J Radiological Exposure Control

Management commitment for an effective Dose Control Program (As Low As Reasonably Achievable) necessitates that detailed radiation protection measures be established and utilized during emergency situations as well as normal operating periods at the Station. These measures are described in Emergency Response Procedure 0ERP01-ZV-IN06, Radiological Exposure Guidelines. A description of applicable radiation control measures are outlined in this section.

J.1 Personnel Exposure Monitoring

The approved Station Radiation Protection Procedures provide the specific actions undertaken to determine and record individual occupational exposures on a 24 hour per day basis.

The Radiological Director or his designee is responsible to ensure that all personnel entering the Station, including visitors, vendors, contractors, construction personnel, and employees, are properly monitored for exposure to ionizing radiation.

Allowable planned emergency exposures and accident exposures to individuals have been established by the Nuclear Regulatory Commission and the Environmental Protection Agency. In all cases and events, administrative control and restriction of exposure to radiation will be monitored by the radiation protection staff in accordance with 0ERP01-ZV-IN06, Radiological Exposure Guidelines.

J.1.1 Emergency Exposure Guidelines

Environmental Protection Agency-400-R-92-001, Manual of Protective Action Guides and Protective Actions for Nuclear Incidents, is used to establish additional exposure guidelines for lifesaving actions and protection of property.

J.1.2 Emergency Exposure Limits

All questions of radiation exposure limits for emergency workers above Code of Federal Regulations, Title 10, Part 20 limits will be directed to the Emergency Director. This individual has the nondelegable authority in an emergency to authorize volunteer emergency workers to receive exposures in excess of Code of Federal Regulations, Title 10, Part 20 limits. The methods of documenting the voluntary status of the workers are authorized in Emergency Response Procedure 0ERP01-ZV-IN06, Radiological Exposure Guidelines.

J.2 Measurement of Radiation Worker Exposure

Twenty-four hour per day capabilities have been established for determining the exposure received by workers by utilization of the Radiation Protection staff. Radiation Protection personnel, under the guidance of the Radiological Manager, will issue dosimetry and maintain logs of activities. The Radiological Manager ensures the Emergency Director and Radiological Director are kept informed of the exposure of emergency responders.

J.3 Contamination Control and Preventive Measures

Preventive measures will be taken to minimize direct exposure to or ingestion of radioactive materials. This will include timely processing of all solid, liquid, and gaseous wastes using the Station radioactive waste processing systems in accordance with established plant procedures or other waste processing systems as necessary. Other contamination control measures are described in detail in the Station's Radiation Protection Program, the Emergency Response Procedures, and are summarized as follows:

In order to avoid personnel contamination or the spread of contamination in the Station areas, contaminated areas will be designated and clearly identified. Access to these areas will be controlled and appropriate protective clothing will be specified to minimize personnel contamination and the spread of contamination. Limits for the use of protective clothing are specified in the Station Radiation Protection Procedures. Personnel and equipment leaving the controlled area are monitored to assure that the limits for contamination control are met. If personnel become contaminated, Station Radiation Protection operating procedures will be implemented.

In general, contaminated areas and materials are permitted to return to normal use when areas meet the Station Radiation Protection Program contamination limits. Some areas and equipment may be returned to service prior to achieving these limits. In such cases, special precautions and measures are taken to prevent personnel contamination and to limit the spread of contamination.

J.4 Drinking Water and Food Contamination Control

Drinking water and food supplies are not allowed in contaminated or potentially contaminated areas. If the potential exists for food or water to become contaminated in normally clean areas, Radiation Protection personnel will perform appropriate surveys and sample analysis, respectively.

If contamination is found, appropriate actions will be taken based on the levels of contamination and its location.

J.4.1 Surveys of Emergency Response Facilities

Radiological surveys of the emergency response facilities and the assembly area for habitability will be performed on a frequent basis. These surveys will include radiation levels and contamination and airborne radioactivity concentrations. Drinking, smoking, and eating are prohibited during a radiological incident in areas where the potential for contamination exists.

J.4.2 Airborne Releases

In the event of an airborne release of radioactive materials, samples will be collected by Station personnel, and State and other agencies. These samples are analyzed and the results recorded and reported to the Emergency Director and the Department of State Health Services for appropriate offsite protective action recommendation decisions.

J.4.3 Colorado River & Selected Wells

Selected wells are analyzed for radioactivity as part of the Radiological Environmental Monitoring Program at the Station. Surface water from the Colorado River is sampled at several locations upstream and downstream of the Station's river discharge. These samples are analyzed for gross activity as part of the Radiological Environmental Monitoring Program.

J.5 Radiological Medical Considerations

Responses to personnel injuries are in accordance with guidelines set forth in 0POP04-ZO-0004, Personnel Emergencies and 0PGP03-ZA-0106, Emergency Medical Response Plan. Normally, in the event a personnel injury occurs in a Radiologically Controlled Area and the person requires offsite medical aid, the person will be taken to the Radiologically Controlled Area Access Control Point. The person is monitored for contamination and, if found to be below the levels for personnel contamination, the person is treated as a normal industrial accident and first aid will be supplied by Station medical assistance personnel. If additional treatment is required, the Station shall transport the person to the Matagorda General Hospital or Palacios Community Medical Center for treatment. Transportation will be provided by the site with Station medical staff in attendance or a contractor ambulance service.

J.5.1 Personnel Contamination

In the event, the person is contaminated above the levels for personnel contamination, reasonable efforts will be made to decontaminate the person at the Radiologically Controlled Area Access Control Point. If this can not be done due to the nature of the injury and/or hospitalization is required immediately, medical treatment and transportation to the hospital will take priority. The person will be placed in clean protective clothing or wrapped in a clean blanket time permitting, to minimize the spread of contamination.

J.5.2 Health Physics Supervision

A Radiation Protection Technician will accompany the individual to the hospital. Health Physics Supervision should meet the person at the hospital. The medical facility will be notified when a contaminated patient is being transported for treatment to allow for establishment of the radiological treatment area.

J.5.3 Hospital Procedures

When the victim arrives at the medical facility, the staff of the hospital will follow their procedures to handle this type of injury. Radiation Protection personnel will conduct surveys to ensure that contamination levels are kept to a minimum and will monitor for contamination until cleanup has been satisfactorily completed.

J.5.4 Contaminated Items

Contaminated items will be returned to the Station for decontamination or disposal.

J.5.5 Radiological Surveys

Radiation Protection personnel will perform radiological surveys and assist with establishing radiologically controlled area boundaries in the medical facilities.

J.6 Personnel Evacuation from Station

- *Personnel evacuated from the site due to a site evacuation shall go to an offsite Reception Center or home as determined by the Emergency Director.*
- *Reception centers are activated by the Matagorda County Emergency Management Director.*
- *The Bay City Reception Center is located at the McAllister Middle School.*
- *The Palacios Reception Center is located at the Palacios High School Field House.*
- *At the reception center, Station personnel are monitored for contamination and decontaminated, as necessary, and are registered and given emergency assistance by the reception center staff.*
- *Reception center operations are fully discussed in the Matagorda County Emergency Management Plan and Procedures.*

J.7 Offsite Assessment, Evaluation

For areas beyond the owner-controlled boundary of the Station, the Department of State Health Services, with assistance from the Governor's Division of Emergency Management, is responsible for the assessment and evaluation of protective action recommendations for the at-risk areas. The Matagorda County Emergency Management Director has the authority to accept, authorize, and implement protective actions.

- *The State of Texas radiological monitoring teams will identify contamination and/or radiation levels and assist in controlling access within the affected area.*
- *Other state agencies will take action, as necessary, to assess and control land, water, and air within the affected area for public, commercial, and agricultural use.*

J.8 Tools and Equipment

All tools and items of equipment used in the Radiologically Controlled Areas must be checked for contamination before being taken from the Radiologically Controlled Area.

- *Vehicles leaving the site will be monitored and decontaminated, as necessary.*
- *Emergency vehicles on life saving missions will not be delayed for radiological considerations.*

J.9 Exposure to Airborne Contamination

In the event of a major radiation emergency, exposure to airborne concentration of radioactivity will be limited by the following policy:

- *Whenever practicable, total internal exposure of any individual during an emergency should be maintained As Low As Reasonably Achievable.*
- *Respiratory protection will be used whenever appropriate.*
- *Exposure limits for noble gases are based on beta plus gamma radiation effects to the skin and lens of the eyes.*
- *Potassium Iodide should be issued to all onsite personnel on a voluntary basis at a General Emergency or when dose projections onsite or survey results projected exceed twenty-five (25) rem Committed Dose Equivalent to the thyroid. The issuance shall be determined by the Emergency Director and Radiological Director.*

J.10 Radiation Monitoring System

The Radiation Monitoring System monitors radioactivity in the station. This system, consisting of two subsystems, provides monitoring capability for area radiation and process/effluent stream radiation monitoring. The process/effluent Radiation Monitoring System is comprised of two smaller subsystems, the Liquid Monitoring System, and the Atmosphere Monitoring System. These Subsystems are described in Section H of this Plan and in the Station Final Safety Analysis Reports Section 9.0, 11.0, and 12.0. The Radiation Monitoring System is designed to provide output in normal and emergency operating ranges and is designed to operate in emergency radiation fields.

J.10.1 Model Description

The dose assessment models described in procedure 0ERP01-ZV-TP01, Offsite Dose Calculations, provides site specific estimates and predictions of atmospheric effluent transport and diffusion during and immediately after an airborne release. The diffusion model used meets the criteria of a Class A model as defined in NUREG-0654/FEMA-REP-1, Rev. 1 and additionally can perform X/Q calculations, dose and dose rate projections, and deposition rates for the Plume Exposure Pathway Emergency Planning Zone.

J.10.2 Area and Process/Effluent Systems

The Area and Process/Effluent Radiation Monitoring Systems are used to classify and assess radiological conditions in accordance with the Station Technical Specifications. These parameters have specific relationships to the Emergency Action Level scheme for classifications of an event by the Initiating Conditions scheme of Section D of this Plan.

J.10.3 Liquid Monitoring

The Liquid Monitoring System of the Radiation Monitoring System is designed to measure the concentration of gamma emitting radionuclides in a liquid process stream.

J.10.4 Airborne Monitoring

The Atmospheric Monitoring System of the Radiation Monitoring System is designed to measure the concentrations of particulates, iodines, and noble gases in atmospheres in the containment and within the Protected Area.

J.10.5 Area Monitoring Subsystem

The Area Radiation Monitoring System is a subsystem of the Radiation Monitoring System. It consists of offline monitors, instrumentation, and alarms that serve to prevent Station personnel from unknowingly entering areas with high radiation fields.

J.11 Radiation Survey and Sample Equipment

The Station maintains radiation survey and sample equipment of different types.

J.11.1 Portable & Fixed Survey Instruments

Sufficient quantities of portable radiation survey instruments capable of measuring alpha, beta, gamma and neutron are maintained onsite to allow for calibration, testing, maintenance and repair. Fixed and portable air monitors are used to sample, determine, and record levels of particulate, iodine, or noble gas radioactivity in Station atmospheres.

J.11.2 Offsite Monitoring

Many of these instruments may be used offsite to monitor and sample an offsite radioactive release and to detect iodines as low as 1E-7 microcuries per cubic centimeter by sample analysis outside the release plume boundaries.

J.12 Laboratory Equipment and Instruments

Available laboratory counting equipment may include gas flow proportional counters, scalers, Geiger Mueller counters, and spectroscopy equipment. This equipment is located at the Station. The laboratory equipment can provide low background beta, gamma, and alpha analysis. Laboratories used for counting and spectroscopy are available when needed seven days per week.