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AUTHOR Mark Wilburn	APPROVAL: Kathy Kiestler	

## 1. PURPOSE:

General responsibilities required of PPG under our State Radioactive Materials licenses. It is also the basis for Job Safety Instructions given to personnel working with or around radioactive materials. Additional information may be by contacting the Radiation Safety Officer.

## 2. RADIOACTIVE MATERIALS CONTROL RESPONSIBILITIES

### 2.1. Radiation Safety Officer (RSO)


- 2.1.1. Shall be a member of the Complex Safety and Health staff, reporting to the Manager of Safety and Health. The RSO shall complete such training to qualify as administrator and conduct all aspects of PPG, Lake Charles' Radioactive Materials License.
- 2.1.2. Must approve all purchase orders associated with radioactive sources, i.e. new applications, overhaul of existing sources, etc. The RSO or alternate is responsible for conducting safety surveys and leak test surveys called for in the state license, and in this procedure.
- 2.1.3. Responsible for all record keeping required by regulation and any other items required assuring compliance with applicable state and federal regulations.

### 2.2. Purchasing Department

- 2.2.1. Will insure that no radioactive or radiation producing device or material is purchased without prior approval of the RSO. The RSO is to approve each purchase requisition, issue an "83" series SAC number and attach sufficient documentation to prove to the vendor that the necessary licensure exists for the given material. Purchasing will also indicate to the warehouse that the given item contains radioactive material and that special receiving procedures are required.

### 2.3. Warehouse-Receiving Department

- 2.3.1. Upon receipt of any shipment containing radioactive or radiation producing devices or material, the Receiving Department will immediately notify either the

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RSO or alternate. The material should be separated from routine traffic areas and no attempt to open the packaging should be made. The RSO or alternate will go to the warehouse, perform the necessary safety surveys and take possession of the device and secure in the radiation storage building until it is to be installed.

2.3.1.1. Remove the outer cover of the box or shipping crate but do not remove the unit from the base skid. Visibly inspect the unit for correctness of labeling and for possible transportation damage to the shutter assembly and locking mechanism. Verify by radiation survey that the shutter is fully closed.

2.3.1.2. If visible damage is evident, the unit should be leak tested for contamination. Damage or any degree of contamination precludes installation. Contact the RSO and notify the manufacturer immediately.


## 2.4. Operating Units

2.4.1. Considered the "owner" of any nuclear gauging device present in its area. As such, they are responsible to insure that the radioactive source holder is maintained in good condition, that the beam shutter is operational at all times, and that necessary identification and signs do not become obliterated by paint, insulation, etc. The radioactive source must be considered an "energy source" for the purpose of lockout procedures prior to vessel entry or other immediate area work impacting the source holder. The owning unit will be responsible for notifying the RSO any time it becomes necessary to "lockout" the radiation source prior to maintenance work being performed. The RSO or alternate will lockout the source with a special lock. Anytime the gauge is in the "OFF" position for other than technical adjustments, it will be locked out of service.

## 2.5. Maintenance Departments

2.5.1. Maintenance Foremen of any unit utilizing radioactive sources are responsible to insure that proper safe work procedures are followed any time work is performed on or near (within a 3' radius) a nuclear gauging device. Each employee required to work on such a job will be given Job Safety Instructions (JSI) concerning the potential hazards associated with such devices.

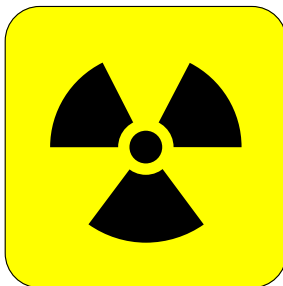
## 2.6. Vessel Inspection Group

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2.6.1. The Vessel Inspection Group coordinates the activities of industrial radiography (x-ray) contractors for the complex. Any safety related questions should be directed to their attention. See Section 5 for additional information.

### 3. GENERAL SAFETY PRECAUTIONS FOR RADIOACTIVE MATERIALS

- 3.1. Small sources of radioactive materials are used throughout the complex for two major uses: nuclear gauges and x-raying process piping or vessels.
- 3.2. Radioactive materials or areas where radiation is present are easily identified by the radiation caution symbol shown below. The "blades" of the symbol are black, purple or magenta colored, on a yellow background.

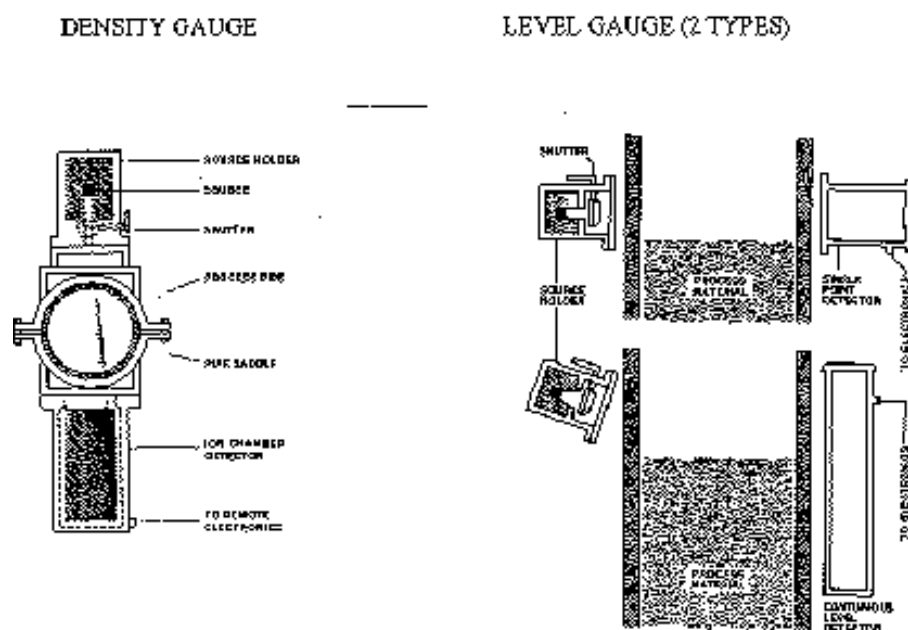


- 3.3. Areas, which are barricaded with this symbol or have restricted access, must not be entered unless you have specific authorization.
- 3.4. Always insure that radiation caution symbols in your area of responsibility have not been obstructed, obliterated, painted over, or otherwise rendered unreadable.
- 3.5. The next two sections deal specifically with the safety precautions to be observed for nuclear gauges and when industrial X-ray work is being done.

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#### 4. SAFETY PRECAUTIONS FOR WORKING ON OR NEAR NUCLEAR GAUGES

Several locations in the Lake Charles Complex use nuclear gauges to measure process densities or levels. These gauges utilize a beam of radiation, produced by a small source of radioactive material.



Nuclear gauges are designed and constructed so that they pose no danger or threat to employee health or the environment if they are used properly. However, certain safety precautions must be observed when working on or near these devices. (Near a device means working within a 3 ft. radius of a gauge, or inside a vessel which uses a nuclear level gauge.) The following points must be remembered.

- 4.1. Don't place hands/feet/body between the source holder and detector while shutter is open.
- 4.2. Never detach the radiation source holder from its mounting without approval and clearance by the RSO or alternate.

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4.3. When in service, radioactive sources are mounted in place with the shutter open – it cannot be moved for any reason without contacting the RSO or alternate. This is to assure the shutter is properly closed and the device is safe to handle.

4.4. The shutter must be closed and locked before source holders are dismantled.

4.5. Vessels which use a nuclear level gauge must never be entered unless the source shutter is closed and locked. Since the source is an "energy source", the shutter must be considered a locking point for lockout and confined space entry procedures. Before entry into a vessel or structure on which a radioactive material is mounted, a radiation survey must be performed by the RSO or alternate and recorded in that source's history file.

4.6. In certain cases, extra lead shielding has been installed to limit the spread of the radiation beam. This shielding must not be removed unless the shutter is closed and locked, and must be replaced before the shutter is re-opened.

4.7. When source holders are being moved or handled, the beam aperture end should be positioned downward or away from the body.

## 5. SAFETY PRECAUTIONS FOR INDUSTRIAL RADIOGRAPHY

### 5.1. Radiographic Vendor Requirements


(This is only a general outline - specifics can be found in Louisiana Radiation Regulations).

5.1.1. Security - The radiographer or his assistant shall maintain a direct surveillance of the operation to protect against unauthorized entry into the radiation area.

5.1.2. Posting/Barricades - Each radiation area shall be taped, barricaded or roped off and conspicuously posted with signs bearing the radiation caution symbol and the words "Caution Radiation Area".

#### 5.1.3. Monitoring:

5.1.3.1. Personnel - During operation, each radiographer or his assistant shall wear a pocket dosimeter, and either a film badge or thermo-luminescent dosimeter.

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5.1.3.2. Source - A survey meter shall be used during and after the job to monitor all radiographic activity and to insure the source has been secured after the shot.

## 5.2. PPG Personnel Obligation

5.2.1. Never cross a barricade.

5.2.2. Notify all control rooms in the vicinity prior to shooting since stray radiation in some areas may adversely affect radioactive or other control devices.

5.2.3. Observe radiographer's activities in regard to all matters above.

5.3. The radiographer's license requirements are controlled by the state and are his responsibility. However, carelessness cannot be ignored. Report all questionable procedures to Vessel Inspection Group and notify the RSO. The RSO can make spot checks on request with a survey meter.


## 6. INDUSTRIAL GAUGE INSTALLATION

6.1. "Installation" means the placement of, or supervising the placement of, the source containing components of a measurement system in an operable use condition. Each separate placement or relocation is to be construed as a new installation. The RSO will supervise any installation or relocation and perform a survey after completion of work.

6.2. ONLY THOSE PERSONS SPECIFICALLY AUTHORIZED ON PPG's STATE LICENSE TO PERFORM THIS WORK OR PERSONS AUTHORIZED BY LICENSE FROM LOUISIANA, AN "AGREEMENT STATE", OR THE NUCLEAR REGULATORY COMMISSION MAY CONDUCT INSTALLATION OF INDUSTRIAL GAUGE DEVICES. The RSO must be physically present at the site during the entire operation.

6.3. Once the requesting unit has contacted the RSO and made arrangements for the source to be installed, the device may be transported from the storage building to job location and mounted.

6.4. A radiation survey will be made by the installer/RSO in accordance with the appropriate survey pattern sheet. Generally all radiation levels measured around an installed device must be less than 5 mR/h one foot from any accessible surface. If this is not the case,

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evaluate the installation for additional shielding needs and make the operating unit aware of posting requirements.

6.5. The installer/RSO will conduct a survey and complete the appropriate survey documentation.

6.6. The RSO, as part of the permanent records for each device, will retain all survey and leak test records.

## 7. RADIATION SURVEYS AND LEAK TESTING

### 7.1. Radiation Survey Procedure

7.1.1. Upon request or at the specified interval, radiation safety surveys shall be conducted.

7.1.2. Complete all information needed on the form to assure accuracy of the survey.

7.1.3. Use of the survey instruments should be in accordance with the instrument manufacturer's instructions and training received at the radiation safety course attended.


### 7.2. Types of Radiation Surveys

7.2.1. Annual Inspection – Inventory and inspection of sources shall be performed at annually. The inspection will verify SAC#, check for operability of the shutter, source identification tags, and condition of caution signs. Inspection records will be filed in the RSO's office.

7.2.1.1. Deficiencies identified in the inspection will be tracked in the electronic safety database.

7.2.2. Receiving - shall be performed as part of the receiving procedure for any radioactive device delivered to the warehouse.

7.2.3. Shipping - shall be performed prior to packaging any device for shipment out of the complex.

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7.2.4. Confined Space Entry - shall be performed after the device is locked and prior to employee entry. Survey sheet must be filled out and placed in device's file in Industrial Hygiene office.

## 8. LEAK TESTING

### 8.1. Leak Testing Procedure

8.1.1. Follow procedures supplied with the Leak Test Kits. Do not close the shutters if the unit is running. Clear all procedures with the unit Lead Operator or Supervisor. The selected supplier will provide the leak test kits and provide documentation of results.

### 8.2. Leak Testing Frequency

- 8.2.1. Periodic - performed at three year intervals, or at intervals stated on License or by Manufacturer.
- 8.2.2. Shipping - performed prior to packaging any device for shipment out of the complex, unless a current test is available.


## 9. STORAGE AND DISPOSAL

- 9.1. When removed from use, all radioactive sources must be promptly placed in the radiation storage building. This building is always locked and may not be opened by anyone other than the RSO or alternate. Devices may not be removed without authorization of the RSO.
- 9.2. When for any reason, a radioactive or x-ray producing device is deemed unusable or otherwise not needed, the RSO must be contacted to assist in arranging for and supervise disposal in compliance with State and Federal regulations.

## 10. RECORDS

- 10.1. Each source will be assigned a separate file, which will contain the detailed history of survey and leak test records for that device. The RSO will maintain all completed survey/leak test forms.



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10.2. An activity log book will be maintained, by source number, in the Industrial Hygiene office. Summaries of all actions taken relating to a given device will be maintained in the logbook.

10.3. A utilization log for each portable licensed source or device shall be maintained. The log shall include: identification of the device, dates of use, location of use, and the name of the authorized individual using the device.

## 11. EMERGENCY PROCEDURES

11.1. Radiation emergencies can exist any time there is accidental exposure to hazardous fields of radiation or any time containment of an isotope is violated. The following items are some, but not necessarily all, of the points to be considered in the evaluations by radiation users of their readiness for emergencies which may either directly or indirectly involve radiation.

### 11.2. Radioactive Source Information


#### 11.2.1. Radioactive isotopes are used for:

Cs 137 - nuclear gauges  
Fe 55 & 109 - portable alloy analyzer

11.2.2. Description of radiation sources and their containment (e.g., source head construction, source size, etc.) - See source inventory in Industrial Hygiene Office, or RSO.

11.2.3. Location of sources - See source inventory located in Industrial Hygiene Office, or RSO.

11.2.4. Source or source containers apt to be affected by fire - Sources located in the organics plant are more likely to experience a fire than those in chlorine, caustic, silica products units, or storage.

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11.2.5. Locations, if any, where fire, explosion, etc. can cause a possible release of radioactive materials - however, due to construction and testing, sealed sources are unlikely to release any radioactive material.

11.2.6. Type and location of radiation detection instruments - Personal Dosimeter Model 3500 – located in Industrial Hygiene Office.

## **12. EMERGENCY GUIDELINES INVOLVING FIRE OR EXPLOSION AND POSSIBLE CONTAMINATION**

12.1. Notify all other persons in the unit or building at once.

12.2. Notify the fire department, plant safety personnel and the RSO.

12.3. Call for any additional advice or assistance necessary – **Call 2700.**

12.4. No one should return to the area without the approval of the RSO; maintain a list of all entrants.


12.5. Injured persons should be removed from the area of the accident with as little contact as possible and held at a transfer point.

12.6. If the incident involves fire, attempts to extinguish it should be made from as great a distance as possible avoiding smoke, fumes, or dust as much as possible.

12.7. Prepare a complete history of the emergency and subsequent activity related thereto.

13. **INCIDENT REPORT** - In the event of a radiation accident, essential facts must be obtained as promptly and accurately as possible. These facts are needed to estimate the magnitude of the incident, limit the extent of damage, and begin remedial measures. Contact the RSO to complete an incident report.


14. Sections D.403 and D.405 of the Louisiana Radiation Regulations contain specific situations that require the notification of the State Division of Nuclear Energy within a given time frame (which varies dependent on circumstances).

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## Incident Report

In the event of a radiation accident, certain essential facts must be obtained as promptly and accurately as possible. These facts are needed to estimate the magnitude of the incident, limit the extent of damage, and begin remedial measures. Contact the RSO at once and describe:

1. What happened?
2. When did it occur? (give time and date)
3. Where did it happen? (building, floor, area)
4. Who was involved? (names, employer)
5. Who was exposed? (name and the extent of injury or exposure)
6. Where is the injured or exposed person now?
7. How much damage to facilities?
  - (a) Was damage confined to company property?
  - (b) What damage was done to property of others?
8. Is radioactive contamination a problem?
  - (a) If so, how extensive is contamination? (on-site, off-site)
  - (b) What is being done to control the contamination?
9. Is outside help (fire, police, NRC) required?
10. Is medical assistance required?
11. Should personnel be evacuated?
  - (a) from the incident area or building?
  - (b) from the site?
  - (c) from the locations off-site?

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12. Who, other than me, has been notified?

13. Where can you be reached if we need you?

This verbal contact should be followed by a written report within 48 hours. Sections D.403 and D.405 of the Louisiana Radiation Regulations contain specific situations that **require** the notification of the State Division of Nuclear Energy within a given time frame!



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**PORTABLE NUCLEAR GAUGE LOG****TYPE AND SERIAL NUMBER OF UNIT:** Portable Alloy Analyzer Model #9388 – Serial #A105**STORAGE LOCATION:** Loss Prevention Inspection Office

ENTRY	DATE	NAME OF USER	LOCATION OF USE
1			
2			
3			
4			
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