropriate for existing conditions.

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TAB 1

Increase in Radiation Levels or Radioactive Effluent Release Rate

Notification of Unusual Event (EPIP-03)

- RCS sample activity requires shutdown per Tech Spec 3.4.7
- Rad Protection and/or RMS confirms radioactive effluent releases exceed:

Plant Vent Monitor	RU-143 Chn. 1	> 3.2 E-3 uci/cc
Fuel Bldg. Exh. Monitor	RU-145 Chn. 1	> 1.04 E-2 uci/cc
Condenser Exh. Monitor	RU-141	> 1.2 E-1 uci/cc

3

- Transportation of internally or externally contaminated injured person to offsite hospital

Alert (EPIP-04)

- RCS sample activity > 300 uC/gm (DE I-131)
- Direct radiation readings within facility increase by 1000
- Rad Protection and/or RMS confirms radioactive effluent releases exceed:

Plant Vent Monitor	RU-144 Chn. 1	> 3.45 E-3 uci/cc
Fuel Bldg. Exh. Monitor	RU-146 Chn. 1	> 1.12 E-1 uci/cc
Condenser Exh. Monitor	RU-142 Chn. 1	> 1.3 E-1 uci/cc

- RCS leak rate > 50 gpm

Site Area Emergency (EPIP-05)

- Major damage to spent fuel

- Rad Protection and/or RMS confirms effluent radioactive releases exceed:

Plant Vent Monitor	RU-144 Chn. 1	30 min. @ > 3.45 E-1 uci/cc
	RU-144 Chn. 2	2 min. @ > 3.45 uci/cc
Fuel Bldg. Exh. Monitor	RU-146 Chn. 1	30 min. @ > 1.12 uci/cc
	RU-146 Chn. 2	2 min. @ > 1.12 E + 1 uci/cc
Condenser Exh. Monitor	RU-142 Chn. 1	30 min. @ > 1.3 E + 1 uci/cc
	RU-142 Chn. 2	2 min @ > 1.3 E + 2 uci/cc

- Radiation Protection measures > 50 MR/Hr at site boundary with portable instruments

General Emergency (EPIP-06)

- Rad Protection and/or RMS confirms effluent radioactive releases exceed:

Plant Vent Monitor	RU-144 Chn. 2	> 6.9 uci/cc
Fuel Bldg. Exh. Monitor	RU-146 Chn. 2	> 2.24 E + 1 uci/cc
Condenser Exh. Monitor	RU-142 Chn. 2	> 2.6 E + 2 uci/cc

- Radiation Protection measures > 1.0 R/Hr at site boundary with portable instruments

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TAB 2

Technical Specification LCO Non-Conformance

Notification of Unusual Event (EPIP-03)

- Rad Protection and/or RMS confirms section 3/4.11 Tech Spec Radiological Effluent limits exceeded
- RCS activity sample requires shutdown per Tech Spec 3.4.7
- Tech Spec LCO action statement requires Rx shutdown, or prevents return to operation pending engineering evaluation

Alert (EPIP-04)

- RCS leakrate >50 gpm
- ATWS

3

Site Area Emergency (EPIP-05)

None

General Emergency (EPIP-06)

None

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TAB 3

Degraded Facility Control, Indication and Alarm

Notification of Unusual Event (EPIP-03)

- Degraded control room indication or alarms on process parameters such that plant shutdown is required

Alert (EPIP-04)

- Loss of most or all annunciators
- Evacuation of control room required or anticipated
- Complete loss of any function needed for plant cold shutdown, when in cold shutdown
- ATWS

Site Area Emergency (EPIP-05)

- Loss of most or all annunciators and plant transient indicated or in progress
- Imminent loss of physical control of the plant
- Complete loss of any function needed for plant hot shutdown, when in hot shutdown
- Control room evacuated and local control of shutdown systems not established within 15 minutes

General Emergency (EPIP-06)

- Loss of physical control of the facility

TAB 4

Fire and/or Security Compromise

Notification of Unusual Event (EPIP-03)

- Fire within the Unit lasting longer than 10 minutes
- Declared Security Emergency
- Declared Security Alert (with offsite authorities notified and immediate response requested) 3

Alert (EPIP-04)

- Required evacuation of control room
- SS/EC determines that the level of plant safety is substantially reduced due to fire or ongoing security compromise.

Site Area Emergency (EPIP-05)

- Imminent loss of physical control of the plant
- Control room evacuated and local control of shutdown systems not established within 15 minutes
- Fire compromising the operability of safety systems in both trains

General Emergency (EPIP-06)

- Loss of physical control of the plant
- Any major internal or external events which could cause massive damage to plant systems potentially leading to releases of large amounts of radioactivity

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TAB 5

Natural Disaster/Physical Hazard to Facility

Notification of Unusual Event (EPIP-03)

- Natural phenomenon beyond usual level experienced or projected

  Earthquake greater than 0.1g ground shaking, flood, tornado onsite

- Other hazards experienced or projected

  Aircraft crash onsite or unusual aircraft activity over facility

  Train derailment onsite

  Explosion near or onsite

  Toxic or flammable gas release near on onsite

  Turbine rotating component failure resulting in rapid shutdown

Alert (EPIP-04)

- Severe natural phenomena experienced or projected with unit in modes 5-6

  Earthquake greater than design levels, 0.2g ground shaking,

  Tornado striking facility, or

  Severe flooding

- Other hazards experienced or projected

  Aircraft crash on facility

  Missile impacts on facility

  Explosion damage to facility affecting plant operation

  Toxic or flammable gas restricts entry to facility environs

Site Area Emergency (EPIP-05)

- Severe natural phenomena experienced or projected with unit in modes 1-4

  Earthquake greater than design levels, 0.2 ground shaking,

  Flood with failure of protection of vital equipment

  Sustained winds in excess of design levels

- Other hazard experienced or projected with unit in modes 1-4

  Aircraft crash affecting vital structures by impact

  Severe damage to safe shutdown equipment by missile or explosion

  Lack of entry into vital areas due to uncontrolled toxic or flammable gas

General Emergency (EPIP-06)

- Any major internal or external events which could cause massive damage to plant systems potentially leading to release of large amounts of radioactivity

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CLASSIFICATION CRITERIA

1.0 CLASSIFICATION CRITERIA

The classification criteria for Notification of Unusual Event through a General Emergency are based on three main considerations:

1) The extent of fission product barrier challenge or failure

2) The projected/actual offsite dose rate associated with radioactivity releases.

3) Potential or actual reductions in the level of plant safety

Evaluation of these criteria allows the development of Emergency Action Levels (EALs) which are independent of event sequences and readily correlate with the symptom/function based Emergency Operating Procedure (EOP) Guidelines.

Using this system, most emergency classifications may be based on the failure of, or challenge to, the fission product barriers. "Failure" of barriers is defined in terms consistent with NUREG-0654, Appendix 1, Example Initiating Conditions - eg: primary coolant leaks of 50 gpm constitutes "failure" of the primary coolant boundary (based on charging pump capacity for 2 pumps minus minimum letdown); 300 uCi/cc dose equivalent I-131 constitutes "failure" of the clad (based on release of 1% equilibrium gas gap equivalent I-131); loss of containment integrity is defined per Technical Specification Section 1.7.

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

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

2) An existing situation which will cause a barrier failure within a given time period unless successful corrective actions are implemented.

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

The SS/EC has the authority to increase the classification above that determined by EPIP-02 when, in his judgement, plant conditions warrant increased response and awareness from offsite personnel and agencies.

Table 3.0 lists indications of barrier challenge/failure for RCS, Clad, Containment, and vital auxiliaries/radiation release.

The fission product barrier criteria is applied to event classification in increasing order of severity as follows:

NOTIFICATION OF UNUSUAL EVENT

1. No loss of and no challenge to a fission product barrier

ALERT

1. A challenge to one barrier, or
2. A verified failure of one barrier

SITE AREA EMERGENCY

1. Challenges to two barriers, or
2. Verified failure of one barrier and a challenge to another, or
3. Verified failure of two barriers

GENERAL EMERGENCY

1. Challenges to all three barriers, or
2. Verified failure of one barrier and challenges to the other two, or
3. Verified failure of two barriers and challenge to the other, or
4. Verified failure of all three barriers

Guidance for evaluation and classification of non Rx trip events is taken directly from NUREG 0654. The arrangement of example situations by event categories provides an efficient method for the operator to make a classification depending upon the severity of the condition.

2.0 EVENT CLASSIFICATION

Appendices A and B present potential plant conditions for consideration in determining event classification. SRO's and Emergency Coordinators responsible for implementing this procedure are required to be familiar with the specific conditions which constitute barrier challenge/failure and those non trip events requiring emergency classification.

Appendix A lists possible challenges/failures that might exist to the fission product barriers. A check by any of the indicated conditions constitutes one barrier challenge or failure. (Therefore, if two conditions under "RCS" are checked, that constitutes two barriers challenged or failed.) Event classification will be made after evaluating the number and extent of barrier challenge/failure along with the projected doses resulting from any offsite releases. The activity release levels associated with emergency classification levels are based on the following NUREG-0654 criteria:

Unusual Event -	Exceed Tech Spec 3/4.11 Radiological Effluent limits.
Alert -	Effluent release rate 10X Tech Spec limits or 1 mR WB @ site boundary for 2 hr release.
Site Area Emergency -	> 50 mR/hr WB @ site boundary for 30 min. release or > 500 mR/hr WB @ site boundary for 2 min release.
General Emergency -	> 1 rem/hr WB @ site boundary.

The Site Area Emergency classification is divided into activity concentrations that must be maintained for either two or thirty minutes in order for the offsite dose limits to be met or exceeded.

Appendix B provides guidance for evaluating conditions not resulting in a Rx trip that require emergency classification per NUREG-0654. Five event categories have been selected, under which, similar non trip events can be listed according to emergency classification. Most classification should be straightforward once the event category has been selected. Event classifications based upon degraded security conditions, however, can be somewhat more involved.

The PVNGS Security Department classifies security infractions nto two types:

1. Security Alert

2. Security Emergency

Any declared Security Emergency will be classified as a Notification of Unusual Event. Should any plant damage, loss of facility control, or loss of accessability result from a degraded security condition, the guidelines for upgrading the emergency classification are in Tab 3, Degraded Facility Control, and Tab 5, Physical Hazards to Facility. Should a security compromise further degrade such that a substantial reduction in the level of plant safety occurs, an alert classification is appropriate. The Shift Supervisor's/Emergency Coordinator's judgement will be required to determine the severity of the security intrusion and the likelihood that a fission product barrier might be challenged to warrant the upgraded emergency classification.

Security compromises resulting in a declared Security Alert with immediate response requested from offsite authorities is also classified Notification of Unusual Event. This will ensure notification of appropriate company management personnel to off-normal conditions serious enough to warrant immediate response from offsite authorities. Security Alerts of a less serious nature where offsite authority assistance is requested would not require classification. It should be understood that the key point to consider for classification of Security Alerts is whether offsite authorities are notified to provide immediate response or assistance.

Table 4.0 lists applicable licensee actions per event classification. These actions will be implemented per the direction of the appropriate EPIP.

TABLE 3.0

Indications of Barrier Challenge/Failure

RCS

___ RVLMS indicates voiding in upper plenum

___ RCS pressure > 2750 psia

___ Uncontrolled loss of RCS inventory > 50 gpm

CLAD

___ ATWS

OR

Excessive RCS Activity (> 300 uCi/gm dose equivalent I-131)

___ CET > 700 F

CONTAINMENT

___ Physical breach of containment

OR

CIAS required but not completed (i.e. both automatic valves in a penetration fail to close)

___ H_2 concentration > 3.5% by volume

___ Containment pressure > 50 psig

VITAL AUXILIARIES/RADIATION RELEASE

___ Loss of offsite and onsite AC power

___ Loss of offsite and onsite AC power for longer than 60 minutes

___ Loss of all Class IE DC power.

___ Loss of all Class IE DC power for longer than 15 minutes.

___ Failure of ESF safety systems (both trains) to actuate when required

___ > 10 gpm primary/secondary leakage concurrent with LOP

OR

> 10 gpm primary/secondary leakage concurrent with loss of secondary coolant outside containment

CONTROLLED DOCUMENT

TABLE 4.0 LICENSEE ACTIONS

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

Unusual Event (EPIP-03)

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

  OR
- Escalate to a higher classification

Alert (EPIP-04)

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

  OR
- Escalate to a higher classification

Site Area Emergency (EPIP-05)

- Inform NRC, State & County authorities of site Area Emergency status/cause; any releases are not expected to exceed EPA/PAG exposure levels beyond the site boundary unless further degradation of safety systems occur
- Recommend to the State that consideration of appropriate protective actions based on actual or projected data is warranted per the appropriate EPIP
- Augment resources by ativtg. STSC, TSC, OSC, EOF, JENC, CHIC, and CEC
- Dispatch (onsite/offsite) Field Monitoring Teams with associated communications equipment
- Provide a dedicated individual for plant status updates to offsite authorities
- Provide meteorological data and dose estimates (for actual releases) to offsite authorities
- Provide release and dose projections based on available plant condition information and foreseeable contingencies
- Terminate (or reduction of) emergency class verbally at EOF followed by written summary within 8 hours

  OR
- Escalate to GENERAL EMERGENCY

General Emergency (EPIP-06)

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

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

PVNGS EMERGENCY PLAN IMPLEMENTING PROCEDURE	PROCEDURE NO. EPIP-03	
NOTIFICATION OF UNUSUAL EVENT IMPLEMENTING ACTIONS	REVISION 7	Page 1 of 22

ASSIGNED COPY

PVNGS # 8-9B

DEPT. HEAD Dennis D. Gowa DATE 4/18/85

PRB/PRG/TRRG REVIEW O.P. Bourque DATE 5/1/85

APPROVED BY O.P. Bourque DATE 5/1/85

EFFECTIVE DATE 05-10-85

DN-1598A/0787A

PV216-00DA (8/92)

PVNGS EMERGENCY PLAN IMPLEMENTING PROCEDURE	PROCEDURE NO. EPIP-03	
NOTIFICATION OF UNUSUAL EVENT IMPLEMENTING ACTIONS	REVISION 7	Page 2 of 22

REVISION HISTORY

Rev. No.	Date	Revised Pages	Comments
5	12-18-84	Complete	Revised Appendices and Callouts
6	02/08/85	Complete	Incorporated PCN's #01 & 02 of Rev. 5 Revised Appendices and Callouts.
7	05.10.85	9, 10, 16	Incorporated PCN #01 of Rev. 6 and added STEP FOR CANCELLATION CRITERIA GROUP PAGE.

TABLE OF CONTENTS

SECTION		PAGE NUMBER
1.0	OBJECTIVE	4
2.0	REFERENCES	4
3.0	LIMITATIONS AND PRECAUTIONS	4
4.0	DETAILED PROCEDURE	5
4.1	Personnel Indoctrination/Responsibilities	5
4.2	Prerequisites	5
4.3	Instructions	5

APPENDICES

Appendix A - Emergency Notification Call List - Emergency Coordinator/STSC Communicator	9
Appendix B - Emergency Notification Call List - PVNGS Security	10
Appendix C - Initial Emergency Message Form	11
Appendix D - Follow-up Emergency Message Form	12
Appendix E - Instructions for Completing Appendix C or D	15
Appendix F - Notification Alert Network (NAN) Radio Backup	18
Appendix G - Protective Action Recommendations	20
Appendix H - Emergency Coordinator Checklist	21

1.0 OBJECTIVE

1.1 This procedure provides a series of implementing actions to be taken upon declaration of a NOTIFICATION OF UNUSUAL EVENT.

2.0 REFERENCES

2.1 Implementing References

2.1.1 EPIP-02, "Emergency Classification"

2.1.2 EPIP-11, "Technical Support Center/Satellite TSC Activation"

2.1.3 EPIP-22, "Personnel Injury"

2.1.4 EPIP-23, "Fire Fighting"

2.1.5 71AC-9ZZ01, "Event Related Reporting"

2.1.6 78AC-0ZZ06, "Document and Record Turnover Control"

2.2 Developmental References

2.2.1 NUREG-0654, Rev. 1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants".

2.2.2 PVNGS Emergency Plan, Rev. 5

3.0 LIMITATIONS AND PRECAUTIONS

3.1 Continued surveillance and assessment of plant conditions are necessary to ensure that the emergency classification is appropriately revised as conditions change or more definitive information is obtained.

4.0 DETAILED PROCEDURE

4.1 Personnel Indoctrination/Responsibilities

4.1.1 In a NOTIFICATION OF UNUSUAL EVENT situation, time is available to take precautionary and constructive steps to prevent a more serious event and/or to mitigate any consequences that may occur. This event status places the plant in a readiness position for possible cessation of routine activities and/or augmentation of onshift resources. No releases of radioactive material requiring offsite response are expected. Appropriate notification of NRC and state/county authorities is made.

4.1.2 The Shift Supervisor shall be responsible for initiating this procedure. The Emergency Coordinator shall be responsible for completing the implementing actions of this procedure.

4.2 Prerequisites

4.2.1 The emergency has been classified per EPIP-02, "Emergency Classification."

4.3 Instructions

4.3.1 The affected unit Shift Supervisor shall perform the following:

NOTE

Designated Unaffected Unit Shift Supervisor to assume the role of the Emergency Coordinator in the Onshift Emergency Organization are:

Affected Unit	Unaffected Unit Shift Supervisor
Unit 1	Unit 2
Unit 2	Unit 1
Unit 3	Unit 2
Entire Site	Unit 1

4.3.1.1 Notify the Shift Supervisor of the designated unaffected unit (or Shift Supervisor of an unaffected unit) to report to the Control Room of the affected unit and assume the duties of the onshift Emergency Coordinator. For notification of unusual events, it will be at the discretion of the affected unit Shift Supervisor if he is to be relieved as Emergency Coordinator by the shift supervisor of an unaffected unit.

4.3.1.2 Announce the following over the plant wide telephone page (phone no. [redacted]) and the site warning siren/public address system:

"ATTENTION ALL PERSONNEL - A NOTIFICATION OF UNUSUAL EVENT HAS BEEN DECLARED. SATELLITE TECHNICAL SUPPORT CENTER AND OPERATIONS SUPPORT CENTER EMERGENCY PERSONNEL FOR UNIT _____, REPORT TO YOUR EMERGENCY STATION. OTHER PERSONNEL ASSIGNED TO THE EMERGENCY ORGANIZATION - STANDBY. ALL OTHER PERSONNEL CONTINUE WITH NORMAL ROUTINE UNTIL FURTHER NOTICE".

(Give a brief description of the event, if appropriate, and repeat the announcement).

NOTE

Protective Action recommendations (Appendix G) are based on plant and containment conditions and these recommendations are made to offsite officials even when no release is in progress.

4.3.1.3 Direct the Satellite TSC Communicator to fill out Appendix C, "Initial Emergency Message Form", in accordance with instructions provided in Appendix E.

4.3.1.4 Notify the Control Rooms of the unaffected units.

4.3.1.5 Ensure the actions of the appropriate Recovery procedures have been implemented.

4.3.2 The Emergency Coordinator/Shift Supervisor shall perform the following:

4.3.2.1 Ensure actuation of the Satellite TSC in accordance with EPIP-11, "Technical Support Center/Satellite TSC Activation".

4.3.2.2 Implement additional Emergency Plan Implementing Procedures according to the situation that resulted in the emergency being classified as a NOTIFICATION OF UNUSUAL EVENT.

4.3.2.3 Determine the need for any additional personnel. If needed, additional personnel should be requested by the existing on-shift organization.

4.3.2.4 Direct the STSC Communicator to prepare Appendix D, "Follow-up Emergency Message Form" in accordance with instructions provided in Appendix E.

4.3.2.5 Reevaluate the emergency classification and perform licensee actions as conditions change by implementing EPIP-02.

4.3.2.6 When the situation warrants downgrading/upgrading a NOTIFICATION OF UNUSUAL EVENT, proceed to appropriate implementing and notification procedures and direct the Shift Supervisor to announce the reclassification over the public address system and inform the other Control Rooms. Keep PVNGS Plant Manager informed as to status of event.

4.3.2.7 The Emergency Coordinator shall complete checklist, Appendix H.

4.3.3 PVNGS Security, after being notified by the Emergency Coordinator or STSC Communicator that a NOTIFICATION OF UNUSUAL EVENT is in progress or has occurred, shall complete Appendix B, "Emergency Notification Call List - PVNGS Security", and notify these individuals or departments of the situation.

4.3.4 Emergency Situation Terminated

4.3.4.1 Consult with the PVNGS Plant Manager prior to closing out emergency.

4.3.4.2 The Shift Supervisor (or Emergency Coordinator) shall sound the "All Clear" signal for approximately (1) minute, silence the signal, and provide the following announcement over the plant wide telephone page (phone no. [redacted]) and the site warning siren/public address system:

"Attention all personnel, the emergency situation declared in Unit _____ has now been terminated." (Provide special instructions as necessary).

4.3.4.3 Repeat signal and announcement once.

4.3.4.4 Direct the STSC Communicator to transmit the termination of the NOTIFICATION OF UNUSUAL EVENT per Appendix A.

4.3.4.5 Within 24 hours of closeout from the NOTIFICATION OF UNUSUAL EVENT classification provide a written summary to offsite authorities, in accordance with 71AC-9ZZ01, "Event Related Reporting".

4.3.5 Record Retention

4.3.5.1 Appendices A, B, C, D and H shall be turned over to the Emergency Planning and Preparedness Dept., mail station 6010, to ensure they are forwarded to DDC for proper storage in accordance with 78AC-0ZZ06, "Document and Record Turnover Control".

EMERGENCY NOTIFICATION CALL LIST

EMERGENCY COORDINATOR/STSC COMMUNICATOR

AGENCY OR INDIVIDUAL	PRIMARY LINK	ALTERNATE LINK	ALTERNATE LINK	DATE/TIME	CALLER
Arizona Department of Public Safety	NAN	Radio System Channel 8 Frequency	[redacted]	/	
Maricopa County Sheriff's Office	NAN	Radio System Channel 8 Frequency		/	
Arizona Radiation Regulatory Agency	NAN	Radio System Channel 8 Frequency		/	
Arizona Division of Emergency Services	NAN	Radio System Channel 8 Frequency		/	
Maricopa County Department of Civil Defense and Emergency Services	NAN	Radio System Channel 8 Frequency		/	
PVNGS Security	[redacted]	[redacted]		/	
Group Paging System		N/A	N/A	/	
PVNGS Plant Manager		[redacted]	N/A	/	
Operations Mgr			N/A	/	
Technical Support Manager *			N/A	/	
Maintenance Manager *			N/A	/	
Plant Services Manager *			N/A	/	
Dispatcher (SOC)	Dispatch phone		N/A	/	
NRC Headquarters			N/A	/	

*Call these personnel in sequence until one of them is reached only if unable to contact PVNGS Plant Manager or Operations Manager.

7

PVNGS EMERGENCY PLAN IMPLEMENTING PROCEDURE	PROCEDURE NO. EPIP-03	APPENDIX B Page 1 of 1
NOTIFICATION OF UNUSUAL EVENT IMPLEMENTING ACTIONS	REVISION 7	Page 10 of 22

EMERGENCY NOTIFICATION CALL LIST-PVNGS SECURITY

Department/Individual	Primary Link	Alternate Link	Date/Time	Caller
Corporate Security			/	
Site Construction Security Office			/	
Nuclear Administration			/	
ANPP Communications*			/	
APS Site Construction Office*			/	
Bechtel Emergency Control Center			/	

*Available during working hours only

7

INITIAL EMERGENCY MESSAGE FORM NOTIFICATION OF UNUSUAL EVENT, ALERT, SITE AREA EMERGENCY, OR GENERAL EMERGENCY

1. Verbatim text of Message: THIS IS (IS NOT) A DRILL!! (Circle One) THIS IS PALO VERDE NUCLEAR GENERATING STATION (NOTIFICATION OF UNUSUAL EVENT) (ALERT) (SITE AREA EMERGENCY) (GENERAL EMERGENCY)
(cross out notifications above not applicable)

declared at _____ (time) - _____ (date) - Wind is from _____ degrees - At _____ (speed) mph.

PALO VERDE AUTHENTICATOR _____
(authenticator letters)

2. This is _____ (name/title), at the Palo Verde Nuclear Generating Station

3. (Circle One)

(a) There is NO, repeat NO, radioactive release taking place and no special protective actions are recommended at this time.

OR

(b) There is NO, repeat NO, radioactive release in excess of allowable operating limits and NO protective actions are recommended at this time.

OR

(c) There is NO, repeat NO, radioactive release taking place; however, the following protective actions are recommended at this time.

Sectors	Distance (Miles)
_____	_____
_____	_____

OR

(d) A radioactive release IS, repeat IS, taking place. We recommend that people in affected sectors remain indoors with windows and doors closed.

Sectors	Distance (Miles)
_____	_____
_____	_____

OR

(e) A radioactive release IS, repeat IS, taking place. We recommend that evacuation of affected sectors be considered.

Sectors	Distance (Miles)
_____	_____
_____	_____

4. THIS IS (IS NOT) A DRILL!! (Circle One)

Approved By _____
(SS/EC/EOD) DATE TIME

FOLLOW-UP EMERGENCY MESSAGE FORM

1. Verbatim text of Message: THIS IS (IS NOT) A DRILL!! (Circle One)
   THIS IS A PALO VERDE NUCLEAR GENERATING STATION follow-up information message concerning the (NOTIFICATION OF UNUSUAL EVENT) (ALERT) (SITE AREA EMERGENCY) (GENERAL EMERGENCY)
   (cross out notifications above not applicable)

   declared at _____ - _____
   (time) (date)

2. This is _____, at Palo Verde Nuclear Generating Station.
   (name/title)

3. Meteorological Data

   a. Wind direction from _____ (degrees) - at _____ miles per hour
   (direction) (speed)

   from _____ to _____
   (sector) (sector)

   b. Stability Class: A B C D E F G
   (Circle One)

   c. Precipitation Yes No
   (Circle One)

4. Radiological Data

   a. Radioactvity (check one)

   ( ) Has been released
   ( ) Has not been released

4. b. Release Time _____

c. Reactor Trip Time _____

d. Location/Source of Release _____

5. Current Release Rates

a. I-131 Equivalent _____ Ci/second
b. Noble Gas _____ Ci/second
c. Particulates _____ Ci/second

7. Two-hour plume centerline projected dose at:

Distance	Sector	Whole Body Dose (REM)	Child Thyroid Dose Commitment (REM)
Site Boundary			
2 miles			
5 miles			
10 miles			

7. Plume arrival time offsite:

_____ 2 mi
_____ 5 mi
_____ 10 mi
_____ Ruth Fisher School
_____ Arlington School

8. Estimated duration of release _____ minutes

9. The Following Emergency Measures Including Protective Actions are Recommended:

_____

_____

_____

10. The Following Emergency Reponse Actions are Underway:

_____

_____

_____

11. We Request the Following Onsite Support and Assistance from Offsite Sources:

_____

_____

_____

12. Our Prognosis of the Emergency is that Conditions:

_____Are Under Control
_____Can Be Expected to Terminate Within _____hours
_____Are Worsening

13. Other Information:

_____

_____

_____

14. THIS IS (IS NOT) A DRILL!! (Circle One)

INSTRUCTIONS FOR COMPLETING APPENDIX C OR D

1.0 INITIAL EMERGENCY MESSAGE FORM (APPENDIX C)

1.1 Fill in data required by steps 1 and 2 of Appendix C, "Initial Emergency Message Form". Obtain authenticator from the confidential envelope marked on the outside with the appropriate month and drill sequence number (if it is a drill).

1.2 Obtain from the Radiation Protection Monitor (onshift) data required to complete step 3 of Appendix C.

1.3 Circle appropriate wording of step 4 of Appendix C.

NOTE

When the NAN ring button is pushed and it appears that all the receiving stations are on line, or, the ring has stopped, the PVNGS originating station shall initiate a roll call in the order listed below. (Consider the time of day.)

NOTE

If the NAN dedicated telephone fails, refer to Appendix F, "Notification Alert Network (NAN) Radio Backup" for instruction on using channel 8, KON-511, for notifications.

1.4 By means of a single call on the Notification and Alert Net dedicated telephone, contact the following State/County agencies listed in Appendix A.

Duty Hours (8:00 a.m. to 5:00 p.m. Monday-Friday)

Maricopa County Sheriffs Office
Maricopa County Department of Civil Defense and Emergency Services
Arizona Department of Public Safety
Arizona Division of Emergency Services
Arizona Radiation Regulatory Agency

Off-Duty Hours (5:00 p.m. to 8:00 a.m., Monday-Friday, all day Saturday, Sunday and Holidays)

Maricopa County Sheriff's Office
Department of Public Safety

1.5 When contact is made, the caller shall identify himself and request that the individuals obtain a copy of the Appropriate Emergency Message Form.

1.6 When each individual has obtained a copy, read the completed Emergency Message Form verbatim and request MCSO to read back verbatim.

1.7 Offer to repeat information and reiterate as necessary.

1.8 Notify additional personnel as listed in Appendix A as necessary and inform them of the situation. Provide the following message for the Group Paging System Notification/Callout:

> "This is PVNGS, Unit ___, classification ONE, please respond appropriately" (Repeat message once).

1.9 If using the Group Paging System to announce event termination, use the following message: 7

> "This is PVNGS, Unit ___, Emergency terminated. Please cancel response to emergency."

1.10 If an individual requests information not contained in the Emergency Message Form, make reasonable efforts to obtain and give the information only after all initial notifications have been made.

1.11 Contact the NRC via the Emergency Notification System (ENS) dedicated telephone within 60 minutes of declaring an emergency. If the ENS phone fails, use commercial phone or HPN phone as an alternate line.

1.12 When contact is made, the caller shall identify himself and read the completed Emergency Message Form verbatim (omit the Palo Verde Authenticator).

1.13 Offer to repeat information and reiterate as necessary.

2.0 FOLLOW-UP EMERGENCY MESSAGE FORM (APPENDIX D)

2.1 Fill in data required by steps 1 and 2 of Appendix D, "Follow-up Emergency Message Form".

2.2 Obtain from the Radiation Protection Monitor data required to complete steps 3-9.

2.3 Obtain from the Emergency Coordinator data required to complete steps 10-13.

2.4 Circle appropriate wording in step 14.

2.5 Dispense information when asked by offsite agencies (NRC or ARRA).

NOTIFICATION ALERT NETOWRK (NAN) RADIO BACKUP

CHANNEL 8 - KON511

In case of failure of the NAN ringdown telephone, the NAN backup is Channel 8 on the PVNGS radio. FCC regulations require the Palo Verde designator 'KON-511' be used to precede and conclude all outgoing communications.

1. Take control of the radio channel by saying: "All stations this net," (Repeat) "All stations this net, this is K-O-N 5-1-1 Palo Verde to all 5-1-1 stations, stand by for Warning Point roll call."

2. Wait 30 seconds to allow the offsite agencies to get to their radios, then repeat the previous transmission.

NOTE

After 5 P.M. weekdays, all day Saturday, Sunday or holidays, Maricopa County Sheriff's Office (MCSO) and Department of Public Safety (DPS) will be the only agencies responding.

3. Initiate roll call of the offsite government agencies, allowing stations on the net to respond.

   3.1 "5-1-1 Palo Verde to 5-1-1 Maricopa County Sheriff's Office. Do you copy?" Allow response: "5-1-1 MCSO copies."

   3.2 "5-1-1 Palo Verde to 5-1-1 Maricopa County Department of Civil Defense & Emergency Services. Do you copy?" (MCDCD&ES) Allow response: "5-1-1 Civil Defense copies."

   3.3 "5-1-1 Palo Verde to 5-1-1 Department of Public Safety. Do you copy?"
   Allow response: "5-1-1 DPS copies."

   3.4 "5-1-1 Palo Verde to 5-1-1 Arizona Division of Emergency Services. Do you copy?"
   Allow response: "5-1-1 ADES (State EOC) copies."

   3.5 "5-1-1 Palo Verde to 5-1-1 Arizona Radiation Regulatory Agency. Do you Copy?"
   Allow response: "5-1-1 ARRA copies."

NOTIFICATION ALERT NETWORK (NAN) RADIO BACKUP (CONT'D)

CHANNEL 8 - KON511

4. Upon completion of roll call, transmit the notification message verbatim. Take an acknowledgement roll call, allowing MCSO to read the message back in its entirety, and provide assistance or clarification, as needed.

5. Upon completion of the second roll call, announce: "K-O-N 5-1-1 Palo Verde off." This is the required FCC sign-off.

6. Continue notifications per Step 1.8 of Appendix E.

PROTECTIVE ACTION RECOMMENDATIONS

Classification Category	Protective Actions Recommendations
Notification of Unusual Event- events are in progress which indicate a potential degradation of the level of safety of the plant; however, no releases of radioactive material requiring offsite response/monitoring are expected unless further degradation of safety systems occur.	Inform state and county authorities of NUE status/ cause and based on the situation recommend that no protective action is necessary or to standby for an update due to potential degradation of plant safety.

CHECKLIST
EMERGENCY COORDINATOR

POSITION FILLED BY: Onshift Organization

1) Shift Supervisor of the designated unaffected unit
2) Shift Supervisor of the affected unit

RESPONSIBILITY: The individual onsite with the responsibility and authority to immediately and unilaterally initiate emergency actions, including providing notification and protective action recommendations to governmental authorities responsible for implementing offsite emergency measures. Provide overall direction and control of the ONSHIFT Emergency response.

	TIME/INITIALS
INITIAL RESPONSE	
1. Provide Plant Wide Public Address Announcement or direct the Shift Supervisor to provide same.	____/____
2. Activate the Satellite STSC per EPIP-11, "Technical Support Center/Satellite TSC Activation."	____/____
3. Commence notification process per Appendix E or direct the STSC Communicator to do same.	____/____
4. Notify unaffected unit control rooms of situation.	____/____
5. Verify personnel resources are on standby in the OSC.	____/____
6. Implement EPIPs according to the situation that resulted in the classification.	____/____
SUBSEQUENT RESPONSE	
5. As necessary, direct implementation of EPIP-23, "Fire Fighting" and EPIP-22, "Personnel Injury."	
(1) For a fire, dispatch the Fire Team and order the Security Director to contact the Bechtel or alternate Fire Department for assistance (if required)	____/____

CHECKLIST
EMERGENCY COORDINATOR

	TIME/INITIALS
(2) For personnel injury, contact the First Aid Station and inform them of the situation. Dispatch a First Aid Team, if necessary, and coordinate any required offsite assistance.	/
6. Determine the need for additional personnel and direct the Security Director to initiate call out.	/
7. As appropriate, complete Follow-up Emergency Message Form.	/
8. Reevaluate the emergency classification as conditions change per EPIP-02, reclassify as necessary. Keep PVNGS Plant Manager informed as to status of event.	
9. Reassess corrective and protective actions. Verify activities underway.	/
Recovery	
10. Consult with the PVNGS Plant Manager prior to closing out emergency.	/
11. Complete notifications when emergency is closed out.	/
12. Provide termination announcement or direct Shift Supervisor to provide same.	/
13. Within 24 hours of closeout from the NOTIFICATION OF UNUSUAL EVENT classification, provide a written summary to offsite authorities.	/

Performed By _____ Date _____
Signature

* Continuing Activity

CHECKLIST
EMERGENCY COORDINATOR

		TIME/INITIALS
	(2) For personnel injury, contact the First Aid Station and inform them of the situation. Dispatch a First Aid Team, if necessary, and coordinate any required offsite assistance.	____/____
6.	Determine the need for additional personnel and direct the Security Director to initiate call out.	____/____
7.	As appropriate, complete Follow-up Emergency Message Form.	____/____
8.	Reevaluate the emergency classification as conditions change per EPIP-02, reclassify as necessary. Keep PVNGS Plant Manager informed as to status of event.	____/____
9.	Reassess corrective and protective actions. Verify activities underway.	____/____
	Recovery	
10.	Consult with the PVNGS Plant Manager prior to closing out emergency.	____/____
11.	Complete notifications when emergency is closed out.	____/____
12.	Provide termination announcement or direct Shift Supervisor to provide same.	____/____
13.	Within 24 hours of closeout from the NOTIFICATION OF UNUSUAL EVENT classification, provide a written summary to offsite authorities.	____/____

Performed By _____ Date _____
Signature

* Continuing Activity

PVNGS EMERGENCY PLAN IMPLEMENTING PROCEDURE	PROCEDURE NO. EPIP-04	
ALERT IMPLEMENTING ACTIONS	REVISION 6	Page 1 of 32

ASSIGNED COPY

PVNGS # 8-9B

DEPT. HEAD Dennis S. Fowler DATE 4/18/85

PRB/PRG/TRRG REVIEW C.A. Brinkman DATE 5/1/85

APPROVED BY C.A. Brinkman DATE 5/1/85

EFFECTIVE DATE 05-10-85

DN-1599A/0180A

PVNGS EMERGENCY PLAN IMPLEMENTING PROCEDURE	PROCEDURE NO. EPIP-04	
ALERT IMPLEMENTING ACTIONS	REVISION 6	Page 2 of 32

REVISION HISTORY

Rev. No.	Date	Revised Pages	Comments
5	2-28-85	All	Revised Procedure and Appendicies; added steps to clarify procedure and added appendix to provide NAN backup instructions
6	05.10.85	10, 11, 17	Incorporated RCN #01 of Rev. 5 and added steps for cancellation of emergency with Callaway page.

TABLE OF CONTENTS

SECTION			PAGE NUMBER
1.0	OBJECTIVE		4
2.0	REFERENCES		4
3.0	LIMITATIONS AND PRECAUTIONS		5
4.0	DETAILED PROCEDURE		5
	4.1	Personnel Indoctrination/Responsibilities	5
	4.2	Prerequisites	5
	4.3	Instructions	6

APPENDIX

Appendix A - Emergency Notification Call List - Emergency Coordinator/STSC Communicator	10
Appendix B - Emergency Notification Call List - PVNGS Security	11
Appendix C - Initial Emergency Message Form	12
Appendix D - Followup Emergency Message Form	13
Appendix E - Instructions for Completing Appendix C or D	16
Appendix F - Notification Alert Network (NAN) Radio Backup	19
Appendix G - Protective Action Recommendations	21
Appendix H - Emergency Coordinator Checklist	22

1.0 OBJECTIVE

1.1 This procedure provides a series of implementing actions to be taken upon declaration of an ALERT.

2.0 REFERENCES

2.1 Implementing References

2.1.1 EPIP-02, "Emergency Classification"

2.1.2 EPIP-11, "Technical Support Center/Satellite TSC Activation"

2.1.3 EPIP-12, "Operations Support Center Activation"

2.1.4 EPIP-13, "Emergency Operations Facility Activation"

2.1.5 EPIP-14A, "Release Rate Determination"

2.1.6 EPIP-14B, "Initial Dose Assessment"

2.1.7 EPIP-15, "Protective Action Guidelines"

2.1.8 EPIP-16, "Inplant Surveys and Sampling"

2.1.9 EPIP-17, "Onsite/Offsite Surveys and Sampling"

2.1.10 EPIP-18, "Emergency Exposure Guidelines"

2.1.11 EPIP-19, "Onsite Evacuation"

2.1.12 EPIP-20, "Personnel Assembly and Accountability"

2.1.13 EPIP-21, "Search and Rescue"

2.1.14 EPIP-22, "Personnel Injury"

2.1.15 EPIP-23, "Fire Fighting"

2.1.16 EPIP-24, "Security"

2.1.17 EPIP-25, "Reentry for Recovery Operations"

2.1.18 EPIP-26, "Potassium Iodide (KI) Administration"

2.1.19 EPIP-31, "Recovery"

2.1.20 EPIP-33, "Offsite Assistance"

2.1.21 71AC-9ZZ01, "Event Related Reporting"

2.1.22 78AC-0ZZ06, "Document And Record Turnover Control"

2.2 Developmental References

2.2.1 NUREG-0654, Rev. 1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants"

2.2.2 PVNGS Emergency Plan, Rev. 5

3.0 LIMITATIONS AND PRECAUTIONS

3.1 Continued surveillance and assessment of plant conditions are necessary to ensure that the emergency classification is appropriately revised as conditions change or more definitive information is obtained.

4.0 DETAILED PROCEDURE

4.1 Personnel Indoctrination/Responsibilities

4.1.1 In an ALERT situation, limited releases of radioactive material may occur and radiological/meteorological information may have to be obtained for assessment of onsite and offsite consequences. The emergency response for an ALERT includes activation of onsite and offsite emergency centers. An ALERT calls for prompt initial and follow-up notification to offsite emergency management organizations. The ALERT status is maintained until the event is terminated or reclassified.

4.1.2 The Shift Supervisor or Emergency Coordinator shall be responsible for initiating and completing implementing actions of this procedure.

4.2 Prerequisites

4.2.1 The emergency has been classified per EPIP-02, "Emergency Classification".

4.3 Instructions

4.3.1 The affected unit Shift Supervisor shall perform the following:

NOTE

Designated Unaffected Unit Shift Supervisor to assume the role of the Emergency Coordinator in the Onshift Emergency Organization are:

Affected Unit	Unaffected Unit Shift Supervisor
Unit 1	Unit 2
Unit 2	Unit 1
Unit 3	Unit 2
Entire Site	Unit 1

4.3.1.1 Notify the Shift Supervisor of the designated unaffected unit (or Shift Supervisor of an unaffected unit) to report to the Control Room of the affected unit and assume the duties of the Emergency Coordinator.

NOTE

Initial notifications shall be made from the Satellite TSC by the Satellite TSC Communicator until activation of the EOF. At that time, all subsequent initial and follow up notifications shall be made by the Government Liaison Engineer in the EOF.

NOTE

Protective ... ion recommendations (Appendix C ... re based on plant and containment conditions and these recommendations are made to offsite officials even when no release is in progress.

4.3.1.2 Direct the Satellite TSC Communicator to fill out Appendix C, "Initial Emergency Message Form," in accordance with instructions provided in Appendix E.

NOTE

Steps 4.3.1.3 and 4.3.1.5 should be performed only if deemed necessary by the Shift Supervisor to maximize the health and safety of station personnel.

4.3.1.3 Sound the accountability signal for approximately 1 minute to alert personnel.

4.3.1.4 Provide the following announcement over the plant wide telephone page (phone no. [redacted]) and the site warning siren/public address system:

"Attention all plant personnel, an emergency situation classified as an Alert exists in Unit _____. All affected Unit Emergency Response Personnel and alternates report to your emergency location. All other personnel standby until further notice. (Provide instructions on route(s) or area(s) to avoid as appropriate).

4.3.1.5 Resound the accountability signal and repeat the announcement.

4.3.1.6 Notify the Control Rooms of the unaffected units.

4.3.1.7 Ensure that the actions of the appropriate Recovery procedures have been implemented.

4.3.2 The Emergency Coordinator/Shift Supervisor shall perform the following:

4.3.2.1 Ensure activation of the Satellite TSC in accordance with EPIP-11, "Technical Support Center/Satellite TSC Activation".

4.3.2.2 Implement additional Emergency Plan Implementing Procedures according to the situation that resulted in the emergency being classified as an ALERT.

4.3.2.3 Direct the Security Director to call in the Onsite and Offsite Emergency Organization personnel by utilizing the appropriate computer call-out listing.

4.3.2.4 Direct the STSC Communicator to prepare Appendix D, "Followup Emergency Message Form" in accordance with instructions provided in Appendix E.

4.3.2.5 Determine the need for offsite assistance. If assistance is necessary, direct a Communicator to contact the required agency per EPIP-33, "Offsite Assistance".

4.3.2.6 Reevaluate the emergency classification and perform license actions as conditions change by implementing procedure EPIP-02.

4.3.2.7 When the situation warrants downgrading/upgrading an ALERT, proceed to appropriate implementing and notification procedures and direct the Shift Supervisor to announce the reclassification over the public address system and inform the other Control Rooms.

4.3.2.8 The Emergency Coordinator shall complete checklist, Appendix H.

4.3.3 PVNGS Security, after being notified by the Emergency Coordinator or STSC Communicator that an alert is in progress or has occurred, shall complete Appendix B, "Emergency Notification Call List - PVNGS Security," and notify these individuals or departments of the situation.

4.3.4 Operations Support Center (OSC) Activation

4.3.4.1 The OSC Coordinator shall implement EPIP-12, "Operations Support Center Activation".

4.3.5 Emergency Operations Facility (EOF) Activation

4.3.5.1 The Emergency Operations Director shall implement EPIP-13, "Emergency Operations Facility Activation".

4.3.6 Emergency Situation Terminated

4.3.6.1 The Shift Supervisor (or Emergency Coordinator) shall sound the All Clear signal for approximately (1) minute, silence the signal, and provide the following announcement over the plant wide telephone page (phone no. [redacted]) and the site warning siren/public address system:

"Attention all personnel. The emergency situation declared in Unit _____ has now been terminated". (Provide special instructions as necessary).

4.3.6.2 Repeat signal and announcement once.

4.3.6.3 Within 8 hours of closeout from an alert classification, provide a written summary to offsite authorities, in accordance with 71AC-9ZZ01, "Event Related Reporting".

4.3.7 Record Retention

4.3.7.1 Appendices A, B, C, D and H shall be turned over to the Emergency Planning and Preparedness Dept., mail station 6010, to ensure they are forwarded to DDC for proper storage in accordance with 78AC10ZZ06, "Document and Record Turn Over Control".

PVNGS EMERGENCY PLAN IMPLEMENTING PROCEDURE	PROCEDURE NO. EPIP-04	APPENDIX A Page 1 of 1
ALERT IMPLEMENTING ACTIONS	REVISION 6	Page 10 of 32

6

EMERGENCY NOTIFICATION CALL LIST

EMERGENCY COORDINATOR/STSC COMMUNICATOR

AGENCY OR INDIVIDUAL	PRIMARY LINK	ALTERNATE LINK	ALTERNATE LINK	DATE/TIME	CALLER
Arizona Department of Public Safety	NAN	Radio System Channel B frequency	N/A	/	
Maricopa County Sheriff's Office	NAN	Radio System Channel B frequency	N/A	/	
Arizona Radiation Regulatory Agency	NAN	Radio System Channel B frequency	N/A	/	
Arizona Division of Emergency Services	NAN	Radio System Channel B frequency	N/A	/	
Maricopa County Department of Civil Defense and Emergency Services	NAN	Radio System Channel P frequency	N/A	/	
PVNGS Security			N/A	/	
Group Paging System			N/A	/	
PVNGS Plant Manager			N/A	/	
Operations Manager			N/A	/	
Dispatcher (SOC)			N/A	/	
NRC Headquarters			N/A	/	

6

PVNGS EMERGENCY PLAN IMPLEMENTING PROCEDURE	PROCEDURE NO. EPIP-04	APPENDIX B Page 1 of 1
ALERT IMPLEMENTING ACTIONS	REVISION 6	Page 11 of 32

EMERGENCY NOTIFICATION CALL LIST - PVNGS SECURITY

DEPARTMENT INDIVIDUAL	PRIMARY LINK	ALTERNATE LINK	DATE/TIME	CALLER
Corporate Security	[redacted]	N/A	__/__	_____
Site Construction Security Office		[redacted]	__/__	_____
Nuclear Administration			__/__	_____
ANPP Communications*			__/__	_____
ANPP Site Construction Office*			__/__	_____
Bechtel Emergency Control Center			__/__	_____

*Available during working hours only.

5

INITIAL EMERGENCY MESSAGE FORM
NOTIFICATION OF UNUSUAL EVENT,
ALERT, SITE AREA EMERGENCY, OR GENERAL EMERGENCY

1. Verbatim text of Message: THIS IS (IS NOT) A DRILL (Circle One) THIS IS PALO VERDE NUCLEAR GENERATING STATION (NOTIFICATION OF UNUSUAL EVENT) (ALERT) (SITE AREA EMERGENCY) (GENERAL EMERGENCY)
(cross out notifications above not applicable)
declared at _____ (time) - _____ (date) - Wind is from _____ degrees - At _____ (speed) mph.

PALO VERDE AUTHENTICATOR _____
(authenticator letters)

2. This is _____ (name/title), at the Palo Verde Nuclear Generating Station

3. (Circle One)

(a) There is NO, repeat NO, radioactive release taking place and no special protective actions are recommended at this time.

OR

(b) There is NO, repeat NO, radioactive release in excess of allowable operating limits and NO protective actions are recommended at this time.

OR

(c) There is NO, repeat NO, radioactive release taking place; however, the following protective actions are recommended at this time.

Sectors	Distance (Miles)
_____	_____
_____	_____

OR

(d) A radioactive release IS, repeat IS, taking place. We recommend that people in affected sectors remain indoors with windows and doors closed.

Sectors	Distance (Miles)
_____	_____
_____	_____

OR

(e) A radioactive release IS, repeat IS, taking place. We recommend that evacuation of affected sectors be considered.

Sectors	Distance (Miles)
_____	_____
_____	_____

4. THIS IS (IS NOT) A DRILL (Circle One)

Approved _____
(SS/EC/EOD) Date Time

FOLLOW-UP EMERGENCY MESSAGE FORM

1. Verbatim text of Message: THIS IS (IS NOT) A DRILL (Circle One) THIS IS A PALO VERDE NUCLEAR GENERATING STATION follow-up information message concerning the (NOTIFICATION OF UNUSUAL EVENT) (ALERT) (SITE AREA EMERGENCY) (GENERAL EMERGENCY)
   (cross out notifications above not applicable)

   declared at _____ - _____
   (time) (date)

2. This is _____, at Palo Verde Nuclear Generating Station.
   (name/title)

3. Meteorological Data

   a. Wind direction from _____ (degrees) - at _____ miles per hour
   (direction) (speed)

   from _____ to _____
   (sector) (sector)

   b. Stability Class: A B C D E F G
   (Circle One)

   c. Precipitation Yes No
   (Circle One)

4. Radiological Data

   a. Radioactvity (check one)

   ( ) Has been released
   ( ) Has not been released

4. b. Release Time _____

   c. Reactor Trip Time _____

   d. Location/Source of Release _____

5. Current Release Rates

   a. I-131 Equivalent _____ Ci/second
   b. Noble Gas _____ Ci/second
   c. Particulates _____ Ci/second

6. Two-hour plume centerline projected dose at:

Distance	Sector	Whole Body Dose (REM)	Child Thyroid Dose Commitment (REM)
Site Boundary			
2 miles			
5 miles			
10 miles			

7. Plume arrival time offsite:

   _____ 2 mi
   _____ 5 mi
   _____ 10 mi
   _____ Ruth Fisher School
   _____ Arlington School

8. Estimated duration of release _____ minutes

9. Following Emergency Measures Including Protective Actions are Recommended:

_____

_____

_____

10. The Following Emergency Reponse Actions are Underway:

_____

_____

_____

_____

11. We Request the Following Onsite Support and Assistance from Offsite Sources:

_____

_____

_____

12. Our Prognosis of the Emergency is that Conditions:

_____Are Under Control

_____Can Be Expected to Terminate Within _____hours

_____Are Worsening

13. Other Information:

_____

_____

_____

14. THIS IS (IS NOT) A DRILL (Circle One)

INSTRUCTIONS FOR COMPLETING APPENDIX C OR D

1.0 Initial Emergency Message Form (Appendix C)

1.1 Fill in data required by Steps 1 and 2 of Appendix C, "Initial Emergency Message Form". Obtain Authenticator from the confidential envelope marked on the outside with the appropriate month and a drill sequence number (if it is a drill).

1.2 Obtain from the Radiation Protection Monitor (onshift) or the Radiological Assessment Coordinator (if EOF is activated) data required to complete Step 3 of Appendix C.

1.3 Circle appropriate wording of Step 4 of Appendix C.

NOTE

When the NAN ring button is pushed and it appears that all the receiving stations are on line or the ring has stopped, the PVNGS originating station shall initiate a roll call in order listed below. (Consider the time of day.)

NOTE

If the NAN dedicated telephone fails, refer to Appendix F, "Notification Alert Network (NAN) Radio Backup", for instructions on using channel 8, KON-511, for notification.

1.4 By means of a single call on the Notification and Alert Net dedicated telephone, contact the following State/County agencies listed in Appendix A.

Duty Hours (8:00 a.m. to 5:00 p.m. Monday-Friday)

Maricopa County Sheriff's Office
Maricopa County Department of Civil Defense and Emergency Services
Arizona Department of Public Safety
Arizona Division of Emergency Services
Arizona Radiation Regulatory Agency.

Off-Duty Hours (5:00 p.m. to 8:00 a.m., Monday-Friday, all day Saturday, Sunday and Holidays)

Maricopa County Sheriff's Office
Department of Public Safety

1.5 When contact is made, the caller shall identify himself and request that the individuals obtain a copy of the appropriate Emergency Message Form.

1.6 When each individial has obtained a copy, read the completed Emergency Message Form verbatim and request MCSO to read back verbatim. Perform warning point roll call.

1.7 Offer to repeat information and reiterate as necessary.

1.8 Notify additional personnel as listed in Appendix A as necessary and inform them of the situation. Provide the following message for the Group Paging System Notification/Callout:

"This is PVNGS, Unit ____, Classification Two, Please respond appropriately." (Repeat message once).

1.9 If using the Group Paging System to announce event termination, use the following message:

"This is PVNGS, Unit ____, Emergency terminated. Please cancel response to emergency."

1.10 If an individual requests information not contained in the Emergency Message Form, make reasonable efforts to obtain and give the information only after all initial notifications have been made.

1.11 Contact the NRC via the Emergency Notification System (ENS) dedicated telephone within 60 minutes of declaring an emergency. If the ENS fails, use the commercial telephone or HPN phone as an alternate line.

1.12 When contact is made, the caller shall identify himself and read the completed Emergency Message Form verbatim (omit the Palo Verde Authenticator).

1.13 Offer to repeat information and reiterate as necessary.

2.0 Follow-up Emergency Message Form (Appendix D)

2.1 Fill in data required by Steps 1 and 2 of Appendix D, "Follow-up Emergency Message Form".

2.2 Obtain the Radiation Protection Monitor or the Radiological Assessment Coordinator (if EOF is activated) data required to complete Steps 3-9.

2.3 Obtain the Emergency Coordinator or the Technical Analysis Coordinator (if EOF is activated) data required to complete Steps 10-13.

2.4 Circle appropriate wording in Step 14.

2.5 Dispense information when asked by offsite Agencies (NRC or ARRA).

NOTIFICATION ALERT NETWORK (NAN) RADIO BACKUP
Channel 8 - KON511

In case of failure of the NAN ringdown telephone, the NAN backup is Channel 8 on the PVNGS radio. FCC regulations require the Palo Verde Designator 'KON511' be used to precede and conclude all outgoing communications.

1. Take control of the radio channel by saying: "All stations this net," (Repeat) "All stations this net, this is K-O-N 5-1-1 Palo Verde. 5-1-1 Palo Verde to all 5-1-1 stations, stand by for Warning Point roll call."

2. Wait thirty seconds to allow the offsite agencies to get to their radios, then repeat the previous transmission.

NOTE

After 5 P.M. weekdays, all day Saturday, Sunday or on holidays, Maricopa County Sheriff's Office (MCSO) and Department of Public Safety (DPS) will be the only agencies responding.

3. Initiate roll call of the offsite government agencies, allowing stations on the net to respond.

   3.1 "5-1-1 Palo Verde to 5-1-1 Maricopa County Sheriff's Office. Do you copy?"
   Allow Response: "5-1-1 MCSO copies."

   3.2 "5-1-1 Palo Verde to 5-1-1 Maricopa County Department of Civil Defense & Emergency Services. Do you copy?" (MCDCD&ES)
   Allow response: "5-1-1 Civil Defense copies."

   3.3 "5-1-1 Palo Verde to 5-1-1 Department of Public Safety. Do you copy?"
   Allow response: "5-1-1 DPS copies."

   3.4 "5-1-1 Palo Verde to 5-1-1 Arizona Division of Emergency Services. Do you copy?"
   Allow response: "5-1-1 ADES (State EOC) copies."

   3.5 "5-1-1 Palo Verde to 5-1-1 Arizona Radiation Regulatory Agency. Do you copy?"
   Allow response: "5-1-1 ARRA copies."

4. Upon completion of roll call, transmit the notification message verbatum. Take acknowledgement roll call, allowing MCSO to read the message back in its entirety, and provide assistance or clarification, as needed.

5. Upon completion of the second roll call, announce: "K-O-N 5-1-1 Palo Verde off." This is the required FCC sign-off.

6. Continue notifications per Step 1.8 Appendix E.

PROTECTIVE ACTION RECOMMENDATIONS

Classification Category	Protective Actions Recommendations
Alert- any releases are expected to be limited to a small fraction of the EPA/PAG exposure levels at the site boundary unless further degradation of safety systems occur.	Inform the state and county authorities of the ALERT status/cause and recommend that the public be appraised of the situation and stay tuned to EBS/KTAR radio station.

CHECKLIST
EMERGENCY COORDINATOR
STSC ACTIVATED

POSITION FILLED BY:

(1) PVNGS Plant Manger
(2) Manager, Technical Support
(3) Shift Supervisor, Unaffected Unit

RESPONSIBILITY: The individual onsite with the responibility and authority to immediately and unilaterally initiate emergency actions, including providing notification and protective action recommendations to Governmental authorities responsible for implementing offsite emergency measures. Provide for the control and coordination of onsite emergency response.

NOTE

Refer to the following pages per appropriate facility activation.

Facility Activated	Appendix G Page
STSC	1 - 4
TSC	5 - 8
TSC/EOF	9 - 11

INITIAL RESPONSE — TIME/INITIALS

1. Receive notification from the Shift Supervisor and report to the Control Room of the affected unit. ____/____

2. Review plant status, initiating event, corrective actions and emergency classification with the Shift Supervisor per EPIP-02, "Emergency Classification". ____/____

CHECKLIST
EMERGENCY COORDINATOR
STSC ACTIVATED

		TIME/INITIALS
3.	Assume position of the onshift Emergency Coordinator.	____/____
4.	Activate the Satellite STSC per EPIP-11, "Technical Support Center/Satellite TSC Activation".	____/____
5.	Commence notification process per Appendix E or direct the STSC Communicator to do so.	____/____
	(1) Direct the Security Director to call in the PVNGS onsite and offsite Emergency Organization personnel.	____/____
6.	Verify personnel resources are on standby in the OSC.	____/____
7.	Reevaluate the emergency classification as conditions change per EPIP-02 "Emergency Classification," reclassify as necessary.	____/____
8.	As necessary, direct implementation of EPIP-23, "Fire Fighting" and EPIP-22, "Personnel Injury".	____/____
	(1) For a fire, dispatch the Fire Team and order the Security Director to contact the Bechtel or alternate offsite fire department for assistance (if required).	____/____
	(2) For personnel injury, contact the First Aid Station and inform them of the situation. Dispatch a First Aid Team, if necessary, and coordinate any required offsite assistance.	____/____
9.	Determine any additional protective action recommendations to be provided to state and county response agencies per EPIP-15, "Protective Action Guidelines".	____/____
10.	As appropriate, complete Follow-up Emergency Message Form.	____/____
11.	Determine the need for offsite support and direct the STSC Communicator to call location(s) in EPIP-33, "Offsite Assitance" and arrange access with the Security Director per EPIP-24, "Security".	____/____

CHECKLIST
EMERGENCY COORDINATOR
STSC ACTIVATED

TIME/INITIALS

Personnel Assembly and Accountability
(If Assembly/Accountability Performed)

12. Within 30 minutes of the accountability signal receive a report on accountability in the protected area from the Security Director. ____/____

13. Be prepare to implement EPIP-21, "Search and Rescue" by providing necessary data to the OSC Coordinator. ____/____

14. Receive report on site area accountability. ____/____

Emergency Exposures and KI

15. Per EPIP-18, "Emergency Exposures Guidelines," and as necessary, authorize emergency exposures. ____/____

16. As necessary, authorize administration of KI per EPIP-26, "Potassium Iodide (KI) Administration" to emergency workers desiring to use it. Consult with the Radiation Protection Monitor. ____/____

TSC Activation and Transfer to Authority

17. When relieved by the onsite Emergency Coordinator, provide a briefing and transfer responsibilities. ____/____

OSC Activation

18. If a release is occuring, consult EPIP-12, "Operations Support Center Activation," to determine habitability of primary OSC. ____/____

19. If uninhabitable, direct the OSC Coordinator to relocate staff and equipment/supplies to the alternate OSC (Service Building). If this is also uninhabitable, direct the OSC Coordator to relocate to a protected area (Control Room/ STSC, TSC or EOF). ____/____

CHECKLIST
EMERGENCY COORDINATOR
STSC ACTIVATED

TIME/INITIALS

Security

20. As necessary, implement EPIP-24, "Security", and order the Security Director to limit access to the station, contact the Maricopa County Sheriff's Office for assistance in controlling site access, and arrange access for necessry personnel not on the Emergency Personnel Access List and/or not having access to the protected area via card-key system. ____/____

21. Ensure the Security Director is appraised of offsite assistance requests to arrange access. ____/____

Corrective Actions

22. Determine needs, consult with staff, authorize reentry per EPIP [redacted]eentry for Emergency Operations". ____/____

Assessment Actions

23. Ensure that the Radiation Proection Monitor is obtaining needed data using EPIP-14A, "Release Rate Determination," EPIP-14B, "Initial Dose Assessment," EPIP-16, "Inplant Surveys and Sampling" and EPIP-17, "Onsite/Offsite Surveys and Sampling". ____/____

Protective Actions

24. Continue to evalute the need for providing any additional protective action recommendations to state and county agencies. ____/____

25. Determine the need for early dismissal/evacuation of non-essentials per EPIP-19, "Onsite Evacuation". (If assembly/accountability performed.) ____/____

Performed by _____ Date _____
Signature

CHECKLIST
EMERGENCY COORDINATOR
TSC ACTIVATED

TIME/INITIALS

INITIAL RESPONSE

1. Receive notification from the onshift Emergency Coordinator and report to TSC. Upon arrival, sign in on the TSC Staffing Board. ____/____

2. Receive a briefing from the onshift Emergency Coordinator and assume responsibilities. ____/____

3. Brief TSC staff and evalute adequacy of TSC activation. ____/____

4. Declare the TSC operational and inform the STSC, Control Rooms, EOF, ANPP Site Construction Office, Bechtel Emergency Control Center and PVNGS Security. ____/____

5. As necessary, continue with or commence notification process per Appendix E or direct STSC Communicator to do so. ____/____

6. Verify personnel resources are on standby in the OSC. ____/____

SUBSEQUENT RESPONSE

7. Reevaluate the emergency classifications conditions change per EPIP-02, "Emergency Classification", reclassify as necessary. ____/____

8. As necessary, direct implementaion of EPIP-23, "Fire Fighting" and EPIP-22, "Personnel Injury". ____/____

   (1) For a fire, dispatch Fire Team and order the Security Director to contact the Bechtel or alternate offsite fire department for assistance (if required). ____/____

   (2) For pesonnel injury, contact the First Aid Station and inform them of the situation. Dispatch a First Aid Team, if necessary, and coordinate any required offsite assistance. ____/____

CHECKLIST
EMERGENCY COORDINATOR
TSC ACTIVATED

TIME/INITIALS

9. Determine any additional protective action recommendations to be provided to state and county response agencies per EPIP-15, "Protective Action Guidelines". ____/____

10. As appropriate, complete Follow-up Emergency Message Form. ____/____

11. Determine the need for offsite support and direct a Communicator to call locations(s) in EPIP-33, "Offsite Assistance" and arrange access with the Security Director per EPIP-24, "Security". ____/____

Personnel Assembly and Accountability
(If Assembly/Accountability Performed)

12. Within 30 minutes of the accountability signal, receive a report on accountability in the protected area from the Security Director. ____/____

13. Be prepared to implement EPIP-21, "Search and Resue", by providing necessary data to the OSC Coordinator (via Emergency Maintenance Coordinator). ____/____

14. Receive report on site area accountability. ____/____

Emergency Exposures and KI

15. Per EPIP-18, "Emergency Exposure Guidelines", and as neccessary, authorize emergency exposures. ____/____

16. As necessary, authorize administration of KI per EPIP-26 to emergency workers desiring to use it. Consult with the Radiological Protection Coordinator. ____/____

OSC Activation

17. If a release is occuring, consult Appendix B of EPIP-12, "Operations Support Center Activation", to determine habitability of primary OSC. ____/____

CHECKLIST
EMERGENCY COORDINATOR
TSC ACTIVATED

	TIME/INITIALS
18. If uninhabitable, direct the OSC Coordinator to relocate staff and equipment/supplies to the alternate OSC (Service Building). If this is also uninhabitable, direct the OSC Coordator to relocate to a protected area (Control Room/ STSC, TSC or EOF).	/
EOF Activation	
19. Per EPIP-13, "Emergency Operations Facility Activation", brief the Emergency Operations Director and transfer the responsibilities for notifications and protective action recommendations.	/
Security	
20. As necessary, implement EPIP-24, "Security", and order the Security Director to limit access to the station, contact Maricopa County Sheriff's Office for assistance in controlling site access, and arrange access for necessary personnel not on the Emergency Personnel Access List and/or not having access to the protected area via card-key system.	/
21. Ensure the Security Director is appraised of offsite assistance requests to arrange access.	/
Corrective Action	
22. Determine needs, consult with staff, authorize reentry per EPIP-25, "Reentry for Emergency Operations".	/
23. Ensure that the Radiological Protection Coordinator is obtaining needed data using EPIP-14A, "Release Rate Determination", EPIP-14B, "Initial Dose Assessment", EPIP-16, "Inplant Surveys and Sampling" and EPIP-17, "Onsite/Offsite Surveys and Sampling".	/

CHECKLIST
EMERGENCY COORDINATOR
TSC ACTIVATED

TIME/INITIALS

Protective Actions

24. Continue to evaluate the need for providing any additional protective action recommendations. ____/____

25. Determine the need for early dismissal/evacuation of non-essentials per EPIP-19, "Onsite Evacuation". (If Assenbly/Accountability Performed.) ____/____

Recovery

26. After the EOF is activated consult with Emergency Operations Director concerning implementing EPIP-31, "Recovery". ____/____

Performed by _____ Date _____
Signature

CHECKLIST
EMERGENCY COORDINATOR
TSC AND EOF ACTIVATED

TIME/INITIALS

INTIAL RESPONSE

1. Receive notification from the onshift Emergency Coordinator and report to the TSC or Control Room of affected unit. Upon arrival at the TSC, sign in on the TSC Staffing Board. ____/____

2. Receive a briefing from the onshift Emergency Coordinator and assume responsibilities. ____/____

3. Brief TSC staff and evalute adequacy of TSC activation. ____/____

4. Declare the TSC operational and inform the STSC, Control Rooms, EOF, ANPP Site Construction Office, Bechtel Emergency Control Center and PVNGS Security. ____/____

5. Per EPIP-13, "Emergency Operations Facility Activation", brief the Emergency Operations Director and transfer the responsibilities for notifications and protective action recommendations. ____/____

6. Verify personnel resources are on standby in the OSC. ____/____

SUBSEQUENT RESPONSE

7. Reevaluate the emergency classifications conditions change per EPIP-02, reclassify as necessary. ____/____

8. As necessary, direct implementation of EPIP-23, "Fire Fighting" and EPIP-22, "Personnel Injury". ____/____

   (1) For a fire, dispatch Fire Team and order the Security Director to contact the Bechtel or alternate offsite fire department for assistance (if required). ____/____

   (2) For pesonnel injury, contact the First Aid Station and inform them of the situation. Dispatch a First Aid Team, if necessary, and coordinate any required offsite assistance. ____/____

CHECKLIST
EMERGENCY COORDINATOR
TSC AND EOF ACTIVATED

TIME/INITIALS

9. Determine the need for offsite support and direct a Communicator to call locations(s) in EPIP-33, "Offsite Assistance" and arrange access with the Security Director per EPIP-24, "Security", and coordinate with the Administration and Logistics Coordinator at the EOF. ____/____

Personnel Assembly and Accountability
(If Assembly/Accountability Performed)

10. Within 30 minutes of the accountability signal, receive a report on accountability in the protected area from the Security Director. ____/____

11. Be prepared to implement EPIP-21, "Search and Rescue", by providing necessary data to the OSC Coordinator (via Emergency Maintenance Coordinator). ____/____

12. Receive report on site area accountability ____/____

Emergency Exposures and KI

13. Per EPIP-18, "Emergency Exposure Guidelines", and as neccessary, authorize emergency exposures. ____/____

14. As necessary, authorize administration of KI per EPIP-26 to emergency workers desiring to use it. Consult with the Radiological Protection Coordinator. ____/____

OSC Activation

15. If a release is occuring, consult EPIP-12, "Operations Support Center Activation", to determine habitability of primary OSC. ____/____

16. If uninhabitable, direct the OSC Coordinator to relocate staff and equipment/supplies to the alternate OSC (Service Building). If this is also uninhabitable, direct the OSC Coordator to relocate to a protected area (Control Room/ STSC, TSC or EOF). ____/____

CHECKLIST
EMERGENCY COORDINATOR
TSC AND EOF ACTIVATED

TIME/INITIALS

Security

17. As necessary, implement EPIP-24, "Security", and order the Security Director to limit access to the station, contact Maricopa County Sheriff's Office for assistance in controlling site access, and arrange access for necessary personnel not on the Emergency Personnel Access List and/or not having access to the protected area via card-key system. ____/____

18. Ensure the Security Director is appraised of offsite assistance requests to arrange access. ____/____

Corrective Action

19. Determine needs, consult with staff, authorize reentry per EPIP-25, "Reentry for Emergency Operations". ____/____

Assessment Actions

20. Ensure that the Radiological Protection Coordinator is obtaining needed data using EPIP-14A, "Release Rate Determination", EPIP-14B, "Initial Dose Assessment", EPIP-16, "Inplant Surveys and Sampling" and EPIP-17, "Onsite/Offsite Surveys and Sampling". ____/____

Protective Actions
(If Assembly/Accountability Performed)

21. Determine the need for early dismissal/evacuation of non-essentials per EPIP-19, "Onsite Evacuation". ____/____

Recovery

22. Consult with the Emergency Operations Director concerning implementing EPIP-31, "Recovery". ____/____

Performed by _____ Date _____
Signature

PVNGS EMERGENCY PLAN IMPLEMENTING PROCEDURE	PROCEDURE NO. EPIP-05	
SITE AREA EMERGENCY IMPLEMENTING ACTIONS	REVISION 6	Page 1 of 32

ASSIGNED COPY
PVNGS # 8-9B

DEPT. HEAD Dennis S. [illegible] DATE 4/9/85

PRB/PRG/TRRG REVIEW [illegible] DATE 4/23/85

APPROVED BY [illegible] DATE 4/23/85

EFFECTIVE DATE 06.01.85

DN-1600A/0787A

PV216-00DA (8/82)

REVISION HISTORY

Rev. No.	Date	Revised Pages	Comments
5	3/4/85	all	Revised callouts and announcements. Added NAN Backup instruction Appendix. Added emergency coordinator checklists.
6	05.01.85	App. A & B	Revised to incorporate PCN #01 of Rev. 5. PCN corrected phone #s in App. A & B.

CONTROLLED DOCUMENT

TABLE OF CONTENTS

SECTION		PAGE NUMBER
1.0	OBJECTIVE	4
2.0	REFERENCES	4
3.0	LIMITATIONS AND PRECAUTIONS	5
4.0	DETAILED PROCEDURE	5
4.1	Personnel Indoctrination/Responsibilities	5
4.2	Prerequisites	5
4.3	Instructions	6

APPENDICES

Appendix A -	Emergency Notification Call List - Emergency Coordinator/STSC Communicator	10
Appendix B -	Emergency Notification Call List - PVNGS Security	11
Appendix C -	Initial Emergency Message Form	12
Appendix D -	Follow-up Emergency Message Form	13
Appendix E -	Instructions For Completing Appendix C or D	16
Appendix F -	Notification Alert Network (NAN) Radio Backup	19
Appendix G -	Protective Action Recommendations	21
Appendix H -	Emergency Coordinator Checklist	22

CONTROLLED DOCUMENT

1.0 OBJECTIVE

1.1 This procedure provides a series of implementing actions to be taken upon declaration of a SITE AREA EMERGENCY.

2.0 REFERENCES

2.1 Implementing References

2.1.1 EPIP-02, "Emergency Classification"

2.1.2 EPIP-11, "Technical Support Center/Satellite TSC Activation"

2.1.3 EPIP-12, "Operations Support Center Activation"

2.1.4 EPIP-13, "Emergency Operations Facility Activation"

2.1.5 EPIP-14A, "Release Rate Determination"

2.1.6 EPIP-14B, "Initial Dose Assessment"

2.1.7 EPIP-15, "Protective Action Guidelines"

2.1.8 EPIP-16, "Inplant Surveys and Sampling"

2.1.9 EPIP-17, "Onsite/Offsite Surveys and Sampling"

2.1.10 EPIP-18, "Emergency Exposure Guidelines"

2.1.11 EPIP-19, "Onsite Evacuation"

2.1.12 EPIP-20, "Personnel Assembly and Accountability"

2.1.13 EPIP-21, "Search and Rescue"

2.1.14 EPIP-22, "Personnel Injury"

2.1.15 EPIP-23, "Fire Fighting"

2.1.16 EPIP-24, "Security"

2.1.17 EPIP-25, "Reentry for Recovery Operations"

2.1.18 EPIP-26, "Potassium Iodide (KI) Administration"

2.1.19 EPIP-31, "Recovery"

2.1.20 EPIP-33, "Offsite Assistance"

2.1.21 71AC-9ZZ01, "Event Related Reporting"

2.1.22 78AC-0ZZ06, "Documentation and Record Turnover Control"

2.2 Developmental References

2.2.1 NUREG-0654, Rev. 1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants"

2.2.2 PVNGS Emergency Plan, Rev. 5

3.0 LIMITATIONS AND PRECAUTIONS

3.1 Continued surveillance and assessment of plant conditions are necessary to ensure that the emergency classification is appropriately revised as conditions change or more definitive information is obtained.

4.0 DETAILED PROCEDURE

4.1 Personnel Indoctrination/Responsibilities

4.1.1 In a SITE AREA EMERGENCY, substantial releases of radioactive material may occur. Any releases are not expected to exceed EPA Protective Action Guideline exposure levels beyond the site boundary. Consideration of appropriate protective actions, based on actual or projected data, is warranted. All onsite and offsite emergency centers are activated. Onsite evacuation will be initiated if appropriate. The station shall provide updated radiological/meteorological information to offsite emergency management organizations. The SITE AREA EMERGENCY status shall be maintained until the event is terminated or reclassification takes place.

4.1.2 The Shift Supervisor or Emergency Coordinator shall be responsible for initiating and completing the implementing actions of this procedure.

4.2 Prerequisites

4.2.1 The emergency has been classified per EPIP-02, "Emergency Classification."

4.3 Instructions

4.3.1 The affected unit Shift Supervisor shall perform the following:

NOTE

Designated Unaffected Unit Shift Supervisor to assume the role of the Emergency Coordinator in the Onshift Emergency Organization are:

Affected Unit	Unaffected Unit Shift Supervisor
Unit 1	Unit 2
Unit 2	Unit 1
Unit 3	Unit 2
Entire Site	Unit 1

4.3.1.1 Notify the Shift Supervisor of the designated unaffected unit (or Shift Supervisor of an unaffected unit) to report to the Control Room of the affected unit and assume the duties of the Emergency Coordinator.

NOTE

Initial notifications shall be made from the satellite TSC by the Satellite TSC Communicator until activation of the EOF. At that time all subsequent initial and follow up notifications shall be made by the Government Liaison Engineer in the EOF.

NOTE

Protective Action recommendations (Appendix G) are based on plant and containment conditions and these recommendations are made to offsite officials even when no release is in progress.

4.3.1.2 Direct the Satellite TSC Communicator to fill out Appendix C, "Initial Emergency Message Form", in accordance with instructions provided in Appendix E.

4.3.1.3 Sound the accountability signal for approximately one minute.

4.3.1.4 Silence the signal and provide the following announcement over the plant wide telephone page (phone no. [redacted]) and the site warning siren/public address system:

> "Attention all plant Personnel, an emergency situation classified as a Site Area Emergency exists in Unit _____. Assembly and accountability are now in progress. All affected Unit Emergency Response Personnel and alternates report to your emergency location. All other personnel report to your assigned assembly area". (Provide instructions on routes or areas to avoid as appropriate).

4.3.1.5 Resound the accountability signal and repeat the announcement.

4.3.1.6 Notify the Control Rooms of the unaffected units.

4.3.1.7 Ensure that actions of the appropriate recovery procedures have been implemented.

4.3.2 The Emergency Coordinator shall perform the following:

4.3.2.1 Ensure activation of the satellite TSC in accordance with EPIP-11, "Technical Support Center/Satellite TSC Activation."

4.3.2.2 Following accountability, and if conditions warrant, initiate EPIP-19, "Onsite Evacuation".

4.3.2.3 Implement additional Emergency Plan Implementing Procedures according to the situation that resulted in the emergency being classified as a SITE AREA EMERGENCY.

4.3.2.4 Direct the Security Director to call in Onsite and Offsite Emergency Organization personnel by utilizing the appropriate computer call-out listing.

4.3.2.5 Direct the STSC Communicator to prepare Appendix D, "Follow-up Emergency Message Form" in accordance with instructions provided in Appendix E.

4.3.2.6 Determine the need for offsite assistance. If assistance is necessary, direct the STSC Communicator (onshift) or the Administrative and Logistics Coordinator to contact the required agency per EPIP-33, "Offsite Assistance".

4.3.2.7 Reevaluate the emergency classification and perform licensee actions as conditions change by implementing procedure EPIP-02.

4.3.2.8 When the situation warrants downgrading/upgrading the SITE AREA EMERGENCY, proceed to appropriate implementing and notification procedures and direct the Shift Supervisor to announce the reclassification over the public address system and inform the other Control Rooms.

4.3.2.9 The Emergency Coordinator shall complete checklist, Appendix H.

4.3.3 PVNGS Security, after being notified by the Emergency Coordinator or STSC Communicator that a Site Area Emergency is in progress or has occurred, shall complete Appendix B, "Emergency Notification Call List - PVNGS Security," and notify these individuals or departments of the situation.

4.3.4 Operations Support Center (OSC) Activation

4.3.4.1 The OSC Coordinator shall implement EPIP-12, "Operations Support Center Activation".

4.3.5 Emergency Operations Facility (EOF) Activation

4.3.5.1 The Emergency Operations Director shall implement EPIP-13, "Emergency Operations Facility Activation".

4.3.6 Emergency Situation Terminated

4.3.6.1 The Shift Supervisor (or Emergency Coordinator) shall sound the "All Clear" signal for approximately (1) minute, silence the signal, and provide the following announcement over the plant wide telephone page (phone no. [redacted] and the site warning siren/public address system:

> "Attention all personnel. The emergency situation declared in Unit _____ has now been terminated". (Provide special instructions as necessary.)

4.3.6.2 Repeat signal and announcement once.

4.3.6.3 Within 8 hours of closeout from a Site Area Emergency classification, provide a written summary to offsite authorities in accordance with 71AC-9ZZ01, "Event Related Reporting".

4.3.7 Record Retention

4.3.7.1 Appendices A, B, C, D and H shall be turned over to the Emergency Planning and Preparedness Dept., Mail Station 6010, to ensure they are forwarded to DDC for proper storage in accordance with 78AC-0ZZ06, "Document and Record Turnover Control".

EMERGENCY NOTIFICATION CALL LIST

EMERGENCY COORDINATOR/SISC COMMUNICATOR

AGENCY OR INDIVIDUAL	PRIMARY LINK	ALTERNATE LINK	ALTERNATE LINK	DATE/TIME	CALLER
Arizona Department of Public Safety	NAN	Radio System Channel 8 Frequency	[redacted]	___/___	_____
Maricopa County Sheriff's Office	NAN	Radio System Channel 8 Frequency		___/___	_____
Arizona Radiation Regulatory Agency	NAN	Radio System Channel 8 Frequency		___/___	_____
Arizona Division of Emergency Services	NAN	Radio System Channel 8 Frequency		___/___	_____
Maricopa County Department of Civil Defense and Emergency Services	NAN	Radio System Channel 8 Frequency	N/A	___/___	_____
Group Paging System		N/A	N/A	___/___	_____
PVNGS Security			N/A	___/___	_____
PVNGS Plant Manager			N/A	___/___	_____
Operations Manager			N/A	___/___	_____
Dispatcher (SOC)			N/A	___/___	_____
NRC Headquarters			N/A	___/___	_____

PVNGS EMERGENCY PLAN IMPLEMENTING PROCEDURE	PROCEDURE NO. EPIP-05	APPENDIX B Page 1 of 1
SITE AREA EMERGENCY IMPLEMENTING ACTIONS	REVISION 6	Page 11 of 32

EMERGENCY NOTIFICATION CALL LIST

PVNGS SECURITY

AGENCY OR INDIVIDUAL	PRIMARY LINK	ALTERNATE LINK	DATE/TIME	CALLER
Corporate Security	[redacted]		/	
Site Construction Security Office			/	
Nuclear Administration			/	
ANPP Communications*			/	
ANPP Site Construction Office*			/	
Bechtel Emergency Control Center			/	

* Available only during working hours.

PV216.00DA (8/82)

INITIAL EMERGENCY MESSAGE FORM
NOTIFICATION OF UNUSUAL EVENT,
ALERT, SITE AREA EMERGENCY, OR GENERAL EMERGENCY

1. Verbatim text of Message: THIS IS (IS NOT) A DRILL!! (Circle One) THIS IS PALO VERDE NUCLEAR GENERATING STATION (NOTIFICATION OF UNUSUAL EVENT) (ALERT) (SITE AREA EMERGENCY) (GENERAL EMERGENCY)
(cross out notifications above not applicable)

declared at _____ (time) - _____ (date) - Wind is from _____ degrees - At _____ (speed) mph.

PALO VERDE AUTHENTICATOR _____
(authenticator letters)

2. This is _____ (name/title), at the Palo Verde Nuclear Generating Station

3. (Circle One)

(a) There is NO, repeat NO, radioactive release taking place and no special protective actions are recommended at this time.

OR

(b) There is NO, repeat NO, radioactive release in excess of allowable operating limits and NO protective action recommendations at this time.

OR

(c) There is NO, repeat NO, radioactive release taking place. However, the following protective actions are recommended at this time.

Sectors	Distance (Miles)
_____	_____
_____	_____

OR

(d) A radioactive release IS, repeat IS, taking place. We recommend that people in affected sectors remain indoors with windows and doors closed.

Sectors	Distance (Miles)
_____	_____
_____	_____

OR

(e) A radioactive release IS, repeat IS, taking place. We recommend that evacuation of affected sectors be considered.

Sectors	Distance (Miles)
_____	_____
_____	_____

4. THIS IS (IS NOT) A DRILL!! (Circle One)

Approved _____
(SS/EC/EOD) Date Time

CONTROLLED DOCUMENT

FOLLOW-UP EMERGENCY MESSAGE FORM

1. Verbatim text of Message: THIS IS (IS NOT) A DRILL!! (Circle One)
   THIS IS A PALO VERDE NUCLEAR GENERATING STATION follow-up information message concerning the (NOTIFICATION OF UNUSUAL EVENT) (ALERT) (SITE AREA EMERGENCY) (GENERAL EMERGENCY)
   (cross out notifications above not applicable)

   declared at _____ - _____
   (time) (date)

2. This is _____, at Palo Verde Nuclear Generating Station.
   (name/title)

3. Meteorological Data

   a. Wind direction from _____ (degrees) - at _____ miles per hour
   (direction) (speed)

   from _____ to _____
   (sector) (sector)

   b. Stability Class: A B C D E F G
   (Circle One)

   c. Precipitation Yes No
   (Circle One)

4. Radiological Data

   a. Radioactivity (check one)

   ( ) Has been released
   ( ) Has not been released

4. b. Release Time _____

c. Reactor Trip Time _____

d. Location/Source of Release _____

6. Current Release Rates

a. I-131 Equivalent _____ Ci/second
b. Noble Gas _____ Ci/second
c. Particulates _____ Ci/second

6. Two-hour plume centerline projected dose at:

Distance	Sector	Whole Body Dose (REM)	Child Thyroid Dose Commitment (REM)
Site Boundary			
2 miles			
6 miles			
10 miles			

7. Plume arrival time offsite:

_____ 2 mi
_____ 5 mi
_____ 10 mi
_____ Ruth Fisher School
_____ Arlington School

8. Estimated duration of release _____ minutes

9. The Following Emergency Measures Including Protective Actions are Recommended:

_____

_____

_____

10. The Following Emergency Reponse Actions are Underway:

_____

_____

_____

11. We Request the Following Onsite Support and Assistance from Offsite Sources:

_____ _____

_____

_____

12. Our Prognosis of the Emergency is that Conditions:

_____Are Under Control
_____Can Be Expected to Terminate Within _____hours
_____Are Worsening

13. Other Information:

_____

_____

_____

14. THIS IS (IS NOT) A DRILL!! (Circle One)

CONTROLLED DOCUMENT

INSTRUCTIONS FOR COMPLETING APPENDIX C OR D

1.0 INITIAL EMERGENCY MESSAGE FORM (APPENDIX C)

1.1 Fill in data required by steps 1 and 2 of Appendix C, "Initial Emergency Message Form". Obtain authenticator from the confidential envelope marked on the outside with the appropriate month and drill sequence number (if it is a drill).

1.2 Obtain from the Radiation Protection Monitor (onshift) or Radiological Assessment Coordinator (if EOF is activated) data required to complete step 3 of Appendix C.

1.3 Circle appropriate wording of step 4 of Appendix C.

NOTE

When the NAN ring button is pushed and it appears that all the receiving stations are on line, or, the ring has stopped, the PVNGS originating station shall initiate a roll call in the order listed below. (Consider the time of day.)

NOTE

If the NAN dedicated telephone fails, refer to Appendix F, "Notification Alert Network (NAN) Radio Backup", for instructions on using channel 8, KON-511, for notifications.

1.4 By means of a single call on the Notification and Alert Net dedicated telephone, contact the following State/County agencies listed in Appendix A.

Duty Hours (8:00 a.m. to 5:00 p.m. Monday-Friday)

Maricopa County Sheriff's Office
Maricopa County Department of Civil Defense and Emergency Services
Arizona Department of Public Safety
Arizona Division of Emergency Services
Arizona Radiation Regulatory Agency

Off-Duty Hours (5:00 p.m. to 8:00 a.m., Monday-Friday, all day Saturday, Sunday and Holidays)

Maricopa County Sheriff's Office
Department of Public Safety

1.5 When contact is made, the caller shall identify himself and request that the individuals obtain a copy of the Appropriate Emergency Message Form.

1.6 When each individual has obtained a copy, read the completed Emergency Message Form verbatim and request MCSO to read back verbatim. Perform warning point roll call.

1.7 Offer to repeat information and reiterate as necessary.

1.8 Notify additional personnel as listed in Appendix A as necessary and inform them of the situation. Provide the following message for the Group Paging System Notification and Callout:

> "This is PVNGS, Unit __, Classification Two, Please Respond appropriately." (Repeat message once).

1.9 If an individual requests information not contained in the Emergency Message Form, make reasonable efforts to obtain and give the information only after all <u>initial</u> notification have been made.

1.10 Contact the NRC via the Emergency Notification System (ENS) dedicated telephone within 60 minutes of declaring an emergency. If the ENS fails, use commercial phone or HPN phone as an alternate line.

1.11 When contact is made, the caller shall identify himself and read the completed Emergency Message Form verbatim (omit the Palo Verde Authenticator).

1.12 Offer to repeat information and reiterate as necessary.

2.0 FOLLOW-UP EMERGENCY MESSAGE FORM (APPENDIX D)

2.1 Fill in data required by steps 1 and 2 of Appendix D, "Follow-up Emergency Message Form".

2.2 Obtain from the Radiation Protection Monitor or the Radiological Assessment Coordinator (if EOF is activated) data required to complete steps 3-9.

2.3 Obtain from the Emergency Coordinator or the Technical Analysis Coordinator (if EOF is activated) data required to complete steps 10-13.

2.4 Circle appropriate wording in step 14.

2.5 Dispense information when asked by offsite agencies (NRC or ARRA).

NOTIFICATION ALERT NETWORK (NAN) RADIO BACKUP
CHANNEL 8 - KON511

In case of failure of the NAN ringdown telephone, the NAN backup is Channel 8 on the PVNGS radio. FCC regulations require the Palo Verde designator 'KON511' be used to precede and conclude all outgoing communications.

1. Take control of the radio channel by saying: "All stations this net," (Repeat) "All stations this net, this is K-O-N 5-1-1 Palo Verde. 5-1-1 Palo Verde to all 5-1-1 stations, stand by for warning point roll call."

2. Wait 30 seconds to allow the offsite agencies to get to their radios, then repeat the previous transmission.

NOTE

After 5 P.M. weekdays, all day Saturday, Sunday or holidays, Maricopa County Sheriff's Office (MCSO) and Department of Public Safety (DPS) will be the only agencies responding.

3. Initiate roll call of the offsite government agencies, allowing stations on the net to respond.

   3.1 "5-1-1 Palo Verde to 5-1-1 Maricopa County Sheriff's Office. Do you copy?"
   Allow response: "5-1-1 MCSO copies."

   3.2 "5-1-1 Palo Verde to 5-1-1 Maricopa County Department of Civil Defense & Emergency Services. Do you copy? (MCDCD&ES)
   Allow response: "5-1-1 Civil Defense copies."

   3.3 "5-1-1 Palo Verde to 5-1-1 Department of public Safety. Do you copy?"
   Allow response: "5-1-1 DPS copies."

   3.4 "5-1-1 Palo Verde to 5-1-1 Arizona Division of Emergency Services. Do you copy?"
   Allow response: "5-1-1 ADES (State EOC) copies."

3.5 "5-1-1 Palo Verde to 5-1-1 Arizona Radiation Regulatory Agency. Do you copy?
Allow Response: "5-1-1 ARRA copies."

4. Upon completion of roll call, transmit the notification message verbatim. Take an acknowledgement roll call, allowing MCSO to read the message back in its entirety, and provide assistance or clarification, as needed.

6. Upon completion of the second roll call, announce: "K-O-N 5-1-1 Palo Verde off." This is the required FCC sign-off.

6. Continue notification per Step 1.8 Appendix E.

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PROTECTIVE ACTION RECOMMENDATIONS

Classification Category	Protective Actions Recommendations
Site Area Emergency- any releases are not expected to exceed EPA/PAG exposures levels beyond the site boundary unless further degradation of safety systems occur.	Inform state and county authorities of Site Area Emergency status/cause and recommend seeking shelter within a 2 mile radius of the plant and within 10 miles in affected sectors as warranted based on plant/containment conditions and projected and/or actual releases.

CONTROLLED DOCUMENT

CHECKLIST
EMEPGENCY COORDINATOR
STSC ACTIVATED

POSITION FILLED BY:

1) PVNGS Plant Manager
2) Manager, Technical Support
3) Shift Supervisor

RESPONSIBILITY: The individual onsite with the responsibility and authority to immediately and unilaterally initiate emergency actions, including providing notification and protective action recommendations to Governmental authorities responsible for implementing offsite emergency measures. Provide for the control and coordination of onsite emergency response.

NOTE

Refer to the following pages
per appropriate facility activation

Facility Activated	Appendix H Page
STSC	1-4
TSC	5-8
TSC/EOF	9-11

TIME/INITIALS

INITIAL RESPONSE

1. Receive notification from the Shift Supervisor and report to the Control Room of affected unit. ____/____

2. Review plant status, initiating event, corrective actions and emergency classification with the Shift Supervisor. ____/____

3. Assume the position of onshift Emergency Coordinator. ____/____

CHECKLIST
EMERGENCY COORDINATOR
STSC ACTIVATED

TIME/INITIALS

INITIAL RESPONSE

4. Activate the Satellite TSC per EPIP-11, "Technical Support Center/Satellite TSC Activation." ____/____

5. Commence notification process per Appendix E or the direct STSC Communicator to do so. ____/____

   (1) Direct the Security Director to call in the PVNGS onsite and offsite Emergency Organization Personnel. ____/____

6. Verify personnel resources are on standby in the OSC. ____/____

7. Reevalute the emergency classification as conditions change per EPIP-02, reclassify as necessary. ____/____

8. As necessary, direct implementation of EPIP-23, "Fire Fighting" and EPIP-22, "Personnel Injury." ____/____

   (1) For a fire, dispatch Fire Team and order the Security Director to contact the Bechtel or alternate offsite fire department for assistance (if required). ____/____

   (2) For personnel injury, contact the First Aid Station and inform them of the situation. Dispatch a First Aid Team, if necessary, and coordinate any required offsite assistance. ____/____

9. Determine any additional protective action recommendations to be provided to state and county response agencies per EPIP-15, "Protective Action Guidelines." ____/____

10. As appropriate, complete Follow-up Emergency Message Form. ____/____

11. Determine the need for offsite support and direct the STSC Communicator to call location(s) in EPIP-33, "Offsite Assistance" and arrange access with the Security Director per EPIP-24, "Security." ____/____

CHECKLIST
EMERGENCY COORDINATOR
STSC ACTIVATED

TIME/INITIALS

SUBSEQUENT RESPONSE

Personnel Assembly and Accountability

12. Within 30 minutes of the accountability signal, receive a report on accountability in the protected area from the Security Director. ____/____

13. Receive a report on site accountability later. ____/____

14. Be prepared to implement EPIP-21, "Search and Rescue", by providing necessary data to the OSC Coordinator. ____/____

Emergency Exposures and KI

15. Per EPIP-18, "Emergency Exposure Guidelines," and as necessary, authorize emergency exposures. ____/____

16. As necessary, authorize administration of KI per EPIP-26, "Potassium Iodine (KI) Administration" to emergency workers desiring to use it. Consult with the Radiation Protection Monitor. ____/____

TSC Activation and Transfer of Authority

17. When relieved by onsite Emergency Coordinator, provide a briefing and transfer responsibilities. ____/____

OSC Activation

18. If a release is occurring, consult EPIP-12, "Operations Support Center Activation," to determine habitability of the primary OSC. ____/____

19. If uninhabitable, direct the OSC Coordinator to relocate staff and equipment/supplies to the alternate OSC (Service Building). If this is also unihabitable, direct the OSC Coordinator to relocate to a protected area (Control Room/ STSC, TSC or EOF). ____/____

CHECKLIST
EMERGENCY COORDINATOR
STSC ACTIVATED

TIME/INITIALS

Security

20. As necessary, implement EPIP-24, "Security," and order the Security Director to limit access to the station, contact Maricopa County Sheriff's Office for assistance in controlling site access, and arrange access for necessary personnel not on the Emergency Personnel Access List and/or not having access to the protected area via card-key system. ____/____

21. Ensure the Security Director is appraised of offsite assistance request to arrange access. ____/____

Corrective Actions

22. Determine needs, consult with staff, authorize reentry per EPIP-25, "Reentry for Emergency Operations." ____/____

Assessment Actions

23. Ensure that the Radiation Protection Monitor is obtaining needed data using EPIP-14A, "Release Rate Determination," EPIP-14B, "Initial Dose Assesment," EPIP-16, "Inplant Surveys and Sampling" and EPIP-17, "Onsite/Offsite Surveys and Sampling." ____/____

Protective Actions

24. Continue to evaluate the need for providing Protective Action recommendations. ____/____

25. Determine need for early dismissal/evacuation of non-essentials per EPIP-19, "Onsite Evacuation." ____/____

26. Establish evacuation order, offsite reassembly area, evacuation route and inform the Security Director. ____/____

27. Order evacuation signal when the Security Director reports that preparations are complete. ____/____

Performed By _____ Date ____
Signature

CONTROLLED DOCUMENT

CHECKLIST
EMERGENCY COORDINATOR
TSC ACTIVATED

TIME/INITIALS

INITIAL RESPONSE

1. Receive notification from the onshift Emergency Coordinator and report to the TSC. Upon arrival, sign in on the TSC staffing Board. ____/____

2. Receive a briefing from the onshift Emergency Coordinator and assume responsibilities. ____/____

3. Brief TSC and staff and evaluate adequacy of TSC activation. ____/____

4. Declare the TSC operational and inform the STSC, Control Rooms, EOF, ANPP Site Construction Office, Bechtel Emergency Control Center and PVNGS Security. ____/____

5. As necessary, continue with or commence notification process per Appendix E or direct the STSC Communicator to do so. ____/____

6. Verify personnel resources in standby in the OSC. ____/____

SUBSEQUENT RESPONSE

7. Reevaluate the emergency classification as conditions change per EPIP-02 "Emergency Classification," reclassify as necessary. ____/____

8. As necessary, direcxt implementation of EPIP-23, "Fire Fighting" and EPIP-22, "Personnel Injury." ____/____

   (1) For a fire, dispatch Fire Team and order the Security Director to contact the Bechtel or alternate offsite fire department for assistance (if required). ____/____

   (2) For personnel injury, contact the First Aid Station and inform them of the situation. Dispatch a First Aid Team, if necessary, and coordinate any required offsite assistance. ____/____

CONTROLLED DOCUMENT

CHECKLIST
EMERGENCY COORDINATOR
TSC ACTIVATED

		TIME/INITIALS
9.	Determine additional protective action recommendations to be provided to state and county response agencies per EPIP-15, "Protective Action Guidelines."	____/____
10.	As appropriate, complete Follow-up Emergency Message Form.	____/____
11.	Determine the need for offsite support and direct a Communicator to call location(s) in EPIP-33, "Offsite Assistance," arrange access with the Security Director per EPIP-24, "Security".	____/____
	Personnel Assembly and Accountability	
12.	Within 30 minutes of the acccountability signal, receive a report on accountability in the protected area from the Security Director.	____/____
13.	Receive a report on site accountability later.	____/____
14.	Be prepared to implement EPIP-21, "Search and Rescue," by providing necessary data to the OSC Coordinator (via Emergency Maintenance Coordinator).	____/____
	Emergency Exposures and KI	
15.	Per EPIP-18, "Emergency Exposure Guidelines," and as necessary, authorize emergency exposures.	____/____
16.	As necessary, authorize administration of KI per EPIP-26 to emergency workers desiring to use it. Consult with the Radiological Protection Coordinator.	____/____
	OSC Activation	
17.	If a release is occurring, consult EPIP-12, "Operations Support Center Activation," to determine habitability of the primary OSC.	____/____
18.	If uninhabitable, direct the OSC Coordinator to relocate staff and equipment/supplies to the alternate OSC (Service Building). If this is also uninhabitable, direct the OSC Coordinator to relocate to protected area (control room/STSC, TSC or EOF).	____/____

CONTROLLED DOCUMENT

CHECKLIST
SITE AREA EMERGENCY
TSC ACTIVATED

TIME/INITIALS

EOF Activation

19. Per EPIP-13, "Emergency Operations Facility Activation," brief the Emergency Operations Director and transfer the responsibilities for notifications and protective action recommendations. ____/____

Security

20 As necessary, implement EPIP-24, "Security," and order the Security Director to limit access to the station, contact Maricopa County Sheriff's Office for assistance in controlling site access, and arrange access for necessary personnel not on the Emergency Personnel Access List and/or not having access to the protected area via card-key system. ____/____

21. Ensure the Security Director is appraised of offsite assistance requests to arrange access. ____/____

Corrective Actions

22. Determine needs, consult with staff, authorize reentry per EPIP-25, "Reentry for Emergency Operations." ____/____

Assessment Actions

23. Ensure that the Radiological Protection Coordinator is obtaining needed data using EPIP-14A, "Release Rate Determination," EPIP-14B, "Initial Dose Assessment", EPIP-16, "Inplant Surveys and Sampling" and EPIP-17, "Onsite/ Offsite Surveys and Sampling." ____/____

Protective Actions

24. Continue to evaluate the need for providing any additional protective action recommendations. ____/____

25. Determine the need for early dismissal/evacuation of non-essentials per EPIP-19, "Onsite Evacuation." ____/____

CHECKLIST
SITE AREA EMERGENCY
TSC ACTIVATED

	TIME/INITIALS
26. Establish evacuation order, offsite reassembly area, evacuation route and inform the Security Director.	____/____
27. Order evacuation signal when the Security Director reports that preparations are complete.	____/____
Recovery	
28. After the EOF is activated, consult with the Emergency Operations director concerning implementing EPIP-31, "Recovery."	____/____

Performed By _____ Date _____
Signature

CHECKLIST
EMERGENCY COORDINATOR
TSC and EOF ACTIVATED

TIME/INITIALS

INITIAL RESPONSE

1. Receive notification from the onshift Emergency Coordinator and report to TSC. Upon arrival, sign in on the TSC Staffing Board. ____/____

2. Receive a briefing from the onshift Emergency Coordinator and assume responsibilities. ____/____

3. Brief TSC staff and evaluate adequacy of TSC activation. ____/____

4. Declare the TSC operational and inform the STSC, Control Rooms, EOF, ANPP Site Construction Office, Bechtel Emergency Control Center and PVNGS Security. ____/____

5. Per EPIP-13, "Emergency Operations Facility Activation," brief the Emergency Operations Director and transfer the responsibilities for notifications and protective action recommendations. ____/____

6. Verify personnel resources are on standby in the OSC. ____/____

SUBSEQUENT RESPONSE

7. Reevaluate the emergency as conditions change per EPIP-02 "Emergency Classification," reclassify as necessary. ____/____

8. As necessary, direct implementation of EPIP-23, "Fire Fighting" and EPIP-22, "Personnel Injury."

   (1) For a fire, dispatch Fire Team and order the Security Director to contact the Bechtel or alternate offsite fire department for assistance (if required). ____/____

   (2) For personnel injury, contact the First Aid Station and inform them of the situation. Dispatch a First Aid Team, if necessary, and coordinate any required offsite assistance. ____/____

CHECKLIST
EMERGENCY COORDINATOR
TSC and EOF ACTIVATED

		TIME/INITIALS
9.	Determine the need for offsite support and direct the STSC Communicator to call location(s) in EPIP-33, "Offsite Assistance" and arrange access with the Security Director per EPIP-24, "Security," and coordinate with the Administrative and Logistics Coordinator at the EOF.	____/____
	Personnel Assembly and Accountability	
10.	Within 30 minutes of the accountability signal, receive a report on accountability in the protected area from the Security Director.	____/____
11.	Receive a report on site accountability later.	____/____
12.	Be prepared to implement EPIP-21, "Search and Rescue," by providing necessary data to the OSC Coordinator (via Emergency Maintenance Coordinator).	____/____
	Emergency Exposures and KI	
13.	Per EPIP-18, "Emergency Exposure Guidelines," and as necessary, authorize emergency exposures.	____/____
14.	As necessary, authorize administration of KI per EPIP-26 to emergency workers desiring to use it. Consult with the Radiological Protection Coordinator.	____/____
	OSC Activation	
15.	If a release is occurring, consult EPIP-12, "Operations Support Center Activation," to determine habitability of the primary OSC.	____/____
16.	If uninhabitable, direct the OSC Coordinator to relocate staff and equipment/supplies to the alternate OSC (Service Building). If this is also uninhabitable, direct the OSC Coordinator to relocate to a protected area (Control Room/ STSC, TSC or EOF).	____/____

CHECKLIST
EMERGENCY COORDINATOR
TSC and EOF ACTIVATED

TIME/INITIALS

Security

17. As necessary, implement EPIP-24, "Security," and order the Security Director to limit access to the station, contact Maricopa County Sheriff's Office for assistance in controlling site access, and arrange access for necessary personnel not on the Emergency Personnel Access list and/or not having access to the protected area via card-key system. ____/____

18. Ensure the Security Director is appraised of offsite assistance requests to arrange access. ____/____

Corrective Actions

19. Determine needs, consult with staff, authorize reentry per EPIP-25, "Reentry for Emergency Operations." ____/____

Assessment Actions

20. Ensure that the Radiological Protection Coordinator is obtaining needed data using EPIP-14A, "Release Rate Determination," EPIP-14B, "Initial Dose assessment," EPIP-16, "Inplant Surveys and Sampling" and EPIP-17, "Onsite/ Offsite Surveys and Sampling." ____/____

Protective Actions

21. Determine the need for early dismissal/evacuation of non-essentials per EPIP-19, "Onsite Eavcuation." ____/____

22. Establish evacuation order, offsite reassembly area, evacuation route and inform the Security Director. ____/____

23. Order evacuation signal when the Security Director reports that preparations are complete. ____/____

Recovery

24. Consult with the Emergency Operations Director concerning implementing EPIP-31, "Recovery." ____/____

Performed By _____ Date _____
Signature

PVNGS EMERGENCY PLAN IMPLEMENTING PROCEDURE	PROCEDURE NO. EPIP-06	
GENERAL EMERGENCY IMPLEMENTING ACTIONS	REVISION 6	Page 1 of 34

DEPT. HEAD Dennis S. Gaus DATE 4/9/85

PRB/PRG/TRRG REVIEW O.P. Bynum DATE 4/23/85

APPROVED BY O.P. Bynum DATE 4/23/85

EFFECTIVE DATE 05.01.85

DN-1601A/0787A

REVISION HISTORY

Rev. No.	Date	Revised Pages	Comments
5	2-14-85	All	Total Revision: Revises procedures and appendices. Included Emergency Coord. checklist.
6	09-01-85	App. A + B	Reused to incorporate PCN # 01 of Rev. 5. PCN corrected phone #'s in App. A + B.

CONTROLLED DOCUMENT

TABLE OF CONTENTS

SECTION		PAGE NUMBER
1.0	OBJECTIVE	4
2.0	REFERENCES	4
3.0	LIMITATIONS AND PRECAUTIONS	5
4.0	DETAILED PROCEDURE	5
4.1	Personnel Indoctrination/Responsibilities	5
4.2	Prerequisites	6
4.3	Instructions	6

APPENDICES

Appendix A - Emergency Notification Call List - Emergency Coordinator/STSC Communicator	10
Appendix B - Emergency Notification Call List - PVNGS Security	11
Appendix C - Initial Emergency Message Form	12
Appendix D - Follow-up Emergency Message Form	13
Appendix E - Instructions For Completing Appendix C or D	16
Appendix F - Notification Alert Network (NAN) Radio Backup	19
Appendix G - Protective Action Recommendations	21
Appendix H - Emergency Coordinator Checklist	23

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1.0 OBJECTIVE

1.1 This procedure provides a series of implementing actions to be taken upon declaration of a GENERAL EMERGENCY.

2.0 REFERENCES

2.1 Implementing References

2.1.1 EPIP-02, "Emergency Classification"

2.1.2 EPIP-11, "Technical Support Center/Satellite TSC Activation"

2.1.3 EPIP-12, "Operations Support Center Activation"

2.1.4 EPIP-13, "Emergency Operations Facility Activation"

2.1.5 EPIP-14A, "Release Rate Determination"

2.1.6 EPIP-14B, "Initial Dose Assessment"

2.1.7 EPIP-15, "Protective Action Guidelines"

2.1.8 EPIP-16, "Inplant Surveys and Sampling"

2.1.9 EPIP-17, "Onsite/Offsite Surveys and Sampling"

2.1.10 EPIP-18, "Emergency Exposure Guidelines"

2.1.11 EPIP-19, "Onsite Evacuation"

2.1.12 EPIP-20, "Personnel Assembly and Accountability"

2.1.13 EPIP-21, "Search and Rescue"

2.1.14 EPIP-22, "Personnel Injury"

2.1.15 EPIP-23, "Fire Fighting"

2.1.16 EPIP-24, "Security"

2.1.17 EPIP-25, "Reentry for Recovery Operations"

2.1.18 EPIP-26, "Potassium Iodide (KI) Administration"

2.1.19 EPIP-31, "Recovery"

2.1.20 EPIP-33, "Offsite Assistance"

2.1.21 71AC-9ZZ01, "Event Related Reporting"

2.1.22 78AC-0ZZ06, "Document and Record Turnover Control"

2.2 Developmental References

2.2.1 NUREG-0654, Rev. 1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants".

2.2.2 PVNGS Emergency Plan, Rev. 5

3.0 LIMITATIONS AND PRECAUTIONS

3.1 Continued surveillance and assessment of plant conditions are necessary to ensure that the emergency classification is appropriately revised as conditions change or more definitive information is obtained.

4.0 DETAILED PROCEDURE

4.1 Personnel Indoctrination

4.1.1 In a GENERAL EMERGENCY, events are in progress or have occurred which involve actual or imminent substantial core degradation or melting with potential for loss of containment integrity. Radioactive releases which may occur can be reasonably expected to exceed EPA Protective Action Guideline exposure levels offsite for more than the immediate site area. There is prompt notification of NRC and appropriate state and county authorities of the General Emergency status.

4.1.2 Accordingly, prompt consideration of appropriate protective actions, based on actual or projected data, is warranted. Consideration of predetermined protective action recommendations (in the event of potential loss of fission product barriers) may also be warranted. Onsite and offsite emergency centers are activated. Onsite evacuation shall be initiated if appropriate. The station shall provide updated radiological/meteorological information to offsite emergency management organizations as necessary. The GENERAL EMERGENCY status shall be maintained until the event is terminated or reclassification takes place.

4.1.3 The Shift Supervisor or the Emergency Coordinator shall be responsible for initiating and completing the implementing actions of this procedure.

4.2 Prerequisites

4.2.1 The emergency has been classified per EPIP-02, "Emergency Classification".

4.3 Instructions

4.3.1 The affected unit Shift Supervisor shall perform the following:

NOTE

Designated Unaffected Unit Shift Supervisor to assume the role of the Emergency Coordinator in the Onshift Emergency Organization are:

Affected Unit	Unaffected Unit Shift Supervisor
Unit 1	Unit 2
Unit 2	Unit 1
Unit 3	Unit 2
Entire Site	Unit 1

4.3.1.1 Notify the Shift Supervisor of the designated unaffected unit (or Shift Supervisor of an unaffected unit) to report to the Control Room of the affected unit and assume the duties of the Emergency Coordinator.

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NOTE

Initial notifications shall be made from the Satellite TSC by the Satellite TSC Communicator until activation of the EOF. At that time all subsequent initial and follow up notifications shall be made by the Government Liaison Engineer in the EOF.

NOTE

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

4.3.1.2 Direct the Satellite TSC Communicator to fill out Appendix C, "Initial Emergency Message Form", in accordance with instructions provided in Appendix E.

4.3.1.3 Sound the accountability signal for approximately one minute.

4.3.1.4 Silence the signal and provide the following announcement over the plant wide telephone page (phone no. [redacted] and the site warning siren/public system:

"Attention all plant personnel, an emergency situation classified as a General Emergency exists in Unit _____. Assembly and accountability are now in progress. All affected Unit Emergency Response Personnel and alternates report to your emergency location. All other personnel report to your assigned assembly area". (Provide instructions on routes or areas to avoid as appropriate).

4.3.1.5 Resound the accountability signal and repeat the announcement.

4.3.1.6 Notify the Control Rooms of the unaffected units.

4.3.1.7 Ensure that actions of the appropriate recovery or casualty procedures have been implemented.

4.3.2 The Emergency Coordinator shall perform the following:

4.3.2.1 Ensure activation of the satellite TSC in accordance with EPIP-11, "Technical Support Center/Satellite TSC Activation."

4.3.2.2 Following accountability, and if conditions warrant, initiate EPIP-19, "Onsite Evacuation".

4.3.2.3 Implement additional Emergency Plan Implementing Procedures according to the situation that resulted in the emergency being classified as a GENERAL EMERGENCY.

4.3.2.4 Direct the Security Director to call in Onsite and Offsite Emergency Organization personnel by utilizing the appropriate computer call-out listing.

4.3.2.5 Direct the STSC Communicator to prepare Appendix D, "Follow-up Emergency Message Form" in accordance with instructions provided in Appendix E.

4.3.2.6 Determine the need for offsite assistance. If assistance is necessary, direct the STSC Communicator (onshift) or Administrative and Logistics Coordinator to contact the required agency per EPIP-33, "Offsite Assistance".

4.3.2.7 Reevaluate the emergency classification and perform licensee actions as conditions change by implementing procedure EPIP-02.

4.3.2.8 When the situation warrants downgrading from a GENERAL EMERGENCY, proceed to appropriate implementing and notification procedures and direct the Shift Supervisor to announce the downgrading over the public address system and inform the other Control Rooms.

4.3.2.9 The Emergency Coordinator shall complete checklist, Appendix H.

4.3.3 PVNGS Security, after being notified by the Emergency Coordinator or STSC Communicator that a General Emergency is in progress or has occurred, shall complete Appendix B, "Emergency Notification Call List - PVNGS Security," and notify these individuals or departments of the situation.

4.3.4 Operations Support Center (OSC) Activation

4.3.4.1 The OSC Coordinator shall implement EPIP-12, "Operations Support Center Activation".

4.3.5 Emergency Operations Facility (EOF) Activation

4.3.5.1 The Emergency Operations Director shall implement procedure EPIP-13, "Emergency Operations Facility Activation".

4.3.6 Emergency Situation Terminated

4.3.6.1 The Shift Supervisor (or Emergency Coordinator) shall sound the "All Clear" signal for approximately (1) minute, silence the signal, and provide the following announcements over the plant wide page (phone no. [redacted] and the site warning siren/public address system:

"Attention all personnel. The emergency situation declared in Unit _____ has now been terminated. (Provide special instructions as necessary.)

4.3.6.2 Repeat signal and announcement once.

4.3.6.3 Within 8 hours of closeout from a General Emergency classification, provide a written summary to offsite authorities, in accordance with 71AC-9ZZ01, "Event Related Reporting".

4.3.7 Record Retention

4.3.7.1 Appendices A, B, C, D, and H shall be turned over to the Emergency Planning and Preparedness Dept., mail station 6010 to ensure they are forwarded to DDC for proper storage in accordance with 78AC-0ZZ06, "Document and Record Turnover Control".

EMERGENCY NOTIFICATION CALL LIST
EMERGENCY COORDINATOR/SISC COMMUNICATOR

AGENCY OR INDIVIDUAL	PRIMARY LINK	ALTERNATE LINK	ALTERNATE LINK	DATE/TIME	CALLER
Arizona Department of Public Safety	NAN	Radio System Channel 6 Frequency	[redacted]	/	
Maricopa County Sheriff's Office	NAN	Radio System Channel 6 Frequency		/	
Arizona Radiation Regulatory Agency	NAN	Radio System Channel 6 Frequency		/	
Arizona Division of Emergency Services	NAN	Radio System Channel 6 Frequency		/	
Maricopa County Department of Civil Defense and Emergency Services	NAN	Radio System Channel 6 Frequency		/	
Group Paging System			N/A	/	
PVNGS Security			N/A	/	
PVNGS Plant Manager			N/A	/	
Operations Manager			N/A	/	
Dispatcher (SOC)			N/A	/	
NCR Headquarters			N/A	/	

EMERGENCY NOTIFICATION CALL LIST - PVNGS SECURITY

DEPARTMENT/INDIVIDUAL	PRIMARY LINK	ALTERNATE LINK	DATE/TIME	CALLER
Corporate Security			/	
Site Construction Security Office			/	
Nuclear Administration			/	
ANPP Communications*			/	
ANPP Site Construction Office*			/	
Bechtel Emergency Control Center			/	

*Available only during working hours.

6

INITIAL EMERGENCY MESSAGE FORM
NOTIFICATION OF UNUSUAL EVENT,
ALERT, SITE AREA EMERGENCY, OR GENERAL EMERGENCY

1. Verbatim text of Message: THIS IS (IS NOT) A DRILL!! (Circle One)
THIS IS PALO VERDE NUCLEAR GENERATING STATION (NOTIFICATION OF UNUSUAL EVENT) (ALERT) (SITE AREA EMERGENCY) (GENERAL EMERGENCY)
(cross out notifications above not applicable)

declared at _____ (time) - _____ (date) - Wind is from _____ degrees - At _____ (speed) mph.

PALO VERDE AUTHENTICATOR _____ (authenticator letters)

2. This is _____ (name/title), at the Palo Verde Nuclear Generating Station

3. (Circle One)

(a) There is NO, repeat NO, radioactive release taking place and no special protective actions are recommended at this time.

OR

(b) There is NO, repeat NO, radioactive release in excess of allowable operating limits and NO protective action recommendations at this time.

OR

(c) There is NO, repeat NO, radioactive release taking place, however, the following protective actions are recommended at this time.

Sectors	Distance (Miles)
_____	_____
_____	_____

OR

(d) A radioactive release IS, repeat IS, taking place. We recommend that people in affected sectors remain indoors with windows and doors closed.

Sectors	Distance (Miles)
_____	_____
_____	_____

OR

(e) A radioactive release IS, repeat IS, taking place. We recommend that evacuation of affected sectors be considered.

Sectors	Distance (Miles)
_____	_____
_____	_____

4. THIS IS (IS NOT) A DRILL!! (Circle One)

Approved _____ (S.S./E.C./E.O.D.) Date Time

FOLLOW-UP EMERGENCY MESSAGE FORM

1. Verbatim text of Message: THIS IS (IS NOT) A DRILL!! (Circle One)
   THIS IS A PALO VERDE NUCLEAR GENERATING STATION follow-up information message concerning the (NOTIFICATION OF UNUSUAL EVENT) (ALERT) (SITE AREA EMERGENCY) (GENERAL EMERGENCY)
   (cross out notifications above not applicable)

   declared at _____ - _____
   (time) (date)

2. This is _____, at Palo Verde Nuclear Generating Station.
   (name/title)

3. Meteorological Data

   a. Wind direction from _____ (degrees) - at _____ miles per hour
      (direction) (speed)

      from _____ to _____
      (sector) (sector)

   b. Stability Class: A B C D E F G
      (Circle One)

   c. Precipitation Yes No
      (Circle One)

4. Radiological Data

   a. Radioactvity (check one)

      ( ) Has been released
      ( ) Has not been released

4. b. Release Time _____

   c. Reactor Trip Time _____

   d. Location/Source of Release _____

5. Current Release Rates

   a. I-131 Equivalent _____ Ci/second
   b. Noble Gas _____ Ci/second
   c. Particulates _____ Ci/second

6. Two-hour plume centerline projected dose at:

Distance	Sector	Whole Body Dose (REM)	Child Thyroid Dose Commitment (REM)
Site Boundary			
2 miles			
5 miles			
10 miles			

7. Plume arrival time offsite:

   _____ 2 mi
   _____ 5 mi
   _____ 10 mi
   _____ Ruth Fisher School
   _____ Arlington School

8. Estimated duration of release _____ minutes

9. The Following Emergency Measures Including Protective Actions are Recommended:

_____

_____

_____

10. The Following Emergency Reponse Actions are Underway:

_____

_____

_____

11. We Request the Following Onsite Support and Assistance from Offsite Sources:

_____

_____

_____

12. Our Prognosis of the Emergency is that Conditions:

_____Are Under Control
_____Can Be Expected to Terminate Within _____hours
_____Are Worsening

13. Other Information:

_____

_____

_____

14. THIS IS (IS NOT) A DRILL! (Circle One)

INSTRUCTIONS FOR COMPLETING APPENDIX C OR D

1.0 INITIAL EMERGENCY MESSAGE FORM (APPENDIX C)

1.1 Fill in data required by steps 1 and 2 of Appendix C, "Initial Emergency Message Form". Obtain authenticator from the confidential envelope marked on the outside with the appropriate month and drill sequence number (if it is a drill).

1.2 Obtain from the Radiation Protection Monitor (onshift) or Radiological Assessment Coordinator (if EOF is activated) data required to complete step 3 of Appendix C.

1.3 Circle appropriate wording of step 4 of Appendix A.

NOTE

When the NAN ring button is pushed and it appears that all the receiving stations are on line, or, the ring has stopped, the PVNGS originating station shall initiate a roll call in the order listed below. (Consider the time of day.)

NOTE

If the NAN dedicated telephone fails, refer to Appendix F, "Notification Alert Network (NAN) Radio Backup", for instructions on using channel 8, KON-511, for notification.

1.4 By means of a single call on the Notification and Alert Net dedicated telephone, contact the following State/County agencies listed in Appendix A.

Duty Hours (8:00 a.m. to 5:00 p.m. Monday-Friday)

Maricopa County Sheriff's Office
Maricopa County Department of Civil Defense and Emergency Services
Arizona Department of Public Safety
Arizona Division of Emergency Services
Arizona Radiation Regulatory Agency

Off-Duty Hours (5:00 p.m. to 8:00 a.m., Monday-Friday, all day Saturday, Sunday and holidays)

Maricopa County Sheriff's Office
Department of Public Safety

1.5 When contact is made, the caller shall identify himself and request that the individuals obtain a copy of the Appropriate Emergency Message Form.

1.6 When each individual has obtained a copy, read the completed Emergency Message Form verbatim and request MCSO to read back verbatim. Perform warning point roll call.

1.7 Offer to repeat information and reiterate as necessary.

1.8 Notify additional personnel as listed in Appendix A as necessary and inform them of the situation. Provide the following message for the Group Paging System Notification and Callout:

> "This is PVNGS, Unit ____, Classification Two, Please respond appropriately." (Repeat message once).

1.9 If an individual requests information not contained in the Emergency Message Form, make reasonable efforts to obtain and give the information only after all initial notification have been made.

1.10 Contact the NRC via the Emergency Notification System (ENS) dedicated telephone within 60 minutes of declaring an emergency. If the ENS fails, use commercial phone or HPN phone as an alternate line.

1.11 When contact is made, the caller shall identify himself and read the completed Emergency Message Form verbatim (omit the Palo Verde Authenticator).

1.12 Offer to repeat information and reiterate as necessary.

2.0 FOLLOW-UP EMERGENCY MESSAGE FORM (APPENDIX D)

2.1 Fill in data required by steps 1 and 2 of Appendix D, "Follow-up Emergency Message Form".

2.2 Obtain from the Radiation Protection Monitor or the Radiological Assessment Coordinator (If EOF is activated) data required to complete steps 3-9.

2.3 Obtain from the Emergency Coordinator or the Technical Analysis Coordinator (If EOF is activated) data required to complete steps 10-13.

2.4 Circle appropriate wording in step 14.

2.5 Dispense information when asked by offsite agencies (NRC or ARRA).

NOTIFICATION ALERT NETWORK (NAN) RADIO BACKUP
Channel 8 - KON511

In case of failure of the NAN ringdown telephone, the NAN backup is Channel 8 on the PVNGS radio. FCC regulations require the Palo Verde Designator 'KON511' be used to precede and conclude all outgoing communications.

1. Take control of the radio channel by saying: "All stations this net," (Repeat) "All stations this net, this is K-O-N 5-1-1 Palo Verde. 5-1-1 Palo Verde to all 5-1-1 stations, stand by for Warning Point roll call."

2. Wait thirty seconds to allow the offsite agencies to get to their radios, then repeat the previous transmission.

NOTE

After 5 P.M. weekdays, all day Saturday, Sunday or holidays, Maricopa County Sheriff's Office (MCSO) and Department of Public Safety (DPS) will be the only agencies responding.

3. Initiate roll call of the offsite government agencies, allowing stations on the net to respond.

   3.1 "5-1-1 Palo Verde to 5-1-1 Maricopa County Sheriff's Office. Do you copy?"
   Allow Response: "5-1-1 MCSO copies."

   3.2 "5-1-1 Palo Verde to 5-1-1 Maricopa County Department of Civil Defense & Emergency Services. Do you copy?" (MCDCD&ES)
   Allow response: "5-1-1 Civil Defense copies."

   3.3 "5-1-1 Palo Verde to 5-1-1 Department of Public Safety. Do you copy?"
   Allow response: "5-1-1 DPS copies."

   3.4 "5-1-1 Palo Verde to 5-1-1 Arizona Division of Emergency Services. Do you copy?"
   Allow response: "5-1-1 ADES (State EOC) copies."

   3.5 "5-1-1 Palo Verde to 5-1-1 Arizona Radiation Regulatory Agency. Do you copy?"
   Allow response: "5-11 ARRA copies."

4. Upon completion of roll call, transmit the notification message verbatum. Take acknowledgement roll call, allowing MCSO to read the message back in its entirety, and provide assistance or clarification, as needed.

5. Upon completion of the second roll call, announce: "K-O-N 5-1-1 Palo Verde off." This is the required FCC sign-off.

6. Continue notification per Step 1.8 Appendix E.

PROTECTIVE ACTION RECOMMENDATIONS

Classification Category	Protective Actions Recommendations
1. A General Emergency has been declared if: (imminent/actual loss of physical control of the plant)	Consider a 2 mile precautionary evacuation.
2. A General Emergency has been declared and large amounts of fission products are in the containment atmosphere. The projected dose using containment area monitor readings is calculated to be: a) whole body > 5 rem b) thyroid > 25 rem	In addition to considering a 2 mile evacuation, consider a 5 mile downwind evacuation of potentially affected sectors.*
3. A General Emergency has been declared and containment failure leading to a direct atmospheric release is likely in the sequence but <u>not</u> imminent and large amounts of fission products in addition to noble gases are in the containment atmosphere. The projected dose using containment area monitor readings is calculated to be: a) whole body > 5 rem b) thyroid > 25 rem	In addition to considering a 2 mile 360° precautionary evacuation, consider a precautionary 360° evacuation to 5 miles and a downwind evacuation to 10 miles of potentially affected sectors. *
4. A General Emergency has been declared and large amounts of fission products other than noble gases in the containment atmosphere and containment <u>failure</u> is <u>judged imminent</u>. The projected dose using containment area monitor readings is calculated to be: a) whole body > 5 rems b) thyroid > 25 rems	In addition to considering a 2 mile 360° precautionary evacuation consider a precautionary 360° evacuation to 5 miles and a downwind evacuation to 10 miles of potentially affected sectors,* and consider shelter for areas where evacuation cannot be completed before the transport of activity to those areas.

* Plume width is equal to 3 sigma y (as a minimum, the downwind sectors and adjacent sectors).

PROTECTIVE ACTION RECOMMENDATIONS (CONT'D)

Classification Category	Protective Actions Recommendations
5. An actual release has occured and the projected does to individuals in the population is calculated to be: a) whole body $\geq$ 0.5 to < 1 rem b) thyroid $\geq$ 1.0 to < 5 rems	Recommend seeking shelter 360° for 2 miles and in affected sectors out to 10 miles.
6. An actual release has occured and the projected does to individuals in the population is calculated to be: a) whole body > 1 rem to $\leq$ 5 rems b) thyroid > 5 rems to $\leq$ 25 rems	Recommend a 360° evacuation for 2 miles and in affected sectors* out to 10 miles. Recommend seeking shelter 360° out to 10 miles.
7. An actual release has occured and the projected does to individuals in the population is calculated to be: a) whole body > 5 rems b) thyroid > 25 rems	Recommend a 360° evacuation for 5 miles and in affected sectors* out to 10 miles. Recommend seeking shelter 360° out to 10 miles.

* Plume width is equal to 3 sigma y (as a minimum, the downwind sector(s) and adjacent sectors).

CHECKLIST
EMERGENCY COORDINATOR
STSC ACTIVATED

POSITION FILLED BY:

1) PVNGS Plant Manager
2) Manager, Technical Support
3) Shift Supervisor

RESPONSIBILITY: The individual onsite with the responsibility and authority to immediately and unilaterally initiate emergency actions, including providing notification and protective action recommendations to Governmental authorities responsible for implementing offsite emergency measures. Provide for the control and coordination of onsite emergency response.

NOTE

Refer to the following pages
per appropriate facility activation

Facility Activated	Appendix H Page
STSC	1 - 4
TSC	5 - 8
TSC/EOF	9 - 12

TIME/INITIALS

INITIAL RESPONSE

1. Receive notification from the Shift Supervisor and report to the Control Room of affected unit. ____/____

2. Review plant status, initiating event, corrective actions and emergency classification with the Shift Supervisor. ____/____

3. Assume the position of onshift Emergency Coordinator. ____/____

4. Activate the Satellite TSC per EPIP-11, "Technical Support Center/Satellite TSC Activation." ____/____

5. Commence notification process per Appendix E or direct STSC Communicator to do so. ____/____

   (1) Direct the Security Director to call in the PVNGS onsite and offsite Emergency Organization personnel. ____/____

CHECKLIST
EMERGENCY COORDINATOR
STSC ACTIVATED

TIME/INITIALS

SUBSEQUENT RESPONSE

6. Verify personnel resources are on standby in the OSC.

7. Reevaluate the emergency classification as conditions change per EPIP-02, reclassify as necessary. ____/____

8. As necessary, direct implementation of EPIP-23, "Fire Fighting" and EPIP-22, "Personnel Injury."

   (1) For a fire, dispatch Fire Team and order the Security Director to contact the Bechtel or alternate offsite fire dept. for assistance (if required). ____/____

   (2) For personnel injury, contact the First Aid Station and inform them of the situation. Dispatch a First Aid Team, if necessary, and coordinate any required offsite assistance. ____/____

9. Determine any additional protective action recommendations to be provided to state and county response agencies per EPIP-15, "Protective Action Guidelines." ____/____

10. As appropriate, complete Follow-up Emergency Message Form. ____/____

11. Determine need for offsite support and direct the STSC Communicator to call location(s) in EPIP-33, "Offsite Assistance" and arrange access with the Security Director per EPIP-24, "Security." ____/____

Personnel Assembly and Accountability

12. Within 30 minutes of the accountability signal, receive a report on accountability in the protected area from the Security Director. ____/____

13. Receive a report on site accountability later. ____/____

14. Be prepared to implement EPIP-21, "Search and Rescue," by providing necessary data to the OSC Coordinator. ____/____

CHECKLIST
EMERGENCY COORDINATOR
STSC ACTIVATED

TIME/INITIALS

Emergency Exposures and KI

15. Per EPIP-18, "Emergency Exposure Guidelines," and as necessary, authorize emergency exposures. ____/____

16. As necessary, authorize administration of KI per EPIP-26, "Potassium Iodide (KI) Administration" to emergency workers desiring to use it. Consult with the Radiation Protection Monitor. ____/____

TSC Activation and Transfer of Authority

17. When relieved by the onsite Emergency Coordinator provide a briefing and transfer responsibilities. ____/____

OSC Activation

18. If a release is occurring, consult EPIP-12, "Operations Support Center Activation," to determine habitability of primary OSC. ____/____

19. If uninhabitable, direct the OSC Coordinator to relocate staff and equipment/supplies to the alternate OSC (Service Building). If this is also uninhabitable, direct the OSC Coordinator to relocate to a protected area (Control Room/ STSC, TSC or EOF). ____/____

Security

20. As necessary, implement EPIP-24, "Security," and order the Security Director to limit access to the station, contact Maricopa County Sheriff's Office for assistance in controlling site access, and arrange access for necessary personnel not on the Emergency Personnel Access List and/or not having access to the protected area via card-key system. ____/____

21. Ensure the Security Director is appraised of offsite assistance requests to arrange access. ____/____

22. Determine needs, consult with staff, authorize reentry per EPIP-25, "Reentry for Emergency Operations." ____/____

CHECKLIST
EMERGENCY COORDINATOR
STSC ACTIVATED

TIME/INITIALS

Assessment Actions

23. Ensure that the Radiation Protection Monitor or is obtaining needed data using EPIP-14A, "Release Rate Determination," EPIP-14B, "Initial Dose Assessment," EPIP-16, "Inplant Surveys and Sampling" and EPIP-17, "Onsite/Offsite Surveys and Sampling." ____/____

Protective Actions

24. Continue to evaluate the need for providing any additional protective action recommendations. ____/____

25. Determine need for early dismissal/evacuation of non-essentials per EPIP-19, "Onsite Evacuation." ____/____

26. Establish evacuation order, offsite reassembly area, evacuation route and inform the Security Director. ____/____

27. Order evacuation signal when the Security Director reports that preparations are complete. ____/____

Performed By _____ Date _____
Signature

CHECKLIST
EMERGENCY COORDINATOR
TSC ACTIVATED

TIME/INITIALS

INITIAL RESPONSE

1. Receive notification from the onshift Emergency Coordinator and report to the TSC. Upon arrival, sign in on the TSC Staffing Board ____/____

2. Receive a briefing from the onshift Emergency Coordinator and assume responsibilities. ____/____

3. Brief TSC staff and evaluate adequacy of TSC activation. ____/____

4. Declare the TSC operational and inform the STSC, Control Rooms, EOF, ANPP Site Construction Office, Bechtel Emergency Control Center and PVNGS Security. ____/____

5. As necessary continue with or commence notification process per Appendix E or direct the STSC Communicator to do so. ____/____

6. Verify personnel resources are on standby in the OSC. ____/____

SUBSEQUENT RESPONSE

7. Reevaluate the emergency classification as conditions change per EPIP-02 "Emergency Classification," reclassify as necessary. ____/____

8. As necessary, direct implementation of EPIP-23, "Fire Fighting" and EPIP-22, "Personnel Injury." ____/____

CHECKLIST
EMERGENCY COORDINATOR
TSC ACTIVATED

TIME/INITIALS

(1) For a fire, dispatch Fire Team and order the Security Director to contact the Bechtel or alternate offsite fire department for assistance (if required). ____/____

(2) For personnel injury, contact the First Aid Station and inform them of the situation. Dispatch a First Aid Team, if necessary, and coordinate any required offsite assistance. ____/____

9. Determine any additional protective action recommendations to be provided to state and county response agencies per EPIP-15, "Protective Action Guidelines." ____/____

10. As appropriate, complete Follow-up Emergency Message Form. ____/____

11. Determine the need for offsite support and direct the STSC Communicator to call location(s) in EPIP-33, "Offsite Assistance," arrange access with the Security Director per EPIP-24, "Security". ____/____

Personnel Assembly and Accountability

12. Within 30 minutes of the accountability signal, receive a report on accountability in the protected area from the Security Director. ____/____

13. Receive a report on site accountability later. ____/____

14. Be prepared to implement EPIP-21, "Search and Rescue," by providing necessary data to the OSC Coordinator (via Emergency Maintenance Coordinator). ____/____

Emergency Exposures and KI

15. Per EPIP-18, "Emergency Exposure Guidelines," and as necessary, authorize emergency exposures. ____/____

CHECKLIST
EMERGENCY COORDINATOR
TSC ACTIVATED

TIME/INITIALS

16. As necessary, authorize administration of KI per EPIP-26 to emergency workers desiring to use it. Consult with the Radiological Protection Coordinator. ____/____

OSC Activation

17. If a release is occurring, consult EPIP-12, "Operations Support Center Activation," to determine habitability of the primary OSC. ____/____

18. If uninhabitable, direct the OSC Coordinator to relocate staff and equipment/supplies to the alternate OSC (service Building). If this is also unihabitable, direct the OSC Coordinator to relocate to a protected area (control room/ STSC, TSC or EOF). ____/____

EOF Activation

19. Per EPIP-13, "Emergency Operations Facility Activation," brief the Emergency Operations Director and transfer the responsibilities for notifications and protective action recommendations. ____/____

Security

20. As necessary, implement EPIP-24, "Security," and order the Security Director to limit access to the station, contact Maricopa County Sheriff's Office for assistance in controlling site access, and arrange access for necessary personnel not on the Emergency Personnel Access List and/or not having access to the protected area via card-key system. ____/____

21. Ensure the Security Director is appraised of offsite assistance requests to arrange access. ____/____

Corrective Actions

22. Determine needs, consult with staff, authorize reentry per EPIP-25, "Reentry for Emergency Operations." ____/____

CHECKLIST
EMERGENCY COORDINATOR
TSC ACTIVATED

TIME/INITIALS

Assessment Actions

23. Ensure that the Radiological Protection Coordinator is obtaining needed data using EPIP-14A, "Release Rate Determination," EPIP-14B, "Initial Dose Assessment," EPIP-16, "Inplant Surveys and Sampling" and EPIP-17, "Onsite/Offsite Surveys and Sampling." ____/____

Protective Actions

24. Continue to evaluate the need for providing any additional protective action recommendations. ____/____

25. Determine the need for early dismissal/evacuation of non-essentials per EPIP-19, "Onsite Evacuation." ____/____

26. Establish evacuation order, offsite reassembly area, evacuation route and inform the Security Director. ____/____

27 Order evacuation signal when the Security Director reports that preparations are complete. ____/____

Recovery

28. After the EOF is activated, consult with the Emergency Operations Director concerning implementing EPIP-31, "Recovery." ____/____

Performed By _____ Date _____
Signature

CONTROLLED DOCUMENT

CHECKLIST
EMERGENCY COORDINATOR
TSC and EOF ACTIVATED

TIME/INITIALS

INITIAL RESPONSE

1. Receive notification form the onshift Emergency Coordinator and report to TSC. Upon arrival, sign in on the TSC Staffing Board. ____/____

2. Receive a briefing from the onshift Emergency Coordinator and assume responsibilities. ____/____

3. Brief TSC staff and evaluate adequacy of TSC activation. ____/____

4. Declare the TSC operational and inform the STSC, Control Rooms, EOF, ANPP Site Construction Office, Bechtel Emergency Control Center and PVNGS Security. ____/____

5. Per EPIP-13, "Emergency Operations Facility Activation," brief the Emergency Operations Director and transfer the responsibilities for notifications and protective action recommendations. ____/____

6. Verify personnel resources are on standby in the OSC. ____/____

SUBSEQUENT RESPONSE

7. Reevaluate the emergency as conditions change per EPIP-02, "Emergency Classification," reclassify as necessary. ____/____

8. As necessary, direct implementation of EPIP-23, "Fire Fighting" and EPIP-22, "Personnel Injury." ____/____

   (1) For a fire, dispatch Fire Team and order the Security Director to contact the Bechtel or alternate offsite fire department for assistance (if required). ____/____

   (2) For personnel injury, contact the First Aid Station and inform them of the situation. Dispatch a First Aid Team, if necessary, and coordinate any required offiste assistance. ____/____

CHECKLIST
EMERGENCY COORDINATOR
TSC and EOF ACTIVATED

TIME/INITIALS

9. Determine the need for offsite support and direct the STSC Communicator to call location(s) in EPIP-33, "Offsite Assistance," arrange access with the Security Director per EPIP-24, "Security," and coordinate with the Administrative and Logistics Coordinator at the EOF. ____/____

Personnel Assembly and Accountability

10. Within 30 minutes of the accountabilty signal, receive a report on accountability in the protected area from the Security Director. ____/____

11. Receive a report on site accountability later. ____/____

12. Be prepared to implement EPIP-21, "Search and Rescue," by providing necessary data to the OSC Coordinator (via Emergency Maintenance Coordinator). ____/____

Emergency Exposures and KI

13. Per EPIP-18, "Emergency Exposure Guidelines," and as necessary, authorize emergency exposures. ____/____

14. As necessary, authorize administration of KI per EPIP-26 to emergency workers desiring to us it. Consult with the Radiological Protection Coordinator. ____/____

OSC Activation

15. If a release is occuring, consult EPIP-12, "Operations Support Center Activation," to determine habitability of primary OSC. ____/____

16. If uninhabitable, direct the OSC Coordinator to relocate staff and equipment/ supplies to the alternate OSC (Service Building). If this is also uninhabitable, direct the OSC Coordinator to relocate to a protected area (Control Room/STSC, TSC or EOF). ____/____

CHECKLIST
EMERGENCY COORDINATOR
TSC and EOF ACTIVATED

TIME/INITIALS

Security

17. As necessary, implement EPIP-24, "Security," and order the Security Director to limit access to the station, contact Maricopa County Sheriff's Office for assistance in controlling site access, and arrange access for necessary personnel not on the Emergency Personnel Access List and/or not having access to the protected area via card-key system. ____/____

18. Ensure the Security Director is appraised of offsite assistance requests to arrange access. ____/____

Corrective Actions

19. Determine needs, consult with staff, authorize reentry per EPIP-25, "Reentry for Emergency Operations." ____/____

Assessment Actions

20. Ensure that the Radiological Protection Coordinator is obtaining needed data using EPIP-14A, "Release Rate Determination," EPIP-14B, "Initial Dose Assessment," EPIP-16, "Inplant Surveys and Sampling" and EPIP-17, "Onsite/Offsite Surveys and Sampling." ____/____

Protective Actions

21. Determine the need for early dismissal/evacuation of non-essentials per EPIP-19, "Onsite Evacuation." ____/____

22. Establish eavcuation order, offsite reassembly area, evacuation route and inform the Security Director. ____/____

23. Order evacuation signal when the Security Director report that preparations are complete. ____/____

CHECKLIST
EMERGENCY COORDINATOR
TSC and EOF ACTIVATED

TIME/INITIALS

Recovery

24. Consult with the Emergency Operations Director concerning implementing EPIP-31, "Recovery." _____/_____

Performed By _____ Date _____
Signature

PVNGS EMERGENCY PLAN IMPLEMENTING PROCEDURE	PROCEDURE NO. EPIP-11	
TECHNICAL SUPPORT CENTER/SATELLITE TSC ACTIVATION	REVISION 3	Page 1 of 53

ASSIGNED COPY

PVNGS ... # 8-9B

DEPT. HEAD [signature] DATE 4/22/85

PRB/PRG/TRRG REVIEW [signature] DATE 5/3/85

APPROVED BY [signature] DATE 5/3/85

EFFECTIVE DATE 05-10-85

DN-1664A/0296A

PVNGS EMERGENCY PLAN IMPLEMENTING PROCEDURE	PROCEDURE NO. EPIP-11	
TECHNICAL SUPPORT CENTER/SATELLITE TSC ACTIVATION	REVISION 3	Page 2 of 53

REVISION HISTORY

Rev. No.	Date	Revised Pages	Comments
3	6.16.85	all	REVISED TO INCORPORATE PCN # 01 of REV. 2 AND TO REFLECT ACTUAL POLICIES AND PRACTICES OF EMERGENCY PLANNING

TABLE OF CONTENTS

SECTION		PAGE NUMBER
1.0	OBJECTIVE	5
2.0	REFERENCES	5
3.0	LIMITATIONS AND PRECAUTIONS	6
4.0	DETAILED PROCEDURE	7
4.1	Personnel Indoctrination/Responsibilities	7
4.2	Prerequisites	8
4.3	Instructions	9

APPENDICES

Appendix A -	Shift Technical Advisor Check List	12
Appendix B -	Radiation Protection Monitor Check List	13
Appendix C -	Satellite TSC Communicator Check List	16
Appendix D -	Technical Engineering Coordinator (Onshift) Check List	19
Appendix E -	Analyst (Onshift)/Systems Engineer (Onsite) Check List	20
Appendix F -	Security Director Check List	21

APPENDICES (CONT'D)

SECTION	PAGE NUMBER	
Appendix G - Technical Engineering Coordinator (Onsite) Check List	27	
Appendix H - Technical Engineering Assistant (Onsite) Check List	29	3
Appendix I - Radiological Protection Coordinator (Onsite) Check List	30	
Appendix J - NRC Liaison - Health Physics Checklist	36	3
Appendix K - Emergency Maintenance Coordinator (Onsite) Check List	37	
Appendix L - Hazards Control Coordinator (Onsite) Check List	39	
Appendix M - Operations Advisor (Onsite) Check List	40	
Appendix N - Personnel Resources Coordinator (Onsite) Check List	41	
Appendix O - Chemistry Coordinator (Onsite) Check List	43	
Appendix P - Reactor Analyst (Onsite) Check List	44	
Appendix Q - Computer Support Coordinator (Onsite) Check List	45	
Appendix R - Field Team Communicator (Onsite) Check List	46	
Appenidx S - Information Monitor Check List	47	3
Appendix T - Operations Coordinator Check List	48	
Appendix U - NRC Liaison, Operations Check List	49	3
Appendix V - Clerical Aide/Status Board Keeper-TSC Check List	50	1
Appendix W - TSC Floor Plan	52	
Appendix X - TSC Equipment Layout	53	3

1.0 OBJECTIVE

1.1 To provide instructions for the activation and operation of the Technical Support Center (TSC) and the Satellite TSC (STSC).

2.0 REFERENCES

2.1 Implementing References

2.1.1 EPIP-03, "NOTIFICATION OF UNUSUAL EVENT Implementing Actions"

2.1.2 EPIP-04, "ALERT Implementing Actions"

2.1.3 EPIP-05, "SITE AREA EMERGENCY Implementing Actions"

2.1.4 EPIP-06, "GENERAL EMERGENCY Implementing Actions"

2.1.5 EPIP-14A, "Release Rate Determination"

2.1.6 EPIP-14B, "Initial Dose Assessment"

2.1.7 EPIP-15, "Protective Action Guidelines"

2.1.8 EPIP-16, "Inplant Surveys and Sampling"

2.1.9 EPIP-17, "Onsite/Offsite Surveys and Sampling"

2.1.10 EPIP-18, "Emergency Exposure Guidelines"

2.1.11 EPIP-20, "Personnal Assembly and Accountability"

2.1.12 EPIP-21, "Search and Rescue"

2.1.13 EPIP-25, "Reentry for Emergency Operations"

2.1.14 EPIP-26, "Potassium Iodide (KI) Administration"

2.1.15 EPIP-28, "Personnel Monitoring and Decontamination"

2.1.16 EPIP-29, "Area/Equipment Monitoring and Decontamination"

2.1.17 78AC-0ZZ06, "Document and Record Turnover Control"

2.2 Developmental References

2.2.1 NUREG 0654, Rev. 1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants"

2.2.2 NUREG 0696, Feb. 1981, "Functional Criteria for Emergency Response Facilities"

2.2.3 PVNGS Emergency Plan, Rev. 5 | 3

2.2.4 75AC-9ZZ01, "Radiation Exposure Authoriztion, Permits and Control", Rev. 2.

2.2.5 ANSI N45.2.9-1974, " Requirements For Collection, Storage, and Maintenance of Quality Assurance Records for Nuclear Power Plants"

2.2.6 7N409.02.00, "Emergency Preparedness Organization and Staffing"; Rev. 0. | 3

3.0 LIMITATIONS AND PRECAUTIONS

3.1 Activation of the TSC should be completed within the augmentation time goals set forth in the PVNGS Emergency Plan.

3.2 The Satellite TSC and the TSC may be used by designated personnel for normal daily activities as well as for training and emergency drills. Use of these facilities shall be limited to activities that will not degrade preparedness to react to abnormal conditions or reduce system(s) reliability. This use shall be reviewed by the Site Emergency Planning Supervisor. | 3

3.3 Each individual in the TSC/STSC upon event termination shall submit their checklists and other written documentation to the Emergency Coordinator who ensures they are forwarded to Emergency Planning and Preparedness Dept. for storage in accordance with 78AC-0ZZ06, "Document and Record Turnover Control".

4.0 DETAILED PROCEDURE

4.1 Personnel Indoctrination/Responsibilities

4.1.1 During a NOTIFICATION OF UNUSUAL EVENT, direction and coordination of onshift emergency operations shall be provided by the Emergency Coordinator at the Satellite TSC. During an ALERT or more severe classification, emergency assessment and control shall initially be directed from the Satellite TSC and transferred to the TSC once it has been activated.

4.1.1.1 Prior to activation of the onsite and offsite Emergency Organizations, the following activities take place in the Satellite TSC:

(1) Environmental assessment (offsite dose projections).

(2) Field Monitoring Team direction by the Radiation Protection Monitor.

(3) Technical analysis by the Shift Technical Advisor (STA).

(4) Emergency management by the Emergency Coordinator (EC).

(5) Initial notifications including protective action recommendations by the Satellite TSC Communicator.

4.1.2 When the onsite and offsite Emergency Organization has been activated, the responsibility for the above listed functions shall be transferred to the TSC and/or the Emergency Operations Facility (EOF).

4.1.2.1 The Satellite TSC then functions as an extension of the TSC to provide direct technical support to the Control Room personnel in the areas of:

(1) Engineering and technical analytical support.

(2) Reactor analytical support.

(3) Unit operations support.

(4) Radiological analytical support.

4.1.3 The functions performed in the TSC are:

(1) Manage onsite emergency response.

(2) Direct onsite radiological protection activities.

(3) Direct emergency maintenance.

(4) Direct personnel accountability and site security.

(5) Direct safety and hazards control.

(6) Perform engineering and technical analysis for Control Room support.

(7) Perform reactor analysis.

(8) Provide emergency I&C support.

(9) Provide computer and chemistry technical support.

(10) Provide dose rate projections.

(11) Direct Inplant/Onsite field monitoring activities.

4.1.4 The TSC radiological emergency kit contains a supply of calibrated radiological monitoring equipment, protective clothing, portable lighting, and additional supplies. 3

4.1.5 Activation of the Satellite TSC shall take place upon declaration of a NOTIFICATION OF UNUSUAL EVENT.

4.1.6 Activation of the TSC and augmentation of the Satellite TSC staff by the onsite Emergency Organization shall take place upon declaration of an ALERT or more severe emergency.

4.2 Prerequisites

4.2.1 A NOTIFICATION OF UNUSUAL EVENT or higher emergency classification has been made.

4.3 Instructions

4.3.1 Activation of the Satellite TSC

4.3.1.1 The following onshift Emergency Organization personnel shall report to the affected unit Satellite TSC and complete their designated check lists: 3

(1) The affected unit Shift Supervisor or Shift Supervisor of the designated unaffected unit (Onshift Emergency Coordinator) - EPIP-03, "Notification Of Unusual Event Implementing Actions," EPIP-04, "Alert Implementary Actions", EPIP-05, "Site Area Emergency Implementing Actions", EPIP-06, "General Emergency Implementing Actions".

(2) Shift Technical Advisor - Appendix A, "Shift Technical Advisor Check List".

(3) Designated Radiation Protection Technician, (Radiation Protection Monitor) - Appendix B, "Radiation Protection Monitor Check List". 3

(4) Designated Nuclear Operator (STSC Communicator) - Appendix C, "STSC Communicator Check List".

4.3.1.2 The following onsite Emergency Organization personnel shall report to the affected unit Satellite TSC (if required), relieve their respective onshift counterpart, and complete their check lists as necessary.

(1) Satellite TSC Communicator - Appendix C.

(2) Radiation Protection Monitor - Appendix B.

4.3.1.3 The affected Unit Superintendent (or affected Unit Day Shift Supervisor) shall report to the STSC and assume the position of Operations Advisor. He provides technical and operational advice to the Shift Supervisor, and ensure that information flow is maintained between the TSC and the Control Room. He shall also complete Appendix M, "Operations Advisor (Onsite) Check List". 3

4.3.2 Preliminary Activation of the Technical Support Center

4.3.2.1 The Shift Systems Engineer shall perform the preliminary activation of the TSC per Appendix D, "Technical Engineering Coordinator (Onshift) Check List".

4.3.2.2 The Shift Analysts shall report to the TSC and assist the Shift Systems Engineer in carrying out his function as Technical Engineering Coordinator, per Appendix E, "Analyst (Onshift)/Systems Engineer (Onsite)".

4.2.3.3 The Security Shift Captain shall report to the TSC, assume the duties of Security Director, and complete the check list in Appendix F, "Security Director Check List".

4.3.3 Complete Activation of the Technical Support Center

4.3.3.1 All Emergency Organization personnel reporting to the TSC shall retrieve their activation materials from the TSC activation cabinet and establish their assigned work areas as shown in Appendix W. 3

4.3.3.2 The Technical Engineering Coordinator of the onsite Emergency Organization shall report to the TSC, relieve the Shift Systems Engineer, and complete the check list in Appendix D (as necessary) and Appendix G.

4.3.3.3 The Security Director of the onsite Emergency Organization shall report to the TSC, relieve the Security Shift Captain, and complete the check list in Appendix F (as necessary).

4.3.3.4 The following onsite Emergency Organization personnel shall report to the TSC and complete their designated check lists:

(1) Emergency Coordinator - EPIP-03, EPIP-04, EPIP-05, and EPIP-06, "Emergency Coordinator Check List". 3

(2) Technical Engineering Assistant - Appendix H, "Technical Engineering Assistant Checklist".

(3) Radiological Protection Coordinator - Appendix I, "Radiological Protection Coordinator (Onsite) Check List".

(4) NRC Liaison - Health Physics - Appendix J, "NRC Liaison - Health Physics Check List". 3

(5) Emergency Maintenance Coordinator - Appendix K, "Emergency Maintenance Coordinator (Onsite) Check List".

(6) Hazards Control Coordinator - Appendix L, "Hazards Control Coordinator (Onsite) Check List".

(7) Personnel Resources Coordinator - Appendix N, "Personnel Resources Coordinator (Onsite) Check List".

(8) Chemistry Coordinator - Appendix O, "Chemistry Coordinator (Onsite) Check List".

(9) Reactor Analyst - Appendix P, "Reactor Analyst (Onsite) Check List".

(10) Computer Support Coordinator - Appendix Q, "Computer Support Coordinator (Onsite) Check List".

(11) Field Team Communicator - Appendix R, "Field Team Communicator (Onsite) Check List".

(12) Information Monitor - Appendix S, "Information Monitor Check List". 3

(13) Operations Coordinator - Appendix T, "Operations Coordinator (Onsite) Check List".

(14) NRC Liaison - Operations - Appendix U, "NRC Liaison - Operations Check List". 3

(15) Clerical Aide/Status Board Keeper-TSC - Appendix V, "Clerical Aide/Status Board Keeper-TSC Check List".

4.3.4 Declaration of TSC Readiness

4.3.4.1 The onsite Emergency Coordinator shall assure TSC readiness and notify the onsite emergency response facilities that the TSC is activated.

4.3.4.2 Upon activation of the TSC, the onsite Emergency Coordinator shall relieve the onshift Emergency Coordinator of the Emergency Coordinator functions.

SHIFT TECHNICAL ADVISOR CHECK LIST

POSITION FILLED BY: (1) Shift Technical Advisor

RESPONSIBILITY: Advise and assist the Shift Supervisor on assessing plant conditions. Activate and monitor SPDS, develop trend data and provide these data to Control Room personnel.

ACTIONS	TIME/INITIALS
1. Report to STSC.	____/____
2. Activate the SPDS.	____/____
*3. Monitor the SPDS.	_____
*4. Develop trend data and provide these data to the Shift Supervisor and other Control Room personnel.	_____
*5. Advise the Shift Supervisor of corrective actions.	_____

* Continuing Activity

Performed By _____
Signature

Date _____

RADIATION PROTECTION MONITOR CHECK LIST

POSITION FILLED BY: (1) Radiation Protection Technician from affected unit | 3

RESPONSIBILITY: Provide initial onsite and offsite dose projections. Initially direct field monitoring teams. Provide technical advice to Emergency Coordinator concerning radiological conditions and protective action recommendations. Monitor radiological assessment activities of onsite Emergency Organization upon being relieved of dose assessment and field monitoring responsibilities by Radiological Protection Coordinator or the Radiological Assessment Coordinator. Provide Control Room with appropriate information. | 3

IMMEDIATE ACTIONS	TIME/INITIALS
1. Report to the STSC upon notification	____/____
2. Ensure operational status of dose calculation computer.	____/____
3. Perform initial offsite dose rate projection per EPIP-14A, "Release Rate Determination", and 14B, "Initial Dose Assessment", if a release has occurred.	____/____ | 3
4. Inform onshift Emergency Coordinator of dose rate projection results and assist in determining what protective actions are necessary per EPIP-15, "Protective Action Guidelines".	____/____
*5. Direct activities of onsite/offsite Field Monitoring Teams per EPIP-16, "Inplant Surveys and Sampling", and and EPIP-17, "Onsite/Offsite Surveys and Sampling".	_____
*6. Evaluate need to administer Potassium Iodide (KI) per EPIP-26, "Potassium Iodide (KI) Administration".	_____
7. If OSC is activated, contact OSC Coordinator, using the Radiological Assessment Line, to ensure that:	
(1) Sufficient radiological protection equipment is available to OSC personnel.	____/____
(2) Continuous habitability surveys (airborne, dose rate, contamination) are being performed in the OSC.	____/____ | 3

* Continuing Activity

SUBSEQUENT ACTIONS

Complete the following until relieved of these responsibilities by the Radiological Protection Coordinator at the TSC or the Radiological Assessment Coordinator at the EOF.

Onsite and Offsite Surveys and Sampling

	TIME/INITIALS
8. Supervise formation, briefing, and dispatch of monitoring teams per EPIP-16 and EPIP-17.	____/____
9. Determine/change offsite sampling locations, if necessary.	____/____ 3
*10. Direct that appropriate surveys and sampling be performed.	_____
*11. Receive reports from monitoring teams every one-half hour via portable radio.	_____

Protective Action Guidelines

*12. Update and refine dose assessments for critical receptor site locations upon significant changes in:	_____
(1) Release rates	
(2) Duration of releases	
(3) Isotopic mixture of release	
(4) Meteorological conditions	
*13. Determine if protective actions are warranted in accordance with EPIP-15 and recommend to Emergency Coordinator.	_____

Search and Rescue

14. Assist OSC Coordinator in determining radiation levels and approximate stay times for teams in affected areas.	____/____ 3

* Continuing Activity

Activation of Onsite Emergency Organization

TIME/INITIALS

15. Contact Radiological Protection Coordinator at TSC, using the Radiological Assessment Line or Environmental Assessment Line, to provide the following: ____/____

    (1) OSC radiation protection status

    (2) Status of dose projections, protective action recommendations, onsite/in-plant field monitoring teams

    (3) Transfer of responsibility for above to Radiological Protection Coordinator

3

16. Transfer control of offsite field monitoring teams to the Radiological Assessment Coordinator upon activation of the EOF. ____/____

3

*17. Monitor radiological assessment activities of onsite Emergency Organization and provide Control Room personnel with appropriate information. _____

*18. Perform dose rate measurements and air samples in STSC/CR, as required. _____

_____

* Continuing Activity

Performed By _____
Signature

Date _____

_____

* Continuing Activity

STSC COMMUNICATOR CHECK LIST

POSITION FILLED BY: (1) Nuclear Operator II from affected unit
(2) Nuclear Operator from affected unit

RESPONSIBILITY: Initiate the notification process as directed by the onshift Emergency Coordinator. Ensure operability of communications equipment. Maintain communications logbook.

IMMEDIATE ACTIONS	TIME/INITIALS
STSC Activation	
1. Report to the STSC upon notification.	____/____
Notification of UNUSUAL EVENT	
2. Complete the Initial Emergency Message Form as directed by the onshift Emergency Coordinator or Shift Supervisor.	____/____
3. Initiate notification process as directed by Emergency Coordinator (or Shift Supervisor, in his absence).	____/____
4. Inform Emergency Coordinator when initial notifications are complete.	____/____
5. Contact the Security Director and inform him to call in additional personnel if so directed by Emergency Coordinator.	____/____
6. Complete the Follow-up Message Form as directed by the Emergency Coordinator.	____/____
*7. Provide follow-up information when requested by the State/County agencies.	_____
*8. Maintain records of communications received or transmitted offsite.	_____

TIME/INITIALS

Notification of ALERT, SITE AREA EMERGENCY, GENERAL EMERGENCY

9. Complete the Initial Emergency Message Form as directed by the Onshift Emergency Coordinator or Shift Supervisor. ____/____

10. Initiate notification process as directed by the Emergency Coordinator (or Shift Supervisor in his absence). ____/____

11. Inform the Emergency Coordinator when initial notifications are complete. ____/____

12. Contact the Security Director and inform him to call in additional personnel if so directed by the Emergency Coordinator. ____/____

13. Prepare the Follow-up Emergency Message Form as directed by the Emergency Coordinator. ____/____

*14. Provide follow-up information when requested by the State/County agencies. _____

*15. Maintain records of communications received or transmitted offsite. _____

Offsite Assistance

16. Contact required offsite assistance (EPIP-33, "Offsite Assistance", Appendix A) via telephone if directed by the Emergency Coordinator. ____/____

17. Record name and time on "Telephone Communication Log Sheet", (EPIP-33, Appendix B). ____/____

18. Transfer call to Emergency Coordinator for clarification, if necessary. ____/____

* Continuing Activity

TIME/INITIALS

19. Inform the Emergency Coordinator of contact/lack of contact, scope of offsite assistance and estimated time of arrival. ____/____

20. Maintain record of all communications received or transmitted offsite. ____/____

ACTIVATION OF ONSITE EMERGENCY ORGANIZATION

21. Transfer continuous communications link with the NRC to the NRC Liaison - Operations in the TSC. ____/____

22. Review status of notifications and transfer responsibility for notifying State/County agencies and NRC to Goverment Liaison Engineer in the EOF. ____/____

23. Notify the Emergency Coordinator when responsibilities have been transferred to the Goverment Liaison Engineer. ____/____

Performed By _____

Date _____

3

TECHNICAL ENGINEERING COORDINATOR (ONSHIFT)
CHECK LIST

POSITION FILLED BY: Shift Systems Engineer

RESPONSIBILITY: Perform preliminary TSC activation and ensure that communication lines and Data Display Systems are operational. Provide technical input to Control Room staff. Assist Emergency Maintenance Coordinator in TSC upon being relieved by onsite Technical Engineering Coordinator.

IMMEDIATE ACTIONS	TIME/INITIALS
1. Report to the TSC upon notification and sign in on the TSC Staffing Board.	____/____
2. Ensure SPDS is operational.	____/____
3. Ensure CRACS is operational.	____/____
4. Ensure TSC computer terminals are operable.	____/____
5. Obtain list of equipment out of commission prior to emergency from Maintenance Control Center.	____/____
*6. Maintain list of equipment out of commission during emergency (or use the status board for same).	_____
*7. Provide technical input to Control Room staff.	_____
*8. Assist Emergency Coordinator in TSC after being relieved by onsite Technical Engineering Coordinator.	_____

* Continuing Activity

Performed By _____
Signature

Date _____

CONTROLLED DOCUMENT

ANALYST (ONSHIFT)/SYSTEMS ENGINEER (ONSITE)
CHECK LIST

POSITION FILLED BY: (1) Maintenance Planner-Coordinator

RESPONSIBILITY: Assist Emergency Maintenance Coordinator by recommending courses of action for emergency repairs and alternatives for maintenance operations. Analysts in the onshift organization serve as Systems Engineers in the onsite organization.

IMMEDIATE ACTIONS	TIME/INITIALS
1. Report to TSC upon notification. Upon arrival, sign in on the TSC Staffing Board	____/____
2. Assist Onshift Technical Engineering Coordinator (Shift Systems Engineer) in physically activating TSC in accordance with EPIP-11, "Technical Support Center/ Satellite TSC Activation".	____/____
SUBSEQUENT ACTIONS	
3. Assume role of Systems Engineer upon activation of onsite emergency organization.	____/____
*4. Report to and assist Emergency Maintenance Coordinator at TSC.	_____
*5. Recommend actions for emergency repairs and provide alternatives for maintenance operations.	_____

* Continuing Activity

Performed By _____
Signature

Date _____

CONTROLLED DOCUMENT

SECURITY DIRECTOR
CHECK LIST

POSITION FILLED BY: Security Shift Captain (Onshift)
Manager, Operations Security (Onsite)
Security Shift Captain (Alternate)

RESPONSIBILITY: Provide for site security, access control, personnel accountability, evacuation and medical transportation. Call out the Emergency Organization upon direction from the Emergency Coordinator.

IMMEDIATE ACTIONS	TIME/INITIALS
1. Report to TSC. Upon arrival, sign in on the TSC Staffing Board and establish responsible area.	____/____
2. If necessary, assign a Security Shift Sergeant to act as Security Shift Captain. Have him report to the Security Building.	____/____
3. Inform Access Point Guards to limit protected area access to those on Emergency Access List.	____/____
4. Call in additional personnel appropriate to the emergency classification as directed by Emergency Coordinator (EC) by utilizing automatic dialing system.	____/____

NOTE

If the Auto Dialer at PVNGS malfunctions call APS 411 Building Security and request the system be activated at the 411 Building.

5. If the Auto Dialer List One shows no acknowledgement by either the primary, alternate or backup respondent for an Emergency Organization position, inform the Emergency Coordinator of the inability to contact the respondent.	____/____

SUBSEQUENT ACTIONS

6. Contact Security Shift Captain by plant phone (ext. [redacted] or [redacted]) and establish security measures for station access by arriving offsite assistance personnel (ALERT or higher).	____/____

SECURITY DIRECTOR
CHECK LIST (Continued)

TIME/INITIALS

TSC Access

7. Determine need for additional security personnel and contact as necessary. ____/____

8. Remain at TSC and complete following, as necessary, until relieved by Onsite Security Director. ____/____

9. Direct a member of the Security Force to be stationed at the TSC Entrance and to limit access to the TSC to only authorized personnel. ____/____

10. Grant access to emergency personnel who have been verbally authorized by Emergency Coordinator. ____/____

Personnel Assembly and Accountability

11. Contact Security Shift Captain at the Security Headquarters and have him prepare for assembly and accountability per EPIP-20, "Personnel Assembly and Accountability". ____/____ 3

12. Inform the Security Access Point guard by normal phone (ext. [redacted] and the Craft Access Point guard (ext. [redacted] that assembly and accountability are in progress and to assist existing personnel. ____/____

13. Arrange for Construction Security to unlock Visitor's Center, if necessary. ____/____

14. Direct the Security Shift Captain to contact the Maricopa County Sheriff's Office by dedicated telephone line or radio to inform them of impending onsite evacuation and to request traffic control north or south of plant on Wintersburg Road. ____/____

15. Approximately 20 minutes after the accountability signal has sounded, obtain copies of the computer print-out of personnel who are in the protected area. (If computer or card-key unoperable, see EPIP-20.) ____/____

16. Receive accountability reports from Security Shift Captain for Assembly Areas in protected area. ____/____

TIME/INITIALS

17. Report protected area accountability to Emergency Coordinator within 30 minutes. ____/____

18. Receive accountability reports from Security Shift Captain from site Assembly Area. ____/____

19. Direct security to routinely check ANPP controlled buildings to ensure they are not occupied. ____/____

20. Report overall accountability outside protected area to EC as soon as practicable. ____/____

21. Arrange to pick up Individual Accountability Sheets for each area as soon as practicable. ____/____

Search and Rescue

22. Inform EC of missing or disabled personnel and last known location so that search and rescue can begin per EPIP 21, "Search and Rescue". ____/____

Onsite Evacuation

23. Obtain information from Emergency Coordinator on assembly area evacuation order, reassembly area and evacuation route. ____/____

24. Contact Maricopa County Sheriff's Office by dedicated telephone or radio to request traffic assistance at key evacuation route points and also at the offsite reassembly area. ____/____

25. Dispatch a Security vehicle with one Security Force Member as Evacuation Team Leader to Bechtel Gate. No. 1 to prepare to lead the Bechtel manuals to the reassembly area. ____/____

26. Contact Construction Security by telephone (ext. [redacted] and request a Security Team to control traffic at the various exit gates. ____/____

27. Contact the Bus Transportation Supervisor by telephone at ext. [redacted] to deploy buses to the ANPP/Bechtel Construction Office pickup point, the Nuclear Operations pickup point, and the Water Reclamation Facility pickup point. Have him inform the drivers of the reassembly area and evacuation route. ____/____

SECURITY DIRECTOR
CHECK LIST (Continued)

TIME/INITIALS

28. Dispatch Security Force to bus pickup points and gates to assure the following order of evacuation (unless a different order is specified by the Emergency Coordinator):

    (1) Bechtel parking lots (personal vehicles) via Gate No. 1, 2, and 3 ____/____

    (2) ANPP/Bechtel Construction Office buses via Gate No. 3 ____/____ 3

    (3) ANPP van pools via Gate No. 1A ____/____

    (4) ANPP parking lots (personal vehicles) via Gate No. 3A ____/____

    (5) ANPP Nuclear Operations buses via Gate No. 3A ____/____

    (6) ANPP Water Reclamation Facility via Gate No. 12 ____/____

29. Contact the Radiological Protection Coordinator and assure that a monitoring/decontamination team has been dispatched to the reassembly area. ____/____

30. Contact the reassembly area by telephone (Palo Verde Inn [redacted] or Hassayampa Pump Station [redacted] or [redacted] and inform them of the impending evacuation. ____/____ 3

31. Contact Assembly Area Supervisor at the following locations to inform them of the impending evacuation signal and the location of bus pickups.

    (1) ANPP Construction Office ext. [redacted] ____/____

    (2) Bechtel Emergency Control Center ext. [redacted] ____/____

    (Have Bechtel inform Bechtel Fire Team and Bechtel Medical Staff to remain at the Bechtel Safety office and not to evacuate).

    (3) Admin. Annex Bldg. Assembly Area ext. [redacted] ____/____

    (4) Water Reclamation Facility ext. [redacted] ____/____ 3

    (5) Visitor's Center ext. [redacted] ____/____

SECURITY DIRECTOR
CHECK LIST (Continued)

TIME/INITIALS

32. Notify the Emergency Coordinator that preparations have been made and the evacuation signal may be given. ____/____

33. Dispatch Security Force to routinely check ANPP trailers and buildings in the Administration area outside the protected area to ensure all non-essential personnel have left the premises. ____/____

34. Request Corporate Site Security by telephone (ext. [redacted] to routinely check the Visitor's Center, construction offices, Bechtel Warehouse and associated areas. ____/____

35. Contact the Evacuation Team Leader by radio or telephone (Palo Verde Inn [redacted] Hassayampa Pump Station [redacted] or [redacted] at the offsite reassembly area to determine if any emergency supplies are needed. Report all needs to Administrative and Logistics Coordinator. ____/____ 3

Offsite Emergency Vehicle/Personnel Access to PVNGS

36. Obtain following information about emergency vehicles that may be used and inform the Security Shift Captain. ____/____

(1) Vehicle type
(2) License or other identification number
(3) Color
(4) Number of occupants

37. Dispatch a Security Force Member to accompany all vehicles. ____/____

38. Direct Security Access Point by telephone (ext. [redacted] to allow entry to protected area of those ANPP personnel or contractors called to PVNGS who have not been previously assigned or named on Access List. ____/____ 3

Fire Fighting

39. Call Bechtel Fire Department, at [redacted] upon direction from EC, and inform of type of fire, location and extent of fire, special precautions, and special equipment. ____/____

SECURITY DIRECTOR
CHECK LIST (Continued)

	TIME/INITIALS
40. Direct Security to assign personnel to escort Bechtel Fire Team to fire.	____/____

Performed By _____
Signature

Date _____

TECHNICAL ENGINEERING COORDINATOR (ONSITE)
CHECK LIST

POSITION FILLED BY: (1) Manager, OPS Engineering
(2) OPS Engineering Supervisor

RESPONSIBILITY: Relieve the onshift Technical Engineering Coordinator. Direct engineering and systems analyses, procedures development and related licensing efforts. Maintain contact with offsite technical support groups.

IMMEDIATE ACTIONS	TIME/INITIALS
1. Report to TSC upon notification. Upon arrival, sign in on the TSC Staffing Board.	____/____
2. Relieve onshift Technical Engineering Coordinator at TSC following briefing and establish responsible area.	____/____
3. Complete Appendix D, "Technical Engineering Coordinator (Onshift)" of this procedure for preliminary TSC Activation as necessary.	____/____
4. Obtain list of equipment out of commission prior to emergency from onshift Technical Engineering Coordinator.	____/____
*5. Maintain list of equipment out of commission during emergency.	_____ 3
*6. Access records management and obtain needed technical materials throughout emergency.	_____
7. Ensure that the following personnel complete their check lists:	3
(1) Chemistry Coordinator	____/____
(2) Reactor Analyst	____/____
(3) Computer Support Coordinator	____/____
(4) Technical Engineering Assistant	____/____

* Continuing Activity

TIME/INITIALS

*8. Determine need for additional engineering and technical support personnel, and inform Personnel Resources Coordinator. _____

9. Determine estimated length of release. ____/____

SUBSEQUENT ACTIONS

*10. Assist Emergency Coordinator as needed to determine corrective actions. _____

*11. Assist Emergency Coordinator as needed during reclassification activities. _____

*12. Provide updated status of reactor and unit to Technical Analysis Coordinator in the EOF using the Technical Line. _____

*13. Periodically brief NRC representative on plant status and corrective actions. _____

*14. Assist in determination of need for offsite technical support. _____

*15. Periodically provide Event Status updates to the Status Board Keeper for posting on Status Board. _____

* Continuing Activity

Performed By _____
Signature

Date _____

13

TECHNICAL ENGINEERING ASSISTANT
CHECK LIST

POSITION FILLED BY: (1) Shift Technical Advisors, off-duty

(2) Other designated personnel with appropriate training

RESPONSIBILITY Monitor plant system data via ERFDADS. Maintain liaision with Architect-Engineer concerning technical status and proposed recommendations.

IMMEDIATE ACTIONS	TIME/INITIALS
1. Report to TSC upon notification. Upon arrival, sign in on the TSC Staffing Board.	____/____
2. Relieve initial briefing from Technical Engineering Coordinator and establish responsible area.	____/____
*3. Monitor plant systems data via ERFDADS.	_____
SUBSEQUENT ACTIONS	
*4. Maintain communication with Architect-Engineer, NSSS Supplier and required vendor personnel concerning plant status and recommendations for corrective action.	_____
*5. Inform Technical Engineering Coordinator of proposed recommendations and significant change in plant status.	_____
8. Submit check list, logs and status board update sheets to Technical Engineering Coordinator when emergency is cancelled.	____/____

* Continuing Activity

Performed By _____
Signature

Date _____

RADIOLOGICAL PROTECTION COORDINATOR (ONSITE)
CHECK LIST

3

POSITION FILLED BY: (1) Manager, Radiological Services
(2) Radiological Engineer

RESPONSIBILITY: Relieve Radiation Protection Monitor of dose rate projection and onsite/inplant field monitoring supervision responsibilities. Direct onsite field monitoring activities and inplant radiological controls. Supervise dose rate projections. 3

IMMEDIATE ACTIONS	TIME/INITIALS
1. Report to TSC upon notification. Upon arrival, sign in on the TSC Staffing Board and establish responsible area.	/
2. Ensure that the following are available:	/
(1) Meteorological overlays and base maps (2) Procedures and forms	
3. Ensure operational status of dose calculation computer.	/
4. Contact Radiation Protection Monitor at STSC using the Radiological Assessment Line or Environmental Assessment Line and determine:	/
(1) Extent of radiological releases and plant conditions (2) Location of onsite and offsite monitoring teams (if dispatched) (3) Status of dose assessments and protective action recommendations	
5. Determine need for additional personnel to assist in dose assessment.	/
6. Relieve Radiation Protection Monitor of responsibility for control of:	/
(1) Onsite field monitoring (2) Inplant radiological controls (3) Release rate determination and dose calculations	

TIME/INITIALS

7. Inform Emergency Coordinator when TSC is ready to conduct dose assessments. ___/___

SUBSEQUENT ACTIONS

Onsite and Inplant Surveys and Sampling

8. Form, brief, and dispatch Monitoring Teams through Emergency Maintenance Coordinator per EPIP-16, Inplant Survey and Sampling", and EPIP-17, "Onsite/Offsite Survey and Sampling". ___/___ 3

9. Direct that appropriate surveys and sampling be performed. ___/___

*10. Receive reports from Inplant/Onsite monitoring teams. _____

*11. Receive reports of sample analysis from Unit Radiation Protection Supervisor or Radiation Protection Technicians. _____

*12. Receive reports on contaminated areas and/or equipment from Radiation Protection Technicians. _____

Protection Action Guidelines

*13. Update and refine dose assessments for critical receptor site locations upon significant changes in: _____

(1) Release rates
(2) Duration of releases
(3) Isotopic mixture of release
(4) Meteorological conditions

15. Determine the protective action most applicable in accordance with EPIP-15, "Protective Action Guidelines", and make recommendations to the Emergency Coordinator. ___/___

Onsite Evacuation

16. Determine the appropriate reassembly area and evacuation route in conjunction with Emergency Coordinator. ___/___ 3

17. Dispatch personnel for monitoring at offsite reassembly areas through the Emergency Maintenance Coordinator. ___/___

* Continuing Activity

	TIME/INITIALS
*18. Provide guidance to the Radiation Monitoring Team at the reassembly area as requested.	/ 3
Emergency Exposure Guidelines	
*19. Authorize doses up to the limits of 10CFR20.	
20. Provide the Emergency Coordinator with radiological evaluation of situation and conditions requiring emergency exposures in excess of 10CFR20 limits.	/
21. Complete and sign Radiation Exposure Permit (75RP-9ZZ44, "Radiation Exposure Permits") or designate individual to complete this task.	/
22. Obtain initial estimates of radiation dose of exposed personnel as quickly as possible.	/
23. Report exposures in excess of 10CFR20 (refer to EPIP-18, Appendix B) to Emergency Coordinator.	/
24. Update and refine dose estimates when time permits.	/
Potassium Iodide (KI) Administration	
25. Advise Emergency Coordinator as to <u>when</u> and <u>who</u> may voluntarily receive KI.	/
26. Obtain bottle(s) of 130mg KI tablets from a Radiological Emergency Kit.	/ 3
27. Dispense one (1) tablet to each individual designated by Emergency Coordinator to voluntarily use KI (task may be delegated).	/
*28. Maintain record of Potassium Iodide Distribution as per EPIP-26, "Potassium Iodide (KI) Administration", Appendix B (task may be delegated).	
Search and Rescue	
*29. Assist OSC Coordinator in determining radiation levels and approximate stay times for teams in Radiologically Controlled areas.	

* Continuing Activity

Personnel Injury

The following check list items should be performed by the Radiological Protection Coordinator, if possible, or by a member of the Radiological Support Staff.

TIME/INITIALS

30. Determine, with advice of plant nurse, the order of priorities for: ____/____

    (1) Treatment
    (2) Evacuation
    (3) Decontamination
    (4) Necessity or protective clothing/respiratory protection
    (5) Other priorities dictated by radiological/hazardous conditions.

31. Direct use of onsite emergency vehicle(s). ____/____

32. Designate an individual to prepare the station ambulance to transport injured personnel to hospital. ____/____ 13

33. Request Security to call offsite ambulance service, if onsite vehicles are unavailable, and to issue dosimetry to ambulance personnel. ____/____

34. Designate individual to meet and accompany ambulance to patient's location. ____/____

35. Determine emergency route to be used per EPIP-22, "Personnel Injury", Appendix D. ____/____

36. Designate one or more individuals qualified in use of G-M survey instruments and radiation control procedures to accompany patient to hospital. ____/____

Personnel and Area/Equipment Monitoring and Decontamination

37. Determine need for personnel monitoring and decontamination per EPIP-28, "Personnel Monitoring and Decontamination". ____/____

TIME/INITIALS

38. Determine if crucial areas and/or equipment requires monitoring and decontamination in accordance with EPIP-29, "Area/Equipment Monitoring and Decontamination". ____/____

39. Complete, date, and sign Radiation Exposure Permit. ____/____

40. Stipulate method of decontamination as described in EPIP-29. ____/____

Fire Fighting

41. Dispatch, upon notification by Emergency Coordinator, a monitoring team to assist with radiological aspects of fire emergency. ____/____

42. Instruct monitoring team to survey all outside fire fighting assistance personnel and supervise decontamination evaluations prior to release from site. ____/____

Reentry for Emergency Operations

43. Contact OSC Coordinator using the OSC Dedicated Phone, and provide, in conjunction with Emergency Coordinator and Emergency Maintenance Coordinator, a description of: ____/____

    (1) Work to be performed
    (2) Number of people work requires
    (3) Necessary tools, spare parts, and equipment
    (4) Radiological conditions, if known

44. Provide Emergency Coordinator, if required, with radiological evaluation of situation(s) requiring emergency exposure(s) and complete Radiation Exposure Permit authorizing emergency exposure in accordance with EPIP-18. ____/____

45. Complete or designate individual to complete the Radiation Exposure Permit detailing specific protective equipment, allowable doses and ALARA procedures outlined in EPIP-25. ____/____

46. Obtain initial estimates of radiation dose of exposed personnel as soon as possible. ____/____

TIME/INITIALS

47. Report exposures in excess of 10CFR20 limits (EPIP-25, Appendix B) and report to Emergency Coordinator. ____/____

48. Update and refine dose estimates when time permits. ____/____

Habitability Surveys of TSC

*49. Designate Radiation Protection personnel in TSC to perform dose rate measurements and air samples as required. _____

* Continuing Activity

Performed By _____
Signature

Date _____

NRC LIAISON - HEALTH PHYSICS
CHECK LIST

POSITION FILLED BY: ALARA Staff Engineer

RESPONSIBILITY: Establish continuous communications with the NRC to provide radiological information until the NRC Emergency Response Team arrives onsite.

IMMEDIATE ACTIONS	TIME/INITIALS
1. Report to TSC. Upon arrival, sign in on the TSC Staffing Board and establish responsible area	____/____
2. Receive briefing from the Radiological Protection Coordinator on radiological status.	____/____
*3. Establish continuous communications with the NRC using the HPN phone.	_____
4. Provide initial radiological conditions to the NRC.	____/____
SUBSEQUENT ACTIONS	
*5. Maintain continuous communications with the NRC until the NRC Emergency Response Team arrives onsite.	_____

Performed By _____
Signature

Date _____

* Continuing Activity

EMERCENCY MAINTENANCE COORDINATOR (ONSITE) CHECK LIST

POSITION FILLED BY: (1) Manager, Maintenance
(2) Superintendent MCC

RESPONSIBILITY: Assume responsibility for plant emergency repair. Coordinate repair and damage control including directing the OSC Coordinator to assemble/dispatch Emergency Repair Teams.

IMMEDIATE ACTIONS	TIME/INITIALS
1. Report to TSC upon notification. Upon arrival, sign in on the TSC Staffing Board and establish responsible area.	____/____
2. Establish contact with the OSC Coordinator via the dedicated OSC Line.	____/____
3. Receive requests for all emergency teams and direct the OSC Coordinator to form these teams.	____/____
4. Access records management and obtain needed materials.	____/____
5. Determine need for additional mechanical support personnel and inform the Personnel Resources Coordinator.	____/____

SUBSEQUENT ACTIONS

Emergency Reentry and Repair

*6. Assess operation of plant systems including mechanical, electrical, and I&C equipment.	_____
*7. Advise Emergency Coordinator on matters dealing with repair, maintenance, and deployment of Emergency Repair Teams.	_____

Reentry for Emergency Operations

*8. Determine if emergency repair operations are crucial to needs of Emergency Organization and inform Emergency Coordinator.	_____

3

* Continuing Activity

TIME/INITIALS

*9. Confer with Emergency Coordinator and Radiological Protection Coordinator prior to contacting OSC Coordinator using Maintenance Control Line with a description of: _____

(1) Work to be performed.

(2) Number of personnel required.

(3) Tools, spare parts and equipment needed.

(4) Radiological conditions, if known.

*10. Direct OSC Coordinator using Maintenance Control Line, to assemble and dispatch Emergency Repair Teams, as necessary. _____

Area/Equipment Monitoring and Decontamination

11. Determine if contaminated areas and/or equipment are crucial to needs of Emergency Organization and inform Emergency Coordinator to arrange for decontamination. ___/___

* Continuing Activity

Performed By _____
Signature

Date _____

HAZARDS CONTROL COORDINATOR (ONSITE) CHECK LIST

3

POSITION FILLED BY: (1) Health and Safety Administrator
(2) Safety Engineer

RESPONSIBILITY: Advise Emergency Coordinator concerning industrial safety of plant personnel. Evaluate hazards of potential or actual toxic material releases and/or chemical spills.

IMMEDIATE ACTIONS	TIME/INITIALS
1. Report to TSC upon notification. Upon arrival, sign in on the TSC Staffing Board and establish responsible area.	____/____
2. Determine areas that pose industrial hazards to personnel and inform Emergency Coordinator and OSC Coordinator through the Emergency Maintenance Coordinator.	____/____
3. Assist Radiological Protection Coordinator with ALARA considerations.	____/____

SUBSEQUENT ACTIONS

Search and Rescue

3

4. Request the Emergency Maintenance Coordinator to direct the OSC Coordinator to assemble and dispatch Search and Rescue Teams.	____/____
5. Complete Search and Rescue information sheet in EPIP-21, "Search and Rescue", Appendix D.	____/____
6. Notify Emergency Coordinator of results of search and rescue efforts.	____/____
7. Inform OSC Coordinator using OSC Dedicated Phone of all significant events.	____/____

Fire Fighting

8. Provide technical advice to Fire Team Leader during an emergency.	____/____

Performed By _____
Signature

Date _____

OPERATIONS ADVISOR (ONSITE)
CHECK LIST

POSITION FILLED BY: (1) Operations Superintendent of affected unit
(2) Operations Day Shift Supervisor of affected unit

3

RESPONSIBILITY: Act as management liaison with Control Room. Analyze plant conditions and advise Shift Supervisor and Emergency Coordinator. Ensure information flow between TSC and Control Room. Assist in development of procedures for conducting emergency operations.

IMMEDIATE ACTIONS	TIME/INITIALS
1. Report to STSC upon notification.	____/____

SUBSEQUENT ACTIONS

STSC Activation/Operation

*2. Provide technical and operational advice to Shift Supervisor and Emergency Coordinator, as necessary.	_____
*3. Analyze conditions using SPDS and CRACS and provide guidance to Emergency Coordinator and Operations personnel.	_____
*4. Establish communications with the Operations Coordinator (Onsite) in the TSC.	_____
*5. Assist in developing emergency procedures as necessary for conducting emergency operations.	_____

Emergency Classification

*6. Advise Emergency Coordinator via the Operations Coordinator (Onsite) as to plant status and re-classification of emergency for ALERT, SITE AREA EMERGENCY or GENERAL EMERGENCY.	_____

* Continuing Activity

Performed By _____
Signature

Date _____

PERSONNEL RESOURCES COORDINATOR (ONSITE)
CHECK LIST

POSITION FILLED BY: (1) Adminstrative Services Manager
(2) Manager, Office Services

RESPONSIBILITY: Relieve Security Director of responsibility for callout of additional emergency personnel. Plan for 24 hour emergency response organization staffing. Assist OSC Coordinator in meeting the manning requirements of OSC. Serve as primary Assembly Area Supervisor in TSC.

IMMEDIATE ACTIONS — TIME/INITIALS

1. Report to TSC upon notification. Upon arrival, sign in on the TSC Staffing Board and establish responsible area. ____/____

2. Assist Security Director with accountability per EPIP-20, "Personnel Assembly and Accountability". ____/____

3. Develop 24-hour manning requirements and augment staffing as required. ____/____

4. Assess and assist OSC Coordinator in meeting the manning requirements of the OSC. ____/____

5. Assign one Clerical Aide/Status Board Keeper to report to the Technical Engineering Coordinator and maintain the status boards. ____/____ 3

SUBSEQUENT ACTIONS

Personnel Assembly and Accountability

6. Assume role of primary Assembly Area Supervisor for TSC. ____/____

7. Record names and badge numbers of personnel who have reported to TSC on Individual Accountability Sheet per EPIP-20. ____/____

8. Contact Security Shift Captain and inform of personnel and badge numbers accounted for. ____/____

PERSONNEL RESOURCES COORDINATOR (ONSITE) CHECK LIST
(Continued)

Security

*9. Grant verbal authorization to personnel requesting access to TSC and notify Security Director to grant access. _____

Performed By _____
Signature

Date _____

* Continuing Activity

CHEMISTRY COORDINATOR (ONSITE)
CHECK LIST

3

POSITION FILLED BY: (1) Manager, Chemical Services
(2) Chemist

RESPONSIBILITY: Provide evaluation of coolant samples and air samples to aid in diagnosing reactor core conditions and release potentials. Interpret results of chemical analyses for evaluation of plant systems.

IMMEDIATE ACTIONS	TIME/INITIALS
1. Report to TSC upon notification. Upon arrival, sign in on the TSC Staffing Board and establish responsible area.	____/____
2. Contact onshift Chemistry Technician using regular phone line and obtain pertinent chemistry plant data.	____/____
3. Determine the need for additional chemistry support personnel, and inform the Technical Engineering Coordinator.	____/____
4. Confer with Technical Engineering Coordinator to determine needs concerning plant chemistry data.	____/____
SUBSEQUENT ACTIONS	
*5. Evaluate coolant samples and air samples and interpret results of chemical analyses and assist Technical Engineering Coordinator, as necessary.	_____

Performed By _____
Signature

Date _____

* Continuing Activity

REACTOR ANALYST (ONSITE)
CHECK LIST

POSITION FILLED BY: (1) Supervisor, Reactor Engineering
(2) Lead Reactor Engineer

RESPONSIBILITY: Perform detailed analyses of core physics and heat transfer parameters. Assess reactor core status and evaluate the integrity of and fuel cladding.

IMMEDIATE ACTIONS	TIME/INITIALS
1. Report to TSC upon notification. Upon arrival, sign in on the TSC Staffing Board and establish responsible area.	/
2. Assess core parameters.	/
3. Access records managements and obtain needed technical materials.	/
4. Determine need for additional reactor support personnel and inform the Technical Engineering Coordinator.	/
5. Inform Technical Engineering Coordinator of recommendations for operation.	/
SUBSEQUENT ACTION	
*6. Continue to conduct analyses and assess and evaluate the integrity of plant systems and assist Technical Engineering Coordinator, as necessary.	
*7 Contact Corporate Analytical Support (Deer Valley) as needed by normal phone [redacted] or [redacted]	3

Performed By _____
Signature

Date _____

* Continuing Activity

COMPUTER SUPPORT COORDINATOR (ONSITE)
CHECK LIST

3

POSITION FILLED BY: (1) Supervisor, Hardware Maintenance
(2) Computer Engineer

RESPONSIBILITY: Provide continuous support of analyses pertaining to plant conditions and dose assessment.

IMMEDIATE ACTIONS	TIME/INITIALS
1. Report to TSC upon notification. Upon arrival, sign in on the TSC Staffing Board and establish responsible area.	____/____
2. Access CRACS and SPDS as requested.	____/____
3. Determine need for additional computer support personnel and inform the Technical Engineering Coordinator.	____/____
SUBSEQUENT ACTIONS	
*4. Provide computer support to TSC staff, when requested.	_____

Performed By _____
Signature

Date _____

* Continuing Activity

FIELD TEAM COMMUNICATOR (ONSITE)
CHECK LIST

POSITION FILLED BY: (1) Radiation Protection Section Staff Member

RESPONSIBILITY: Maintain direct radio contact with PVNGS Inplant/Onsite Field Monitoring Teams. Assist the Radiological Protection Coordinator with dose rate projections. 3

IMMEDIATE ACTIONS	TIME/INITIALS
1. Report to TSC upon notification. Upon arrival, sign in on the TSC Staffing Board and establish responsible area.	____/____
2. Report to Radiological Protection Coordinator and obtain information on deployment of Inplant/Onsite Monitoring Teams.	____/____ 3
3. Ensure that radio communications equipment is operable.	____/____
4. Synchronize TSC clocks with affected unit clock.	____/____
SUBSEQUENT ACTIONS	
*4. Maintain communications with Inplant/Onsite Monitoring Teams via portable radio or plant telephone.	_____ 3
*5. Assist Radiological Protection Coordinator in performance of dose assessment calculations as necessary.	_____

Performed By _____
Signature

Date _____

* Continuing Activity

PVNGS EMERGENCY PLAN IMPLEMENTING PROCEDURE	PROCEDURE NO. EPIP-11	APPENDIX S Page 1 of 1
TECHNICAL SUPPORT CENTER/SATELLITE TSC ACTIVATION	REVISION 3	Page 47 of 53

3

INFORMATION MONITOR CHECKLIST

POSITION FILLED BY: (1) Compliance Supervisor
(2) Compliance Engineer

RESPONSIBILITY: Shall monitor communications between the Emergency Coordinator, Operations Coordinator, and the Operations Advisor and periodically provide emergency status updates to the Onsite Emergency Organization.

IMMEDIATE ACTIONS	TIME/INITIALS
1. Report to TSC. Upon arrival, sign in on TSC Staffing Board and establish responsible area.	____/____
2. Establish communications link with the Emergency Coordinator, Operations Coordinator and the Operations Advisor.	____/____
*3. Provide periodic emergency status update to the Onsite Emergency Organization.	_____

Performed By _____
Signature

Date _____

* Continuing Activity

OPERATIONS COORDINATOR (ONSITE) CHECK LIST

3

POSITION FILLED BY: (1) Operations Superintendent of designated unaffected unit.
(2) Operations Day Shift Supervisor of designated unaffected unit.

RESPONSIBILITY: Receive technical and operational input from the Operations Advisor and maintain the flow of information between the TSC and Control Room. Report to and assist the Emergency Coordinator.

IMMEDIATE ACTIONS	TIME/INITIALS
1. Report to TSC. Upon arrival, sign in on the TSC Staffing Board and establish responsible area.	____/____
2. Establish communications with the Operations Advisor (Onsite) in the STSC.	____/____
*3. Receive data from the Operations Advisor (Onsite) and report it to the Emergency Coordinator.	_____

Performed By _____
Signature

Date _____

* Continuing Activity

NRC LIAISION - OPERATIONS CHECKLIST

POSITION FILLED BY: (1) License Training Instructor

RESPONSIBILITY: Assume responsibility of continuous communications with the NRC from STSC Communicator until the NRC Emergency Response Team arrives onsite.

IMMEDIATE ACTIONS	TIME/INITIALS
1. Report to TSC. Upon arrival, sign in on the TSC Staffing Board and establish responsible area.	____/____
2. Receive briefing from Operations Coordinator on plant status.	____/____
3. Contact STSC Communicator and receive NRC communications status.	____/____
4. Assume continuous communications with NRC from STSC Communicator using the ENS phone.	____/____
SUBSEQUENT ACTION	
5. Maintain continuous communications with NRC until NRC Response Team arrives onsite.	____/____

Performed By _____
Signature

Date _____

CLERICAL AIDE/STATUS BOARD KEEPER-TSC
CHECK LIST

POSITION FILLED BY: (1) Designated person(s) with appropriate training.

RESPONSIBILITY: Maintain record of emergency actions taken by ANPP Emergency Organization on status board. Record status of emergency.

IMMEDIATE ACTIONS: TIME/INITIALS

1. Report to TSC upon notification. Upon arrival, sign in on the TSC Staffing Board. ____/____
2. Receive briefing from Personnel Resources Coordinator and establish responsible area. ____/____
3. Report readiness to Personnel Resources Coordinator. ____/____
4. Receive assignment to maintain status boards. Receive status from Technical Engineering Coordinator ____/____

SUBSEQUENT ACTIONS:

Status Board

*5. Record status of emergency as expressed by Technical Engineering Coordinator. _____

Recovery

6. Submit check list to Personnel Resources Coordinator upon cancellation of emergency. ____/____

Performed By _____
Signature

Date _____

* Continuing Activity

CLERICAL AIDE/STATUS BOARD KEEPER - TSC

EVENT STATUS BOARD

EVENT STATUS

UNIT: _____ EMERGENCY CLASS: _____ TIME: _____

Time: _____ **Date:** _____

Rx Coolant System

Avg. Temp. Th ____ °F Tc ____ °F

Pzr. Pressure ____ PSIA

Pzr. Level ____ %

Rx Vessel Level ____ %

Subcool Margin ____ °F

Boron ____ PPM

Time: _____ **Date:** _____

Containment

Pressure ____ PSIG

Temperature ____ °F

Humidity ____ %

Radiation Level ____ R/hr.

Where ____

Activity ____ uCi/cc

Recirc. Sump Level ____ ft.

Isolation Status ____

Cont. Spray ____ A ____ B

Time: _____ **Date:** _____

Met. Data

Wind Speed ____ mph

Wind Direction (from) ____ °true

Stability Class ____

Precipitation ____ in./24hrs.

Forecast ____

Inoperable Equipment

	Time	Date

Time: _____ **Date:** _____

Make-up

Total SI Flow ____ GPM

RWT Level ____ %

Pumps Available:

LPSI ____ A ____ B

HPSI ____ A ____ B

Charging ____ A ____ B ____ E

Time: _____ **Date:** _____

Heat Removal

Reactor Coolant Pumps ____ 1A ____ 1B ____ 2A ____ 2B

S/D Cooling Train ____ A ____ B

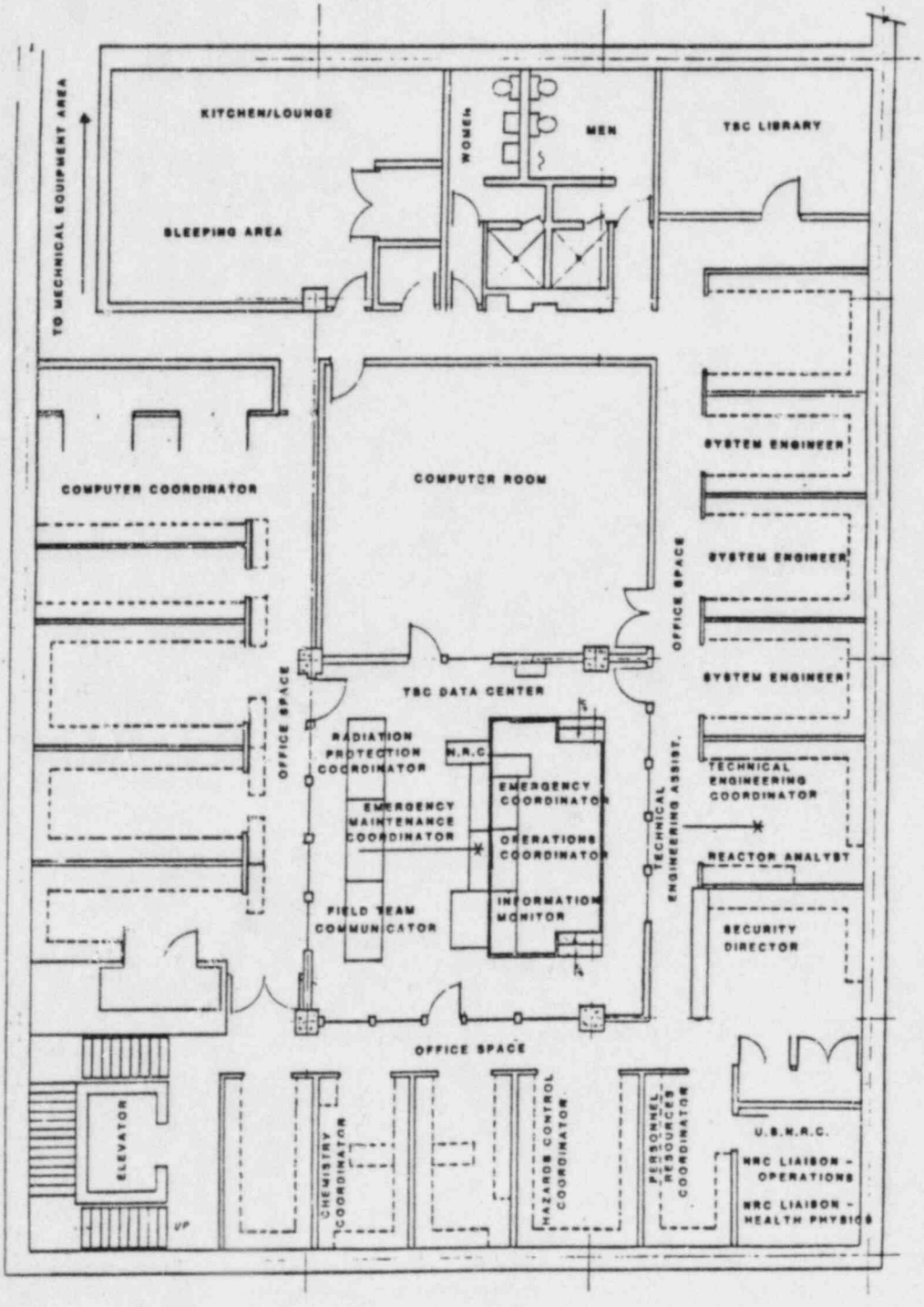
Steam Generator Level, %WR ____ 1 ____ 2

Aux. Feed Water to SG, GPM ____ 1 ____ 2

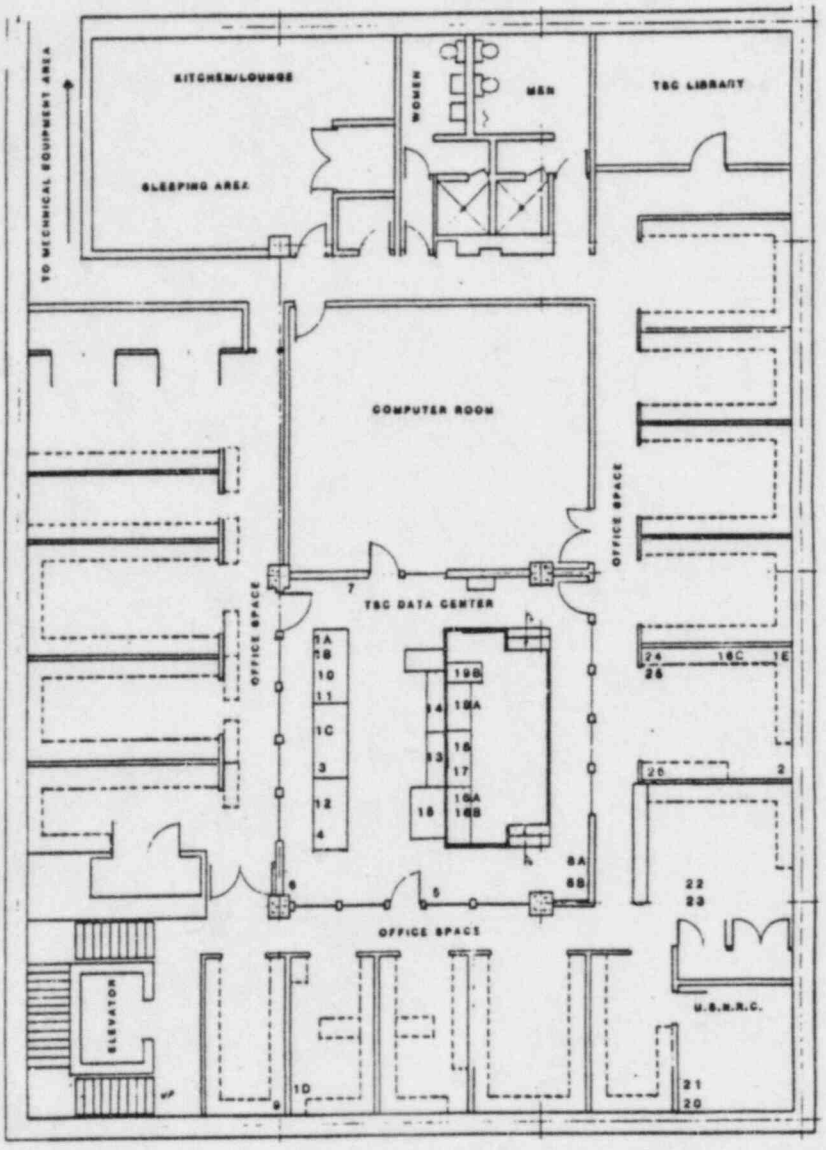
Aux. Feed Water Pumps Running ____ A ____ B ____ N

Condensate Storage Tank Level ____

FLOORPLAN - TECHNICAL SUPPORT CENTER (TSC)
PALO VERDE NUCLEAR GENERATING STATION (PVNGS)



TSC EQUIPMENT LAYOUT



1 A-E - ERFDADS Terminals
2 - ERFDADS Printers
3 - IBM Computer
4 - ANPP Radio
5 - REMS Terminal
6 - REMS Terminal
7 - TSC Emergency Kit
8 A-B - TSC Activation Cabinet
9 - Auto Dialer Terminal
10 - Environmental Assmt. Line
11 - Radiological Assmt. Line
12 - Weather Alert Radio
13 - Maintenance Control Line
14 - OSC Line
15 - Map Table
16 A-C - Technical Line
17 - Control Room Line
18 - STSC Line
19 A,B - EC/EOD Line
20 - ENS Phone
21 - HPN Phone
22 - High Speed Telecopier
23 - Dedicated Telecopier
24 - NAN
25 - OPS Voice Lines 1-4
26 - EOF Line

PVNGS EMERGENCY PLAN IMPLEMENTING PROCEDURE	PROCEDURE NO. EPIP-12	
OPERATIONS SUPPORT CENTER ACTIVATION	REVISION 3	Page 1 of 13

ASSIGNED COPY

PVNGS # 8-9B

DEPT. HEAD Dennis G. Yoe DATE 4/29/85

PRB/PRG/TRRG REVIEW L G Papworth DATE 5/8/85

APPROVED BY L G Papworth DATE 5/9/85

EFFECTIVE DATE ~~05-10-85~~ 05-17-85 FJ 5/16/85

DN-1666A/0196A

PV216-00DA (8/82)

CONTROLLED DOCUMENT

PVNGS EMERGENCY PLAN IMPLEMENTING PROCEDURE	PROCEDURE NO. EPIP-12	
OPERATIONS SUPPORT CENTER ACTIVATION	REVISION 3	Page 2 of 13

REVISION HISTORY

Rev. No.	Date	Revised Pages	Comments
3	09-10-85	4, 5, 6, 7, 8, 9,	REVISED TO BRING INTO LINE WITH ACTUAL OSC COORD. FUNCTIONS

TABLE OF CONTENTS

SECTION			PAGE NUMBER
1.0	OBJECTIVE		4
2.0	REFERENCES		4
3.0	LIMITATIONS AND PRECAUTIONS		5
4.0	DETAILED PROCEDURE		5
	4.1	Personnel Indoctrination/Responsibilities	5
	4.2	Prerequisites	7
	4.3	Instructions	7

APPENDICES

Appendix A - OSC Coordinator Check List		9
Appendix B - OSC Habitability Criteria		13

1.0 OBJECTIVE

This procedure provides instructions for the activation of the Operations Support Center (OSC) and alternate OSC (Service Building).

2.0 REFERENCES

2.1 Implementing References

2.1.1 EPIP-04, "ALERT Implementing Actions"

2.1.2 EPIP-05, "SITE AREA EMERGENCY Implementing Actions"

2.1.3 EPIP-06, "GENERAL EMERGENCY Implementing Actions"

2.1.4 EPIP-18, "Emergency Exposure Guidelines"

2.1.5 EPIP-20, "Personnel Assembly and Accountability"

2.1.6 EPIP-21, "Search and Rescue"

2.1.7 EPIP-25, "Reentry for Emergency Operations"

2.1.8 EPIP-29, "Area/Equipment Monitoring and Decontamination"

2.1.9 78AC-0ZZ06, "Document and Record Turnover Control".

2.2 Developmental References

2.2.1 NUREG 0654, Rev. 1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants".

2.2.2 NUREG 0696, Feb. 1981, "Functional Criteria for Emergency Response Facilities".

2.2.3 PVNGS Emergency Plan, Rev. 5.

2.2.4 10CFR20, "Standards for Protection Against Radiation", 1983.

2.2.5 ANSI N45.2.9 - 1974, "Requirements For Collection, Storage, and Maintenance of Quality Assurance Records for Nuclear Power Plants.

3

3.0 LIMITATIONS AND PRECAUTIONS

NOTE

In the onshift emergency organization, the Radiation Protection Monitor at the STSC determines the need to relocate the OSC staff and so informs the Emergency Coordinator.

3.1 Appendix B lists the habitability criteria established for the OSC. Habitability checks shall be conducted upon initial manning and as required thereafter. The results of the survey are to be transmitted to the Emergency Coordinator, via the Radiological Protection Coordinator, who determines the need to relocate personnel to the alternate OSC (Service Building).

3.2 If the Service Building is also uninhabitable, the Emergency Coordinator shall direct OSC personnel to report to one of the protected facilities (Control Room/Satellite Technical Support Center, Technical Support Center or Emergency Operations Facility).

3.3 At the direction of the Emergency Coordinator, the OSC may be partially activated to provide manpower resources for Emergency Teams (e.g., Search and Rescue, Emergency Repair) for a NOTIFICATION OF UNUSUAL EVENT emergency classification.

3.4 Requests for teams to be dispatched shall be channeled through E.C./S.S in the Onshift Emergency Organization or the Emergency Maintenance Coordinator in the Onsite Emergency Organization. 3

3.5 The OSC Coordinator shall forward his checklist and other written documentation along with any OSC team checklist and other written documentation to the Emergency Planning Group after event termination for forwarding to DDC in accordance with 78AC-0ZZ06, "Document and Record Turnover Control".

4.0 DETAILED PROCEDURE

4.1 Personnel Indoctrination/Responsibilities

4.1.1 The OSC is the assembly and staging area for unit/station personnel pooled for emergency response assignments. Designated emergency response personnel shall report to the OSC if not specifically assigned to a particular emergency position.

4.1.2 The OSC Coordinator is responsible for:

(1) Activating the OSC.

(2) Organizing emergency personnel who report to the OSC.

(3) Ensuring emergency personnel are available for dispatch.

(4) Maintaining a communications link with the Emergency Maintenance Coordinator. 3

4.1.3 The function of the OSC remains the same for an ALERT, SITE AREA EMERGENCY or GENERAL EMERGENCY classification. Personnel/equipment augmentation may vary according to specific circumstances.

4.1.4 The OSC emergency positions and personnel primarily responsible for them include:

(1) OSC Coordinator -I&C Shift Maintenance Foreman.

(2) Field Monitoring Teams and Radiological Surveys (in plant/onsite/offsite) - Radiation Protection Personnel.

(3) Radiation Protection Teams (Personnel Monitoring/ Dosimetry/Decontamination/Access Control/Reentry Control) - Radiation Protection Personnel.

(4) Repair Teams (Maintenance/Repair/Damage Control) - Maintenance Staff.

(5) Chemistry Sampling/Analysis - Chemistry Personnel.

(6) Search and Rescue Teams/First-Aid Teams - Designated personnel with appropriate training. 3

(7) Fire Team - Designated personnel with appropriate training.

(8) Repairs Coordinator - Mechanical Shift Maintenance Foreman (onsite emergency organization).

4.1.5 The primary OSC is located in the lunchroom of the affected unit's Auxiliary Building.

4.1.6 The OSC is equipped with dedicated telephone lines for communication with the TSC, Control Room, STSC and EOF.

4.1.7 The alternate OSC is located in the Service Building. OSC personnel shall relocate to this area if the Emergency Coordinator determines that this action is necessary.

4.1.8 Emergency radiological monitoring equipment, first aid supplies, decontamination supplies, protective clothing, protective breathing apparatus, field communications equipment, and portable lighting are stored adjacent to the OSC.

4.2 Prerequisites

4.2.1 An ALERT or more severe emergency has been declared and EPIP-04, "ALERT Implementing Actions", EPIP-05, "SITE AREA EMERGENCY Implementing Actions", or EPIP-06, "GENERAL EMERGENCY Implementing Actions", is being implemented.

4.3 Instructions

4.3.1 Activation of the Primary OSC

4.3.1.1 The I&C Shift Maintenance Foreman shall report to the affected unit OSC and complete the check list in Appendix A, "OSC Coordinator (Onshift and Onsite) Check list".

4.3.1.2 The following personnel shall report to the OSC and follow the directions of the OSC Coordinator:

(1) Maintenance Staff

(2) Radiation Protection Personnel

(3) Chemistry Personnel

(4) Computer Personnel

3

4.3.1.3 The OSC Coordinator shall direct onshift Radiation Protection, Chemistry and Maintenance Technicians to contact their immediate Supervisor and discuss the emergency situation including any additional manpower (Technicians) that is required.

4.3.1.4 The OSC Coordinator shall direct Radiation Protection personnel to establish a radiological control point to maintain the cleanliness of the OSC. 3

4.3.1.5 If any additional manpower is required, the OSC Coordinator shall call Security at ext. [redacted] or [redacted] in the Onshift Emergency Organization or the Personnel Resources Coordinator at the TSC in the Onsite Emergency Organization. Request the required technicians be manually notified to report to the OSC or as otherwise directed.

4.3.2 Activation of the Alternate OSC

4.3.2.1 In the event the primary OSC becomes uninhabitable (see Appendix B for habitability criteria), the Emergency Coordinator shall direct OSC personnel to evacuate/report to the alternate OSC (i.e., Service Building).

4.3.2.2 The OSC Coordinator shall ensure the transport of emergency equipment, including decontamination supplies, necessary to establish the alternate OSC.

4.3.2.3 In the event the alternate OSC becomes uninhabitable (see Appendix B for habitability criteria), OSC personnel shall report to one of the protected facilities (i.e., Control Room/Satellite Technical Support Center, Technical Support Center, Emergency Operations Facility) per the Emergency Coordinator's direction.

OSC COORDINATOR (ONSHIFT AND ONSITE)
CHECK LIST

POSITION FILLED BY: (1) I & C Shift Maintenance Foreman

RESPONSIBILITY: Activate OSC. Coordinate, assemble and dispatch manpower and equipment resources available at OSC. Serve as OSC Assembly Area Supervisor.

IMMEDIATE ACTIONS	TIME/INITIALS
1. Report to OSC upon notification.	____/____
2. Ensure that communication devices are operable.	____/____ 3

NOTE

Personnel accountability is at the Shift Supervisor/Emergency Coordinator's discretion at an ALERT. It is mandatory at Site Area Emergency or higher.

3. Conduct personnel accountability per EPIP-20, "Personnel Assembly and Accountability."

   (1) Obtain badge numbers and names of emergency personnel reporting to OSC and complete Individual Accountability Sheet. ____/____

   (2) Inform Security Director of accountability within 20 minutes of initiation of signal. ____/____

4. Ensure that OSC emergency equipment and supplies are available and in a state of readiness. ____/____ 3

5. Ensure that OSC reporting personnel have signed in on the OSC Staffing Board. ____/____

6. Direct Radiation Protection, Chemistry, and Maintenance Technicians to contact their immediate Supervisors and discuss the emergency situation including any additional manpower requirements. ____/____

7. Ensure that a radiological control point is established to maintain cleanliness of the OSC. ____/____

8. Report OSC readiness to Emergency Coordinator at STSC/CR (Onshift) using a dedicated phone line or at the TSC (Onsite) using the TSC dedicated phone line. ____/____

TIME/INITIALS

SUBSEQUENT ACTIONS

ALTERNATE OSC

9. If the primary OSC is uninhabitable, relocate OSC staff and necessary equipment to the alternate OSC, as directed by the Emergency Coordinator.

   (1) Service Building is the first alternate. ____/____

   (2) If the Service Building is also uninhabitable, relocate to one of the protected facilities (i.e., STSC/CR, TSC, EOF). ____/____

SEARCH AND RESCUE

10. Upon direction from Emergency Maintenance Coordinator, form Search and Rescue Team(s) per EPIP-21, "Search and Rescue". ____/____

    (1) Each team consists of 2 members.

    (2) Assign one member as Team Leader.

11. Obtain information from the Emergency Coordinator concerning identification and location of missing persons. ____/____

12. Provide Team(s) with search and rescue data: ____/____

    (1) I.D. of missing person(s).

    (2) Last known location (check REP if one was issued).

    (3) Job the individual was working.

    (4) Pertinent details of plant status.

13. Determine radiation levels and stay times with Radiation Protection Monitor (STSC) using the Radiological line or with Radiological Protection Coordinator (TSC, when activated) also using the Radiological line. ____/____

14. Inform the Team(s) of radiation exposure limits, if necessary, in accordance with EPIP-18, "Emergency Exposure Guidelines". ____/____

TIME/INITIALS

15. Direct Team(s) to notify Hazards Control Coordinator by radio (at TSC when activated) of location and/or removal of missing personnel. ____/____

16. Recall Team via radio when search and rescue operations are no longer necessary. ____/____

17. Inform the Hazards Control Coordinator at the TSC using the TSC dedicated phone line when Team has concluded its activities and returned to OSC. ____/____

RE-ENTRY FOR EMERGENCY OPERATIONS

18. Deploy Emergency Repair Team, per EPIP-25, "Re-entry for Emergency Operations", upon direction from Control Room (Onshift) or the Emergency Maintenance Cordinator in the TSC (Onsite). ____/____

    (1) Team shall consist of at least two Maintenance Technicians and if radiological conditions necessitate, assign a Radiation Protection Technician to the team.

    (2) Designate one member the Team Leader.

19. Receive information from Emergency Coordinator, Emergency Maintenance Coordinator and Radiological Protection Coordinator on: ____/____

    (1) Work to be performed.

    (2) Number of people required.

    (3) Equipment needed.

    (4) Radiation conditions, if known.

20. Receive 1/2 hour reports from Team Leader via portable radio. ____/____

21. Receive report from Team Leader upon leaving if task cannot be completed in allotted stay time or allotted dose. ____/____

TIME/INITIALS

AREA/EQUIPMENT MONITORING AND DECONTAMINATION

22. Deploy Decontamination Teams, per EPIP-29, "Area/Equipment Monitoring and Decontamination", upon guidance from Control Room (Onshift) or the Emergency Maintenance Coordinator in the TSC (Onsite). _____/_____

    (1) Team shall consist of one Radiation Protection Technician and necessary Chemical, Mechanical, Electrical, or I & C Technicians. _____/_____

PERSONNEL

*23. Coordinate OSC personnel requirements with the Personnel Resources Coordinator at the TSC, using the TSC dedicated phone line. _____

LOG

*24. Maintain an Emergency Action Log throughout emergency. _____

Performed By _____
Signature

Date _____

* Continuing Activity

OSC HABITABILITY CRITERIA

The following limits should be considered upper limit habitability criteria.

WHOLE BODY DOSE RATE	AIRBORNE ACTIVITY CONCENTRATION[1]	CONSIDER EVACUATION WITHIN
2-10 mrem/hour	1-4 x MPC	48 hours
10-50 mrem/hour	4-20 x MPC	10 hours
50-100 mrem/hour	20-40 x MPC	5 hours
100-500 mrem/hour	40-200 x MPC	1 hour
> 500 mrem/hour	> 200 x MPC	Immediately

[1] Where MPC is the maximum permissible concentration for areas as defined in Column 1, Table I, Appendix B to 10CFR20. This calculation will allow 200 MPC hours which conservatively limits internal exposure. This criteria is based on personnel not wearing respiratory equipment.

PVNGS EMERGENCY PLAN IMPLEMENTING PROCEDURE	PROCEDURE NO. EPIP-13	
EMERGENCY OPERATIONS FACILITY ACTIVATION	REVISION 3	Page 1 of 50

DEPT. HEAD Dennis B. [illegible] DATE 4/16/85

PRB/PRG/TRRG REVIEW [illegible] DATE 4/24/85

APPROVED BY [illegible] DATE 4/24/85

EFFECTIVE DATE 05-01-85

DN-1765A/0295A

CONTROLLED DOCUMENT

PVNGS EMERGENCY PLAN IMPLEMENTING PROCEDURE	PROCEDURE NO. EPIP-13	
EMERGENCY OPERATIONS FACILITY ACTIVATION	REVISION 3	Page 2 of 50

3

REVISION HISTORY

Rev. No.	Date	Revised Pages	Comments
3		all	TOTAL REVISION
			INCORPORATING EPIP's
			39-52.

3

TABLE OF CONTENTS

SECTION		PAGE NUMBER
1.0	OBJECTIVE	5
2.0	REFERENCES	5
3.0	LIMITATIONS AND PRECAUTIONS	6
4.0	DETAILED PROCEDURE	6
4.1	Personnel Indoctrination/Responsibilities	6
4.2	Prerequisites	7
4.3	Instructions	7

APPENDICES

Appendix A - Emergency Command Center Equipment Layout	10
Appendix B - Emergency Command Center Layout	11
Appendix C - Emergency Operations Director Checklist	12
Appendix D - Administrative and Logistics Coordinator Checklist	16
Appendix E - Radiological Assessment Coordinator Checklist	19
Appendix F - Technical Analysis Coordinator (Offsite) Checklist	22
Appendix G - Radiological Assessment Communicator Checklist	25
Appendix H - Government Liaison Engineer Checklist	27
Appendix I - EOF Contact Checklist	29
Appendix J - Logistics Communicator Checklist	32

3

TABLE OF CONTENTS

APPENDICES (CONT'D.)

Appendix K - Security Cooridnator Checklist 34

Appendix L - Dosimetry Clerk Checklist and TLD Log 36

Appendix M - Clerical Aide/Status Board Keeper - EOF Checklist and Status Boards 39

Appendix N - Off-site Technical Representative Checklist and Log 45

Appendix O - JENC Technical Advisor Checklist 48

Appendix P - Security Force Member Check List 49

Appendix Q - EOF Floorplan 50

CONTROLLED DOCUMENT

3

1.0 OBJECTIVE

1.1 To provide instructions for the activation of the Emergency Operations Facility (EOF).

2.0 REFERENCES

2.1 Implementing References

2.1.1 EPIP-04, "ALERT Implementing Action"

2.1.2 EPIP-05, "SITE AREA EMERGENCY Implementing Actions"

2.1.3 EPIP-06, "GENERAL EMERGENCY Implementing Actions"

2.1.4 EPIP-14A, "Release Rate Determination"

2.1.5 EPIP-14B, "Initial Dose Assessment"

2.1.6 EPIP-14C, "Continuing Dose Assessment"

2.1.7 EPIP-31, "Recovery"

2.1.8 EPIP-33, "Offsite Assistance"

2.1.9 78AC-0ZZ06, "Document and Record Turnover Control""

2.2 Developmental References

2.2.1 NUREG-0654, Rev. 1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants".

2.2.2 NUREG 0696, Feb. 1981, "Functional Criteria for Emergency Response Facilities".

2.2.3 PVNGS Emergency Plan, Rev. 5.

2.2.4 ANSI N45.2.9 - 1974, "Requirements for the Collection, Storage, and Maintenance of Quality Assurance Records for Nuclear Power Plants".

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3.0 LIMITATIONS AND PRECAUTIONS

3.1 Activation of the EOF should be completed within the time augmentation goals as set forth in the PVNGS Emergency Plan.

3.2 Each individual in the EOF upon event termination shall submit their checklist(s) and other written documentation to the Emergency Operations Director who ensures they are forwarded to Emergency Planning and Preparedness Dept. for storage in accordance with 78AC-0ZZ06, "Document and Record Turnover Control".

3.3 The EOF may be used by designated personnel for normal daily activities as well as for training and emergency drills. Use of this facility shall be limited to activities that will not degrade preparedness to react to abnormal conditions or reduce system(s) reliability. This use shall be reviewed by the Site Emergency Planning Supervisor.

4.0 DETAILED PROCEDURE

4.1 Personnel Indoctrination/Responsibilities

4.1.1 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 management of the PVNGS emergency organization.

4.1.2 During an ALERT, or more severe accident, overall command and coordination of ANPP emergency operations shall be exercised by the Emergency Operations Director at the EOF. He shall provide direction and support for inplant emergency response actions to the Emergency Coordinator, and coordinate corporate support through the CEC. In addition, he shall communicate plant status updates and radiological release data to the Joint ENC and the CEC.

3

4.1.3 Functional assignments at the EOF, in addition to those of the Emergency Operations Director are:

4.1.3.1 Radiological Analysis

Receive and evaluate source-term, release and meteorological information from the TSC. Interface with ARRA representatives to recommend protective action(s) for the population-at-risk.

4.1.3.2 Technical Liaison

Function as a primary interface with NRC/state/county personnel stationed in the EOF to provide updates on the status of the reactor and unit.

4.1.3.3 Administrative and Logistics Support

Provide needed technical documents, communications and analytical equipment, clerical assistance, transportation/housing support and security for EOF.

4.1.3.4 Public Information Support

Gather necessary information and transmit for subsequent release to the media from the Joint ENC.

4.1.4 The EOF shall be activated and manned for an ALERT or more severe emergency classification.

4.2 Prerequisites

4.2.1 An ALERT or more severe level emergency has been declared and procedure EPIP-04, "ALERT Implementing Actions", EPIP-05, "SITE AREA EMERGENCY Implementing Actions", or EPIP-06, "GENERAL EMERGENCY Implementing Actions" is being implemented.

4.3 Instructions

4.3.1 Activation of the EOF

4.3.1.1 The Security Director shall assign a Security Force Member to the EOF to lock the door by stairway #2. The Security Force Member shall then station himself inside the Annex Building basement air lock to restrict entrance into the EOF only to authorized personnel and complete checklist in Appendix P.

NOTE

Each individual listed is responsible for set up of their working area of the EOF. This includes phone hook-up (if necessary) and breaking out from the storage closet all required material to function properly.

4.3.1.2 The following Offsite Emergency Organization personnel shall report to the EOF and complete their check lists:

(1) Emergency Operations Director - Appendix C, "Emergency Operations Director Checklist".

(2) Administration and Logistics Coordinator - Appendix D, "Administration and Logistics Coordinator Checklist".

(3) Radiological Assessment Coordinator - Appendix E, "Radiological Assessment Coordinator Checklist".

(4) Technical Analysis Coordinator - Appendix F, "Technical Analysis Coordinator Checklist".

(5) Radiological Assessment Communicator - Appendix G, "Radiological Assessment Communicator Checklist".

(6) Government Liaison Engineer - Appendix H, "Government Liaison Engineer Checklist".

(7) EOF Contact - Appendix I, "EOF Contact Checklist".

(8) Logistics Communicator - Appendix J, "Logistics Communicator Checklist".

(9) Security Coordinator - Appendix K, "Security Coordinator Checklist".

(10) Dosimetry Clerk - Appendix L, "Dosimetry Clerk Checklist and TLD Log".

(11) Clerical Aide/Status Board Keeper - Appendix M, "Clerical Aide/Status Board Keeper-EOF Checklist".

(12) R.P. Support Staff - No Checklist Provided. To Be Filled By Training Personnel.

CONTROLLED DOCUMENT

3

4.3.1.3 The Offsite Technical Representative shall report to the Technical Operations Center (TOC) at the State Emergency Operations Center (EOC) and complete the check list in Appendix N.

4.3.1.4 The JENC Technical Advisor shall report to the Joint Emergency News Center and complete the check list in Appendix O.

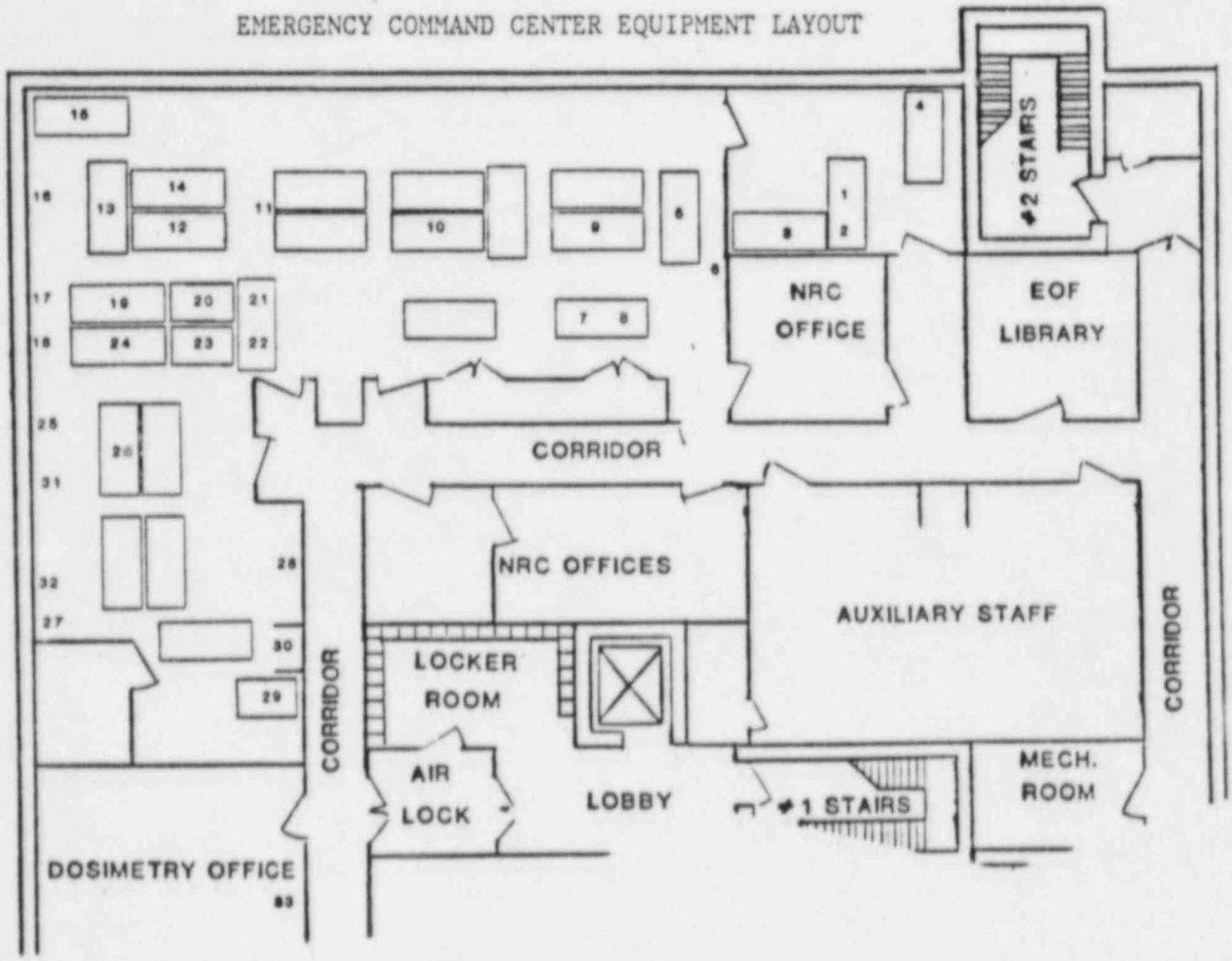
4.3.1.5 Appendices A, B and Q are provided to show EOF layout and floorplan.

4.3.2 Declaration of EOF Readiness

4.3.2.1 Upon completion of EOF staffing and readiness checks, the Emergency Operations Director shall contact the Emergency Coordinator, the Corporate Emergency Center (if activated) and the Joint Emergency News Center and inform them that the EOF is operational.

3

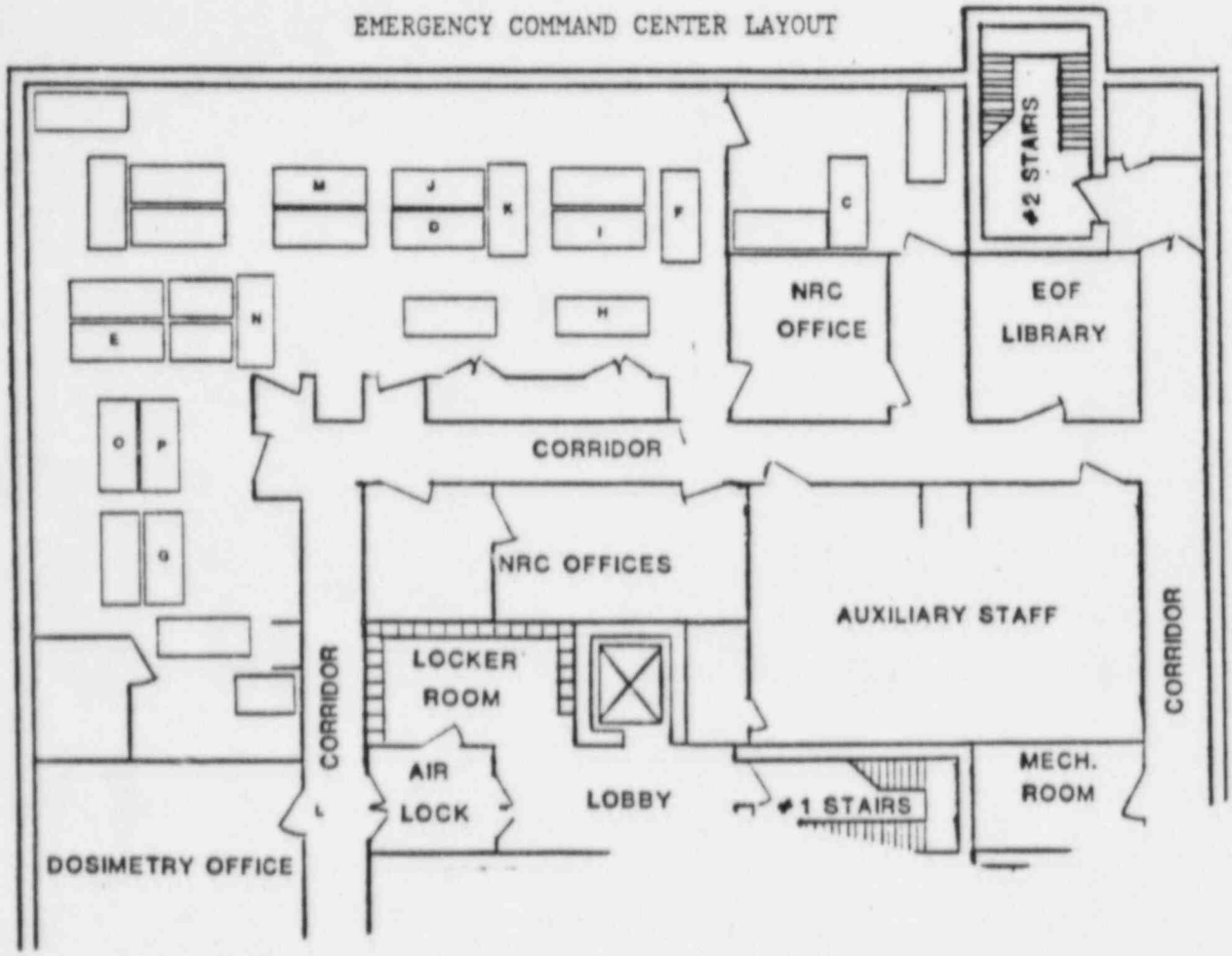
EMERGENCY COMMAND CENTER EQUIPMENT LAYOUT



1. EC/EOD Line
2. Ops. Voice #1
3. Exec. Pvt. Line
4. NOAA Weather Radio
5. Technical Line
6. ERFDADS Terminal
7. NAN
8. Ops. Voice #4
9. Public Info. #1
10. OSC Line
11. Copy Machine
12. High Speed Telecopier
13. Telecopier Circuit #1
14. Telecopier Circuit #2
15. SIMS/MMIS Computer
16. ERFDADS Printer
17. ERFDADS Terminal
18. CRACS
19. Env Assmt. Line
20. IBM Computer
21. TSC Line
22. STSC Line
23. Map Table
24. Ops. Voice #3
25. State Radio
26. Ops. Voice #2
27. CR Line
28. High Speed Telecopier
29. ANPP Radio
30. EOF Emergency Kit
31. ERFDADS Terminal
32. ERFDADS Terminal
33. REMS Terminal

3

EMERGENCY COMMAND CENTER LAYOUT



C - Emergency Operations Director
D - Administrative and Logistics Coordinator
E - Radiological Assessment Coordinator
F - Technical Analysis Coordinator
G - Radiological Assessment Coordinator
H - Government Liaison Engineer
I - EOF Contact
J - Logistics Communicator
K - Security Coordinator
L - Dosimetry Clerk
M - Clerical Aide/Status Board Keeper
N - Radiological Support Staff
O - State of Arizona
P - Federal Emergency Management Agency

* No 'A' & 'B' designated. Letters C through M correspond to the position appendices of this procedure.

3

EMERGENCY OPERATIONS DIRECTOR (OFFSITE)
CHECK LIST

POSITION FILLED BY: (1) Assistant Vice-President, Nuclear Production
(2) Manager, Operations
(3) Director, Technical Services

RESPONSIBILITY: Command and coordinate ANPP emergency operations. Maintain overall responsibility for ANPP onsite and offsite emergency functions. Interface between ANPP and federal/state/county emergency response agencies. Oversee the communication of plant status updates and radiological release data and the notification of state and local agencies concerning recommended protective actions. Provide administrative, technical, and logistical support to station emergency operations and ensure the continuity of emergency organization resources. Make appropriate exceptions to QA/QC and plant administrative procedures.

IMMEDIATE ACTIONS: TIME/INITIALS

NOTE

All actions listed in the EOD Checklist shall be noted in the EOD Log by the EOD or EOD Stenographer.

1. Report to the EOF upon notification. Upon arrival, sign in on the EOF Staffing Board. ____/____

2. Contact Emergency Coordinator at TSC using Emergency Coordinator/Emergency Operations Director (EC/EOD) line and review:

   (1) Basis for classification of event. ____/____
   (2) Status of plant conditions. ____/____
   (3) Corrective actions being implemented. ____/____
   (4) Status of notifications to other ANPP offsite staff and offsite emergency management agencies. ____/____

3. Ensure that all the following positions are staffed. As necessary, assign temporary personnel to fill staff positions until primary personnel arrive. ____/____

3

TIME/INITIALS

(1) Radiological Assessment Coordinator ____/____
(2) Technical Analysis Coordinator ____/____
(3) EOF Contact ____/____
(4) Administrative and Logistics Coordinator ____/____
(5) Logistics Communicator ____/____
(6) Government Liason Engineer ____/____
(7) Security Coordinator ____/____
(8) Clerical Aide/Status Board Keeper ____/____
(9) Radiological Assessment Communicator ____/____
(10) Dosimetry Clerk ____/____
(11) Alternate EOD (to serve as an assistant if needed) ____/____

4. Conduct briefing with available EOF personnel. As a minimum, the following items should be discussed:

(1) Adequacy of activation. ____/____
(2) Ability of assigned personnel to assume their emergency duty roles. ____/____
(3) Operability of equipment. ____/____

5. Notify the Emergency Coordinator at the TSC using EC/EOD line, the Corporate Emergency Director at the CEC using the Executive Private Ringdown circuit and ADES (TOC) using OPS voice circuit Number 1 that:

(1) EOF is operational ____/____

(2) Current plant status ____/____

(3) Recommended protective actions ____/____

6. Ensure EOF contact notifies the Joint Emergency News Center (JENC) that:

(1) The EOF is operational. ____/____

(2) The EOD has assumed control and responsibility for offsite communications. ____/____

*7. As appropriate, make exceptions to QA/QC and plant administrative procedures. ____

8. Ensure the following offsite agencies are contacted and notified by the GLE that the EOF is operational and the Emergency Operations Director is in command and has offsite communications responsibilities.

3

TIME/INITIALS

(1) Arizona Division of Emergency Services (using dedicated voice circuit). ___/___

(2) Arizona Radiation Regulatory Agency (using dedicated voice circuit). ___/___

(3) Maricopa County Dept. of Civil Defense and Emergency Services (using dedicated voice circuit). ___/___

(4) NRC Headquarters (using ENS or alternate, HPN). ___/___

9. Ensure the Followup Emergency Message Form is completed by the GLE in anticipation of next offsite update and recommendation of protective actions. ___/___

10. Provide initial briefing to federal and state staff at EOF.

*11. Brief EOF staff periodically using the EOF Public Address System. _____

12. As necessary, place EOF on recirculation. ___/___

13. If evacuation is ordered, receive from Emergency Coordinator total number of evacuees. _____ Total ___/___

SUBSEQUENT ACTIONS:

Notification

*14. Review onsite actions and requirements periodically with the Emergency Coordinator. _____

*15. Communicate with Corporate Emergency Director and provide periodic status updates as necessary. _____

*16. Consult with EOF Staff as necessary. _____

17. Repeat steps 8 and 9 periodically as necessary and whenever the emergency class changes. ___/___

(Update No. 2) ___/___
(Update No. 3) ___/___
(Update No. 4) ___/___

3

TIME/INITIALS

18. Within 8 hours following a closeout or reduction in Emergency Classification provide a written summary to offsite authorities. ____/____

Recovery

19. Do not inform JENC of downgrading, coordinate release of this information through the State EOC/TOC so that protective action recommendations may be considered.

20. Consult with Emergency Coordinator, NRC (in EOF), ADES and ARRA (in EOF); Declare the emergency over when the unit is in a controlled, stable condition; notify offsite agencies as in Step 8 and the ANPP emergency organization. ____/____

21. Collect all EOF personnel check lists and logs. ____/____
    (1) Technical Analysis Coordinator
    (2) EOF Contact
    (3) Radiological Assessment Coordinator
    (4) Administrative and Logistics Coordinator

22. Establish Recovery Organization and assume duties and responsibilities of Recovery Manager in accordance with EPIP-31, "Recovery". ____/____

23. Notify affected offsite Emergency Management Organizations using dedicated voice circuit systems that recovery operations are in progress. ____/____

Performed By: _____ _____
Signature

Date _____

* Continuing Activity

3

ADMINISTRATIVE AND LOGISTICS COORDINATOR
CHECK LIST

POSITION FILLED BY: (1) Manager, Operations Computer Systems

(2) Other Designated Personnel with appropriate training

RESPONSIBILITY: Calls in offsite resources and plans and provides logistical support for the onsite emergency organization. Logistical support includes provision of needed technical documents, additional communications and analytical equipment, additional security support, manpower support, transportation, housing and food needs. Acts as liaison to reporting support personnel and American Nuclear Insurers.

IMMEDIATE ACTIONS: TIME/INITIALS

1. Report to EOF upon notification. Upon arrival, sign in on the EOF Staffing Board. ____/____

2. Receive initial briefing from Emergency Operations Director and establish responsible area. ____/____

3. Ensure that the following equipment is operational:

   (1) SPDS ____/____

   (2) CRACS ____/____

   (3) EOF RE&M Terminals ____/____

   (4) EOF SIMS Terminal ____/____

4. Ensure that the following positions are staffed and fully briefed:

   (1) Logistics Communicator. ____/____
   (2) Security Coordinator. ____/____
   (3) Clerical Aide/Status Boardkeeper ____/____
   (4) DDC Staff ____/____
   (5) SIMS/MMIS Computer Staff ____/____

3

ADMINISTRATIVE AND LOGISTICS COORDINATOR
CHECK LIST (Cont.)

Time/Initials

5. Check that facilities available to Emergency Response Personnel are adequate. ____/____

NOTE

The SIMS/MMIS Computer Staff reports to the Administrative and Logistics Coordinator and normally returns to the SIMS/MMIS data center. If the Annex Building is uninhabitable, they relocate to the EOF.

6. Provide readiness briefing to Emergency Operations Director. ____/____

7. Maintain a log of actions as required. ____/____

SUBSEQUENT ACTIONS:

Offsite Assistance

*8. Contact support organizations listed in EPIP-33, "Offsite Assistance", to obtain necessary technical and/or additional manpower support (assume this function from Emergency Coordinator) using the commercial telephone line (see EPIP-33 for phone numbers). _____

*9. Contact American Nuclear Insurers, using the commercial telephone line and keep ANI informed of situation as necessary (until relieved of this responsibility by the Corporate Financial Coordinator). _____

Logistical Support

*10. Obtain, as necessary, required:

(1) Technical documents _____
(2) Communication equipment _____
(3) Analytical equipment _____
(4) Manpower support _____
(5) Transportation support _____
(6) Housing and food for Emergency Response Personnel _____

*11. Assist Government staff with logistics as necessary. _____

3

ADMINISTRATIVE AND LOGISTICS COORDINATOR
CHECK LIST (Cont.)

Time/Initials

Recovery

12. Receive check list and associated logs from the Logistics Communicator after emergency is terminated. ____/____

13. Receive check list and associated logs from the Security Director after emergency is terminated. ____/____

14. Receive check list and associated logs from the Clerical Aide/Status Board Keeper after the emergency is terminated. ____/____

15. Submit check list, logs, and other data to Emergency Operations Director when emergency is cancelled. ____/____

Performed By: _____
Signature

Date _____

* Continuing Activity

3

RADIOLOGICAL ASSESSMENT COORDINATOR CHECK LIST

POSITION FILLED BY: (1) Manager, Radiation Protection & Chemistry
(2) Other Designated Personnel

RESPONSIBILITY: Principal liaison of the PVNGS emergency response organization with the Radiological Technical Directorate. Receive and evaluate dose rate projection information from the Radiological Protection Coordinator. Advise the Emergency Operations Director of protective action recommendations to be provided to offsite authorities. Coordinate offsite monitoring efforts. Direct the Radiological Assessment Communicator.

IMMEDIATE ACTIONS:		TIME/INITIALS
1.	Report to EOF upon notification. Upon arrival, sign in on the EOF Staffing Board.	____/____
2.	Receive initial briefing from Emergency Operations Director and establish responsible area.	____/____
3.	Ensure that the Radiological Assessment Communicator's position is staffed and fully briefed and that communication systems are operational.	____/____
4.	Ensure R.P. Support Staff is briefed and ready to perform dose projections.	____/____
*5.	Access CRACS to receive current dose projection data. (If CRACS is available)	____/____
6.	Ensure operational status of dose calculation computer	____/____

* Continuing Activity

CONTROLLED DOCUMENT

3

RADIOLOGICAL ASSESSMENT COORDINATOR
CHECK LIST

TIME/INITIALS

7. Ensure that the following materials needed to perform manual dose assessments are available:

   (1) EPIP-14A, "Release Rate Determination", ___/___
   EPIP-14B, "Initial Dose Assessment", ___/___
   EPIP-14C, "Continuing Dose Assessment", ___/___
   (2) Isopleths ___/___
   (3) Base Map ___/___

8. Contact the Radiological Protection Coordinator at TSC using the Environmental Assessment line at ext. [redacted] and determine:

   *(1) Extent and consequence of radiological releases and plant conditions. _____
   (2) Protective action recommendations made to date. ___/___
   (3) Potential for future radiological releases. ___/___
   *(4) Location of offsite field monitoring teams, when dispatched. (May also contact Radiation Protection Monitor for this information). _____

9. Maintain a log of actions as required. ___/___

SUBSEQUENT ACTIONS:

Dose Rate Projections

10. Analyze source term, meteorological and field monitoring data to determine reasonableness and consistency of data with dose projections used as basis for protective actions. ___/___

*11. Evaluate plant conditions to determine probability and magnitude of possible emission increases. _____

*12. Ensure Radiological Status Boards are updated as information becomes available. _____

* Continuing Activity

3

RADIOLOGICAL ASSESSMENT COORDINATOR
CHECK LIST

TIME/INITIALS

Protective Actions

*13. Advise the Emergency Operations Director as to the need for protective actions. _____

*14. Provide updates to State of Arizona Representative concerning Protective Actions. _____

Field Monitoring

*15. Provide updates to the ARRA State Representative as necessary. _____

*16 Direct Radiological Assessment Communicator to position offsite field monitoring teams, as necessary _____

Recovery

17. Receive checklist and associated logs from the Radiological Assessment Communicator after emergency is terminated. ____/____

18. Receive checklist and associated logs from the Dosimetry Clerk after emergency is terminated. ____/____

19. Submit check list, logs and other data to Emergency Operations Director when emergency is cancelled. ____/____

Performed By: _____
Signature

Date _____

* Continuing Activity

7

TECHNICAL ANALYSIS COORDINATOR (OFFSITE) CHECK LIST

POSITION FILLED BY: (1) Designated person from Independent Safety Engineering Group (ISEG)

(2) Other Designated Personnel

RESPONSIBILITY: Function as the primary interface with NRC/state/county personnel stationed in the EOF. Provide updates on the status of the reactor and unit. Supervise the JENC Technical Advisor, GLE and OTR.

IMMEDIATE ACTIONS: TIME/INITIALS

1. Report to EOF upon notification. Upon arrival, sign in on the EOF Staffing Board. ____/____

2. Receive initial briefing from Emergency Operations Director and establish responsible area. ____/____

3. Ensure that the following positions are staffed and fully briefed:

   (1) Government Liaison Engineer. ____/____
   (2) Offsite Technical Representative. ____/____
   (3) JENC Technical Advisor ____/____

*4. Obtain information on plant status from TSC using the Technical line (ext. [redacted] or normal phone line. _____

*5. Brief Emergency Operations Director on operational status. _____

*6. Maintain a log of actions required. _____

---

* Continuing Activity

CONTROLLED DOCUMENT

3

TECHNICAL ANALYSIS COORDINATOR (OFFSITE)
CHECK LIST (Cont.)

SUBSEQUENT ACTIONS: TIME/INITIALS

Technical Guidance

*7. Provide Emergency Operations Director with technical guidance on how plant status may impact offsite emergency response actions. _____

*8. Receive reports on technical changes and recommendations from the Technical Engineering Coordinator in the TSC. _____

Government Staffing at EOF

*9. Provide updates to NRC, state, and county personnel as necessary on the status of the reactor and unit; assisted by Government Liaison Engineer. _____

Public Information

*10. Verify the technical accuracy and adequacy of all public information releases prior to dissemination to the news media. _____

*11. Supervise JENC Technical Advisor informing the JENC Facility Manager of plant status. _____

* Continuing Activity

3

TECHNICAL ANALYSIS COORDINATOR (OFFSITE)
CHECK LIST (Cont.)

SUBSEQUENT ACTIONS: TIME/INITIALS

Recovery

12. Receive check list and associated logs after emergency is terminated from
    (1) Government Liaison Engineer
    (2) Offsite Technical Representative
    (3) JENC Technical Advisor _____/_____

13. Submit check list, logs and other data to Emergency Operations Director when emergency is cancelled. _____/_____

Performed By: _____
Signature

Date _____

3

RADIOLOGICAL ASSESSMENT COMMUNICATOR CHECK LIST

POSITION FILLED BY: (1) Designated person from Radiation Protection Section with appropriate training.

(2) Other Designated Personnel

RESPONSIBILITY: Maintain a record of matters pertaining to radiological assessment. Maintain communications with radiological assessment personnel at the TSC and STSC.

IMMEDIATE ACTIONS:	TIME/INITIALS
1. Report to EOF upon notification. Upon arrival, sign in on the EOF Staffing Board.	____/____
2. Obtain initial briefing from Radiological Assessment Coordinator and establish responsible area.	____/____
3. Determine operability of following communications circuits:	
(1) Normal phone	____/____
(2) Dedicated voice circuits	____/____
(3) Environmental Assessment Line	____/____
(4) Base station radio	____/____
4. Report inoperable circuits to Radiological Assessment Coordinator and Administrative and Logistics Coordinator.	____/____
*5. Establish and maintain communications with TSC and STSC Radiological Assessment personnel using the normal PBX phone line.	_____

* Continuing Activity

3

RADIOLOGICAL ASSESSMENT COMMUNICATOR
CHECK LIST (Continued)

SUBSEQUENT ACTIONS: Time/Initials

Radiological Assessment

*6 Direct offsite radiological field assessment teams to various sampling locations as requested by the Radiological Assessment Coordinator. Coordinate team movement with state and other agency teams as required. _____

*7. Plot reported dose rates and various team locations as an aid in plume tracking. _____

*8. Inform the Radiological Assessment Coordinator of changes in radiological status. _____

*9. Maintain records of communications concerning radiological assessment. _____

*10. Maintain a log of actions as required _____

Recovery

11. Submit check list and logs to Radiological Assessment Coordinator when emergency is cancelled. ____/____

Performed By _____
Signature

Date _____

* Continuing Activity

3

GOVERNMENT LIAISON ENGINEER
CHECK LIST

POSITION FILLED BY: (1) Designated person from Nuclear Engineering or Licensing Department with appropriate training.

(2) Other Designated Personnel

RESPONSIBILITY: Relieve STSC Communicator of responsibility of making initial and subsequent notifications of changes in emergency classification to Federal, State and County Agencies. Assist Technical Analysis Coordinator with briefings of Government staff at EOF.

IMMEDIATE ACTIONS:	TIME/INITIALS
1. Report to EOF upon notification. Upon arrival sign in on the EOF Staffing Board.	____/____
2. Establish responsible area.	____/____
3. Receive initial briefing from Technical Analysis Coordinator.	____/____
4. Inform the STSC Communicator, using the normal phone line (Unit I - ext. [redacted] Unit II - ext. [redacted] that you are on station and assume the responsibility for offsite notifications of changes in emergency classification.	____/____
*5. Establish and maintain communications with offsite agencies, per EPIP-04, EPIP-05, or EPIP-06 and using Voice Circuit #4.	____
*6. Maintain log of communications per EPIP-04, EPIP-05, or EPIP-06.	____

* Continuing Activity

CONTROLLED DOCUMENT

3

IMMEDIATE ACTIONS: (Cont'd) TIME/INITIALS

7. Notify the FAA using commercial phone lines as necessary. ____/____

8. Notify the National Transportation Board using commercial phone lines as necessary. ____/____

*9. Maintain a log of actions as required. _____

SUBSEQUENT ACTIONS:

Government Staffing at EOF

*10. Assist Technical Analysis Coordinator with briefings of Government staff at EOF, as necessary. _____

Recovery

11. Provide termination of emergency announcement per EPIP-04, EPIP-05 or EPIP-06. _____

12. Submit check list, logs, and other data to Technical Analysis Coordinator when emergency is cancelled. ____/____

Performed By: _____
Signature

Date _____

* Continuing Activity.

3

EOF CONTACT CHECK LIST

POSITION FILLED BY: (1) PVNGS Training Department Individual with Appropriate EOF Contact Training

(2) Other Designated Personnel

RESPONSIBILITY: Report significant changes in plant status to JENC Facility Manager for subsequent release to media. Maintain close contact with JENC Facility Manager.

IMMEDIATE ACTIONS: TIME/INITIALS

1. Report to EOF upon notification. Upon arrival, sign in on the EOF Staffing Board. ____/____

2. Receive initial briefing from Emergency Operations Director. ____/____

*3. Establish and maintain communications with the CHIC Director until the Joint ENC is activated. ____/____

*4. Establish and maintain communications with the JENC Facility Manager at the Joint Emergency News Center using the Public Information Ringdown Phone Circuit #1. ____/____

5. Report readiness to Emergency Operations Director. ____/____

*6. Maintain a log at actions as required. ____

SUBSEQUENT ACTIONS:

Public Information

> CAUTION
>
> PROTECTIVE ACTIONS RECOMMENDED TO STATE AUTHORITIES BY ANPP SHALL NOT BE TRANSMITTED TO THE JENC.

*7. Maintain continuous contact with JENC Facility Manager using the Public Information Ringdown Phone Circuit #1. ____/____

* Continuing Activity

3

EOF CONTACT CHECK LIST — TIME/INITIALS

*8. Assure that press releases are reviewed expeditiously at the EOF by the Emergency Operations Director (EOD). _____

9. Submit check list, logs and other data to EOD when emergency is cancelled. ____/____

Performed By _____
Signature

Date _____

* Continuing Activity

3

EOF CONTACT INFO SHEET

THIS IS/IS NOT A DRILL
Telecopy to JENC/CHIC

DATE _____ TIME _____ SERIAL # _____

1. EVENT CLASSIFICATION:
   a. UNUSUAL EVENT ALERT SITE AREA EMERGENCY GENERAL EMERGENCY.
   b. Basis (E A L) c. Release (YES / NO)
   Wind: _____ / _____ / _____
   Speed From Stability
   c. Initiating Event: _____
   1) Basis for event classification: _____
   _____

2. EMERGENCY FACILITY ACTIVATION:
   a. STSC/TSC (YES / NO) b. EOF (YES / NO) c. OSC (YES / NO)
   d. Accountability; Plant Evacuation:
   Ordered: (YES / NO) Complete: (YES / NO)
   Missing People: (YES / NO) Search Ordered: (YES / NO)
   e. Injuries (YES / NO) Contamination: (YES / NO)

3. PLANT STATUS:
   Criticality: _____ Rod Position: _____ Boron: _____

   Power: _____ Hot Leg Temp: _____ T ave: _____

   RCS Pressure: _____ Vessel Level: _____ CTMT Pressure: _____

   CTMT Humidity: _____ Temp: _____ CTMT Dose Rate: _____

   CTMT Water Level: _____ Sub Cool Margin: _____ SI Flow: _____

   Pressurizer Level: _____ RWT Level: _____

4. EQUIPMENT STATUS:
   RCS Pumps: _____ Turbine: _____ Diesels: _____ Charging Pumps: _____
   Safety Injection - HPSI: A _____ B _____ LPSI: A _____ B _____
   CTMT Spray: A _____ B _____ CTMT Isolation: _____

5 RADIOLOGICAL STATUS:
   Value: _____ Instrument Type: _____
   Meaning: _____
   _____
   _____
   _____

3

LOGISTICS COMMUNICATOR
CHECK LIST

POSITION FILLED BY: (1) Designated person from Materials Control Section with appropriate training

(2) Other Designated Personnel

RESPONSIBILITY: Maintain record of logistics support needed and obtained. Contact offsite support organizations to obtain needed support at direction of Administrative and Logistics Coordinator.

IMMEDIATE ACTIONS: TIME/INITIALS

1. Report to the EOF upon notification. Upon arrival, sign in on the EOF Staffing Board. ____/____
2. Receive initial briefing from the Administrative and Logistics Coordinator. Establish responsible area. ____/____
3. Ensure all EOF communications equipment is operational with assistance of Radiological Assessment Communicator. ____/____
4. Synchronize EOF clocks with affected unit control room clock. ____/____
5. Establish and maintain a record of logistic support obtained and required. ____/____
6. Report readiness to Administrative and Logistics Coordinator. ____/____
*7. Maintain an action log as required. _____

SUBSEQUENT ACTIONS:

Offsite Assistance

*8. Contact offsite support organizations per EPIP-33, "Offsite Assistance", at direction of Administrative and Logistics Coordinator. _____

3

LOGISTICS COMMUNICATOR
CHECK LIST

Recovery

9. Submit check list and records to Administrative and Logistics Coordinator upon cancellation of emergency. ____/____

Performed By: _____
Signature

Date _____

_____

* Continuing Activity

3

SECURITY COORDINATOR CHECK LIST

POSITION FILLED BY: (1) Designated person from Security Department with appropriate training.

(2) Other Designated Personnel

RESPONSIBILITY: Maintain communications with Security Director regarding offsite personnel required onsite. Process personnel necessary for site support prior to site entry.

IMMEDIATE ACTIONS: TIME/INITIALS

1. Report to EOF upon notification. Upon arrival, sign in on the EOF Staffing Board. ____/____

2. Receive initial briefing from Administrative and Logistics Coordinator and establish responsible area. ____/____

3. Contact Security Director at TSC using the normal phone at ext. [redacted] or alternate (the security radio frequency) to determine present site access conditions. ____/____

4. Inform the Administrative and Logistics Coordinator of site security conditions and report readiness. ____/____

*5. Maintain action log as required. _____

SUBSEQUENT ACTIONS:

Security/Site Access

6. Inform the Security Director at TSC using the normal phone or alternate (the security radio frequency), of offsite personnel required onsite to expedite badging process. ____/____

*7. Maintain communications with the Security Director at TSC using the normal phone line regarding personnel granted access to site. _____

*8. Process personnel necessary for site support prior to site entry per appropriate security procedures. _____

3

SECURITY COORDINATOR CHECK LIST

Recovery

9. Submit check list and logs to the Administrative and Logistics Coordinator upon cancellation of emergency. ___/___

Performed By: _____
Signature

Date _____

* Continuing Activity

3

DOSIMETRY CLERK
CHECK LIST AND TLD LOG

POSITION FILLED BY: (1) Designated person from Radiation Protection Section with appropriate training

(2) Other Designated Personnel

REPONSIBILITY: Provide proper dosimetry and TLDs, as necessary, to EOF personnel, support personnel reporting to site assignment, and site personnel. Maintain dosimetry issuance records. Perform habitability surveys of the EOF.

IMMEDIATE ACTIONS:	TIME/INITIALS
1. Report to EOF upon notification. Upon arrival, sign in on the EOF Staffing Board.	____/____
2. Receive initial briefing from the Radiological Assessment Coordinator and establish responsible area.	____/____
3. Obtain emergency dosimetry from EOF emergency locker in preparation for distribution.	____/____
4. Report readiness to the Radiological Assessment Coordinator.	____/____
*5. Maintain action log as required.	_____

SUBSEQUENT ACTIONS:

6. Provide dosimetry and TLDs, as necessary, to the following:	
(1) EOF personnel.	____/____
(2) Support personnel reporting for site assignment.	____/____
(3) Site personnel.	____/____
*7. Maintain dosimetry issuance records.	_____
*8. Report need for additional dosimetry to the Radiological Assessment Coordinator.	_____

3

DOSIMETRY CLERK
CHECK LIST AND TLD LOG (Cont'd)

SUBSEQUENT ACTIONS:	TIME/INITIALS
*9. As required perform habitability surveys of the EOF.	_____
10. Submit check list and dosimetry issuance records to the Radiological Assessment Coordinator upon cancellation of emergency.	_____/_____

* Continuing Activity

Performed By _____
Signature

Date _____

3

DOSIMETRY CLERK
CHECK LIST AND TLD LOG (Cont'd)

EMERGENCY PLAN TLD LOG

NAME	Employee No., or Company	TLD No.	ISSUE DATE

3

CLERICAL AIDE/STATUS BOARD KEEPER-EOF
CHECK LIST & STATUS BOARDS

POSITION FILLED BY: (1) Designated person with appropriate training.

RESPONSIBILITY: Maintain record of emergency actions taken by ANPP Emergency Organization on Status Boards. Record status of emergency.

IMMEDIATE ACTIONS: TIME/INITIALS

1. Report to EOF upon notification. Upon arrival, sign in on the EOF Staffing Board. ____/____

2. Receive briefing from Administrative and Logistic Coordinator and establish responsible area. ____/____

3. Report readiness to Administrative and Logistics Coordinator. ____/____

SUBSEQUENT ACTIONS:

Status Board

*5. Record status of emergency as expressed by Technical Analysis Coordinator or Radiological Assessment Coordinator. _____

NOTE

Ensure time recorded on status boards is event time rather than posting time.

Recovery

6. Submit check list to Administrative and Logistics Coordinator upon cancellation of emergency. ____/____

Performed By _____
Signature

Date _____

* Continuing activity

CLERICAL AIDE/STATUS BOARD KEEPER-EOF
CHECK LIST & STATUS BOARDS

EVENT STATUS

UNIT:_____ EMERGENCY CLASS:_____ TIME:_____

Time:_____ Date:_____

Rx Coolant System

Avg. Temp. Th____°F Tc____°F
Pzr. Pressure_____PSIA
Pzr. Level_____%
Rx Vessel Level_____%
Subcool Margin_____°F
Boron_____PPM

Time:_____ Date:_____

Containment

Pressure_____PSIG
Temperature_____°F
Humidity_____%
Radiation Level_____R/hr
Where_____
Activity_____uCi/cc
Recirc. Sump Level_____ft
Isolation Status_____
Cont. Spray____A____B

Time:_____ Date:_____

Met. Data

Wind Speed_____mph
Wind Direction (from)_____°true
Stability Class_____
Precipitation_____in./24hrs
Forecast_____

Inoperable Equipment

	Time	Date

Time:_____ Date:_____

Make-up

Total SI Flow_____GPM
RWT Level_____%

Pumps Available:

LPSI____A____B
HPSI____A____B
Charging____A____B____E

Time:_____ Date:_____

Heat Removal

Reactor Coolant Pumps____1A____1B____2A____2B
S/D Cooling Train____A____B
Steam Generator Level, %WR____1____2
Aux. Feed Water to SG, GPM____1____2
Aux. Feed Water Pumps Running____A____B____N
Condensate Storage Tank Level_____

PV216 000A (8/82)

CONTROLLED DOCUMENT

CLERICAL AIDE/STATUS BOARD KEEPER-EOF
CHECK LIST & STATUS BOARDS

PLANT STATUS

DATE: _____ **TIME:** _____ **UNIT:** _____

R_X Power _____ % Trend _____ Boron Conc. _____ PPM

CEA Status _____ Reactor Tripped Yes / No

RCS Press. _____ PSIA Trend _____ Subcooled Margin _____ °F Trend _____

RCS Temps.: Loop 1 T_H _____ °F T_{CA} _____ °F T_{CB} _____ °F

Loop 2 T_H _____ °F T_{CA} _____ °F T_{CB} _____ °F

PZR Level _____ % R_XVL _____ % Core Exit TC: Highest _____ °F AVG _____ °F

CHRG Pumps Operating A B E RCP's Operating _____

RCS Activity Sample _____ µCi/gm RCS Rad. Mon. _____ µCi/gm

SG1 Level _____ %WR Press. _____ PSIG ISOL/SBCS/ATMOS Dump

Activity _____ µCi/gm AFW Flow _____ GPM

SG2 Level _____ %WR Press. _____ PSIG ISOL/SBCS/ATMOS Dump

Activity _____ µCi/gm AFW Flow _____ GPM

PV216 000A (8/82)

3

CLERICAL AIDE/STATUS BOARD KEEPER-EOF
CHECK LIST & STATUS BOARDS

SI: SDC _____ Cold Leg Inj. _____ RAS _____ Hot/Cold Inj. _____

HPSI Cold Leg Flow GPM 1A _____ 1B _____ 2A _____ 2B _____

HPSI Hot Leg Flow GPM 1 _____ 2 _____

LPSI Cold Leg Flow GPM 1 _____ 2 _____

SITS (Level/Outlet Valve) 1A ___/___ 1B ___/___ 2A ___/___ 2B ___/___
(Ann / open-closed)

CTMT: Press. _____ PSIG Temp. _____ °F Temp. Trend _____ °F/HR

CIAS ____ Yes/No CSAS ____ Yes/No Total CS Flow _____ GPM

Radwaste Sump Level A _____ IN B _____ IN

Recirc. Sump Level A _____ FT B _____ FT

H_2 Conc. _____ Humidity _____

H_2 Recombiners _____ CTMT Rad. Mon. _____

H_2 Purge Unit _____

AFW Pumps On _____ CST Level _____ FT

PBA SO3 On _____ PBB SO4 On _____

DG's Operating _____ Offsite Power Avail. _____

Estimated Prim/Sec Leakrate _____ GPM

PV216-00DA (8/82)

3

CLERICAL AIDE/STATUS BOARD KEEPER-EOF
CHECK LIST & STATUS BOARDS

SOURCE-TERM STATUS AND TRENDS

Monitor	Channel	Reading / Time	Reading / Time	Reading / Time	Reading / Time	Reading / Time	Reading / Time	Reading / Time	Reading / Time
Containment Atmosphere	Part. μCi/cc								
	Iodine μCi/cc								
	Gas μCi/cc								
Plant Vent	Part. μCi/cc								
	Iodine μCi/cc								
	Gas μCi/cc								
Fuel Bldg. Exhaust	Part. μCi/cc								
	Iodine μCi/cc								
	Gas μCi/cc								
Condenser Off Gas	Part. μCi/cc								
	Iodine μCi/cc								
Steamline Monitor	mR/hr								
Containment Area Monitor	R/hr								

3

CLERICAL AIDE/STATUS BOARD KEEPER-EOF
CHECK LIST & STATUS BOARDS

RADIOLOGICAL STATUS

Date: _____ Time: _____

Release: Occuring _____ Controlled _____ Yes/No

Anticipated _____ When _____

Location of Release: Plant vent _____ Steam _____

Containment _____ Condenser _____

Fuel Building _____ Aux Feed Pump _____

Release Monitored: Yes _____ No _____

Form: Gas _____ Particulate _____ Liquid _____

Iodine — 131 Equiv.: Release rate: _____ µCi/cc x _____ CC/sec. = _____ µCi/sec.

Particulate Release rate: _____ µCi/cc x _____ CC/sec. = _____ µCi/sec.

Noble gas: Release rate: _____ µCi/cc x _____ CC/sec. = _____ µCi/sec.

Est. of Surface Contamination: _____ dpm/100 cm²

Where _____

Unusual Radiation Level in Plant: _____ mR/hr.

Where _____

Wind Velocity: _____ mph Direction (from) _____ °true

Sigma _____

Stability: Class _____ ΔT _____ °F Precipitation _____ in./24 hrs

Recommended Protective Measures/Emergency Actions: _____

PLANT MONITORING DATA

Location	Time	Dose Rate	Count Rate	Iodine Conc.	Particulate Conc.
		mR/hr.	cpm	µCi/cc	µCi/cc
		mR/hr.	cpm	µCi/cc	µCi/cc
		mR/hr.	cpm	µCi/cc	µCi/cc
		mR/hr.	cpm	µCi/cc	µCi/cc
		mR/hr.	cpm	µCi/cc	µCi/cc
		mR/hr.	cpm	µCi/cc	µCi/cc
		mR/hr.	cpm	µCi/cc	µCi/cc
		mR/hr.	cpm	µCi/cc	µCi/cc
		mR/hr.	cpm	µCi/cc	µCi/cc
		mR/hr.	cpm	µCi/cc	µCi/cc
		mR/hr.	cpm	µCi/cc	µCi/cc
		mR/hr.	cpm	µCi/cc	µCi/cc
		mR/hr.	cpm	µCi/cc	µCi/cc
		mR/hr.	cpm	µCi/cc	µCi/cc
		mR/hr.	cpm	µCi/cc	µCi/cc
		mR/hr.	cpm	µCi/cc	µCi/cc
		mR/hr.	cpm	µCi/cc	µCi/cc
		mR/hr.	cpm	µCi/cc	µCi/cc

CENTERLINE DOSE PROJECTIONS

Site Bound.	2 hr Proj Dose W.B.	2 hr Proj Dose Thy.	Proj Int Dose W.B.	Proj Int Dose Thy.	Sector
2 mi					
5 mi					
10 mi					

OFFSITE TECHNICAL REPRESENTATIVE
CHECK LIST & LOG

POSITION FILLED BY: (1) Designated person from Nuclear Operations Licensing with appropriate training.

(2) Other Designated Personnel

RESPONSIBILITY: Coordinate ANPP emergency response activities with federal/state/county agencies at the State EOC/TOC. Provide up-to-date site information. Interpret substantiated data regarding PVNGS emergency status and conditions for emergency response agencies assigned to the State EOC/TOC.

IMMEDIATE ACTIONS:	TIME/INITIALS
1. Report to Technical Operations Center (TOC) at State Emergency Operations Center (EOC), ADES Headquarters, 5636 East McDowell Road in Phoenix, upon notification.	____/____
2. Report presence to ARRA Director of Radiological Technical Operations.	____/____
3. Contact Technical Analysis Coordinator at EOF using dedicated voice circuit and receive initial briefing.	____/____

SUBSEQUENT ACTIONS:

APS and State EOC/TOC Coordination

*4. Maintain communications and coordinate actions between ARRA Director of Radiological Technical Operations and ANPP Technical Analysis Coordinator at EOF using dedicated voice circuit.	_____
*5. Provide site information and interpret data at State TOC.	_____

3

OFFSITE TECHNICAL REPRESENTATIVE
CHECK LIST and Log (Cont.)

	TIME/INITIALS
*6. Maintain log as necessary.	_____

Recovery

7. Submit check list and log to Technical Analysis Coordinator at EOF upon cancellation of emergency.	____/____

Performed By _____
Signature

Date _____

*Continuing Activity

3

OFFSITE TECHNICAL REPRESENTATIVE CHECKLIST AND LOG

	Time	Person Contacted	Information Related
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			

Performed By _____
Signature

Date _____

CONTROLLED DOCUMENT

3

JENC TECHNICAL ADVISOR CHECK LIST

POSITION FILLED BY: (1) Designated person from Nuclear Engineering Department with appropriate training.

(2) Other Designated Personnel

RESPONSIBILITY: Provide any necessary technical explanations and background to JENC Facility Manager. Review technical content of all media releases.

IMMEDIATE ACTIONS: TIME/INITIALS

1. Upon notification report to Joint Emergency News Center (JENC) at 5636 E. McDowell Rd., Phoenix. ____/____

2. Report presence to JENC Facility Manager. ____/____

3. Contact Technical Analysis Coordinator at EOF using dedicated voice circuit (or alternate) and receive initial briefing. ____/____

SUBSEQUENT ACTIONS:

Public Information

*4. Maintain frequent communication with EOF contact and receive plant status updates. _____

*5. Provide technical explanations and background information tc JENC Facility Manager, as necessary (and to media if required). _____

*6. Review technical content of all media releases. _____

Recovery

7. Submit check list to Technical Analysis Coordinator at EOF upon cancellation of emergency. ____/____

Performed By _____
Signature

Date _____

3

SECURITY FORCE MEMBER
CHECK LIST

POSITION FILLED BY: Security Personnel

RESPONSIBILITY: Restrict access to EOF.

IMMEDIATE ACTIONS: TIME/INITIALS

1. Upon being relieved by the reporting Security Officer proceed to EOF and perform the following:

   (1) Lock door by stairway #2 (see Appendix Q) to restrict entrance to the EOF. _____/_____

   (2) Man post inside the Annex Building basement air lock to restrict entrance into the EOF. _____/_____

2. Report completion of EOF readiness to Security Captain at Security Building. (Ext. [redacted]) _____/_____

SUBSEQUENT ACTIONS:

3. Submit checklist to Security Coordinator when emergency is terminated. _____/_____

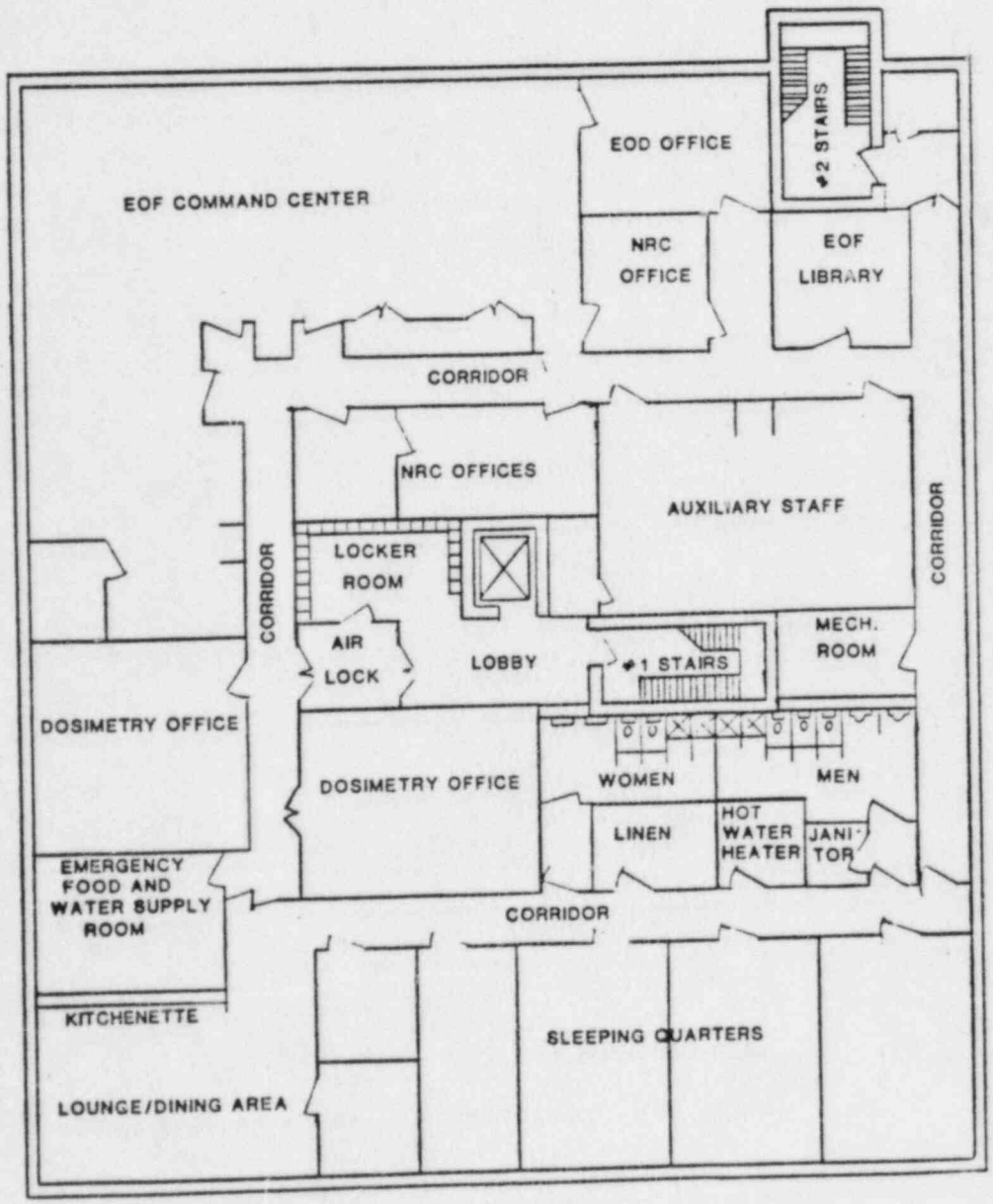
Performed By _____
Signature

Date _____

PVNGS EMERGENCY PLAN IMPLEMENTING PROCEDURE	PROCEDURE NO. EPIP-13	APPENDIX Q Page 1 of 1
EMERGENCY OPERATIONS FACILITY ACTIVATION	REVISION 3	Page 50 of 50

3

EMERGENCY OPERATIONS FACILITY LAYOUT



PVNGS EMERGENCY PLAN IMPLEMENTING PROCEDURE	PROCEDURE NO. EPIP-14A	
RELEASE RATE DETERMINATION	REVISION 6	Page 1 of 23

DEPT. HEAD Dennis S. Ferro DATE 3/19/85

PRB/PRG/TRRG REVIEW J.M. Allen DATE 3/29/85

APPROVED BY [illegible] DATE 4/5/85

EFFECTIVE DATE 04.10.85

DN-1620A/0651A

REVISION HISTORY

Rev. No.	Date	Revised Pages	Comments
5	~~12-21-84~~ OA-10-85	4, 8, 15	Revised SLM Correction Factor Calculational Method.
6		3,9,10,19-23	Incorporated new Bechtel calculations for isolated containment and external monitors.

TABLE OF CONTENTS

SECTION		PAGE NUMBER
1.0	OBJECTIVE	4
2.0	REFERENCES	4
3.0	LIMITATIONS AND PRECAUTIONS	4
4.0	DETAILED PROCEDURE	5
4.1	Personnel Indoctrination/Responsibilities	5
4.2	Prerequisites	5
4.3	Instructions	6

APPENDICES

Appendix A -	Release Rate Determination From an Effluent Release Point	10
Appendix B -	Effective Age Correction Factors For the Effluent Monitors	12
Appendix C -	Noble Gas and Iodine Radiological Data	13
Appendix D -	Release Rate Determination from Main Steam System	14
Appendix E -	Release Rate Determination from an Isolated Containment Using Design Basis Leak Rates and Area Monitors or External Containment Radiation Monitors	17

1.0 OBJECTIVE

This procedure permits determination of radioactive release rates (Sections 4.3.1 and 4.3.2) or the projection of release rates using design basis containment leak rates (Sections 4.3.3 and 4.3.4).

2.0 REFERENCES

2.1 Implementing References

2.1.1 EPIP-14B, "Initial Dose Assessment"

2.1.2 78AC-0ZZ06, "Document and Record Turnover Control"

2.1.3 74CH-9ZZ47, "Core Damage Assessment"

2.2 Developmental References

2.2.1 PVNGS Emergency Plan, Rev. 5

2.2.2 FSAR, Chapter 11, "Process and Effluent Radiological Monitoring and Sampling Systems", Section 11.5, August 1981.

2.2.3 NUREG-0737, "Clarification of TMI Action Plan Requirements", October 1980.

2.2.4 EPA-520/1-75-001, "Manual of Protective Action Guides and Protective Actions for Nuclear Incidents," Rev. 6/80.

2.2.5 CE System 80 CESSAR, Standard PWR NSSS

2.2.6 Steam Tables; Table 1, ASME, 1967

2.2.7 ANPP: Radiation Design Guide, SYS 80-PE-RG, Rev. 2

2.2.8 "Reactor Shielding Design Manual," T. Rockwell, III, editor. D. Van Nostand, Princeton NJ

2.2.9 "Radiological Health Handbook," US DNEW, 1970, National Technical Information Service

3.0 LIMITATIONS AND PRECAUTIONS

3.1 The accuracy of plant vent monitors is ±25% and the accuracy of containment area monitors is ±20%. Therefore, release rate calculations may be limited to two significant figures.

4.0 DETAILED PROCEDURE

4.1 Personnel Indoctrination/Responsibilities

4.1.1 Monitor readings and monitor channel number should be obtained from the communication console in the Control Room or the console in the Radiation Protection office.

4.1.2 "Effective age" refers to the time between core shutdown and time of the release. Release rates will vary as a function of "effective age".

4.1.3 When selecting values from the appendices, data corresponding to 1% failed fuel shall be used unless plant conditions indicate severe fuel cladding failure. When the effective age falls between two listed values, an effective age that yields the higher value shall be used.

4.1.4 The Radiation Protection Technician (affected unit) shall be responsible for the initial release rate determinations and off-site dose calculations (EPIPs-14A, 14B).

4.1.5 The Radiological Protection Coordinator shall be responsible for dose assessment when the TSC is activated (EPIPs-14A, 14B, 14C).

4.1.6 If the CRAC System or IBM PC Dose Projection programs are to be used, proceed directly to the CRAC System Operations Procedure or the PVNGS Emergency Off-site Dose Calculation Computer Program, App. E, of EPIP 14B.

4.1.7 All release rate determination/projection documents shall be processed in accordance with 78AC-0ZZ06, "Document and Record Turnover Control". These documents may be in the form of the Data Tables in the appendices or computer printouts from CRACS or the IBM PC program.

4.2 Prerequisites

None

4.3 Instructions

NOTE

Use Section 4.3.1 for actual releases through the Plant Vent, Fuel Building Vent Exhaust and/or Condenser Air Removal System. If the release is through the main steam lines only, proceed to Section 4.3.2. If it is desired to predict release rates from containment, proceed to Section 4.3.3.

4.3.1 Determination of Activity Release Rate From an Effluent Release Point (Appendix A)

4.3.1.1 Complete Section A of Appendix A, "Release Rate Determination From an Effluent Release Point" and obtain RMS data and monitor channel number from RP office or Control Room to determine the monitor correction factor from Appendix B.

4.3.1.2 From the Control Room, determine which fans are operating and complete Section B. If fan operating information is not available, assume that all fans are running. Total plant release rate is the sum of the individual pathway release rates.

4.3.1.3 Complete Section C using the Total Noble Gas Release Rate from Section B and the values listed in Appendix C.

4.3.1.4 If a release is in progress via the main steam lines, continue with Section 4.3.2; if not, perform offsite dose projections in accordance with EPIP-14B, "Initial Dose Assessment".

4.3.2 Determination of Activity Release Rate From the Main Steam Lines (Appendix D)

NOTE

Due to the low effective energy, Main Steam Line Monitors will not detect a noble gas release under maximum design operating parameters (1% Failed Fuel; FSAR Chapter 11). If Main Steam Line Monitor readings are above normal operating background levels then severe core degradation should be assumed and the higher source term values of total core inventory should be used for release rate and dose projection calculations. Notify the Shift Supervisor or Radiation Protection Coordinator (if present) immediately.

4.3.2.1 Complete Section A of Appendix D, "Release Rate Determination from Main Steam System".

4.3.2.2 Enter the value of the higher reading monitor for the affected steam generator in Section B of Appendix D, pg. 1. (Ex. If only one steam generator is exhibiting primary to secondary leakage, enter the higher value between the A & B channel for this steam generator. If both steam generators exhibit primary to secondary leaks then the higher channel for both RU-139 and RU-140 shall be entered and the releases added together.)

4.3.2.3 Multiply the higher monitor reading from RU-139 A or B and/or RU-140 A or B by the Correction Factor shown below to obtain Steam Line Concentration. Record in Section B both Correction Factor used and Steam Line Concentration.

Monitor Correction Factors (4.3.2.3)

Effective Age (HR)	Monitor Correction Factor (hr-μCi / mr-cc)
0	.078
.5	.089
1.0	.11
1.5	.13
2.0	.17
2.5	.24
3.0	.28
3.5	.32
4	.44
5	1.3
6	1.8
7	5.2
8	15.6

4.3.2.4 Record Noble Gas Concentration in microcuries per cubic centimeter for each monitor used in Section B.

NOTE

Reactor Coolant System Temperature is used as steam temperature for steam density compensation.

4.3.2.5 Obtain from the Control Room the Reactor Coolant System (RCS) temperature in degrees Fahrenheit and steam line flow rates in pounds per hour. Record flow rates in Section B.

4.3.2.6 Using RCS temperature and page 3 of Appendix D, select the appropriate Conversion Factor and record in Section B.

4.3.2.7 Complete Section B by multiplying Noble Gas Concentration by Conversion Factor and Steam Flow Rate.

4.3.2.8 Complete Section C using Total Noble Gas Release Rate from Section B and values listed in Appendix C (Total Core Inventory) for Total I/NG ratio and I-131/Total I ratio for given effective age.

4.3.2.9 Add noble gas and I-131 release rates to those determined in Section 4.3.1, if applicable, and perform offsite dose projections in accordance with EPIP-14B.

4.3.3 Release Rate Projections From an Isolated Containment Using Design Basis Leak Rates and Area Monitors or External Containment Radiation Monitors (Appendix E)

NOTE

This section is to be performed using information from area monitors (RU-148 or RU-149) or external containment monitors. Projections based on the use of these numbers should be verified as soon as possible utilizing field measurements and/or lab analysis. If the area monitors, RU-148 or RU-149, are inoperative proceed to Appendix E, section 2.0, use of external containment radiation monitors.

4.3.3.1 Complete Appendix E, page 1 using the instructions and tables in Appendix E.

4.3.3.2 Enter the Core Damage Estimate found in Section 1.2.13 of Appendix E in Section E of page 1, Appendix E.

RELEASE RATE DETERMINATION FROM AN EFFLUENT RELEASE POINT

Section A: Release Data

RX SHUTDOWN: Date _____ Time _____ EFFECTIVE AGE _____

REL START: Date _____ Time _____

Section B: Noble Gas Release Rate Determination

Part 1. Plant Vent (Aux & Radwaste Bldg, Cntmt Refueling & Cntmt Power Access Purge)

HAN-J01A (30,000 cfm)	_____				
HAN-J01B (30,000 cfm)	_____				
HRN-J01A (25,500 cfm)	_____		Noble Gas		
HRN-J01B (25,500 cfm)	_____		Conc	Conversion	Noble Gas
CPN-J01A (16,500 cfm)	_____	Effective Age	(RU-143 or	Constant	Release
CPN-J01B (16,500 cfm)	_____	Correction	RU-144)	(cc-Ci/cfm	Rate
CPN-J02 (2,200 cfm)	_____	Factor (App B)	(µCi/cc)	sec-µCi)	(Ci/sec)

TOTAL FLOW RATE (cfm) _____ X _____ X _____ X 4.72E-04 = _____

Part 2. Condenser Air Removal System

Vacuum Pump A (60 cfm)	_____		Noble Gas		
Vacuum Pump B (60 cfm)	_____		Conc	Conversion	Noble Gas
Vacuum Pump C (60 cfm)	_____	Effective Age	(RU-141 or	Constant	Release
Vacuum Pump D (60 cfm)	_____	Correction	RU-142)	(cc-Ci/cfm	Rate
Steam Packing Exhaust	_____	Factor (App B)	(µCi/cc)	sec-µCi)	(Ci/sec)

TOTAL FLOW RATE (cfm) _____ X _____ X _____ X 4.72E-04 = _____

Part 3. Fuel Building Vent

HFN-J01A (21,750 cfm)	_____		Noble Gas		
HFN-J01B (21,750 cfm)	_____		Conc	Conversion	Noble Gas
HFA-J01 (6,000 cfm)	_____	Effective Age	(RU-145 or	Constant	Release
HFB-J01 (6,000 cfm)	_____	Correction	RU-146)	(cc-Ci/cfm	Rate
		Factor (App B)	(µCi/cc)	sec-µCi)	(Ci/sec)

TOTAL FLOW RATE (cfm) _____ X _____ X _____ X 4.72E-04 = _____

TOTAL EFFLUENT NOBLE GAS RELEASE RATE (Ci/sec) = _____

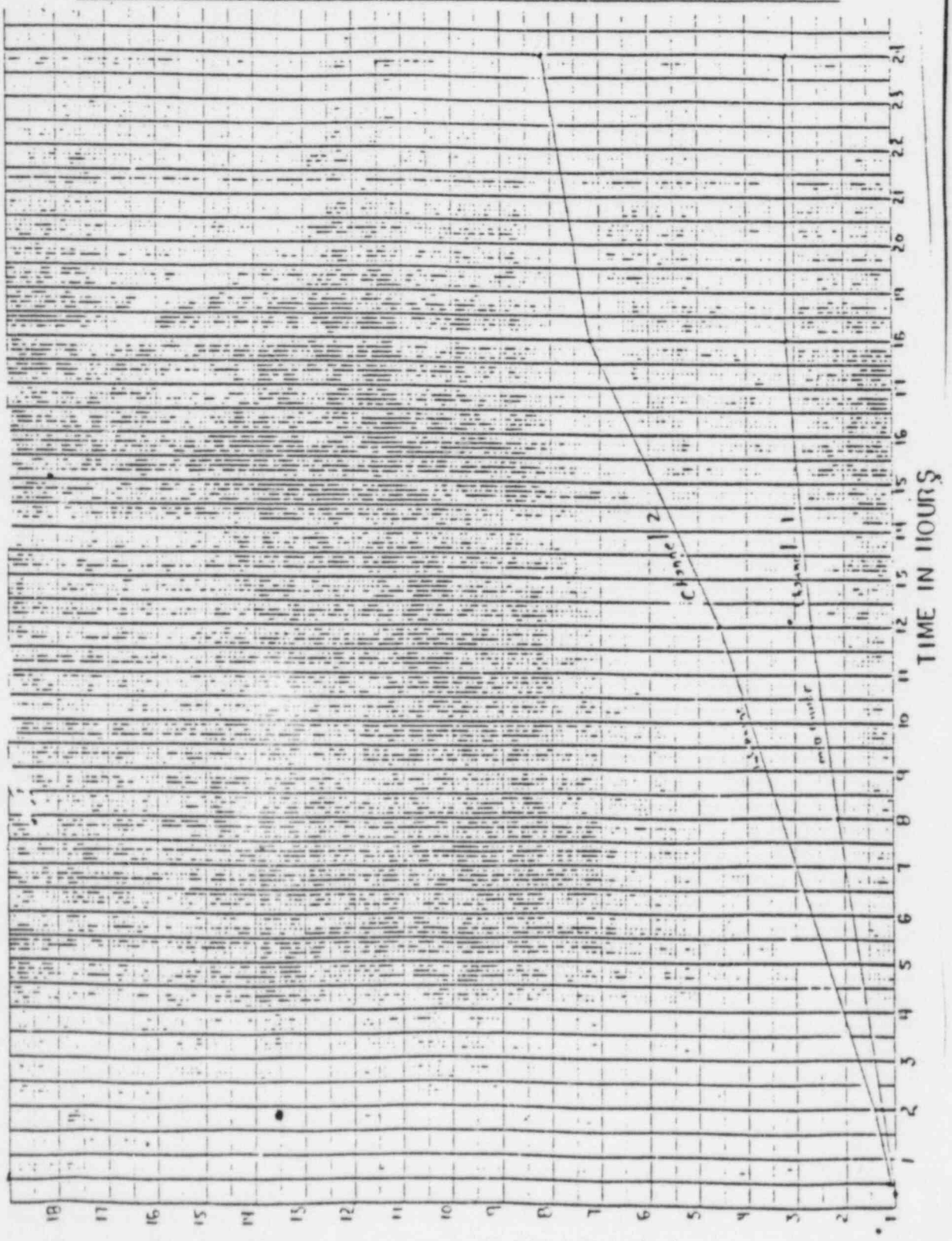
Section C: I-131 Release Rate Determination Table Used: |___| 1% Failed Fuel

|___| Total Core Inventory

Noble Gas Release Rate (Section B) (Ci/sec)		Total Iodine to Noble Gas Ratio (Appendix C)		Volatile Factor		Total Iodine Release Rate (Ci/sec)
_____	X	_____	X	.25	=	_____

Total Iodine Release Rate (Ci/sec)		I-131 to Total Iodine Ratio (Appendix C)		I-131 Release Rate (Ci/sec)
_____	X	_____	=	_____

EFFECTIVE AGE CORRECTION FACTORS FOR THE EFFLUENT MONITORS



NOBLE GAS AND IODINE RADIOLOGICAL DATA

Effective Age (hr)	1% FAILED FUEL		TOTAL CORE INVENTORY	
	Relative Release Rate Ratios of Total I/NG	Relative Release Rate Ratios of I-131/Total I	Relative Release Rate Ratios of Total I/NG	Relative Release Rate Ratios of I-131/Tot I
0-1	.29	.28	1.5	.14
1-10	.25	.35	1.5	.25
10-100	.16	.75	.8	.75
>100	.3	1.0	1.2	1.0

RELEASE RATE DETERMINATION FROM MAIN STEAM SYSTEM

Section A: Release Data

REACTOR SHUTDOWN: Date _____ Time _____

RELEASE START: Date _____ Time _____

EFFECTIVE AGE: _____

Section B: Noble Gas Release Rate Determination

NOTE: Enter N/A for non-affected steam generator.

Monitor Number	Monitor Reading (mr/hr)		Monitor Correction Factor		Steam Line Concentration (µCi/cc)
RU-139 (higher reading channel, if applicable)	_____	X	_____	=	_____
RU-140 (higher reading channel, if applicable)	_____	X	_____	=	_____

	Noble Gas Concentration (µCI/cc)		Steam Density Conversion Factor (cc-Ci-hr/lb-µCi-sec)		Steam Flow (lb/hr)		Noble Gas Release Rate (Ci/sec)
RU-139	_____	X	_____	X	_____	=	_____
RU-140	_____	X	_____	X	_____	=	_____

RU-139 Noble Gas Release Rate		RU-140 Noble Gas Release Rate		Total Noble Gas Release Rate
_____	+	_____	=	_____

RELEASE RATE DETERMINATION FROM MAIN STEAM SYSTEM (CONT'D)

Section C: I-131 Release Rate Determination (Use Total Core Inventory Ratios in App. C)

Noble Gas Release Rate (Section B) (Ci/sec)		Total Iodine to Noble Gas Ration (Appendix C)		Volatility Factor		Total Iodine Release Rate (Ci/sec)
_____	X	_____	X	.01	=	_____

Total Iodine Release Rate (Ci/sec)		I-131/total Iodine Ratio (Appendix C)		I-131 Release Rate (Ci/sec)
_____	X	_____	=	_____

Reactor Coolant System/Steam Temperature(°F)	Steam Density Converstion Factor (cc-Ci-hr/lb- μ Ci-sec)
200	2.65E-04
220	1.82E-04
240	1.28E-04
260	9.25E-05
280	6.81E-05
300	6.08E-05
320	3.86E-05
340	2.97E-05
360	2.33E-05
380	1.84E-05
400	1.47E-05
420	1.18E-05
440	9.58E-06
460	7.81E-06
480	6.42E-06
500	5.31E-06
520	4.39E-06
540	3.67E-06
560	3.06E-06
580	2.53E-06
600	2.10E-06
620	1.74E-06
640	1.42E-06
660	1.14E-06
680	8.75E-07

NOTE

The Steam Density Conversion Factor compensates for steam density changes, converts μCi to Ci, and converts flow rate to release rate.

This table was developed from Table 1 of the ASME Steam Tables using the specific volume (ft^3/lb) of saturated vapor at a given temperature (°F).

RELEASE RATE PROJECTION FROM AN ISOLATED CONTAINMENT USING DESIGN BASIS LEAK RATES AND AREA MONITORS OR EXTERNAL CONTAINMENT RADIATION MONITORS

Section A: Plant Data

REACTOR SHUTDOWN: Date _____ Time _____

RELEASE START: Date _____ Time _____

EFFECTIVE AGE: _____

RU-148 reading or: _____ r/hr
Table 2 Correlation

RU-149 reading or: _____ r/hr
Table 2 Correlation

Section B: Highest of RU-148 and RU-149 Readings (or Table 2 correlations)

Highest of Monitor Readings (Section A) (r/hr)

_____

Section C: Noble Gas Release Rate Projection based on area monitors

Projected Noble Gas Concentration (Table 1) (µCi/cc)		Projected Leak Rate (Tech Specs) (cc/sec)		Conversion Constant (µCi to Ci)		Projected Noble Gas Release Rate (Ci/sec)
_____	X	8.52E+02	X	1E-06	=	_____

Section D: I-131 Release Rate Projection based on area monitors

Projected Iodine Concentration (Table 1) (µCi/cc)		Projected Leak Rate (Tech Specs) (cc/sec)		Conversion Constant (µCi to Ci)		Total Iodine Release Rate
_____	X	8.52E+02	X	1E-06	=	_____

Section E: Core Damage Estimate based on Table 1 (Section 1.2.13)

_____% of fuel rods are damaged.

Estimating Containment Airborne Concentrations
from Internal and External Containment Monitors

1.0 Containment Airborne Concentration Estimation Using RE-148, RE-149

1.1 Summary: The Nomograph in table 1 of this appendix relates the indicated dose rate at either high range in-containment area monitor to the airborne concentrations of either noble gases or radioiodines in the containment. As the airborne concentration is related to the extent of core damage (given releases from the reactor coolant system) the nomograph also identifies core damage after taking decay into consideration.

1.2 Instructions

1.2.1 Enter time, date, and name in legend space on table 1.

1.2.2 This nomograph requires data from either high range in-containment monitor (RE-148 or RE-149). Obtain a reading from the higher reading monitor. If monitor data are not available or of questionable validity, refer to Sect. 2.0, Correlation of External Containment Monitors to RE-148 or RE-149.

1.2.3 Enter monitor number and reading (R/hr) on table 1.

1.2.4 Locate the right hand vertical axis labeled Rem/hr.

1.2.5 Make a mark on the axis at a point responding to the value of the radiation monitor reading.

1.2.6 Locate the portion of the horizontal axis labeled "Time After Shutdown."

1.2.7 Mark the axis at the time corresponding to effective age of the mixture in containment.

1.2.8 Draw a vertical line through the time marked on the "Time After Shutdown" axis.

1.2.9 Draw a horizontal line from the mark on the Rem/hr axis to the left until it intersects the vertical line drawn in step 1.2.8.

1.2.10 Draw a curved line up and to the left parallelling the curve for the monitor being used (RE-148 or RE-149) to where the line intersects the axis marked "Reference Rem/hr." Mark the point of intersection.

1.2.11 Draw a horizontal line to the left from the mark on the "Reference Rem/hr" axis through the "Core Damage" axes.

1.2.12 Identify the "Core Damage" axis that is the labeled for the monitor being used (RE-148 or RE-149). Mark that axis at the point that it is intersected by the line drawn in step 1.2.11.

1.2.13 Read the core damage estimate at the point marked in step 1.2.12.

1.2.14 Extend the vertical line drawn in step 1.2.8 until it intersects the curve corresponding to 100% core damage for the detector used (RE-148 or RE-149). The 100% core damage curve is the uppermost curve. Mark the point of intersection.

1.2.15 Draw a horizontal line to the right from the point made in step 1.2.14 to the intersection of the "Rem/hr" axis and mark this point.

1.2.16 Locate the "Rem/hr" scale on the horizontal axis to the left of the core damage axes. Mark the point on the "Rem/hr" axis corresponding to the value from 1.2.15.

1.2.17 Draw a vertical line through this point intersecting all four curves above it.

1.2.18 Mark the intersection of the vertical line with the noble gas and iodine curves for the monitor being used (RE-148 or RE-149).

1.2.19 On the left side of the horizontal axis, locate the "Normalization Factor" portion. Mark the axis at the point corresponding to the core damage estimate read in step 1.2.13.

1.2.20 Draw a vertical line through the "Normalization Factor" axis at the value marked above.

1.2.21 Draw a horizontal line to the left from the point on the iodine curve marked in 1.2.18 until it intersects the vertical drawn in 1.2.20. Mark this intersection.

1.2.22 Draw a line down and to the left at a 45 degree angle from the intersection marked in 1.2.21 (this line will parallel the heavy diagonal lines already drawn on the nomograph) until it intersects the left vertical axis marked "µCi/cc." Mark this point.

1.2.23 Read the value marked in 1.2.22 and record the value in Appendix E, as the iodine concentration.

1.2.24 Repeat steps 1.2.21 through 1.2.23 for the noble gas curve.

2.0 Containment Airborne Concentration Estimation Using Area Monitors External to Containment.

2.1 This section is to be used when the containment high range monitors are not operable or the readings are suspect.

2.1.1 The following external detectors may be used when the In-containment high range monitors are inoperative or their readings are suspect.

2.1.1.1 RE-158 B&C Accident range external containment area monitors, they are ion chambers with a range of 0.1 to 10,000 R/hr.

2.1.1.2 RE-37&RE-38 Power Access Purge Area (PAPA) monitors, they are GM tubes with a range of 0.1 to 10,000 mR/hr.

2.1.1.3 Hand-held — A portable instrument, held against the outside of containment on the 104' elevation by the tendon gallery. This instrument should have a range of 0.1 10,000 mR/hr. Two instruments may be required to meet this range (e.g., an RO-2 and an RO-2A).

2.2 Instructions

2.2.1 Obtain a reading from one of the above instruments (the instrument selected should be taken in the order listed in 2.1.1).

2.2.2 On table 2, mark the instrument reading on the horizontal axis labeled Dose Rate (Rem/hr).

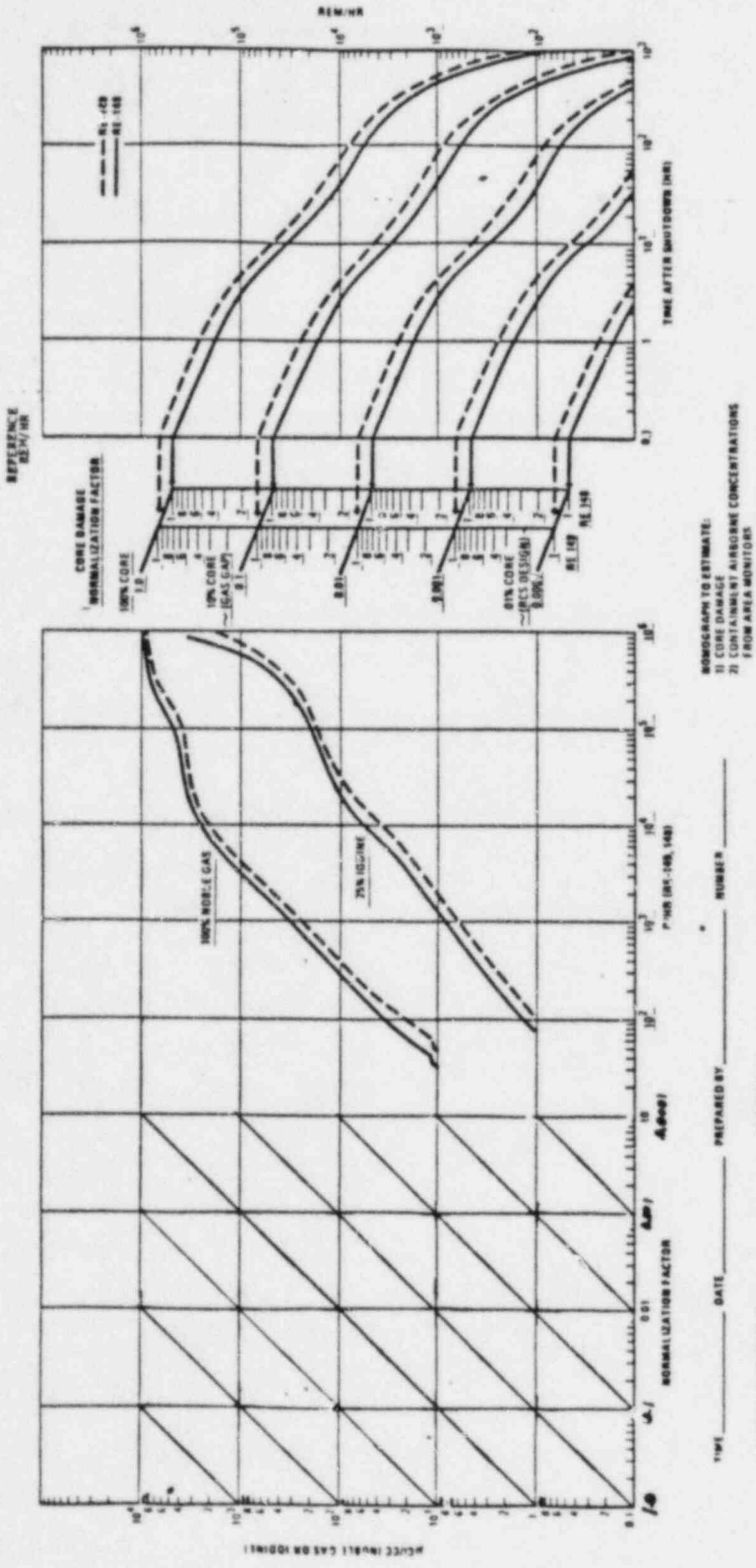
2.2.3 Draw a vertical line up through this point until the line intersects the curve of the detector used. Mark this intersection.

2.2.4 Draw a horizontal line from this point to the right until it intersects the curves for RE-148 & 149. Mark the points of intersection.

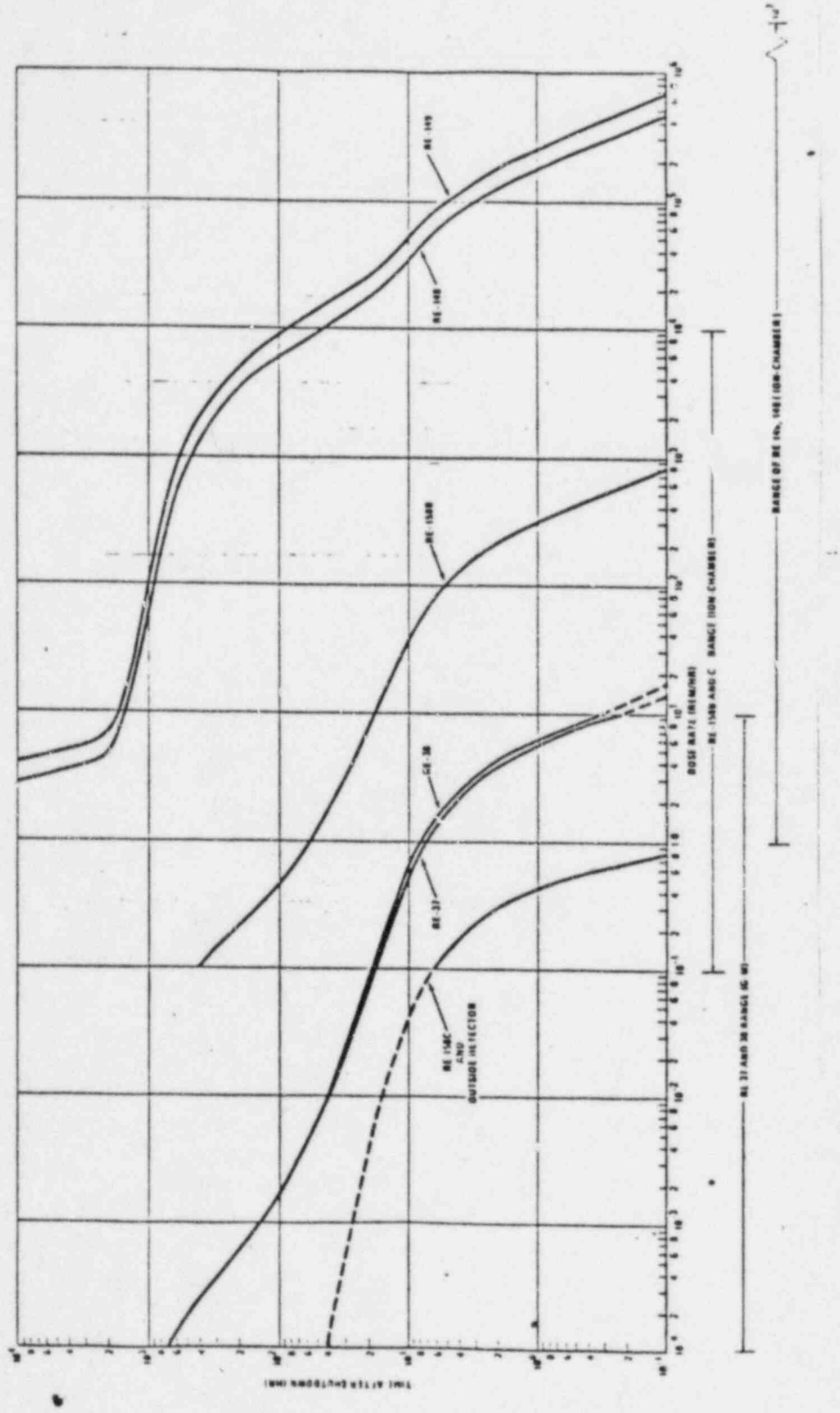
2.2.5 Draw a vertical line from these points down to the horizontal axis. Mark the intersections on the axis.

2.2.6 Transfer the higher reading from above to the data sheet and go to section 1.0 to determine the containment airborne concentration.

Appendix E, Table 1



Appendix E, Table 2



PVNGS EMERGENCY PLAN IMPLEMENTING PROCEDURE	PROCEDURE NO. EPIP-14B	
INITIAL DOSE ASSESSMENT	REVISION 3	Page 1 of 54

DEPT. HEAD Dennis B Ower DATE 4/1/85

PRB/PRG/TRRG REVIEW O.J. Zudrague DATE 4/1/85

APPROVED BY O.J. Zudrague DATE 4/1/85

EFFECTIVE DATE 04-09-85

DN-1614A/0794A

CONTROLLED DOCUMENT

PVNGS EMERGENCY PLAN IMPLEMENTING PROCEDURE	PROCEDURE NO. EPIP-14B	
INITIAL DOSE ASSESSMENT	REVISION 3	Page 2 of 54

REVISION HISTORY

Rev. No.	Date	Revised Pages	Comments
3	4-9-85	3-10, APPENDIX E	

TABLE OF CONTENTS

SECTION			PAGE NUMBER
1.0	OBJECTIVE		4
2.0	REFERENCES		4
3.0	LIMITATIONS AND PRECAUTIONS		5
4.0	DETAILED PROCEDURE		5
	4.1	Personnel Indoctrination/Responsibilities	5
	4.2	Prerequisites	5
	4.3	Instructions	6

APPENDICES

Appendix A -	Calculation of Projected Whole Body and Thyroid Doses	11
Appendix B -	Plume Centerline Xu/Q Values (sec-mi/m^3-hr)	12
Appendix C -	Radiological Data	14
Appendix D -	PVNGS Emergency Offsite Dose Projection Computer Program Instructions	16
Appendix E -	Alternate Methods for Obtaining Meteorological Data	47

CONTROLLED DOCUMENT

1.0 OBJECTIVE

This procedure provides instruction to assess projected offsite whole body and thyroid inhalation doses based upon meteorological data and noble gas/I-131 release rates. Dose calculations provide a basis for decision making concerning recommendation of appropriate protective action to state or county authorities.

2.0 REFERENCES

2.1 Implementing References

2.1.1 EPIP-14A, "Release Rate Determination"

2.1.2 The CRAC System User's Manual, Rev. 2, April 1983

2.1.3 78AC-0ZZ06, "Document and Record Turnover Control"

2.1.4 70AC-0ZZ01, "Procedure Format, Content and Numbering"

2.2 Developmental References

2.2.1 PVNGS Emergency Plan, Rev. 5

2.2.2 NRC Reg Guide 1.145, August 1979; "Atmospheric Dispersion Models for Potential Accident Consequence Assessments at Nuclear Power Plants"

2.2.3 NRC Reg Guide 1.111, July 1, 1977, Rev 1; "Methods for Estimating Atmospheric Transport and Dispersion of Gaseous Effluent in Routine Releases from Light-Water-Cooled Reactors"

2.2.4 Introduction to Nuclear Engineering, John R. LaMarsh, Addison Wesley Publishing Company, December 1977

CONTROLLED DOCUMENT

2.2.5 Health Physics Journal, November 1981, Volume 41 No. 5, page 759

2.2.6 NRC Reg Guide 1.109 "Calculation of Annual Doses to Man from Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10CFR50, Appendix I", October 1977

2.2.7 EPA "Manual of Protective Action Guides and Protective Actions for Nuclear Incidents" Appendix D, Revised June 1980

2.2.8 Desert dispersion parameters as referenced in NUREG/CR-2858, "PAVAN: An Atmospheric Dispersion Program for Evaluating Design Basis Accidental Releases of Radioactive Materials from Nuclear Power Stations", November 1982

2.2.9 Meteorology and Atomic Energy, David A. Slade, Editor, 1968

2.2.10 Journal of Applied Meteorology, Volume 3, Pages 83-91, "A Diffusion Model for an Urban Area", D. B. Turner, 1964.

3.0 LIMITATIONS AND PRECAUTIONS

3.1 None

4.0 DETAILED PROCEDURE

4.1 Personnel Indoctrination/Responsibilities

4.1.1 The Radiation Protection Monitor shall be responsible for initial offsite dose projections.

4.1.2 The Radiological Assessment Coordinator (at the EOF) shall be responsible for dose projections when available.

4.1.3 One Calculation of Projected Doses, Appendix A, shall be completed for centerline site boundary, two, five and ten miles.

4.1.4 Upon event termination transmit Appendix A to DDC for retention in accordance with 78AC-0ZZ06, "Document and Record Turnover Control".

4.2 Prerequisites

4.2.1 A release of airborne radioactive material has occurred or is imminent and its rate of release has been determined in accordance with EPIP-14A, Release Rate Determination.

CONTROLLED DOCUMENT

4.3 Instructions for Computer Assisted Dose Calculation

NOTE

If both the CRAC system and the IBM are not available, carry out the manual procedure described in section 4.4. Upon completion of dose calculations (whether manual or computer-assisted), proceed with section 4.5.

NOTE

If actual airborne activity levels are known, either from field samples or RMS/PASS sample analysis, these levels, vice monitor readings, may be used to formulate protective action recommendations.

4.3.1 Calculate doses and dose rates using the CRAC system, following instructions in the CRAC System User's Manual.

4.3.2 If the emergency dose assessment capability of the CRAC system is unavailable, carry out the procedure for performing dose calculations using the IBM PC computer, as described in Appendix D.

4.4 Manual Dose Calculations

NOTE

It is permissable to fill out Appendix A, section A, Meteorology, reactor shutdown date and time, release date and time and make the required number of copies prior to entering individual receptor sites. This is to alleviate needless hand entering of identical data and speed up the dose projection process.

4.4.1 Initiate Appendix A for each receptor site by recording location, date/time of reactor shutdown and date/time of release.

NOTE

Delta T is to be used to define atmospheric stability whenever it is available. Only when delta T cannot be determined should Sigma Theta, the standard deviation of wind direction, be used. Sigma Theta is determined in Appendix E, Section IV, "Set Up and Operation of the Mechanical Weather Station."

4.4.2 Complete Section A, Meteorology, using the 35ft. elevation and 15 min. averages on ERFDADS. If the ERFDADS is unavailable refer to Appendix E, Alternate Methods for Obtaining Meteorological Data.

4.4.2.1 Using the delta T (°F) or σθ from above and the table below enter the stability class in Section A, or use the default value from Appendix E. If default values are used, write DEFAULT in the section A header after Meteorology.

STABILITY CLASSIFICATION	STABILITY CATEGORIES	Δ T (°F) (200 Foot. Temp. - 35 Ft. Temp.)	σ θ* (DEGREES)
Extremely unstable	A	< - 1.71	> 22.5°
Moderately unstable	B	-1.71 to -1.53	22.5° to 17.5°
Slightly unstable	C	-1.55 to -1.35	17.5° to 12.5°
Neutral	D	-1.35 to -0.45	12.5° to 7.5°
Slightly stable	E	-0.45 to 1.35	7.5° to 3.75°
Moderately stable	F	1.35 to 3.6	3.75° to 2.1°
Extremely stable	G	> 3.6	< 2.1

* σθ is the standard deviation of wind direction fluctuation averaged over fifteen minutes. If wind speed is less than 3.3 mph, σθ should not be used due to statistical inaccuracies. At wind speeds below 3.3 mph, a default stability class of G should be used.

4.4.2.2 Using wind direction, find the affected sectors. The affected sectors are the sector with the plume center line passing through it and the sector to either side, except for sectors N, P, and Q. If the plume centerline is through one of these sectors, (N, P or Q), then two sectors to either side are affected. This is to account for additional dispersion by the Palo Verde Hills.

4.4.3 Selection of Key Receptor Sites.

NOTE

As a minimum, the site boundary and points 2, 5 and 10 miles distant shall be key receptor sites. See Appendix B for a list of population centers by sector.

4.4.3.1 Select the appropriate overlay that corresponds to the determined stability category and match the overlay with the release point on the map.

4.4.3.2 Rotate the overlay until the direct downwind plume centerline is oriented in the direction of the compass heading of the wind.

4.4.4 Determine Effective Age and Plume Arrival Time at Receptor Site by completing Section B.

4.4.4.1 Enter downwind distance at receptor site and divide by wind speed from Section A. This gives the plume transit time to the receptor site.

4.4.4.2 Add the effective age of the reactor at time of release to the transit time to get the effective age at the receptor site.

4.4.4.3 Add the transit time to the time of release to find the plume arrival time.

4.4.5 Complete Section C, X/Q Determination, using Appendix B, Plume Centerline Xu/Q Values.

4.4.6 Complete Section D, Radioactivity Concentration at Receptor, using X/Q from Section C, noble gas release rate and iodine release rate.

4.4.7 Whole Body Dose Projection, Section E.

4.4.7.1 Enter noble gas concentration from section D and effective average gamma decay energy ($E_{\tau eff}$) from Appendix C (Use effective age at receptor site).

4.4.7.2 Multiply noble gas concentration, effective energy and the dose rate conversion factor together to find the projected dose rate at the receptor site.

NOTE

Protective Action Guides are based on projected does for two hours, therefore a two hour dose projection should be determined.

4.4.7.3 Determine the expected duration of the release by requesting this information from the control room. If expected duration is less than two hours, use two hours as a minimum value.

4.4.7.4 Multiply projected dose rate times the expected duration to find the projected dose for the plume passage.

4.4.8 Thyroid Dose Commitment, Section F

4.4.8.1 Enter the iodine concentration from section D and the release duration from Section E.

4.4.8.2 Using the column corresponsing to the assumed core damage, find the summation of iodine conversion factor, Σ_IDCF, in Appendix C and enter this value in Section F.

4.4.8.3 Multiply iodine concentration by Σ_IDCF and record the result as does commitment per exposure hour.

4.4.8.4 Multiply dose commitment per hour of exposure times the duration to obtain the adult thyroid 50 year commitment.

4.4.8.5 Multiply the adult thyroid dose commitment by two to get the child thyroid 50 year dose commitment.

4.4.9 Refer to EPIP-15 to formulate protective action recommendations.

4.5 Updating Dose Projections

4.5.1 Update and refine dose calculations every hour and upon significant changes (as indicated below):

4.5.1.1 Release rate change of 20 per cent;

4.5.1.2 Wind direction change of 25 degrees;

4.5.1.3 Wind speed change of 20 per cent;

4.5.1.4 Change of stability class.

CONTROLLED DOCUMENT

PV216-000A (8/82)

Calculation of Whole Body Dose Rate, Dose Commitment and Thyroid Dose Commitment

Receptor Site: _____

Reactor Shutdown Date: _____ Time: _____ Release Date: _____ Time: _____

A: Meteorology

1. Wind Direction (deg.) _____
2. Wind Speed (mph) _____
3. delta T (°F)/σ_θ (deg) _____
4. Stability class _____
5. Affected sector _____

B: Effective Age and Plume Arrival Time

Downwind Distance (mi.)		Windspeed (mph)	=	Transit Time (hr)	+	Eff Age @ Release (hr)	=	Eff Age @ Receptor (hr)
_____	/	_____	=	_____	+	_____	=	_____

Plume Arrival Time = _____ (transit+release time)

C. X/Q Determination

Xu/Q (App. B) (mi-sec/hr-m^3)		Windspeed (mph) (mph)	=	X/Q (sec/m^3)
_____	/	_____	=	_____

D. Radioactivity Concentration at Receptor

	Release Rate (Ci/sec)		X/Q (sec/m^3)	=	Receptor Concentration (Ci/m^3)
1. NG	_____	x	_____	=	_____
2. I	_____	x	_____	=	_____

E. Whole Body Dose Projection

Receptor Noble Gas Concentration (Ci/m^3)		E Yeff (MeV/dis) (App. C)		Dose Rate Conversion Factor ($\frac{\text{Rem-dis-m}^3}{\text{hr-MeV-Ci}}$) 8.90×10^2	=	Projected Dose Rate (Rem/hr)	x	Exposure Time (hr)	=	Projected Dose (Rem)
_____	x	_____	x		=	_____	x	_____	=	_____

F. Thyroid Dose Commitment

Iodine Concentration (Ci/m^3)		ΣIDCF (Rem m^3 /hr-Ci)	=	Thyroid Dose Commitment per Exposure hr (Rem/hr)	x	Release Duration (hr)	=	Adult Thyroid Dose Commitment (Rem)	x 2 =	Child Thyroid Dose Commitment (Rem)
_____	x	_____	=	_____	x	_____	=	_____	x 2 =	_____

_____ Performed by

_____ Reviewed by

PLUME CENTERLINE Xu/Q VALUES (mi-sec/hr-m^3)

Wind From:	Dist	A	B	C	D	E	F	G
S (169-191)	0.82	8.9E-06	2.2E-05	4.3E-05	1.5E-04	2.9E-04	4.5E-04	6.9E-04
SSW (191-214)	0.83	8.7E-06	2.2E-05	4.0E-05	1.5E-04	2.8E-04	4.5E-04	6.9E-04
SW (214-236)	1.58	1.8E-06	4.9E-06	1.0E-05	5.6E-05	1.1E-04	2.0E-04	3.4E-05
WSW (236-259)	1.37	2.7E-06	6.9E-06	1.4E-05	6.9E-05	1.4E-04	2.5E-04	4.0E-04
W (259-281)	1.34	2.7E-06	7.4E-06	1.5E-05	7.2E-05	1.4E-04	2.5E-04	4.0E-04
WNW (281-304)	1.28	3.1E-06	8.1E-06	1.6E-05	7.6E-05	1.5E-04	2.7E-04	4.3E-04
NW (304-326)	1.31	2.9E-06	7.6E-06	1.5E-05	7.4E-05	1.5E-04	2.5E-04	4.3E-04
NNW (326-349)	1.88	1.2E-06	3.4E-06	6.9E-06	4.3E-05	8.9E-05	1.6E-04	2.9E-04
N (349-011)	1.68	1.6E-06	4.3E-06	8.9E-06	4.9E-05	1.0E-04	1.9E-04	3.1E-04
NNE (011-034)	1.14	4.0E-06	1.1E-05	2.1E-05	9.2E-05	1.8E-04	2.9E-04	4.9E-04
NE (034-056)	0.75	1.1E-05	2.9E-05	4.5E-05	1.8E-04	3.1E-04	4.9E-04	7.8E-04
ENE (056-079)	0.63	1.7E-05	4.3E-05	7.4E-05	2.2E-04	4.0E-04	6.3E-04	9.4E-04
E (079-101)	0.62	1.7E-05	4.5E-05	7.6E-05	2.5E-04	4.0E-04	6.3E-04	9.4E-04
ESE (101-124)	0.63	1.7E-05	4.3E-05	7.4E-05	2.2E-04	4.0E-04	6.3E-04	9.4E-04
SE (124-146)	0.74	1.2E-05	2.9E-05	5.1E-05	1.8E-04	3.1E-04	5.1E-04	7.8E-04
SSE (146-169)	0.83	8.7E-06	2.2E-05	4.0E-05	1.5E-04	2.8E-04	4.5E-04	6.9E-04
	1.00	5.6E-06	1.5E-05	2.7E-05	1.1E-04	2.1E-04	3.6E-04	5.6E-04
	2.00	1.0E-06	2.9E-06	6.3E-06	3.8E-05	8.3E-05	1.5E-04	2.7E-04
	3.00	5.6E-07	1.1E-06	2.5E-06	2.0E-05	4.7E-05	9.2E-05	1.7E-04
	4.00	4.3E-07	7.6E-07	1.2E-06	1.3E-05	3.1E-05	6.5E-05	1.3E-04
	5.00	3.6E-07	6.3E-07	7.8E-07	9.2E-06	2.2E-05	4.9E-05	9.8E-05
	6.00	2.9E-07	5.4E-07	6.7E-07	6.9E-06	1.8E-05	3.8E-05	8.1E-05
	7.00	2.5E-07	4.7E-07	5.8E-07	5.4E-06	1.5E-05	3.1E-05	6.7E-05
	8.00	2.2E-07	4.0E-07	5.1E-07	4.5E-06	1.2E-05	2.7E-05	6.0E-05
	9.00	2.0E-07	3.6E-07	4.7E-07	3.6E-06	1.0E-05	2.5E-05	5.1E-05
	10.00	1.8E-07	3.4E-07	4.3E-07	3.1E-06	8.9E-06	2.1E-05	4.7E-05
	11.00	1.7E-07	3.1E-07	4.0E-07	2.7E-06	7.8E-06	1.9E-05	4.3E-05
	12.00	1.5E-07	2.9E-07	3.6E-07	2.5E-06	6.9E-06	1.7E-05	3.8E-05
	13.00	1.4E-07	2.7E-07	3.4E-07	2.1E-06	6.3E-06	1.5E-05	3.6E-05
	14.00	1.3E-07	2.5E-07	3.1E-07	1.8E-06	5.6E-06	1.4E-05	3.1E-05
	15.00	1.3E-07	2.2E-07	2.9E-07	1.7E-06	5.1E-06	1.3E-05	2.9E-05

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Additional Centerline Xu/Q Values for Population Centers by Sector:

	Dist	A	B	C	D	E	F	G
Sector A:								
The Red Quail Store	2 Miles	1.0 E-6	2.9 E-6	6.3 E-6	3.8 E-5	8.3 E-5	1.5 E-4	2.7 E-4
Ruth Fisher School	7 Miles	2.5 E-7	4.7 E-7	5.8 E-7	5.4 E-6	1.5 E-5	3.1 E-5	6.7 E-5
Sector F:								
Hassayampa	8 Miles	2.2 E-7	4.0 E-7	5.1 E-7	4.5 E-6	1.2 E-5	2.7 E-5	6.0 E-5
Palo Verde School	11 Miles	1.7 E-7	3.1 E-7	4.0 E-7	2.7 E-6	7.8 E-6	1.9 E-5	4.3 E-5
Sector G:								
Arlington	7 Miles	2.5 E-7	4.7 E-7	5.8 E-7	5.4 E-6	1.5 E-5	3.1 E-5	6.7 E-5
Arlington School	8 Miles	2.2 E-7	4 E-7	5.1 E-7	4.5 E-6	1.2 E-5	2.7 E-5	6.0 E-5
Sector R:								
Tonopah	8 Miles	2.2 E-7	4 E-7	5.1 E-7	4.5 E-6	1.2 E-6	2.7 E-6	6.0 E-5

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NOBLE GAS MEAN GAMMA DECAY ENERGY

Effective Age (hours)	1% Failed Fuel (MeV)	Total Core Inventory (MeV)
0.0	0.253	0.590
0.5	0.233	0.549
1.0	0.210	0.503
1.5	0.195	0.471
2.0	0.181	0.420
2.5	0.167	0.390
3.0	0.152	0.360
3.5	0.145	0.334
4.0	0.136	0.310
5.0	0.117	0.238
6.0	0.104	0.223
7.0	0.090	0.184
8.0	0.075	0.160
9.0	0.069	0.142
10.0	0.064	0.123
11.0	0.059	0.104
12.0	0.051	0.089
16.0	0.042	0.059
20.0	0.040	0.049
24.0	0.037	0.040
48.0	0.031	0.031
>48.0	0.030	0.030

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Summation of Iodine Dose Conversion Factors vs. Effective Age for Adults

Effective Age (hours)	1% Failed Fuel Σ_IDCF (Rem m^3/hrCi)	Total Core Inventory Σ_IDCF (Rem m^3/hrCi)
0.0	6.85×10^5	3.07×10^5
0.5	7.06×10^5	3.53×10^5
1.0	7.27×10^5	3.81×10^5
1.5	7.59×10^5	4.16×10^5
2.0	7.75×10^5	4.46×10^5
2.5	7.96×10^5	4.67×10^5
3.0	8.17×10^5	5.10×10^5
3.5	8.29×10^5	5.33×10^5
4.0	8.50×10^5	5.37×10^5
5.0	8.60×10^5	5.88×10^5
6.0	9.04×10^5	5.99×10^5
7.0	9.16×10^5	6.45×10^5
8.0	9.39×10^5	6.65×10^5
9.0	9.66×10^5	6.81×10^5
10.0	9.80×10^5	7.19×10^5
11.0	1.00×10^6	7.47×10^5
12.0	1.02×10^6	7.60×10^5
16.0	1.90×10^6	8.32×10^5
20.0	1.17×10^6	9.37×10^5
24.0	1.21×10^6	9.60×10^5
48.0	1.46×10^6	1.26×10^6
72.0	1.60×10^6	1.50×10^6
96.0	1.68×10^6	1.62×10^6
120.0	1.73×10^6	1.69×10^6
144.0	1.77×10^6	1.77×10^6

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PALO VERDE NUCLEAR GENERATING STATION (PVNGS)

EMERGENCY OFFSITE DOSE CALCULATION COMPUTER PROGRAM

1.0 SOFTWARE DESCRIPTION

The PVNGS Emergency Dose Projection Computer Program has been designed for rapid assesment of emergency radioactive effluent releases based upon core inventory. The program is designed for use with the IBM personal computer (64K advanced basic) with one double sided/double density disk drive and an AST card, an Okidata 93 printer (preferably with a graphics chip to imitate an Epson printer), however the program can operate without a printer.

The computer program calculates both noble gas dose and iodine 50 year dose commitment and dose rates at site boundary, 2 miles, 5 miles, and 10 miles based on straight line Gaussian meterological model. Plume arrival and effective age at the above downwind distances are determined also. Based upon the site boundary dose rates, one of the four emergency classification (or none) will be selected. Dose calculations are based on EPIP-14B and 14C and release rate calculations are based on EPIP-14A.

To aid in the tracking of plumes, the program is capable of variable trajectory plume plotting. The plume generated has only one constant plume width (or dispersion). It should be noted that the plume plot is only an aid and actual plume configuration and dose rates will be different to some extent.

2.0 OPERATION

2.1 Computer and Optional Printer Preparation

> CAUTION
>
> DO NOT TOUCH THE INNER PORTION OF THE DISKETTE.

2.1.1 Insert the "Emergency Offsite Dose Projection" diskette into disk drive 'A' (left side) with the diskette label on the top. Close the disk drive 'A' door.

CAUTION

NEVER REMOVE THE DISKETTE OR REBOOT WHILE THE RED DISK DRIVE LIGHT IS ON.

2.1.2 Turn the computer on. The switch is located on the right side near the rear. If the power is already on, press 'Ctrl', 'Alt' and 'Del' all at the same time to reboot the disk. The program will automatically be loaded and run.

NOTE

Sections 2.1.4 through 2.1.6 are to set-up the Okidata printer.

2.1.3 Ensure the cable is connected between the printer and the computer.

2.1.4 Check the small dial on the front left side of the printer to make sure that it is set to '7'.

2.1.5 Ensure that the perforation line of the paper is above print head then turn on the power. The switch is located on the back right side of the printer.

2.2 Program Operation

2.2.1 The program starts by allowing the operator to update the current date and time and the date and time of the reactor shutdown (see fig. 1). The current time is displayed as a running clock. Press the number associated with the item to be updated. Remember to include the'-' or ':' where shown.

2.2.1.1 The program will not allow a reactor shutdown date and time to surpass the present date and time or an error beep will occur when continuing. If this error beep occurs and will not allow continuation, change the reactor shutdown date and/or time.

2.2.1.2 If the reactor is still operating under power, leave the shutdown date and time unchanged (00-00-00 and 00:00).

2.2.1.3 Press '5' to continue with the program.

2.2.2 The main menu will now be displayed on the screen (see fig. 2). This is the menu which will allow different calculations or operations to be performed.

2.2.3 Selection number 1, 'Current Release Dose Determination'. This selection should be chosen to reflect actual radioactive releases which are occuring and will perform the following:

a. Plot current plume position on the screen and will update each minute.

b. Calculate two hour dose (in rem) and dose rates (in rem/hr.) for both noble gasses and total iodines. The total iodine doses are 50 year dose commitments. The screen will display the child iodine dose rate which is twice that of the adult.

c. Determine emergency classification based on the site boundary noble gas and total iodine dose rates.

Emergency Classification based on noble gas dose rate (rem/hr).

< 5.0 E-5	NONE
5.0 E-5 thru 4.9 E-4	UNUSUAL EVENT
5.0 E-4 thru 4.9 E-2	ALERT
5.0 E-2 thru 9.9 E-1	SITE AREA EMERGENCY
> 1.0	GENERAL EMERGENCY

Emergency Classification based on total iodine dose rate (rem/hr) is five times the above noble gas dose rates.

2.2.3.1 After pressing '1', fig. 3 will display on the screen. The following is a description of those items displayed on the screen:

a. At the top right of the screen is the viewing screen which displays the plume. This screen is updated each minute.

b. At the top left of the screen is the current date and running clock which was entered in 2.2.1.

c. Below this is the screen description. This screen is 'CURRENT RELEASE PROJECTIONS'.

d. Below this is the emergency classification.

e. Below this is the indicator for whether the plume data is ready to be updated. If the words 'PRESS SPACE BAR TO UPDATE' does not appear, then the plume is already being updated and the cursor is positioned at one of the seven input parameters.

f. Seven input parameters pertaining to each plume. These parameters will be discussed in more detail later.

g. Date and time of reactor trip which was entered in 2.2.1.

h. Plume number; two numbers are associated with this number. The number on the left indicates the number of plumes on the screen and the other indicates the total number of plumes generated and on file.

i. The bottom right of the screen displays dose rate information and operator messages.

NOTE

Obtain temperatures, wind speed and wind direction from meterological tower using ERFDADS.

NOTE

If the input parameter is to remain unchanged, just press 'Return'.

2.2.3.2 To create or update a plume, press the space bar. This will stop the clock and the space bar update prompt will erase. The cursor will move to input #1, 'stability classification'. Enter the proper classification of A-G and press 'return'. If the classification is unknown then enter a 'U'. The screen will prompt the operator for the meterological tower temperature difference of 200 feet - 35 feet. A stability classification will be determined.

2.2.3.3 Move the cursor to input #2, 'Wind Speed'. Enter the wind speed in mi/hr. Do not leave the speed at zero. Press 'Return' and the cursor will advance to input #3.

2.2.3.4 For input #3, 'Wind From', enter the degrees from which the wind is blowing. This is a value from 0 to 360. Press 'Return' and the degrees to which the wind is going will be displayed along with the effected downwind sector on the plume centerline. The cursor will advance to input #4.

2.2.3.5 For input #4, 'Rel. Date', enter the date (mm-dd-yy) on the plume release or its update. This date can not surpass today's date. If the date is surpassed, an error beep will sound when the plume attempts to update and the date will need to be changed. The cursor will advance to input #5.

2.2.3.6 For input #5, 'Rel. Time', enter the time (24 hour clock HH:MM) which the plume was released or the time which one of the input parameters changed. The release time can not surpass today's date and current time. If the time is surpassed, an error beep will sound when the plume attempts to update and the time will need to be changed. The cursor will advance to input #6.

2.2.3.7 For input #6, 'Noble Gas', enter the noble gas release rate in curies per second. The number may be entered as decimal or scientific notation. If the value is unknown, press 'U' and answer the questions relating to the release rate portion of the program. Release rate calculations are discussed in later sections and are performed using the method of EPIP-14A. The cursor will advance to input #7.

2.2.3.8 For input #7, 'I-131', enter the iodine-131 release rate in curies per second. The number may be entered as decimal or scientific notation. If the value is unknown, press 'U' and answer the questions relating to the release rate portion of the program. Release rate calculations are discussed in later sections and are performed using the method of EPIP-14A.

2.2.3.9 Upon answering #7 the prompt 'PRESS SPACE BAR TO UPDATE' will reappear and the 'CURRENT TIME' clock will restart.

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2.2.3.10 At this point the operator has several options to choose from. The following are the choices:

> CAUTION
>
> IF THE LEADING EDGE OF A PLUME EXTENDS PAST THE TEN MILE RADIUS, THE PLUME WILL BE DELETED FROM THE SCREEN. THIS MUST BE TAKEN INTO CONSIDERATION IF THE PLUME OVERLAPS (REVERSE DIRECTION).

a. Wait until the clock reaches the minute mark and the current plume information will be used to construct a plume and perform dose calculations. Dose calculations will be performed only if a new plume is detected (change in parameter). The operator will be prompted to whether a printout is needed. Next the dose rates will be displayed, the plume will be drawn and the emergency classification will be updated along with the plume numbers. See fig. 4 for an example of a screen display of a plume and dose rate values. See fig. 5 for an example of a dose printout. Plume information and doses will be stored on disk for later retrieval.

b. Press the F1 key. This forces the plotting of the plume (and dose calculations if new plume). This performs the same items as 2.2.3.10.*a*. above. Function keys will be discussed in more detail later.

c. Press F3 to delete the latest plume. Function keys will be discussed in more detail later.

d. Press other function keys (discussed later) to manipulate the viewing screen.

e. Press the space bar to correct or update plume information/parameters per sections 2.2.3.2 through 2.2.3.9.

f. Press 'R' to return to the main menu in section 2.2.2.

2.2.4 Menu Selection number 2, 'Project Dose Determination'. This selection should be chosen to project doses of radioactive releases which might occur (a what if situation). This selection is essentially the same as menu selection '1' with the following exceptions:

a. Plume plotting is not capable with this selection.

b. All function keys except F1 (dose calculations) are inoperable.

c. This selection will allow the operator to input a release date and time that surpasses the current date and time.

NOTE

Prior to starting dose projections, past entries should be reviewed and deleted if not needed. To delete all past entries, enter the word 'KILL' for the plume number and press 'Return'.

2.2.5 Menu Selection number 3, 'Review Past Entries'. This selection is used to review plume and dose information stored on the diskette.

2.2.5.1 Plume data files are identified by two numbers (e.g. 1-1230). The first being the plume number, which is a consecutive numbering system. It is possible to have two of these numbers the same if a plume had been deleted and another plume with a different time was entered.

2.2.5.2 The second number is the release time of the plume. All files will have the trailing '.dat' which indicates a data file.

2.2.5.3 Fig. 6 is an example of the past entry review screen. All files will be listed (if any) and the operator will be prompted for the file to review. Files may be deleted at this time by entering the word 'KILL' for plume number.

2.2.5.4 Once the file numbers have been entered, the relevent information for the plume will be displayed on the screen (see fig. 7). A printout may be obtained by pressing both the 'shift' and 'PrtSc' keys. (Remember to form feed the paper and place back on-line.)

2.2.5.5 Pressing the space bar will put the operator back in fig. 6; the operator may review another file or return to the main menu by entering an 'R' for the plume number.

2.2.6 Menu Selection number 4, 'FIELD DATA'. This selection is used to calculate total iodine doses using iodine air samples taken by field monitoring teams.

2.2.6.1 The screen will list all the questions to be answered. See fig. 8 for an example of questions, answers and calculated doses.

2.2.6.2 The 'location' is any name which will identify where the sample was taken. An 'R' may be entered for location to return to the main menu.

2.2.6.3 Samples will be decay corrected from the time of reactor shutdown. If the reactor shutdown date shows that it is still operating, an effective age of zero (0) is used (plume travel is not considered).

2.2.7 Menu Selection number 5, 'CHANGE REACTOR SHUTDOWN/TIME'. This selection allows the operator to return and change or update the current date and time and also the reactor shutdown date and time in section 2.2.1.

2.3 Function Keys

2.3.1 There are then (10) function keys (F1-F10) located on the left side of the keyboard. Seven of these keys are used by the program. See fig. 9 for the template which is placed over the function keys to aid in screen manipulations.

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CAUTION

WHEN PRESSING FUNCTION KEYS, ATTENTION SHOULD BE PAID TO THE RUNNING CLOCK. IF THE CLOCK HAS NOT APPEARED ON THE SCREEN OR THE CLOCK IS NOT RUNNING, THEN THE PROGRAM IS PERFORMING CALCULATIONS AND NO OTHER FUNCTION KEYS SHOULD BE PRESSED UNTIL IT STARTS TO RUN AGAIN.

2.3.1.1 Function key 'F1' is used in both 'Current Release Dose Determination' and 'Projected Dose Determination'. Pressing this key forces the program to draw and update the plume instead of waiting till the minute update. If the program detects a change in one or more of 5 input parameters, a dose projection will be calculated and the eemergency classification based on site boundary dose rates will be displayed. No plume will be drawn in the 'Projected Dose Determination' selection.

2.3.1.2 Function key 'F2' is used in 'Current Release Dose Determination' only. Pressing this key switches to a large screen for plotting of plumes. Pressing both the 'shift' and 'PrtSc' will print the plume. This will take approximately 2.5 minutes to complete. This screen will not update each minute. Press the space bar to return to the plume parameter screen.

2.3.1.3 Function key 'F3' is used in 'Current Release Dose Determination' only. Pressing this key will delete the last plume plotted and will return all seven input parameters including plume number and emergency classification back to their previous values. Prior to deleting the plume the operator will be questioned as to if the plume is to be deleted in case the key was pressed inadvertently.

2.3.1.4 Function key 'F7' is used in 'Current Release Dose Determination' only. Pressing this key will make the plume screen zoom in (or increase in size). If the screen is increased too much, an error will occur.

2.3.1.5 Function key 'F8' is used in 'Current Release Dose Determination' only. Pressing this key will make the plume screen zoom out (or decrease in size). If the screen is decreased too much, an error beep will occur.

2.3.1.6 Function key 'F9' is used in 'Current Release Dose Determination' only. Pressing this key will draw in 2, 5, and 10 mile radiuses including the 16 sector marks.

2.3.1.7 Function key 'F10' is used in 'Current Release Dose Determination' only. Pressing this key will draw in major roads and highways.

2.3.2 A region of interest may be focused in on by using the four arrow keys on the number pad on the right side of the keyboard. These keys are '8' for looking up (moves map down), '2' for looking down, '4' for looking left (moves map right) and '6' for looking right. Moving too far in one direction will cause an error beep.

2.3.2.1 Fig. 10 shows a plume on large screen (F2) with radiuses (F9) and roads (F10). Fig. 11 shows the same plume but in addition, the map is zoomed in (F7 twice), moved down (up arrow, '8'), and moved to the left (right arrow, '6').

2.4 Release Rate Calculations

2.4.1 When a 'U' is selected for either the noble gas or iodine release rate, release rate calculations will be performed and the screen will display five types of calculations that may be peformed. Press the number of the calculation to be performed.

2.4.1.1 Selecting Plant Vent, Fuel Building Vent or Condenser Air Removal will display, for the most part, the same type of screen. The only difference will be the 'fans running' if the total flow is unknown. The following questions will be prompted:

a. Total Flow, The previous flow will be displayed in CFM. If the flow is to remain the same then just press the return key. If the new flow is different then enter the new number. If the flow is unknown then enter a 'U'. The screen will prompt the operator for which fans/pumps are running and the flow from each will be summed.

NOTE

For plant vent, if a no is the answer to if an effluent monitor is in use then the program defaults to prompting for containment area monitor readings or hand held instrument readings.

b. Enter the gross beta channel reading from the effluent monitor in uCi/cc. If there is an iodine channel, the operator will be prompted to enter its value in uCi/cc also. Fig. 12 is an example display of Plant Vent prompts.

c. The program will then calculate the noble gas, I-131 and total iodine release rates and will display them on the screen. If a mistake was made when inputting data, then press the 'R' to redo calculations. Pressing the space bar will return to Plume plotting and dose projections. Fig. 13 is an example display of calculated release rate values.

2.4.1.2 Main Steam Line:

a. Enter the monitor reading or average reading on the effected steam line(s) in mR/hr.

b. Enter the number of steam line monitors that are releasing steam. Enter the steam flow in thousands of pounds per hour and the monitor correction factor for each steam line.

c. The program will then calculate the noble gas, I-131 and total iodine release rates and will display them on the screen. If a mistake was made when inputting data, then press the 'R' to redo calculations. Pressing the space bar will return to plume plotting and dose projections. Fig. 14 is an example display of Main Steam Line Release prompts.

2.4.1.3 Containment Curie Calculation

a. Enter the number of isotopes from the grab sample analysis.

b. Enter the isotope name, activity, (uCi/cc), and half-life (hrs.). Each of these will be entered prior to pressing the return key but are separated by a comma.

c. Enter the containment temperature (deg. F) and pressure (psig).

d. The program will then calculate the total curies in the containment. This value could be taken and used in containment leak rate dose projections. Answer the prompt for if another calculation is needed. Fig. 15 is an example display of Containment Atmosphere prompts.

FIGURE 1

SELECT OPTION NUMBER TO UPDATE

1) TODAY'S DATE = 01-01-1980

2) CURRENT TIME = 00:02:42

3) REACTOR SHUTDOWN RATE (MM/DD/YY) = 00-00-00

4) REACTOR SHUTDOWN TIME (HH:MM 24 Hr. CLOCK) = 00:00

5) CONTINUE

FIGURE 2

SELECT OPTION BY PRESSING APPROPRIATE NUMBER

1) CURRENT RELEASE DOSE DETERMINATION

2) PROJECTED DOSE DETERMINATION

3) REVIEW PAST ENTRIES

4) FIELD DATA

5) CHANGE REACTOR SHUTDOWN / TIME

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PVNGS EMERGENCY PLAN IMPLEMENTING PROCEDURE	PROCEDURE NO. EPIP-14B	APPENDIX D Page 14 of 31
INITIAL DOSE ASSESSMENT	REVISION 3	Page 29 of 54

FIGURE 3

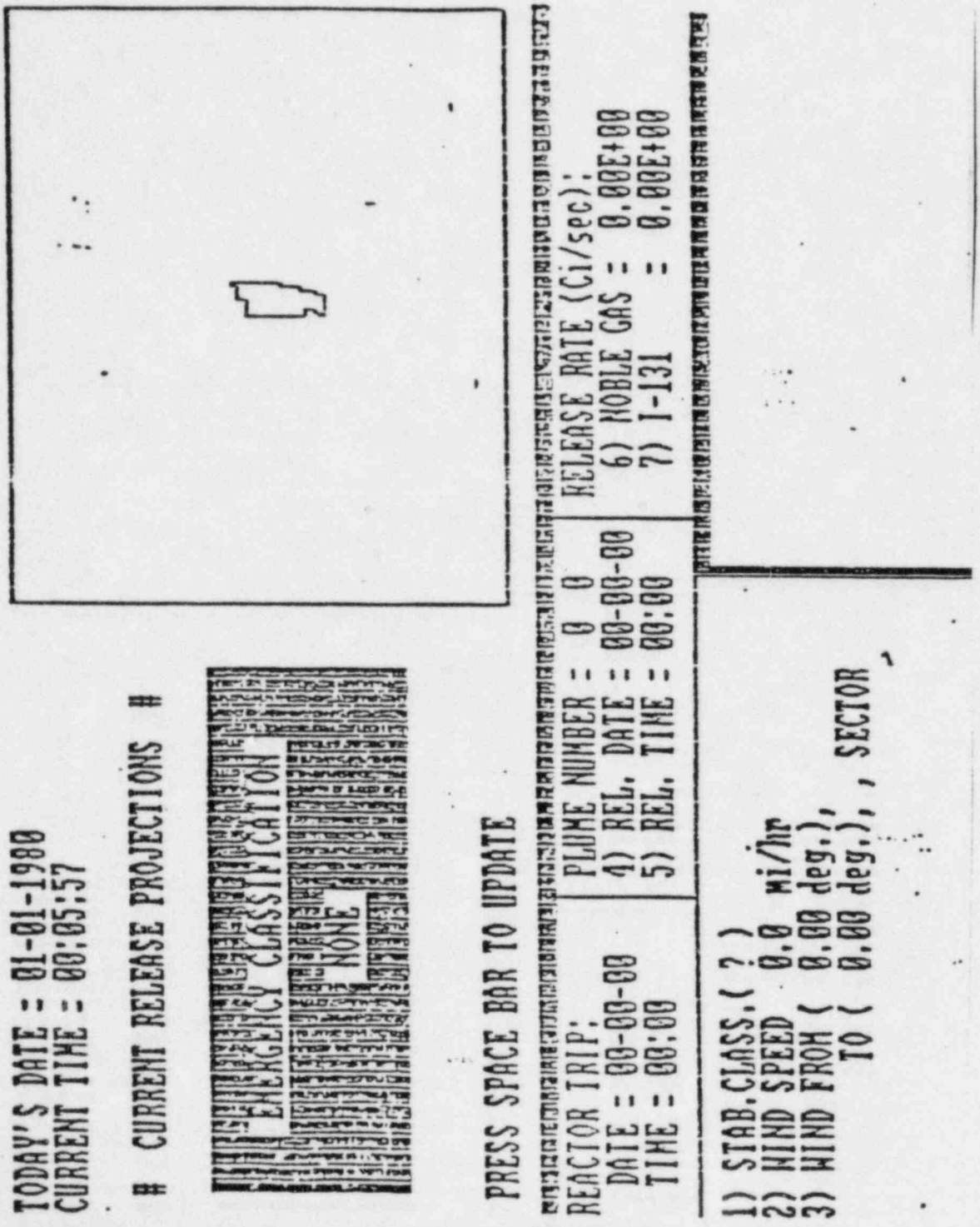
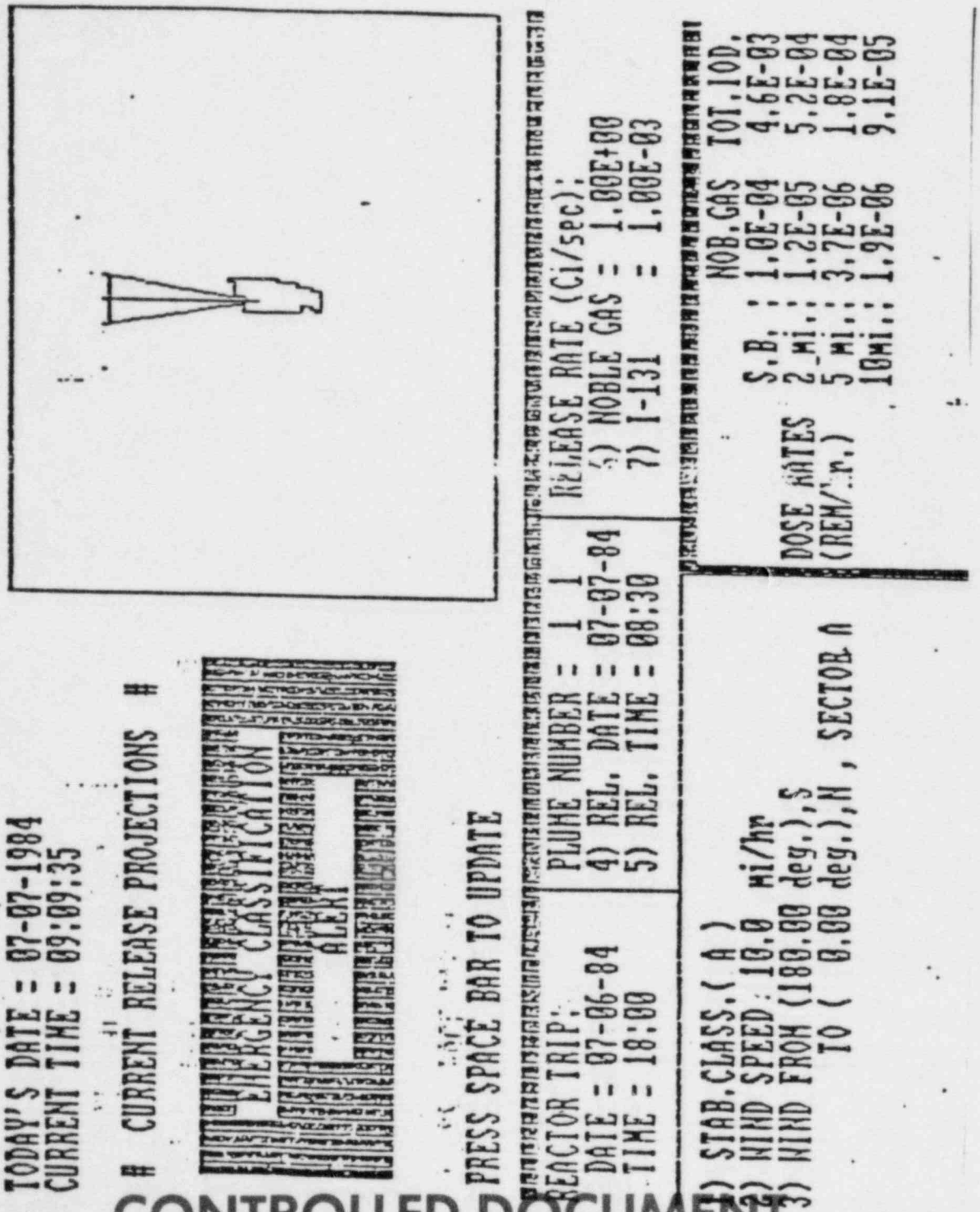


FIGURE 4



CURRENT RELEASE DATA PLUME # 2

TODAY'S DATE = 07-19-1984 CURRENT TIME = 15:36

REACTOR SHUTDOWN DATE & TIME = 07-19-84 AT 12:00 (hrs.)
RELEASE DATE & TIME = 07-19-84 AT 15:10 (hrs.)

** METEROLOGICAL INFORMATION **
WIND SPEED (mi/hr) = 10
STABILITY CLASSIFICATION = F
WIND DIRECTION FROM (W) AT (270) degs. TO THE (E) AT (90) degs.

** RELEASE RATE INFORMATION **
NOBLE GAS (Ci/sec) = .1
I-131 (Ci/sec) = .001

	DOWNWIND DISTANCE			
	SB	2	5	10
	2.5E-05	1.5E-05	4.9E-06	2.1E-06
PLUME ARRIVAL (HRS.)	0.13	0.20	0.50	1.00
EFFECTIVE AGE (HRS.)	3.30	3.37	3.67	4.17
** DOSE RATES (rem/hr)**				
NOBLE GASES	3.0E-04	1.9E-04	6.1E-05	2.6E-05
ADULT I-131 INHALATION	4.6E-02	2.8E-02	9.2E-03	3.9E-03
ADULT TOT.IODINE INHALATION	7.4E-02	4.5E-02	1.5E-02	6.0E-03
** 2 hr.DOSE COMMITMENT (rem) **				
NOBLE GAS	6.1E-04	3.7E-04	1.2E-04	5.1E-05
ADULT THYROID INHALATION	1.5E-01	9.0E-02	2.9E-02	1.2E-02
CHILD THYROID INHALATION	2.9E-01	1.8E-01	7.3E-02	2.4E-02

FIGURE 5

EMERGENCY CLASSIFICATION
ALERT

FIGURE 6

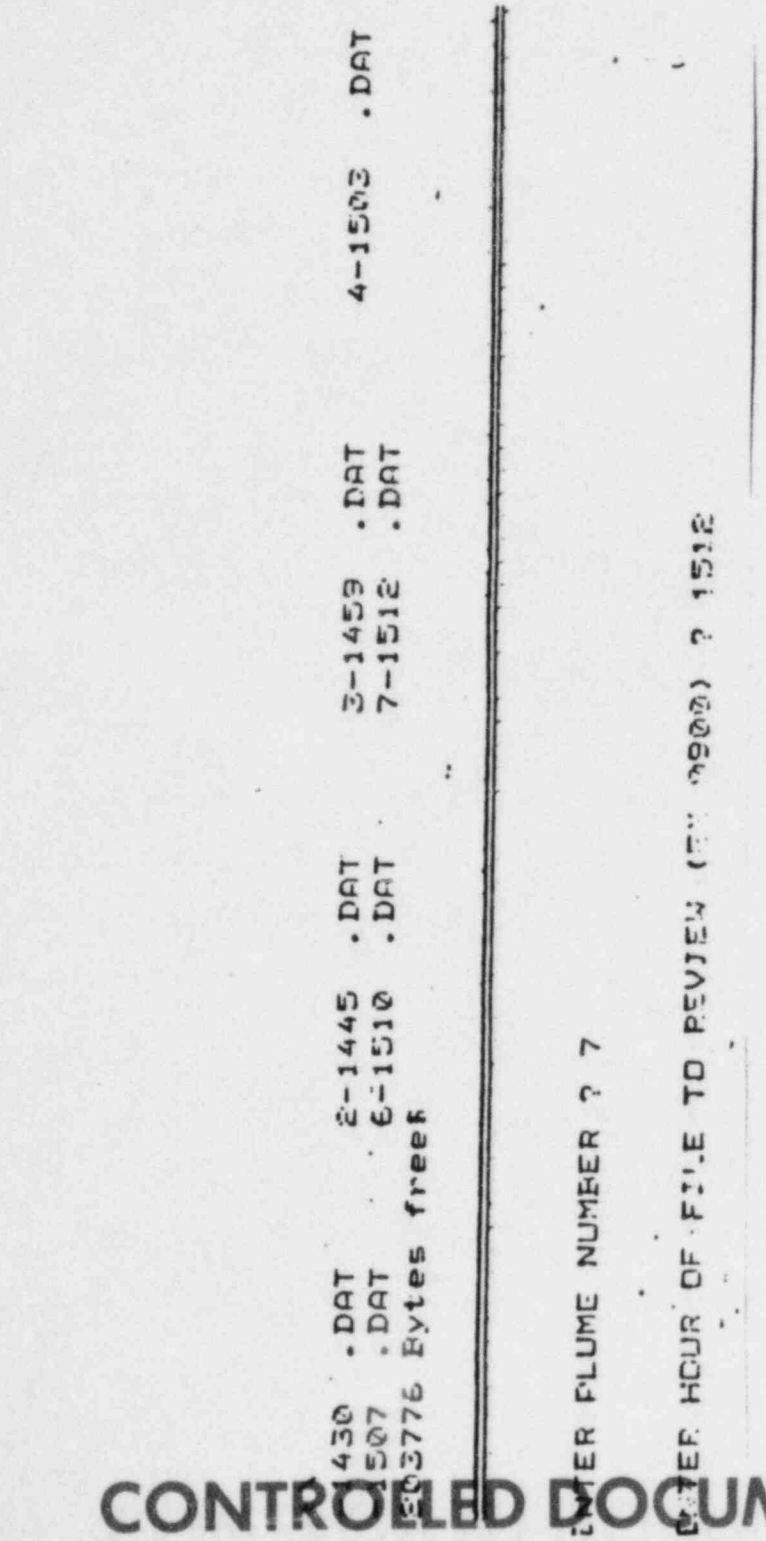


FIGURE 7

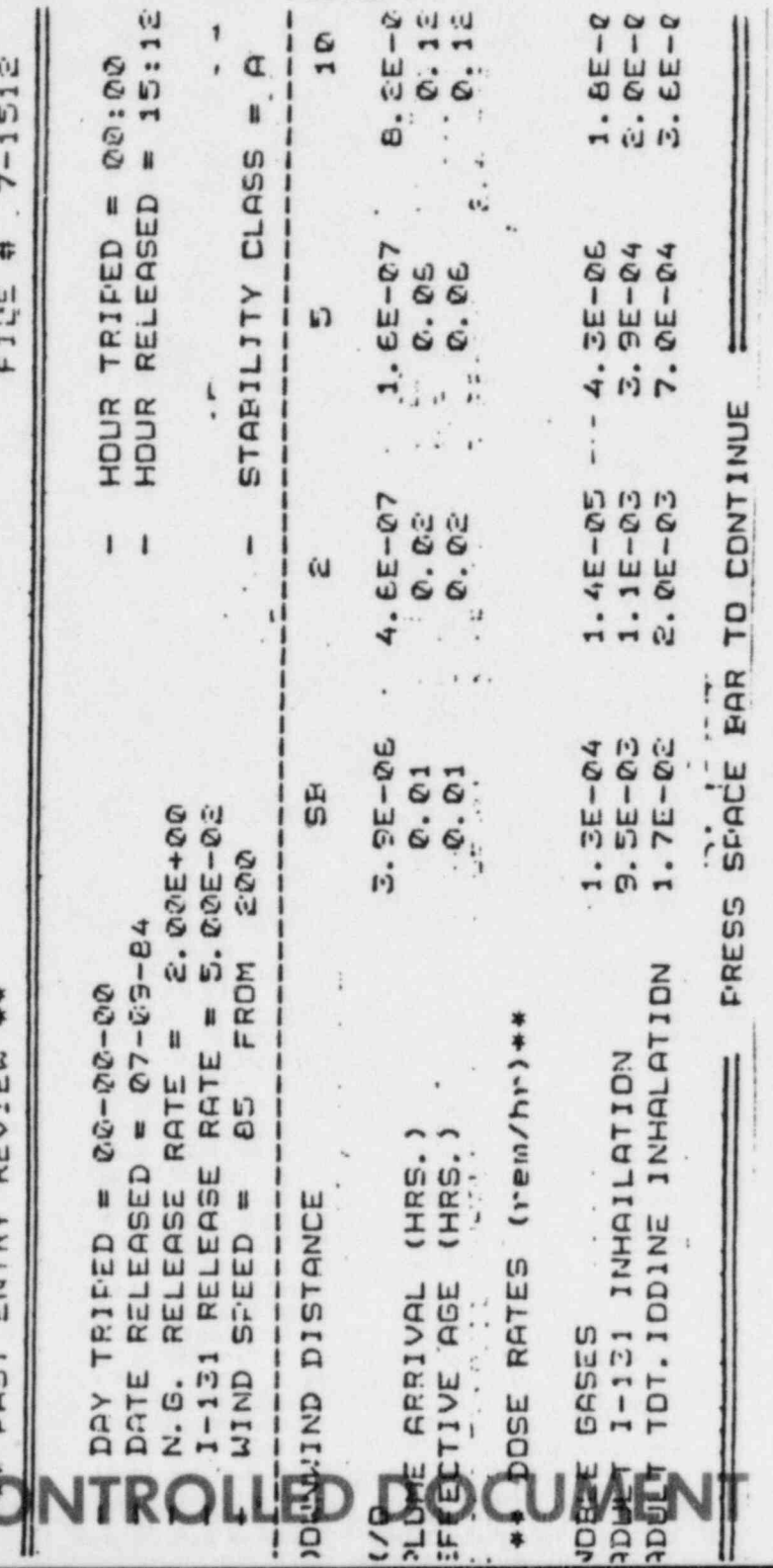


FIGURE 8

```
** FIELD IODINE DATA **

LOCATION = 355 & BECKEYE/SOLOME HWY.
SAMPLE TIME (HHMM) = 1500
SAMPLE DATE (MM/DD/YY) = 05/25/83
NET COUNTS = 1235
TOTAL VOLUME (CU.FT.) = 10
DETECTOR EFF. = .01

uC/cc = 1.95E-07

ADULT THYROID DOSE (REM) = 1.1E
CHILD THYROID DOSE (REM) = 2.3E
```

FIGURE 9

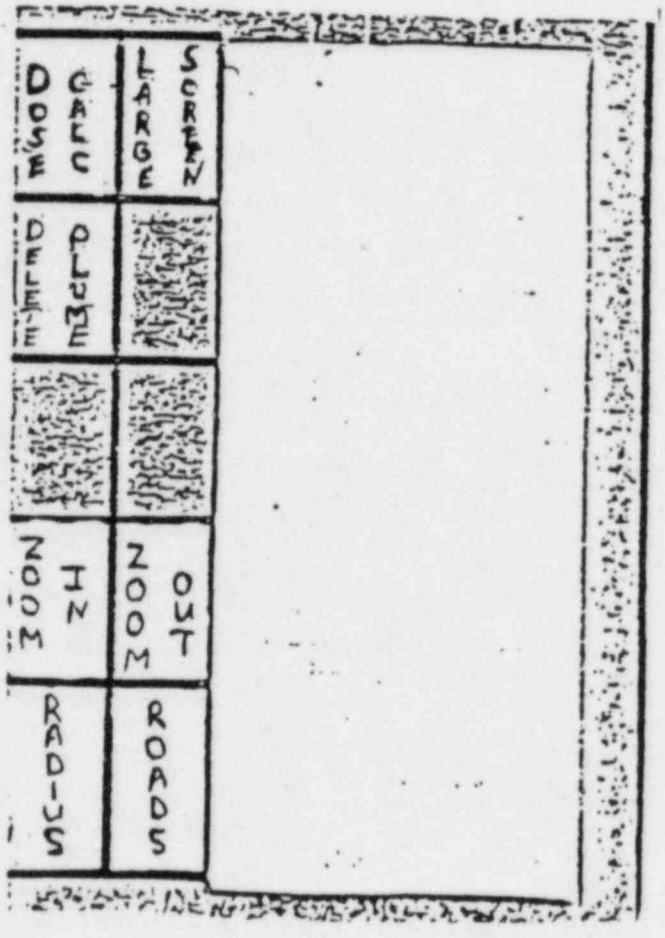


FIGURE 10

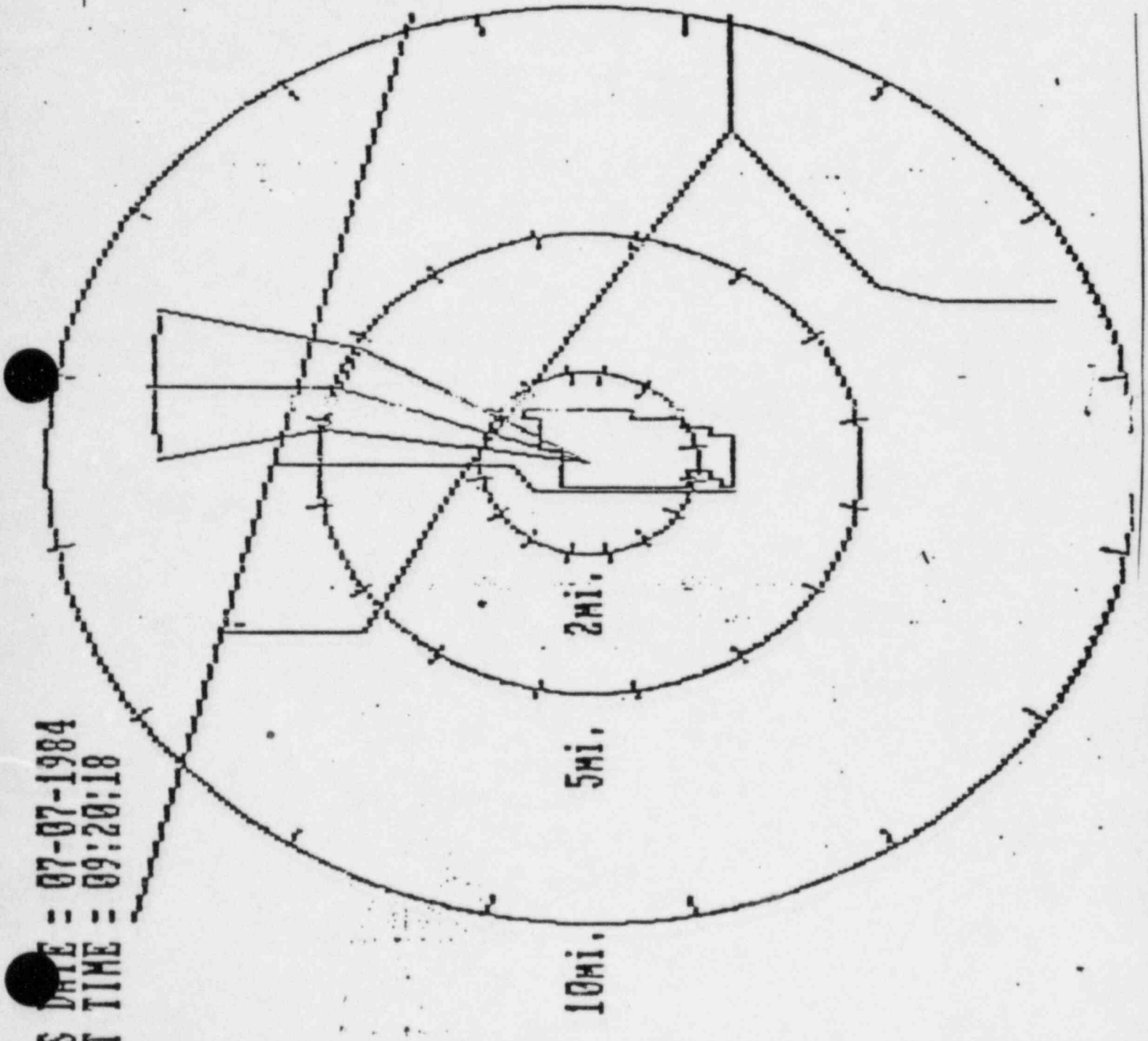


FIGURE 11

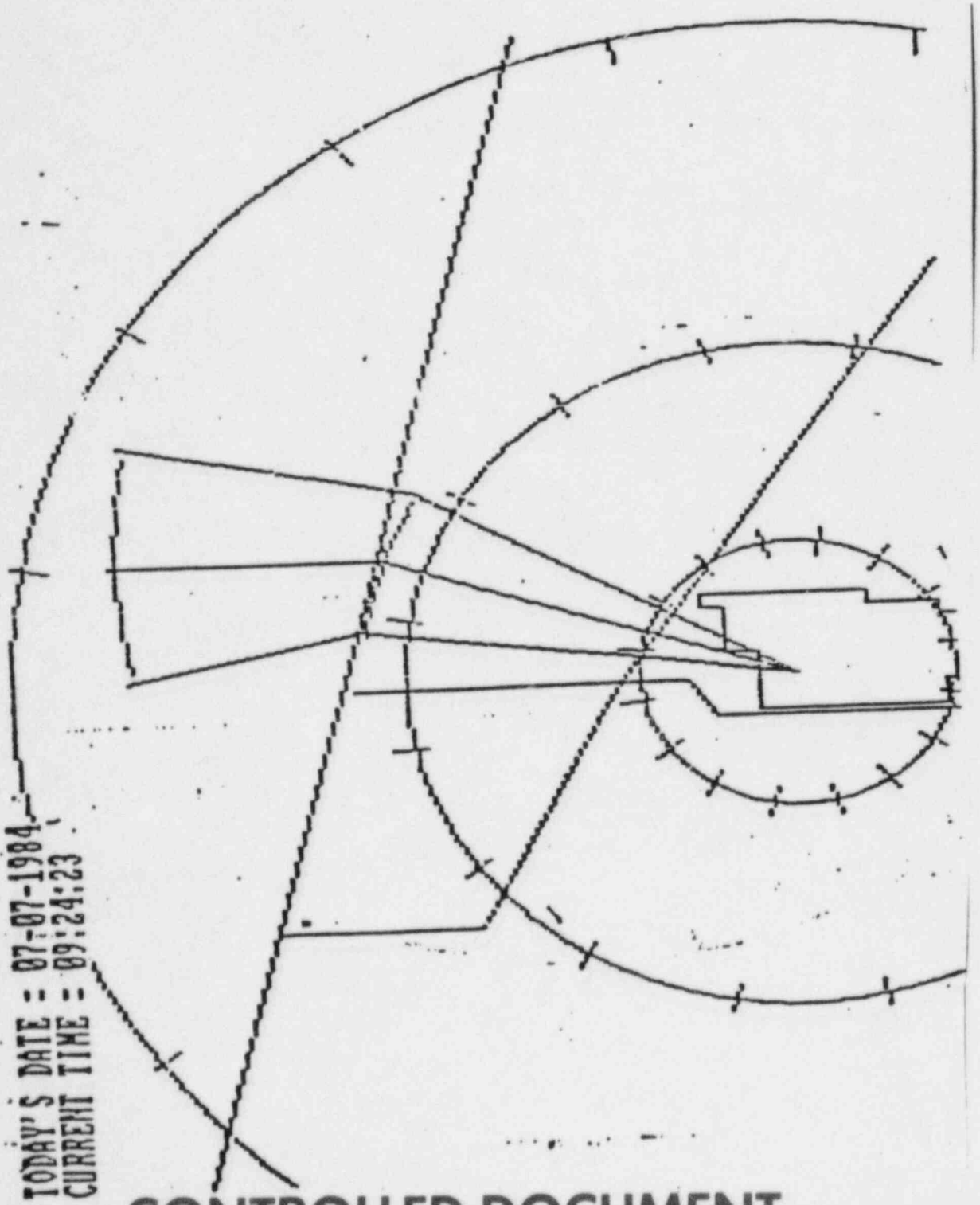


FIGURE 12

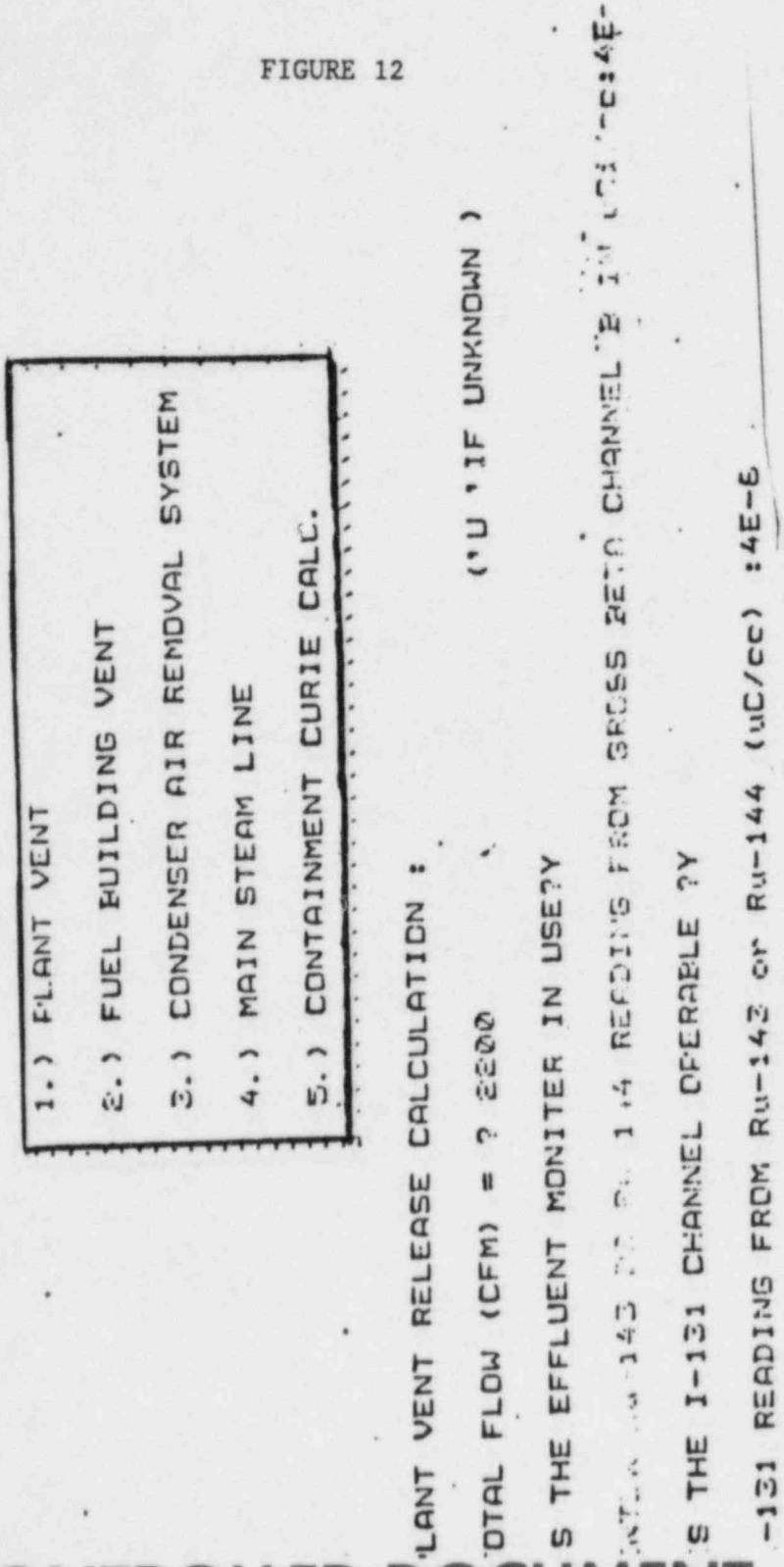


FIGURE 13

```
-------------------------------------------------
     PLANT VENT RELEASE CALCULATION :

NOBLE GAS RELEASE RATE=  4.15E-03 Ci/sec

I-131 RELEASE RATE =  4.15E-06 Ci/sec

TOTAL IODINE RELEASE RATE =  4.62E-06 Ci/sec
-------------------------------------------------
```

PRESS SPACE BAR TO CONTINUE
('R ' TO REDO)

CONTROLLED DOCUMENT

FIGURE 14

```
MAIN STEAM LINE RELEASE CALCULATION :

READING FROM Ru-139A,B or Ru-140A,B (mr/hr):
HOW MANY STEAM FLOW MONITERS ARE YOU INPUTTING?
FLOW FROM MONITER # 1 (10^3 lbs/hr):?
ENTER CORRECTION FACTOR:
```

FIGURE 15

```
CONTAINMENT ATMOSPHERIC TOTAL CURIE CALCULATION

ENTER TOTAL NUMBER OF NUCLIDES TO BE CONSIDERED:?

ENTER ISOTOPE  1 (NAME,ACT(uCi/cc),T1/2(HRS):?

ENTER CONTAINMENT TEMPERATURE (deg.F) ?

ENTER CONTAINMENT PRESSURE (PSIG)?

ENTER TIME IN HRS SINCE SAMPLE WAS TAKEN (hrs.):
```

Exhibit 3

PROGRAM DESCRIPTION USED TO CALCULATE THE TOTAL ISOTOPIC CURIE CONTENT OF CONTAINMENT

The program "Containment Curie Content" is used to calculate the total isotopic curie content of containment for a given temperature and pressure. Utilizing manually inputted sample results, pressure, temperature and time since sampling, the program corrects the containment volume to STP and then calculates the total curie content per isotope and overall.

The program uses 7.4191×10^{10} cc as the standard containment volume.

EQUATIONS USED

1) Temperature Correction

$$°K = ((°F - 32) \times 5/9) + 273$$

Where:

°K = Temperature absolute

°F = Temperature °F

2) STP Correction

$$\text{Corrected Volume} = \frac{14.7 \text{ (psia)} \times 7.42 \text{ E+10(cc)}}{273 \text{ (°K)}} \quad \frac{T_2 \text{ °K}}{P_2 \text{ (psia)}}$$

$$(V_2)$$

3) Correction to Ci calculation

Corrected Act (Ci) = (Act (uCi) x corrected Volume)/1 X E + 6 uCi/Ci)

Exhibit 3 (Continued)

EQUATION DERIVATIONS

Pressure/Temperature from Boyles Law:

$$V_2 = \frac{P\ V}{T}\ \frac{(T_2)}{(P_2)}$$

At STP the total free volume of containment = 2.62 E + 6 Ft^3 which converts to:

$$\frac{2.62 \times 10^{6}\ Ft3}{3.5314 \times 10^{-5}\ \frac{Ft^3}{Cm^3}} = 7.42\ E{+}10cc$$

Therefore the volume at some other temperature and pressure is:

$$V_2 = \frac{(14.7\ (psia) \times 7.42E{+}10(cc)}{273\ (^\circ K)}\ \frac{T_2\ (^\circ K)}{P_2 (psia)}$$

Exhibit 3 (Continued)

Manual Calculation:

Base Data

Date: 22 September 1983

Sample Date: 22 September 1983

Time: 0729

Sample Time: 0629

Containment Temperature: 110°F

Containment Pressure: 15.3 PSIA

Total free containment volume: 2.62×10^6 Ft^3

Isotopic Breakdown:

Isotope	Activity
1) I-131	3.5 E -6
2) I-132	4.7 E -7
3) I-133	6.2 E -5
4) I-134	8.7 E -6
5) I-135	1.3 E -6
6) Xe-135	2.4 E -4
7) Xe-133	8.7 E -4
8) Kr-87	6.3 E -5
9) Kr-85m	1.8 E -6
10) KR-88	2.5 E -3
11) Ar-41	1.7 E -3

CONTROLLED DOCUMENT

Exhibit 3 (Continued)

TOTAL ACTIVITY CALCULATION

	Isotope	Activity uCi/cc	Total Activity uCi	Activity Ci
1)	I-131	3.5 E - 6	2.761 E + 5	2.761 E - 1
2)	I-132	4.7 E - 7	3.707 E + 4	3.707 E - 2
3)	I-133	6.2 E - 5	4.891 E + 6	4.891 E + 0
4)	I-134	8.7 E - 6	6.863 E + 5	6.863 E - 1
5)	I-135	1.3 E - 6	1.025 E + 5	1.025 E - 1
6)	Xe-135	2.4 E - 4	1.8932 E + 7	1.893 E - 1
7)	Xe-133	8.7 E - 4	6.863 E + 7	6.863 E - 1
8)	Kr-87	6.3 E - 5	4.9696 E + 6	4.9696 E - 0
9)	Kr-85m	1.8 E - 6	1.42 E + 5	1.42 E - 1
10)	Kr-88	2.5 E - 3	1.972 E + 8	1.972 E + 2
11)	Ar-41	1.7 E - 3	1.341 E + 8	1.341 E + 2
			TOTAL	4.30 E +2

CONTROLLED DOCUMENT

Exhibit 3 (Continued)

CONTAINMENT TOTAL CURIE CONTENT

Date: 9/22/83 UNIT: 1
Time: 729
Containment Temp: 110 F
Containment Press: 15.3 PSIA

	ISOTOPE	TOTAL ACTIVITY (Ci)
1)	I-131	2.761 E-1 Ci
2)	I-132	3.707 E-2 Ci
3)	I-133	4.891 E+0 Ci
4)	I-134	6.863 E-1 Ci
5)	XE-135	1.893 E+1 Ci
6)	XE-133	6.863 E+1 Ci
7)	KR-87	4.970 E+0 Ci
8)	KR-85M	1.420 E-1 Ci
9)	KR-88	1.972 E+2 Ci
10)	AR-41	1.341 E+2 Ci
TOTAL CURIES:		4.30 E+2 Ci

I. Introduction

This appendix is used as an alternate method for determining meteorological conditions in the site environs when the ERFDADS/Meteorological Tower is inoperative.

Immediately on determination that communications with ERFDADS has been lost or that the met tower is inoperative a technician should be dispatched to the met tower area to obtain weather data locally. The dose projection process should not be held up while waiting for the technician to report. However, the technician should report the wind direction before the affected sectors are determined. The default value for affected sectors should not be used unless there is no indication of wind direction available.

The following is a listing of the three backup methods and a brief description of when to use each one.

1. Default Values - used for initial does projection when the ERFDADS/Meteorological Tower is unavailable. These values are extremely conservative and should be replaced with real data as soon as possible.

2. Local Readings from the main meteorological tower - on a loss of communications via ERFDADS during a release or with a release imminent, a technician should be dispatched to the meteorological tower and readings relayed from the local instruments. Dose projections should not be held up while waiting for this data. Default conditions should be used until the local station is manned.

3. Mechanical Weather Station - for use when the main met tower is unavailable (inoperative). Default values must be used until a technician reaches the met station. The mechanical weather station reads out on a strip chart inside the unit.

The following sections are divided into two parts. Part A is a description of the method and Part B is the operating instructions for that method.

II. Default Assumptions and Values

A. Assumptions

The use of default values requires that estimates be made conservative enough to ensure proper protective action recommendations are made to protect the general public. The assumed meteorological conditions must be such that they will yield the most restrictive plume dispersal factors for the ten mile EPZ.

Because accurate determination of wind direction cannot be made, then a conservative assumption must be used regarding site boundary distance and affected sectors. The most restrictive site boundary from an emergency classification standpoint is the west boundary along Wintersburg Road. This boundary is affected when the wind is from the east. Therefore, when choosing the Xu/Q value for site boundary, use the value listed for wind from ninety degrees.

For affected sectors, have the technician at the met tower visually check the wind vane on the met tower at the thirty-five foot elevation or on the mechanical weather station. If the technician is unable to make an estimation of wind direction based on observation of the wind vanes at the met tower, then all sectors should be considered affected.

Wind speed presents a problem in that a low wind speed will give a conservative estimate of X/Q, but results in less conservative values for transit time/effective age at the receptor. High assumed wind speeds result in errors in the X/Q, while being conservative in transit time and effective age. To compensate for this it is necessary to assume two wind speeds, a low wind speed for X/Q determination and a high wind speed for plume transport.

For atmospheric dispersion factor (X/Q) selection, the class selected must allow for the least dispersion during transport. The stability category that allows for the least dispersion is a condition of extreme stability, Class G.

B. Instructions

1. The following parameters should be used for default values for projecting off-site doses:

   1.1 Wind direction - 90 degrees

   1.2 Wind speed - for X/Q determination, use 1 mph
   - for transit time, use 10 mph

   1.3 Stability class - G

   1.4 For affected sectors and protective action recommendations, use indicated wind direction, if available, or default to all sectors if no direction obtainable.

III. Local Readout at the Meteorological Tower

A. Discussion

This section is to be used when communications from the met tower to the ERFDADS are not available. Initial dose projections should not be held up while waiting to use this section, default values are to be used until a technician gets to the met tower. When the technican arrives at the met tower, he must determine that the met tower is operable. If the met tower is not operable report this to the EOF/STSC and proceed to section IV.

B. Instructions

1.0 Send a technician to the met tower.

1.1 The key for the met tower may be obtained from shift security personnel.

2.0 At the met tower.

2.1 Establish communcations with the EOF (if manned) or the STSC.

2.2 Verify operability of the met tower.

2.2.1 If the tower is inoperative, report this to the EOF or STSC and proceed to Section IV of this appendix.

2.2.2 If the tower is operable, proceed to step 2.3.

2.3 Obtain the following data and transmit it to the EOF or STSC.

NOTE

Use fifteen minute averages for data points.

2.3.1 Wind direction in degrees at the thirty-five foot elevation.

2.3.2 Wind speed in miles per hour at the thirty-five foot elevation.

2.3.3 Delta T in degrees Fahrenheit (200 ft. - 35 ft.).

IV. Set Up and Operation of the Mechanical Weather Station

NOTE

Default values should be used for dose projections until the mechanical weather station is verified to be running and has been accumulating data for a minimum of fifteen minutes.

A. Discussion

The mechanical weather station is a self-contained portable met station designed to operate in remote areas with little or no routine attention. Its only power requirement is four D-cell batteries to run the chart drive. The chart paper and batteries are good for a thirty day period. Wind speed and wind direction automatically score the special chart paper when actuated by a wind. Wind speed is measured by a standard three cup anemometer and wind direction is measures by a vane assembly. The temperature probe has a scribe attached to score the chart paper.

The wind speed and direction elements drive rollers through a gear assembly. The rollers have integral spiral ridges around then that make contact with the paper and score it as the vane or anemometer rotates. The wind direction chart goes from north to north. The continuous spiral ensures tracking for wind shifts greater than 360 degrees.

Wind speed, or wind run, accumulates on the chart from 0 - 10 miles. When the anemometer has rotated the roller through ten miles or run, the roller starts accumulating from zero again. To find the wind speed in miles per hour, add the total accumulated miles in the last 15 minute time period and divide by .25 hour to get average wind speed in miles per hour for the last 15 minutes.

If wind speed is greater than 3.3 mph, the wind direction trace can be also be used to determine the stability class. This is accomplished by computing the standard deviation of the wind direction flucuation, $\sigma\theta$. The value of $\sigma\theta$, in degrees, can be used to assign a stability class. To accurately calculate $\delta\theta$ requires a relatively lengthy calculation. However, $\delta\theta$ can be approximated by estimating the range of wind fluctuation over the time period of concern, then dividing by six. That is, if wind direction for the last hour has fluctuated between 180 deg and 240 deg. then the range of fluctuation would be 60 deg. 60 deg. /6 = 10 deg. So in the above situation, $\sigma\theta$ would equal 10 deg. and by comparing that value with the table in the procedure, the stability class can be found. This is valid only if wind speed is greater than 3.3 mph. For speeds less than 3.3 mph, a default stability class of G must be assumed.

B. Operating Instructions

1.0 Mounting the Mechanical Weather Station (MWS)

NOTE

If station is already operating proceed to section 2.0.

1.1 Remove MWS transport case from the met trailer.

1.2 Open the case and inspect the MWS.

1.2.1 Check that the MWS does not appear to be physically damaged.

1.2.2 Inspect the batteries, the MWS requires four D-cells. Ensure the batteries are not corroded.

1.2.3 Check that the chart recorder has chart paper in it and that it is the proper paper (#1072-2, 30 day chart paper).

1.2.4 Check that all parts are present.

1.3 Mounting the MWS

1.3.1 Remove the main housing from the case.

1.3.2 Lower the main housing onto the mounting tube and align the scribe marks on the tube and weather station.

1.3.3 Tighten the set screws inside the MWS to lock the station to its mounting tube.

1.4 Anemometer Installation

1.4.1 Remove the anemometer retaining nut and plate.

1.4.2 Align the holes in the anemometer with the screw heads on the drive assembly.

1.4.3 Replace the retainer plate and tighten the retaining nut.

1.5 Installing the wind direction vane tail assembly

1.5.1 Loosen the collet nut.

1.5.2 Insert the tail assembly through the collet nut and into the collet.

1.5.3 Tighten the collet nut.

1.6 Install the batteries and battery cover.

1.7 Align the chart paper to the correct time. Mark the date and time the MWS was placed in service on the chart.

1.8 Turn on the chart drive (switch on the lower left side of the chart assembly).

1.9 Depress the roller engagement lever located above the chart assembly to start recording data.

1.10 Allow data to collect for at least fifteen minutes prior to using this information.

2.0 Obtaining Data from the MWS

NOTE

For initial does projections using default values, the wind direction may be an instaneous value. It is not necessary to wait for a 15 minute average.

2.1 Verify that the MWS is operating and has accumulated data for at least 15 minutes prior to use.

NOTE

The smallest time division on the chart is 30 minutes. The technician will have to judge half the distance between time divisions for 15 minute time periods.

2.2 Mark a fifteen minute time period on the chart.

CAUTION

CARE MUST BE TAKEN TO ENSURE THAT IT IS WIND FLUCTUATION ABOUT A POINT AND NOT A SHIFT IN THE WIND THAT IS BEING MEASURED. IF THE DETERMINATION IS MADE THAT A WIND SHIFT HAS OCCURRED, THEN DEFAULT VALUES FOR DIRECTION AND STABILITY CLASS MUST BE USED UNTIL THE WIND HAS SETTLED ONTO A NEW HEADING.

2.3 Obtaining Wind Direction and $\sigma\theta$

2.3.1 Mark the average fluctuation on the chart (Wind direction trace will not be a steady line, but will fluctuate to a certain degree depending on the atmospheric stability).

2.3.2 Take the average of the fluctuations and report this as average wind direction.

2.3.3 Measure the distance of average fluctuation in degrees. This is the range of wind fluctuation.

2.3.4 Divide the range by six and report the result as $\sigma\theta$.

2.4 Obtaining Wind Speed

NOTE

The MWS records wind run, which is the total distance in miles that the wind covers in the time selected. The chart records wind run in ten mile increments.

2.4.1 Sum the total miles of wind run in the fifteen minute period marked on the chart.

2.4.2 Multiply the wind run by four to get average wind speed in miles per hour for that fifteen minute period. Report this result.

PVNGS EMERGENCY PLAN IMPLEMENTING PROCEDURE	PROCEDURE NO. EPIP-14C	
CONTINUING DOSE ASSESSMENT	REVISION 1	Page 1 of 61

ASSIGNED COPY

PVNGS # 8-9B

DEPT. HEAD Dennis B. Gow DATE 4/1/85

PRB/PRG/TRRG REVIEW O.A. Zimmerman DATE 4/1/85

APPROVED BY O.A. Zimmerman DATE 4/1/85

EFFECTIVE DATE 04-09-85

DN-9618A/0867A

PVNGS EMERGENCY PLAN IMPLEMENTING PROCEDURE	PROCEDURE NO. EPIP-14C	
CONTINUING DOSE ASSESSMENT	REVISION 1	Page 2 of 61

REVISION HISTORY

Rev. No.	Date	Revised Pages	Comments
1	4-9-85	Total Rewrite	

TABLE OF CONTENTS

SECTION		PAGE NUMBER
1.0	OBJECTIVE	5
2.0	REFERENCES	5
3.0	LIMITATIONS AND PRECAUTIONS	6
4.0	DETAILED PROCEDURE	7
4.1	Personnel Indoctrination/Responsibilities	7
4.2	Prerequisites	7
4.3	Instructions	7

APPENDICES

Appendix A -	Data Sheets for Dose Projection and Comparison	17
	A-1 Calculation of Whole Body and Thyroid Dose Commitments	18
	A-2 Whole Body Dose Rate Comparison	19
	A-3 Thyroid Dose Commitment Comparison	
	A-4 Particulate Ground Deposition Comparison	20
Appendix B -	Alternate Methods for Obtaining Meteorological Data	21
Appendix C -	Atmospheric Dispersion Factors	28
	Table C-1 Valves of Xu/Q For Site Boundary to 50 Miles and Key Receptor Sites by Sector.	28
	Table C-2 Values of Sigma y and Sigma z for Site Boundary to 50 Miles.	30
Appendix D -	Radiological Data	33

APPENDICES (CONT'D)

SECTION	PAGE NUMBER
Table D-1 Mean Gamma Decay Energy vs. Effective Age for Noble Gas Mixtures	33
Table D-2 Summation of Iodine Dose Conversion Factors vs Effective Age and Total Iodine to I-131 Dose Ratios for Adult Thyroid	34
Appendix E- PVNGS Emergency Off-Site Dose Projection Computer Program Instructions	35

1.0 OBJECTIVE

This procedure provides instructions and calculations necessary to determine actual or projected offsite whole body gamma and thyroid inhalation dose commitments based upon actual meteorological data and noble gas and I-131 release rates (Ci/sec). Actual or projected dose calculations provide a basis for decision making concerning recommendations of appropriate protective actions to state or county authorities.

2.0 REFERENCES

2.1 Implementing References

2.1.1 EPIP-14A, "Release Rate Determination"

2.1.2 EPIP-14B, "Initial Dose Assessment"

2.1.3 EPIP-15, "Protective Action Guidelines"

2.1.4 EPIP-16, "Inplant Surveys and Sampling"

2.1.5 EPIP-17, "Onsite/Offsite Surveys and Sampling"

2.1.6 The CRAC System User's Manual

2.1.7 EPIP-33, "Offsite Assistance"

2.2 Developmental References

2.2.1 PVNGS Emergency Plan, Rev. 5.

2.2.2 NRC Reg Guide 1.145, August 1979; "Atmospheric Dispersion Models for Potential Accident Consequence Assessments at Nuclear Power Plants".

2.2.3 NRC Reg Guide 1.111, July 1, 1977, Rev 1; "Methods for Estimating Atmospheric Transport and Dispersion of Gaseous Effluent in Routine Releases from Light-Water-Cooled Reactors".

2.2.4 Introduction to Nuclear Engineering, John R. LaMarsh, Addison Wesley Publishing Company, December 1977.

2.2.5 Health Physics Journal, November 1981, Volume 41 No. 5, page 759.

2.2.6 NRC Reg Guide 1.109 "Calculation of Annual Doses to Man from Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10CFR50, Appendix I", October 1977.

2.2.7 EPA "Manual of Protective Action Guides and Protective Actions for Nuclear Incidents" Appendix D, Revised June 1980.

2.2.8 Desert dispersion parameters as referenced in NUREG/CR-2858, "PAVAN: An Atmospheric Dispersion Program for Evaluating Design Basis Accidental Releases of Radioactive Materials from Nuclear Power Stations", Nov. 82.

2.2.9 Meteorology and Atomic Energy, David A. Slade, Editor, 1968.

2.2.10 Journal of Applied Meteorology, Volume 3, p 83-91, "A Diffusion Model for an Urban Area", D. B. Turner, 1964.

2.2.11 ANSI N45.2.9 "Requirements for Collection, Storage and Maintenance of Quality Assurance Records for Nuclear Power Plants, 1974.

2.2.12 Safety Guide 23 "Onsite Meteorological Programs", USAEC, 2/17/72.

2.2.13 Handbook of Environmental Radiation, Alfred W. Klement, ed., CRC Press Inc.

3.0 LIMITATIONS AND PRECAUTIONS

3.1 Release rate determinations shall be conducted in accordance with EPIP-14A, "Release Rate Determination:

3.2 Actual dose rates and integrated doses vary as a function of:

1) The duration of the release;

2) The release rates (dependent upon effective age);

3) The isotopic mixture of the release (dependent upon effective age);

4) Existing meteorological conditions.

4.0 DETAILED PROCEDURE

4.1 Personnel Indoctrination/Responsibilities

4.1.1 The Radiation Protection Monitor shall be responsible for initial offsite dose calculations and/or projections.

4.1.2 The Radiological Assessment Coordinator (at the EOF) shall be responsible for dose calculations and/or projections when the EOF becomes operational.

4.2 Prerequisites

4.2.1 An ALERT or more severe class emergency has been declared.

4.2.2 A release of airborne radioactive material has occured or is imminent.

4.3 Instructions for Computer Assisted Dose Assessment

4.3.1 Calculate doses and dose rates using the CRAC system, following instructions in the CRAC System User's Manual. If the emergency dose assessment capability of the CRAC system is unavailable, carry out the procedure for performing dose calculations using the IBM PC computer, as described in section 4.3.2.

4.3.2 Calculate doses and dose rates using the PVNGS Emergency Offsite Dose Projection computer program and the IBM PC computer, following the instructions included in Appendix J. If the program or the computer is not available, carry out the manual procedure described in section 4.3.1 through 4.4. Upon completion of dose calculations (whether manual or computer-assisted), proceed with section 4.3.11.

4.4 Instruction for Manual Dose Assessment

4.4.1 Meteorological Data - Appendix A, Table A-1, Section A.

NOTE

Appendix A, Table A-1 must be completed for the site boundary, two miles, five miles, ten miles.

4.4.1.1 Complete Appendix A header section, filling in receptor site, reactor shutdown date and time, and release date and time.

NOTE

If ERFDADS is unavailable, refer to Appendix C for alternate methods to calculate current meteorological conditions.

4.4.1.2 Using ERFDADS, call up the current meteorological data using the fifteen minute average channel and thirty-five foot data.

4.4.1.3 Enter the wind direction, wind speed, and delta T or $\sigma\ \theta$ in Section A of Table A-1.

4.4.1.4 Using the table below, determine the atmospheric stability classification and enter it in Section A.

TABLE 4.3.3-1

Stability Class	Delta T (°F)	$\sigma\ \theta$ (degrees)
A	< -1.72	> 22.5°
B	-1.72 to -1.54	22.5° to 17.5°
C	-1.54 to -1.36	17.5° to 12.5°
D	-1.36 to -0.45	12.5° to 7.5°
E	-0.45 to 1.34	7.5° to 3.75°
F	1.34 to 3.62	3.75° to 2.1°
G	> 3.62	< 2.1°

4.4.1.5 Select the appropriate overlay that corresponds to the determined stability category and match the overlay with the release point on the map.

CONTROLLED DOCUMENT

> CAUTION
>
> THE COMPASS HEADING ON THE 10 MILE EPZ MAP IS ROTATED 180°.

4.4.1.6 Rotate the overlay until the direct downwind plume centerline is oriented in the direction of the compass heading of the wind.

4.4.1.7 Identify key receptor locations in the path of the dispersing plume.

> NOTE
>
> Affected sectors are the sector that the plume centerline passes through and one sector to either side of it, unless the plume centerline passes through sector N, P, or Q. If the plume centerline passes through one of these sectors, then two sectors to either side are affected to account for additional dispersion of the plume due to the Palo Verde Hills.

4.4.1.8 Enter the affected sector in Section A.

4.4.1.9 Plot the path of the dispersing plume by tracing the overlay.

4.4.2 Data Table A-1, Section B - Effective Age at Receptor, Transit Time, and Plume Arrival Time.

4.4.2.1 Enter the downwind distance of the receptor site in miles (found in Appendix C., Table C-1). Divide downwind distance by the windspeed in miles/hour from Section A to get the transit time.

4.4.2.2 Add the effective age of the mixture determined in EPIP-14A, "Release Rate Determination", to the transit time to get the effective age of the mixture at the receptor site.

4.4.2.3 To determine the plume arrival time, take the release time from the header and add the transit time to it. Enter this time in the space for plume arrival time in Section B.

4.4.3 Data Table A-1, Section C - X/Q Determination

NOTE

For downwind receptor distances not listed in Appendix D, the following formula may be used:

For plume centerline values -

$$Xu/Q = 1/[\ \pi\ \sigma y^2 \sigma z^2]$$

For off centerline values -

$$Xu/Q = (Xu/Q)_c\ e^{-[y2/\sigma y^2]},$$

where: $(Xu/Q)_c$ = centerline Xu/Q
y = distance from centerline (meters)
σy = from table in Appendix D
σz = from table in Appendix D

4.4.3.1 Find Xu/Q for the downwind distance and atmospheric stability class in Appendix C., Table C-1. Divide Xu/Q by wind speed to obtain the X/Q for that receptor site.

4.4.4 Data Table A-1, Section D - Radioactivity Concentration at Receptor.

4.4.4.1 From EPIP-14A, Appendix A, enter the noble gas release rate and the total iodine release rate.

4.4.4.2 Multiply the release rates by the X/Q for the receptor site to obtain the noble gas and total iodine concentrations at the receptor site.

4.4.5 Data Table A-1, Section E - Whole Body Dose Projection

4.4.5.1 Enter receptor site noble gas concentration and effective gamma decay energy from Appendix D, Table D-1 (use 1% failed fuel data, unless core damage in excess of 1% failed fuel is suspected, then use total core inventory).

4.4.5.2 Perform the indicated multiplication to get the projected noble gas dose rate.

4.4.5.3 Mulitply projected dose rate by two hours or the duration of the release to get the projected whole body dose, whichever is more.

4.4.6 Data Table A-1, Section F - Thyroid Dose Commitment

4.4.6.1 Enter receptor site iodine concentration and exposure time.

4.4.6.2 Using Appendix D, Table D-2, enter the Σ_IDCF for adult thyroid.

4.4.6.3 Perform the indicated multiplications to find the projected thyroid dose commitment for child and adult exposures.

4.4.7 Complete Data Table A-1 for each receptor site distance in the affected sectors.

4.4.8 Update and refine dose calculations every hour and upon significant (as indicated below) changes in one or more of the following parameters using Appendix A, Table A-1.

4.4.8.1 Release Rates (± 20% change)

4.4.8.2 Duration of the Release (± 20%)

4.4.8.3 Existing Meteorological Conditions
(WD ± 25° change Stability - ± 1 category)
(WS - ± 20% change)

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4.5 Estimation of Off-site Doses and Ground Contamination Based on Field Measurements.

NOTE

Off-site samples may be analyzed in the Radiological Emergency Response Vehicle and/or the on-site chemistry lab and the data transmitted to the STSC/EOF for incorporation into off-site dose calculations. This data should then be compared with projected doses and concentration.

4.5.1 Calculation and comparison of whole body does based on field surveys.

4.5.1.1 Sample teams shall report gross mR/hr at 3', the sample location and sample time. Enter the data in columns 1.2 and 3 of Appendix A, table A-2.

4.5.1.2 Determine an equivalent dose rate for the time and location using section 4.4.5. Enter this value in column 4 of table A-2.

4.5.1.3 Divide column 4 by column 3 and record the result in column 5 as the ratio of calculated whle body dose rate to measured whole body dose rate.

4.5.2 Calculation and comparison of thyroid dose commitments based on field measurements.

4.5.2.1 Sample teams shall report iodine sample data in terms of sample location, time, net count rate, duration, flow rate, instrument efficiency and type of instrument used.

NOTE

Type of instrument is required only to determine whether the results are gross iodine concentration or I-131 concentration (the SAM-2 counts only I-131, while a frisker counts gross iodine.)

4.5.2.2 Enter the data in the appropriate columns of Appendix A, table A-3.

4.5.2.3 Calculate the airborne concentration of iodine using the following formula:

$$\text{activity} = \frac{\text{Net CPM} \times 1.59\text{ E-11 uCi-ft}^3\text{/dpm-cc}}{V_s \times T_s \times E_c \times 0.9}$$

Where:

activity = either gross iodine or I-131 activity.

Net CPM = net iodine count rate.

V_s = sample flow rate in cfm.

T_s = sample count time.

E_c = sample counter efficiency.

4.5.2.4 Enter the iodine concentration in column 7 of table A-3.

4.5.2.5 Calculate the iodine dose commitment using the following formulae:

for gross iodine activity: $D = \text{activity} \times \Sigma_I \text{ DCF}$

for I-131 activity: $D = \text{activity} \times \text{I-131 DCF} \times \text{total I/I-131}$

Where:

D = thyroid dose dose commitment in rem per hour of exposure to the iodine concentration.

activity = iodine concentration in uCi/cc, either total iodine or I-131.

Σ_I DCF = Summation of iodine dose correction factors, found in Appendix D, table D-2.

I-131 DCF = I-131 dose factor x breathing rate = I-131 DCF = 1.77 E + 06.

Total I/I-131 = ratio to convert I-131 dose commitment to total iodine dose commitment. Found in Appendix D, table D-3. Used only when iodine filter is counted on a SAM-2.

4.5.2.5 Enter the thyroid commitment calculated above in column 8 of Appendix A, table A-3.

4.5.2.6 Calculate an equivalent thyroid dose for the same time and location using the procedure in section 4.4.6 and enter this value in column 9 of table A-3.

4.5.2.7 Divide column 9 by column 8 and enter the ratio in column 10.

4.5.3 Sample teams will report particulate concentrations in terms of location, time net count rate, sample duration, flow rate of sampler, and counting efficiency of counter. Enter this data in the appropriate columns of Appendix A, table A-4.

4.5.3.1 Calculate particulate activity using the following formula:

$$\text{Activity} = \frac{\text{Net cpm} \times 1.59\text{ E-11 uCi-ft}^3\text{/dpm-cc}}{V_s\ (\text{cfm}) \times t_s\ (\text{min}) \times E_c\ (\text{cpm/dpm})}$$

Where:

Activity = particulate activity in uCi/cc.

Net cpm = Net count rate.

V_s = sample flow rate in cfm.

t_s = sample count duration in minutes.

E_c = instrument counting efficiency in cpm/dpm.

4.5.3.2 Enter the particulate activity in column 7 of table A-4.

4.5.4 Calculate the projected ground deposition (surface contamination) using the following formula:

$$C(Ci/m^2) = \text{Act (uCi/cc)} \times V_d\ (\text{m/sec}) \times t_d\ (\text{sec.})$$

Where:

C = Surface contamination.

Act = Particulate or iodine concentration.

V_d = Deposition velocity = .01 m/sec for iodine and .03 m/sec for particulates.

t_d = duration of the release in seconds

Enter the projected particulate contamination level in table A-4, column 8.

4.6 Comparison of projected values to field measurements.

> CAUTION
>
> ANY ADJUSTMENT TO THE SOURCE TERM BASED ON THE FOLLOWING COMPARISONS SHOULD BE DONE ONLY AFTER CAREFUL SCRUTINY OF APPENDIX A, TABLE A-2 AND A-3. CHECK THE LOCATION OF THE MEASURED FIELD DATA IN RELATION TO THE PLOTTED PLUME.

4.6.1 Check the ratios in column 5 of table A-2 and column 10 of table A-3.

4.6.1.1. If the values are consistently less than 1.0, this indicates that field measurements are greater than projected. Check that proper source term assumptions were made and that an unmonitored release is not occurring. If, at the discretion of the Radiological Assessment Coordinator (RAC), it is decided to adjust the source term; divide the calculated value by the average value of the ratio in column 5 of table A-2 for noble gas whole body dose or column 10 of table A-3 for thyroid dose commitment.

4.6.1.2 If values in column 5 of table A-2 or column 10 of table A-3 are consistently greater than 1.0, then field measurements are less than calculated values. If, at the discretion of the Radiological Assessment Coordinator (RAC), it is decided to adjust the source term after calculation, then divide the calculated value by the average value of the ratio in column 5 of table A-2 for noble gas or column 10 of table A-3 for thyroid dose commitment.

4.6.1.3 Similiar comparisons should be made betweeen grab samples and release data.

4.7 Compare commitments calculated here with the Protective Action Guides listed in EPIP 15, "Protective Action Guides" to make offsite protective action recommendations to the State.

4.8 Continue dose projections and field measurements until the Emergency Director secures the Dose Assessment Team.

TABLE A-1

Calculation of Whole Body Dose Rate, Dose Commitment and Thyroid Dose Commitment

Receptor: _____

Reactor Shutdown Date: _____ Time: _____ Release Date: _____ Time: _____

A. Meteorology

1. Wind Direction (deg.)	_____		
2. Wind Speed (mph)	_____		
3. delta T (°F)	_____		
4. Stability Class	_____		
5. Affected Sectors	_____		

B. Effective Age and Plume Arrival Time

Downwind Distance (mi.)	Wind Speed (mph)	Transit Time (hr)	Eff. Age @ Release (hr)	Eff. Age @ Receptor (hr)
_____	_____	_____	_____	_____
		=	+	=

Plume Arrival Time = _____ (transit + release time)

C. X/Q Determination

Xu/Q (App. B) _____ (mi-sec/hrs 3) = Windspeed (mph) _____ (mph) X/Q _____ (sec/m 3)

D. Radioactivity Concentration at Receptor

	Release Rate (Ci/sec)		X/Q (sec/m 3)		Receptor Concentration (Ci/m 3)
1. NG	_____	X	_____	=	_____
2. I	_____	X	_____	=	_____

E. Whole Body Dose Projection

Receptor Noble Gas Concentration (Ci/m 3)		Dose Rate Conversion Factor E eff (MeV/dis) (App. C)		Projected Dose Rate (Rem/hr)		Exposure Time (hr)		Projected Dose (Rem)
_____	X	_____	X	_____	=	_____	=	_____

[1 Rem-dis-m 3 / hr. MeV-Ci] 12 = 8.90 x 10

F. Thyroid Dose Commitment Projection

Iodine Concentration (Ci/m 3)		IDCF (Rem m 3 /hr-Ci)		Thyroid Dose Commitment per Exposure hr (Rem/hr)		Release Duration (hr)		Adult Thyroid Dose Commitment (Rem)		Child Thyroid Dose Commitment (Rem)
_____	X	_____	=	_____	X	_____	=	_____	X 2 =	_____

Performed By _____ Reviewed By _____

Table A-2

WHOLE BODY DOSE RATES
COMPARISON OF FIELD DATA AND CALCULATIONS/GRAB SAMPLE DATA

Column 1	2	3	4	5
Location	Time	Measured(*) (mR/hr)	Calculated (mR/hr)	RATIO (Calculated/ Measured)

* Measured data will be transmitted from the onsite chemistry lab to the STSC/TSC.

APPENDIX A

THYROID DOSE COMMITMENTS - COMPARISON OF FIELD DATA AND CALCULATIONS/GRAB SAMPLE DATA

Column 1	2	3	4	5	6	7	8	9	10
Location	Time	Net Iodine (cpm)	Sample Duration (min)	Flow Rate (cfm)	Counting Efficiency (cpm/dpm)	Iodine Concntrtn (uCi/cc)	Measured Dose Commitment (mR/hr)	Calculated Dose Commitment (mR/hr)	Ratio

* $uCi/cc = \frac{net\ Cpm \times (1.59\ E{-}11)\ uci - ft3/dpm - cc}{CFM \times collection\ time\ (min) \times Ec\ (cpm/dpm)}$

D(mrem/hr) = uCi/cc x cc/hr x 1.49 E+3 mrem/uCi.

APPENDIX A

PARTICULATE CONCENTRATIONS -
COMPARISON OF FIELD DATA AND CALCULATIONS/GRAB SAMPLE DATA

1 Location	2 Time	3 Net Particulate (cpm)	4 Sample Duration (min)	5 Flow Rate (cfm)	6 Counting Efficiency (cpm/dpm)	7 Measured Particulate Concentration (uCi/cc)	8 Calculated Particulate Surface Contamination (Ci/m2)	9 Calculated Iodine Surface Contamination (Ci/m2)

uCi/cc = $\frac{\text{Net cpm} \times 1.59 \text{ E-11 uCi - ft}^3/\text{dpm - cc}}{\text{cfm} \times \text{collection time (min)} \times E \text{ (cpm/dpm)}}$

Ci/m2 = uCi/cc x Vd x td (release duration in seconds)

Vd = .01 m/sec for Iodine
= .03 m/sec for particulates

Alternate Methods for Determining Meteorological Data

I. Introduction

This appendix is used as an alternate method for determining meteorological conditions in the site environs when the ERFDADS/Meteorological Tower is inoperative.

The following is a listing of the three backup methods and a brief description of when to use each one.

A. Default Valves - Used for initial dose projection when the ERFDADS/Meteorological Tower is unavailable. These values are extremely conservative and should be replaced with real data as soon as possible.

B. Local readings from the main meteorological tower - on a loss of communications via ERFDADS during a release or with a release imminent, a technician should be dispatched to the meteorological tower and readings relayed from the local instruments. Dose projections should not be held up while waiting for this data. Default conditions should be used until the local station is manned.

C. Mechanical Weather Station - for use when the main met tower is unavailable (inoperative). Default values must be used until a technician reaches the met station. The mechanical weather station reads out on a strip chart inside the unit.

The following sections are divided into two parts. Part A is a description of the method and Part B is the operating instructions for that method.

II. Default Assumptions and Values

A. Assumptions

The use of default values requires that estimates be made conservative enough to ensure proper protective action recommendations are made to protect the general public. The assumed meteorological conditions must be such that they will yield the most restrictive plume dispersal factors for the ten mile EPZ.

Because accurate determination of wind direction cannot be made, then a conservative assumption must be used regarding site boundary distance and affected sectors. The most restrictive site boundary from an emergency classification standpoint is the west boundary along Wintersburg Road. This boundary is affected when the wind is from the east. Therefore, when choosing the Xu/Q value for site boundary, use the value listed for wind from ninety degrees. For affected sectors, assume all sectors are affected until actual wind direction is determined.

Wind speed presents a problem in that a low wind speed will give a conservative estimate of X/Q, but results in less conservative values for transit time and effective age at the receptor site. High assumed wind speeds results in errors in the X/Q, while being conservative in transit time and effective age. To compensate for this it is necessary to assume two wind speeds. A low wind speed for X/Q determination and a high wind speed for plume transport.

For atmospheric dispersion factor (X/Q) selection, the class selected must allow for the least dispersion during transport. The stability category that allows for the least dispersion is a condition of extreme stability, Class G.

B. Instructions

1. The following parameters should be used for default values for projecting off-site doses:

   1.1 wind direction - 90 degrees
   1.2 wind speed - for X/Q determination, use 1 mph for transit time use 10 mph
   1.3 stability class - G
   1.4 for affected sectors and protective action recommendations, use all sectors.

III. Local Readout at the Meteorological Tower

A. Discussion

This section is to be used when communications from the met tower to the ERFDADS are not available. Initial dose projections should not be held up while waiting to use this section, default values are to be used until a technician gets to the met tower. When the technician arrives at the met tower, he must determine that the met tower is operable. If the met tower is not operable report this to the TSC/STSC and proceed to section IV.

B. Instructions

1.0 Send a technician to the met tower.

1.1 The key for the met tower may be obtained from shift security personnel.

2.0 At the met tower:

2.1 Establish communications with the TSC (if manned) or the STSC.

2.2 Verify operability of the met tower.

2.2.1 If the tower is inoperative, report this to the RPC, or RPM, and proceed to Section IV of this appendix.

2.2.2 If the tower is operable, proceed to step 2.3.

2.3 Obtain the following data and transmit it to the TSC or STSC.

NOTE: Use fifteen minute averages for data points.

2.3.1 Wind direction in degrees at athe thirty-five foot elevation.

2.3.2 Wind speed in miles per hour at the thirty-five foot elevation.

2.3.3 Delta T in degrees Fahrenheit (200 ft.-35 ft.).

IV. Set Up and Operation of the Mechanical Weather Station

Note: Default values should be used for dose projections until the mechanical weather station is verified to be running and has been accumulating data for a minimum of fifteen minutes.

A. Discussion

The mechanical weather station is a self-contained portable met station designed to operate in remote areas with little or no routine attention. Its only power requirement is four D-cell batteries to run the chart drive. The chart paper and batteries are good for thirty day period. Wind speed and wind direction automatically score the special chart paper when actuated by a wind. Wind speed is measured by a standard three cup anemometer and wind direction is measured by a vane assembly. Temperature is measured by a bi-metallic thermometer. The temperature probe has a scribe attached to score the chart paper.

The wind speed and direction elements drive rollers through a gear assembly. The rollers have integral spiral ridges around them that make contact with the paper and score it as the vane or anemometer rotates. The wind direction chart goes from north to north. The continuous spiral ensures tracking for wind shifts greater than 360 degrees.

Wind speed, or wind run, accumulates on the chart from 0-10 miles. When the anemometer has rotated the roller through ten miles of run, the roller starts accumulating from zero again. To find the wind speed in miles per hour, add the total accumulated miles in the last 15 minute time period and divide by .25 hour to get average wind speed in miles per hour for the last 15 minutes.

If wind speed is greater than 3.3 mph, the wind direction trace can also be used to determine the stability class. This is accomplished by computing the standard deviation of the wind direction fluctuation, $\sigma\theta$. The value of $\sigma\theta$, in degrees, can be used to assign a stability class. To accurately calculate $\sigma\theta$ requires a relatively lengthy calculation. However, $\sigma\theta$ can be approximated by estimating the range of wind fluctuation over the time period of concern, then dividing by six. That is, if wind direction for the last hour has flutuated between 180° and 240° then the range of fluctuation would be 60° 60°/6 = 10°. So in the above situation, $\sigma\theta$ would equal 10° and by comparing that value with the table in the procedure, the stability class can be found. This is valid only if wind speed is greater than 3.3 mph. For speeds less than 3.3 mph, default stability class of G must be assumed.

B. Operating Instructions

1.0 Mounting the Mechanical Weather Station (MWS)

NOTE: If station is already operating proceed to section 2.0.

1.1 Remove MWS transport case from the met trailer.

1.2 Open the case and inspect the MWS.

1.2.1 Check that the MWS does not appear to be physically damaged.

1.2.2 Inspect the batteries, the MWS requires four D-cells. Ensure the batteries are not corroded.

1.2.3 Check that the chart recorder has chart paper in it and that it is the proper paper (#1072-2, 30 day chart paper).

1.2.4 Check that all parts are present.

1.3 Mounting the MWS

1.3.1 Remove the main housing from the case.

1.3.2 Lower the main housing onto the mounting tube and align the scribe marks on the tube and weather station.

1.3.3 Tighten the set screws inside the MWS to lock the station to its mounting tube.

1.4 Anemometer Installation

1.4.1 Remove the anemometer retaining nut and plate.

1.4.2 Align the holes in the anemometer with the screw heads on the drive assembly.

1.4.3 Replace the retainer plate and tighten the retaining nut.

1.5 Installing the wind direction vane tale assembly

1.5.1 Loosen and collet nut.

1.5.2 Insert the tail assembly through the collet nut and into the collet.

1.5.3 Tighten the collet nut.

1.6 Install the batteries and battery cover.

1.7 Align the chart paper to the correct time. Mark the date and time the MWS was placed in service on the chart.

1.8 Turn on the chart drive (switch on the lower left side of the chart assembly).

1.9 Depress the roller engagement lever located above the chart assembly to start recording data.

1.10 Allow data to collect for at least fifteen minutes prior to using this information.

2.0 Obtaining Data from the MWS

2.1 Verify that the MWS is operating and has accumulated data for at least 15 minutes prior to use.

NOTE: The smallest time division on the chart is 30 minutes. The technician will have to judge half the distance between time divisions for 15 minute time periods.

2.2 Mark a fifteen minute time period on the chart.

CAUTION

CARE MUST BE TAKEN TO ENSURE THAT IT IS WIND FLUCTUATION ABOUT A POINT AND NOT A SHIFT IN THE WIND THAT IS BEING MEASURED. IF THE DETERMINATION IS MADE THAT A WIND SHIFT HAS OCCURRED, THEN DEFAULT VALUES FOR DIRECTION AND STABILITY CLASS MUST BE USED UNTIL THE WIND HAS SETTLED ONTO A NEW HEADING.

2.3 Obtaining Wind Direction and $\sigma\theta$

2.3.1 Mark the average fluctuation on the chart (Wind direction trace will not be a steady line, but will fluctuate to a certain degree depending on the atmospheric stability).

2.3.2 Take the average of the fluctuations and report this as average wind drection.

2.3.3 Measure the distance of average fluctuation in degrees. This is the range of wind fluctuation.

2.3.4 Divide the range by six and report the result as $\sigma\theta$.

2.4 Obtaining Wind Speed

NOTE: The MWS records wind run, which is the total distance in miles that the wind covers in the time selected. The chart records wind run in ten mile increments.

2.4.1 Sum the total miles of wind run in the fifteen minute period marked on the chart.

2.4.2 Multiply the wind run by four to get average wind speed in miles per hour for that fifteen minute period. Report this result.

Table C-1

SITE BOUNDARY DISTANCES

Wind Direction FROM (a)	Distance (mi)
S (168.75 - 191.25)	0.82
SSW (191.25 - 213.75)	0.83
SW (213.75 - 236.25)	1.58
WSW (236.75 - 258.75)	1.37
W (258.75 - 281.75)	1.34
WNW (281.75 - 303.75)	1.28
NW (303.75 - 326.25)	1.31
NNW (326.25 - 348.75)	1.88
N (348.75 - 11.25)	1.68
NNE (11.25 - 33.75)	1.14
NE (33.75 - 56.25)	0.75
ENE (56.25 - 78.75)	0.63
E (78.75 - 101.25)	0.62
ESE (101.25 - 123.75)	0.63
SE (123.75 - 146.25)	0.74
SSE (146.23 - 168.75)	0.83

(a) Based on 22 1/2° sectors.
(b) Distances are from Unit 2

Site Boundary Xu/Q Values

Stability Category A	B	C	D	E	F	G
4.0 E-6	1.0 E-5	1.9 E-5	6.8 E-5	1.3 E-4	2.0 E-4	3.1 E-4
3.9 E-6	1.0 E-5	1.8 E-5	6.7 E-5	1.2 E-4	2.0 E-5	3.1 E-4
8.2 E-7	2.2 E-6	4.6 E-6	2.5 E-5	5.1 E-5	9.0 E-5	1.5 E-4
1.2 E-6	3.1 E-6	6.2 E-6	3.1 E-5	6.2 E-5	1.1 E-4	1.8 E-4
1.2 E-6	3.3 E-6	6.5 E-6	3.2 E-5	6.4 E-5	1.1 E-4	1.8 E-4
1.4 E-6	3.6 E-6	7.2 E-6	3.4 E-5	6.8 E-5	1.2 E-4	1.9 E-4
1.3 E-6	3.4 E-6	6.8 E-6	3.3 E-5	6.6 E-5	1.1 E-4	1.9 E-4
5.4 E-7	1.5 E-6	3.1 E-6	1.9 E-5	4.0 E-5	7.3 E-5	1.3 E-4
7.1 E-7	1.9 E-6	4.0 E-6	2.2 E-5	4.6 E-5	8.3 E-5	1.4 E-4
1.8 E-6	4.8 E-6	9.3 E-6	4.1 E-5	8.0 E-5	1.3 E-4	2.2 E-4
5.0 E-6	1.3 E-5	2.0 E-5	7.9 E-5	1.4 E-4	2.2 E-4	3.5 E-4
7.5 E-6	1.9 E-5	3.3 E-5	1.0 E-4	1.8 E-4	2.8 E-4	4.2 E-4
7.8 E-6	2.0 E-5	3.4 E-5	1.1 E-4	1.8 E-4	2.8 E-4	4.2 E-4
7.5 E-6	1.9 E-5	3.3 E-5	1.0 E-4	1.8 E-4	2.8 E-4	4.2 E-4
5.2 E-6	1.3 E-5	2.3 E-5	8.0 E-5	1.4 E-4	2.3 E-4	3.5 E-4
3.9 E-6	1.0 E-5	1.8 E-5	6.7 E-5	1.3 E-4	2.0 E-4	3.1 E-4

Plume Centerline Xu/Q Values

Stability Category	Xu/Q Values 2 mi	5 mi	10 mi	15 mi	20 mi	25 mi
A	4.6 (E-7)	1.6 (E-7)	8.2 (E-8)	5.6 (E-8)	4.3 (E-8)	3.5 (E-8)
B	1.3 (E-6)	2.8 (E-7)	1.5 (E-7)	1.0 (E-7)	7.9 (E-8)	6.5 (E-8)
C	2.8 (E-6)	3.5 (E-7)	1.9 (E-7)	1.3 (E-7)	1.0 (E-7)	8.5 (E-8)
D	1.7 (E-5)	4.1 (E-6)	1.4 (E-6)	7.4 (E-7)	4.7 (E-7)	3.3 (E-7)
E	3.7 (E-5)	1.0 (E-5)	4.0 (E-6)	2.3 (E-6)	1.5 (E-6)	1.1 (E-6)
F	6.7 (E-5)	2.2 (E-5)	9.3 (E-6)	5.7 (E-6)	4.0 (E-6)	3.0 (E-6)
G	1.2 (E-4)	4.4 (E-5)	2.1 (E-5)	1.3 (E-5)	9.8 (E-6)	7.7 (E-6)

Stability Category	30 mi	35 mi	40 mi	45 mi	50 mi
A	3.2 (E-8)	3.2 (E-8)	3.2 (E-8)	3.2 (E-8)	3.2 (E-8)
B	6.7 (E-8)	4.8 (E-8)	4.3 (E-8)	3.8 (E-8)	3.5 (E-8)
C	7.2 (E-8)	6.3 (E-8)	5.6 (E-8)	5.0 (E-8)	4.6 (E-8)
D	2.7 (E-7)	2.4 (E-7)	2.2 (E-7)	2.0 (E-7)	4.3 (E-7)
E	8.7 (E-7)	7.0 (E-7)	5.8 (E-7)	5.0 (E-7)	4.3 (E-7)
F	2.4 (E-6)	2.0 (E-6)	1.7 (E-6)	1.5 (E-6)	1.3 (E-6)
G	7.1 (E-6)	6.9 (E-6)	6.8 (E-6)	6.8 (E-6)	6.6 (E-6)

For additional Xu/Q values, use the sigma y and sigma z values on the following page.

Table C-1, Page 2 of 2

Additional Population Centers and Xu/Q Values by Sector:

Dist	A	B	C	D	E	F	G
Sector A:							
The Red Quail Store 2 Miles	1.0 E-6	2.9 E-6	6.3 E-6	3.8 E-5	8.3 E-5	1.5 E-4	2.7 E-4
Ruth Fisher School 7 Miles	2.5 E-7	4.7 E-7	5.8 E-7	5.4 E-6	1.5 E-5	3.1 E-5	6.7 E-5
Sector F:							
Hassayampa 8 Miles	2.2 E-7	4.0 E-7	5.1 E-7	4.5 E-6	1.2 E-5	2.7 E-5	6.0 E-5
Palo Verde School 11 Miles	1.7 E-7	3.1 E-7	4.0 E-7	2.7 E-6	7.8 E-6	1.9 E-5	4.3 E-5
Sector G:							
Arlington 7 Miles	2.5 E-7	4.7 E-7	5.8 E-7	5.4 E-6	1.5 E-5	3.1 E-5	6.7 E-5
Arlington School 8 Miles	2.2 E-7	4 E-7	5.1 E-7	4.5 E-6	1.2 E-5	2.7 E-5	6.0 E-5
Sector R:							
Tonopah 8 Miles	2.2 E-7	4 E-7	5.1 E-7	4.5 E-6	1.2 E-6	2.7 E-6	6.0 E-5

CONTINUING DOSE ASSESSMENT

Table C-2

SITE BOUNDARY y, Z VALUES (METERS)

dis. (mi.)	A		B		C		D		E		F		G	
	y	z	y	z	y	z	y	z	y	z	y	z	y	z
.62	300.1	135.4	175.3	92.8	139.6	66.3	69.9	43.2	109.6	15.7	164.2	6.8	254.4	2.9
.63	304.6	138.5	177.8	94.8	141.6	67.6	70.7	43.8	111.1	15.9	166.7	6.9	258.4	3.0
.74	353.2	174.3	205.6	118.0	163.4	82.4	79.6	50.0	127.7	17.2	193.1	7.2	302.3	3.0
.75	357.6	177.7	208.1	120.2	165.4	83.8	80.3	50.6	129.2	17.4	195.5	7.2	306.3	3.0
.82	388.3	202.6	225.5	136.3	179.1	93.8	85.8	54.4	139.6	18.2	212.2	7.4	334.1	3.0
.83	392.6	206.2	228.0	138.7	181.0	95.2	86.5	55.0	141.0	18.3	214.5	7.5	338.1	3.0
1.14	525.9	331.8	303.4	219.9	240.2	143.1	109.1	71.5	185.6	21.6	286.9	8.3	460.7	3.2
1.20	585.1	395.7	336.8	260.7	266.3	166.0	118.8	78.6	205.2	22.9	319.0	8.6	515.8	3.2
1.31	597.7	409.9	343.9	269.7	271.9	171.0	120.8	80.2	209.3	23.2	325.9	8.6	527.6	3.2
1.34	610.3	424.2	351.0	278.8	277.4	176.0	122.8	81.7	213.5	23.4	332.7	8.7	539.3	3.2
1.37	622.9	438.8	358.1	288.0	282.9	181.0	124.8	83.2	217.6	23.7	339.5	8.7	551.1	3.2
1.58	710.3	545.3	407.2	354.1	321.3	217.0	138.5	93.6	246.1	25.5	386.9	9.1	633.3	3.3
1.68	751.6	598.8	430.3	386.6	339.3	234.4	144.9	98.4	259.6	26.3	409.3	9.3	672.4	3.3
1.88	833.7	711.1	476.2	453.2	375.1	270.1	157.3	108.0	286.1	27.9	453.7	9.7	750.3	3.3

PV216-000A (8/82)

CONTINUING DOSE ASSESSMENT

Table C-2

SITE BOUNDARY y, Z VALUES (METERS)

dis.	A		B		C		D		E		F		G	
	y	z	y	z	y	z		z	y	z	y	z	y	z
1	466.1,	272.3	269.6,	181.5	213.7,	120.9	99.2,	64.1	165.7,	20.1	254.5,	7.9	405.4,	3.1
2	882.6,	781.8	503.5,	494.0	396.4,	292.0	164.6,	113.7	301.8,	28.8	480.2,	9.9	796.9,	3.4
3	1282.1,	1000.0	725.5,	859.2	568.8,	500.6	221.4,	158.9	428.6,	35.6	696.1,	11.2	1183.4,	3.5
4	1671.1,	1000.0	940.2,	1000.0	735.1,	809.6	273.2,	201.5	549.7,	41.3	906.0,	12.2	1566.5,	3.6
5	2052.3,	1000.0	1149.6,	1000.0	896.7,	1000.0	321.6,	242.3	668.8,	46.3	1111.5,	13.1	1947.3,	3.7
6	2427.6,	1000.0	1354.8,	1000.0	1054.9,	1000.0	367.4,	281.7	780.7,	50.9	1313.5,	13.9	2326.1,	3.8
7	2797.9,	1000.0	1556.7,	1000.0	1210.2,	1000.0	411.2,	320.0	892.0,	55.1	1512.7,	14.6	2703.3,	3.9
8	3164.0,	1000.0	1755.7,	1000.0	1363.1,	1000.0	453.4,	357.3	1001.2,	59.0	1709.5,	15.2	3079.2,	3.9
9	3526.5,	1000.0	1952.3,	1000.0	1513.9,	1000.0	494.2,	393.8	1108.6,	62.7	1904.3,	15.8	3453.9,	4.0
10	3885.9,	1000.0	2146.7,	1000.0	1663.0,	1000.0	533.7,	429.6	1214.4,	66.3	2097.2,	16.3	3827.6,	4.0
11	4242.4,	1000.0	2339.2,	1000.0	1810.3,	1000.0	572.2,	464.8	1318.7,	69.6	2288.5,	16.8	4200.3,	4.0
12	4596.4,	1000.0	2530.0,	1000.0	1956.3,	1000.0	609.8,	499.4	1421.8,	72.8	2478.4,	17.3	4572.2,	4.1
13	4948.0,	1000.0	2719.2,	1000.0	2100.9,	1000.0	646.5,	533.5	1523.8,	75.9	2666.9,	17.7	4943.4,	4.1
14	5297.6,	1000.0	2906.9,	1000.0	2244.3,	1000.0	682.5,	567.2	1624.6,	78.8	2854.3,	18.1	5313.8,	4.2
15	5645.1,	1000.0	3093.4,	1000.0	2386.6,	1000.0	717.8,	600.5	1724.5,	81.7	3040.5,	18.5	5683.5,	4.2
16	5990.8,	1000.0	3278.6,	1000.0	2527.9,	1000.0	752.5.	633.4	1823.6,	84.5	3225.6,	18.9	6052.6,	4.2
17	6334.8,	1000.0	3462.6,	1000.0	2668.2,	1000.0	786.6,	665.9	1921.7,	87.2	3409.8,	19.3	6421.2,	4.2
18	6677.2,	1000.0	3645.6,	1000.0	2807.6,	1000.0	820.2,	698.1	2019.1,	89.8	3593.1,	19.6	6789.2,	4.3
19	7018.1,	1000.0	3827.6,	1000.0	2946.1,	1000.0	853.2,	730.0	2115.8,	92.3	3775.5,	20.0	7156.7,	4.3
20	7357.7,	1000.0	4008.7,	1000.0	3083.9,	1000.0	885.9,	761.8	2211.8,	94.8	3957.1,	20.3	7523.7,	4.3
21	7695.8,	1000.0	4188.8,	1000.0	3220.9,	1000.0	918.0,	792.9	2307.1,	97.2	4138.0,	20.6	7890.2,	4.3
22	8032.7,	1000.0	4368.1,	1000.0	3357.2,	1000.0	949.8,	823.9	2401.9,	99.6	4318.1,	20.9	8256.4,	4.4
23	8368.4,	1000.0	4546.6,	1000.0	3492.9,	1000.0	981.1,	854.8	2496.0,	101.9	4497.6,	21.2	8622.0,	4.4
24	8702.9,	1000.0	4724.3,	1000.0	3627.8,	1000.0	1012.1,	885.3	2589.6,	104.2	4676.4,	21.5	8987.4,	4.4
25	9036.4,	1000.0	4901.3,	1000.0	3762.2,	1000.0	1042.8,	915.7	2682.7,	106.4	4854.6,	21.8	9352.3,	4.4
26	9368.8,	1000.0	5077.6,	1000.0	3896.0,	1000.0	1073.1,	945.9	2775.3,	108.6	5032.2,	22.0	9716.8,	4.4
27	9700.1,	1000.0	5253.3,	1000.0	4029.3,	1000.0	1103.2,	975.8	2867.4,	110.7	5290.2,	22.3	10,000.0,	4.5

CONTINUING DOSE ASSESSMENT

Table C-2

Sigma y, Sigma z Values (METERS)

dis.	A		B		C		D		E		F		G	
	y	z	y	z	y	z		z	y	z	y	z	y	z
28	10,000,	1000.0	5428.2,	1000.0	4162.0,	1000.0	1132.9,	1000.0	2959.0,	112.8	5385.6,	22.6	10,000,	4.5
29	10,000,	1000.0	5602.6,	1000.0	4292.4,	1000.0	1162.3,	1000.0	3050.2,	114.9	5561.5,	22.8	10,000,	4.5
30	10,000.	1000.0	4776.4,	1000.0	4425.8,	1000.0	1191.5,	1000.0	3141.0,	116.9	5737.0,	23.1	10,000,	4.5
31	10,000,	1000.0	5949.6,	1000.0	4557.0,	1000.0	1220.4,	1000.0	3231.3,	118.9	5911.9,	23.3	10,000,	4.5
32	10,000,	1000.0	6122.3,	1000.0	4687.8,	1000.0	1249.0,	1000.0	3321.3,	120.9	6086.4,	23.5	10,000,	4.6
33	10,000,	1000.0	6294.3,	1000.0	4816.1,	1000.0	1277.4,	1000.0	3410.9,	122.8	6260.3,	23.8	10,000,	4.6
34	10,000,	1000.0	6466.0,	1000.0	4948.0,	1000.0	1305.6,	1000.0	3500.1,	124.7	6433.9,	24.0	10,000,	4.6
35	10,000,	1000.0	6637.1,	1000.0	5077.5,	1000.0	1333.6,	1000.0	3589.0,	126.6	6607.0,	24.2	10,000,	4.6
36	10,000,	1000.0	6807.7,	1000.0	5206.5,	1000.0	1361.3,	1000.0	3677.5,	128.5	6779.7,	24.2	10,000,	4.6
37	10,000,	1000.0	6977.8,	1000.0	5335.2,	1000.0	1388.9,	1000.0	3765.7,	130.3	6952.0,	24.6	10,000,	4.6
38	10,000,	1000.0	7147.5,	1000.0	5463.5,	1000.0	1416.2,	1000.0	3853.6,	132.1	7123.9,	24.8	10,000,	4.6
39	10,000,	1000.0	7316.8,	1000.0	5591.4,	1000.0	1433.4,	1000.0	3941.2,	133.9	7295.5,	25.0	10,000,	4.7
40	10,000,	1000.0	7485.6,	1000.0	5718.9,	1000.0	1470.3,	1000.0	4028.4,	135.7	7466.6,	25.2	10,000,	4.7
41	10,000,	1000.0	7654.0,	1000.0	5846.2,	1000.0	1497.1,	1000.0	4155.4,	137.4	7637.4,	25.4	10,000,	4.7
42	10,000,	1000.0	7822.0,	1000.0	5973.7,	1000.0	1523.7,	1000.0	4202.1,	139.1	7807.9,	25.6	10,000,	4.7
43	10,000,	1000.0	7989.6,	1000.0	6099.6,	1000.0	1550.2.	1000.0	4288.5,	140.8	7978.0,	25.8	10,000,	4.7
44	10,000,	1000.0	8156.8,	1000.0	6225.8,	1000.0	1576.4,	1000.0	4374.6,	142.5	8147.8,	26.0	10,000,	4.7
45	10,000,	1000.0	8323.6,	1000.0	6351.7,	1000.0	1602.5,	1000.0	4460.5,	144.2	8317.3,	26.2	10,000,	4.7
46	10,000,	1000.0	8490.2,	1000.0	6477.4,	1000.0	1628.5,	1000.0	4546.1,	145.8	8486.5,	26.4	10,000,	4.7
47	10,000,	1000.0	8656.2,	1000.0	6602.7,	1000.0	1654.3,	1000.0	4631.5,	147.5	8655.2,	26.5	10,000,	4.7
48	10,000,	1000.0	8822.0,	1000.0	6727.7,	1000.0	1679.9,	1000.0	4716.6,	149.1	8823.8,	26.7	10,000,	4.8
49	10,000,	1000.0	8987.2,	1000.0	6852.5,	1000.0	1705.5,	1000.0	4801.5,	150.7	8992.1,	26.9	10,000,	4.8
50	10,000,	1000.0	9152.6,	1000.0	6976.9,	1000.0	1730.8,	1000.0	4886.1,	152.3	9160.0,	27.1	10,000,	4.8
51	10,000,	1000.0	9317.4,	1000.0	7101.1,	1000.0	1756.1,	1000.0	4970.6,	153.8	9327.7,	27.2	10,000,	4.8
52	10,000,	1000.0	9481.8,	1000.0	7225.0,	1000.0	1781.2,	1000.0	5054.7,	155.4	9495.0,	27.4	10,000,	4.8
53	10,000,	1000.0	9645.9,	1000.0	7348.7,	1000.0	1806.1,	1000.0	5138.7,	156.9	9662.2,	27.6	10,000,	4.8
54	10,000,	1000.0	9809.8,	1000.0	7472.1,	1000.0	1831.0,	1000.0	5222.5,	158.4	9829.1,	27.7	10,000,	4.8
55	10,000.	1000.0	9973.3,	1000.0	7595.3,	1000.0	1855.7,	1000.0	5306.0,	160.0	9995.7,	27.9	10,000,	4.8

Table D-1
NOBLE GAS MEAN GAMMA DECAY ENERGY

Effective Age (hours)	1% Failed Fuel (MeV)	Total Core Inventory (MeV)
0.0	0.253	0.590
0.5	0.233	0.549
1.0	0.210	0.503
1.5	0.195	0.471
2.0	0.181	0.420
2.5	0.167	0.390
3.0	0.152	0.360
3.5	0.145	0.334
4.0	0.136	0.310
5.0	0.117	0.238
6.0	0.104	0.223
7.0	0.090	0.184
8.0	0.075	0.160
9.0	0.069	0.142
10.0	0.064	0.123
11.0	0.059	0.104
12.0	0.051	0.089
16.0	0.042	0.059
20.0	0.040	0.049
24.0	0.037	0.040
48.0	0.031	0.031
72.0	0.030	0.030
96.0	0.030	0.029
120.0	0.030	0.030
144.0	0.030	0.030
168.0	0.030	0.030

Table D-2
Summation of Iodine Dose Conversion Factors vs.
Effective Age For Adults

Effective Age (hr)	1% Failed Fuel Σ_I DCF (Rem m^3/hrCi)	Total Core Inventory Σ_I DCF (Rem m^3/hrCi)	1% F.F. Tot.I/I-131 Dose Ratio	TCI Tot.I/I-131 Dose Ratio
0.0	6.85×10^5	3.07×10^5	1.23	1.45
0.5	7.06×10^5	3.53×10^5	1.22	1.42
1.0	7.27×10^5	3.81×10^5	1.22	1.42
1.5	7.59×10^5	4.61×10^5	1.21	1.41
2.0	7.75×10^5	4.46×10^5	1.21	1.41
2.5	7.96×10^5	4.67×10^5	1.20	1.41
3.0	8.17×10^5	5.10×10^5	1.20	1.37
3.5	8.29×10^5	5.33×10^5	1.19	1.37
4.0	8.50×10^5	5.37×10^5	1.19	1.37
5.0	8.60×10^5	5.88×10^5	1.19	1.35
6.0	9.04×10^5	5.99×10^5	1.18	1.34
7.0	9.16×10^5	6.45×10^5	1.17	1.32
8.0	9.39×10^5	6.65×10^5	1.17	1.31
9.0	9.66×10^5	6.81×10^5	1.16	1.31
10.0	9.80×10^5	7.19×10^5	1.16	1.29
11.0	1.00×10^6	7.47×10^5	1.15	1.29
12.0	1.02×10^6	7.60×10^5	1.15	1.26
16.0	1.09×10^6	8.32×10^5	1.13	1.24
20.0	1.17×10^6	9.37×10^5	1.11	1.21
24.0	1.21×10^6	9.60×10^5	1.10	1.18
48.0	1.46×10^6	1.26×10^6	1.05	1.09
72.0	1.60×10^6	1.50×10^6	1.02	1.04
96.0	1.68×10^6	1.62×10^6	1.01	1.03
120.0	1.73×10^6	1.69×10^6	1.01	1.01
144.0	1.75×10^6	1.75×10^6	1.00	1.01
168.0	1.77×10^6	1.77×10^6	1.00	1.00

CONTROLLED DOCUMENT

PALO VERDE NUCLEAR GENERATING STATION (PVNGS)

EMERGENCY OFFSITE DOSE CALCULATION COMPUTER PROGRAM INSTRUCTIONS

1.0 SOFTWARE DESCRIPTION

The PVNGS Emergency Dose Projection Computer Program has been designed for rapid assessment of emergency radioactive effluent releases based upon core inventory. The program is designed for use with the IBM personal computer (64K advanced basic) with one double sided/double density disk drive and an AST card, an Okidata 93 printer (preferably with a graphics chip to imitate an Epson printer). However, the program can operate without a printer.

The computer program calculates both noble gas dose and iodine 50 year dose commitment and dose rates at site boundary, 2 miles, 5 miles, and 10 miles based on a straight line Gaussian meterological model. Plume arrival and effective age at the above downwind distances are determined also. Based upon the site boundary dose rates, one of the four emergency classifications (or none) will be selected. Dose calculations are based on EPIP 14b and 14c and release rate calculations are based on EPIP 14a.

To aid in the tracking of plumes, the program is capable of variable trajectory plume plotting. The plume generated has only one constant plume width (or dispersion). It should be noted that the plume plot is only an aid and actual plume configuration and dose rates will be different to some extent.

2.0 OPERATION

2.1 Computer and Optional Printer Preparation

CAUTION
DO NOT TOUCH THE INNER PORTION OF THE DISKETTE.

2.2.1 Insert the "Emergency Offsite Dose Projection" diskette into disk drive "A" (left side) with the diskette label on the top. Close the disk drive "A" door.

> CAUTION
>
> NEVER REMOVE THE DISKETTE OR REBOOT WHILE THE RED DISK DRIVE LIGHT IS ON.

2.1.2 Turn the computer on. The switch is located on the right side near the rear. If the power is already on, press "Ctrl", "Alt" and "Del" all at the same time to reboot the disk. The program will automatically be loaded and run.

NOTE

Sections 2.1.4 through 2.1.6 are to set-up the Okidata printer.

2.1.3 Ensure the cable is connected between the printer and the computer.

2.1.4 Check the small dial on the front left side of the printer to make sure that is is set to "7".

2.1.5 Ensure that the perforation line of the paper is above print head then turn on the power. The switch is located on the back right side of the printer.

2.2 Program Operation

2.2.1 The program starts by allowing the operator to update the current date and time and the date and time of the reactor shutdown (see fig. 1). The current time is displayed as a running clock. Press the number associated with the item to be updated. Remember to include the "-" or ":" where shown.

2.2.1.1 The program will not allow a reactor shutdown date and time to surpass the present date and time or an error beep will occur when continuing. If this error beep occurs and will not allow continuation, change the reactor shutdown date and/or time.

2.2.1.2 If the reactor is still operating under power, leave the shutdown date and time unchanged (00-00-00 and 00:00).

2.2.1.3 Press "5" to continue with the program.

2.2.2 The main menu will now be displayed on the screen (see fig. 2). This is the menu which allows different calculations or operations to be performed.

2.2.3 Selection number 1, "Current Release Dose Determination". This selection should be chosen to reflect actual radioactive releases which are occurring and will perform the following:

a) Plot current plume position on the screen and will update each minute

b) Calculate two hour dose (in rem) and dose rates (in rem/hr.) for both noble gasses and total iodines. The total iodine doses are 50 year dose commitments. The screen will display the child iodine dose rate which is twice that of the adult.

c) Determine emergency classification based on the site boundary noble gas and total iodine dose rates.

Emergency Classification based on noble gas dose rate (rem/hr).

< 5.0 E-5	NONE
5.0 E-5 thru 4.9 E-4	UNUSUAL EVENT
5.0 E-4 thru 4.9 E-2	ALERT
5.0 E-2 thru 9.9 E-1	SITE AREA EMERGENCY
> 1.0	GENERAL EMERGENCY

Emergency Classification based on total iodine dose rate (rem/hr) is five times the above noble gas dose rates.

CONTROLLED DOCUMENT

2.2.3.1 After pressing "1", fig. 3 will display on the screen. The following is a description of those items displayed on the screen:

a) At the top right of the screen is the viewing screen which displayed the plume. This screen is updated each minute.

b) At the top left of the screen is the current date and running clock which was entered in 2.2.1.

c) Below this is the screen description. This screen is "CURRENT RELEASE PROJECTIONS".

d) Below this is the emergency classification.

e) Below this is the indicator for whether the plume date is ready to be updated. If the words "PRESS SPACE BAR TO UPDATE" does not appear, then the plume is already being updated and the cursor is positioned at one of the seven input parameters.

f) Seven input parameters pertaining to each plume. These parameters will be discussed in more detail later.

g) Date and time of reactor trip which was entered in 2.2.1.

h) Plume number; two numbers are associated with this number. The number on the left indicates the number of plumes on the screen and the other indicates the total number of plumes generated and on file.

i) The bottom right of the screen displays dose rate information and operator messages.

NOTE

Obtain temperatures, wind speed and wind direction from meterological tower using ERFDADS.

NOTE

If the input parameter is to remain unchanged, just press "Return".

2.2.3.2 To create or update a plume, press the space bar. This will stop the clock and the space bar update prompt will erase. The cursor will move to input #1, "stability classification". Enter the proper classification of A-G and press "return". If the classification is unknown then enter a "U". The screen will prompt the operator for the meterological tower temperature difference of 200 feet - 35 feet. A stability classification will be determined.

2.2.3.3 Move the cursor to input #2, "Wind Speed". Enter the wind speed in mi/hr. Do not leave the speed at zero. Press 'Return' and the cursor will advance to input #3.

2.2.3.4 For input #3, "Wind From", enter the degrees from which the wind is blowing. This is a value from 0 to 360. Press "Return" and the degrees to which the wind is going will be displayed along with the effected downwind sector on the plume centerline. The cursor will advance to input #4.

2.2.3.5 For input #4, "Rel. Date", enter the date (mm-dd-yy) on the plume release or its update. This date can not surpass today's date. If the date is surpassed, an error beep will sound when the plume attempts to update and the date will need to be changed. The cursor will advance to input #5.

2.2.3.6 For input #5, "Rel. Time", enter the time (24 hour clock HH:MM) which the plume was released or the time which one of the input parameters changed. The release time can not surpass today's date and current time. If the time is surpassed, an error beep will sound when the plume attempts to update and the time will need to be changed. The cursor will advance to input #6.

2.2.3.7 For input #6, "Noble Gas", enter the noble gas release rate in curies per second. The number may be entered as decimal or scientific notation. If the value is unknown, press "U" and answer the questions relating to the release rate portion of the program. Release rate calculations are discussed in later sections and are performed using the method of EPIP-14A. The cursor will advance to input #7.

2.2.3.8 For input #7, "I-131", enter the iodine-131 release rate in curies per second. The number may be entered as decimal or scientific notation. If the value is unknown, press "U" and answer the questions relating to the release rate portion of the program. Release rate calculations are discussed in later sections and are performed using the method of EPIP-14A.

2.2.3.9 Upon answering #7 the prompt "PRESS SPACE BAR TO UPDATE" will reappear and the "CURRENT TIME" clock will restart.

2.2.3.10 At this point the operator has several options to choose from. The following are the choices:

CAUTION

IF THE TRAILING EDGE OF A PLUME EXTENDS PAST THE TEN MILE RADIUS, THE PLUME WILL BE DELETED FROM THE SCREEN. THIS MUST BE TAKEN INTO CONSIDERATION IF THE PLUME OVERLAPS (REVERSES DIRECTION).

a) Wait until the clock reaches the minute mark and the current plume information will be used to construct a plume and perform dose calculations. Dose calculations will be performed only if a new plume is detected (change in parameter). The operator will be prompted to whether a printout is needed. Next the dose rates will be displayed, the plume will be drawn and the emergency classification will be updated along with the plume numbers. See fig. 4 for an example of a screen display of a plume and dose rate values. See fig. 5 for an example of a dose printout. Plume information and doses will be stored on disk for later retrieval.

b) Press the F1 key. This forces the plotting of the plume (and dose calculations if new plume). This performs the same items as 2.2.3.10.a above. Function keys will be discussed in more detail later.

c) Press F3 to delete the latest plume. Function keys will be discussed in more detail later.

d) Press other function keys (discussed later) to manipulate the viewing screen.

e) Press the space bar to correct or update plume information/parameters per sections 2.2.3.2 through 2.2.3.9.

f) Press "R" to return to the main menu in section 2.2.2.

2.2.4 Menu Selection number 2, "Projected Dose Determination". This selection should be chosen to project doses of radioactive releases which might occur (a what if situation). This selection is essentially the same as menu selection "1" with the following exceptions:

a) Plume plotting is not capable with this selection.

b) All function keys except F1 (dose calculations) are inoperable.

c) This selection will allow the operator to input a release date and time that surpasses the current date and time.

NOTE

Prior to starting dose projections, past entries should be reviewed and deleted if not needed. To delete all past entries, enter the word "KILL" for the plume number and press "Return".

2.2.5 Menu Selection number 3, "Review Past Entries". This selection is used to review plume and dose information stored on the diskette.

2.2.5.1 Plume data files are identified by two numbers (exp. 1-1230). The first being the plume number, which is a consecutive numbering system. It is possible to have two of these numbers the same if a plume has been deleted and another plume with a different time was entered.

2.2.5.2 The second number is the release time of the plume. All files will having the trailing ".dat" which indicates a data file.

2.2.5.3 Fig. 6 is an example of the past entry review screen. All files will be listed (if any) and the operator will be prompted for the file to review. Files may be deleted at this time by entering the word "KILL" for plume number.

2.2.5.4 Once the file numbers have been entered, the relevant information for the plume will be displayed on the screen (see fig. 7). A printout may be obtained by pressing both the "shift" and "PrtSc" keys (remember to form feed the paper and place back on-line).

2.2.5.5 Pressing the space bar will put the operator back in fig. 6; the operator may review another file or return to the main menu by entering an "R" for the plume number.

2.2.6 Menu Selection number 4, "FIELD DATA". This selection is used to calculate total iodine doses using iodine air samples taken by field monitoring teams.

2.2.6.1 The screen will list all the questions to be answered. See fig. 8 for an example of questions, answers and calculated doses.

2.2.6.2 The "location" is any name which will identify where the sample was taken. An "R" may be entered for location to return to the main menu.

2.2.6.3 Samples will be decay corrected from the time of reactor shutdown. If the reactor shutdown date shows that it is still operating, an effective age of zero (0) is used (plume travel is not considered).

2.2.7 Menu Selection number 5, "CHANGE REACTOR SHUTDOWN/TIME". This selection allows the operator to return and change or update the current date and time and also the reactor shutdown date and time in section 2.2.1.

2.3 FUNCTION KEYS

2.3.1 There are ten (10) function keys (F1-F10) located on the left side of the keyboard. Seven of these keys are used by the program. See fig. 9 for the template which is placed over the function keys to aid in screen manipulations.

> CAUTION
>
> WHEN PRESSING FUNCTION KEYS, ATTENTION SHOULD BE PAID TO THE RUNNING CLOCK. IF THE CLOCK HAS NOT APPEARED ON THE SCREEN OR THE CLOCK IS NOT RUNNING, THEN THE PROGRAM IS PERFORMING CALCULATIONS AND NO OTHER FUNCTION KEYS SHOULD BE PRESSED UNTIL IT STARTS TO RUN AGAIN.

2.3.1.1 Function key "F1" is used in both "Current Release Dose Determination" and "Projected Dose Determination". Pressing this key forces the program to draw and update the plume instead of waiting until the minute update. If the program detects a change in one or more of 5 input parameters, a dose projection will be calculated and the emergency classification based on site boundary dose rates will be displayed. No plume will be drawn in the "Projected Dose Determination" selection.

2.3.1.2 Function key "F2" is used in "Current Release Dose Determination" only. Pressing this key switches to a large screen for plotting of plumes. Pressing both the "shift" and "PrtSc" will print the plume. This will take approximately 2.5 minutes to complete. This screen will not update each minute. Press the screen bar to return to the plume parameter screen.

2.3.1.3 Function key "F3" is used in "Current Release Dose Determination" only. Pressing this key will delete the last plume plotted and will return all seven input parameters including plume number and emergency classification back to their previous values. Prior to deleting the plume the operator will be questioned as to if the plume is to be deleted in case the key was pressed inadvertently.

2.3.1.4 Function key "F7" is used in "Current Release Dose Determination" only. Pressing this key will make the plume screen zoom in (or increase in size). If the screen is increased too much, an error beep will occur.

2.3.1.5 Function key "F8" is used in "Current Release Dose Determination" only. Pressing this key will make the plume screen zoom out (or decrease in size). If the screen is decreased too much, an error beep will occur.

2.3.1.6 Function key "F9" is used in "Current Release Dose Determination" only. Pressing this key will draw in 2, 5, and 10 mile radiuses including the 16 sector marks.

2.3.1.7 Function key "F10" is used in "Current Release Dose Determination" only. Pressing this key will draw in major roads and highways.

2.3.2 A region of interest may be focused in on by using the four arrow keys on the number pad on the right side of the keyboard. These keys are "8" for looking up (moves map down), "2" for looking down, "4" for looking left (moves map right) and "6" for looking right. Moving too far in one direction will cause an error beep.

2.3.2.1 Fig. 10 shows a plume on large screen (F2) with radiuses (F9) and roads (F10). Fig. 11 shows the same plume but in addition, the map was zoomed in (F7 twice), moved down (up arrow, "8"), and moved to the left (right arrow, "6").

2.4 Release Rate Calculations

2.4.1 When a "U" is selected for either the noble gas or iodine release rate, release rate calculations will be performed and the screen will display five types of calculations that may be performed. Press the number for the calculation to be performed.

2.4.1.1 Selecting Plant Vent, Fuel Building Vent or Condenser Air Removal will display, for the most part, the same type of screen. The only difference will be the "fans running" if the Total flow is unknown. The following questions will be prompted:

a) Total Flow, the previous flow will be displayed in CFM. If the flow is to remain the same, then just press the return key. If the new flow is different, then enter the new number. If the flow is unknown then enter a "U". The screen will prompt the operator for which fans/pumps are running and the flow from each will be summed.

NOTE

For plant vent, if a no is the answer to if an effluent monitor is in use then the program defaults to prompting for containment area monitor readings or hand held instrument readings.

b) Enter the gross beta channel reading from the effluent monitor in uCi/cc. If there is an iodine channel, the operator will be prompted to enter its value in uCi/cc also. Fig. 12 is an example display of Plant Vent prompts.

c) The program will then calculate the noble gas, I-131 and total iodine release rates and will display them on the screen. If a mistake was made when inputting data, then press the "R" to redo calculations. Pressing the space bar will return to plume plotting and dose projections. Fig. 13 is an example display of calculated release rate values.

2.4.1.2 Main Steam Line:

a) Enter the monitor reading or average readings on the effected steam line(s) in mR/hr.

b) Enter the number of steam line monitors that are releasing steam. Enter the steam flow in thousands of pounds per hour and the monitor correction factor for each steam line.

c) The program will then calculate the noble gas, I-131 and total iodine release rates and will display them on the screen. If a mistake was made when inputting data, then press the "R" to redo calculations. Pressing the space bar will return to plume plotting and dose projections. Fig. 14 is an example display of Main Steam Line Release prompts.

2.4.1.3 Containment Curie Calculation

a) Enter the number of isotopes from the grab sample analysis.

b) Enter the isotope name, activity (uCi/cc), and half-life (hrs.). Each of these will be entered prior to pressing the return key but are separated by a comma.

c) Enter the containment temperature (deg. F) and pressure (psig).

d) The program will then calculate the total curies in the containment. This value could be taken and used in containment leak rate dose projections. Answer the prompt if another calculation is needed. Fig. 15 is an example of Containment Atmosphere prompts.

SELECT OPTION NUMBER TO UPDATE

1) TODAY'S DATE = 01-01-1980

2) CURRENT TIME = 00:02:42

3) REACTOR SHUTDOWN RATE (MM/DD/YY) = 00-00-00

4) REACTOR SHUTDOWN TIME (HH:MM 24 Hr. CLOCK) = 00:00

5) CONTINUE

Fig. 1

SELECT OPTION BY PRESSING APPROPRIATE NUMBER

1) CURRENT RELEASE DOSE DETERMINATION

2) PROJECTED DOSE DETERMINATION

3) REVIEW PAST ENTRIES

4) FIELD DATA

5) CHANGE REACTOR SHUTDOWN / TIME

Fig. 2

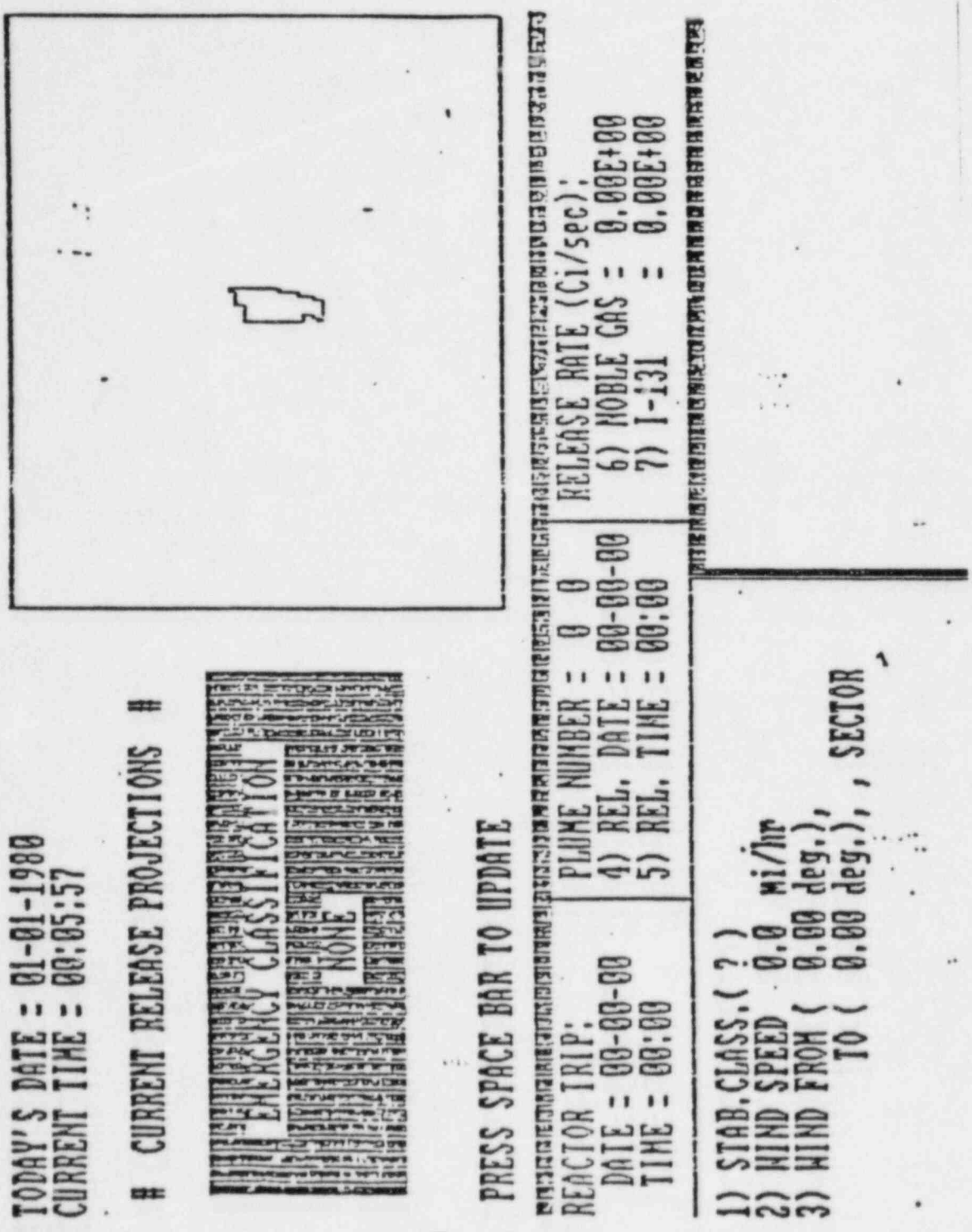
TODAY'S DATE = 01-01-1980
CURRENT TIME = 00:05:57
CURRENT RELEASE PROJECTIONS
EMERGENCY CLASSIFICATION
NONE
PRESS SPACE BAR TO UPDATE
REACTOR TRIP:
DATE = 00-00-00
TIME = 00:00
PLUME NUMBER = 0 0
4) REL. DATE = 00-00-00
5) REL. TIME = 00:00
RELEASE RATE (Ci/sec):
6) NOBLE GAS = 0.00E+00
7) I-131 = 0.00E+00
1) STAB.CLASS.(?)
2) WIND SPEED 0.0 mi/hr
3) WIND FROM (0.00 deg.), , SECTOR
TO (0.00 deg.),

Fig. 3

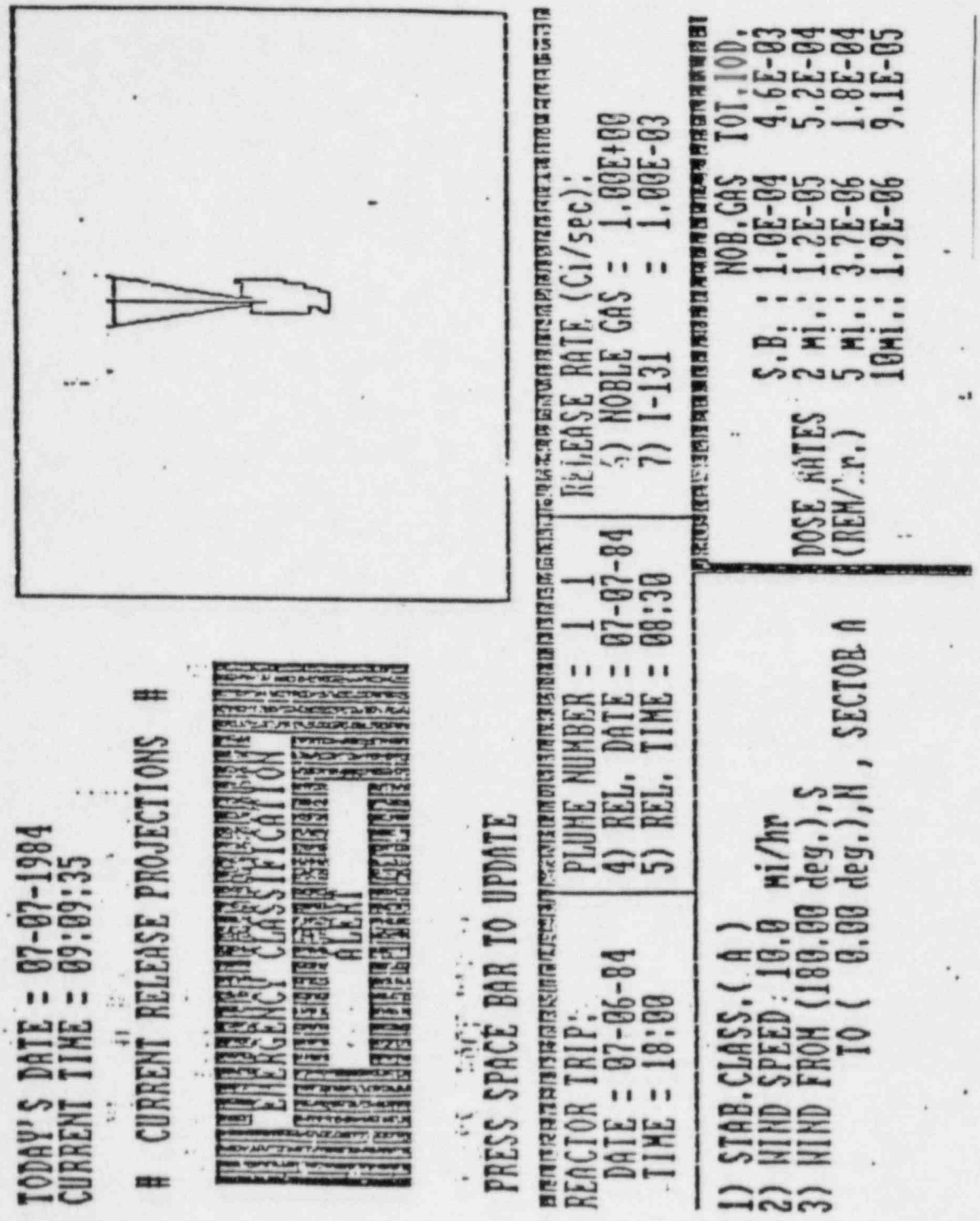

Fig. 4

CURRENT RELEASE DATA — PLUME # 2

TODAY'S DATE = 07-19-1984 — CURRENT TIME = 15:36

- REACTOR SHUTDOWN DATE & TIME = 07-19-84 AT 12:00 (hrs.)
- RELEASE DATE & TIME = 07-19-84 AT 15:10 (hrs.)

** METEROLOGICAL INFORMATION **
- WIND SPEED (mi/hr) = 10
- STABILITY CLASSIFICATION = F
- WIND DIRECTION FROM (W) AT (270) deps. TO THE (E) AT (90) deps.

** RELEASE RATE INFORMATION **
- NOBLE GAS (Ci/sec) = .1
- I-131 (Ci/sec) = .001

	DOWNWIND DISTANCE			
	SR	2	5	10
C/D	2.5E-05	1.5E-05	4.9E-06	2.1E-06
PLUME ARRIVAL (HRS.)	0.13	0.20	0.50	1.00
EFFECTIVE AGE (HRS.)	3.30	3.37	3.67	4.17
** DOSE RATES (rem/hr)**				
NOBLE GASES	3.0E-04	1.9E-04	6.1E-05	2.6E-05
ADULT I-131 INHALATION	4.6E-02	2.8E-02	9.2E-03	3.9E-03
ADULT TOT. IODINE INHALATION	7.4E-02	4.5E-02	1.5E-02	6.0E-03
** 2 hr. DOSE COMMITMENT (rem) **				
NOBLE GAS	6.1E-04	3.7E-04	1.2E-04	5.1E-05
ADULT THYROID INHALATION	1.5E-01	9.0E-02	2.9E-02	1.2E-02
CHILD THYROID INHALATION	2.9E-01	1.8E-01	7.3E-02	2.4E-02

EMERGENCY CLASSIFICATION
ALERT

Fig. 5

```
:\
-1430  .DAT       2-1445  .DAT       3-1459  .DAT       4-1503  .DAT
-1507  .DAT       6-1510  .DAT       7-1512  .DAT
203776 Bytes free
```

```
ENTER PLUME NUMBER ? 7

ENTER HOUR OF FILE TO REVIEW (EX 0900) ? 1512
```

Fig. 6

```
** PAST ENTRY REVIEW **                                   FILE # 7-1512

-  DAY TRIED = 00-00-00                          -  HOUR TRIED = 00:00
-  DATE RELEASED = 07-03-84                      -  HOUR RELEASED = 15:12
-  N.G. RELEASE RATE =  2.00E+00
-  I-131 RELEASE RATE = 5.00E-02
-  WIND SPEED =  05  FROM  200                   -  STABILITY CLASS = A

)OWNWIND DISTANCE          SB          2          5          10

(/D                     3.9E-06    4.6E-07    1.6E-07    8.3E-0
)LUME ARRIVAL (HRS.)       0.01       0.02       0.05       0.12
:FFECTIVE AGE (HRS.)       0.01       0.02       0.05       0.12

** DOSE RATES (rem/hr)**

)OBLE GASES             1.3E-04    1.4E-05    4.3E-06    1.8E-0
)DULT I-131 INHAILATION 9.5E-03    1.1E-03    3.9E-04    2.0E-0
)DULT TOT. IODINE INHALATION 1.7E-02  2.0E-03  7.0E-04    3.6E-0

                PRESS SPACE BAR TO CONTINUE
```

Fig. 7

```
**    FIELD IODINE DATA    **

LOCATION = 355 & BECKEYE/SOLOME HWY.
SAMPLE TIME (HHMM) = 1500
SAMPLE DATE (MM/DD/YY) = 05/25/83
NET COUNTS =  1225
TOTAL VOLUME (CU.FT.) =  10
DETECTOR EFF. =  .01

uC/cc =  1.95E-07

2 hr. ADULT THYROID DOSE (REM) =     1.1
2 hr. CHILD THYROID DOSE (REM) =     2.3
```

Fig. 8

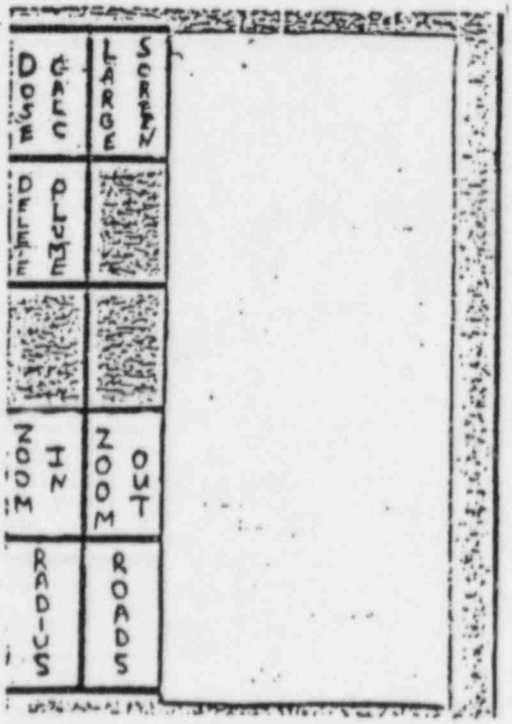

Fig. 9

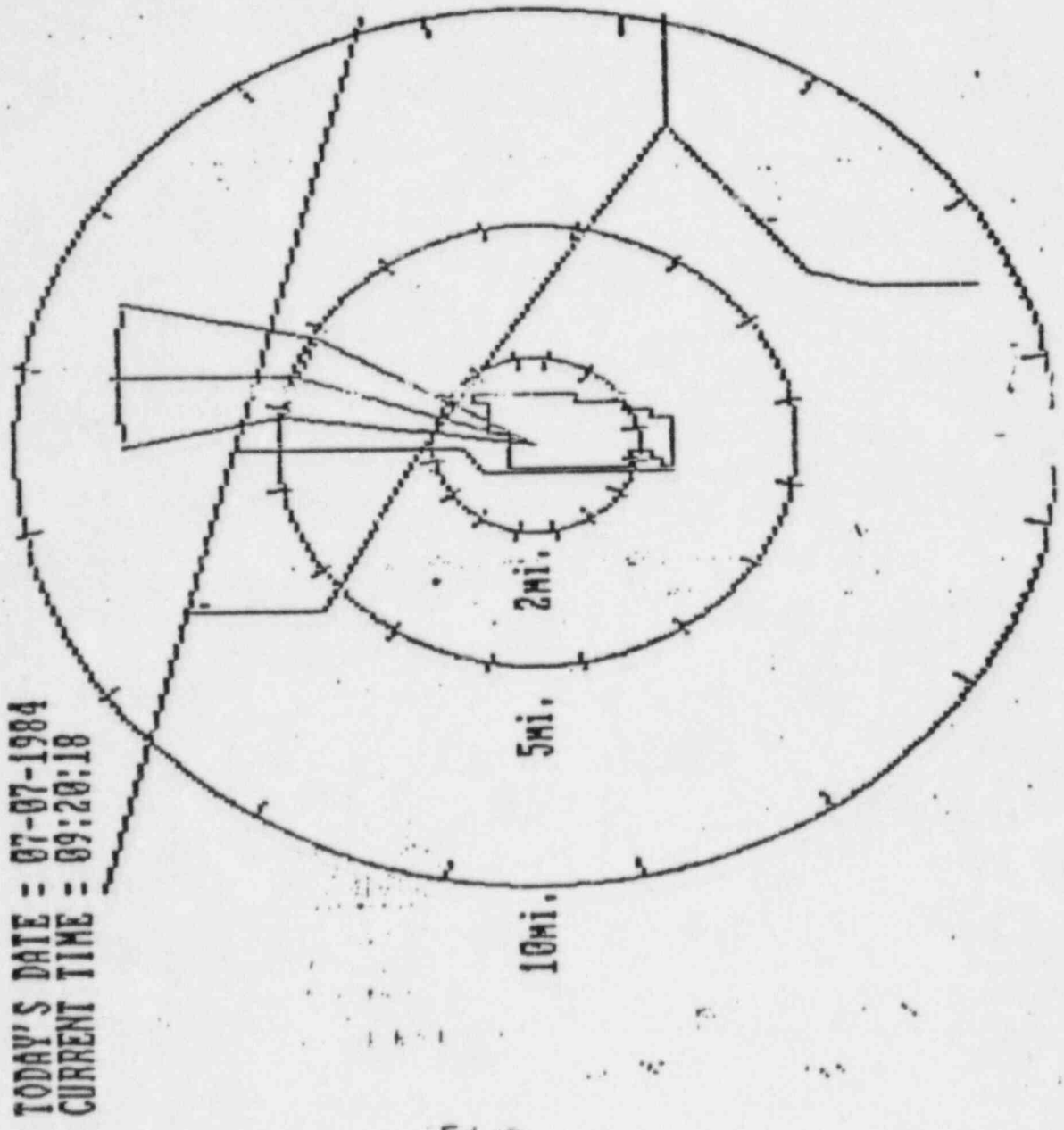

Fig 10

PVNGS EMERGENCY PLAN IMPLEMENTING PROCEDURE	PROCEDURE NO. EPIP-14C	APPENDIX E Page 20 of 27
CONTINUING DOSE ASSESSMENT	REVISION 1	Page 54 of 61

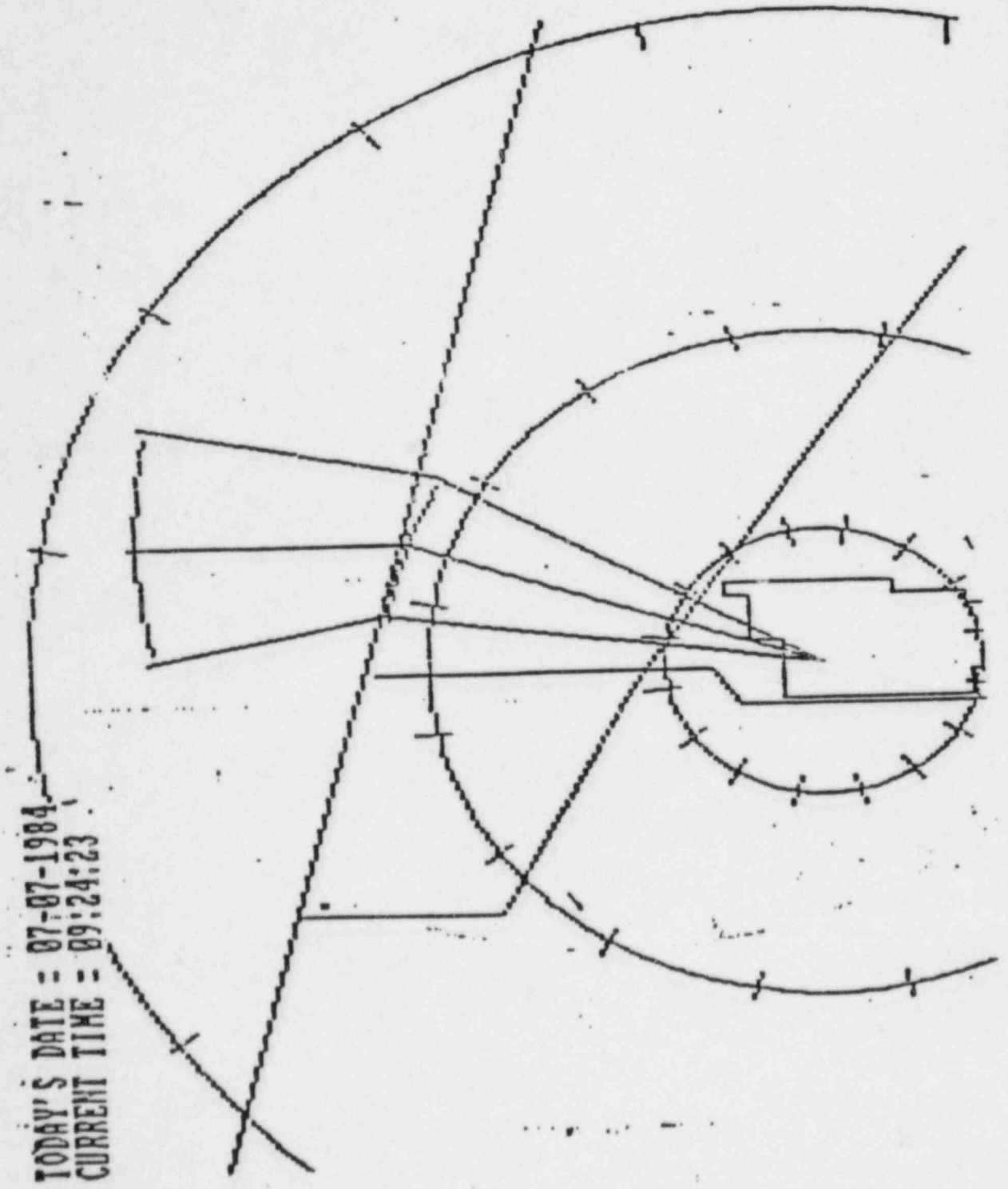

Fig 11

```
1.) PLANT VENT
2.) FUEL BUILDING VENT
3.) CONDENSER AIR REMOVAL SYSTEM
4.) MAIN STEAM LINE
5.) CONTAINMENT CURIE CALC.
```

'LANT VENT RELEASE CALCULATION :

'OTAL FLOW (CFM) = ? 2200 ('U ' IF UNKNOWN)

S THE EFFLUENT MONITER IN USE?Y

INTL. ... 143 ... Ru 144 READING FROM GROSS BETA CHANNEL "B" IN uCi/cc:4E-

S THE I-131 CHANNEL OPERABLE ?Y

-131 READING FROM Ru-143 or Ru-144 (uC/cc) :4E-6

Fig. 12

```
-------------------------------------------------
     PLANT VENT RELEASE CALCULATION :
NOBLE GAS RELEASE RATE=  4.15E-03 Ci/sec
I-131 RELEASE RATE =  4.15E-06 Ci/sec
TOTAL IODINE RELEASE RATE =  4.62E-06 Ci/sec
-------------------------------------------------
```

PRESS SPACE BAR TO CONTINUE
('R ' TO REDO)

Fig. 13

```
MAIN STEAM LINE RELEASE CALCULATION :

READING FROM Ru-139A,B or Ru-140A,B (mr/hr):
HOW MANY STEAM FLOW MONITERS ARE YOU INPUTTING?
FLOW FROM MONITER # 1 (10^3 lbs/hr):?
ENTER CORRECTION FACTOR:
```

Fig. 14

```
CONTAINMENT ATMOSPHERIC TOTAL CURIE CALCULATION

ENTER TOTAL NUMBER OF NUCLIDES TO BE CONSIDERED:?

ENTER ISOTOPE  1 (NAME,ACT(uCi/cc),T1/2(HRS):?

ENTER CONTAINMENT TEMPERATURE (deg.F) ?

ENTER CONTAINMENT PRESSURE (PSIG)?

ENTER TIME IN HRS SINCE SAMPLE WAS TAKEN (hrs.):
```

Fig. 15

Exhibit 3

PROGRAM DESCRIPTION USED TO CALCULATE THE TOTAL ISOTOPIC CURIE CONTENT OF CONTAINMENT

The program "Containment Curie Content" is used to calculate the total isotopic curie content of containment for a given temperature and pressure. Utilizing manually inputted sample results, pressure, temperature and time since sampling, the program corrects the containment volume to STP and then calculates the total curie content per isotope and overall.

The program uses 7.4191×10^{10} cc as the standard containment volume.

EQUATIONS USED

1) Temperature Correction

$$°K = ((°F - 32) \times 5/9) + 273$$

Where:

°K = Temperature absolute

°F = Temperature °F

2) STP Correction

$$\text{Corrected Volume} = \frac{14.7 \text{ (psia)} \times 7.42 \text{ E+10(cc)}}{273 \text{ (°K)}} \quad \frac{T \text{ °K}}{P \text{ (psia)}}$$

3) Correction to Ci calculation

Corrected Act (Ci) = (Act (uCi) x corrected Volume)/1 X E + 6 uCi/Ci)

Exhibit 3 (Continued)

EQUATION DERIVATIONS

Pressure/Temperature from Boyles Law:

$$V_2 = \frac{P\ V}{T_1}\ \frac{(T_2)}{(P_2)}$$

At STP the total free volume of containment = 2.62 E + 6 Ft^3 which converts to:

$$\frac{2.62 \text{ X } 106 \text{ Ft3}}{3.5314 \text{ X } 10^{-5}\ \frac{Ft^3}{Cm^3}} = 7.42 \text{ E+10cc}$$

Therefore the volume at some other temperature and pressure is:

$$V = \frac{(14.7 \text{ (psia) X } 7.42\text{E } +10\text{(cc)}}{273\ (^\circ K)}\ \frac{T\ (^\circ K)}{P\ \text{(psia)}}$$

Exhibit 3 (Continued)

Manual Calculation:

Base Data

Date: 22 September 1983

Sample Date: 22 September 1983

Time: 0729

Sample Time: 0629

Containment Temperature: 110°F

Containment Pressure: 15.3 PSIA

Total free containment volume: 2.62×10^6 Ft^3

Isotopic Breakdown:

Isotope	Activity
1) I-131	3.5 E -6
2) I-132	4.7 E -7
3) I-133	6.2 E -5
4) I-134	8.7 E -6
5) I-135	1.3 E -6
6) Xe-135	2.4 E -4
7) Xe-133	8.7 E -4
8) Kr-87	6.3 E -5
9) Kr-85m	1.8 E -6
10) KR-88	2.5 E -3
11) Ar-41	1.7 E -3

CONTROLLED DOCUMENT

Exhibit 3 (Continued)

TOTAL ACTIVITY CALCULATION

	Isotope	Activity uCi/cc	Total Activity uCi	Activity Ci
1)	I-131	3.5 E - 6	2.761 E + 5	2.761 E - 1
2)	I-132	4.7 E - 7	3.707 E + 4	3.707 E - 2
3)	I-133	6.2 E - 5	4.891 E + 6	4.891 E + 0
4)	I-134	8.7 E - 6	6.863 E + 5	6.863 E - 1
5)	I-135	1.3 E - 6	1.025 E + 5	1.025 E - 1
6)	Xe-135	0.4 E - 4	1.8932 E + 7	1.893 E - 1
7)	Xe-133	8.7 E - 4	6.863 E + 7	6.863 E - 1
8)	Kr-87	6.3 E - 5	4.9696 E + 6	4.9696 E - 0
9)	Kr-85m	1.8 E - 6	1.42 E + 5	1.42 E - 1
10)	Kr-88	0.5 E - 3	1.972 E + 8	1.972 E + 2
11)	Ar-41	1.7 E - 3	1.341 E + 8	1.341 E + 2
			TOTAL	4.30 E +2

CONTROLLED DOCUMENT

Exhibit 3 (Continued)

CONTAINMENT TOTAL CURIE CONTENT

Date: 9/22/83 UNIT: 1
Time: 729
Containment Temp: 110 F
Containment Press: 15.3 PSIA

	ISOTOPE	TOTAL ACTIVITY (Ci)
1)	I-131	0.761 E-1 Ci
2)	I-132	3.707 E-2 Ci
3)	I-133	4.891 E+0 Ci
4)	I-134	6.863 E-1 Ci
5)	XE-135	1.893 E+1 Ci
6)	XE-133	6.863 E+1 Ci
7)	KR-87	4.970 E+0 Ci
8)	KR-85M	1.420 E-1 Ci
9)	KR-88	1.972 E+2 Ci
10)	AR-41	1.341 E+2 Ci
TOTAL CURIES:		4.30 E+2 Ci

CONTROLLED DOCUMENT

PVNGS EMERGENCY PLAN IMPLEMENTING PROCEDURE	PROCEDURE NO. EPIP-16	
INPLANT SURVEYS AND SAMPLING	REVISION 3	Page 1 of 16

DEPT. HEAD Dennis D Arnold DATE 4/24/85

PRB/PRG/TRRG REVIEW O.J. Bourque DATE 5/3/85

APPROVED BY O.J. Bourque DATE 5/3/85

EFFECTIVE DATE 05-10-85

DN-1629A/0190A

PVNGS EMERGENCY PLAN IMPLEMENTING PROCEDURE	PROCEDURE NO. EPIP-16	
INPLANT SURVEYS AND SAMPLING	REVISION 3	Page 2 of 16

REVISION HISTORY

Rev. No.	Date	Revised Pages	Comments
3	05.10.05	4,5,6,7,8,9,	Revised to update
		10,11,14,15,16	references and to
			correctly reflect
			current method for
			surveys and sampling

TABLE OF CONTENTS

SECTION	PAGE NUMBER
1.0 OBJECTIVE	4
2.0 REFERENCES	4
3.0 LIMITATIONS AND PRECAUTIONS	5
4.0 DETAILED PROCEDURE	6
4.1 Personnel Indoctrination/Responsibilities	6
4.2 Prerequisites	7
4.3 Instructions	7
4.3.1 General Instructions	7
4.3.2 Gross Radioactivity Measurement	8
4.3.3 Contamination Surveys	9
4.3.4 Particulate and Radioiodine Air Samples	9
4.3.5 Exiting Controlled Area	11

APPENDICES

Appendix A - Emergency Inplant Monitoring Data Sheet: Beta/Gamma Dose Rate Measurements	12
Appendix B - Emergency Inplant Monitoring Data Sheet: Smear Samples	13
Appendix C - Emergency Inplant Monitoring Data Sheet: Particulate and Radioiodine Samples	14
Appendix D - Inplant Monitoring Team Check List	15

1.0 OBJECTIVE

1.1 To provide for emergency inplant radiological monitoring and surveys in the event of a release of radionuclides.

2.0 REFERENCES

2.1 Implementing References

2.1.1 EPIP-17, "Onsite/Offsite Surveys and Sampling"

2.1.2 EPIP-18, "Emergency Exposure Guidelines"

2.1.3 EPIP-28, "Personnel Monitoring and Decontamination"

2.1.4 EPIP-29, "Area/Equipment Monitoring and Decontamination"

2.1.5 78AC-0ZZ06, "Document and Record Turnover Control"

2.2 Developmental References

2.2.1 NUREG-0654, Rev. 1 "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants"

2.2.2 NUREG-0737, "Clarification of TMI Action Plan Requirements", Oct. 1980

2.2.3 75RP-9ZZ46, "Radioactive Contamination Survey Procedure", Rev. 2. 3

2.2.4 75RP-9ZZ47, "Radiation Survey Procedure", Rev. 1.

2.2.5 75RP-9ZZ48, "Airborne Radioactivity Sampling and Measurement", Rev. 2. 3

2.2.6 75AC-9ZZ01, "Radiation Exposure Authorization, Permits and Control", Rev. 2.

2.2.7 F & J Specialty Products, Inc. "Radioiodine Absorption Cartridge Documentation and Technical Performance Specifications for NRC Audits of Radioiodine Sampling Procedures", 1984.

2.2.8 ANSI N45.2.9, "Requirements for Collection, Storage and Maintenance of Quality Assurance Records for Nuclear Power Plants, 1974. 3

2.2.9 PVNGS Emergency Plan, Rev. 5

3.0 LIMITATIONS AND PRECAUTIONS

3.1 The Radiological Protection Coordinator (RPC) may authorize exposures in excess of PVNGS Administrative Radiation Exposure Limits up to the limits of 10 CFR 20. Exposures in excess of 10 CFR 20 limits up to Emergency Exposure Limits of EPIP-18, "Emergency Exposure Guidelines," shall be authorized by the Emergency Coordinator. Exposures in excess of Emergency Exposure Limits shall not be authorized.

3.2 The Radiation Monitor or RPC should check RMS dose rates via ERFDADS monitor prior to RP access into an area.

3.3 Use appropriate protective clothing, equipment and respirators.

3.4 Ensure that proper dosimetry is worn.

3.5 Check batteries and perform source check test on survey instruments to be used.

3.5.1 Allow warm up time for high range survey equipment.

3.6 While in route to the survey location, keep the survey meter turned on with the meter set to the high scale, switching down as necessary.

3.7 Under the following conditions inplant monitoring personnel should withdraw from the area immediately and relay this information to the Radiological Protection Coordinator.

3.7.1 If the unanticipated area gamma dose rate is equal to or greater than 10 R/hr.

NOTE

The following conditions may indicate airborne radioactivity: a continuous air monitor in a valid alarm condition or observation of steam.

3.7.2 If airborne activity is suspected at the survey location and the field monitoring team is not wearing respirators, control access and leave the area.

4.0 DETAILED PROCEDURE

4.1 Personnel Indoctrination/Responsibilities

4.1.1 The Radiation Protection Monitor, until relieved by the Radiological Protection Coordinator, is responsible for the implementation of this procedure.

4.1.2 Technicians involved in air and gross gamma and beta sampling should be familiar with operation of the air samplers, cartridges, filters, and survey instruments. Monitoring Team members should be familiar with 75RP-9ZZ48, "Airborne Radioactivity Sampling and Measurement", 75RP-9ZZ46, "Radioactive Contamination Survey Procedure", and 75RP-9ZZ47, "Radiation Survey Procedure".

4.1.3 Members of Monitoring Teams should proceed to the Operations Support Center for instructions.

4.1.4 The Operations Support Center Coordinator shall supervise the formation of Inplant Monitoring Teams.

4.1.5 The Emergency Maintenance Coordinator shall direct the briefing and dispatching of Inplant Monitoring Teams. 3

4.1.6 The Unit Supervising Radiation Physicist shall provide technical support for the inplant survey teams in coordination with the RPC.

4.1.7 The Inplant Monitoring Team Leader should communicate with the RPC at least every 30 minutes via phone and/or portable radio (channel #4).

4.2 Prerequisites

4.2.1 An ALERT or more severe emergency has been classified per EPIP-02, "Emergency Classification".

4.2.2 Don protective clothing and respiratory apparatus if necessary.

4.2.3 Obtain emergency equipment from the OSC emergency kit. 3

4.2.4 Record serial numbers and calibration dates of survey instruments and air samplers in Appendices A and C.

4.2.5 Check batteries and perform source check tests on survey instruments. Allow warm up time (approximately 2 minutes) for high range survey equipment.

4.2.6 Check batteries in portable radio.

4.2.7 Complete heading for Appendices A, B and C.

4.3 Instructions

4.3.1 General Instructions

4.3.1.1 The inplant teams shall be briefed on area(s) to be monitored, specific surveys to be performed and any special instructions needed.

4.3.1.2 Airborne activity (radioiodine, particulates, and noble gases), beta/gamma, should be sampled as directed by the Radiation Protection Monitor or Radiological Protection Coordinator. The Inplant Monitoring Team Leader shall complete the check list in Appendix D.

4.3.1.3 Survey meters should be left on while in transit. All unposted or unexpected inplant readings above 1 R/hr shall be reported immediately to the Radiological Protection Coordinator.

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4.3.1.4 Areas to be surveyed shall be determined by the Radiation Protection Monitor or the Radiological Protection Coordinator. Determination of areas to be surveyed should depend on the type of accident, area radiation monitor readings and previous survey data. The major accident categories are listed below with suggested survey areas.

Accident Type	Suggested Survey Area
LOCA	All areas around containment Areas around operating ESF equipment during recirculation phase
SGTR	Main Steam Lines, Turbine, and Condenser
WGDTR	Area around WGDT including entire radwaste building
FHA	Fuel handling area

4.3.2 Gross Radioactivity Measurement 3

4.3.2.1 Ensure that appropriate dosimetry is worn.

4.3.2.2 Use one of the following instrument types (as appropriate):

1. Extended probe
2. 0-5 R/hr survey meter
3. 0-50 R/hr survey meter

4.3.2.3 Access the controlled area using the emergency Radiation Exposure Permit Number 9999, if required. 3

4.3.2.4 While in route to the survey location, keep the survey meter on with the meter set on the high scale switching down as necessary.

4.3.2.5 Upon arrival at the survey location evaluate radiological conditions. Record findings on survey map and transpose to applicable Appendices. Report findings to the Radiological Protection Coordinator.

4.3.2.6 Maintain communications with the RPC/Field Team Communicator and transmit radiation readings when they change significantly.

4.3.2.7 If the dose rate exceeds expected levels or if exposure of any member of the team exceeds their assigned limit, the entire team shall retreat to a low level radiation background area, notify the RPC and await further instructions. 3

4.3.3 Contamination Surveys

4.3.3.1 Perform contamination surveys in assigned survey location.

4.3.3.2 Record smear location on the survey map.

4.3.3.3 Have smears counted in unit RP counting lab if available, or approximate activity by performing a direct frisk with a pancake probe assuming 10% efficiency.

4.3.3.4 Transmit results to the RPC using Appendix B and/or applicable survey maps.

4.3.4 Particulate and Radioiodine Air Samples (Appendix C) 3

NOTE

Air sample volumes should be 10 ft^3 or as directed.

4.3.4.1 Assemble the sample head. The particulate filter should be upstream from the iodine cartridge. Attach the sample head to the air sampler.

4.3.4.2 If using a variable rate air sampler, start the sampler in the variable position.

4.3.4.3 Adjust the flow rate. The maximum flow rate should be 4 CFM. It is suggested that the flow rate be 2 CFM. The nonvariable flow rate air samplers are fixed at 2 CFM.

4.3.4.4 Determine the sampling time necessary to collect a sample volume of $10ft^3$ and collect sample.

4.3.4.5 In a low radiation background area, record the sampling time (in minutes) on Appendix C and calculate the flow rate in CFM using the following method:

$$\frac{\text{CFM (Initial)} + \text{CFM (Final)}}{2} = \text{CFM (Sample Collection)}$$

Where: CFM (Initial), (CFM Final) and CFM (Sample Collection) are the initial flow rate, final flow rate, and mean flow rate, respectively, in CFM. Record the mean flow rate value on Appendix C.

4.3.4.6 Calculate the sample volume as follows and record in Appendix C.

$V(ft^3)$ = CFM (Sample Collection) x Sample Collection Time (Minutes)

NOTE

If the air sampling cartridge binds in the air sampler head, allow several minutes for the a/s head to cool, rather than forcing the cartridge.

3

4.3.4.7 Disassemble the sample head. Place the particulate filter in a plastic bag and label the bag with the date, time, location, and sample volume.

4.3.4.8 Have samples counted in unit chemistry lab or as directed by RPC.

4.3.4.9 Save samples for recount or dispose of as radioactive material as directed by the RPC.

4.3.5 Exiting Controlled Area

4.3.5.1 Notify RPC/Field Team Communicator that survey is complete and of your intention to return to OSC.

4.3.5.2 Gather all survey equipment and data, place in plastic bags and exit area observing step-off pads and RP procedures and practices as reasonably possible.

4.3.5.3 Perform thorough body frisk.

4.3.5.4 If contaminated, notify RPC and proceed with decontamination procedures per EPIP-28, "Personnel Monitoring and Decontamination," as directed. 3

4.3.5.5 Ensure that all survey equipment is surveyed and released if possible.

4.3.5.6 Notify RPC of any survey equipment, etc. that is contaminated and/or damaged and needs to be replaced.

4.3.5.7 RP shall transmit results to the RPC and records shall be retained per 78AC-0ZZ06, "Document and Record Turnover Control". 3

4.3.5.8 Report to the RPC for debriefing.

EMERGENCY INPLANT FIELD MONITORING DATA SHEET: BETA/GAMMA DOSE RATE MEASUREMENTS

Team# ______________ Field Monitoring Team Leader ______________ Field Monitoring Team Member ______________

Date ______________ Time Started ______________ Instrument Type ______________ Serial# ______________

______________ Calibration Date ______________

Monitoring Location	Time	Net Dose Rate mR/hr: Readings at 3' from equipment, potential hot spot, etc.	Beta/Gamma readings on contact	Beta/Gamma readings for the general area

Performed by ______________ Date ______________

Reviewed by ______________ Date ______________

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EMERGENCY INPLANT MONITORING DATA SHEET: SMEAR SAMPLES

Team# _____ Field Team Leader _____ Field Team Member _____

Date _____ Time Started _____ Counting Instrument Used for Analysis _____

Counting Efficiency _____ Counter Bkgd. _____

SMEAR SAMPLES

Monitoring Location	Gross (CPM)	Bkgd. (CPM)	Net (CPM)	Counter Eff.	dpm/100 cm^2

Performed by _____ Date _____

Reviewed by _____ Date _____

EMERGENCY INPLANT MONITORING DATA SHEET: PARTICULATE/RADIOIODINE AIR SAMPLES

Date _____ Location _____

Air Sampler No. _____ Calibration Date _____

Start Time _____ Initial Flow _____

Stop Time _____ Final Flow _____

Sample Duration _____ (min) Average Flow _____ (cfm)

Volume _____ (m3)

Volume = Sample duration (min) X avg flow (cfm) X 2.832 E-2.

Net Activity (cpm)		Efficiency * Factor (dpm/cpm)		Sample Vol (m3)		Conversion Factor (uci - m3/dpm-cc)		Gross Conc. (uci/cc)
_____	X	_____	/	_____	X	4.5 E-13	=	_____
_____	X	_____	/	_____	X	4.5 E-13	=	_____
_____	X	_____	/	_____	X	4.5 E-13	=	_____
_____	X	_____	/	_____	X	4.5 E-13	=	_____
_____	X	_____	/	_____	X	4.5 E-13	=	_____

Performed by _____ Date _____

Reviewed by _____ Date _____

* Efficiency factor equals 1/counting efficiency. Counting efficiency is posted on the daily performance check sheet.

3

3

INPLANT
MONITORING TEAM
CHECK LIST

POSITION FILLED BY: Radiation Protection Technician

RESPONSIBILITY: Perform inplant radiation monitoring.

IMMEDIATE ACTIONS	TIME/INITIALS
1. Report to OSC upon notification.	____/____
2. Obtain briefing from supervisory individual: (a) Radiation Protection Monitor (Onshift) or (b) Radiological Protection Coordinator (Onsite).	____/____
3. Obtain the following equipment as required: (1) Legal TLD, job TLD (alarming dosimeter optional) ____ (2) Emergency equipment as required from the OSC emergency kit. ____	____/____
4. Record serial numbers and calibration dates of survey instruments and air samplers in Appendix A and C, EPIP-16.	____/____
5. Check batteries and perform source check tests on survey instruments.	____/____
6 Check batteries in portable radio.	____/____
7. Allow warm-up time for high range survey equipment	____/____

13

INPLANT
MONITORING TEAM
CHECK LIST

8. Conduct surveys and sampling per EPIP-16, and as directed, for: ____/____

   a. Gross radioactivity measurement _____
   b. Particulate and radioiodine air samples _____
   c. Surface contamination samples _____

9. Save all samples for recount in unit labs or dispose of sampling media as radioactive waste upon direction from the RPC. ____/____ 3

SUBSEQUENT ACTIONS

Reporting

10. Communicate with the Radiation Protection Monitor (onshift) or the Radiological Protection Coordinator at least every one half hour via portable radio. ____/____

Documentation

11. Complete Appendices A, B, C, and D, EPIP-16. ____/____

Decontamination

12. Be checked for contamination. ____/____

13. Decontaminate self as required, per EPIP-28, "Personnel Monitoring and Decontamination". ____/____ 3

Signature _____

Date _____

CONTROLLED DOCUMENT

PVNGS EMERGENCY PLAN IMPLEMENTING PROCEDURE	PROCEDURE NO. EPIP-18	
EMERGENCY EXPOSURE GUIDELINES	REVISION 3	Page 1 of 10

DEPT. HEAD Dennis S. Jones DATE 4/24/85

PRB/PRG/TRRG REVIEW O.J. Bennett DATE 5/3/85

APPROVED BY O.J. Bennett DATE 5/3/85

EFFECTIVE DATE 05-10-85

DN-1632A/0190A

CONTROLLED DOCUMENT

PVNGS EMERGENCY PLAN IMPLEMENTING PROCEDURE	PROCEDURE NO. EPIP-18	
EMERGENCY EXPOSURE GUIDELINES	REVISION 3	Page 2 of 10

REVISION HISTORY

Rev. No.	Date	Revised Pages	Comments
3	05.10.05	3, 6	Updated text to reflect ALARA principles and updated references.

TABLE OF CONTENTS

SECTION		PAGE NUMBER
1.0	OBJECTIVE	4
2.0	REFERENCES	4
3.0	LIMITATIONS AND PRECAUTIONS	5
4.0	DETAILED PROCEDURE	6
4.1	Personnel Indoctrination/Responsibilities	6
4.2	Prerequisites	6
4.3	Instructions	6

APPENDICES

Appendix A -	PVNGS Adminsitrative Radiation Exposure Limits	8
Appendix B -	Maximum Permissible Dose Limits for Occupational Workers	9
Appendix C -	Emergency Exposure Limits	10

1.0 OBJECTIVE

1.1 This procedure addresses required authorization, guidance, and maximum exposure criteria in the event of a radiological emergency where it becomes necessary for emergency workers to exceed PVNGS Administrative Radiation Exposure Limits or 10CFR20 exposure limits.

2.0 REFERENCES

2.1 Implementing References

2.1.1 EPIP-26, "Potassium Iodide (KI) Administration"

2.1.2 75RP-9ZZ44, "Radiation Exposure Permits" | 3

2.2 Developmental References

2.2.1 NCRP Report #39, 1971 Basic Radiation Protection Criteria

2.2.2 EPA-520/1-75-001, Manual of Protective Action Guides and Protective Actions for Nuclear Incidents, Revised June 1980

2.2.3 10CFR20, Standards for Protection Against Radiation, 1983

2.2.4 PVNGS Emergency Plan, Rev. 5 | 3

2.2.5 NUREG 0654, Rev. 1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants".

2.2.6 NUREG 0737, "Clarification of TMI Action Plan Requirements", October, 1980

2.2.7 75AC-9ZZ01, "Radiation Exposure Authorization, Permits and Control", Rev. 13 | 3

IRS 5/3/85

3.0 LIMITATIONS AND PRECAUTIONS

3.1 The Radiological Protection Coordinator may authorize exposures in excess of normal PVNGS Administrative Radiation Exposure Limits (Appendix A) up to the Limits of 10CFR20 (shown in Appendix B). Exposures in excess of 10CFR20 Limits up to Emergency Exposure Limits (Appendix C) shall be authorized by the Emergency Coordinator. Exposures in excess of those listed in Appendix C shall not be authorized.

3.2 Personnel authorized to receive exposures in excess of 10CFR20 limits should meet the following criteria:

3.2.1 Personnel shall be volunteers.

3.2.2 Women of child-bearing age and capability should not be permitted to receive emergency exposures (except for lifesaving actions).

3.2.3 Personnel shall be familiar with the hazards of exposure received under emergency conditions.

3.2.4 Radiation exposure history of volunteers should be known.

3.2.5 Use of volunteers above age 45 should receive first consideration.

3.2.6 Emergency exposures for life saving actions shall be limited to one occurrence.

3.3 Administrative methods to minimize personnel exposure should remain in force to the extent consistent with timely rescue, corrective and protective actions.

3.4 Personnel shall wear dosimeters appropriate for the measurement of anticipated exposure levels. These should include:

3.4.1 Thermoluminescent Dosimeter (Legal).

3.4.2 Thermoluminescent Dosimeter (Job).

3.4.3 Extremity Dosimeters, if appropriate (Appendix B, Note 2).

3.4.4 Alarming Dosimeters.

3.5 If necessary, potassium iodide (KI) tablets should be administered in accordance with EPIP-26, "Potassium Iodide (KI) Administration".

3.6 Protective clothing and/or respirators should be used as appropriate.

4.0 DETAILED PROCEDURE

4.1 Personnel Indoctrination/Responsibilities

4.1.1 The Radiological Protection Coordinator may authorize exposures in excess of PVNGS Administrative Radiation Exposure Limits (See Appendix A) up to the Limits of 10CFR20 (See Appendix B). Exposures in excess of 10CFR20 Limits up to Emergency Exposure Limits (See Appendix C) shall be authorized by the Emergency Coordinator. Exposures in excess of those listed in Appendix C shall not be authorized.

4.1.2 During an emergency, radiation exposures in excess of occupational limits may be necessary.

4.1.3 Emergency dose limits (Appendix C) are defined for three categories: 1) lifesaving actions, 2) corrective and/or protective actions and 3) sampling under emergency conditions.

4.1.4 Emergency exposures are justifiable only if the doses are commensurate with the significance of the objective and every reasonable effort is made to maintain emergency worker doses as low as is reasonably achievable.

4.2 Prerequisites

4.2.1 An emergency condition has resulted in the need to conduct lifesaving actions, corrective or protective actions and/or sampling activities which might result in doses exceeding PVNGS Administrative Radiation Exposure Limits.

4.3 Instructions

4.3.1 Authorization

NOTE

The following actions shall be performed to document emergency radiation exposures. Although it is preferable to perform these steps before the exposure is received, the Emergency Coordinator may verbally authorize the emergency exposure with documentation to be completed at a later time.

4.3.1.1 The Radiological Protection Coordinator shall provide the Emergency Coordinator with a radiological evaluation of the situations and conditions requiring emergency exposures.

4.3.1.2 During emergency conditions, personnel shall be instructed to use the standing Emergency Radiation Exposure Permit (REP 9999). Verbal instruction shall be provided on protective equipment, procedures and allowable emergency doses.

4.3.1.3 Documentation shall be completed when time allows in the form of a signed Radiation Exposure Permit (REP 9999) per 75RP-9ZZ44, "Radiation Exposure Permits".

4.3.2 Personnel Exposure Control

4.3.2.1 Individuals shall abide by all conditions specified in the REP.

4.3.2.2 Individuals shall not enter any area where dose rates are unmeasureable with instruments immediately available.

4.3.2.3 Personnel unable to complete the task within the allotted stay time or allotted dose shall exit the radiation area.

4.3.3 Subsequent Actions

4.3.3.1 The Radiological Protection Coordinator shall obtain initial estimates of the radiation dose of exposed personnel as quickly as possible, update and refine dose estimates at a later time and immediately report exposures in excess of 10CFR20 Limits to the PVNGS Plant Manager who shall then report to the NRC per 10CFR20.403 and 10CFR20.405.

3

PVNGS EMERGENCY PLAN IMPLEMENTING PROCEDURE	PROCEDURE NO. EPIP-18	APPENDIX A Page 1 of 1
EMERGENCY EXPOSURE GUIDELINES	REVISION 3	Page 8 of 10

3

PVNGS ADMINISTRATIVE RADIATION EXPOSURE LIMITS

	Weekly	Quarterly	Yearly
Whole Body	300 mrem	1.0 REM	4.0 REM

MAXIMUM PERMISSIBLE DOSE LIMITS
FOR OCCUPATIONAL WORKERS

Critical Organ	DOSE LIMITS mrem/quarter
Whole Body, Head and Trunk, Active Blood-Forming Organs, Lens of the Eye or Gonads	1,250[1]
Hands, Forearms, Ankles, Feet	18,750[2]
Skin of Whole Body	7,500[2]
Other Organs (Thyroid), Tissues and Organ Systems	5,000[4]
Pregnant Women (With Respect to the Fetus)	$\frac{500\text{mrem}}{9\text{ months}}$[3]

1. 3,000 millirem is permitted in a calendar quarter or 12,000 millirem in a year as long as the accumulative occupational dose to the whole body does not exceed 5,000 millirem x (age - 18) and the individual's lifetime exposure history is recorded on the NRC's Form 4 or equivalent. Doses exceeding 1,250 mrem/quarter must be reported to the NRC per 10CFR20.403 and 10CFR20.405.

2. The licensee is required to supply appropriate personnel monitoring equipment and shall require the use of such equipment by each individual who enters a high radiation area or that receives or is likely to receive a dose in any calendar quarter in excess of 25% of the applicable 10CFR20 value.

3. NCRP, ICRP Guidance.

4. NUREG 0737.

EMERGENCY EXPOSURE LIMITS

	Sampling Under Accident Conditions	Corrective or Protective Actions	Litesaving Actions
Whole Body (rem)	5 *	25 ****	75 ****
Thyroid (rem)	25 ****	125 ****	NO LIMIT ***
Extremities (rem)	75 *	100**	200**

* NUREG 0737, Nov. 1980

** NCRP Report #39, 1971

*** No specific upper limit is given for thyroid exposure since in the extreme case complete thyroid loss might be an acceptable penalty for a life saved. However, this should not be necessary if respirators and/or thyroid protection for rescue personnel are available as a result of adequate planning.

**** Manual of Protective Action Guides and Protective Actions for Nuclear Incidents, Revised June 1980.

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PVNGS EMERGENCY PLAN IMPLEMENTING PROCEDURE	PROCEDURE NO. EPIP-19	
ONSITE EVACUATION	REVISION 3	Page 1 of 19

ASSIGNED COPY

PVNGS # 8-9B

DEPT. HEAD Dennis D. Dow DATE 4/24/85

PRB/PRG/TRRG REVIEW C.J. Eargott DATE 5/3/85

APPROVED BY C.J. Eargott DATE 5/3/85

EFFECTIVE DATE 05-10-85

DN-1586A/0188A

PV216-00DA (8/82)

PVNGS EMERGENCY PLAN IMPLEMENTING PROCEDURE	PROCEDURE NO. EPIP-19	
ONSITE EVACUATION	REVISION 3	Page 2 of 19

REVISION HISTORY

Rev. No.	Date	Revised Pages	Comments
3	04/10/91	4,5,6,7,10,18	REVISED TO UPDATE REFERENCES AND CLARIFY PORTIONS OF TEXT OF PROCEDURE.

TABLE OF CONTENTS

SECTION		PAGE NUMBER
1.0	OBJECTIVE	4
2.0	REFERENCES	4
3.0	LIMITATIONS AND PRECAUTIONS	4
4.0	DETAILED PROCEDURE	5
4.1	Personnel Indoctrination/Responsibilities	5
4.2	Prerequisites	5
4.3	Instructions	6

APPENDICES

Appendix A - Onsite Evacuation Routes and Bus Pickup Points	12
Appendix B - Offsite Reassembly Areas and Evacuation Routes	13
Appendix C - Radiation Monitoring Team Checklist	16
Appendix D - Evacuation Team Leader Checklist	18

1.0 OBJECTIVE

1.1 To provide guideline information pertinent to evacuation of onsite personnel including company, construction, contractors and visitors who are not engaged in emergency response activities.

2.0 REFERENCES

2.1 Implementing References

2.1.1 EPIP-04, "ALERT Implementing Actions" 3

2.1.2 EPIP-05, "SITE AREA EMERGENCY Implementing Actions"

2.1.3 EPIP-06, "GENERAL EMERGENCY Implementing Actions"

2.1.4 EPIP-11, "Technical Support Center/Satellite TSC Activation"

2.1.5 EPIP-20, "Personnel Assembly and Accountability"

2.1.6 EPIP-28, "Personnel Monitoring and Decontamination"

2.1 78AC-0ZZ06, "Document and Record Turnover Control"

2.2 Developmental References

2.2.1 NUREG-0654 Rev. 1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants"

2.2.2 PVNGS Emergency Plan, Rev. 5 3

2.2.3 ANSI N45.2.9 - 1974, "Requirements for Collection, Storage and Maintenance of Quality Assurance Records for Nuclear Power Plants".

3.0 LIMITATIONS AND PRECAUTIONS

3.1 This procedure should be conducted in an orderly fashion to avoid personnel injury.

3.2 ANPP Medical staff members shall be considered essential personnel and shall not be evacuated. 3

3.3 Bechtel Fire Team and Medical staff members shall be considered essential personnel and shall not be evacuated.

3.4 Construction Security shall be considered essential personnel and shall not be evacuated.

3.5 Appendices C and D shall be submitted to the Radiological Protection Coordinator and the Security Director, respectively upon event termination so that they may be forwarded to the Emergency Planning and Preparedness Dept. for retention in accordance with 78AC-0ZZ06, "Document and Record Turnover Control". 3

4.0 DETAILED PROCEDURE

4.1 Personnel Indoctrination/Responsibilities

4.1.1 In the event of an emergency at PVNGS, it may be desirable to send persons home before there is an uncontrolled release of radioactive material. Such cases may be treated as early dismissal from work and subject only to Section 4.3.1 of this procedure. Notification of such dismissal shall come from the Emergency Coordinator and should be passed down the supervisory chain to accomplish an orderly sequence of dismissal. Security shall provide traffic control.

4.1.2 The remainder of this procedure applies in the event of evacuations where persons may be contaminated and is addressed in Section 4.3.2 of this procedure. 3

4.1.3 Assembly and accountability per EPIP-20, "Personnel Assembly and Accountability", shall be accomplished prior to any evacuation.

4.1.4 The Emergency Coordinator is responsible for determining the need for onsite evacuation, the offsite reassembly area evacuation routes, and the order of evacuation from various parking lots.

4.1.5 The Security Director is responsible for conducting the evacuation.

4.2 Prerequisites

4.2.1 A SITE AREA EMERGENCY or GENERAL EMERGENCY has been declared or the Emergency Coordinator has determined that the condition warrants evacuation of non-essential personnel.

4.2.2 Assembly and accountability have been completed per EPIP-20 and all groups of non-essential personnel are at their assembly areas awaiting evacuation instructions.

4.3 Instructions

NOTE

Accountability shall be completed per EPIP-20 prior to early dismissal.

4.3.1 Early Dismissal

4.3.1.1 The Emergency Coordinator may determine that it is desirable to send persons home before there is a danger of radiation exposure.

4.3.1.2 The Emergency Coordinator shall direct the Security Director to inform all Assembly Area Supervisors who shall in turn inform their groups.

4.3.1.3 The preferred order of notification and early dismissal shall be as follows:

(1) Visitor's Center
(2) Bechtel and subcontractor manuals
(3) Bechtel and subcontractor non-manuals
(4) ANPP/Bechtel Start-up
(5) ANPP Construction
(6) PVNGS Nuclear Operations

4.3.1.4 The ANPP Medical Staff and Bechtel Fire Team and Medical Staff shall not be dismissed early. The Fire Team shall report to its equipment building and await further instruction. The Medical Staffs shall report to their First Aid Stations and await further instruction.

3

4.3.1.5 Construction Security shall not be dismissed early. They shall report to their duty stations and await instructions.

4.3.1.6 PVNGS Nuclear Operations technical and training personnel shall be directed to report to the offsite reassembly area rather than go home so that they may be recalled if their support is needed.

4.3.2 The Emergency Coordinator shall:

NOTE

The instructions provided below have been incorporated into the Emergency Coordinator's checklist located in EPIP-05, "SITE AREA EMERGENCY Implementing Actions", or EPIP-06, "GENERAL EMERGENCY Implementing Actions".

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4.3.2.1 Determine if an evacuation is required per the level of emergency classification or if onsite evacuation is otherwise desirable.

4.3.2.2 Consult with the Radiological Protection Coordinator (or Radiation Protection Monitor) and determine the appropriate offsite assembly area and evacuation route (See Section 4.3.9 of this procedure).

4.3.2.3 Determine the necessity to reassemble emergency personnel in the Operations Support Center and Service Building into one of the protected facilities, i.e., the CR/STSC, Technical Support Center or Emergency Operations Facility.

4.3.2.4 Consult with the Security Director to assure that traffic control and other activities are sufficiently advanced to allow proper evacuation.

4.3.2.5 Order the Shift Supervisor to sound the emergency siren to signal evacuation and make a PA announcement with specific instructions.

4.3.3 The Security Director shall:

NOTE

The information provided below has been incorporated into the Security Director checklist located in EPIP-11, "Technical Support Center/Satellite TSC Activation".

4.3.3.1 Contact the Maricopa County Sheriff's Office by dedicated telephone or radio to request assistance as required.

4.3.3.2 Inform the Sheriff's Office of the designated offsite reassembly area (Palo Verde Inn or Hassayampa Pump Station) once that is determined by the Emergency Coordinator.

4.3.3.3 Request Sheriff's Office assistance with traffic control at the offsite reassembly area.

4.3.3.4 Arrange for an orderly sequence of evacuation.

4.3.3.5 Direct the Security Force to routinely check ANPP trailers and buildings in the Administration area outside the protected area to ensure all non-essential personnel have left the premises.

4.3.3.6 Direct Corporate Site Security to check the Visitor's Center and associated areas.

4.3.3.7 Contact the Evacuation Team Leader at the offsite reassembly area to determine if any emergency supplies are needed. The Administrative and Logistics Coordinator shall arrange for any needed supplies.

4.3.3.8 Provide periodic reports on evacuation status to the Emergency Coordinator.

4.3.4 Radiological Protection Coordinator

NOTE

The instructions provided below have been incorporated into the Radiological Protection Coordinator checklist located in EPIP-11.

4.3.4.1 The Radiological Protection Coordinator shall assist the Emergency Coordinator in determining the appropriate offsite reassembly area and evacuation route.

4.3.4.2 Palo Verde Inn should be selected as the offsite reassembly area unless the conditions warrant use of the alternative. In that case, Hassayampa Pump Station should be used. Appendix B contains the evacuation routes to the two offsite reassembly areas.

4.3.4.3 Provide guidance to the Radiation Monitoring team at the reassembly area as requested.

4.3.5 Radiation Monitoring Team shall:

4.3.5.1 Use the checklist provided in Appendix C.

4.3.5.2 Take direction from the Radiological Protection Coordinator and proceed to the offsite reassembly area.

4.3.5.3 Establish a monitoring point and, if necessary, a decontamination area in accordance with EPIP-28, "Personnel Monitoring and Decontamination".

4.3.5.4 Monitor and clear all individuals and vehicles before release. Names and addresses of evacuees suspected of having received a dose in excess of 250 mrem or those requiring any decontamination shall be obtained before the evacuees are allowed to leave the reassembly area.

4.3.5.5 Periodically inform the Radiological Protection Coordinator of the progress of monitoring and decontamination efforts.

4.3.6 Evacuation Team Leader shall:

4.3.6.1 Be a member of the Security Force appointed by the Security Director.

4.3.6.2 Report to the Bechtel Gate No. 1 and await the evacuation signal. When the signal is given, he shall lead the evacuating group to the offsite reassembly area.

4.3.6.3 Direct arriving groups to assembly areas at the offsite reassembly area, per Section 4.3.9.1. or 4.3.9.2. He should use arriving Assembly Area Supervisors for assistance. 3

4.3.6.4 Assist the Radiation Monitoring Team, as necessary, in the logistics of monitoring and decontamination. He shall assure that no individual or vehicle leaves the reassembly area until cleared by that team.

4.3.6.5 Provide periodic progress reports and direct requests for resources, if necessary, to the Security Director.

4.3.7 Assembly Area Supervisors shall:

4.3.7.1 Receive instructions on impending evacuation from the Emergency Coordinator via P.A. announcements and pass along to the assembly area group. 3

4.3.7.2 Release his group to enter personal vehicles or buses once the evacuation signal is given.

4.3.7.3 Report to the Evacuation Team Leader at the offsite reassembly area and assist him as necessary.

4.3.8 Evacuating Personnel shall:

4.3.8.1 Wait at their assembly areas until the evacuation signal is given as shown in Appendix A. 3

4.3.8.2 Take direction from Assembly Area Supervisors and Security Force members during evacuation.

4.3.8.3 Proceed as follows when the evacuation signal is given:

(1) Personnel using their personal vehicles shall proceed at an orderly pace to the site exit gates and follow the Evacuation Team Leader.

(2) Personnel using buses shall line up at the pick-up point and fill each bus as it pulls up to the pick-up point.

4.3.8.4 Proceed to the offsite reassembly area and take direction from the Evacuation Team Leader.

4.3.8.5 Remain at the offsite reassembly area until cleared to leave by the Radiation Monitoring Team.

4.3.9 Offsite Reassembly Areas and Evacuation Routes

NOTE

At no time shall buses or personal vehicles block the fire station next to the Palo Verde Inn. A clear path shall be kept open for the emergency vehicles located at the station.

NOTE

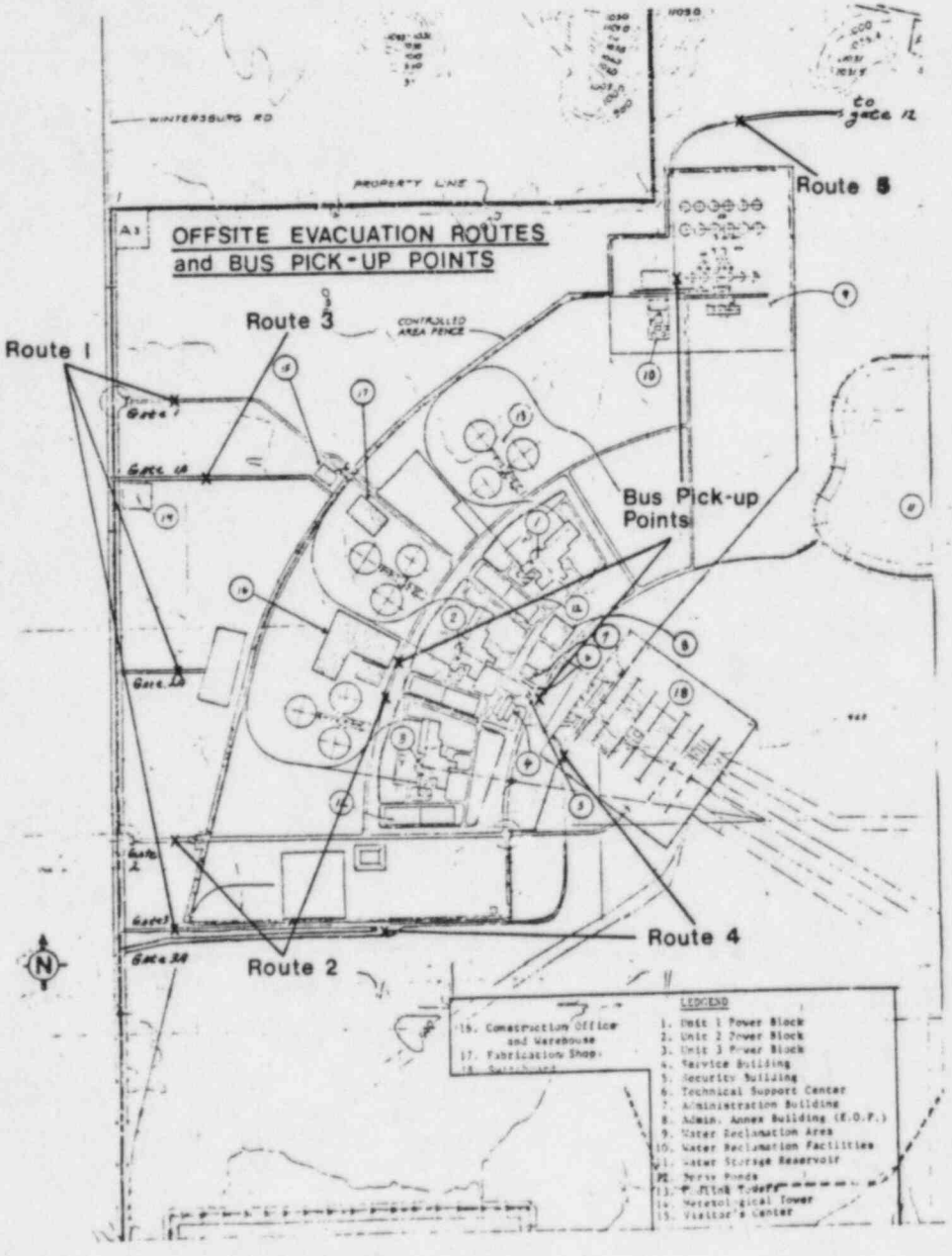
No personnel may be allowed inside the Palo Verde Inn without approval of the Evacuation Team Leader.

4.3.9.1 The primary offsite reassembly area shall be Palo Verde Inn. Personal vehicles shall be directed into parking lots around the Palo Verde Inn. Buses shall be unloaded outside the parking lot. Personnel shall remain at their vehicles or where they are unloaded.

4.3.9.2 The alternate offsite assembly area shall be the Hassayampa Pump Station. This should be used only if meteorological conditions require an alternate to the Palo Verde Inn. The Evacuation Team Leader shall assign assembly locations upon arrival.

4.3.9.3 Appendix B contains the evacuation routes to the two areas.

PVNGS EMERGENCY PLAN IMPLEMENTING PROCEDURE	PROCEDURE NO. EPIP-19	APPENDIX A Page 1 of 1
ONSITE EVACUATION	REVISION 3	Page 12 of 19



OFFSITE REASSEMBLY AREAS AND EVACUATION ROUTES

Directions to Primary Offsite
Reassembly Area (Palo Verde Inn)

Primary Route

(1) Exit Plant Site and proceed North on Wintersburg Road to intersection of Wintersburg Road and Buckeye - Salome Highway.

(2) At the intersection turn left.

(3) Follow Buckeye - Salome Highway (West) to turn-off to Tonopah (411th Ave.).

(4) At turn-off, turn right (North) and proceed to the Palo Verde Inn.

Alternate Route

(1) Exit Plant Site and proceed north on Wintersburg Road to Interstate 10 (I-10).

(2) Turn left onto I-10 (West).

(3) Follow I-10 to the Tonopah Exit.

(4) Turn left off of I-10 onto 411th Ave.

(5) Follow 411th Ave to the Palo Verde Inn.

OFFSITE REASSEMBLY AREAS AND EVACUATION ROUTES

Direction to the Alternate Offsite Reassembly Area (Hassayampa Pump Station)

Primary Route

(1) Exit Plant Site and Proceed south on Wintersburg Road to the intersection of Wintersburg Road and Elliot Road.

(2) At the intersection turn left (East) onto Elliot Road and proceed to 355th Avenue.

(3) At 355th Avenue, turn left (North) onto 355th and proceed to Dobbins Road.

(4) At Dobbins Road turn right (East) onto Dobbins and proceed to 351st Avenue.

(5) At 351st Avenue turn left (North) and proceed to the Buckeye - Salome Highway.

(6) At the Buckeye - Salome Highway turn right (East) and proceed to the intersection of Buckeye - Salome Highway and Baseline Road.

(7) At Baseline Road, turn left (angle turn) and follow Baseline to Johnson Road.

(8) At Johnson Road turn right (South) onto Johnson and proceed to Lower River Road.

(9) At Lower River Road turn right (West) and proceed to the pump station.

Alternate Route

(1) Exit Plant Site and proceed South on Wintersburg Road to Elliot Road.

(2) At Elliot Road turn left (East) and proceed to 355th Avenue.

(3) At 355th Avenue turn left (North) and go to Dobbins Road.

(4) At Dobbins Road turn right (East) and proceed to the Buckeye Salome Highway.

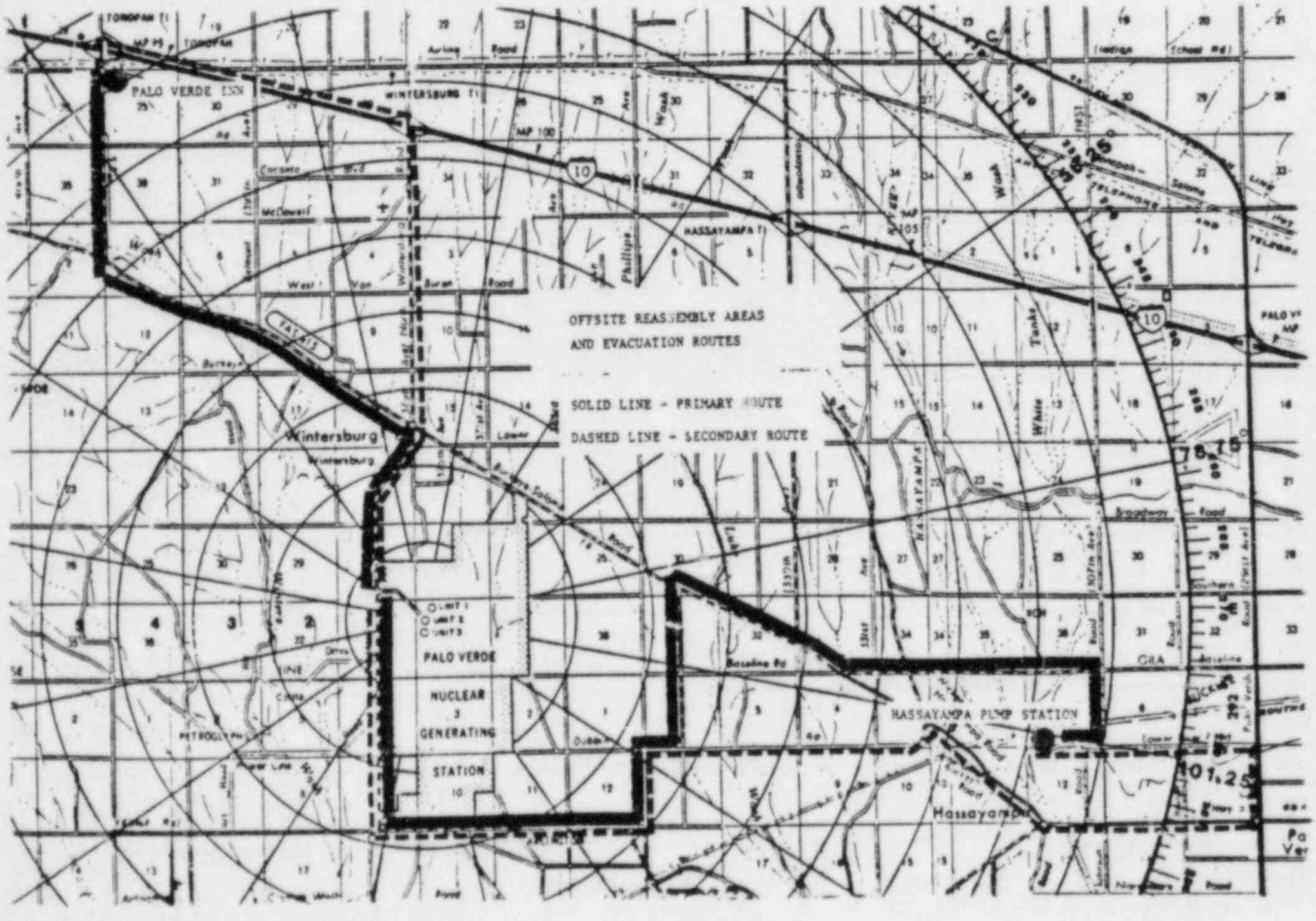
Alternate Route (continued)

(5) At the Buckeye - Salome Highway turn right and proceed to Old Highway 80.

(6) At Old Highway 80 Turn left (East) and proceed to Palo Verde Road.

(7) At the Palo Verde Road turn left (North) and go to Lower River Road.

(8) At the Lower River Road turn left (West) and proceed to the pump station.



OFFSITE REASSEMBLY AREA
RADIATION MONITORING TEAM
CHECKLIST

POSITION FILLED BY: Radiation Protection Technicians

RESPONSIBILITIES: Perform monitoring and decontamination of evacuated personnel as necessary at the offsite reassembly area.

IMMEDIATE ACTIONS	TIME/INITIALS
1. Receive initial briefing from Radiological Protection Coordinator.	____/____
2. Obtain the "Emergency Evacuation Decontamination Kit" from the Security Desk of Annex Building, or obtain the necessary monitoring and decontamination supplies from the Radiation Protection Office per EPIP-28, "Personnel Monitoring and Decontamination". (Use OSC, TSC, EOF Emergency Kits if Radiation Protection Office is not accessible.)	____/____
3. Arrange for a vehicle for transport to the offsite reassembly area.	____/____
4. Proceed directly to offsite reassembly area (see Appendix B) and establish a monitoring control point.	____/____
SUBSEQUENT ACTIONS	
5. Monitor and clear all evacuated personnel and vehicles.	____/____
6. Establish decontamination area and decontaminate per EPIP-28, if necessary.	____/____
7. Obtain names and addresses of evacuees suspected of having received a dose in excess of 250 mrem or those requiring any decontamination before release.	____/____
8. Periodically inform by telephone (or Evacuation Team Leader radio) the Radiological Protection Coordinator of the progress of monitoring and decontamination.	____/____

Performed By: _____ Date _____
Signature

PERSONNEL MONITORING LIST

Person Monitored	Social Security Number	Monitor Reading	Disposition

EVACUATION TEAM LEADER
CHECK LIST

POSITION FILLED BY: Security Force Member

RESPONSIBILITIES: Lead the evacuating group to the offsite reassembly area, exercise control at the area, report status to Security Director.

IMMEDIATE ACTIONS	TIME/INITIALS
1. Receive initial briefing from the Security Director.	____/____
2. Obtain Security vehicle and portable radio and transport Security Team to Bechtel Gate No. 1.	____/____
3. Upon sounding of the evacuation signal, lead the evacuating vehicles to the offsite reassembly area (see Appendix B).	____/____

SUBSEQUENT ACTIONS

4. Direct arriving groups to appropriate assembly points at the offsite reassembly area.	____/____

NOTE

At the Palo Verde Inn, personal vehicles shall be directed into parking lots around the Inn. Buses shall unload outside the parking lot. Personnel shall remain at their vehicle or where they unload. At the Hassayampa Pump Station, the Evacuation Team Leader shall assign assembly locations on arrival.

5. Brief arriving Assembly Area Supervisors to provide you with assistance.	____/____
6. Assist the Radiation Monitoring Team with logistics, as appropriate.	____/____
7. Assure that no individual or vehicle leaves the reassembly area until cleared by the Radiation Monitoring Team.	____/____

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EVACUATION TEAM LEADER
CHECK LIST

SUBSEQUENT ACTIONS (Cont'd) TIME/INITIALS

8. Periodically inform the Security Director as to progress using telephone or portable radio. ____/____

Performed By: _____
Signature

_____
Date

PVNGS EMERGENCY PLAN IMPLEMENTING PROCEDURE	PROCEDURE NO. EPIP-23	
FIRE FIGHTING	REVISION 3	Page 1 of 7

ASSIGNED COPY

PVNGS # 8.9B

DEPT. HEAD Dennis D. Shaw DATE 4/22/85

PRB/PRG/TRRG REVIEW L. E. Thayer DATE 5/8/85

APPROVED BY L. E. Thayer DATE 5/9/85

EFFECTIVE DATE ~~05-10-85~~ 05 17 85 T-Y 5/10/85

DN-1671A/0196A

PV216-00DA (8/82)

PVNGS EMERGENCY PLAN IMPLEMENTING PROCEDURE	PROCEDURE NO. EPIP-23	
FIRE FIGHTING	REVISION 3	Page 2 of 7

REVISION HISTORY

Rev. No.	Date	Revised Pages	Comments
3	06.10.86	4, 6	Updated references and provided correct references in text of procedure

PVNGS EMERGENCY PLAN IMPLEMENTING PROCEDURE	PROCEDURE NO. EPIP-23	
FIRE FIGHTING	REVISION 3	Page 3 of 7

TABLE OF CONTENTS

SECTION		PAGE NUMBER
1.0	OBJECTIVE	3
2.0	REFERENCES	3
3.0	LIMITATIONS AND PRECAUTIONS	4
4.0	DETAILED PROCEDURE	4
4.1	Personnel Indoctrination/Responsibilities	4
4.2	Prerequisites	4
4.3	Instructions	4

1.0 OBJECTIVE

1.1 This procedure details actions necessary for the efficient, orderly, and expedient treatment of a fire at PVNGS that cannot be controlled by the PVNGS Fire Team.

2.0 REFERENCES

2.1 Implementing References

2.1.1 EPIP-02, "Emergency Classification"

2.1.2 EPIP-18, "Emergency Exposure Guidelines"

2.1.3 EPIP-24, "Security"

2.1.4 14AC-0ZZ02, "Fire Emergency Notification and Response"

2.1.5 PVNGS Prefire Strategies

2.1.6 EPIP-03, "NOTIFICATION OF UNUSUAL EVENT IMPLEMENTING ACTIONS" 3

2.1.7 EPIP-04, "ALERT Implementing Actions"

2.1.8 EPIP-05, "SITE AREA EMERGENCY Implementing Actions"

2.1.9 EPIP-06, "GENERAL EMERGENCY Implementing Actions"

2.2 Developmental References

2.2.1 NUREG 0654, Rev. 1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants"

2.2.2 NUREG 0696, "Functional Criteria for Emergency Response Facilities", February 1981

2.2.3 PVNGS Emergency Plan, Rev. 5 3

2.2.4 NFPA 1975 Code Pamphlet 27

2.2.5 83TR-0ZZ07, "Fire Team Training", Rev. 1

2.2.6 75AC-9ZZ01, "Radiation Exposure Authorization, Permits and Control", Rev. 2 3.

CONTROLLED DOCUMENT

2.2.7 10CFR20, "Standards for Protection Against Radiation", 1983.

3.0 LIMITATIONS AND PRECAUTIONS

3.1 As this procedure deals with the handling of emergency situations it is intended to be used as a guide. The actual conditions at the station may alter emergency and subsequent actions.

3.2 The Radiological Protection Coordinator may authorize exposures in excess of PVNGS Administrative Radiation Exposure Limits up to the Limits of 10CFR20. Exposures in excess of 10CFR20 Limits up to Emergency Exposure Limits of EPIP-18, "Emergency Exposure Guidelines" shall be authorized by the Emergency Coordinator. Exposures in excess of Emergency Exposure Limits shall not be authorized.

4.0 DETAILED PROCEDURE

4.1 Personnel Indoctrination/Resonsibilities

4.1.1 The Emergency Coordinator has overall responsibility for implementation of this procedure.

4.1.2 When the Bechtel Fire Department or alternate offsite Fire Department assistance has been summoned, the PVNGS Fire Team Leader shall retain his leadership role at the fire scene.

4.2 Prerequisites

4.2.1 A fire is in progress and is being fought per 14AC-OZZ02, "Fire Emergency Notification and Response".

4.2.2 An incident has occurred which has been classified per the provisions of EPIP-02, "Emergency Classification".

4.3 Instructions

4.3.1 At the scene of the fire:

4.3.1.1 Upon determining that fire cannot be rapidly extinguished by the PVNGS Fire Team, the Fire Team Leader shall go to the nearest phone and notify the Control Room of the following:

(1) Nature and extent of fire,
(2) Location,
(3) Recommendation for outside assistance,
(4) Description of special requirements (i.e., precautions and equipment needs).

4.3.2 Control Room

4.3.2.1 Upon receipt of information of a significant fire onsite, the Shift Supervisor shall call the Security Shift Captain (Security Director), using normal phone Line (ext. [redacted], and notify him of the following:

(1) Nature and extent of fire,
(2) Location,
(3) Request for support from the Bechtel Fire Department, or other Offsite Department,
(4) Special Requirements (i.e., precautions and equipment needs).

4.3.2.2 The Shift Supervisor or Emergency Coordinator shall refer to EPIP-02 and classify/reclassify the emergency as indicated.

4.3.2.3 Subsequent emergency actions shall be taken per EPIP-03, "NOTIFICATION OF UNUSUAL EVENT Implementing Actions", EPIP-04, "ALERT Implementing Actions" EPIP-05, "SITE AREA EMERGENCY Implementing Action", EPIP-06, "GENERAL EMERGENCY Implementing Actions". 3

4.3.2.4 The Emergency Coordinator shall ensure the Hazards Control Coordinator is kept informed of the situation.

4.3.3 Security Director

4.3.3.1 At the direction of the Emergency Coordinator, the Security Director shall contact the Bechtel Fire Department or alternate offsite Fire Department, and provide the following information:

(1) Nature and extent of fire,
(2) Location,
(3) Special precautions, if required.
(4) Special equipment required.

4.3.3.2 The Security Director shall inform the security force that offsite fire fighting assistance is expected and designate personnel to issue dosimetry and escort the offsite fire department personnel and equipment to the scene of the fire in accordance with EPIP-24, "Security".

4.3.4 Radiological Protection Coordinator

4.3.4.1 Upon notification by the Emergency Coordinator, the Radiological Protection Coordinator shall dispatch a monitoring team to the scene of the fire if required to assist with radiological aspects of the emergency.

4.3.4.2 The monitoring team shall collect dosimetry issued to the Offiste Fire Department members prior to their release from the site.

4.3.4.3 The monitoring team shall survey all personnel and equipment prior to their release from the site following termination of the emergency.

4.3.4.4 The monitoring team shall supervise any decontamination evolutions that are required prior to release of offsite personnel or equipment.

4.3.5 When the fire has been extinguished:

4.3.5.1 Fire Team Leader shall inform the Shift Supervisor and Emergency Coordinator.

4.3.5.2 The Shift Supervisor shall have an announcement made over the PA system regarding termination of the fire.

4.3.5.3 The Emergency Coordinator shall release members of the offsite fire department after completion of any required radiological monitoring and/or decontamination.

PVNGS EMERGENCY PLAN IMPLEMENTING PROCEDURE	PROCEDURE NO. EPIP-31	
RECOVERY	REVISION 3	Page 1 of 12

DEPT. HEAD Dennis D. Ware DATE 4/2/85

PRB/PRG/TRRG REVIEW [signature] DATE 4/10/85

APPROVED BY [signature] DATE 4/10/85

EFFECTIVE DATE 04-10-85

DN-1667A/0196A

PV216 00DA (8/82)

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REVISION HISTORY

Rev. No.	Date	Revised Pages	Comments
3	~~4/1/85~~ 04-16-85	all	Revised procedure to reflect lessons learned from emergency exercises and drills. Also added new Recovery Manager checklist.

TABLE OF CONTENTS

SECTION		PAGE NUMBER
1.0	OBJECTIVE	4
2.0	REFERENCES	4
3.0	LIMITATIONS AND PRECAUTIONS	4
4.0	DETAILED PROCEDURE	5
4.1	Personnel Indoctrination/Responsibilities	5
4.2	Prerequisites	5
4.3	Instructions	5

APPENDIX

Appendix A -	Post-Emergency Recovery Organization Palo Verde Nuclear Generating Station (PVNGS)	9
Appendix B -	Recovery Manager Checklist	10

1.0 OBJECTIVE

1.1 This procedure prescribes those recovery operations necessary to identify the extent of station damage and radiological contamination (if any) and return the station to an operating status which is in compliance with the unit(s) technical specifications.

2.0 REFERENCES

2.1 Implementing References

2.1.1 78AC-0ZZ06, "Document and Record Turnover Control"

2.2 Developmental References

2.2.1 NUREG-0654, Rev. 1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants".

2.2.2 PVNGS Emergency Plan, Rev. 5

2.2.3 ANSI N45.2.9-1974, "Requirements for Collection, Storage, and Maintenance of Quality Assurance Records for Nuclear Power Plants"

3.0 LIMITATIONS AND PRECAUTIONS

3.1 Exposure to personnel should be kept As Low As Reasonably Achievable consistent with the nature of the recovery operation required.

3.2 Recovery operations may begin when the unit is in a controlled and stable condition. No action shall be taken which might disturb this situation without the express approval of the Recovery Manager.

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4.0 DETAILED PROCEDURE

4.1 Personnel Indoctrination/Responsibilities

4.1.1 Recovery operations for PVNGS are conducted in two phases. Phase I efforts involve recovery measures undertaken during and immediately following the emergency. These measures are a functional responsibility of the emergency organization and may be augmented by corporate and short-term contract support. Phase II recovery operations include the longer term post-emergency efforts that follow a major incident. These operations are performed by station and other ANPP personnel, contract experts and specialists, and qualified engineers - contractors under the direction of the Recovery Organization.

4.1.2 The Emergency Operations Director, with the advice of the Emergency Coordinator, is responsible for implementing this procedure.

4.2 Prerequisites

4.2.1 Radiation levels are stable or decreasing with time.

4.2.2 Releases of radioactive materials to the environment have ceased or are controlled within permissible license limits.

4.2.3 Fire or other similar emergency conditions no longer constitute a hazard to the unit or unit personnel.

4.2.4 Measures have been successfully instituted to correct or compensate for malfunctioning equipment.

4.3 Instructions

4.3.1 Upon recognition that the prerequisites (Section 4.2) have been established, the Emergency Operations Director shall establish the Recovery Organization as depicted in Appendix A and complete the checklist located in Appendix B, "Recovery Manager's Checklist".

4.3.2 The Emergency Operations Director shall assume the duties and responsibilities of the Recovery Manager and notify, via NAN, affected offsite emergency management organizations and the NRC that recovery operations are in progress.

4.3.3 For known or suspected significant unit damage, and at the discretion of the Recovery Manager, survey teams may be formed consisting of Operations, Engineering, Maintenance, and Radiation Protection personnel.

4.3.4 These teams shall perform an organized survey of the unit to ascertain the extent of physical damage and areas of contamination/high radiation.

4.3.5 The results of these surveys should be used by the Recovery Manager, the Station Operations Manager (PVNGS Plant Manager or designated alternate), and Radcon/Radwaste Manager (Radiation Services Manager or designated alternate) in planning the approach to be utilized in repairing and bringing the unit back into operation.

4.4 Planning

4.4.1 Under the direction of the Recovery Manager, pertinent recovery organization members, as well as selected offsite personnel, shall address the planning and coordination of the recovery effort.

4.4.2 Such activities as the repair and maintenance of existing station system/components, modification, installation, and decontamination, as well as determining the need for portable shielding and special procedures, shall be discussed, prioritized, and planned.

4.4.3 The Planning/Scheduling Manager (Manager, Scheduling or designated alternate) shall develop an overall schedule to guide the recovery effort.

4.5 Recovery Implementation

4.5.1 Upon definition of the problems to be faced, finalization of the overall recovery plan, development of any special procedures, and allocation of adequate repair equipment and properly trained personnel, actual recovery operations shall begin.

4.5.2 In lieu of any special requirements in place at the time, normal unit practices shall be followed concerning maintenance, repair, modification, decontamination, and personnel exposure control.

4.5.3 The Recovery Manager (Assistant Vice-President, Nuclear Production or designated alternate) shall have overall corporate responsibility for restoring the station to normal operating configuration.

4.5.4 The Radcon/Radwaste Manager (Radiation Services Manager or designated alternate) shall, in addition to developing plans to process and control liquid, gaseous, and solid wastes, periodically estimate total population dose in conjunction with state and federal authorities. He shall also coordinate activities of staff Radiological Engineers and Radiation Protection personnel involved in Radwaste.

4.5.5 The Station Operations Manager (PVNGS Plant Manager or designated alternate) manages day-to-day inplant operations and during recovery is responsible for ensuring that repairs and modifications shall optimize post-recovery plant operational effectiveness and safety.

4.5.6 The Design and Construction Support Manager (Nuclear Construction Manager or designated alternate), focuses necessary engineering, design, and construction resources on those aspects of plant recovery requiring redesign, modification, or new construction and directs and coordinates NSSS and balance-of-plant engineering and construction/repair work.

4.5.7 The Technical Support Manager (Manager Technical Support or designated alternate) shall provide analysis, plans, schedules, and procedures in direct support of plant operations.

4.5.8 The Quality Assurance Manager (Manager Corporate Quality Assurance or designated alternate) shall insure that the overall conduct of recovery operations is performed in accordance with corporate policy and rules and regulations governing activities which may affect public health and safety.

4.5.9 The Administrative/Logistics Manager (Manager Administrative Services or designated alternate) shall supply administrative, logistic, communications, and personnel support for the recovery operation.

4.5.10 The Manager, ANPP Communications or designated alternate shall coordinate the flow of information to the media concerning recovery operations.

4.5.11 As the recovery operation proceeds, any unforeseen problems which are encountered shall be evaluated and factored into the overall recovery plan. The schedule should be adjusted accordingly.

4.5.12 Upon completion of the recovery effort, Technical Specifications compliance shall be verified prior to beginning normal unit operations.

4.5.13 Each individual in the Recovery Organization upon completion of the recovery effort shall submit checklists or other written documentation to the Recovery Manager who ensures they are forwarded to Emergency Planning and Preparedness Department for storage in accordance with 78AC-0ZZ06, "Document and Record Turnover Control".

4.6 Training

4.6.1 In consideration of the situation to be handled, special training material should be developed and training conducted for special work tasks to the maximum extent possible.

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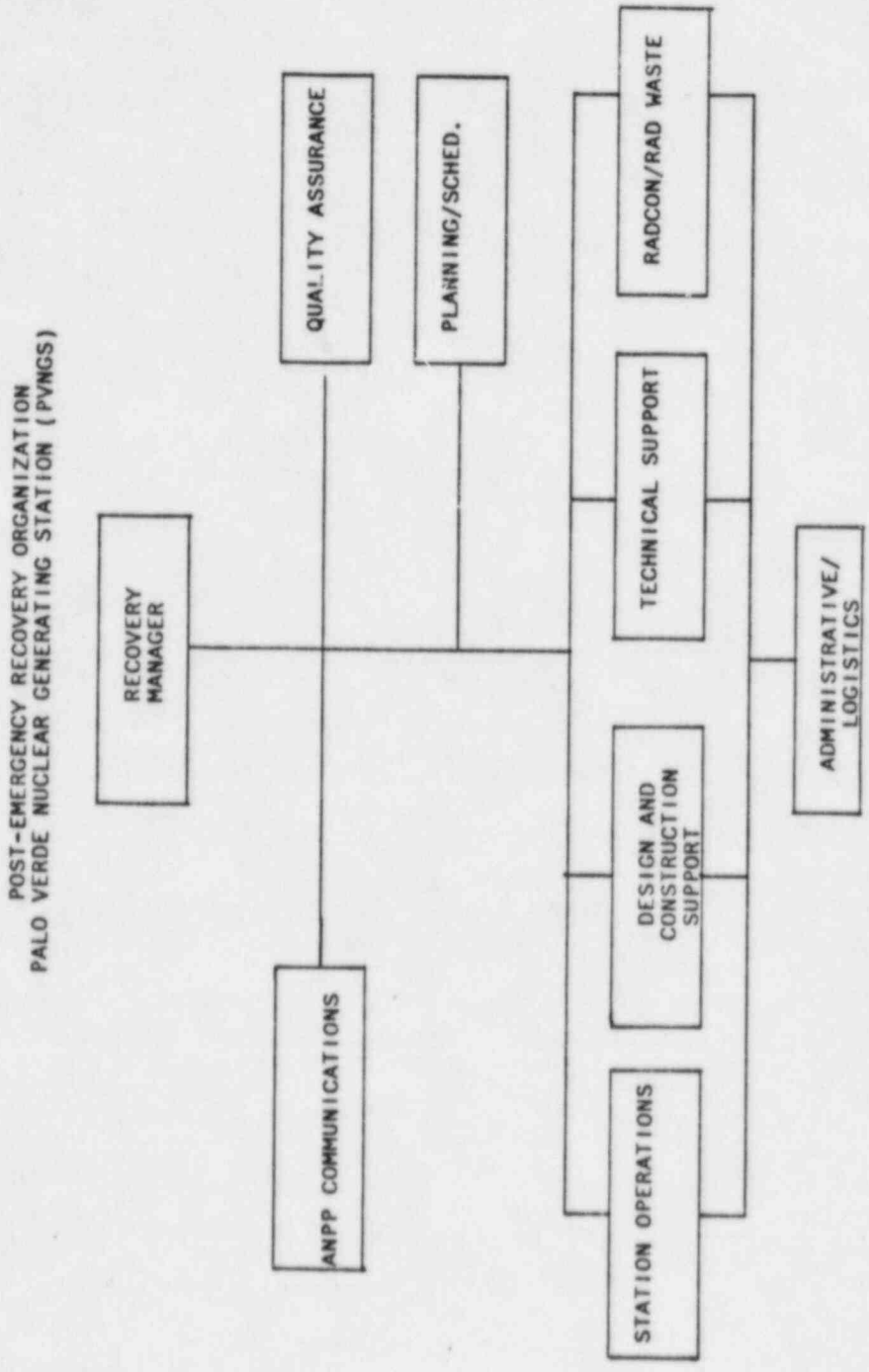

PV216 00DA (8/82)

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RECOVERY MANAGER CHECKLIST

Position Filled By: Assistant Vice-President, Nuclear Production or designated alternate.

Responsibilities: The Recovery Manager shall have overall corporate responsibility for restoring the station to normal operating configuration.

ACTIONS: Time/Initials

1. EOD evaluate plant conditions. _____/_____

2. If plant conditions meet prerequisites for recovery in EPIP-31, the EOD should:

   (1) Request the Recovery Organization meet in the EOF.

   (The Recovery Manager may assign personnel to the Recovery Organization based on available individuals from management levels of appropriate departments.)

   - Station Operations Manager _____/_____
   - Design and Construction Manager _____/_____
   - Radcon/Radwaste Manager _____/_____
   - Technical Support Manager _____/_____
   - Administrative and Logistics Manager _____/_____
   - Planning and Scheduling Manager _____/_____
   - Manager, ANPP Communications _____/_____
   - QA Manager _____/_____
   - NRC _____/_____

   (2) Direct Government Liaison Engineer to inform offsite facilities over the NAN of current plant conditions. _____/_____

   (3) Direct EOF Contact to inform JENC and CHIC of current plant conditions. _____/_____

RECOVERY MANAGER CHECKLIST

(4) Direct Technical Analysis Coordinator, or other member of EOF staff, to inform CEC of current plant conditions. ____/____

(5) Inform Recovery Organization and NRC representatives that the prerequisites for downgrading have been met. Ask NRC if they concur that we move from a classified emergency to Recovery Operations. ____/____

(6) Indicate that:

- Plant conditions are stable. ____/____
- Release terminated or within operating license limits. ____/____
- Preliminary surveys of the Unit completed. ____/____
- Radiation levels decreasing or stable. ____/____
- Radiation Protection will authorize re-entry. ____/____

Check-off Item

3. If the NRC concurs "downgrade" to Recovery Operation:

(1) EOD or alternate call State TOC and indicate downgrading to Recovery. ____/____

(2) Inform the CHIC/JENC of Recovery. Instruct CHIC to coordinate final news briefing at JENC and facilitate transfer of press operations to the Forward News Center and/or CHIC as appropriate. ____/____

(3) Call each facility and inform them that they are requested to remain in their facility until specifically directed back to their normal work location or Recovery assignment. ____/____

4. Recovery implementation meeting

(1) Assessment of current status (Unit condition). ____/____

(2) Assess personnel exposures and need for additional decontamination. ____/____

(3) Areas contaminated; access with protective gear, or no access. ____/____

3

RECOVERY MANAGER CHECKLIST

(4) Assessment of hardware. ____/____

(5) Plan to achieve cold shutdown. ____/____

(6) Plan to recover buildings or areas. ____/____

(7) Need for offsite support. ____/____

(8) Plan to record/document event details. ____/____

(9) Plan to produce information for public, media, employees, and other audiences. ____/____

(10) Plan for logistical support. ____/____

(11) Accounting for the costs and preliminary estimates to owners. ____/____

(12) NRC involvement and interfaces. ____/____

(13) Assign work groups, tasks and staffing. ____/____

5. Completion of Recovery effort.

(1) Request all members of the Recovery Organization to submit all documents to the Recovery Manager for forwarding to the Emergency Planning and Preparedness Department. ____/____

Performed By: _____/_____
Signature Date