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1.0 PURPOSE

1.1 This standard defines the minimum requirements for the safe handling of radioactive materials and instruments that emit ionizing radiation to ensure that control measures reduce MPC and contract personnel exposures to ALARA ("As Low As Is Reasonably Achievable") levels.

2.0 APPLICATION

2.1 This standard applies to all personnel who may encounter radioactive materials or instruments that emit ionizing radiation while working at the LRD. It is intended to supplement the requirements of the Radiation Protection regulations contained in the Louisiana Administrative Code (LAC) Title 33: Part XV. There are numerous low activity radioactive sources contained in process level gauges and portable analyzers in use at the Louisiana Refining Division (LRD) and periodic use of much higher activity sources used for nondestructive radiographic material testing and assessment of flow in process vessels.

3.0 IMPLEMENTATION

3.1 The implementation of the requirements outlined in the Radiation Exposure Control Standard Practice shall be adhered to on this standard's effective date.

4.0 ADMINISTRATION/RESPONSIBILITIES

4.1 Addition of New/Changes to Existing Equipment/Instruments that Emit Ionizing Radiation

The following personnel must notify and gain approval from the LRD Radiation Safety Officer (RSO) prior to acquiring new or changing any type of process equipment or analytical instrument that can emit ionizing radiation because it contains radioactive material or an x-ray tube. This notification is necessary to ensure that the LRD remains in compliance with Louisiana Department of Environmental Quality (LDEQ)/ Nuclear Regulatory Commission (NRC) regulations.

4.1.1 Engineers who plan to specify, select or design installation of new or modify the design of existing process equipment/instrument installations.

4.1.2 Instrumentation supervisors who plan to order a replacement for existing equipment/instruments.

4.1.3 Inspection, Laboratory and Warehouse supervisors that plan to order new or replacement analytical instruments.

4.1.4 Procurement representatives who have been asked to order new or replacement process equipment or analytical instruments.

4.2 Contractor

4.2.1 Contractors shall adhere to the guidelines contained in the procedure in addition to all Federal, State, and Local guidelines pertaining to radioactive materials and devices.

4.2.2 The contractor representative shall have a Radiation Safety Officer (RSO) on site when handling radioactive material at the LRD (i.e. radioactive sealed sources used for the examination of materials/welds, gauges, etc.)

4.2.3 The Contractor representative shall be responsible for obtaining the items listed below, and submitting the items to the MPC RSO for approval of all non-destructive examination X-ray companies used on MPC work.

4.2.3.1 State radiographic license

4.2.3.2 Operating & Emergency Procedure

4.2.3.3 List of qualified X-ray Technicians

4.3 LRD Radiation Safety Officer

The Radiation Safety Officers (RSO) main objective is to ensure radiological safety (ALARA) and compliance with Federal, State (Louisiana DEQ) and company requirements with conditions identified on the Radioactive Material License or Registration Certificate(s). These responsibilities include the following:

4.3.1 The LRD Radiation Safety Officer (RSO) is responsible for the development and maintenance of safe procedures for the handling of radioactive materials and sealed radiation sources at the LRD.

4.3.2 Stops activities the RSO considers unsafe.

4.3.3 Review proposals for the use of sealed radiation sources by MARATHON PETROLEUM COMPANY LP (MPC) personnel and contractors at the LRD.

4.3.4 Responsible to assure that the proposed use of radioactive materials is conducted in a safe manner and that all Federal, State and MPC safety requirements are followed.

4.3.5 Maintenance of a current sealed radiation source and X-ray source inventory, wipe test records and ensuring that the source holders are in good mechanical condition.

4.3.6 Knows the origins of radiation exposure and aware of trends in exposures.

4.3.7 Shall investigate the circumstances to radiological safety incidents to determine causes and prevent the likelihood of re-occurrence. This includes periodically reviewing procedures to identify situations in which exposures can be reduced.

4.3.8 Responsible for ensuring that the equipment utilized for radiation safety is maintained in good working order, calibrated and used properly.

4.3.9 Actively keep site personnel informed about presence of radiological hazards and how to mitigate.

4.3.10 Obtain a Radioactive Material License from Louisiana DEQ as required for each regulated radiation device source.

4.3.10.1 The Radioactive Material License is to be

renewed every five (5) years. The application for renewal shall be filed not less than 30 calendar days prior to expiration of the existing license.

4.3.10.2

4.4 Safety Department

4.4.1 The Safety Department is responsible for maintaining additional Radiation Safety Officer certified personnel to act as Alternate Radiation Safety Officers (ARSO) in the Radiation Safety Officer's absence. The ARSOs will be responsible for maintaining the guidelines contained in the Radiation Exposure Control Standard Practice in the RSO's absence.

5.0 DEFINITIONS

5.1 ***ALARA*** – As Low as Reasonably Achievable

5.2 ***Alternate Radiation Safety Officer (ARSO)*** – personnel who have completed and received certification for 40 hour Radiation Safety Training, are authorized by the LDEQ to perform the duties of the LRD RSO as a backup to the primary RSO.

5.3 ***Collocated*** – radioactive materials are to be considered aggregated or collocated if breaching a common physical security barrier would allow access to the radioactive material or devices containing the radioactive material.

5.4 ***General Public*** – anyone, including occupational workers, that are not trained/approved to handle or work with radiation

5.5 ***Ionizing Radiation*** – particulate radiation emitted from radioactive materials and electromagnetic radiation (e.g., gamma rays emitted from radioactive materials and x-rays from x-ray machines).

5.6 ***Millirem*** (mrem) – A unit of radiation dose. A millirem is equal to one-thousandth of a rem.

5.7 ***Nuclear Regulatory Commission (NRC)*** – an independent U.S. agency designated to ensure the safe use of radioactive materials by regulation through licensing, inspection, and enforcement.

5.8 **Nuclear Level Gauging Systems**- Consist of a shielded source holder, containing radioactive material, that directs gamma or neutron radiation emissions into a vessel in a tightly controlled pattern and a detector that converts radiation into an electrical signal, providing an indication of the process stream level in a vessel or pipe.

5.8.1 **Gamma emitting level gauges-** Emitted gamma rays pass through a vessel or pipe to a detector on the opposite side. If the process stream is above the level of the detector, the rays are blocked and no signal is transmitted. If the process stream is below the level of the detector, gamma rays reach the detector and transmit a signal. Radiation exposure levels around a detector are well below the LRD limit of 2 mREM/hr.

5.8.2 **Neutron Backscatter level gauges-** Emitted neutrons enter coke drums, interact with hydrogen molecules in the Coker feed, and scatter in all directions while a relatively small number of lower energy neutrons are directed back at the detector, which is located in the source holder. If coke feed in the drum is above the level of the detector, more neutrons interact with hydrogen molecules and a stronger signal transmitted. If coke feed in the drum is below the level of the detector, fewer neutrons interact with hydrogen molecules and a weaker signal is transmitted. Radiation exposure levels around a Neutron Backscatter source holder / detector are above the LRD limit of 2 mREM/hr.

5.9 **Increased Controls Requirements-** Enhanced control of radioactive materials to reduce the risk of unauthorized access or removal of radioactive materials, through access controls to aid prevention and prompt detection, assessment and response to minimize the potential for use that could result in consequences that would be detrimental to public health.

The following isotopes and aggregated activity amounts require dual means of control to maintain compliance with Radioactive Material License.

Cesium (Cs) 137 (≥27 Ci)
Americium (Am) 241 (≥16 Ci), and
Cobalt (Co) 60 (≥8.1 Ci)

At the Garyville Refinery, ≥5 Ci Cs-137 isotopes shall have two means of securement (e.g., Physical connection with bolts requiring tools & chain/lock or two separate lock & key assemblies).

5.10 ***NRC Permissible Exposure Limits*** –

5.10.1 No individual in any unrestricted area will receive a dose exceeding 2 millirems in one hour, 100 millirems in 7 days, or 5,000 millirems in any one calendar year.

5.10.2 No fetus is to be exposed to a dose exceeding 500 millirems during its term due to exposure of the mother.

5.11 ***Radioactive*** –adjective describing anything that emits radiation when an unstable atom breaks up.

5.12 ***Radiation Area*** – any area, accessible to personnel, in which there exists radiation at levels where a major portion of the body could receive in any 1 hour a dose in excess of 5 millirem, or in any 5 consecutive days a dose in excess of 100 millirem.

5.13 ***Radiation Safety Officer (RSO)*** – a person who has been selected to be responsible for overseeing radiation safety in an organization.

5.14 ***Restricted Area*** – area that has controlled access for the purpose of protecting personnel from exposure to radiation or radioactive materials.

6.0 REQUIREMENTS

6.1 Radioactive source materials may be encountered at the LRD in the form of level gauges, portable metal analyzers, and radiographic testing equipment. The protocol contained in this practice shall be followed when working with or in the vicinity of any radioactive source materials.

6.2 A complete inventory of radioactive source materials present at the LRD, indicating the date of receipt of the source, date and location of installation, radioisotope with activity (in Curies), and condition of the source(s), shall be maintained by the Safety Department and is available upon request. This inventory shall be performed annually at a minimum. Person performing this inventory (an RSO or ARSO or Radiation Gauge User) shall include their name and date when performed.

6.3 When the potential for workplace exposure to ionizing radiation exists, engineering controls will be given priority consideration to control and minimize employee exposure.

6.4 Where radioactive materials are present, keep a distance of greater than three (3) feet from any secured, sealed radiation sources used for level gauging in the Coker and a distance of greater than one (1) foot from sealed radiation sources used for level gauging elsewhere at the LRD. Remain outside barriers set up during radiographic testing.

6.5 Notify the Safety Department if work must be conducted within 3 feet of nuclear level gauging instruments in the Unit 05 and 205 Cokers or within (1) foot from sealed radiation sources used for level gauging elsewhere at the LRD.

6.6 Notify the Shift Supervisor "001" and the LRD RSO immediately, in the event of an emergency involving radioactive material.

6.7 IDENTIFICATION OF RADIATION SOURCES & AREA POSTING

6.7.1 Each source holder on instruments containing radioactive material shall bear a:

6.7.1.1 Standard Radiation Symbol

6.7.1.2 Label with the following wording: "Caution, Radioactive Material"

6.7.1.3 Label which indicates the source manufacturer, the radioisotope, its activity, date manufactured and serial number (i.e. CE Invalco, CS-137, 50mCi, 9/76, 1230).

6.7.1.4 LRD specific equipment ID# (e.g., 210-LX-1866-A).

6.7.2 Areas around source holders or receiving units accessible to individuals shall require appropriate signage where radiation levels could result in an individual receiving a dose equivalent of greater than 2 millirems in one hour shall require posting of a sign with the Standard Radiation Symbol and the words "Caution Radiation Area".

6.7.2.1 The words **Caution Radiation Area** if radiation levels exceed 5 mRem at a distance of greater that 1 foot from the nuclear level gauging system device.

6.7.2.2 The words **Caution Radioactive Material** if radiation levels are less than 5 mRem at a distance of greater than 1 foot from the nuclear level gauging system device.

6.8 HANDLING, INSTALLATION AND MAINTENANCE OF SEALED RADIATION SOURCES

6.8.1 Initial installation of a nuclear level gauging device containing a sealed radiation source must be performed by the manufacturer or manufacturer's representative authorized by the LDEQ.

6.8.2 The LRD RSO or Safety Department must be contacted prior to work on a nuclear level gauging device containing a sealed radiation source, entry into a vessel on which a nuclear level gauging device containing a sealed radiation source is mounted or if work must be conducted within 3 feet of a nuclear level gauging device with sealed radiation source is posted with a sign that reads **Caution Radiation Area** so that required energy isolation and exposure control measure determination is conducted.

6.8.3 Maintenance (including mounting and relocation) of a nuclear level gauging device containing a sealed source that involves any disassembly of the device, can only be performed by the manufacturer or those specifically authorized by the Louisiana Department of Environmental Quality (LDEQ) and approved by the Louisiana Refining

Division RSO.

6.8.4 Only the LRD RSO and ARSOs are authorized to lock shutters of nuclear level gauging device, sealed source holders in the “off” or “closed” position, for the purpose of energy isolation.

6.8.4.1 Prior to removal of the source holder or detector from a pipe or vessel.

6.8.4.2 Prior to individuals working on or adjacent to the source holder.

6.8.4.3 Whenever a vessel with a fixed gauge is empty and an individual is working around the exterior of the vessel.

6.8.4.4 Before a vessel on which a sealed source is mounted must be entered.

6.8.4.5 Whenever the sealed source is placed in storage.

6.8.4.6 The following protocol shall be followed when isolating radioactive source holders:

6.8.4.6.1 The Unit Operator or Operations Maintenance Coordinator shall contact the Safety Department to request isolation of the source.

6.8.4.6.2 The LRD RSO or an LRD ARSO shall isolate the equipment according to the manufacturer’s recommendation. At a minimum, isolation should include:

6.8.4.6.2.1 Close and lock the radioactive source shutter using a hasp that can be locked with an LRD Operations and a Radiation / Safety Department Lock. The shutter shall be in the “off” or “closed” position.

6.8.4.6.2.2 An Energy Isolation Tag shall be placed on the device noting the name of the item isolated, reason for isolation, date isolated, name of person performing the isolation, and their supervisor.
***Note*:** The radiation source shall be included in the Operations Isolation List for the equipment.

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6.8.4.6.2.3 The LRD RSO will maintain control of the radiation source lock key in the Safety Department and will remove the lock from the source holder shutter once equipment is ready to be placed back in service.

6.8.4.6.2.4 The LRD RSO or ARSO shall complete the LRD Radioactive Source Inventory & Handling Form (Paper or electronic) to document energy isolation and the radiation survey to ensure the effectiveness of the shutter source holder. The completed Radioactive Source Inventory & Handling Form shall be retained (hardcopy or electronic) on-site for a minimum of three years.

6.8.5 The LRD Instrument Technicians, who receive 40-hour Radiation Safety Training and/or radiation Level Gauge User Safety Training, are authorized by the LRD RSO to perform

tasks necessary to verify that source holder shutters and the nuclear level gauging systems are operating properly. This work involves:

6.8.5.1 Lubricating and opening and closing shutters.

6.8.5.2 Closing source holder shutters to verify that high level gauges will indicate a high process level if the condition was to occur and proper shutter function. Shall be performed at a minimum every six (6) months.

6.8.6 Leak tests for all radioactive source devices shall be performed at six month intervals by third-party service provider (e.g., BBP Sales, Inc.) unless otherwise specified by the License.

6.9 RADIATION DOSIMETRY

6.9.1 LRD does not perform radiation dosimetry quarterly or annually for occupational workers, unless specifically requested by the employee or performing Non-Routine Operations (i.e., fixed gauge relocation, installation, or alignment).

This is based upon the following calculated justification (Dose - Whole Body):

= 15 mR/hr @ 1ft (*Dual VEGA Coker Sources ALARA shielding removed*) x 0.25hr/week x 52 weeks/year

= 195 mR/Year

- <500 mREM / Year (10% of 5 REM)
- Not accessing “High Radiation Areas”, >100 mR/hr

Additionally, LRD maintains legacy dosimetry evaluations demonstrating individuals are not likely to receive in a one-year period from sources external to the body a dose in excess of 10 percent (%) of the limits specified in LAC 33:XV.410.A.

6.10 PORTABLE METAL ANALYZERS

6.10.1 Individuals shall have documentation verifying current instrument specific training prior to an individual’s use of any metal analyzer which contains radioactive material(s) or can generate X-Ray emissions

6.10.2 Utilization records shall be maintained for each portable metal analyzer. Each record should include the instrument make, model, the source serial number, source description and location and dates of use.

6.11 CONTRACTORS UTILIZING RADIOACTIVE SEALED SOURCES FOR INSPECTION

6.11.1 All contractors who utilize radioactive sealed sources for gauging and radiographic inspection within the Louisiana Refining Division complex shall be properly licensed by the State of Louisiana and/or NRC as applicable.

6.11.2 Contractors shall be responsible for the safety of their sub-contractors using radioactive sealed sources and shall submit the information listed in Section 4.1 of this document to the LRD RSO for approval prior to work being performed.

6.11.3 When radioactive materials or radiographic sources are brought into the facility, the following requirements shall be adhered to:

6.11.3.1 Contractor/sub-contractor shall be approved by the LRD RSO.

6.11.3.2 The LRD RSO must be notified of new or temporarily used sources or materials brought into the facility. This includes but is not limited to the activity of the radioactive sources(s) to be used and the location(s) where the radioactive source(s) will be used.

6.11.3.3 The contractor/sub-contractor shall be responsible for obtaining a Work Permit from the affected unit operator for the work to be performed.

6.11.3.4 It shall be the responsibility of the contractor /sub-contractor to ensure the safety of all personnel conducting radiographic testing or scanning of process vessels, control the area by means of barricade rope/tape, and post applicable signs. Signs shall read “CAUTION RADIATION AREA”. Radiographic barricades shall be established in such a manner that plant personnel will not receive an exposure in excess of 2mr in any one hour period or 100 mr in any (7) consecutive days.

6.11.3.5 Contractors/sub-contractors shall provide calibrated survey instruments and/or monitoring instruments and these instruments shall be used to assure adequate protection of personnel. These instruments shall be available for:

6.11.3.5.1 Determining the extent of the restricted work area and to assure the allowable dosage is not being exceeded.

6.11.3.5.2 Locating a lost or leaking source and to barricade such an area in an emergency.

6.11.3.5.3 Surveying the area on completion of work to assure no radioactive material has been left.

6.11.3.6 Contractors/sub-contractors performing radiography in the refinery shall NOT leave radioactive sources unattended at any time.

6.11.3.7 In the event of an accident or emergency involving radioactive materials/sources the responsible person shall notify the Operations Shift Supervisor and the LRD RSO by pressing the orange button on their radio.

6.12 AUDITS AND INSPECTIONS

6.12.1 Annually, a self-assessment of the refinery radiation safety program shall be performed by the RSO/ARSO (See Form# RSW-0164-FORM 15-GV “Radiation Protection Program Self-Assessment Checklist”). This assessment needs to be completed within 12 months of the previous self-assessment. Any corrective action plans shall be tracked to completion in Intelex or equivalent management system.

6.12.2 An HESS Audit Team and/or RSO/ARSO shall periodically audit/inspect radiographic companies performing services in the refinery to evaluate the overall safety performance of contractor(s) (See Appendix B).

Note: An unsatisfactory safety evaluation may be reason for removal from approved contractor/sub-contractor list.

6.13 EMERGENCY PROCEDURES

6.13.1 Personnel shall report all incidents involving radioactive materials immediately in accordance with the guidelines set in LRD HES Standard RSW-0124-GV, Incident Reporting and Investigation. All emergencies involving radioactive materials shall be reported to the Operations Shift Supervisor "001" and the LRD RSO by pressing the orange button on their radio.

6.13.2 The emergency procedures for radiation emergencies can be found in the LRD Integrated Contingency Plan (Section 12E – Radiation Incident).

6.13.3 Immediate actions needed in the event of an accidental radiation exposure:

- Stop all activities in the affected area(s).
- Notify Radiation Safety Officer (RSO) or Alternate Radiation Safety Officer (ARSO) in the Safety Department.
- Remove all individuals from the affected work area. Obtain written statements from each individual about their tasks, duration, and specific location(s).
- In the event of a fire/explosion that may include a radioactive source, establish an emergency barricade at 2 mR/hr boundary or a minimum of 100ft from the source and limit access within the barricade – requiring personal dosimeters for those needing to access.
- Except for injured, detain persons exposed to radioactive material until arrival or instruction of Radiation Control Authority (i.e., Louisiana DEQ).
- Notify the Louisiana DEQ if sources are compromised or if there's ANY suspicion of being compromised (e.g., lead shielding has a low melting point).
- Contact Radiation Safety Consultant (such as BBP, SunTrac Services, Inc) to initiate a radiation dose exposure estimate.

6.14 DISPOSAL

6.14.1 Disposal of all radioactive sources will be performed under the guidance of the LRD RSO.

6.14.2 Disposal of any radioactive source or source holder will be accomplished by returning them to the manufacturer utilizing an La DEQ Approved Agent. When disposal by the manufacturer is not possible (e.g., Manufacturer is no longer is business), the LRD will contact a licensee specifically authorized to possess radioactive material to assist in disposal. A licensed disposal site will be selected to dispose of the material.

6.14.3 Disposal records are maintained by the LRD RSO.

6.15 CONTACTS

6.15.1 See Appendix A for contact information of responsible personnel, source manufacturers, and regulatory agencies.

7.0 TRAINING

7.1 Training for the Radiation Exposure Control Standard Practice and revisions to this procedure will be provided to employees and contractors via the monthly HESS meeting.

7.2 MPC employees with the potential for exposure to radiation during their work at the LRD are required to complete awareness level computer-based training initially upon assignment and annually thereafter.

7.3 RSO/ARSO authorized to perform select "Non-Routine Maintenance" associated with the mounting/removing source holders need to complete hands-on "Non-Routine Maintenance Training Checklist Procedures for Removing and Remounting a Source Holder".

7.4 Radiation Level Gauge User Safety Training (Initial & Every 3 years thereafter) – See Section 6.8.5.

7.5 Individuals who operate analytical X-Ray Equipment (XRF & PMI Analyzers) need to complete equipment-specific training how to safely operate and understand radiation hazards & means to communicate concerns.

8.0 REFERENCES

8.1 29 CFR 1910.1096 - Ionizing Radiation
8.2 10 CFR 19.20 – Standards for Protection Against Radiation
8.3 HLT-2016– Radiation Safety Management Program
8.4 DOC. LIB.NO.: 311.13
8.5 Louisiana DEQ Radioactive Material License
8.6 Louisiana DEQ – Title 33, Part XV – "Radiation Protection"

9.0 APPENDICES

9.1 Contact List
9.2 Radiation Safety Contractor Audit/Inspection Report

10.0 REVISION HISTORY

Revision Number	Description of Change	Written by	Approved by	Revision Date	Effective Date
0	Change procedural format	Safety	Refinery Management Team	8/1/2009	8/1/2009
1	Definitions- added specific requirements of an ARSO. Added definition of Nuclear Level Gauging System, Gamma Emitting Level Gauges, Neutron Backscatter Level Gauges, NRC Increased. Control requirements. Added requirements for Handling, Installation and Maintenance of Sealed Radiation Sources. Grammatical changes	Chuck Whitman LRD RSO	Safety	8/1/2012	8/1/2012
2	Added requirement for notification of/approval from the LRD RSO is necessary before any changes to equipment that emits ionization radiation under Addition of New/Changes to Existing Equipment/Instruments that Emit Ionizing Radiation under ADMINISTRATION/RESPONSIBILITIES	Chuck Whitman LRD RSO	Safety	5/30/2013	5/30/2013
3	Added inadvertently deleted reference to ALARA safety principles to the standard.	Chuck Whitman LRD RSO	VPP Committee on 6/12/2014 RLT on 6/19/2014	6/20/2014	6/20/2014
4	Updated 6.10.3.2 to capture the contractor notifying 001 and the RSO of the next day's activities	Amanda Hall	Refinery Leadership Team 8/7/2014 VPP Committee- 7/17/2014	8/13/2014	8/13/2014
5	3 Year Review- No changes	Al Morales	Safety	7/30/2015	7/30/2015
6	Updated Appendix A with MPC ARSO	Amanda Fortie	Safety	1/18/2016	1/18/2016

7	**Updated Appendix A with MPC ARSO's and contact information**	**Mariah Bennett**	**Safety**	**10/25/2017**	**10/25/2017**
8	**Changed "leak" to "physical" survey in 6.8.4.5.4, in 6.10.3 removed notifications to 001 and Security of source locations daily and when sources brought into facility and added to notify LRD RSO of new sources materials brought onsite, updated contact information in Appendix A.**	**Jessica Myers**	**Safety: 7/5/2018** **VPP: 7/11/2018** **RLT: 7/19/2018**	**7/19/2018**	**7/19/2018**
9	**Included the need to retain records for energy isolation when isolating nuclear gauges (6.8.4.5.2.4) MOC #: 59863**	**Al Morales**	**VPP:11/14/18 RLT:3/14/19**	**3/14/19**	**3/14/19**
10	**Various administrative updates.** **Added need for annual self-assessment and use of form to be used.** **Updated Appendix A:** - **Names & Phone numbers** - **Company Contacts** ***No operational impacts made.***	**Alex Mapel**	**Safety**	**8/28/2020**	**8/28/2020**
11	**Annual review and updates. Changes pertain to the following:** - Procedures for select activities, - Dosimetry calculation decision, - Emergency Response Actions, & - Updated Contact Information.	**Alex Mapel**	**Safety**		**6/24/2021**
12	**Changes to reflect HLT-2016 update:** – **Radioactive Material License renewal requirements** – **Examples of items to be included in a Radioactive Source Inventory** – **Requirement for radiation sources to be included in the Operations Isolation List** **Updated RSO/ARSO Contact Information**	**Brendan Mullins**	**RLT**	**11/30/2022**	**11/30/2022**
13	**Added Appendix "D"**	**Shawn Scott**	**Safety**	**4/21/2025**	**4/21/2025**

APPENDIX A

Contact Information

NAME	PHONE NUMBER
MPC Personnel	
Shawn Scott - RSO	(985) 535-7300 – Office (419) 255-3421 - Mobile
Taiwo Oyadiran – ARSO	(419) 315-7354
Ryan Louque – ARSO	(985)742-6735
Jeremy Morgan - ARSO	(985) 535-7228
Jared Folse – Instrumentation & Analyzer Superintendent	(985)535-7391- Office (985) 212-9490- Mobile
Michael Kahl- Instrument & Analyzer Supervisor	(985) 742-7004- Office (985) 379-8762- Mobile
Consultant(s):	
David Morgan, BBP (*VEGA Representatives*)	(225)235-3666
Seth Vaccaro, BBP (*VEGA Representatives*)	(225)615-4309
Agencies	
LA DEQ - Radiation Registration & Certifications Section	(225)765-0160 – Emergency Only (225)342-1234 – All Other
Nuclear Regulatory Commission "NRC" **Note**: ***Ensure clear communication with LA DEQ when notifying NRC***	(301)816-5100 – Emergency Only (800)695-7403 – All Other
Manufacturer	
Ohmart/Vega Americas	(800)367-5383
Berthold Technologies U.S.A. LLC	(865)483-1488
HORIBA Instruments Inc.	(800)446-7422
Thermo Scientific (*includes Niton, TN Technologies & Kay-Ray/Sensall*)	(800)875-1578

Appendix B

Radiation Safety Contractor Audit/Inspection Report

Date:	**Time In:**	**Gate Entered:**
X-Ray Company/ Contractor:		
Exact Location:		
Technician (Name):	**Assistant (Name):**	
Source Type: **Iridium**_____ **Cobalt**_____ **X-Ray**_____ **Other**_____ **Serial #:**_____ **Activity:**_____		

PROCEDURES	**Satisfactory**	**Un-Satisfactory**	**N/A**
1. Copy of license			
2. Notice to Employees			
3. Source Decay Chart (Leak Test)			
4. Dosimeter Log/Report			
SAFETY EQUIPMENT			
5. Calibrated Survey Meter			
6. Film or TLD Badges Worn			
7. Dosimeters Worn and Zeroed			
8. Radiation Signs (High Radiation Area)			
9. Barricade Tape			
SAFETY OPERATIONS			
10. Permit Obtained			
11. Area Barricaded & Posted for 2mrem			
12. Plant & HES Standard Practices Followed			
13. Proper Personal Protective Equipment Used			
CLEAN UP & SECURING OPERATIONS			
14. Area Cleaned Up (Tape, Paper, etc.)			
15. Radiation Source Locked & Stored			
16. Permit Returned			
17. MPC Personnel Notified of Job Completion			

Auditor Comments:	
Auditor Evaluation: Satisfactory:_____ Un-Satisfactory:_____	
Auditor Name:	Auditor Title:

Provide completed report to RSO. A copy shall be provided to contractor and/or RSO/ARSO.

Appendix C

Basic Procedures for Select Activities

Mounting a Source Holder:

1.) Only allowed to be performed by persons who have been specifically authorized by the LaDEQ Radioactive Material License. Must be present during the entire operation.
2.) Personnel performing task shall wear personal radiation dosimetry while performing this task (e.g., Ludlum 25-IS).
3.) Communicate to all affected personnel about radiation source content and hazards.
4.) Perform a preliminary survey of the unit at the storage location. Verify radiation field is normal. If radiation field is abnormal (e.g., >5 mR/hr @ 1ft) contact RSO & restrict access.
5.) Visually inspect the source holder. Check the shutter mechanism appears to be operable and ensure external surfaces are not damaged.
6.) Ensure personnel and equipment are available to mount the unit (cranes, hoists, supports, etc.). Source holders are very heavy and can weigh up to 2,000 pounds.
7.) Mount the source holder in position per the manufacturer's engineering drawings and specifications. Ensure there is adequate clearance to operate the shutter mechanism.
8.) Ensure leak tests and radiation surveys (and posting, if required) are performed by a person specifically licensed after installation (commissioning).

Removing a Source Holder:

1.) Only allowed to be performed by persons who have been specifically authorized by the LaDEQ Radioactive Material License. Must be present during the entire operation.
2.) Personnel performing task shall wear personal radiation dosimetry while performing this task (e.g., Ludlum 25-IS).
3.) Discuss with all affected personnel how the source holder is going to be handled.
4.) Perform visual inspection (signs of damage may affect shielding).
5.) Ensure shutter mechanism is OFF and secured shut with "Radiation" Lock.
6.) Perform and document a radiation survey.

Receiving / Storing a Source Holder:

1.) Visually inspect the source holder for damage.
2.) Make sure the on/off mechanism is closed and locked with "Radiation" Lock.
3.) Ensure the shipment is complete before the truck leaves.
4.) Provide RSO paperwork for record retention requirements.
5.) Interim storage container shall be used for source holders not installed immediately. Perform a survey and coordinate a leak test to provide additional assurance is in a safe condition. Storage container is kept double locked and identified with radiation hazards.

Appendix D

XRF-PMI DEVICE USER LOG

Device Serial #	Name Print	Signature (OUT)	Date	Location Used	Signature (IN)	Date

Device must be signed out before removing it from the authorized storage area.
Device must be signed in and locked in the authorized storage area after use each day.