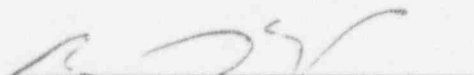


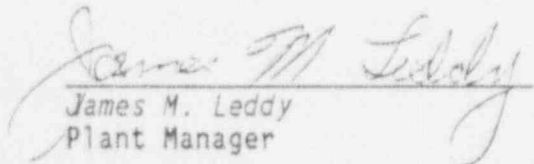
BAY COUNTY ENERGY SYSTEMS, INC.

RADIATION PROTECTION PROGRAM

Revision 0

  
Richard S. Brookins Jr.  
Industrial Hygiene, Safety,  
and Environmental Coordinator

Date 24 April 84

  
James M. Leddy  
Plant Manager

Date 4/14/84

## RADIATION SAFETY TRAINING

### 1.0 BACKGROUND

Long experience in the nuclear gaging industry with hundreds of gages, where the source is contained in a source holder, indicates that the radiation dose received by operations and maintenance personnel is below the minimum required for monitoring.

Most radioactive material used in the gaging industry is regulated by the United States Nuclear Regulatory Commission (NRC). The NRC issues licenses to users and manufacturers of gaging devices utilizing radioactive materials and inspects sites where materials are used to determine compliance with the terms and conditions of the license.

The NRC has issued rules on:

Instructions to employees (10 CFR Part 19)

The licensing of radioactive materials and devices (10 CFR Part 30)

Radiation safety (10 CFR Part 20)

In 1962, the NRC began entering into agreements with individual states to transfer regulatory authority to them. Known as "agreement states", their regulations parallel those of the NRC and are essentially identical. *Florida is an "agreement state".*

### 2.0 TIME - DISTANCE - SHIELDING

The time/distance/shielding rule is quite simple. Basically it says that the least amount of time spent in a radioactive area along with the greatest distance from the source and using the most shielding will result in the lowest possible dose of radiation received. Here at BCESI no work shall be done in area affected by the radiation sources, with the sources left on. **ALL SOURCES MUST BE IN THE CLOSED POSITION FOR WORK TO PROCEED IN THE AREA.**

### 3.0 RONAN EQUIPMENT

The Ronan measuring equipment on site uses two different size gamma emitting sources. The level gauges use a 500 ucurie source, and the weigh scales use a 100 ucurie source. Each source contains Cs-137 in a sealed source

holder (pig). Inventories and radiation surveys are performed each year. Every two years a wipe test is performed on each source holder to detect any possible leakage around the shutter. The radiation survey meters are calibrated each year to verify their accuracy.

#### 4.0 ENTERING A RADIATION AREA

Before performing work in an area affected by a radiation source, notify the Shift Supervisor. He will instruct the operations staff to close the shutter on the radiation source.

After the shutter is closed, the operations staff will verify closure using the radiation meter. *NOTE: If the rad meter is not available check the meter reading on the gauge itself. If it reads full with a known empty feed chute, the shutter is closed. This procedure is to be used ONLY if the rad meter is off site for repair, calibration, etc.*

After verification of closure of the radiation source, the Shift Supervisor will authorize entry into the area.

When work is complete, notify the Shift Supervisor, who will make arrangements for restoring the system to operation.

#### 5.0 WORK INVOLVING RADIATION SOURCES

Before any work involving the radiation sources, their supports, or their safety systems can be performed, the Radiation Safety Officer (or his designee) must be notified.

In addition to notifying the Radiation Safety Officer, before any work involving movement of radiation sources can begin arrangements must be made for securing the source (in the event of a temporary removal) or for shipment offsite (for permanent removals). **NO UNUSED SOURCES WILL BE ALLOWED TO REMAIN ON SITE**

#### 6.0 REFERENCES

Ronan Continuous Level Monitor Operating Manual

State of Florida, Department of Health and Rehabilitative Services, Control of Radiation Hazards Regulations



Pittsburgh - (W) Building  
Corporate Environmental Affairs  
C W Bickerstaff

RECEIVED  
ENVIR. AFFAIRS

MAR 31 1994

From 2166 Gateway  
WIN 272-3580  
Date March 30, 1994  
Subject Request for Inventory

To Industrial Hygiene & Safety Officers (GG)  
Environmental Control Officers (HK)  
EHS Council Members

In response to several recent radiological safety incidents, Environmental Affairs has initiated a task team comprised of corporate and business unit experts to develop a program to ensure the appropriate management of radiological sources, X-ray equipment and LASERS. The accumulated data provided to Environmental Affairs and the Environmental, Health & Safety (EHS) Council will be used to develop or modify current programs on radiation protection.

In support of this effort, you are requested to perform an inventory of radioactive sources and material licenses, X-ray equipment and LASERS in use or in storage. This inventory should include laboratory equipment usage, however do not include class 1 optical lasers for classroom lectures, nor radioactive sources found in smoke detectors. In addition, a self-audit checklist has been provided to guide your efforts in evaluating your radiation protection program.

Please complete the inventory form and return it to Wayne Bickerstaff, Manager, Industrial Hygiene-Environmental Affairs, Gateway 1574, with a copy to your business unit EHS Council Representative by April 30, 1994.

If you have specific questions or comments please contact Wayne Bickerstaff on WIN 272-3880 or 412-642-3880.

Thank you for your assistance in this effort.

William D. Wall  
Assistant General Counsel  
Environmental Affairs

## Radioactive Sources, X-Ray and Laser Equipment Inventory

### What Can Go Wrong?

- Transfer, sale or abandonment of X-ray or LASER equipment without giving notice to the state or authority prior to event.
- Removal of the interlock device or protective housing from the Class 1 LASER system which is an integral part of a Class 4 LASER.
- Receipt of, or sending a radioactive sealed source or contaminated product which is not covered by a material license of the receiver or is beyond the quantity of activity licensed or the facility has no license to possess radioactive materials.
- Removal of an unneeded sealed radioactive source from service or moving component for maintenance and not monitoring its location for storage or disposal.

All of these examples of things which can go wrong have happened and have required considerable time and money to correct. For this reason, as the holder of one or more licensed radioactive source(s), X-ray machines(s), LASER(s) or radioactive material license(s), you are requested to perform a thorough review and accounting for these devices.

The attached checklist has been provided to help perform your review of radioactive material licenses, radioactive sources, X-ray equipment, and LASERS. Please review the checklist and then complete the Inventory Form. Return the Inventory Form to Corporate Environmental Affairs with a copy to your Business Unit member of the Corporate Environmental, Health and Safety Council. For your information, following is a list of the Council representatives.

### EHS Council Business Unit Representative

Michele Dewitt	Energy Systems BU	Energy Center West 511A
Lee Elm	Thermo King	Thermo King-Minneapolis
Bob Ross	Broadcasting	Group W-Philadelphia
Jon Elmendorf	Power Generation	PGBU-Orlando MC 661
Chris Logelin	Environmental Services BU	9 Foster Plaza
Lou Newett	The Knoll Group	Knoll - East Greenville
Kay Rand	Electronic Systems	Baltimore - MS A275
Debbie Welker	Electrical Materials Division (Industrial Products and Services BU)	Manor, PA

## Self-Audit Radioactive Sources, X-Ray and LASER Equipment Checklist

1. Check all **radioactive source(s) or material license(s), X-ray equipment or LASER equipment** on site or used on a project.

Examples: Medical x-ray; laboratory detection system; density scale; electron beam welding; laser welding; radiography sources; radiography x-ray machines.

2. Review specific requirements in Nuclear Regulatory Commission (NRC) or state authority licenses including the regulatory requirements for possessing such licenses, registration, or devices, and the requirements for periodic inspection, disposal and labeling.
3. Ensure there is a designated Radiation Safety Officer (RSO), LASER Safety Officer (LSO), or responsible person for monitoring the program at the site or project.
4. Ensure that the responsible person is appropriately trained in accordance with your license, regulations, or consensus standards.
5. Validate your written procedure governing the chain of custody plan, operation, exposure minimization protocol, maintenance requirements, detection criteria, and emergency notification sequence.
6. Review your established administrative controls to limit exposure to users, bystanders, visitors, maintenance employees, and contractors.
7. Validate the procedures and systems in place to track or monitor sources and equipment on-site or on projects while in use or in storage or repair.
8. Ensure that while in use or storage, the source or equipment is protected against loss or unauthorized movement.
9. Review your training programs for personnel who might potentially be exposed to, or who work near or come in contact with, sealed source, X-ray or LASER radiation.

10. Review the requirements for transfer of a radioactive source, X-ray equipment or LASER system.
11. Review the notification requirements with your Business Unit representative, Environmental Affairs, and governmental agencies, in the event of an agency inspection, inquiry, accident or incident.
12. Ensure that your facility definitely needs every radioactive source and all X-ray or LASER equipment. (It is recommended that you promptly and properly remove any sources or equipment not used or implement a less hazardous alternative, if possible.)

**CONTACT WAYNE BICKERSTAFF (412) 642-3880 OR WIN 272-3880 OF ENVIRONMENTAL AFFAIRS IF YOU NEED ASSISTANCE IN ANY OF THE REQUIREMENTS DISCUSSED ABOVE OR IF YOU DESIRE MORE INFORMATION OR IF YOU WOULD LIKE TO DISPOSE OF ANY SOURCES OR EQUIPMENT.**

**INVENTORY OF RADIOACTIVE SOURCE AND  
MATERIAL LICENSES, X-RAY AND LASER EQUIPMENT**

Facility Name \_\_\_\_\_  
Address \_\_\_\_\_  
Business Unit \_\_\_\_\_  
Person Completing Inventory \_\_\_\_\_  
Title \_\_\_\_\_  
Phone (Bell and/or WIN) \_\_\_\_\_

- Yes, this site does have one or more licensed radioactive source(s), NRC or State Material License(s), X-ray equipment or radiography process, LASER equipment. (Fill out rest of form.) Exclude Class I optical lasers and smoke detector radioactive sources.
- No, this site does not. (Proceed no further and return form to Corporate Environmental Affairs and EHS Council business unit representative.)

I. LICENSED RADIOACTIVE SEALED SOURCE(S)

TOTAL # \_\_\_\_\_ TYPE(s) \_\_\_\_\_ Activity \_\_\_\_\_ mCi  
Licensed by \_\_\_\_\_ NRC or \_\_\_\_\_ State \_\_\_\_\_  
Use(s) \_\_\_\_\_

II. MATERIAL LICENSE(S)

TOTAL # \_\_\_\_\_ TYPE(s) \_\_\_\_\_ Limit \_\_\_\_\_ mCi  
Use(s) \_\_\_\_\_

III. LASERS

TOTAL # \_\_\_\_\_ TYPE(s) \_\_\_\_\_ POWER \_\_\_\_\_ CLASS \_\_\_\_\_  
(e.g., CO<sub>2</sub>)  
Licensed by \_\_\_\_\_ or State or other Authority \_\_\_\_\_  
Use(s) \_\_\_\_\_

IV. X-RAY EQUIPMENT

TOTAL # \_\_\_\_\_ TYPE(s) \_\_\_\_\_ POWER \_\_\_\_\_  
(e.g., MEDICAL)  
Use(s) \_\_\_\_\_

Radiation Safety Officer Name \_\_\_\_\_ Phone: \_\_\_\_\_  
Training & Qualifications (T&Q): \_\_\_\_\_

Laser Safety Officer Name: \_\_\_\_\_ Phone: \_\_\_\_\_  
T&Q: \_\_\_\_\_

Program Representative (If RSO & LSO not assigned): \_\_\_\_\_  
Phone: \_\_\_\_\_  
T&Q: \_\_\_\_\_

**Return to Wayne Bickerstaff, Corporate Environmental Affairs, with a copy to your Environmental Health and Safety Council Business Unit Representative**

If additional space is needed, please use back of sheet or copy blank form.