PVNGS 2/12/82

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Arizona Public Service Company Nuclear Operations Support Department NON-CONTROLLED NO. 82-1

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1.0 PURPOSE

This program sets forth the philosophies and basic policies for radiation protection at PVNGS. These philosophies and policies are based on and stem from regulations of the Nuclear Regulatory Commission as contained in Title 10 of the Code of Federal Regulations, Part 19, 20, 50, and 71, and appropriate Regulatory Guides.

It is the policy of Arizona Public Service Company (APS) to maintain personnel radiation exposure within the limits established by the Federal Government through the U.S. Nuclear Regulatory Commission (USNRC). It is the policy of APS to further reduce and limit personnel radiation exposure to "as low as reasonably achievable" (ALARA) below the limits established by the Government, based on technical and economical considerations in operating Palo Verde Nuclear Generating Station.

2.0 REFERENCES

2.1 Implementing

2.1.1 Palo Verde Nuclear Generating Station Manual, Section 75.

2.2 Developmental

- 2.2.1 Arizona Public Service Company Policy Statement on ALARA. (later)
- 2.2.2 10 CFR Parts 19, 20, 50, and 71
- 2.2.3 49 CFR Part 173
- 2.2.4 Regulatory Guides 1.8, 1.86, 8.10, 8.13, 5.14, 8.15, 8.2, 8.4, 8.7, 8.8, and 8.9.
- 2.2.5 PVNGS Technical Specifications
- 2.2.6 PVNGS FSAR Section 12.

3.0 DEFINITIONS AND ABBREVIATIONS

3.1 Restricted Area - As defined in 10CFR20.3(a) (14). All areas within the protected area security fence.

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- 3.2 Radiologically Posted Area Any area posted with a yellow and magenta sign with a three bladed radiation warning symbol for the purpose of controlling or restricting access to that area for radiation protection purposes.
- 3.3 Radioactive Materials Storage Area Any area within the Restricted area designated for storage of radioactive and/or contaminated materials.
- 3.4 Locked High Radiation Area Any area in which the intensity of radiation is greater than 1000 mrem/hr measured 12 inches from any radiation source.
- 3.5 Whole Body Exposure Radiation exposure received to the head and trunk; active blood forming organs; lens of the eyes; or gonads.
- 3.6 Extremity Exposure Radiation exposure received to hands and forearms; feet and ankles.
- 3.7 Radiation Worker Any individual authorized to engage in activities within the restricted area and receive occupational exposure to radiation.

4.0 RESPONSIBILITIES

- 4.1 The Manager of Nuclear Operations has overall managerial responsibility for the PVNGS Radiation Protection Program.
- 4.2 The Engineering and Technical Services Manager is responsible to the Manager of Nuclear Operations for ensuring proper administration of the Radiation Protection Program.
- 4.3 The Radiation Protection Supervisor has the responsibilities of the on-site Radiation Protection Manager, described in Regulatory Guide 8.8. He is responsible to the Engineering and Technical Services Manager for:
 - 4.3.1 Formulating, maintaining and implementing the Radiation Protection Program.

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4.3.2	Formulating administrative pradioactive releases ALARA a Appendix I.	policies to maint in accordance with	ain h 10CFR50
4.3.3	Developing procedures associ monitoring, radiation survey	iated with person is and monitoring	nel.
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4.3.5	Radioactive waste operations	and management.	
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4.3.8	Ensuring Radiation Protection technical competence and pro- qualifications.	on Technicians mai ficiency through	intain training and
4.4 The Rad	Supervising Radiation Physic iation Protection Supervisor	ist is responsibl for:	le to the
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4.5 Rad per mai Per and saf	iation Protection Technicians forming radiation surveys and ntaining control points; prep mits; issuing and testing res providing effective radiolog e working environment.	are responsible instrument colib aring Radiation E piratory protocti ical protection t	for: rations; xposure on equipment; hat ensure a
4.6 Rad Proj are proj	iological Engineers are respo tection Supervisor for provid as of dosimetry; ALARA review cedures; and radiation protec	nsible to the Rad ing technical sup ; emergency imple tion procedures.	iation port in the menting
4.7 Dep sup	artment Heads are responsible port in implementing the Radi	to the Plant San	ager for

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4.8 Individuals

Although radiation protection personnel, who are specially trained in radiation protection, normally oversee radiological controls, each individual involved in work within a controlled area must constantly remain aware of potential radiological problems. Each individual's actions directly affect his/her exposure to radiation in a controlled area. The individual has the following responsibilities:

- Remain in as low a radiation area as practicable to accomplish work.
- Not to loiter in radiation areas.
- Remain aware of their personnel radiation exposure status and avoid exceeding exposure limits.
- Obey posted, oral and written radiological control instructions, including instruction on Radiation Exposure Permits (R.E.P.'s).
- Wear anticontamination clothing and respiratory protection devices properly.
- Frisk or be frisked for contamination when leaving a contaminated area or a radiological control point.
- Correctly wear TLD and/or other dosimetry devices as and when required by procedures and instructions.
- Promptly notify radiation protection personnel of a known or possible radioactive spill and minimize its spread.
- Ensure tools and equipment are not radioactive or contaminated prior to removing from a radiation controlled area.
- Report to radiation protection personnel all open wounds prior to entry into a controlled area, and wounds or skin contamination received while in the controlled area.

 Ensure that their activities do not create radiological problems for others and be alert for the possibilities that the activities of others may change the radiological conditions to which they are exposed.

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5.0 PROGRAM DESCRIPTION

5.1 Radiation Protection Standards

Radiation Protection standards were developed to assure that the risk associated with radiation exposure is acceptable to the individual and the population at large in view of the benefits received from the use of nuclear power and radioactive materials.

This Radiation Protection Program is based on the assumption that any exposure no matter how small involves some risk; exposure within the accepted limits represents a small risk compared with normal hazards of life. Therefore, each individual must decide if employment at PVNGS for work within the Restricted Area of the station, involving actual or potential exposure to radiation, is an acceptable risk. The Radiation Protection Section will provide information, counseling and guidance to any employee concerning the effects of radiation and the PVNGS Radiation Protection Program.

5.2 Personnel Exposure Limits

Radiation exposure limits following the criteria indicated above have been developed by the Federal Government and defined in 10CFR20.

These limits are set as the maximum permissible occupational exposure limits for PVNGS. It should be recognized that the philosophy of ALARA is dedicated to reducing the risk of exposure to radiation to the minimum practicable, therefore, these limits are not goals for exposure usage, rather they are the framework in which ALARA will be applied.

The following maximum permissible exposure limits apply to personnel at PVNGS except pregnant females and personnel under eighteen (18) years of age.

Maximum Permissible Exposure Limits

Exposure Period	Whole Body	Skin	Extremeties
Quarterly	1.25 rem*	7.5 rem	18.75 rem
Yearly .	5 rem*	30 rem	75 rem

An individual's whole body exposure may not exceed at any time. 5(N-18) rem.

N = Employee's age in years as of last birthday

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* If the individual's exposure history is documented and the lifetime permissible exposure is not exceeded, an individual may be allowed to receive 3 rem whole-body exposure during a calendar quarter for each quarter during a calendar year.

Women of reproductive capacity will be limited to the radiation exposure limits as above. If a female employee should become pregnant while employed as a radiation worker at PVNGS, she will not be authorized to exceed 0.5 rem whole-body exposure for the entire gestation period.

Normally, no individual under 18 years of age will be allowed to receive exposure to radiation or airborne radioactivity at PVNGS. For entry into the restricted area of PVNGS for individuals under the age of 18, authorization must be obtained from the Manager of Nuclear Operations.

Individuals, under 18 years of age, authorized entry into the restricted area.will not exceed the limits as contained in 10CFR20.104.

5.2.1 Administrative Exposure Control Limits

Administrative exposure control limits are placed on individuals working in the restricted area to ensure personnel do not exceed the maximum permissible occupational exposure limits. Specific authorization and approval by the Radiation Protection Supervisor or his designee is required to exceed the Administrative Exposure Control Limits.

5.3 Personnel Radiation Dosimetry

Personnel who enter the Restricted Area are required to wear approved personnel dosimetry devices.

Personnel who are assigned dosimetry devices will wear them at all times within the Restricted Area and are responsible for their safekeeping. Dosimetry devices are serviced, maintained and evaluated by the Radiation Protection Section. Personnel assigned dosimetry devices will not tamper with them in any way or cause them to be exposed to radiation except during the performance of work requirements at PVNGS. Personnel dosimetry devices will not be removed from the Restricted Area of PVNGS without prior authorization and approval by the Radiation Protection Section. Lost or damaged dosimetry devices will be reported to the Radiation Protection Section immediately.

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Dosimetry devices are normally worn on the front of the body, between the waist and head and if more than one device is issued they are worn together. Other placement of dosimetry requires prior approval by the Radiation Protection Section. Dosimetry is worn so as to prevent contamination of the dosimeter itself.

Personnel dosimetry is not issued, and therefore, entry into the Restricted Area is prohibited until personnel have satisfactorily completed radiation protection orientation and training for PVNGS. With special prior approval by the Manager Nuclear Operations,

Restricted Area entry may be allowed without having received radiation protection training. Persons approved to make such entry are accompanied at all times in the Restricted Area by an authorized escort who has been properly trained in PVNGS radiation protection. Dosimetry will be issued to all personnel who are required to have an approved escort to enter the Restricted Area. The waiving of training requirements will be restricted to a temporary measure until training can be provided, and will not be used as an alternative to such training.

5.3.1 External Dosimetry

The official and permanent record of an individual's external radiation exposure is obtained from the use of a thermoluminescent dosimeter (TLD). Badges are issued to individuals requiring dosimetry and will contain several TLD's to be used for assessment of external exposure. Dosimeters (TLDs) are processed periodically on a scheduled basis to determine each individual's exposure, and new badges issued. Processing frequency may be increased depending on each individuals' work requirements within the Restricted Area.

Additionally, job TLDs are used for estimating personnel exposure for specific jobs requiring Radiation Exposure Permits (REP). The job TLD will allow dose control between periods of record TLD processing. Individuals requiring job TLDs will have the TLD processed at least daily when working at PVAGS.

Individuals working in high radiation areas or on high dose rate jobs are also required to have a self-indicating dosimeter in addition to the record TLD and job TLD.

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The Radiation Protection Section may establish special dosimetry requirements for certain jobs. Such dosimetry may include finger rings (TLDs), extremity badges (TLDs), neutron dosimetry or other devices. Requirement and issue will be provided by the Radiation Protection Section.

5.3.2 Internal Dosimetry

Internal dose determinations are made by special methods of body burden analysis, including whole-body counting, thyroid counting and bioassay. Additionally, for exposure to known concentrations of specific isotopes, calculation methods may be required to support dose determinations.

Whole-body counting is used to determine dose resulting from the uptake by the body of radioisotopes. Each employee who will work in the Controlled Area will normally have a whole-body count prior to initial entry into the Controlled Area. Whole-body counts will be required annually thereafter or more frequently as determined by the Radiation Protection Section.

Whole-body counting will normally be required for non-plant personnel prior to entry into Controlled Areas. Persons who have received a whole-body count at PVNGS will normally have a final whole-body count prior to termination of employment or assignment at PVNGS.

Bioassays are used as a supplement to whole-body counting for internal dose determination, except in the case of alpha or beta emitting radionuclides when it will be the primary means of dose determinations. Bioassay is the radiochemical analysis of tissues, fluids, or excretions from the body and commonly involves both urine and fecal analysis. Bioassays are performed routinely for selected personnel, as confirmation of the effectiveness of PVNGS radiation protection measures.

5.3.3 Dosimetry Records and Reporting

The Radiation Protection Section maintains personnel exposure records for all persons entering the Restricted Area and issued personnel dosimetry. Records will include previous occupational exposure prior to employment with APS at PVNGS, occupational exposure received at other facilities while employed at PVNGS, and the results of all personnel external and internal dosimetry while employed at PVNGS.

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The Radiation Protection Section issues reports pertaining to radiation exposure as required by Federal and State regulations. Radiation exposure reports include daily or weekly exposure determined from job TLDs and monthly, quarterly, and annual exposure for each individual as determined by record TLD badge results. Additionally, reports of accidental or emergency exposure as well as exposure investigations will be made as required by the Radiation Protection Section.

5.4 Radiation Protection Training

Personnel who enter the Restricted Area at PVEGS will have received prior training in radiation protection rules, regulations and requirements. Radiation protection training is considered an essential part of establishing radiation safety, a safe working environment, and implementation of the Radiation Protection Program and ALARA philosophy.

5.4.1 Requirements

Plant and non-plant personnel are trained in radiation protection prior to entry and work in the Restricted Area at PVNGS unless special approval is given to temporarily waive this requirement (Section 5.3 of this program). Additional specialized training is provided for Radiation Protection Technicians to assure proper technical knowledge and proficiency in radiation protection.

Plant and non-plant personnel are retrained in radiation protection on an annual basis. Training for Radiation Protection Section personnel is on a continuing basis.

5.4.2 Restricted Area Worker Training

Training for those persons requiring entry and work within the Restricted Area includes both theory and practical aspects of radiation protection necessary to assure the worker can perform his duties within the Restricted Area at PVNGS in a safe manner, consistent with the requirement of this program.

Restricted Area worker training is supplemented with additional and perhaps specialized training depending on the requirements for Controlled Area work and the work group involved.

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5.4.3 Radiation Protection Technician Training

Radiation Protection Technicians are given specialized training in Radiation Protection in an ongoing program to assure they maintain technical competence and proficiency, and a current knowledge of Radiation Protection rules, regulations and practices. The technician training is divided into two major categories as follows:

A. Basic Training

- Technical Technicians are required to have a basic technical education in Academic Fundamentals, Health Physics Fundamentals and Radiation Protection Training either from accredited course studies such as a technical school program, a military-nuclear program or training at PVNGS.
- Practical Radiation Protection Technicians are required to demonstrate their proficiency and skill in practical Radiation Protection applications. This demonstration will be documented through the PVNGS Basic Nuclear Qualifications and PVNGS Radiation Protection Technician Qualifications.
- B. Supplementary Training Continuing, periodic training is provided to assure technicians maintain current knowledge of Radiation Protection rules, regulations and practices. The specific area of training and frequency is determined by the Radiation Protection Supervisor and training sessions established as necessary to meet these requirements. Additionally, Radiation Protection Technicians are sent to offsite training courses, conferences and seminars, when necessary and approved, as part of their training program.

5.4.4 On-The-Job Training

Supervisors of plant personnel are responsible for providing specific on-the-job training in radiation protection work practices, contamination control, exposure control and reduction (ALARA), and other specific areas determined by the type of work and location. The Radiation Protection Section will assist the supervisors in providing this training.

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The technical competence and proficiency of plant personnel in radiation protection will be evaluated through testing, demonstration exercises and other means as appropriate. The evaluation of training and a record of the specific training provided and experience possessed are maintained for each individual. These training records may be reviewed by the Radiation Protection Section as part of the access control function.

5.5 Radiation Exposure Control

Methods of personnel exposure control are necessary to assure exposure is maintained within limits and further reduced to ALARA. Control of personnel exposure requires control of access to Controlled Areas, control over the storage, handling and use of radioactive material and use of appropriate personnel work practices.

5.5.1 Personnel Exposure Control

Each person is responsible for controlling his exposure within the limits specified and additionally to take all practical steps to reduce his exposure to "as low as reasonably achievable" (ALARA). Control of personnel exposure depends on the knowledge of good radiation/contamination area work practices, specific exposure reduction (ALARA) methods, and the current status of one's exposure. Radiation/Contamination area work practices are presented as part of the Radiation Worker Training, specific procedures developed by the Radiation Protection Section and other groups, and on-the-job training. Exposure reduction (ALARA) methods are detailed in the ALARA program which personnel will be required to be familiar with. The Radiation Protection Section will provide periodic reports giving the current exposure status for all Restricted Area workers as an aide to personnel exposure control and planning.

5.5.2 Access Control

Access to Controlled Areas at PVNGS is controlled by the use of certain administrative methods, including Radiation Exposure Permits (REP), access control points, posting, labeling and specific procedures.

Controlled area entry requires the authorization of a Radiation Exposure Permit (REP), appropriate prior training, and obtaining dosimetry from the Radiation Protection Section.

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Radiation Areas, Contamination Areas and Airborne Radioactivity Areas will be controlled by the use of control points, appropriate barriers and labeling or posting. Access to high Radiation, Contamination or Airborne Radioactive Material Areas will be controlled as required by 10CFR20, with positive physical locked barriers or other authorized means of positive physical access control. Additionally, all such areas will be posted and labeled as required by 10CFR20.

Entry into High Radiation, High Contamination, or High Airborne Radioactive Materials Areas for specific jobs requires a Radiation Exposure Permit (REP) which specifies the job to be performed and the radiation protection measures to be used for the job. Entry into such areas requires continuous monitoring (local or remote), timekeeping or other means of positive control of personnel exposure during occupancy of the area.

5.5.3 Area and Facility Control

The basis for area and facility control is defined by the requirements of 10CFR20 for the establishment and posting of Radiation Areas, High Radiation Areas, Airborne Radioactivity Areas, Contamination Areas and High Contamination Areas. The design of PVNGS is such that access to Controlled Areas and the above mentioned areas can be controlled for the purposes of radiation protection.

For the purposes of exposure control, the following controls are used at PVNGS for the establishment, posting and barricading of specific areas. All posting will be done in accordance with the requirements of 10CFR20.

	Posting Designation	At Which Posting is Required
)	Radiation Area	5 millirem/hour
	High Radiation Area	100 millirem/hour
	Locked High Radiation Area	1,000 millirem/hour
ľ	Contamination Area	2,000 dpm/100 cm ²
		$200 \text{ dpm}/100 \text{ cm}^2 \text{ alpha}$
	High Contamination Area	50,000 dpm/100 cm ² beta-gamma
		5,000 dpm/100 cm ² alpha

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III) Airborne Radioactivity Area

25% MPC for specific concentrations in 10CFR20, App. B, Table 1, Col. 1 or 7.5x10⁻¹⁰ uCi/cc for unidentified isotopes

5.6 Personnel Radiation Protection

PVNGS is operated with the philosophy of minimizing radiation and contamination levels throughout the station in order to maintain a safe working environment and reduce personnel exposure to ALARA. Specific measures are taken and equipment provided to assure personnel radiation safety and protection for the radiation and contamination levels present. Personnel protection is provided by means of specific procedures and work practices for Controlled Area work by personnel protective equipment and supplies, and by continuing assessment of the hazards present to determine appropriate corrective action when needed.

5.6.1 Personnel Protective Equipment

Personnel protective equipment for Controlled Area work includes protective clothing such as lab coats, coveralls, hoods, gloves, shoe covers and other items. The requirements for use of specific clothing items are established by the Radiation Protection Section and communicated through the Radiation Exposure Permit (REP). The protective clothing necessary depends upon the conditions encountered and as previously mentioned, facility operation is based on the philosophy of maintaining areas in the plant such that a minimum of protective clothing will be required.

Additionally, protective equipment is provided when necessary for respiratory protection. Special procedures have been developed for respiratory protection and the equipment available, use and care are detailed therein. Use of respiratory protective equipment will be allowed only for qualified and trained personnel, with no exceptions to this rule. Qualification and training are detailed in the Respiratory Protection Administrative Control procedure 75AC-0ZZ09.

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5.6.2 Controlled Area Work Requirements

Access and work in a Controlled Area requires a Radiation Exposure Permit (REP). Radiation Exposure Permits (REP) are required for routine entry, inspection, testing, equipment operation, and all maintenance work performed in the controlled area. Radiation Exposure Permits (REPs) provide the means of communicating personnel protection requirements and accountability of exposure usage by job for ALARA analysis.

General rules for Controlled Area work are issued by the Radiation Protection Section and apply to all Controlled Area Entries.

Individuals will be required to acknowledge their understanding of radiation conditions, protective and safety measures required, and their responsibility for following Controlled Area rules and practices, by signing Radiation Exposure Permits (REPs).

5.6.3 Radiation Monitoring

Monitoring of station radiological conditions is accomplished by several methods including fixed monitoring instrumentation, portable monitoring instrumentation employed by the Radiation Protection Section and monitoring instrumentation employed by personnel leaving Controlled and Restricted Areas.

Fixed monitoring instrumentation is provided throughout each unit to monitor area and process (liquid and gaseous) . systems. This instrumentation provides warning for personnel of increasing or abnormally high radiation levels in a work area and provides monitoring of process systems for controlling the transfer and release of radioactive concentrations in air and water. These systems provide records for trend analysis and information concerning emergency or accident conditions.

Portable instrumentation is utilized by the Radiation Protection Section to ascertain radiological conditions and monitor the conditions during the progress of work. This instrumentation provides a means for planning and controlling exposure of personnel and controlling radioactive material and contamination. This instrumentation provides the primary means for radiological monitoring and establishing personnel exposure control methods.

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Monitoring instrumentation is provided for personnel exiting Controlled and Restricted Areas to assure control of contamination and radioactive material. The instrumentation consists of portal monitors, hand and foot monitors and probe detectors to monitor personnel and equipment and thus prevent the spread of contamination from the controlled area and to unrestricted areas. Use of this equipment is required by all personnel upon leaving Controlled Areas.

5.7 Handling and Control of Radioactive Material

Radioactive contamination is simply radioactive material in a location where it is unwanted. The purpose of control of radioactive material at PVNGS is to control contamination and provide as clean a work area and environment as possible resulting in reduced exposure of personnel. To assure proper control of radiation and contamination, all materials and equipment to be removed from the Controlled Area and/or Restricted Area require monitoring and authorization by the Radiation Protection Section.

5.7.1 Contamination Control

Contamination Control is accomplished by several methods including establishment and posting of Contaminated Areas, controls for movement of traffic and materials, protective clothing for personnel, contamination containment methods, and proper surveillance measures to indicate corrective action when necessary.

Additionally, specific limits have been established for control of contamination within the PVNGS facility. The following working limits have been established for personnel, equipment and surfaces in both the Controlled and Restricted Areas. The basis for these limits is that contamination will be controlled such that the hazard to personnel is minimal and compliance with exposure limits (internal and external) is assured.

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A. <u>Contamination Limits for Restricted Areas</u> (Applicable to equipment and surfaces)

	Contamination Limits		
Type of Contamination	Removable (dpm/100 cm2)	Fixed (Contact)	
beta-gamma	1000	0.10 mR/Hr	
alpha	20	20 dpin/probe	

* Defined by specific survey procedures for alpha contamination monitoring.

These limits are not applicable to average levels throughout the restricted area. The above limits are allowable only for relatively small portions of the restricted area generally totalling less than 25% of the total area (excluding Controlled Areas).

B. Contamination Limits for Radioactive Storage Areas

Contamination limits for Controlled Areas apply to requirements for establishing contaminated areas, posting and access control given in Section 5.5.3 of this program. Control of contaminated equipment or materials is established as indicated below:

The second secon	Contamination	Level	(dpm/	100	cm^2)	Location	Storage	Requiremen
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>1,000 and	<2,000	(Beta-Gamma)	Controlled	Area -
>20 and	<200	(Alpha)	Controlled	Storage

>2,000 and <50,000 (Beta-Gamma) >200 and <5,000 (Alpha)

> High Contamination Area

Contaminated Area

area*

>50,000 (Beta-Gamma) >5,000 (Alpha)

Controlled storage areas shall be provided within the Controlled Areas for items contaminated with less than 2,000 dpm/100 cm² (Beta-Gamma) and 200 dpm/100 cm² (Alpha).

Contaminated equipment and material shall generally be stored in areas which are contaminated to the same range of levels as the items being stored to prevent either the items or area from becoming more contaminated due to the location of storage.

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Although levels within the Controlled Area may be greater than 1,000 dpm/100 cm² (Beta-Gamma) or 20 dpm/100 cm² (Alpha) without requiring posting as a "Contamination Area", the intent is to limit levels to less than these amounts throughout the Controlled Area locations, having "Contamination Areas" only in certain locations. Furthermore, it is the philosophy of operation to reduce the number of "Contamination Areas" to ALARA.

C. Contamination Limits for Protective Clothing

Personnel protective clothing is normally free of all removable contamination prior to use. Fixed contamination levels for protective clothing is limited to 2.0 mR/Hr (at contact). Shoe covers and gloves fixed contamination levels is limited to 5 mR/hr.

D. Personnel Contamination

Contamination of the skin and personal clothing of personnel is limited as follows:

	Contaminatie	on Limits
Type of Contamination	Removable (dpm/100 cm2)	Fixed
beta-gamma alpha	none (skin) 1000 (clothing) none (skin)	1000 dpm 1000 dpm No detectable
	20 (clothing)	20 dpm/probe

E. Concamination containment methods are used whenever practical to control contamination on equipment and surfaces. Plastic bags or other containment will be used for storage of equipment and materials. Containment work structures will be used whenever practicable to minimize the spread of contamination and promote rapid cleanup. The Radiation Protection Section will provide guidance and instructions on the installation of containment work structures.

The Radiation Protection Section provides routine and periodic surveillance of Contaminated Areas and equipment to evaluate conditions so as to determine if decontamination or special precautions are necessary.

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5.7.2 Decontamination

Contamination occurs as a result of reactor operations, maintenance, sampling, waste disposal operations, refueling and the use of radioactive materials. When contamination levels exceeds the working limits established, decontamination is preferred rather than "reclassifying" the area as a higher-level Contaminated Area. As an example, if levels in a portion of the Controlled Area increased from 1,000 dpm/100 cm² to 2,000 dpm/100 cm², rather than establishing the area as a <u>permanent</u> Contamination Area, it should be established as a temporary Contamination Area until decontaminated to the original levels or less. In accordance with the philosophy of keeping contamination levels at PVNGS as low as reasonably achievable, routine decontamination is desirable even though upper limits have not been reached.

Surfaces, areas, and equipment are decontaminated routinely to minimize personnel exposure, prevent the spread of contamination as a general condition in the plant, and to prepare for shipment, transfer or release of items from the station. It is the responsibility of each individual to perform his work in such a manner as to prevent or minimize the spread of contamination, therefore, if decontamination becomes necessary as a result of specific work activities, the personnel whose work resulted in the contamination will perform the decontamination. Decontamination work may be performed by Operations, Maintenance or others depending on the situation. The decontamination work is performed under the guidance of the Radiation Protection Section.

Supervision is responsible for planning decontamination efforts when work is to be performed in an area known to have high contamination levels.

Special decontamination equipment is available for decontamination of personnel, areas, surfaces and equipment. Additionally, special areas are provided at PVNGS for decontamination work. Specific decontamination procedures and methods will be developed by the Radiation Protection Section.

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5.7.3 Radioactive Waste Disposal

Release of radioactive material from PVNGS will be controlled within the limits specified by 10CFR20 and other applicable guidelines and regulations, and therefore all radioactive waste disposal (solid and gases) is performed under the guidance and direction of the Radiation Protection Section. Additionally, it is the policy of PVNGS to reduce the amount of radioactive material waste disposal to ALARA.

Radioactive material disposal requires the review and approval of the Radiation Protection Supervisor prior to disposal or release from PVNGS. All handling and disposal activities are performed in accordance with procedures. Material which is "clean", as indicated by meeting the limits for release to unrestricted areas, will not be disposed of as radioactive waste. Additionally, every effort will be made to minimize waste volumes prior to final disposal.

5.7.4 Control of Licensed Material

Licensed radioactive material must be strictly controlled and accounted for in accordance with the requirements of 10CFR20 and the license conditions. Requirements for obtaining and using licensable by-product material must be approved by the Radiation Protection Supervisor. The Radiation Protection Section will be notified immediately upon receipt of licensed material to allow proper monitoring, inspection, recording and storage within the period of time required by 10CFR20. All licensed material will be assigned to individuals who will act as custodians of the material and be reponsible for its safekeeping, proper use, storage and handling. Additionally, the custodians are required to maintain accountability and prove such for periodic inventories of licensed by-product material performed by the Radiation Protection Section. Disposal of any licensed by-product material is prohibited without prior notification to and approval of the Radiation Protection Supervisor.

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5.8 Radiological Incidents

Radiological incidents are events which involve the actual or potential loss of control of radioactive materials. concentrations or radiation dose rates. Loss of control creates the potential for personnel injury, damage to equipment or facilities, and financial loss due to cleanup or disposal. Prompt action is necessary to minimize the impact of or prevent the loss of control of radiological conditions. Each person is responsible for being alert to any situation which could lead to a loss of radiological control and reporting such situations promptly to the Shift Supervisor and the Radiation Protection Section. Immediate action will be taken to insure the safety of all personnel, evaluate the radiological conditions, minimize the consequences, and reestablish control as quickly as possible. The Radiation Protection Supervisor will determine if incidents require notification to the State, USNRC, or other agencies and will notify the Manager of Nuclear Operations who will effect such notifications. Information concerning some of the major incidents and responses is provided below.

5.8.1 Personnel Exposure in Excess of Limits

If an individual exceeds a personnel exposure limit, administrative or mandatory (10CFR20), or it is suspected that a limit has been exceeded, he will report to the Radiation Protection Section immediately. Such an individual will be prohibited from entering a Controlled Area until the actual dose received is ascertained. Approval and authorization from the Radiation Protection Supervisor must be obtained before he can reenter a Controlled Area. If it is suspected that the dose received could result in illness or injury, prompt medical care will be provided for the individual. Surveys and sampling by the Radiation Protection Section will be initiated upon notification of a potential overexposure to assure prompt identification of radiological conditions which the individual was exposed to. Once the initial response to protect the individual and establish the dose and radiological conditions present during the incident has been taken, an official investigation will be initiated by the Radiation Protection Supervisor to determine the cause of the incident and establish corrective actions to prevent recurrence. All reports of overexposure investigations will be sent to the Manager of Nuclear Operations, who then makes official notifications as required.

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5.8.2 Loss of Control of Radioactive Material

> Loss of control includes radioactive spills, unexpected high airborne activity, unplanned releases of radioactive materials, unexpected high radiation levels, and contamination detected outside of established Contamination Areas in excess of allowable limits. As in all radiological incidents, the initial action will be to protect personnel then minimize the spill or consequences of the loss of control and reestablish control as quickly as possible. The consequences of the loss of control will then be determined and formal investigation and reporting made as required.

5.8.3

Personnel Injury or Illness Inside a Controlled Area

Personnel injury or illness in a Controlled Area requires response which takes into consideration the radiolocial conditions present. Immediate response for serious illness or injury is to protect the injured and assure his safety and well being. Treatment of ill or injured personnel will always take precedence over contamination or radiation control. However every effort should be made to control personnel exposure and the spread of contamination without jeopardizing the person needing treatment. It is assumed that the person involved is contaminated until proven otherwise, therefore tearing of clothing, opening of wound areas, dressing wounds and all first aid measures will consider this hazard. If the ill or injured can be moved based on sound first aid practices, he should be taken as soon as possible to an area of minimal or no contamination or radiation, and a control zone will be established to prevent the spread of contamination. The Radiation Protection Section will be notified and present as soon as possible during transfer or treatment of the person to assure proper radiation protection measures are taken. Any incident involving the transport of a person out of the Controlled Area or off-site requires the constant accompaniment of Radiation Protection Personnel. Any support by personnel who have not received radiation protection training requires the constant attendance by Radiation Protection personnel. Radiation Protection Section will perform the necessary surveys and collect the necessary data to assure accurate ' dose or exposure determination for the person treated and for those providing treatment.

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5.8.4 Personnel Violations

Personnel who willfully and knowingly violate radiation protection rules, instructions or proper practices will be reported immediately. Any person observing such actions on the part of others will report such incidents to their immediate Supervisor and/or the Radiation Protection Section. Such violations include tampering with personnel or radiation monitoring devices, violation of control boundaries or administrative controls and violation of REP requirements.

5.9 Radiation Protection Records and Reports

Records and reports of radiation protection activities and radioactive material control are required by 10CFR19 and 10CFR20. The records required include those for personnel exposure, radiation surveys, monitoring, sampling and analysis, licensed material control, waste disposal, ALARA analysis, radiological control incidents and others. Radiation protection records will be readily accessible and available for audits by the USNRC and other authorized personnel.

5.9.1 Personnel Exposure Records and Reports

Records of personnel exposure and applicable reports are maintained and issued by the Radiation Protection Section and will include personnel exposure history, current exposure, body burden or bioassay analysis, reports and investigations of overexposure. Non-occupational or medical radiation exposures will not be recorded or filed. Additionally, requests and approvals for exceeding administrative control limits will be recorded and filed.

5.9.2 Radioactive Materials Records and Reports

Records are maintained and reports issued concerning the shipment, receipt, transfer use and disposal of all licensed tadioactive material. Included in such records will be the specific activity, isotopic analysis, custodians, users and methods of disposal of licensed radioactive material. Radioactive material shipment records and inventory records will be maintianed. Releases of radioactive effluents will be recorded and reported as required.

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5.9.3 Reporting Radiological Incidents

Records and reports of all radiological incidents will be maintained and will include details as to persons involved, extent of the incident, impact on personnel and the environment, and resolution of the incident, including corrective action requirements. Any incidents requiring notification to offsite authorities will be documented and filed, including records of telephone conversations and telegraph messages as well as letters or other supporting documents. A specific file will be maintained for each separate incident, containing all necessary information and appropriate approval signatures to indicate that all actions related to the incident have been completed properly.

5.10 Administrative Procedures

The Radiation Protection Section will develop administrative procedures that are applicable in carrying out this program. These procedures will be available and distributed to appropriate personnel to assure compliance with the requirements therein.

5.11 Implementing Procedures

Implementing procedures will be developed for use by Radiation Protection Section personnel in implementing the requirements of this program. Addendum for Revision 1 of the Radiation Protection Program:

21 11

Section 5.6.3 - Radiation Monitoring

Portable instruments are calibrated at least every six months to a source traceable to NBS and the Radiation Protection Section shall affix a sticker assuring the identification of those instruments in calibration. Response checks will be made at each use or daily (which ever is less frequent) and will be used to verify that the instruments are functioning properly between calibrations. The following is a generic description of the instrument calibration methods for PVNGS survey meters. The detailed procedures include the exact manufacturer's specifications and the experience and knowlege of the radiation protection personnel of PVNGS. The Radiation Protection Program (75PR-9ZZO1) defines those policies of dosimetry, exposure control and handling of radioactive material under which calibrations of instruments are accomplished.

Instructions

6. Calibration of a Survey Meter.

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- 6. .1 Place a check source near the detector probe and move range selector switch to a range that gives an up-scale reading.
- 6.____2 Push the reset button and observe meter reading dropping rapidly to zero. When reset button is released, an upscale reading will again be observed.
- 6.__.3 The response knob should be adjusted to get the most desirable compromise between speed of response and meter fluctuation.
- 6.__.4 Verify phone output by connecting headset to phone jack and listening for counts.
- 6._.5 Verify high voltage to voltage using an electrostatic voltmeter.
- 6. .6 If meter is to be calibrated to mR/h on all ranges:

Caution

All calibration adjustments are to be made with the calibrating source in a shielded position or the instrument removed from the source. At no time are adjustments to be made to the instrument where the possibility of extremity exposure is imminent.

- 6.__.6.1 Place the detector in Gamma Radiation Fields equal to about one-fourth and three-fourths scale on the meter.
- 6.__.6.2 Adjust the calibration control for the range selected until the meter reading agrees with the radiation field to within 10 percent.
- 6.__.6.3 Repeat steps 6.__.6.1 and 6.__.6.2 for each scale (x0.01, x0.1, x1.0 and x10).
- 6. .7 If the meter is to be calibrated to CPM on all ranges:

 - 6.__.7.2 Adjust Pulse Generator Frequency to correspond with approximately one-fourth and three-fourths scale meter readings and adjust the calibration control for the range selected until meter reading agrees with the frequency.

- 6.__.8 Check for meter linearity at approximately one-fourth to one-half full scale on all ranges. Readings should be within ±5% of full scale when driven with repetitive signal.
- 6. .9 Instrument Electronics Checkout:

1 1 1 1

- 6.__.9.1 Connect a variable low voltage supply to the instrument in place of batteries.
- 6. .9.2 Connect a milliammeter in series with positive lead.
- 6.__.9.3 Connect electrostatic voltmeter to the High Voltage Connector.
- 6.__.9.4 With the Variable Low voltage supply set at _____ volts, battery current should not exceed _____ milliamps, and high voltage should read between _____ and ____ volts.
- 6.__.9.5 With the Variable Low voltage supply set at _____ volts, battery current should not exceed _____ milliamps, and High Voltage should not change more than _____ volts from 6.__.9.5, nor drop below _____ volts.
- 6.__.9.6 Battery check must read at line with the Variable Low voltage supply adjusted to ____ to ____ volts.

Radiation Protection Program

Although a number of requested procedures may have been stated in the PVNGS station manual, we can only review material license application based on the information submitted. Therefore, you should provide the requested information and not refer to a document that is not in our files.

- a. Sealed source leak test procedures. Please refer to Item 15.c of the enclosed guide for what additional information you should submit.
- b. Emergency and operating procedures. We do not believe possession of licensed materials is a prerequisite to develop an emergency and operating procedure. Manufacturer's literature can be obtained without possession of the materials. This manual, to operating personnel (see Item 15(d) of the enclosed guide), should be available to your personnel prior to possession of the materials.
- c. Shipping and receiving of radioactive material. The pertinent procedures in the PVNGS station manual should be part of the information submitted for this application.

PVNGS RESPONSE FOR ITEM 3(a):

Attached is a draft sealed leak test procedure for PVNGS. Personnel who will perform this procedure will be qualified to the level of paragraph 4.5.2 ANSI 3.1 1978. The principal instruments for the radiation measurements of this procedure are programmable to output in counts or microcuries once calibrated (i.e., the calculation can be internal to the equipment). Radiological Engineers and Technicians will conduct response checks at each use or daily (whichever is less frequent) to verify that the instruments are functioning properly between calibrations.





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FREFARED DI:				DATE		
REVIEWS REQUIRED: NUCLEAR SAFETY	YES	NO	QUALITY	SECTION	YES	NO
NUCLEAR SAFETY ANALYSIS REQUIRED:	YES	NO				
TECHNICAL REVIEWER				DATE		
QUALITY SECTION				DATE		
DEPARTMENT HEAD				DATE		
PLANT REVIEW BOARD CONCURRENCE				- DATE		1
					•	
APPROVED BY:				DATE		
DN-0446A/0046A	DATE	EFFE	CTIVE			

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APPENDICES

A - Inventory and Leak Test Record	8
B - Radioactive Source Checkout Log	9
C - Source Accountability and Inventory	10





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1.0 PURPOSE/OBJECTIVE

This procedure describes the methods for leak testing and inventorying of radioactive sources. The procedure implements the requirements of PVNGS Technical Specification 3/4.7.10.

2.0 REFERENCES

2.1 Implementing References

2.1.1 PVNGS Technical Specifications

- 2.2 Developmental References
 - 2.2.1 10 CFR 20.402, Standards for Protection Against Radiation
 - 2.2.2 10 CFR 30.70, Schedule A
 - 2.2.3 10 CFR 30.71, Schedule B
 - 2.2.4 75PR-9ZZ01, Radiation Protection Program
 - 2.2.5 NUREG-0212 Revision 3, Standard Technical Specification

3.0 DEFINITIONS AND ABBREVIATIONS

- 3.1 Exempt Sources Material in individual quantities each of which does not exceed the Applicable Quantity set forth in 10CFR30.70, Schedule A or 10CFR30.71, Schedule B.
- 3.2 Non-Exempt Sources Material in individual quantities each of which exceeds the Applicable Quantity set forth in 10CFR30.70, Schedule A or 10CFR30.71, Schedule B.

4.0 JOB PLANNING

- 4.1 Resources
 - 4.1.1 Materials
 - 4.1.2.1 Smear Papers

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4.1.2.2 Scaler with G-M detector or equivalent to count beta-gamma radiations.

4.1.2.3 Tennelec LB5100 or equivalent to count alpha radiation.

4.2 Precautions

- 4.2.1 Handle all high activity sources with a remote handling device to keep personnel exposure ALARA.
- 4.2.2 Sources should be handled appropriately so as not to damage the source.
- 4.2.3 Do not directly wipe the surface of an alpha source.
- 4.3 Prerequisites

None.

5.0 INSTRUCTIONS

NOTE

Sources integral to instrumentation and not readily accessible may be tested by smearing the accessible area of the instrument that is closest to the source.

- 5.1 Leak Testing Requirements for Sources
 - 5.1.1 Each sealed source containing radioactive material either in excess of 100 microcuries of beta and/or gamma emitting material or 5 microcuries of alpha emitting material shall be free of greater than or equal to 0.005 microcuries of removable contamination. A report shall be prepared and submitted to the commission on an annual basis if sealed source or fission detector leakage tests reveal the presence of greater than or equal to 0.005 microcuries of removable contamination.
 - 5.1.2 Each category of sealed sources (excluding startup sources and fission detectors previously subjected to core flux) shall be tested at the frequencies described below:
- 5.1.2.1 Sources in use at least once per six months for all sealed sources containing radioactive material with a half-life greater than 30 days (excluding hydrogen 3), and in any form other than gas.

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- 5.1.2.2 Stored sources not in use each sealed source and fission detector shall be tested prior to use or transfer to another licensee unless tested within the previous six months. Sealed sources and fission detectors transferred without a certificate indicating the last test date shall be tested prior to being placed in use.
- 5.1.2.3 Startup sources and fission detectors each sealed startup source and fission detector shall be tested within 31 days prior to being subjected to core flux or installed in the core and following repair or maintenance to the source or detector.

5.2 Leak Testing of Beta-Gamma Sources

- 5.2.1 Remove beta-gamma source from its storage container.
- 5.2.2 Wipe the source or container with a slightly dampened smear disc. Return source to storage container.
- 5.2.3 Air dry the smear disc.
- 5.2.4 Measure activity of disc using a mini-scaler or equivalent counting equipment.
- 5.2.5 Complete the Inventory and Leak Test Record, Appendix A.
- 5.2.6 If the leak test indicates the presence of 1,000 dpm/smear of gross removable activity, the source shall be immediately withdrawn from service and the Radiation Protection Supervisor notified. This will preclude exceeding the PVNGS Technical Specifications 3/4.7.10 which states .005 microcuries per sample shall not be exceeded.
- 5.3 Leak Testing of Alpha Sources
 - 5.3.1 Remove alpha source from its storage container.

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LEAK TESTI OF RADIO	NG AND INVENTORY ACTIVE SOURCES	REVISION 1	Page 6 of 10
	CAUTI	ON	
	DO NOT DIRECTLY WIPE THE ALPHA SOURCE.	SURFACE OF THE	
5.3.2	Carefully wipe the alpha sour container with a slightly dam source to storage container.	ce periphery and pened smear disc	the , then return
5.3.3	Air dry the smear disc thorou	ighly.	
5.3.4	Measure the activity of the s LB5100 or equivalent alpha co	mear disc using ounting equipment	a Tennelec •
5.3.5	Complete the Inventory and Le	ak Test Record,	Appendix A.
5.3.6	If the leak test indicates th gross removable activity, the withdrawn from service and th Supervisor notified.	e presence of 20 source shall be a Radiation Prot	dpm/smear of immediately ection
5.4 In	ventory of Radioactive Sources		
	NOTE		
	With the exception of sources equipment, all radioactive so stored in the radiation calib in a locked area under the co department supervisor possess Radioactive Source Checkout L shall be completed each time from the locked area.	installed in or ources shall be ration facility ontrol of the ing the source. og, Appendix B a source is remov	on or ved
5.4.1	The inventory of radioactive a semi-annual basis.	sources shall be	performed on
5.4.2	All sources shall be physical inventory.	ly accounted for	by the
5.4.3	The Source Accountability and conjunction with the radioact be used to insure that accura locations is readily availabl	Inventory, Appe ive source check te information of e.	ndix C, in out log shall f all source

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- 5.4.4 A comprehensive search and investigation shall be performed by Radiation Protection personnel if a licensed source is determined to be lost or missing.
- 5.4.5 Reports of loss or theft of licensed radioactive sources will be completed in accordance with 10 CFR 20.402.
- 5.4.6 Results of completed inventories are to be forwarded to the Radiation Protection Supervisor and filed in the Radiation Protection office.

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LEAK OF	TESTING AN RADIOACTIV	D INVENTORY E SOURCES	REVISION	1	Page 8 of 10
					• •
		LAVENTORY at	nd LEAK TEST RECORD		
	Semi-Annual L Serial Number	eak Test Required	Yes	No	
	Licensable Qu	antity	Yes (No	
	Activity	2£	Date		
	Date Received				
	Use		e		
	Storage Locati Additional Inf	ormation			
		60 12 100.			
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	Date	Smear Result	Tech Initials	Remark	S
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RADIOACTIVE SOURCE CHECKOUT LOG

PVNGS	S	OURCE REMOVI	ED	SO	URCE RETURNE	D
NUMBER	DATE	TIME	SIGNATURE	DATE	TIME	SIGNATURE
					1. 1. 1. 1.	
		1.16.13				
					Sec. 1	
		SA 3 5				
		12.5.612				
						_
		15.519				
			a ma a la			
		AA	ANNEAM			
		Ca M		2	1000	
		CH 6-	1119 -			
		600-				
		and the second				
				10.11		
	5.1.1.1.1.1					
		1.				
1990						
	1000					
	-					
Contraction of the second			a start and a start			1. S.



PALO VERDE N STAT	IUCLEAR	GENERATING	PROCEDURE NO. XCOR 75RP-92226	APPENDIX C Page 1 of 1
LEAK TESTIN OF RADIOA	G AND INVEN	TORY ES	REVISION 1	Page 10 of 10
Y and INVENTORY Date Page	resent, Missing, Installed) REMARKS	SANP		
ICE ACCOUNTABILIT	LEAK TEST REQUIRED (Yes or No) (
anos	LICENSE REQUIRED (Yes or No)			
	ACTIVITY			
	SOURCE NUMBER			

PVNGS RESPONSE FOR ITEM 3(b):

Prior to individuals working with radioactive material, a Radiation Exposure Permit (REP) will be issued which will provide instructions to personnel on the following parts of Regulatory Guide 10.7:

15.d. (1) Apparel
(3) Surveys
(4) Safety Precautions
(6) Posting
and (7) Personnel Monitoring Devices

A specimen of a draft PVNGS REP form is attached and one will be completed by the Radiation Protection Section with all up-to-date measurements, job requirements, and instructions before the job can begin. All individuals on that job must be familiar with the REP.

In addition to the control by REP issue, individuals who are authorized to enter a controlled area and work with radioactive material will receive training specific to this work. The position of Regulatory Guide 8.27 has been accepted in that the duration and topics, and requirements will be utilized as a basis for the station radiation protection training program which will provide for training as required based on experience, previous training, and satisfactory completion of onsite examinations. Records will be available at the station. The training provides the instructions to personnel on parts 15.d. (2), (5), (8), (10), (11), (13) and (14) of Regulatory Guide 10.7. Part 15.d (9) is followed by the APS commitment to 10CFR Part 20 and Part 30 records storage for the life of the plant. Part 15.d (12) is not applicable to PVNGS.

	STAG	UARU KAULA	TICN AFXPOSE	IRE PERMI	T		
PVNGS I	INIT Y		LAR	Jo .		REP # 2	80001-B
VAL ID F	ROM 08:00 1014N78	TO 16:0	00 10 IAN78	A	the	.10R #	(10)
DED STA	TUS externed (30)		00,100/010			TVDE (10)
TACK B	CONDON			~	KEP	TIPE _	10)
TASK #	XXXX COMPON	ENI Recirc	Pump A (3	0)			
JOB DES	CRIPTION Replace	e Recirc Pu	ump A Seal	(60)			
MAP #	xxx LOCATION Un	it 1, conta	ainment, el	evation	597, Pump	Room (50)
REP REQ	UIRED BY 08:00, 10.	JAN78 EXP	JOB DURATI	ON <u>8</u> ho	urs PROC	ESSING P	RIORITY
RADIATI	ON SURVEY CONDITION	NS				:	
MAP # BETA-GA	xxxxSURVEY # xxxxx MMA (mR/hr) (13)	AIR SAMPL	LE ID # <u>xxx</u> AMINATION (XXX TOTA DPM) (1	L MPC FRA 3) W	CTION O ET/DRY	.000 Wet
RADIATI	ON PROTECTION REQU	IREMENTS					
INST &	SPECIAL DOSIMETRY				ANTI-C R	EQUIREME	NTS
xxSelf	Reading dosimeter				xx Plast	ic Shoe	Covers .
(23)						
RESPIRA	TORY PROTECTION RE	0				231	
	dence Time			1		231	
XX Resi	dence lime	DC 1 16 (011 22017	×			
SPECIAL GENERAL (Gener	INSTRUCTIONS (As) INSTRUCTIONS al Instructions to	RG 1.16 (required -	CLASS (10 215 Charac) ters max - will b	imum) e the sam	e for al	1 REPs)
XX Resi SPECIAL GENERAL (Gener SIGN-OF Request RP Prep RP Appr	INSTRUCTIONS (As a INSTRUCTIONS al Instructions to FS AND APPROVALS ed By_ aration_ oval	RG 1.16 (required -	CLASS (10 215 Charac ed by ANPP SS/Unit Withdraw Complete) ters max - will b Ready n/Cancel d Bv	imum) e the sam ed by	e for al	1 REPs)
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, ... PVNGS RESPONSE FOR ITEM 3(c):

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The following is a description of the PVNGS procedure for receipt of radioactive materials. The procedure is based on these developmental references:

PVNGS 2/12/82 0293

49CFR - Subchapter C, "Department Transportation - Hazardous Materials Regulations"

- 10CFR20, "Standards for Protection Against Radiation"
- 10CFR71, "Packaging of Radioactive Material for Transport and Transportation of Radioactive Material Under Certain Conditions"

75PR-9ZZ01, "Radiation Protection Program" (Enclosed)

The procedure includes the definitions of the following terms:

Closed Transport Vehicle Encapsulation Exclusive Use Fissile Classes Large Quantity Radioactive Material Limited Quantity Radioactive Material Low Specific Activity (LSA) Material Normal Form Radioactive Materials Special Form Radioactive Materials Radioactive Materials Transport Group Transport Index Mixed Lading Type "A" Packaging Type "A" Quantity Radioactive Material Type "B" Packaging Type "B" Quantity Radioactive Material

PVNGS personnel handling the receipt of radioactive materials will be familiar with these terms and will complete the following:

- 1. Review shipping documents for completeness.
- 2. Inspect the documents for discrepancies.
- 3. Record the shipment under PVNGS Logs.
- 4. Conduct the radiation and contamination level surveys.
 - (a) For the vehicle exterior.
 - (b) For the vehicle interior.
 - (c) For each shipping container.

- 5. Record these results and verify against the shipping documents.
- 6. Store materials in the designated radioactive materials storage areas.

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All radiation and contamination limits are at least as restrictive as those listed in the developmental references.

The following is a description of the PVNGS procedure for preparation of shipping documents for radioactive materials. The procedure is based on these developmental references:

- 49 CFR, "Department of Transportation Hazardous Materials Regulations"
- 10 CFR 20, "Standards for Protection Against Radiation"
- 10 CFR 71, "Packaging of Radioactive Material for Transport and Transportation of Radioactive Material Under Certain Conditions"

75PR-92201, "Radiation Protection Program" (enclosed)

10 CFR 30, "Rules of General Applicability to Domestic Licensing of By-product Material"

The procedure includes the same definitions as previously noted for the radioactive material receipt procedure.

PVNGS personnel will complete the following instructions when shipping radioactive material offsite:

- 1. Shipment must be accompanied by a radioactive shipment record.
- 2. Obtain the Radioactive Material Receipt and Shipment Survey Data worksheet.
- 3. Verify on the transferrees license that the material is authorized to be received.
- 4. Determine the transport group of the packages.
- 5. Determine the material category of the packages.
- 6. Ensure proper labeling of each package.
- 7. Check that all data blanks on paperwork are completed.
- 8. Assign a serial number to the shipment.
- 9. Total the number of packages and weight of shipment.
- 10. Complete the final requirements of the Radioactive Shipment Record.

- Complete the vehicle placarding requirements. 11.
- 12. Load vehicle.

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- Complete the vehicle radiation survey. 13.
- 14. Complete the adequate bracing or shoving of packages.
- 15. Complete the shipment file folder and shipment envelope.