



GoM Region Radiation Safe Work Practice – Specifically Licensed Devices

1 Purpose/Scope

The purpose of this document is to define the BP GoM Region Radiation Protection Program to comply with the regulations set forth by the U.S. Nuclear Regulatory Commission (NRC) and with the terms of any active specific license agreement between BP and the NRC. It is also the intent of this program to reduce the exposure from occupational sources of ionizing radiation to As Low As Reasonably Achievable (ALARA) (10 CFR 20.1101) to employees and the public.

Radioactive materials, as sealed sources in devices, are used in the Gulf of Mexico (GoM) to monitor and measure density and analyze water and oil interfaces. **Currently, there is no specific license in effect between BP and the NRC and there are no specific training requirements in effect. This document covers the requirements if one were to be put into effect.**

OMS Sub Element 3.4.2 reads as follows: *"Assess exposures and risks from identified health hazards, and implement and maintain plant, process, people and performance risk reduction measures identified as necessary to manage them. Use this as an input to the entity risk register."*

2 Definitions

Dose-Pocket dosimeter – small air filled ionization chamber that measures radiation dose by responding to ionization in the air.

Leak test – check for the escape of radioactive material from a source housing.

Millirem (mrem) – a measure of the dose to the human body tissues in terms of its estimated biological effect. (1 mrem = 0.01 mSv)

Millisievert (mSv) – the SI measure of the dose to the human body tissues in terms of its estimated biological effect. (1 mSv = 100 mrem)

Radiation Area – an area, accessible to individuals, in which radiation levels could result in an individual receiving a dose equivalent in excess of 0.005 rem (0.05 mSv) in 1 hour at 30 centimeters from the radiation source or from any surface that the radiation penetrates or 100 millirem in any 5 consecutive days.

Radiation Safety Officer (RSO) – person who is responsible for overseeing Radiation Safety and the Radiation Safety Program.



Radiation Symbol – The standardized radiation presence symbol. Also known as the “*Trefoil*”.

Restricted Area – area with access controlled for the purpose of radiation protection.

Sealed Source – radioactive material sealed in a capsule designed to prevent leakage or escape of the material.

Special Form Radioactive Material – radioactive material that is either a single solid piece or is contained in a sealed capsule that can be opened only by destroying the capsule and the piece or capsule has at least one dimension not less than 5 mm (0.2 in).

3 General Requirements

Health: Due to potential health effects resulting from exposure to radiation, exposure levels should be kept As Low As Reasonably Achievable (ALARA).

Safety – Special PPE & Hazards: Minimum Personal Protective Equipment (PPE) required includes hardhat, safety glasses, gloves, hearing protection, and Fire Retardant Clothing. Survey Meters and personal dosimeters / film badges are usually not required.

Quality: The BP license requires annual calibration of survey meters, and leak tests and function tests of safety devices every six months unless a longer interval has been approved by the NRC. The Radiation Safety Officer (RSO) and authorized users shall be certified through appropriate training.

Environmental: All sources are shielded and special form radioactive material to minimize exposure and prevent release of radioactive materials.

Security: Facility employees shall establish and maintain a high level of alertness as described in the Facility Security Plan. Devices shall be secured in use and in storage.

4 Key Responsibilities

4.1 Offshore Installation Manager (OIM)/Person In Charge (PIC)

The Offshore Installation Manager (OIM)/Person in Charge (PIC) is responsible for the implementation of this procedure by ensuring that the proper resources and equipment are allocated with regard to radiation safety.

4.2 Radiation Safety Officer (RSO)

Individual responsible for technical support to the BP GoM Radiation Safety Program. Responsibilities include maintaining the appropriate license with the US NRC, auditing the program, maintaining records, notifying the NRC of any radiation emergencies, and directing any radiation work in accordance with the license. It also involves communicating with contract company RSO's when applicable. Currently, the GOM RSO is the Health and Industrial Hygiene Team Lead or their designate.

[Provide assurance the GoM Region Radiation SWP for Specifically Licensed Devices is being effectively implemented by developing and monitoring leading and lagging indicators of its effectiveness in preventing non-compliance and over exposure of personnel to radiation.](#)

Assess at defined intervals the results of self-assessments and audits to identify trends, emerging risks and opportunities to improve risk reduction measures for preventing non-compliance and over exposure to radiation.

4.3 Assistant Field Radiation Safety Officers

Responsible for assisting the RSO in the Radiation Safety Program and overseeing radiation activities with guidance from the RSO and in accordance with BP's specific license.

4.4 Authorized Users

BP Personnel who conduct radiation work (eg., safety checks) in accordance with BP's specific license and through the direction of the RSO.

5 Procedures

5.1 General Operating Procedures

The radioactive material used in the level indicator is contained in a special form sealed source double stainless steel sealed capsule, which is loaded into a shielded source housing. The source housing is plumbed directly into the vessel. Radiation passes through the product and vessel wall to a detector strip, which transmits an electronic signal to the Control Room. A Specific radioactive material license has been issued by the Nuclear Regulatory Commission for these sources.

All radioactive devices shall be maintained in accordance with the requirements of BP's license issued by the Nuclear Regulatory Commission and as outlined in this procedure.

Employees shall be trained on the location of radioactive devices when they are located on the facility. Employees shall not perform any work that will require "accessing" the radioactive source or device (i.e. removal of the device, service of the device, etc).

Source housings shall be identified by the conventional trefoil radiation symbol. The blades will be magenta on a yellow background. The sign will read: "Caution-Radioactive Materials".

Each gauge shall be operated within the manufacturer's specified temperature and applicable environmental limits such that the shielding and insertion rod/cable mechanism of the source housing is not compromised.

Any incident, Notice of Violation (NOV), leak test failure / noticeable radiation increase, or any other occurrence involving the radioactive device shall be reported immediately to the RSO and HSSE Management. Any NOV shall be submitted to the BP E & P Legal Department.

Any incident, Notice of Violation (NOV), leak test failure / noticeable radiation increase, or any other occurrence involving the radioactive device shall be investigated through the RCFA (Root Cause Failure Analysis) process.

Specific License registration fees shall be paid according to Federal and State licensing requirements.

5.2 Leak Tests, Operation Checks, and Inventory

The RSO, or appropriately trained delegate (see training section) working under the direction of the RSO, will inventory and perform operational inspections and leak tests of all nuclear sources every six months,

unless a longer term has been agreed upon by the NRC, and will complete and maintain appropriate documentation.

An inventory of all devices stating the manufacture name, isotope, activity, location, serial number and model number shall be maintained by the RSO.

Devices shall be tested for proper operation of the on-off mechanism and indicator, at intervals not to exceed 6 months or at other intervals specified by the device registration.

Leak tests shall be performed by an organization approved by the NRC or an Agreement State to provide leak-testing services or with a leak test kit supplied by an organization authorized by the NRC or an Agreement State to provide leak test kits. The leak test kit manufacturer's instructions must be followed for safety.

Sources held in storage and in use do not need to be tested. When the source is removed from storage for use or transfer to a company licensed to receive sources for disposal, it shall be tested before use or shipping.

5.3 Labeling and Signage

The source housing shall have a label that states the type and quantity of radioactive material, the date of manufacture, and the manufacturer's name. The label shall bear the conventional trefoil radiation symbol. The label shall be maintained in a readable condition. A radiation warning sign shall be posted near the source when the dose rate is equal to or greater than 5 mrem/hr at a distance of 12 inches from the surface of the gauge.

5.4 Emergency Procedures

In the event of a radiation emergency such as: Fire, Stuck Shutter, Loss or Theft, Fall or Collision or Radiation Exposure:

- Handle the immediate emergency first, and inform fire-fighting personnel that radioactive sources are in the area. As soon as the immediate emergency is taken care of:
- Isolate the areas around the source in all directions.
- Note the names of all personnel who may have been in the area
- Notify the RSO Immediately. The RSO will guide any further actions.
- Emergency Phone Numbers: a list of emergency numbers shall be kept by the RSO and shall include at a minimum the Nuclear Regulatory Commission and the device manufacturer.

In the event of a facility evacuation, any devices containing radioactive material shall be retracted into the source housing and locked in the off position. The isolation of the source complies with the current BP GoM Energy Isolation Practices and shall be documented in accordance with this practice.

Furthermore, the source housing shall be secured to the facility with a cable and lock during evacuation and shall also be documented on the isolation documentation.

5.5 Radiation Emergency Kit

An emergency radiation kit shall be available in the event a radiation emergency should occur. The kit shall be equipped with the following:

- Radiation warning signs
- 200 ft. of barricade rope
- 200 ft. of radiation hazard flagging
- Wipe test kits
- Rubber gloves
- Survey meter (spare batteries)
- Plastic bags
- Rolled plastic sheeting
- Emergency procedures

5.6 Receipt, Installation, Removal, Storage, and Disposal

Prior to purchasing radioactive devices, employees shall contact the GoM RSO. The device shall be listed on BP's license from the NRC.

When receiving radioactive materials onsite, a visual inspection shall occur to check for damage to the source housing, to ensure the ON/OFF mechanism is closed and locked, and to verify the shipment is complete.

After receiving radioactive materials onsite and prior to installation, all radioactive material shall be kept in a secured storage location. Personnel shall be notified that radioactive material is onsite. A copy of the shipping manifest and receipt shall be kept on file by the RSO.

Installation of devices shall only be performed by the manufacturer, distributor, or other personnel specifically licensed to install devices.

Devices in storage do not require leak tests or operation checks but shall remain on the facility inventory which is updated semi-annually.

Removal, transfer, and disposal of devices shall only be performed by the manufacturer, distributor, or other personnel specifically licensed to move, transport, relocate, or dispose of devices. A review by the GoM RSO of the third party license to ensure that it applies to offshore facilities under NRC jurisdiction shall be done prior to the start of any work. Agreement State licensees must have applied for reciprocity with the U.S. NRC.

A copy of records of receipt, transfer, and disposal must be kept on file by the RSO.

Sources deemed to be inoperable shall be repaired or disposed of properly to prevent accumulation and possibility of a radiation incident. Contact the RSO for assistance with inoperable sources.

NOTE: BP IS NOT AUTHORIZED TO PERFORM NON-ROUTINE ACTIVITIES AS DEFINED BY THE LICENSE AGREEMENT WITH THE NRC.

5.7 Confined Space Entry

When confined space entry is required on vessels equipped with devices containing radioactive material, the source(s) shall be retracted into the source housing and locked in the off position. Confirmation of radiation levels with a survey instrument shall be done prior to entry into the vessel. The isolation of the source complies with the current BP GoM Energy Isolation Practices and shall be documented in accordance with this practice.

5.8 Radiographic Inspection

Radiographic inspections performed by third party contractors shall be conducted under the radiography organization's license and radiation safety program. The RSO shall review the radiography contractor's license to ensure that it applies to offshore facilities under NRC jurisdiction. Agreement State licensees must have applied for reciprocity with the NRC.

5.9 Monitoring

In the event of an emergency, a radiation survey meter and pocket dosimeter shall be used by the RSO when evaluating the situation.

Because personnel monitoring is required only for individuals who could receive in excess of 500 mrem in a year, BP employees are unlikely to require dosimetry. When sources are loaded in vessels, the radiation area will be below 5 mrem/hour 12" from the vessel wall.

Exposure monitoring records are available to monitored employees upon request to the RSO.

All employees must obey radiation signs and barricaded areas established by the RSO or radiography contractors during radiography procedures.

5.10 Notices

The following items shall be posted in a conspicuous location available to all employees:

- Copies of Nuclear Regulatory Commission (NRC) Form 3
- A notice of where BP's Specific License and 10 CFR Parts 19 and 20 may be inspected
- Any Notice of Violation or citation issued by the NRC

5.11 Security

The following actions shall be implemented, where applicable, to mitigate potential threats:

- Control personnel access through security screenings at heliport.
- Establish heightened sensitivity to the presence of any suspicious packages transported by personnel or observed in the vicinity of the facility.
- Limit the potential for theft or sabotage of licensed materials by securing devices during evacuation.
- Promptly report relevant suspicious or unusual activities involving radioactive materials to the BP Offshore Installation Manager (OIM) and the RSO.

5.12 Training

- All personnel arriving at a BP facility will be given a brief notification regarding the presence and location of nuclear (radioactive sources) at the facility as part of the HSSE orientation.
 - Additional basic radiation safety awareness training will be given upon arrival to those individuals working in areas, which possess devices containing radioactive material. Content will follow the procedures set forth in this policy.
 - More detailed training will be given upon assignment to authorized users of the devices in accordance with 10 CFR 30.33(a) (3).
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- RSOs are required to receive additional training in accordance with 10 CFR 30.33(a) (3).

5.13 Auditing

Audits shall be conducted at intervals not to exceed 12 months (10 CFR 20.1101) and records for previous audits shall be maintained for three years by the RSO. The audits shall identify any deficiencies and ensure corrective actions are taken for said deficiencies.

Items to be audited include but are not limited to:

- Organization and Scope of Program
- Training and Instructions to Workers
- Radiation Survey Instruments
- Gauge Inventory
- Personnel Radiation Protection
- Public Dose
- Operating and Emergency Procedures
- Leak Tests
- Maintenance of Gauges
- Transportation
- Auditor's Independent Survey Measurements (If Made)
- Notification and Reports
- Posting and Labeling
- Record Keeping
- Bulletins and Information Notices
- Special License Conditions or Issues

5.14 Record keeping

The following records shall be retained by the RSO:

- Initial radiation survey (for reference)
- Leak tests
- Operation checks (shutter tests)
- Receipt of gauge (shipping papers)
- User training
- Transfer or disposal of material
- Maintenance records
- Monitoring records
- Survey records
- Audit records

6.0 Key Documents and References

- Nuclear Regulatory Commission 10CFR Part 19
 - Nuclear Regulatory Commission 10CFR Part 20
 - Nuclear Regulatory Commission 10CFR Part 33
 - Nuclear Regulatory Commission 10CFR Part 35
 - NRC License Number 42-29262-01
 - [BP GoM Naturally Occurring Radioactive Material \(NORM\) Manual](#)
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7.0 Revision Log

Revision Date	Authority	Custodian	Revision Details
08/28/2012	Director, Health and Safety	Health and Industrial Hygiene Team Lead	<p>Changed document title to cover Specifically Licensed Devices.</p> <p>Added OIM to Key Responsibilities Section.</p> <p>Updated to include reference to the Naturally Occurring Radioactive Material (NORM) Manual.</p> <p>Amended definition of rem to include SI conversion.</p> <p>Added the definition of the SI unit.</p> <p>Updated the definition of radiation area to match the NRC's definition.</p> <p>Defined radiation symbol as "Radiation Trefoil", and provided a pictogram. </p> <p>Updated Senior Industrial hygienist to Health and Hygiene Team Leader.</p> <p>Updated RSO training requirements with additional NRC CFR reference</p> <p>Changed document authority and custodian to Director, Health and Safety and Health and Industrial Hygiene Team Lead, respectively.</p>
12/15/08	GoM HSSE Director	GoM HSSE Programs Manager	Section 4.0 - Changed RSO to Joe Gallucci from Katie Venter. In Section 5.11-Training - Clarified the training requirements for basic radiation awareness training.
02/01/08	GoM HSSE Director	GoM HSSE Programs Manager	Initial issue.