

U. S. NUCLEAR REGULATORY COMMISSION

REGION V

Report No. 50-528/83-14

Docket No. 50-528

License No. CPPR-141

Licensee: Arizona Public Service Company  
P. O. Box 21666  
Phoenix, Arizona 85836

Facility Name: Palo Verde Nuclear Generating Station - Unit 1

Inspection at: Palo Verde Site - Wintersburg, Arizona

Inspection conducted: April 11 thru May 12, 1983

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Inspection Summary:

Inspections during April 11 - May 12, 1983 (Report No. 50-528/83-14)

Areas Inspected: Announced preoperational inspection of the emergency preparedness program, including administration of emergency preparedness, emergency organization, training and retraining, facilities and equipment, emergency plan implementing procedures, coordination with offsite groups, drills and exercises, and emergency preparedness exercise and associated critiques. These two inspections involved 608 hours of onsite time by the 12 inspectors and observers.

Results: No items of noncompliance or deviations were identified. A total of 34 items were identified as "Open" because additional actions are required to reach full implementation of the program. These "Open" items existed in seven (7) of the eight (8) inspection areas. No "Open" items were found during the emergency preparedness exercise and associated critiques.



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## DETAILS

### 1.0 Administration of Emergency Preparedness

The administration of the Arizona Public Service Company (APS or applicant) emergency preparedness program was reviewed with respect to the requirements of 10 CFR 50.47(b)(1) and (16) and 10 CFR 50, Appendix E, Paragraphs IV.A and G; and the criteria contained in NUREG-0654, Section II.A and P.

The inspector reviewed Sections 4.0 and 8.0 of the Palo Verde Nuclear Generating Station Emergency Plan (EP) concerning organization and control, and discussed administration of the overall emergency preparedness program with applicant representatives. According to the EP, APS has designated the Vice President, Electric Operations as the individual with overall responsibility and authority for emergency response planning. The Vice President, Electric Operations reports to the Executive Vice President. According to the EP, the Corporate Health Physicist and Emergency Planner has the collateral duty of Emergency Planning Coordinator. Section 8.13 of the EP generally describes the responsibilities of the Corporate Health Physicist and Emergency Planner and the Onsite Emergency Planning Coordinator (EPC) with regard to offsite and onsite emergency planning activities, respectively.

During the appraisal, the inspector was informed of a recent (February 1983) organizational change at the corporate level in which an Emergency Planning Task Force was established with an Emergency Planning Director as the head. The Emergency Planning Director reports directly to the Executive Vice President. The task force has eight corporate management personnel assigned with authority and responsibilities in the area of public information; training; emergency planning; legislative and governmental affairs; and finance, accounting, risk management and power operations. The Corporate Health Physicist and Emergency Planner is the Emergency Planner on the task force. The task force also interfaces and coordinates with Federal, State, and County agencies, consultants and APS construction and operation departments. During meetings with the Director of Emergency Planning and the Executive Vice President, the inspector was informed that the current task force whose charter is scheduled to expire after the May 11, 1983 joint emergency exercise, will be replaced with a permanent APS Corporate Emergency Planning and Preparedness Group consisting of an Emergency Planning and Preparedness Director, Emergency Planning Coordinator - Offsite Support, Emergency Planning Coordinator - Onsite Support (Lead person plus three others), Emergency Response Training Administrator, Emergency Preparedness Health Physicist and a secretary. The Director of this group will report to the Executive Vice President or the Vice President, Electric Operations. The applicant committed to have this group staffed by June 15, 1983. The applicant was informed that the upgraded emergency planning program should be reflected in the EP and that a revision be made thereto. The applicant committed to submit a description of the current task force and the permanent group by June 15, 1983, and confirm this commitment in Rev. 3 to the EP, currently scheduled for September 1983. Other proposed commitments made by the applicant in the areas of: 1) training, 2) equipment, 3) support organization agreements, 4) procedure changes for

drills and exercises, 5) action item tracking system, and 6) site action items were discussed at the entrance meeting on April 11, 1983. The applicant intends to furnish these commitments in writing.

The present onsite EPC was appointed to that position on August 27, 1982, and on March 23, 1983, a position reassignment was made in which the onsite EPC was to report directly to the Manager, Nuclear Operations until completion of the May 11, 1983 joint emergency exercise. The manager of Nuclear Operations (i.e., plant manager), who has the responsibility for safe and efficient operation of the Palo Verde Nuclear Generating Station (PVNGS), assumes the position of Emergency Coordinator (EC) during an emergency condition. The inspector asked about the reassignment of the onsite EPC after the May exercise. The Manager of Nuclear Operations indicated that the onsite EPC would probably be assigned to the Technical Support Department, reporting to the Technical Support Manager. Although the onsite EPC is not a member of the Plant Review Board (PRB), he would have input to safety meetings through the RPC Manager who is a member of the PRB.

The position descriptions for the personnel in the proposed Corporate Emergency Planning and Preparedness Group were not available; however, a description of this group included the responsibilities of each individual and the overall mission of the group. The APS position description (undated) for the position of Lead Site Emergency Planner (onsite EPC) was reviewed by the inspector. The description included the responsibilities of the onsite EPC and the make-up of the emergency planning group, and specifies that the onsite EPC reports to the Radiation Protection Supervisor. It was noted that this line of authority is not consistent with the current organization nor the proposed change for the onsite EPC scheduled to occur at the conclusion of the May exercise. The onsite EPC appears to be receiving management support. Due to the nature of his work and the need to work with many different groups within the applicant's organization, this individual appears to be receiving high visibility.

The inspector discussed professional development training for emergency planning personnel with the applicant. At the corporate level this has not been addressed. The onsite EPC has attended a one week seminar on emergency planning and preparedness and has observed emergency exercises at other commercial nuclear power plants. In addition, the onsite EPC has attended the workshop on ERF appraisals and the quarterly meeting of the Western Regional Mutual Assistance Groups. A program for professional development training of onsite emergency planners has not been developed. The onsite emergency planning group is currently undergoing reorganization. One member is scheduled to attend a one-week training course on emergency planning.

A program exists for the review, revision and distribution of the EP and Emergency Plan Implementing Procedures (EPIPs), and amendments thereto. The Corporate Emergency Response Program has been incorporated as Appendix H to the EP. The APS Corporate Nuclear Emergency Program is reviewed and approved by the office of the President of APS. The Executive Vice President has reinforced the company policy of giving nuclear safety the highest priority. APS Policy No. 726B states that,

"Any employee in the nuclear organization who does not feel that a safety concern is being adequately addressed, has the responsibility to go directly to any officer of the company."

Section 8.2 of the EP specifies that there will be an annual review and updating of the EP, with special attention given to the station-government agencies interfaces and maintaining effective channels of communication. An a quarterly frequency telephone numbers on notification lists, as well as confirming the individuals to be contacted, are to be checked. Section 8.2 also requires an independent audit of the various aspects of the emergency preparedness program on an annual basis. Emergency Plan Implementing Procedure (EPIP)-35, requires that an audit be performed by competent individuals, either from within APS or from an outside consulting firm, who are not immediately responsible for the emergency preparedness program. Audit results are to be presented to the Vice President, Electric Operations as well as appropriate station and APS management. Cognizant State and county officials will be informed of comments affecting their organizations. To date three such audits have been performed to assist in establishing the required emergency preparedness program.

Nuclear Operations Support Department Procedure 14.01 and EPIP-35 address the requirements for the issuance of and the revisions to the EP. Procedure 14.01, which is general and brief, assigns the responsibility for issuance and control of copies of the EP to the Corporate Health Physicist and Emergency Planner. EPIP-35 states that revisions to or updates of the EP are to be handled in accordance with (site) Procedure 10 AC-0ZZ02 (see Section 5.1 concerning 10 AC-0ZZ02). Interviews disclosed that the responsibility for controlling the issuance of the EP and revisions thereto had been transferred to the APS Drawing and Document Control (DDC) which as located at the site. The review of records showed that (1) 23 persons had not acknowledged receipt of Revision 2 to the EP and required follow-up action had not been taken, (2) the controlled copy of the EP issued to the previous Manager of Nuclear Operations was out of date and (3) the list of persons with controlled copies of the EP was more extensive than expected based on the NRC requirements and participating organizations in the EP.

#### 1.1 Conclusions: Administration of Emergency Preparedness

Based on the above findings no significant deficiencies were identified in this portion of the program. However, the following three items were considered to be open due to a lack of specific information.

- a. The staffing of the Corporate Emergency Planning and Preparedness group had not be finalized and positions filled. (83-14-01)
- b. The staffing and organizational position of the onsite emergency planning group had not been determined. (83-14-02)
- c. A training program had not been developed for all emergency planners. (83-14-03)

## 2.0 Emergency Organization

The emergency organization was reviewed with respect to the requirements of 10 CFR 47(b)(1) and (2); 10 CFR 50, Appendix E, Paragraph IV.A; and the criteria in NUREG-0654, Section II.A and B.

### 2.1 Onsite Organization

The inspector reviewed Section 4 of the EP and discussed the onsite organization with the applicant. An initial onshift and an augmented emergency response organization have been established by the applicant and are discussed in the EP. Figures 4.1-2 and 4.2-1 of the EP show the normal shift organization and Onshift Emergency Organization, respectively. The Onsite Emergency Organization is depicted in Figure 4.2-2 of the EP and includes personnel assigned to the Control Room/Satellite Technical Support Center (Satellite TSC), TSC, Operations Support Center (OSC) and Service Building. During the appraisal, the inspector was informed that organizational changes had been made in the Onshift Emergency Organization and that other changes in the normal station organization were being considered. The most significant change was the replacement of the Duty Manager by the Shift Supervisor of the unaffected unit as Emergency Coordinator (EC) at PVNGS. The EC is the individual in charge of the Onsite Emergency Organization. This change was discussed with the applicant with regard to the current organizational status of Unit 1 as well as the time when Unit 2 would be licensed. The inspector discussed the EP revision that would be needed to reflect the current emergency organization. The applicant committed to submit the description of the current Onshift Emergency Organization by June 15, 1982, and to confirm this description in Rev. 3 to the EP, currently scheduled for September 1983. The inspector discussed the roles of and interfaces between the onsite and offsite organizations with key members of the Onsite Emergency Organization. The inspector interviewed the Radiation Protection Supervisor, Chemistry Supervisor, Manager - Nuclear Operations, Maintenance Superintendent, Administrative Services Manager, Radiological Engineer III, Engineering Manager, Security Manager, Instrument and Control Foreman, and Radiation Protection Technicians. These individuals fill key positions in the Onshift and Onsite Emergency Organizations.

The discussions with these members of the Onsite Emergency Organization indicate that they have an understanding of the general functional areas in which they would be expected to perform. The inspection effort included evaluation of the response of Shift Supervisors (S/S) to postulated emergency situations. Interviews were conducted with six (6) Unit One S/S and two (2) Unit Two S/S in as much as the latter S/S are designated to relieve the affected Unit S/S (one) as Emergency Coordinator in the event of activation of the on-site Emergency Organization. Evaluation was based on the interviewee's facility in use of the Emergency Plan and EPIP's. Five of six Unit One and both of the Unit Two Shift Supervisors demonstrated adequate knowledge to permit them to perform effectively in the Emergency Organization. One person would not be

an effective addition at his current level of knowledge and ability to use the references. As an example of inadequate knowledge, one S/S was unable to classify a set of initiating conditions dealing with fuel failure from a deteriorating set of initial conditions for approximately seventeen (17) minutes.

Neither the EP nor EPIPs identify, down to the working level, the names of the individuals that would be assigned to the various emergency teams. These teams are discussed in Section 4 of the EP; general instructions are provided in EPIP-12, "Operations Support Center Activation," Rev. 1. The inspector noted that onshift HP technicians may be assigned to several of the emergency teams - firm team, search and rescue team, emergency repair team, first aid team, onsite survey team, and offsite survey team - and discussed the need to reassign personnel, other than HP technicians, to some of the emergency teams or to prioritize the use of HP technicians in the event reassignment was not feasible. The applicant has identified this problem and is working to resolve the matter.

## 2.2 Augmentation Organization

Section 4 of the EP describes the Offsite Emergency Organization and Figure 4.2-3 illustrates the key members of this group. The Offsite Emergency Organization operates the EOF and, except for the Emergency Operations Director and Administrative and Logistics Coordinator, is staffed by APS personnel assigned to the plant staff. The inspector reviewed the EPIPs related to activation of the EOF, TSC and OSC, and interviewed key members of the Offsite Emergency Organization. These included the Vice President - Nuclear Operations, Radiation Protection and Chemistry Manager, Operations Support Supervisor, Radiation Protection Technician, Shift Technical Advisor/Independent Safety Engineering Group Supervisor, Security Specialist and Senior Startup Liaison Engineer. The discussions indicated that these members of the Offsite Emergency Organization has an understanding of the general functional areas in which they would be expected to perform. All members of the Onsite and Offsite Emergency Organization that were interviewed were familiar with the EPIPs related to their emergency duties, the location of their assigned job, the individual(s) to whom they reported and communicated with, their alternates and their response times following notification of an emergency.

Appendix H to the EP describes the Corporate Emergency Response Program and Section 4 generally describes the responsibilities of the key members. Figure 2.2-1 of Appendix H illustrates the Corporate Emergency Organization and Figure 4.2-4 of the EP shows the interface between the Corporate and Offsite Emergency Organizations. At the corporate level, the inspector interviewed the Executive Vice President, Corporate Health Physicist and Emergency Planner and Manager - Nuclear Operations Support. The discussions held with the above members of the Corporate Emergency Organization indicated that emergency plan training had been completed and that they were familiar with their roles in an emergency. The inspector reviewed the Corporate Emergency Center (CEC), including draft

procedures, communications, and status boards. The CEC is functional, but not yet fully completed. Plans call for installation of Emergency Response Facilities Data and Display System (ERFDADS) and Chemical and Radiological Assessment Computer (CRAC) terminals. In addition, the CEC procedures have not been submitted for NRC review.

The augmentation times for the Onsite and Offsite Emergency Organizations were discussed with the applicant. Section 4.2.3 and 4.2.4 of the EP state that the TSC and EOF, respectively, will be activated and rapidly staffed according to goals established in NUREG-0654, Table B-1. However, EPIP-11 and -13 specify full functional operation of the TSC and EOF, respectively, as soon as possible (generally within 90 minutes). Although the applicant had previously studied the response times of various individuals on the emergency organizations, there has been no call-out drill or recent study to determine the augmentation capability of key personnel that would be required for effective operation of the TSC and EOF. Additionally, the applicant has not attempted to review the capability of other onshift personnel to fulfill 30 minutes responder functions (on an interim basis). From discussions with 16 key personnel assigned to the TSC and EOF, the inspector determined that the response time, after notification, for all personnel fell into two groups - 30 minutes and 45 minutes, with a few exceptions. The applicant's EP and EIPs are not consistent regarding augmentation times and the applicant has not proposed an acceptable alternative method for meeting the acceptance criteria of NUREG-0654, Table B-1.

### 2.3 Conclusions: Emergency Organization

Based on the above findings no significant deficiencies were identified in the portion of the program. However, the following four (4) items are considered to be open because additional action is required to reach full implementation of the program.

- a. The present EP and augmentation capability is not consistent with Table B-1 of NUREG-0654 and no acceptable alternative has been provided. (83-14-04)
- b. The assignment of the HP technicians to the various emergency teams is greater than the number of technicians available at the Operations Support Center. (83-14-05)
- c. The CEC implementing procedures had not been submitted to the NRC as required by Section V of Appendix E to 10 CFR Part 50. (83-14-06)
- d. The installation of equipment in the CEC had not been completed. (83-14-07)

### 3.0 Training

#### 3.1 Program

The following documents and files pertaining to the applicant's emergency plan training program were reviewed by the inspector PVNGS Emergency Plan Rev. 2, Section 8.0 and figure 8.1-1; EPIP-36 "Emergency Preparedness Training" Rev. 0; Station Procedure 80 PR-0ZZ01 "Training Program;" Training Matricies for Onsite, Corporate, and Public Information Emergency Personnel; Training Records and Course Attendance Sheets for Station Emergency Personnel; Draft Corporate Document "Emergency Response Training Program for the Palo Verde Nuclear Generating Station" Rev.0; All onsite emergency preparedness lesson plans and lessons; All corporate self-study training modules and associated corporate emergency procedures (CPIPs); Instructor qualification and certification records. Interviews were held with the Site Training Manager, Corporate Emergency Preparedness Training Coordinator, Manager of Public Information, Director of Communications, Corporate Radiological Engineer, Site General Training Supervisor, Project Director for Seville Technologies Inc.; and the Corporate Health Physicist regarding portions of the Emergency Plan Training Program for which they had responsibility. Interviews with various personnel assigned to each functional area were conducted.

The overall APS Emergency Response Training Program consists of four major elements PVNGS, offsite (Non-APS), Corporate and Public Information and media. The responsibility for the initial training and retraining in the program areas is separated into several departments/division of the applicant's organization. The PVNGS Training Manager is responsible for the training of personnel at PVNGS. The Interim Emergency Response Training Coordinator is responsible for coordinating the training of corporate individuals, offsite agencies and contract support. Training of Public Information personnel and the media is the responsibility of the APS Director of Communications and Energy Management.

An overview of the applicant's Emergency Preparedness Training Program is contained in the Emergency Plan, EPIP-36 Rev. 1 and Draft Corporate document "Emergency Response Training Program for the Palo Verde Nuclear Generating Station," these documents contain numerous inconsistencies and need to be reviewed and brought in line with each other and with actual program implementation. At this time none of the four major program elements have a formally approved and documented retraining program. As per the emergency plan and procedures the applicant has committed to providing Emergency Preparedness annual training and retraining to the appropriate elements of the site, corporate, offsite support, news media, state and local emergency response agencies. The major program elements have not established provisions or procedures to train members of the emergency organization in changes to the plan, procedures or equipment.

### 3.2 PVNGS Training

The site training department has identified PVNGS personnel, and their alternates who are to be included in the PVNGS emergency preparedness training. The training needs of these personnel have been assessed and training courses have been designed and created to meet these needs. From this information a training matrix has been created to match personnel with required training and to track training accomplishment and the need for retraining. At this time the list of personnel identified as needing training and the training matrix is not part of any station procedure or listed in any station program description. The training matrix attached to EPIP-36 is inconsistent with the matrix used to track training. The number and designation of the training categories is consistent with the number and designation of the functional areas of emergency activity, with the exception that no training course has yet been created to address post accident sampling and analysis. The courses consist of formal lesson plans, student handouts, and exams. The lesson plans contain clearly stated performance objectives which are used to provide a basis for the course exam. The record keeping system is designed as designated in 80 PR-OZZ01 and maintains the appropriate training related information. The program is periodically audited by a training department auditor and by the QA department in accordance with Quality Audit procedure 60 AC-OZZ04. The training program consists of lecture type classroom instruction, however, at this time there has been no effort to incorporate hands-on training in the use of emergency related equipment. Although the training courses have been approved and signed off, they do not as yet meet all of the criteria set forth in procedure 80 PR-OZZ01 "Training Program" (e.g., sections 4.7.1 and 5.1). The training offered for individuals assigned to licensee first aid teams is the Medic First Aid course which the auditor was told was evaluated by the applicant as being equivalent to or better than the Red Cross Multi-media Course. All individuals completing the course earn a certificate in CPR. The course content for certain key individuals (e.g., STSC, TSC, EOF directors) needs to be reviewed against the criteria outlined in the Emergency Plan Section 8.1.1.2, in relation to "Cross-subject" training, effects of meteorology on radioactive plumes, protective action decision making and its relation to plant conditions, etc.

### 3.3 Offsite Training

A training matrix has been generated for offsite organizations and some training has been conducted. The list of organizations to be trained contained in the draft corporate letter does not cover all organizations who could be called upon to provide support service during an emergency. Many of these organizations are listed in EPIP-36, Section 4.3.3.1. All letters of agreement need to be reviewed to determine which service organizations should be provided training. At this time a completed training program with lesson plans, objectives performance criteria, etc. is not in existence. The records for off-site training are maintained at APS headquarters

and do not appear to be included in a periodic audit of all emergency response plan training.

### 3.4 Program Implementation

At this time only a portion of the overall Emergency Preparedness Training Program has been completed, approved and implemented. Training matrices and records indicate that a large portion of the initial training has been performed. This was confirmed by interviews with emergency response personnel. Interviews confirmed that the lack of hands-on training has contributed to a lack of knowledge about the use of some emergency related equipment (e.g., ND-6, XTEX alarming dosimeter). Comments by some personnel indicate a wish for some practical and hands-on type training.

### 3.5 Conclusions: Emergency Plan Training and Retraining

Based on the above findings, no significant deficiencies were identified in this portion of the program. However, the following six items are considered open due to a lack of information necessary to reach a conclusion on the adequacy of the items.

- a. The EP Training and Retraining Program covering all elements of the emergency response organization and related offsite support has not been documented and approved. (83-14-08)
- b. The qualifications for the EP training instructors had not been established. (83-14-09)
- c. The offsite and corporate training programs did not include provisions for evaluating and documenting student performance. (83-14-10)
- d. A course for training personnel in the use of the post-accident sampling system had not been established. (83-14-11)
- e. Hands-on training had not be incorporated into the courses. (83-14-12)
- f. The EP training had not been completed. (83-14-13)

In addition to the above findings, the following items should be considered for improving the program.

1. An integrated record keeping system should be established for all EP training. (83-14-35)
2. A method should be establish for identifying when a special training effort should be made for changes to the EP, EPIP and emergency equipment. (83-14-36)
3. Site EP training courses should be consistent with the criteria in 80PR-0ZZ01. (83-14-37)

4. The EP, EPIP-36 and draft corporate EP training document should be reviewed for the purpose of removing inconsistencies among the three documents. (83-14-38)
5. Training for fire team members should include specific techniques for fighting fires at nuclear facilities. (83-14-39)
6. The APS nurse should be included in the training matrices. (83-14-40)

#### 4.0 Emergency Facilities and Equipment

##### 4.1 Emergency Facilities

##### 4.1.1 Assessment Facilities

##### 4.1.1.1 Control Room (CR)

The CR, located in the Control Building 140 foot level, is designed to be habitable during Design Basis Accidents. In addition to the Radiation Exposure and Management (REM) terminal, terminals capable of accessing SPDS and QSPDS data sets (Emergency Response Facility Data Acquisition and Display System, ERFDADS) are available. Some data is available only on the ERFDADS CRT, e.g., the meteorological data set of wind speed, direction and temperatures. Plant drawings, the Emergency Plan and its Implementing Procedures, and one Radiological Emergency kit are currently in place in the area of the CR. The CR is provided with two consoles that ensure adequate primary and backup communications capability for use in an emergency.

##### 4.1.1.2 Technical Support Center (TSC) and Satellite Technical Support Center (STSC)

The applicant has two "TSC's." The STSC, manned upon notification of any EP classified event is located immediately adjacent to the CR. STSC staffing provides environmental assessment, technical analysis, field monitoring team direction, initial notifications, and emergency management by the EC, who reports from duties as the Shift Supervisor in the "designated, unaffected Unit." Upon activation of the Emergency Organization upon Alert, the above functions transfer to the EOF and TSC.

Communication equipment required to be at the STSC is in place, but operability is

questionable because equipment is not available/not on-line (e.g., the NAN telephone is on the floor and unmarked with the standard circuit diagram; no writing area is currently provided for some personnel that will be stationed in STSC). No status boards, maps, etc. are provided in STSC.

The TSC is located below grade with adequate shielding and designed ventilation to ensure habitability during Design Basis Accidents (DBA). Physically located east of and opposite Unit 2, the TSC is approximately 500 yards from the Unit 1 Control Room. Alert EAL activates the TSC, and places an emergency organization in operation in the TSC which is normally administrative engineering spaces. Ample space is provided for personnel, and required communication systems are in place. Two FTS lines to the NRC office space remain to be installed to fulfill the function of the HPN line. Utilization of the space and allocation and arrangement of the spaces is being modified as the license applicant learns from various drills and exercises currently being conducted. At the present time, numerous status boards are located on the walls of a large, central "core" area requiring the various coordinators to revolve around the core to view all boards. Critical electrical systems (e.g., computer equipment) are powered from an Uninterruptable Power Supply (UPS, battery to static inverter) initially on loss of AC normal power. A manual start diesel generator is provided to supply emergency power. During the inspection and walk-through of these systems, the inspector noted the original design, radiator expansion tank for the emergency diesel to be "adrift" in the cage housing the radiator and its fan. A very small appearing expansion tank has been apparently "jury-rigged" to serve the function. No walk-through verifications of the adequacy of the RMS system for either the TSC or the Emergency Operations Facility (EOF) could be performed in-as-much-as only the three (3) channel analyzer ( $I_2$ , noble gas, particulate) is installed. Annunciator location, monitoring responsibilities, procedures, etc. are not available at present and will be prepared as the system is turned over to the applicant.

#### 4.1.1.3 Operations Support Center (OSC)

The OSC is located in the lunchroom of each unit's Auxiliary Building, proximate to the Unit's Radiation Protection Area. The area is currently used as a tag-out control area with many files, cabinets, and counters that would prevent its use for the stated purpose in the Emergency Organization. To provide necessary communication links, appropriate telephone lines have been installed, however, their wall-mounting with no appropriate writing space will be inefficient to their intended use. At the present time, a "radiological emergency kit" is the only equipment staged at the OSC. Many other items are required by the EP.

In the event the primary OSC becomes uninhabitable, the Service Building, located approximately 300 yards east of Unit 2 will become the alternate OSC on orders of the EC. Communications capability is limited relative to the normal OSC, and only a radiological emergency kit is pre-staged. It is noted that the Service Building is a fully-capable machine shop.

#### 4.1.1.4 Emergency Operations Facility (EOF)

The license applicant's EOF is located below grade in the Administration Annex Building, several hundred yards southeast of Unit 1. The EOF has adequate shielding and designed ventilation to ensure habitability during DBA's. The EOF is activated and manned upon Alert or more severe EAL, and becomes the focal point for coordination of onsite and offsite emergency response activities. Adequate space is available for the utility, offsite, and NRC emergency personnel to perform their functions; temporary sleeping quarters and emergency News Center (ENC) located 8 miles northwest of PVNGS at the Palo Verde Inn in Tonopah. Limited media use above the EOF is available for the Press Pool.

The EOF is equipped with color CRT's to permit access to SPOS parameters for any of the three units. NRC Regulatory Guide 1.97, Rev. 2 parameters are accessible, along with numerous records management systems, RE and M System, and each unit's Radiation Monitoring System (RMS). Many systems such as ERFDADS and CRACS (Chemistry and Radiological Analysis Computer System) are relied on heavily in the Emergency Organization to provide Unit information and

perform various calculations such as dose assessment, but the systems are not on line, and in some cases may not be on-line for a long time period. Interim calculational aids such as an Osborne portable computer are available to perform EPIP-14A and 14B, but not reflected in the EP. The Osborne is now the primary method of calculation, and manual is the backup.

Installation of a RMS, three channel system (particulate,  $I_2$ , Noble Gas) is currently in process. No verifications were possible on this system to ensure its ability to perform its intended function.

Radiological emergency kits are staged in the EOF to provide minimal emergency protective capability. A document room is immediately adjacent to the Emergency Command Center (ECC) and provides capability for storage of NUREG-0696, paragraph 4.9 records; some records are not currently available due to other limitations. Most conceivable status and assignment boards are posted, and site-maps with sector locations, environmental sampling locations, and appropriate isopleths are available in the ECC. Station meteorology must be accessed through a computer terminal. All necessary communication links are provided; backup power or redundant links are available to communication as well as the various computer terminals.

The EP provides for an alternate EOF at the Palo Verde Inn, Tonopah. It's location is 8 miles NW of PVNGS and is to be used when the site EOF is inaccessible. A dedicated phone circuit (PBX) is available to PVNGS, but no other facility for communication or "portable backup equipment...for continuity of dose projection and decision making capability" per Table 1, Supplement 1, NUREG-0737 is in place. Alternate EOF activation, staffing, and use is not addressed in current EPIP's.

#### 4.1.1.5 Post-Accident Coolant Sampling and Analysis

The inspection included an examination of the facilities and available equipment to be used in post-accident sampling of primary coolant and discussions of related procedures. A special system (PASS) has been designed and will be installed for accomplishing post-accident sampling activities. At the time of the

inspection the installation of the PASS was in the initial phase; however, the applicant had not yet received all of the PASS equipment.

The PASS provides a capability for sampling the primary coolant as well as liquids and gases at other locations in the facility. The PASS has been described in Amendment 1 to the PVNGS Lessons Learned Implementation Report (tendered April 6, 1981) that was submitted to the NRC as an attachment to an August 3, 1981 letter (see page II.B.3-1 of the amendment). Section 9.3.2 of the PVNGS Final Safety Analysis Report also discusses post-accident sampling. The inspection disclosed the following differences in PASS from that description contained in the above identified reference: (a) the PASS will be used for hydrogen analysis of samples, (b) a multi-channel analyzer, using two collimated intrinsic Ge detectors, and a computer for spectral stripping will be used for isotopic analysis of PASS samples, (c) the boron, dissolved oxygen and gaseous oxygen analysis detectors will require manual calibration, (d) a gross gamma detector will control the alignment of the collimators associated with the Ge detectors, and (e) operation of PASS, including the valve sequencing controller, is governed by the chemical and Radiological Analysis Computer System (CRACS) or by manual actions of an operator. PASS is not provided with a backup source of power for emergency situations.

The physical layout and equipment installed at the time of the inspection were examined. The PASS does not provide a capability for diluting the samples to be radio analyzed. It appears that the dead-time of the PASS counting equipment analyzing an undiluted primary coolant sample with 10 curies per milliliter of activity (potential maximum concentration) may be of the order of 80-90 percent which would be considered excessive. The examination also disclosed that the PASS liquid sample pump was located "upstream" of the Ge detectors which could cause distorted results if contamination collects on the pump and is subsequently transferred to the liquid being sampled. An area radiation monitor is located about 20 feet from PASS.

The PASS operating and calibration procedures were found to be incomplete due to the present status of the system. Also, procedures for the operation of CRACS had not been developed.

#### 4.1.1.6 Post-Accident Containment Air Sampling and Analysis

The PASS provides a capability to sample and analyze the post-accident containment atmosphere. The containment atmosphere process monitor includes a grab sample capability; however, valves will isolate the monitor when containment pressure is 2 psig or higher. Section 4.1.1.5 of this report discusses PASS and the differences found from the description provided in Amendment 1 to the PVNGS Lessons Learned Implementation Report.

The examination of the PASS disclosed several items that might affect the representativeness of the gaseous (air) samples. The one-half inch (1/2") sample lines were connected directly to the one-fourth inch (1/4") PASS routing and dilution lines without a gradual reduction. Sample line pipe bends had radii greater than 2.5 times the inside diameter of the pipe; however, there were "T" pipe junctions with no radii of curvature in both the sample lines and the PASS routing and dilution lines. The sample lines were not heat traced to assure the iodine would not plate out. Section 4.2 of ANSI Standard N13.1-1969 discusses the subject of representative samples. It was also noted that the PASS gaseous sample pump was located "upstream" of the Ge detectors which could cause distorted results if contamination collects on the pump is subsequently transferred to the gas being sampled. The problem related to counting samples with large amounts of activity (up to the potential maximum of 0.1 curies per milliliter), that was discussed in Section 4.1.1.5, also applies to gaseous samples.

Two additional items were covered during the examination of the post-accident containment air sampling capability. Presently there are no provisions to provide shielding for grab samples that need to be transported to and stored in the laboratory facilities. The PASS operating and calibration procedures for the gaseous samples were also incomplete.

#### 4.1.1.7 Post-Accident Effluent Sampling and Analysis

The licensee has identified the following gaseous discharge locations as sites for post-accident effluent sampling; plant vent

stack, which includes ventilation exhausts from the auxiliary and radwaste buildings and the containment purge exhaust; fuel building ventilation vent; turbine building ventilators; exhaust stack for the condenser air removal and turbine gland sealing systems. The effluent radiological monitors, including extended range instruments to satisfy Item II.F.1 of NUREG-0737, and routine sampling of effluents will also be used for post-accident sampling of effluents.

At the time of the inspection the effluent monitoring instrumentation was in the early stages of installation. Because this instrumentation is still being installed the related procedures for operation, calibration and sampling have not yet been prepared.

There are no liquid effluents released from the plant. Liquids not retained in the plant are deposited in a lined evaporation pond on the site. The applicant said that grab samples would be taken and analyzed to determine the activity in the pond or being sent to the pond.

#### 4.1.1.8 Offsite Laboratory Support

Arizona State University provides the offsite, backup laboratory capability for the applicant. This arrangement is covered by a written agreement. The agreement does address the financial aspects of this program, including the providing of a multi-channel analyzer system for sample analysis. The examination of the University facility disclosed it provided shielding for handling the samples. The method and equipment for moving the samples to the facility had not been finalized. Equipment for handling and analyzing the samples had not been received. Procedures for accomplishing the various tasks had not been prepared. It had not been determined whether the applicant's personnel could use these facilities if none of the authorized University personnel were available.

#### 4.1.2 Protective Facilities

##### 4.1.2.1 Assembly/Reassembly Areas

The applicant has identified fourteen assembly areas for protected area and construction personnel as illustrated in EPIP - 20 "Personnel

Assembly and Accountability" Appendix E. Four alternate outdoor assembly areas are designated to be used in the event of a bomb threat. EPIP - 19 "Onsite Evacuation" designates the Palo Verde Inn as the primary offsite reassembly area with the Hassayampa Pump Station as an alternate. The administration Annex Building Cafeteria or the Visitor's Center is designated as the assembly area for non-essential protected area personnel, it is not clearly stated which is to be the primary and which the backup. All assembly areas viewed appeared to be adequate in size and location for their intended purposes. The emergency equipment, supplies and protective clothing stored in or near some assembly areas is described in EPIP - 38 "Emergency Equipment and Supplies Inventory" and PVNGS Emergency Plan Section 10 Appendix E.

#### 4.1.2.2 Medical Treatment Facilities

The applicant has established two first aid facilities and will establish an additional first aid room in each of the three Auxiliary Buildings. The primary first aid facility is in the Administration Building. A first aid station has also been established at the onsite Water Reclamation Facilities. The first aid rooms in the Auxiliary Buildings of the individual plants are located next to the access control point on the 140 foot level. The applicant's first aid facilities are presently supported by the onsite Bechtel first aid facilities.

The primary first aid facility is supplied with equipment and materials normally found in an industrial site with a Registered Nurse. Supplies are adequate for treatment of minor injuries - lacerations, avulsions, burns and fractures. There is also a spirometer, used in connection with a medical evaluation for the approval to use respiratory protective equipment, and a hearing test booth. This facility has a standard EKG unit as well as a "Lifepack" that consists of an EKG capability, defibrillator and radio for communication with a hospital/doctor. The equipment includes an examining table, resuscitator and breathing oxygen. A fully equipped ambulance is located just outside the Administration Building. According to the applicant consideration is being given to providing a supply of controlled

substances for burns, cardiac and possibly pain treatment in the primary first aid facility.

First aid supplies have been placed at the Water Reclamation Facilities. These supplies include a burn kit, breathing oxygen, resuscitator, first aid kit, various splints and other first initial response supplies for minor injuries and lacerations. Prior to loading fuel the first aid room in the Unit 1 Auxiliary Building will be equiped in a manner similar to the Water Reclamation Facilities; however, the applicant is still deciding what equipment to place in this room.

The above facilities are presently supported by the onsite first aid capability provided by Bechtel. In addition to the basic first aid station, there is a special trailer onsite to support a five day per week doctor and staff. The special trailer provides patient examining rooms, an x-ray unit, eye treatment equipment and a small laboratory. Bechtel maintains two fully equiped ambulances onsite. These Bechtel first aid facilities will remain until the late stages of the Unit 3 construction.

#### 4.1.2.3 Decontamination Facilities

The primary decontamination facilities are located near the Health Physics offices and access control point on the 140 feet level. The first aid room will also be located in this area. This area consists of a west decon room and an east decon room both containing shower areas and sinks, the drains in this area feed into the rad-waste system. Within the power block another decon facility consisting of shower areas and sinks is located outside the containment air lock at the 140 feet elevation.

Additional decontamination capability exists at the TSC and EOF. Both the TSC and EOF have sinks and showers that could be used for decontamination purposes. EPIP-28 "Personnel Monitoring and Decontamination contains procedures for establishing decontamination stations in the field.

At this time none of the decon facilities within the power block are complete and functional, nor are any of the decontamination areas completely stocked with decontamination supplies. The list of supplies contained in EPIP-38 "Emergency

Equipment and Supplies Inventory" does not indicate the quantity of each item nor does it specifically indicate where supplies are to be stored (e.g., TSC, EOF, West decon room, etc.)

#### 4.1.3 Other Facilities

##### 4.1.3.1 News Center

The applicant has established three information center to be used during various stages of an emergency. During an emergency classified as an "unusual event" the Corporate Headquarters Information Center (CHIC), located on the third floor of the APS headquarters building, serves as the news center. For more severe emergencies the Joint Emergency News Center (JENC) is used. The third location, called a forward facility, may be used to provide the media with an opportunity to take pictures of the facility. The JENC is the location where APS, the State and County jointly provide the media with information concerning the emergency. The JENC is on the Papago Military Reservation which is also the location of the State and County EOC's. The building which is adequate for about 200 media people, is divided into two work areas, one for the media personnel and one for the Public Information Officers from the various involved organizations. The equipment to be used in the JENC is stored in a large, locked container box next to the rear of the building.

The JENC has been provided with appropriate communications equipment. There are two dedicated ringdown lines that connect the CHIC and the EOF with the JENC as well as the CHIC with the JENC. Two unlisted dial circuits provide the State EOC and the County EOC respectively with a capability to contact the JENC. Six telephone numbers on rotary provide the media with an opportunity to contact the JENC for information. Four telephone lines have been reserved for Federal use. There is a telecopier capability between the JENC and the State EOC and the CHIC and JENC are connected into the two telecopier circuits at PVNGS. There is word processor circuit that connects the CHIC to the JENC. Finally, there are about 15 telephones in the area of the JENC assigned to the media personnel. The location of the JENC allows the media to transmit directly to a relay facility.

The utility will provide additional support to the JENC. Information packets will be available for distribution to the media personnel. The utility's audio visual and graphics capability will also provide needed support to the JENC. The moderator of the press briefings is normally an APS employee. The utility will also provide a spokesperson capable of discussing the technical aspects of the emergency. One of the co-directors of JENC is from APS.

#### 4.1.3.2 Expanded Support Facilities

PVNGS emergency operations are intended to be enhanced and expedited through the Corporate Emergency Center (CEC), located at APS headquarters offices, Phoenix. Senior executive personnel man the CEC upon site area or General Emergency, and have authority to commit corporate resources to extent necessary to cope with emergency situation. Necessary communication links with PVNGS, including facsimile machines, and various references are available at CEC.

#### 4.1.4 Conclusions: Emergency Facilities

Based on the above findings, no significant deficiencies were identified in this portion of the program. However, the following six items are considered open due to lack of information necessary to reach a conclusion on the adequacy of the items.

- a. The Control Room, TSC, OSC and EOF had not been completed and the required equipment had not been completely installed. (83-14-14)
- b. The post-accident sampling systems had not been installed. (83-14-15)
- c. The emergency effluent sampling equipment, which is also the normal effluent monitoring equipment, had not been installed. (83-14-16)
- d. The offsite, backup laboratory had not been fully equipped and licensed and appropriate procedures had not been prepared. (83-14-17)
- e. The assembly areas had not been clearly marked. (83-14-18)
- f. The decontamination areas had not been stocked with appropriate supplies and made operational. (83-14-19)

## 4.2 Emergency Equipment

### 4.2.1 Assessment

#### 4.2.1.1 Emergency Kits and Emergency Survey Instrumentation

The inspectors examined the kits and emergency survey instrumentation that are prepositioned for use by emergency response personnel. The applicant has prepositioned supplies and survey instruments in the OSC, TSC, EOF, CR, Service Building (alternate OSC), Emergency Vehicle, Maryvale Samaritan Hospital, and the Security Building. EPIP-38 specifies that the Radiation Protection Supervisor will be responsible for conducting a quarterly inventory of emergency equipment and supplies. The Radiation Protection Section will be responsible for calibration and calibration record keeping for radiation survey instruments (Calibrations are currently being performed by a vendor).

The kits specified in the procedure were located as designated and would be readily available. Each kit is provided with a breakaway lock, however, no seal system is provided to ensure kit integrity between inventories. Each kit contained an inventory list taken from EPIP-38 Rev. 1. The kits did not contain the supplies indicated due either to lack of equipment or the use of the kits during a recent exercise. The inspectors were informed that not all equipment and supplies had been received and placed in the kits and supply locations.

In addition, not all inventory lists in EPIP-38 designate quantities of supplies to be located in some area (e.g., First Aid Room). The emergency plan states (Section 8.3) that quarterly inspections of equipment and supplies will take place and calibrations will be in accordance with Technical Specifications. Radiation Protection Technicians and plant staff demonstrated an awareness of kit and supply locations.

Instruments in the kits were spot checked for operability and calibration and were found to be calibrated and in working order. Equipment to be used for survey has the capability for detection of beta and gamma radiation fields. An ND-6 with a 2"x2" NaI crystal will be used in the field and has the capability for detecting airborne radioiodine concentrations of at least  $1\text{E}-7$  uCi/cc and airborne particulate activity of  $1\text{E}-09$  uCi/cc (Cs-137 equivalent). It had yet to be decided what, if any, shielding would be provided for the NaI crystal, this

will have an effect on the detection efficiency in areas of high background. The applicant has not been able to perform extensive field tests on the ND-6 system to determine the effects of adverse field conditions.

Rade Co. samplers are provided in the emergency kits with AgZ cartridges for detecting radioiodine in the presence of noble gases. Typical instrumentation located in the emergency kits includes Eberline mod. E-520, Ludlum 14C and Ludlum mod. 177 meters. Extensible probe instruments are available from the HP office and I&C calibration shop. Two XETEX 415A alarming dosimeters were located in the kits, however, no other personnel self-reading dosimeters were provided.

#### 4.2.1.2 Area and Process Radiation Monitors

The applicants area and process monitoring system is described in the PVNGS FSAR Section 11.5 and in the PVNGS Emergency Plan Section 7, Table 7.3-1. The overall system consists of the Process Monitoring System, the Effluent Monitoring System and the Area Monitoring System. All monitor readouts are accessible in the Control Room on both CRT displays and meters. The auditor was informed that at this time only two monitors in the entire system were operable and calibrated, these were Ru-19 and 31 in the fuel building. The rest of the system was in various stages of installation and testing. A spot check of the monitors and sensors found the installed units to be of the type and in the locations specified in the FSAR.

#### 4.2.1.3 Non-Radiation Process Monitors

Non-radiation process monitors described in the EP and EIPs as being relied upon for emergency detection, classification and assessment are in various stages of installation, testing and calibration. All monitor readouts are located in the CR and will be readily observable when operational.

#### 4.2.1.4 Meteorological Instrumentation

The basis for the inspector's review of the applicant's meteorological program included the criteria set forth in Regulatory Guides 1.23, 1.97 and 1.101, and NUREG's-0696 and -0737.

The applicant outlined the characteristics of their meteorological measurements system in Emergency Plan Section 7.3.1.1. The integration of meteorological

into the applicant's dose projection scheme is briefly summarized in Section 7.3.1.10 of the plan and manual dose assessment is implemented using Emergency Plan Implementing Procedure EPIP-14B. The inspector also reviewed the applicant's meteorological instrumentation and its associated maintenance program with the applicant.

The meteorological instrumentation provided the basic parameters (i.e., wind direction and speed, and an estimation of atmospheric stability) necessary to perform the dose assessment function. Data in the form of 15-minute averages from the meteorological measurements system are planned to be interrogable from the control room and to be displayed via CRT. A printer is planned to be available in the satellite TSC to provide hard copies of current and past data. Strip chart records for the meteorological measurements were located in the instrument shelter near the meteorological tower.

A procedure for meteorological system calibration, including outputs, every  $92 \pm 23$  days has been established in Station Manual Procedure No. 36 MT-9RG02 and is being implemented. A procedure for weekly checks of the meteorological system at the tower has been established in Station Manual Procedure No. 36 MT-9RG01 and is being implemented.

The siting and exposure of the meteorological instrumentation on the tower meets the criteria in Regulatory Guide 1.23. A passive notification system for the control room had not been established for severe weather conditions affecting or likely to affect the site. A source of meteorological data, other than from the meteorology tower, has not been planned.

Since the radiological dose assessment procedure (Emergency Plan Implementing Procedure EPIP-14B) involved the use of data from the meteorological tower sensors and the data acquisition system, ERFDADS (SPDS), which is not installed, this capability could not be evaluated.

#### 4.2.2 Protective Equipment

##### 4.2.2.1 Respiratory Protection

The applicant is currently establishing a respiratory protection program. The presently possessed self contained breathing apparatus (SCBA) consist of Ranger ISI (30 minute compressed air), Biomarine Biopack (recirculation, oxygen enhanced 60 minute)

and Service Air (30 minute compressed air) units. The applicant presently possesses about 30 of these units. The applicant has requested bids on SCBA's with 60 minute use capabilities and is considering the use of only one type of unit rather than the current three. A breathing air bottling system is being purchase and will be installed onsite to provide the applicant with a SCBA bottle refilling capability. This breathing air bottling system includes a cascade manifold, regulators, particulate, charcoal and other filters and compressors. The applicant has made arrangements with a company in Phoenix and the Mesa Fire Department to provide for filling of SCBA bottles during an emergency.

The respiratory program also includes the use of other protective equipment. MSA full face respirators with particulate and particulate-activated charcoal cannisters have been purchased. Bubble hoods that use supplied air have also been obtained, however, the plant breathing air system required for these hoods is not scheduled to be installed until 1985. A supplied air system that can serve up to 15 supplied air masks, with a 15 minute reserve if power is lost, is to be ordered in the near future.

The applicant has purchased and received the necessary testing equipment. The personnel testing booth, which uses corn oil, is NIOSH approved. To date about 400 plant and company personnel have fit tested using the booth. The applicant also has purchased a NIOSH approved mask testing unit that uses hot 0.3 micron DOP for testing. A NIOSH approved unit for testing the cannisters has been purchased. Neither of these latter two testing units is operational at this time.

Procedures for the testing of respirator masks and cannisters and the emergency filling of SCBA bottles have not yet been prepared.

#### 4.2.2.2 Protective Clothing

The applicant is in the process of purchasing the necessary protective clothing. This clothing will include cotton coveralls, cotton hoods and surgical caps, rubber shoe covers, disposable plastic shoe covers, 14 inch butal rubber gloves, surgical rubber gloves and cotton glove liners. The quantities of each of these items has not yet been established, but supplies for the other two units will provide a backup source for Unit 1. The applicant also intends to keep addition supplies in the warehouse with

minimum-maximum control system to assure adequate quantities are always available.

The applicant intends to do their own laundering of the reuseable items. Operating procedures for the cleaning and care of the protective clothing have not been completed.

#### 4.2.3 Emergency Communication Equipment

The applicant has an elaborate communications capability that connects the control room with the ERF's and all required off-site organizations during an emergency. Section 7.0 of the EP describes location of the various circuits as a part of the discussion of the ERF's, and Section 7.2 discusses the Communication Systems in detail. Many multi-line phone systems dedicated to the onsite emergency communication network, unrelated to PVNGS PBX communications, are provided, e.g., Technical Line, Radiological Line, Environmental Assessment Line, Maintenance Control Line, and the EC/EOD Line. Battery-backed power is available for these systems. Procedures are in place for periodic testing of the telephone systems (EPIP-37A).

Numerous radio consoles are installed in the ERF's with multi-channel capability and battery-backed for redundant power capability. Included in this system is the APS Field Monitoring Radio System for controlling environment assessment by the appropriate Emergency Center. No attempt has been made or is planned to determine that all areas in the 10 mile EPZ can be covered by the mobile units. Testing in Unit 1 has indicated poor coverage in the lower levels of the Auxiliary Building and Radwaste areas. Enhanced transmitter capability expected to be on-line by August 1, 1983, should provide adequate coverage to these areas. Procedures are in place for periodic testing (EPIP-37A). Enhanced pocket pagers are currently being installed that will permit coverage for key members of the Emergency Organization 24 hours per day in areas between Phoenix (Corporate headquarters, residences) and the site.

Area and Unit Evacuation Alarms are provided with the meanings established to provide for assembly, for accountability, and for evacuation. No alarms are in place or have administrative procedures been established for meaning assignment of existing tones to provide for unit radiation or unit fire alarms. Some areas have been identified that may be high noise areas and thus require light-type alarm indicators to ensure operator awareness. The license applicant intends to continue to evaluate the need for light indicators as hot operational testing of equipment proceeds.

Notification systems for offsite agencies are in place or planned including the ENS system, FTS lines at appropriate locations for use as the "HPN" circuit, and the Notification Alert Nets (NAN) that provides the link between site EOF's and offsite agencies other than NRC. The NAN backup was established as the National Warning System (NAWAS), but recent directive has caused the applicant to have to withdraw use of NAWAS and provide for an additional channel on the radio-telephone consoles. Demonstration of this back-up to NAN has not been completed. Required routine testing of NAN is in place (EPIP-37A).

Private Branch Exchange (PBX) is the type of telephone service utilized normally at PVNGS. Because of switching equipment location and 8 hour redundant power capability, it is expected that the system will continue to function during emergencies as it does normally.

The off-site public warning system consists of 37 sirens installed within the ten (10) mile EPZ based on two (2) year old demographic data. Installation was predicted on fulfilling Appendix 3, NUREG-0654, Rev. 1 criteria. Sirens were tested in January 1983, however, contractual problems with the testing consultant have resulted in test data evaluation not being completed at the present time. The applicant indicated that data evaluation should be completed by the end of May 1983. Electro-mechanical difficulties and vandalism now plague the installation. The 34 electro-mechanical sirens are presently de-activated because of spurious operation after activation (fail to shut down after three minute run time). Three (3) battery/solar powered siren units are currently inoperative due to vandalism, and require repair as well as installation of "vandal-proofing" restraints. Repairs are planned for completion by June 17, 1983. Administrative procedures for periodic maintenance and testing of the siren system per NUREG-0654 are not in place. Public training on the relationship of the sirens and the public's response of tuning to appropriate media broadcasts is covered by mail out packages to each residence within the EPZ and the conduct of voluntary Open Houses on an annual basis.

Postage-free return cards for additional information are included in the mail-out packages but no provision is provided to ensure each residence receives a package and understands their responsibility in the event of an emergency. Transient population instructions were not in place on a siren examined by the inspector, however, the applicant indicated that new signs are being produced for attachment to each siren.

#### 4.2.4 Other Equipment

##### 4.2.4.1 Damage Control/Corrective Action and Maintenance Equipment and Supplies

The inspector discussed the above subject area with the EPC after noting that no procedures or equipment appeared to be in place. The EPC confirmed that no needs for onsite damage control, corrective action and/or maintenance equipment and supplies have been considered or met.

##### 4.2.4.2 Reserve Emergency Supplies and Equipment

The inspectors reviewed the normal onsite supplies and equipment that would be required to handle a radiological emergency. This review included survey instruments, personnel and environmental dosimetry, and protective clothing and equipment.

The licensee maintains emergency kits which contain survey instrumentation and other supplies and equipment that would be required to operate the Emergency Response Facilities and to equip emergency survey teams. The contents of the emergency kits have been discussed in Section 4.2.1.1 of this report. In addition to this emergency equipment, the applicant will maintain reserve supplies of normal (unassigned) equipment.

The applicant has established a dosimetry facility in a room in the basement of the Administration Annex Building. Spare supplies of TLD's (thermoluminescent dosimeters), extremity exposure devices and self reading pocket ion chambers will be located in this facility. Alarming dosimeters are the only dosimetry equipment that will be located in the emergency kits. Additional TLD's will be kept at the control access point which is located near the OSC. According to the applicant they intend to use the self reading pocket ion chambers on a very limited scale and will rely primarily on the "job" TLD's that are to be used.

The applicant intends to establish a minimum/maximum system in the warehouse to assure an adequate level of supplies is maintained there. This system, which will be computerized, will include protective clothing. According to the applicant 10,000 sets of protective clothing will constitute the initial supply for Unit 1. Lesser quantities, possibly 8,000 for Unit 2 and 5,000 for Unit 3, will be obtained for the other two units and will provide a reserve for use during emergencies. Some additional

sets of protective clothing will be kept in the warehouse and maintained by the minimum-maximum system. The levels maintained in the warehouse will depend on the rate of usage that results from the onsite laundry process. The initial estimate of the warehouse supply was 1,000 to 2,000 sets.

The applicant intends to use the same survey instrumentation in the emergency kits as is used during normal operations. Therefore, all such instruments used during normal operations represent a reserve for those instruments stored in the emergency kits. The inventory of survey instruments will take into account those that may be unavailable because they need repair or calibration.

#### 4.2.4.3 Transportation

The applicant has a variety of vehicles onsite for use during emergencies. Some have been assigned to the radiation protection organization. The security and maintenance organizations have assigned sedans and pickup trucks. During an emergency these vehicles are available for use by the emergency organization. During non-regular working hours the keys to the security assigned vehicles are kept at the access control facility and the keys to the maintenance assigned vehicles are kept in the maintenance office. There are more than 15 vehicles at the site for use during an emergency.

#### 4.2.5 Conclusions: Emergency Equipment

Based on the above findings, no significant deficiencies were identified in this portion of the program. However, the following nine items are considered open due to a lack of information necessary to reach a conclusion on the adequacy of the items.

- a. The emergency kits and supplies had not been stocked in accordance with EPIP-38. (83-14-20)
- b. The area, process and effluent monitoring systems had not been completely installed, functionally checked and calibrated. (83-14-21)
- c. The non-radiation monitors listed in Table 5.1-2 of Section 5 of the EP and EPIP's-03, -04, -05 and -06 had not been completely installed, operationally checked and calibrated. (83-14-22)
- d. An alternate source of meteorological data which could be used to represent conditions in the vicinity

of the site (about 10 mile radius) had not been identified. (83-14-23)

- e. There were no provisions for equipment and/or procedures to possibly notify control room personnel of severe weather conditions affecting or likely to affect the site. (83-14-24)
- f. The meteorological data acquisition system, which is part of ERFDADS, had not been installed and tested. (83-14-25)
- g. The respiratory protection program had not been fully implemented. (83-14-26)
- h. Not all of the protective clothing had been received and a related cleaning program had not been established. (83-14-27)
- i. A program for damage control and maintenance of related equipment and supplies had not been established. (83-14-28)

In addition to the above findings, the following items should be considered for improving the program.

- 1. A seal system for the emergency kits should be considered for insuring kit integrity between inventories. (83-14-41)
- 2. Evaluate the need for providing some personnel dosimetry capability in the emergency kits. (83-14-42)
- 3. Consideration should be given to consolidating the APS supplied equipment with that supplied by the hospital into a single emergency kit. (83-14-43)
- 4. Consideration should be given to increasing the weekly meteorological system check to two or three times per week. (83-14-44)

## 5.0 Emergency Plan Implementing Procedures (EPIP)

### 5.1 General Information

The preoperational inspection included a review of the 55 EPIP's (see Appendix B for listing) that had been written. The procedure format included the following subject material(s): objectives, references, limitations and precautions, procedure details and appendices consisting of tables, checklists, etc. Procedures have been developed for each of the positions that constitute the applicant's organization for responding to an emergency. Procedures have also been written for specific activities to be performed,

e.g., onsite surveys, (radioactive) release rate determinations, reentry for emergency operations, personnel assembly and accountability. Five separate procedures have been written for emergency event classification and the actions to be taken for each of the four event classifications (unusual event, alert, site emergency and general emergency).

Several procedures control the development, review, issuance and modifications of the EPIP's. These procedures include (1) 70AC-0ZZ01 (Procedure Format, Content and Numbering), (2) 70AC-0ZZ02 (Review and Approval of Station Procedures, (3) 78AC-0ZZ01 (Station Manual Control and Distribution) and (4) EPIP-35 (Review Update, and Revision of the PVNGS Emergency Plan). Since the EPIP's are site procedures, they are reviewed and approved by the Plant Review Board and the Manager of Nuclear Operations. Changes and modifications to the EPIP's receive the same reviews and approvals as the original document. EPIP-35 requires that revisions to the EPIP's be forwarded to the "Corporate Emergency Planner" to insure there are no conflicts with the emergency plan.

The examination of the procedures identified in the previous paragraph and interviews disclosed some problems with these procedures as well as with the distribution of them. EPIP-35 states that revisions and updates of the EPIP's shall be handled in accordance with document control procedure 10 AC-0ZZ02. According to the Drawing and Document Control (DDC) personnel, who are responsible for the issuance and control of the EPIP's, 10AC-0ZZ02 pertains to reference documents submitted by Bechtel to APS. According to DDC personnel, onsite distribution of changes to the EPIP's is accomplished by runners who insert the changes into each individual's controlled copy book rather than giving the changes to the designated individuals. Records in the DDC showed a number of instances where required acknowledgements had not been received and procedure required actions following the lack of acknowledgements had not been taken. The inspection disclosed that the Maricopa County Civil Defense Director did not have a current (Revision 1) set of EPIP's. Section 5.4.1 of 78AC-0ZZ01 states that emergency procedures are not contained in the Station Manual Index. However, DDC personnel said that procedure 78AC-0ZZ01 controls the distribution of the EPIP's and changes to them.

EPIP-02, Emergency classification, provides for classifying emergencies into one of four categories - Unusual Event, Alert, Site Area Emergency and General Emergency. Appendix A to this procedure contains 15 tables with each tab being an event situation, e.g., radiation alarm, loss of secondary coolant, loss of power, limiting conditions for operation, natural phenomena and other hazards. Each tab has been divided into the four emergency categories with each category containing the conditions which results in that classification. The examination of these tabs disclosed instances where items in Appendix 1 of NUREG-0654 do not appear to have been addressed (e.g., Unusual Event Item 4 and Alert Item 9 of NUREG-0654). There were also examples where the Tab items were too general (e.g., Unusual Event Item in Tab 5 and Alert Item No. 2 in

Tab 6 of EPIP-02). Tables 5.1-1 through 5.1-4 of the Emergency Plan provide the EAL's (emergency action levels) for the various items in Appendix 1 to NUREG-0654. The Tables in the EP do not appear to have the problems described for EPIP-02.

## 5.2 EPIP Review

The review of the EPIP's identified a number of problems and areas where improvement could be accomplished. The following items which are not considered to be all inclusive, are examples of such problems and improvement areas.

- a. EPIP-02 does not reference Procedures 71AC-OZZ01, Event-Related Reporting, and 71AC-OZZ02, Periodic Reports to Regulatory Agencies, for reporting items identified in 10 CFR 50.72 but not meeting the classification requirements for off-normal events addressed in this procedure.
- b. EPIP-08, Notification Process - Alert, Site Emergency, or General Emergency, does not provide any guidance on action(s) to be taken if the Auto Dialer System used to contact APS personnel is not operating. In addition this notification system does not function on the basis of priority notification of the APS personnel.
- c. EPIP-09, Emergency Coordinator, does not clearly identify those responsibilities that can not be delegated to other persons in the emergency organization headed by the Emergency Coordinator. EPIP-01, Emergency Organization, does identify the responsibilities the emergency coordinator that cannot be delegated. Item 3 of the Limitations and Precautions Section of this procedure states that the 15 minute notification period starts when the Emergency Coordinator initially declares the emergency. Appendix 1 to NUREG-0654 (page 1-3) states that the period starts when the operators recognize that events have occurred which meet the criteria for declaring the specific class of event.
- d. EPIP-16, Onsite Surveys and Sampling, requires that "all inplant readings above 10 R/hr and outside readings above 0.2 mR/hr should be reported to the Radiological Protection Coordinator" (see 4.3.1.2 of the procedure). The instruments identified in 4.3.2.1 to be used do not have the range to measure both values (10 R/hr and 0.2 mR/hr) with a single instrument. Also these survey instruments do not appear to be consistent with those in EPIP-38, Emergency Equipment and Supplies Inventory.
- e. EPIP-17, Offsite Surveys and Sampling, does not clearly describe the instrumentation to be used to count the iodine (silver zeolite) and particulate air samples. The counting instrument(s) must have a minimum detection limit of  $1\text{E-}7$  uCi/cc for radioiodine. The sampling locations shown in Appendix D of the procedure are not the same or coordinated

with the sampling locations used by the State. This procedure does not provide guidance regarding alternate action if the portable 2-way radios fail. Step 4.2.3.1 of this procedure makes reference to equipment in lockers at locations identified in EPIP-38; however, the equipment in the emergency lockers per EPIP-38 is not consistent with the equipment described in step 4.2.3.1. Neither this procedure nor EPIP-01 (Section 4.3.2.3) addresses changing radiation protection requirements for teams in the field caused by changes in radioactive release conditions.

- f. EPIP-18, Emergency Exposure Guidelines, permits the Emergency Coordinator to authorize exposures up to 100 rem whole body for life saving actions. The referenced EPA document, EPA-5201 1-75-001 (Revised June 1980) establishes this exposure limit at 75 rem. This exposure limit of 100 rem is used in EPIP-25 and other EPIP's. EPIP-18 also gives the Radiological Protection Coordinator the authority to approve exposures up to 4 rem; however, it is not clear whether this is a total for the quarter or the exposure for this emergency action(s). The latter definition could result in an individual being exposed to up to 6.9 rem for a quarter. One of the criteria (3.2.4) in the Limitations and Precautions Section is that the radiation exposure history of volunteers should be known. This criteria does not state that the prior exposure (history) should be as current as possible. Note 2 to Appendix B of EPIP-18 does not include entry into a high radiation area (10 CFR 20.202(a)(3)).
- g. Instruction 4.3.1.1e of EPIP-13, Emergency Operations Facility Activation, instructs security to lock the door by stairs No. 2 to restrict entrance to the EOF. However, the Appendix B diagram, which is referenced in this instruction does not identify which of the two stairs is No. 2. Also, this procedure does not instruct security to control access to the EOF or where such control should be established.
- h. EPIP-19 references EPIP-15, Protective Action Guidelines. The former relates to the guidelines and evacuation of onsite personnel, while the latter concerns the recommended protective actions APS makes to the county and state agencies. Since EPIP-15 does not appear to address the subject of exposure control for nonessential personnel, this may be an inappropriate reference for EPIP-19. Section 3.2 of EPIP-20, which is also referenced by EPIP-19, states that a site evacuation will be initiated if an assembly area outside the protected will likely be exposed to radiation exceeding 2 mR/hr. This evacuation criteria of 2 mR/hr is not mentioned or specifically referenced in either EPIP-15 or EPIP-19.
- i. The Radiation Exposure Permit, Appendix C of EPIP-25, to be used during emergencies does not provide for written indication that emergency exposures per EPIP-18 have been approved by the appropriate individual.

- j. EPIP-38, Emergency Equipment and Supplies Inventory, requires that equipment and supplies be inventoried per Section 8 of the EP (once a quarter). There are no provisions for assuring that emergency equipment and supplies used during a drill or exercise are replaced and the emergency lockers returned to a state of readiness immediately following the drill or exercise. In addition the procedure does not address the shelf life of batteries.
- k. There were a number of instances where the references included the procedure itself (e.g., EPIP-20 lists itself in Section 2.1.8). There were also instances where incorrect references were made within the procedure (e.g., Instruction 4.3.1 refers to Section 3.0 rather than 4.2). It was also noted that EPIP-25 had two Instructions numbered 4.3.2.2.

### 5.3 Evacuation and Accountability

Evacuation and personnel accountability of personnel during an emergency has been assigned to the Security Organization. The EC is responsible for initiating the action. EPIP-20 describes personnel assembly and accountability, detailing the numerous assembly groups and their areas of assembly. EPIP-19 describes evacuation procedures and diagrams site and off-site paths to the re-assembly points. Due to the rather complicated nature of handling so many different groups, billfold cards indicating the meaning of the various sirens, assembly area locations, and evacuation routes will be issued to all persons entering the protected area. Such personal instructions are not presently available.

Accountability relies heavily on a card reader system that is computer controlled. The automated system is experiencing significant pre-operational test problems that are hoped to be cured by June 1, 1983, so that a two month test phase may then begin. In the event that the card reader system is not available, manual handling of accountability and badging would be required. Procedures for such manual handling and guard force manpower are not currently available.

Release rates based on monitor readings from inside the containment building, but not from post-accident sampling data. The selection of which of the several calculations contained in EPIP-14A to perform is left to a decision by the responsible individual. Also, EPIP-14A does not appear to provide for calculations using the normal containment building leak rate. The dose assessment procedures do not provide for comparing the calculational results which the results of the environmental monitoring surveys. The dose assessment calculations are used in EPIP-15 which provides the instructions for concluding what recommended protective actions should be communicated to the county and state agencies.

During this inspection the applicant conducted two drills on the dose assessment process. These drills covered EPIP-14A and -14B.

Personnel who are expected to perform these calculations attended the drills. The drills were observed by an inspector. Because the computer capability to perform the dose calculations (CRACS) is not expected to be operational for some time, the applicant has developed a capability to use a portable, micro computer system for making the calculations. This portable computer was used during the drills. These drills covered the appropriate material.

#### 5.4 Assessment Actions

The primary dose assessment responsibilities area assigned to the Radiological Protection Coordinator who is located in the TSC. This individual provides technical advice to the Emergency Coordinator and the Radiological Assessment Coordinator concerning recommendations for offsite protective actions based on the results of dose projections. According to EPIP-41, the Radiological Assessment Coordinator (RAC) is to analyze source term, meteorological and field monitoring data to determine the reasonableness of those data with dose projections being used as the basis for protective actions, including recommendations made to the county and state agencies. According to the individual primarily assigned to the EOD position, the RAC functions as an independent evaluation of the actions performed in this area by the Radiological Protection Coordinator.

EPIP-14A and -14B provide the instructions for performing the dose assessment calculations. Procedure 14A addresses release rate determinations and 14B covers the calculation of dose using the release rate determinations. The former provides a capability to determine.

#### 5.5 Conclusions: Emergency Plan Implementing Procedures

Based on the above findings no significant deficiencies were identified. However, the following four items are considered open due to the lack of completed procedures.

- a. Procedures for the operation and calibration of the PASS had not be prepared (see Sections 4.1.1.5 and 4.1.1.6 of this report). (83-14-29)
- b. Procedures for the operation and calibration of the effluent monitors and the collection and analysis of effluent samples had not been prepared (see Section 4.1.1.7 of this report). (83-14-30)
- c. The current system for control and distribution of the EP and EPIP's was not as stated in 78AC-OZZ02, EPIP-35 and Nuclear Operations Support Department Procedure 14.01 (see Sections 1.0 and 5.1 of this report). (83-14-31)
- d. The accountability system, which relies heavily on the computer controlled card reader system, was not operational because the card reader system was not operational. (83-14-32)

In addition to the above findings, the following items should be considered for improving the program.

1. Examine Section 5.2 and make appropriate changes to the EPIP's. (83-14-45)
2. Review EPIP-02 and compare the emergency action levels to the criteria in Appendix 1 to NUREG-0654 (see Section 5.1 of this report). (83-14-46)
3. Review EPIP-14A and determine whether it is capable of using post-accident sampling data in calculating release rates. Also evaluate whether the procedure can calculate release rates using the normal containment building leak rate. (83-14-47)
4. Consider the need for including in EPIP's-14A and B a comparing of the calculational results with the results of the environmental surveys. (83-14-48)

## 6.0 Coordination with Offsite Groups

### 6.1 Offsite Agencies

The area of offsite agencies was reviewed with respect to the requirements of 10 CFR 50.47(b)(3) and criteria in NUREG-0654, Section II A, B, E and L.

Section 4.2.5 and Figure 4.3-2 of the EP generally describes the non-APS support agencies that may be called upon in the event of an emergency at PVNGS. Appendix A of the EP has been designated for agreement letters; however, no agreement letters have been appended to the EP. The inspector reviewed proposed agreement letters between APS and Arizona State University, Bechtel Fire Support, National Weather Service, Institute for Nuclear Power Operations, Radiation Management Corporation and the Utility Mutual Assistance Group; and a proposed Memorandum for Understanding with the Arizona Radiation Regulatory Agency (ARRA). Most of these agreements had not been finalized at the time of the appraisal.

The inspector discussed the agreement letters, in general, with the applicant and stressed the need for a continued, strong effort in this area in order to successfully complete those proposed by the applicant as well as those with other agencies identified in the EP as providing support. In some cases, the support is statutory in nature, and a formal agreement letter is not indicated. However, the inspector pointed out that all support agencies should be covered by agreement letter, memorandum of understanding, signature page, or reference in the EP to the laws, regulations or executive orders where separate written agreements are not necessary.

The inspector met with representatives from Maryvale Samaritan Hospital, Maricopa County Office of Civil Defense and Emergency Services and ARRA. The following paragraphs describe the results of these meetings.

At the Maryvale Samaritan Hospital, the inspector reviewed the hospital emergency facilities, equipment and procedures. The inspector noted that a helipad and decontamination station were provided on the roof of the hospital; however, the Security Director of the hospital informed the inspector that these facilities would not be used. In the event a helicopter was required for rapid transportation, it would land on the hospital grounds adjacent to the emergency room entrance. The emergency equipment kit had several items missing and equipment was being stored in several areas of the hospital. Emergency kits are discussed further in Section 4.2.1.1 of this report. The inspector noted that the hospital emergency procedures had recently been reviewed and revised, however, the telephone number for PVNGS lacked the appropriate extension number for the control room or TSC.

The inspector discussed the role of local support agencies with the Director of the Maricopa County Civil Defense and Emergency Services (Civil Defense Director). The inspector noted that the PVNGS, Rev. 1, mailed on March 30, 1983, had not been received and/or posted to the controlled document book in the Civil Defense Director's Office. The Civil Defense Director stated that this would be looked into. From the discussion with the Civil Defense Director and members of his staff, the auditor determined that they were satisfied with the arrangements in effect and that APS had maintained contact and had conducted drills and exercises.

The inspector discussed the overall role of ARRA with the Director of ARRA and members of his staff. The inspector expressed concern over the decision-making chain illustrated in Figure 6.6-1 of the EP. This figure shows eight steps (including both recommendations and directions to implement) in the decision-making process starting with the Radiological Protection Coordinator at PVNGS to the actual implementation of protective actions in the 10-mile emergency planning zone of Maricopa County. The Director of ARRA explained that a close working relationship had been developed between the PVNGS Offsite Emergency Organization at the EOF and ARRA regarding the decision-making process. The Director of ARRA did express concern over the need for maps used by the Radiological Emergency Assistance Teams (REAT) to be similar to those used by PVNGS; the need for improving the flow of information to ARRA from PVNGS and capability for aerial monitoring for more effective plume tracking.

APS has conducted training for members of ARRA on the emergency action level and classification scheme used by PVNGS. In addition, ARRA has participated in table-top drills and exercises. Another dress-rehearsal exercise was scheduled for (and was completed on) April 27, 1983.

## 6.2 General Public

The applicant has developed a program for providing the general public in the plume exposure EPZ with information on emergency planning related to PVNGS. This program included mailing of emergency brochures, open house presentations, a quarterly

newsletter and two pages of emergency information in the telephone book distributed to residents within the plume exposure EPZ. Open house presentations were held on November 7, 1981 and April 24, 1982 with a third one scheduled for April 23, 1983. There were about 3400 attendees for the first two open houses and approximately 1800 reservations have been received for the third one.

The brochures provide the general public within the plume exposure EPZ with information on radiation, event classification, notification and protective actions, a glossary of important words, special needs for the handicapped and a contact for additional information. Three revisions to the brochure has been distributed. The fourth revision is presently being reviewed for readability by an expert consultant from Arizona State University. The applicant noted that the next revision will include a map showing the locations of the reception centers in addition to their being identified. These brochures have been included in packetts distributed during the two open houses at the site and given to the media personnel during their briefing sessions. According to the applicant there will be an annual mailing of the brochures to all residents within the 10 mile radius of the facility. New persons moving into the 10 mile radius area will be identified by the APS customer service office in the area so that the brochure can be sent to them in a timely manner.

The applicant has arranged with the employers in the plume exposure EPZ to distribute inserts, providing written instructions where emergency planning information can be obtained and written in spanish, with the paychecks. According to the applicant there are only a few employers in the plume exposure EPZ and most of the population in the area has a working knowledge of english.

To date there have been two mailings to the residences in the plume exposure EPZ which included a postcard to be sent if special assistance is needed during an emergency. These postcards were also included in the packetts distributed during the second open house on April 24, 1982, and will be included in the packetts used for the third open house on April 23, 1983. The postcards are addressed to APS who records the information and then transfers the cards to the county for appropriate action. The applicant said that they had received replys from about 10 percent of the population (4000) in the plume exposure EPZ.

The applicant has prepared posters for displaying in general public areas. These posters provide information on actions to be taken in response to the warning siren or emergency condition. These have been posted in restaurants, stores, schools and trailer parks.

During 1982 the applicant's public education program included presentations to various organizations and visits to homes in the area. Emergency preparedness for PVNGS was a significant part of the presentation. According to the applicant they will continue to make speakers available to the various organizations and emergency preparedness will be a part of the presentation. In 1983 the

applicant is planning to survey the houses in the area around the facility to determine the level of emergency planning knowledge and ascertain the receipt of emergency planning materials.

### 6.3 News Media

The applicant has developed a program for briefing the media on emergency planning for PVNGS. The State of Arizona and Maricopa County are participants in ten program. The initial presentation consisted of three one day sessions (April 5, 6 and 7, 1983) that were provided to executives and Phoenix and Tucson working press members respectively. Representatives of the NRC and FEMA also participated in the presentation. Attendees were provided with packets containing appropriate information on the facility, radiation and emergency planning, including a copy of the brochure distributed to the general public. The attendees were also given a tour of the facility. According to the applicant a briefing session will be presented to media personnel in the Los Angeles, California area in the near future. Also, there will be briefing sessions for the media on an annual basis to maintain their level of knowledge.

### 6.4 Conclusions: Coordination with Offsite Groups

Based on the above findings, no significant deficiencies were identified. However, the following item is considered open due to incomplete action.

Letters of agreement or memorandum of understanding with offsite support organizations, including Bechtel fire and medical support, had not been completed, signed and appended to the EP. (83-14-33)

In addition to the above finding the following item should be considered for improving the program.

Review the concerns expressed by the Director of ARRA and described in Section 6.1 of this report and consider possible corrective actions to these concerns. (83-14-49)

## 7.0 Drills and Exercises

### 7.1 Program

Section 8.1.2 of the Emergency Plan describes the requirements and frequency of emergency drills and exercises. EPIP Nos. -37A and -37B provide for the implementation of the drills and exercise requirements respectively. The listed drills and exercises meet the essential requirements of Planning Standards N2.a-e and 3 of NUREG, Rev. 1.

The Site is responsible for conducting the drills and Headquarters has overall responsibility for the exercises. According to EPIP-37A the Onsite Emergency Planning Coordinator is responsible for coordinating the planning and scheduling of each drill. This

individual is also responsible for coordinating the assignment of observers/controllers, conducting critiques after the drills and informing management, including the Manager of Nuclear Operations, of the drill results. EPIP-37B says the Corporate Health Physicist and Emergency Planner, with the assistance of the Onsite Emergency Planning Coordinator, is responsible for coordinating the development, conduct, evaluation and documentation of emergency preparedness exercises. The initial emergency preparedness exercise had been scheduled for May 11, 1983 (see Section 8.0 of this report). EPIP-37A and -37B provide for appropriate documentation of the drills and exercises.

During the period March 31 and April 27, 1983, the applicant, County and State conducted and scheduled a number of drills covering the various aspects of the EP. The drills were being conducted in accordance with the established procedures. At the time of this inspection not all of these drill identified improvement items had been resolved. The applicant had assigned priority attention to the corrective actions on the improvement items.

#### 7.2 Walk-Through Observations

The inspection included evaluating the response of selected individuals to emergency situations postulated by various NRC team members. Where equipment had not been installed and/or appropriate procedures prepared walk-throughs were not conducted. The responses were primarily evaluated by comparing them to the EP, EPIP's and applicable plant procedures. The results of the walk-throughs have been incorporated into the previous paragraphs of this report.

#### 7.3 Conclusions: Drill and Exercises

Based on the above findings, no significant deficiencies were identified. However, the following item is considered open due to incomplete action.

Some of the scheduled drills and a practice exercise had not been conducted. (83-14-34)

### 8.0 Emergency Preparedness Exercise

#### 8.1 Emergency Exercise Planning

The Emergency Planning Task Force had the responsibility for the planning, scheduling, and coordinating the emergency preparedness exercise. The Corporate Health Physicist and Emergency Planner had the lead assignment for the exercise. The Onsite Emergency Planning Coordinator was the coordinator for the onsite participation in the exercise preparation. The applicant had issued a contract to HMM associates covering the development of the scenario for the May 11, 1983 exercise, control and observation of the exercise and provisions for an exercise critique, including a written report. The exercise was developed in concert with the several participating offsite jurisdictions and the Federal Emergency Management Agency

(FEMA). NRC Region V also reviewed the exercise objectives and scenario during the planning stage. The exercise document included the purpose and objectives, schedule and participating parties, the scenario (including initial plant conditions), controller messages and data sheets, duties of controllers and players and exercise controller/evaluator evaluation sheets. The exercise document was controlled by APS/HMM and distribution was limited to persons having a specific need, designated non-players of participating local agencies and members of FEMA and NRC who were evaluating the exercise. Copies of the exercise document were not provided to any of the players, including those of the offsite agencies. This emergency planning exercise satisfied the initial exercise required by Section IV.1.b of Appendix E, 10 CFR Part 50.

## 8.2 Exercise Scenario

The exercise started at 5:00 a.m. on May 11, 1983 with a "Notification of Unusual Event" caused by a contaminated injury of an employee. This was followed by fuel cladding failure due to a dropped rod that caused an "Alert" to be declared. A series of events then followed that escalated the situation into a "Site Area Emergency" and ultimately to a "General Emergency." These events included a rod ejection accident (loss of coolant), failure of the power access purge system and an uncontrolled fire. The meteorological conditions were changed during the scenario to permit exercising all offsite aspects of the EP.

## 8.3 Observers

The exercise was observed and evaluated by several organizations. The applicant, including HMM, provided controllers/evaluators for all onsite areas, activities in near site environmental monitoring performed by APS personnel the Emergency News Center and transportation of the injured employee to the hospital. Provisions were made for controlling any changes made during the course of the exercise due to circumstances at the time. The participating offsite jurisdictions provided evaluators for their portions of the exercise.

Observers from the NRC and FEMA Region IX were also present during the exercise. The FEMA team of observers were evaluating the portions of the exercise that involved local and state agencies as well as the interface occurring at the EOF. The NRC observed activities in the Control Room, STSC, TSC, OSC, EOF and Emergency News Center. The NRC also observed the activities of teams dispatched into the plant to respond to the injured employee and fire and take actions to evaluate or mitigate the conditions related to the emergency situations.

On May 9, 1982, HMM held a briefing for all the controllers and evaluators. Copies of the exercise documentation, including the updated information, were distributed. The briefing covered the exercise objectives, the holding of critiques immediately following the exercise, the responsibilities of the controller vs the

evaluator and other items important to the controllers/evaluators. The messages to be provided to the players were distributed to the appropriate controllers. The importance of completing the evaluation sheets and the review and final documentation process were also discussed.

#### 8.4 Exercise

The exercise started at 5:00 a.m. on May 11 and continued until about 1:00 p.m. The exercise involved the following locations described in the PVNGS EP: Control Room, STSC, TSC, OSC, ENC and EOF. Offsite areas, including the EOF, that were observed by the FEMA team will be described in a report issued by that agency. The exercise included sending teams into the plant to respond to the injured employee, respond to the fire and simulate evaluation and repair activities. Radiation monitoring activities around the site as well as in plant were also conducted as part of the exercise.

#### 8.5 Critiques

A series of critiques were held to evaluate the results of the exercise. Immediately following the exercise the various emergency centers (e.g., TSC, EOF and OSC) held a critique of their areas of interest. Later that afternoon the controllers/evaluators met to discuss and summarize the earlier critique sessions. Some problems needing corrective actions were identified; however, the conclusion was that the exercise did not identify any major difficulties. There were some communications problems, including temporary equipment failure, but alternative equipment was used satisfactorily to accomplish the notifications in a timely manner. The technician could not locate the emergency kit in the EOF to obtain the necessary supplies and equipment for use in connection with the evacuation of plant personnel. There was considerable delay in obtaining bus transportation for evacuating the plant personnel. There appeared to be a need for guidance to be used by the TSC and EOF in downgrading the emergency classification.

The alternate OSC needs to be improved, including additional communications capability, to function satisfactorily. With respect to the joint objectives, there was an instance where the State failed to discuss with APS, in advance of implementation, recommended protective actions that were different than those APS had recommended.

A summary session involving the organizations that participated in the exercise was held in the afternoon of May 12. The findings were summarized by representatives from APS, the State and HMM.

#### 8.6 Exercise Summary

On May 13 a summary of the exercise results was presented at the State Division of Emergency Services facility on the Papago Park Military Reservation. The State, FEMA Region IX and NRC presented a summary of their findings to the exercise participants. APS and a

couple of other participants also made brief statements. This session was followed by a presentation on the exercise findings provided specifically for members of the public and media. The following organizations were the participants in this latter presentation: APS, State of Arizona, FEMA Region IX and NRC.

## 9.0 Exit Interviews

### 9.1 Preoperational Inspection

On April 22, 1983, an exit interview was held with the applicant for the purpose of discussing the preliminary findings of the preoperational inspection. Those applicant personnel who attended the meeting have been identified in Attachment A to this report. The following persons representing the NRC were also present: R. Fish, NRC Team Leader; D. Perrotti, NRC and Team Member; G. Martin, Battelle Northwest Laboratories and Team Member; D. Schultz, Comex and Team Member; E. King, EG&G Services and Team Member; G. Fiorelli, NRC Senior Resident Inspector. The findings were discussed in terms of the seven (7) major areas of the preoperational inspection. The deficiencies and open items described in Sections 1.1, 2.3, 3.3, 4.1.4, 4.2.5, 5.5, 6.4 and 7.3 of this report were discussed. Most of the recommended items for improving the emergency preparedness program, that are discussed in these sections of the report, were also discussed. The applicant was given an opportunity to comment on these NRC findings. No objections to the findings were raised. The applicant was informed that an additional inspection(s) would be required to address the open items. The applicant was also told that some of the open items need not be completed until prior to going above five percent of licensed full power; however, these items would be identified at a later date.

### 9.2 Emergency Preparedness Exercise

On May 12, 1983, an exit interview was held to discuss the findings pertaining to the emergency preparedness exercise. Those applicant and contractor personnel who attended this meeting have been identified in Attachment A to this report. The following persons representing the NRC were also present: M. D. Schuster, NRC Region V Security Licensing and Emergency Preparedness Section Chief; R. Fish, NRC Team Leader; H. North, NRC Team Member; G. Johnston, NRC Resident Inspector and Team Member; L. Ivey, NRC Team Member; J. Hanchett, NRC Team Member; D. Perrotti, NRC Team Member; J. Martin, Battelle Northwest Laboratories (BNL) and Team Member; G. Martin, BNL and Team Member; E. Hickey, BNL and Team Member; P. Brown, Comex and Team Member. The applicant was informed that no items of noncompliance or deviations were identified. The following NRC observations, none of which were considered significant, were discussed during this meeting.

- a. Communications could be improved. One example of this was the time the Shift Supervisor was away from the control room to talk to the Operations Advisor in the TSC rather than using a

phone, also the STSC, EOF and Emergency News Center did not know the cause of the loss of coolant was a rod ejection. The applicant stated that the TSC had determined the cause (rod ejection) but did fail to communicate this fact.

- b. The operations of the TSC appeared to be very cumbersome and could probably benefit from a human engineering evaluation. The TSC appeared to be well managed and the onsite and offsite survey teams well controlled.
- c. The physical layout of the EOF was not consistent with the applicable EPIP. Also the EPIP's did not address the performing of surveys in the EOF and TSC. The applicant indicated that some additional physical changes in the EOF may be made in the near future.
- d. Several radiation safety problems were identified in connection with the repair team sent to close the leaking valve. Dosimeters and survey instruments were not obtained initially. There was a lack of self contained breathing apparatus for the team members until the second leaving from the OSC. There also appeared to be a lack of necessary planning and preparation for the team.
- e. There appeared to be some problems with plant direction (plant north vs true north). In addition, a missing person was called a victim which might result in confusion as to whether an injury was involved.
- f. Three suggested improvements were made in the area of offsite monitoring. Because of heat problems during the summer, there appears to be a need for criteria related to the wearing of self contained breathing apparatus. The maps used by the team were of poor quality and difficult to use. Also the team should be periodically briefed on the status of the plant so as to anticipate changes to their assignments and need for protective actions.
- g. Some status boards in the TSC and EOF were not used or maintained with current information. Also, there should be a review of the status boards to determine which ones are important, what information should be placed on them and where they should be located.
- h. There were some delays in providing information to the media initially; however, this problem seemed to disappear by about 11:30 a.m. The adequacy of the storage of the equipment should be re-examined to assure the sensitive equipment will not be damaged by the summer heat. The applicant stated they were already considering the need to change the storage capability to protect the equipment from heat damage.

## ATTACHMENT A

Individuals ContactedI Inspection During Period April 11-22, 1933A. Licensee Personnel1. Palo Verde Nuclear Generating Station

\*J. Bynum, Manager, Nuclear Operations  
 S. M. Moyers, Maintenance Superintendent  
 L. Brown, Manager, Radiation Protection and Chemistry  
 T. Cotton, Manager, Engineering  
 F. Hicks, Manager, Training  
 D. Nelson, Manager, Security  
 J. Tench, Supervisor, Administrative Services  
 J. Cederquist, Supervisor, Chemistry  
 R. Simmons, Supervisor, Training  
 R. Bernier, Unit 1 Operations Supervisor  
 B. Rogers, Supervisor, Computer Services  
 G. Anderson, Supervisor, Instrument and Control (I&C)  
 L. I'card, Supervisor, I&C  
 J. Minnicks, Supervisor, I&C  
 J. Self, Supervisor, STA/ISE Group  
 V. Tersini, Supervisor, Drawing and Document Control (DDC)  
 P. Wiley, Senior Shift Supervisor - Unit 1  
 Shift Supervisors - Unit 1 (5)  
 Shift Supervisors - Unit 2 (2)  
 E. Cullen, Supervisor, Security Training and Support Services  
 M. Lantz, Lead Radiation Physicist  
 M. Hill, Radiological Engineer  
 I&C Foremen (2)  
 I&C Senior Specialist and Specialist (3)  
 DDC personnel (3)  
 Chemistry Technician (1)  
 L. Hopson, Senior Radiation Protection Technician  
 Radiation Protection Technicians (8)  
 \*D. Yows, Site Emergency Planning Coordinator  
 Emergency Planner (1)  
 J. Clark, Maintenance Coordinator  
 S. Taul, Foreman, Station Services  
 Mechanic (1)  
 C. Dunaway, Safety Administrator  
 M. Maddix, Nurse

2. Headquarters

\*T. Woods, Executive Vice President  
 \*G. C. Andognini, Vice President, Nuclear Operations  
 \*E. Lewis, Director, Emergency Planning  
 \*D. Green, Director of Communications  
 J. Vorees, Manager, Nuclear Operations Support

J. Brand, Manager, Consumer and Energy Affairs  
 \*P. Klute, Manager, Public Information  
 \*J. McGurik, Emergency Planner, Emergency Planning Task Force  
 D. Phillips, Supervisor, Operations Support  
 \*S. Frost, Supervisor, Licensing  
 \*J. Mann, Corporate Health Physicist and Emergency Planner  
 R. Badsgard, Senior Startup Liaison Engineer  
 L. Borneman, Health Physicist  
 S. Larson, Radiological Engineer  
 D. Santana, Startup Engineer

\*Denotes those present at Exit Interview on April 22, 1983.

B. Other Personnel

C. Blackwell, Jr., M.D., Contractor to Bechtel  
 K. Johnston, Assistant Safety Project Supervisor, Bechtel  
 Dr. J. McKleen, Professor, Arizona State University  
 R. Bluhm, Director, Maricopa County Civil Defense and  
 Emergency Services  
 T. Gleason, Chief of Nuclear Division, Maricopa County Civil Defense  
 and Emergency Services  
 D. Ballard, Training Officer, Maricopa County Civil Defense and  
 Emergency Services  
 C. Tedford, Director, Arizona Radiation Regulatory Agency  
 C. Amato, Associate Director, Arizona Radiation Regulatory Agency  
 J. Lutton, Health Physicist, Arizona Radiation Regulatory Agency  
 R. Richards, Security Director, Maryvale Samaritan Hospital  
 C. Belden, Clinical Director of Nursing, Maryvale Samaritan Hospital  
 A. Polino, Project Director, Seville Tech. Inc.

C. Persons Present at April 22, 1983 Exit Interview Only

M. DeMichele, President, Arizona Public Service Company  
 E. Van Brunt, Jr., Vice President, Nuclear Projects Management  
 W. Quinn, Supervisor, Safety and Licensing Engineering  
 D. Bonnette, Emergency Planner, Southern California Edison Company

II Inspection During Period May 9-12, 1983

A. Licensee Personnel

\*\*J. Bynum, Manager, Nuclear Operations  
 S. Moyers, Maintenance Superintendent  
 D. Nelson, Manager, Security  
 T. Cotton, Manager, Engineering  
 L. Brown, Manager, Radiation Protection and Chemistry  
 R. Bernier, Unit 1 Operations Supervisor  
 B. Rogers, Supervisor, Radiation Protection  
 B. Cederquist, Supervisor Chemistry  
 J. Malik, Day Shift Supervisor  
 R. Gouge, Shift Supervisor  
 J. Nedermeyer, Shift Supervisor

K. Gross, Shift Technical Advisor  
 D. Ensign, Assistant Shift Supervisor  
 K. Oberdorf, Supervising Radiation Physicist  
 R. Johnson, Supervising Chemist  
 R. Zering, Supervisor, Station Services  
 M. Lantz, Lead Radiation Physicist  
 J. Sims, Radiological Engineer  
 E. Cole, Special Projects  
 W. Durham, Senior Fire Protection Analyst  
 \*\*D. Yows, Site Emergency Planning Coordinator  
 T. Delnoce, Security Officer  
 J. Exum, Chemical Technician Trainee  
 \*\*L. Lewis, Director, Emergency Planning  
 \*\*R. Page, Supervisor of Energy Affairs  
 J. Mann, Corporate Health Physicist and Emergency Planner  
 S. Larson, Radiological Engineer  
 T. Nishikawa, Health Physicist  
 Radiation Protection Technicians (several)

\*\*Denotes those present at Exit Interview on May 12, 1983.

B. Other Personnel

C. Amato, Assistant Director, Arizona Radiation Regulatory Agency  
 R. Merlino, Project Manager, HMM Associates  
 \*\*M. O'Hare, Chief Controller, HMM Associates

\*\*Denotes those present at Exit Interview on May 12, 1983.

C. Persons Present at May 12, 1983 Exit Interview Only

M. DeMichele, President, Arizona Public Service Company  
 T. Woods, Executive Vice President  
 C. G. Andognini, Vice President, Nuclear Operations  
 E. Van Brunt, Jr., Vice President, Nuclear Projects Management  
 J. Allen, Manager, Technical Support  
 S. Frost, Supervisor, Licensing

## ATTACHMENT B

Emergency Plan Implementing Procedures

<u>Procedure No.</u>	<u>Title</u>
EPIP-01	Emergency Organization
EPIP-02	Emergency Classification
EPIP-03	UNUSUAL EVENT Implementing Actions
EPIP-04	ALERT Implementing Actions
EPIP-05	SITE EMERGENCY Implementing Actions
EPIP-06	GENERAL EMERGENCY Implementing Actions
EPIP-07	Notification Process - Notification of UNUSUAL EVENT
EPIP-08	Notification Process - ALERT, SITE AREA EMERGENCY, GENERAL EMERGENCY
EPIP-09	Emergency Coordinator
EPIP-10	Shift Supervisor
EPIP-11	Technical Support Center/Satellite TSC Activation
EPIP-12	Operations Support Center Activation
EPIP-13	Emergency Operations Facility Activation
EPIP-14A	Release Rate Determination
EPIP-14B	Dose Assessment
EPIP-15	Protective Action Guidelines
EPIP-16	Onsite Surveys and Sampling
EPIP-17	Offsite Surveys and Sampling
EPIP-18	Emergency Exposure Guidelines
EPIP-19	Onsite Evacuation
EPIP-20	Personnel Assembly and Accountability
EPIP-21	Search and Rescue
EPIP-22	Personnel Injury

EPIP-23	Fire Fighting
EPIP-24	Security
EPIP-25	Reentry for Emergency Operations
EPIP-26	Potassium Iodine (KI) Administration
EPIP-27	Sample Analysis at the Station
EPIP-28	Personnel Monitoring and Decontamination
EPIP-29	Area/Equipment Monitoring and Decontamination
EPIP-30	Not Written
EPIP-31	Recovery
EPIP-32	Not Written
EPIP-33	Offsite Assistance
EPIP-34	Transportation Accidents
EPIP-35	Review, Update, and Revision of the PVNGS Emergency Plan
EPIP-36	Emergency Preparedness Training
EPIP-37A	Emergency Preparedness Drills
EPIP-37B	Emergency Preparedness Exercises
EPIP-38	Emergency Equipment and Supplies Inventory
EPIP-39	Emergency Operations Director (EOD)
EPIP-40	Administrative and Logistics Coordinator (ALC)
EPIP-41	Radiological Assessment Coordinator (RAC)
EPIP-42	Technical Analysis Coordinator (TAC)
EPIP-43	Radiological Assessment Communicator (RACom)
EPIP-44	TSC Liaison Engineer (TLE)
EPIP-45	Government Liaison Engineer (GLE)
EPIP-46	EOF Contact
EPIP-47	Logistics Communicator
EPIP-48	Security Coordinator

EPIP-49	Dosimetry Clerk
EPIP-50	Status Board Keeper (SBK)
EPIP-51	Offsite Technical Representative (OTR)
EPIP-52	JENC Technical Advisor
EPIP-53	Government Staffing at TSC
EPIP-54	Government Staffing at EOF
EPIP-55	TSC/EOF Personnel Identification