



August 14, 2019

Ms. Elizabeth Ulrich  
U.S. Nuclear Regulatory Commission  
Nuclear Materials Safety Region I  
2100 Renaissance Boulevard  
King of Prussia, PA 19406-2713

RE: Radioactive Materials License Number 47-11451-01  
Docket Number: 030-06692  
Control: 612632

REC-61 0819-19 PM 10:09

Dear Ms. Ulrich:

This is in response to your electronic letter of July 23, 2019 and the follow on discussion with our consultant and me. After a review of this information, it is decided to retract the Radiation Protection Manual that was submitted to your office. We will use it as our in-house training document for Authorized Users and feel free to change and amend it, as appropriate, to keep it updated.

In addition, we plan to continue the request for an amendment to the above referenced license. The need to performing non-routine services is remote; however, whenever a source holder is no longer serviceable, it must be removed from service. This non-routine task is oriented to this removal function in the event the manufacturer is not responsive or financially competitive. We have reviewed the appropriate NUREGs that provide procedures for the performing of this task. The procedures have been assembled and presented as an attachment to this request. These procedures supplement the procedures that are already on file and approved by your agency. Thank you for your review of our request. To continue:

1. This is a request to amend the above referenced license, as follows:

Change Condition 17 to read:

**17.A. "The following services shall be performed by the licensee: Installation, surveys, relocation, removal from service, and routine maintenance repair as describe in the device SSDR.**

**17.B. The following services shall not be performed by the licensee: Dismantling, alignment, replacement, disposal of sealed sources and non-routine maintenance or repair of components related to the radiological safety of the gauge (i.e., the sealed source, the source holder, source drive mechanism, on-off mechanism (shutter), shutter control (shielding). These services shall be performed only by persons specifically licensed by the U.S. Nuclear Regulatory Commission or an Agreement State to perform such services."**

612632

NMSS/RGN1 MATERIALS-002



Change Condition 20 to read:

**20.A. Prior to initial use and after installation, relocation, the licensee shall assure that a radiological survey is performed to determine radiation levels in accessible areas around, above, and below the gauge with the shutter open. This survey shall be performed by the licensee or by persons authorized by the U.S. Nuclear Regulatory Commission or an Agreement to perform such services.**

*20.B. Prior to dismantling, alignment, or any other activity involving the source or removal of the shielding, the licensee shall assure that a radiological survey is performed to determine radiation levels in accessible areas around, above, and below the gauge with the shutter open. This survey shall be performed by persons authorized by the U.S. Nuclear Regulatory Commission or an Agreement to perform such services.*

2. As an item from the Radiation Protection Manual, the annual review checklist by the RSO is attached. This was stated in the response to an inspection item that the checklist would be submitted with the Radiation Protection Manual. And, since it is being retracted, the checklist is attached in this correspondence.
3. To further provide sufficient information for your review, the nomenclature of the survey meter is the Ludlum Model 5 GM counter with a range up to 2,000 mR/hour.

During your review, if you have any questions, please contact our consultant, Ben Warren of Applied Environmental Consulting, Inc. at (352) 215-1231 or me. Thank you for your attention to this matter.

Sincerely,

Andrew Frye,  
Radiation Safety Officer

Enc. Procedures performing non-routine activities with fixed gauges  
ALARA checklist

C: Ben Warren, AEC

## **INFORMATION NEEDED TO SUPPORT APPLICANT'S REQUEST TO PERFORM NON-ROUTINE OPERATIONS ON FIXED NUCLEAR (OTHER THAN CF-252)**

**This is to confirm that the elements of Appendix J of NUREG 1556 have been reviewed. This information is to support a request to perform this work by company personnel after approval by the Agency.**

### **DEFINITIONS:**

**ADVANCED ACTIVITIES or NON-ROUTINE ACTIVITIES** include gauge installations, non-routine maintenance or service, relocations, and removal from service and placed in storage. Only the manufacturer, representatives of the manufacturer, persons specifically authorized to do so, or company AAUs, or workers under the direct supervision and in their physical presence of the AAU, are authorized to perform advanced activities. **NOTE: Gauge maintenance or repair that requires removal of the source from the source holder is prohibited.**

**ADVANCED AUTHORIZED USER (AAU)** is an employee who can do all the duties of the AU as defined below, plus issue the Radiation Work Permit (RWP) and directly supervise (in the physical presence of) the installation, relocation (removal from the pipe or tank), maintenance and repair of devices. This person must have satisfactorily completed a minimum of a 40-hour Advanced Radiation Training acceptable by the Agency or an Agreement State.

**(NOTE: No person can remove the source from the source holder)**

**ALARA** (acronym for "as low as reasonably achievable") means making every reasonable effort to maintain exposures to radiation as far below the dose limits as is practical, consistent with the purpose for which the licensed activity is undertaken, taking into account the state of technology, the economics of improvements in relation to the state of technology, the economics of improvements in relation to benefits to the public health and safety, and other social and socioeconomic considerations, and in relation to utilization of nuclear energy and license materials in the public interest. Annually, the Company is required to perform a review of the program to assure that the procedures and tasks are keeping doses to the workers and public ALARA. This report can be performed by the RSO or a qualified expert who is assisting the radiation protection program. After completion of the report, it is to be reviewed and signed by the RSO.

**ANCILLARY WORKER** is a non-occupational worker but able to assist with the permitted activity outside the radiation area boundary (e.g., crane or hoisting operator, welder or helper), shall be authorized by the AAU and be given an orientation as the radiation hazards commensurate with the job. The ancillary personnel cannot use a survey meter or make any decisions regarding dose levels. This worker's exposure rate is limited to 2 mR/hour and an annual whole body dose of 100 mrem.

**NOTE: Central Shipping & Receiving personnel are typically ancillary workers. However, they cannot sign shipping documents (incoming or outgoing) of hazardous**

**materials unless they are trained in the hazard according to 49 CFR Subpart H. These personnel are typically AUs to be qualified to survey the package to ensure the proper Transport Index and sign shipping documents involving radioactive materials.**

**AUTHORIZED USER (AU)** is able to perform all the basic activities regarding the handling of the source holders except be the supervisor of installing, relocating, maintenance and repair of a gauge. The AU can do the following: Perform an inventory, perform a leak test using an approved leak test kit, use a survey meter, perform basic repair and maintenance without removing the gauge from the pipe or tank, open and close the shutter, lock out a shutter, follow an RWP, sign as a shipper of radioactive materials (USDOT HAZMAT training every 3 years) and secure the source holder in storage.

**RADIATION SAFETY OFFICER (RSO)** is designated on the Company radioactive materials license as being responsible for managing nuclear sources and ensuring that those devices are used at the facility in compliance with applicable governmental regulations. The Radiation Safety Officer (RSO) must have received training to meet the U.S. Nuclear Regulatory Commission licensing requirements.

**RADIATION WORK PERMIT (RWP)** is a form which, when approved by the RSO or AAU, authorizes specific personnel to do specified work, to enter an area that requires special conditions and precautions and to minimize a radiological hazard. The RWP normally specifies authorized personnel, description of task to be performed and protective measures. The RWP is normally used only under special conditions, such as relocating devices and must be directly supervised by an Advanced Authorized User or RSO. However, it can be used if personnel are working for extended periods in the immediate “proximity” of a device that has been locked out. In this case, the AAU performs the calculation on the RWP and assigns the appropriate dose for the workers on that project. The RWP will be marked as a “PROXIMITY” RWP. (See RWP form)

## **DUTIES OF THE RADIATION SAFETY OFFICER**

### **Radiation Safety Officer**

1. Ensure that licensed material possessed by the licensee is limited to the kinds and quantities of radioactive material listed on the license.
2. Ensure that the source holders are used only by individuals authorized by the license.
3. Ensure that individuals using source holders are properly trained in accordance with section 6 of this Manual; are designated by the RSO and receive refresher

training.

4. If used, ensure that personnel monitoring devices are used correctly and reports of personnel exposure are reviewed in a timely manner and to alert the radiation worker in the event of a high or unusual exposure, to notify the Agency as required of the high or unusual exposure, and to investigate all such unusual exposures and take any necessary corrective action to prevent these incidents from occurring again.
5. Ensure that the source holders are properly secured against unauthorized removal when not in use.
6. Ensure that proper authorities are notified in case of accident, damage to source holders, fire or theft.
7. Ensure that audits are performed at least annually to ensure that (a) the licensee is abiding by the Agency's regulations and the terms and conditions of the license (e.g. periodic leak tests, inventories, use limited to trained, approved users), (b) the licensee's radiation protection program content and implementation achieve occupational doses and doses to members of the public that are ALARA, and (c) the licensee maintains required records with all required information (e.g. records of personnel exposure; receipt, transfer and disposal of licensed material, leak testing, inventories and training) sufficient to comply with the Agency's requirements. (See attached Checklist)
8. Ensure that all incidents, accidents and personnel exposure to radiation in excess of U.S. NRC regulations are investigated and reported to the Agency and other authorities, as appropriate, within the required time limits.
9. Ensure that licensed material is transported in accordance with all applicable USDOT requirements.
10. Ensure that licensed material is disposed of properly.
11. Ensure that the licensee has up-to-date copies of the Agency regulations, reviews new or amended Agency regulations and revises licensee procedures, as needed, to comply with Agency regulations.
12. Ensure that the license is amended whenever there are changes in licensed activities, responsible individuals, or information or commitments provided to the Agency in the licensing process.
13. Ensure that Authorized Users who have received greater than 100 mrem in a calendar year receive written notice of that dose. The RSO is to maintain a record that the employee received the notice.

14. Identify an Alternate RSO that has been trained and authorized to fulfill the responsibilities in the RSO's absence.

## **GAUGE INSTRUCTIONS**

All gauge-related operations, including routine cleaning and maintenance, must be in accordance with the gauge manufacturer's instructions and recommendations as outlined in the SSDR for that particular device.

Personnel are prohibited from entering any hopper, vessel, conveyor system, or other area where radiation levels exceed 2 mR/hour or during periods when a portion of any individual's body may be subject to the direct radiation beam until the source holder has been locked out in accordance with the gauge lock-out/tag-out procedure. The Company will review and modify, as appropriate, the "lock out/tag out" procedure whenever a new device is obtained in order to incorporate the device manufacturer's recommendations as outlined on the Sealed Source & Device Registry for that device.

### **Opening or removing a source from its housing is prohibited.**

The RSO, AAUs, AUs and company personnel shall take all appropriate actions to ensure that unauthorized personnel do not have access to the radiation sources at the plant.

The air gap between the radiation source holder and detector of the gauging device is less than 45 centimeters (18 inches). And, the air gap of the device would not allow insertion of a 30 cm (12 inch) diameter sphere into the radiation beam of the device without removal of a barrier. And, the radiation dose rate in the radiation beam of the device at 45 cm (18 inches) from the radiation source with the device shutters in the open position does not exceed 100 mrem/hour.

Prior to conducting any of the non-routine activities, an AAU is to initiate a RWP. As such, the AAU will perform a survey to assure that the shutter or closing mechanisms are functioning properly and are closed, where applicable. A record of the completion of this survey shall be made on the RWP. After the removal, relocation, maintenance or repair and the device is reinstalled, a final survey shall be performed with a record of the completion of the survey kept on the RWP.

Gauge installations and relocations will include radiation surveys. Surveys will be taken at 1 foot around the sources and at the surface of the source holder to verify that the source is properly shielded and aligned with the detector. The highest radiation level at the SURFACE is to determine dose rates for the EXTREMITY and the highest radiation level at one foot is to determine the dose rates for the WHOLE BODY. Measurements will also be performed to establish the 5 mR/hour boundary (to determine if "Caution – Radiation Area" signs must be posted). A copy of the appropriate manufacturer's operation manual or Sealed Source and Device Evaluation from the Sealed Source & Device Registry (SSDR) must be available with applicable instructions.

The Radiation Work Permit (RWP) as attached must be used for Advanced Services. An RWP is a written document remaining on-site until completion of the task. Completed copies shall be maintained for inspection by the Department.

The RWP shall:

- Authorize specific individuals to enter and work;
- Establish "Lock-Out" procedures for each device;
- Outline the specific job to be done;
- Outline instructions on the safe and correct handling procedure prior to work commencing;
- Outline survey results;
- Outline a specific time period that a given worker may conduct activities based on proximity to the source; and,
- Be placed in a plastic cover hanging on the Radiation Area Caution tape or as otherwise providing it being obviously displayed.

The RSO shall approve and document by means of a RWP the installation, relocation, or movement to storage, of devices containing radioactive materials. This documentation shall include:

- Radioactive Material (element and mass number)
- Manufacturer & model number of the sealed source & device
- Previous location (building number, name, site in building)
- New location (building no., location in bldg) - facility address
- Survey of the source holder to assure the shutter is closed. Indicate maximum survey readings taken at directional points of the device (top, bottom, etc.) both at the surface and at a distance of one foot.
- The model and serial number and calibration date of the survey instrument used.
- During the survey, a reading of greater than 5 mR/hour at 30 cm from the source shall required posting as a radiation area.
- For movement to storage, the device is to be surveyed collectively with the other sources in storage to assure that the radiation levels are within a Radiation Area level.
- Serial number of the source holder
- Date performed
- Transportation documentation, if necessary
- Persons involved in the transfer

The AAU shall inspect the site of the gauge to be removed and any area for storage of the removed gauge before the permit is issued to determine which gauge is to be handled, that the sites are safe, that safety equipment is in place, and that established safety precautions have been taken. The AAU shall assure that access to the Radiation Areas are restricted using physical barriers or having personnel immediately present to monitor ingress and egress of other personnel.

Calculated exposure shall be conducted as part of the RWP. The AAU shall utilize the calculated exposure as the assigned dose for the workers for that task. The AAU shall inspect the site before the permit is issued to close or have closed and locked the source shutter, where applicable, and survey the area with a calibrated survey meter. Based on the survey result, time restrictions must be calculated to establish time limits for work tasks based on proximity of a radiation worker to the source, thereby limiting occupational worker (AU) exposure to no more than 2 mR/hr or 125 mrem/quarter dose. This is the administrative control to assure that radiation workers will not exceed 10% of the allowable annual dose for an occupational worker.

Ancillary personnel who help with the permitted activity beyond the radiation area boundary (e.g., crane or hoisting operator, welder or helper) shall be authorized by the AAU and be given an orientation as the radiation hazards commensurate with the job. The ancillary personnel cannot use a survey meter or make any decisions regarding dose levels. Based on the survey result, time restrictions must be calculated to establish time limits for work tasks based on proximity of a ancillary worker to the source, thereby limiting individual exposure to no more than 2 mR/hr and 100 mrem/year dose. This is the regulatory limit for members of the public.

A barrier, rope, sign, or other indicator of a permit work area may be around the work area, as necessary, to advise other personnel of the restricted access area. The barrier shall be posted, "CAUTION: RADIATION AREA."

Following completion of all work and the return-to-service of the gauge, the RWP must be signed by the RSO. The completed permit then will be forwarded to the RSO's office to be filed.

Work conducted in an area where the exposure rates are less than defined as a "Radiation Area" does not require personnel monitoring. This provision of the procedures is conditional that the calculated quarterly dose for a Radiation Worker does not exceed 125 mrem per quarter; or, 10% of the quarterly dose for an occupational worker. The exception would be in the event of an emergency, such as fire or source displacement from its shielded position.

"Lock-out" procedures specific to radioactive materials as addressed in these procedures shall be observed for each device to prevent inadvertent opening by the shutter and unwanted exposure to the employees. As a minimum, these procedures shall include:

1. Review of the shutter operation to understand the shutter mechanism fully, if applicable;
2. Means to ensure the source holder is locked in the "OFF" position during maintenance, repair, relocation or other work in, on, or around the bin, tank, hopper, belt or pipe on which the device is mounted.



3. These lock-out procedures are not applicable for Low Activity Sources (LASs) with microcurie sources that do not have shutter mechanisms (per Sealed Source and Device Registry documentation). Manufacturer-supplied shipping cover will be put into shipping position for storage or transfer of these units.
4. Lockout procedures shall be posted as part of the radiation work permit.
5. Prior to return-to-service following movement of any gauge, appropriate radiation signs shall have been installed and the gauge secured in its installed location. A survey is required following installation or relocation activities. If necessary, a leak test will be performed to be in accordance with procedures outlined in the leak test procedures.
6. Conditions requiring Lock-Out
  - A. Prior to any work being performed in the immediate vicinity of a gauge radiation beam when a distance or gap exists between a gauge's radioactive source and the radiation detector that permits entry of all or a portion of a person's body into the primary radiation beam;
  - B. During any manipulation of a gauge, including the source holder or the detector, which involves physical movement of the device or separation from a pipe, vessel, etc. including installation, relocation or storage;
  - C. When individuals are working on or adjacent to a gauge during periods of shutdown;
  - D. Whenever an individual enters a vessel in which such a gauge is located; and,
  - E. Whenever a vessel with such a gauge is empty and an individual is working around the exterior of the device.
  - F. Whenever performing routine activities around the gauge as defined by the manufacturer's instructions and recommendations as described in the SSDR.
7. Lock-out/Tag-out specifications
  - A. Lockout devices will consist of either a key or combination lock capable of holding the gauge in the safe (closed) position such that the gauge cannot operate until the lock-out device is removed. Lock-out devices will be substantial enough to prevent removal without the use of excessive force or unusual techniques.
  - B. Tag-out devices will consist of a durable tag and a means of attachment that can be securely fastened to

the gauge to indicate that the gauge may not be operated until the tag-out device is removed. Tag-out devices will be substantial enough to prevent inadvertent or accidental removal, and able to withstand the ambient environment for the maximum period of time that exposure is expected. Tag-out device attachments will be of the non-reusable type, attachable by hand, self-locking, and non-releasable with a minimum unlocking strength of no less than 50 pounds, with the general design and basic characteristics at least equivalent to a one-piece, all-environment-tolerant nylon cable tie. Tag-out devices will warn against hazardous conditions if the gauge is operated and must include a legend such as Do Not Open or Do Not Operate. Tags shall be legible and understandable to all personnel who may be in the area.

- C. Lock-out and/or tag-out devices will indicate the identity of the individual applying the device(s). Lock-out and/or tag-out devices will be standardized in at least one of the following criteria: color; shape; or size, and the print and format of tag-out devices will be standardized.

#### SURVEY METER USAGE.

The RSO has the responsibility to ensure that proper instrumentation is on site for performing surveys of the gauges. The instruments shall be calibrated yearly. Training in proper usage is required prior to usage. The manufacturer's manual will be the guide for proper usage. Care and maintenance of the instrument will be in accordance with the manufacturer's instructions. Prior to usage, the instrument will be turned on, allowed to warm up, battery checked, calibration checked, response checked, then used and stored. If not usable or out of calibration, the instrument will be tagged out of service. Instrumentation performing advanced activities shall be able to measure up to 200 mR/hour.

Each radiation survey meter will be calibrated by the manufacturer or other person authorized by the USNRC or an Agreement State to perform radiation survey meter calibrations.

The Company will use radiation survey instruments that meet the criteria in Section 8.10.2, "Radiation Monitoring Instruments", in NUREG-1556, Volume 4, Revision 1, "Consolidated Guidance About Materials Licenses: Program-Specific Guidance About Fixed Gauge Licenses.

## POSTINGS

Radiation areas, such as hoppers, are required to have the following posting:



**CAUTION - RADIATION AREA  
or RADIATION HAZARD**

### Storage Areas

Each area or room where radioactive materials are used or stored shall be conspicuously posted with a sign bearing the radiation caution symbol and the words:



**CAUTION - RADIOACTIVE  
MATERIAL**

Storage areas may also require the "Caution-Radiation Area" posting. These areas shall be secured with the key under jurisdiction of the RSO, AAUs, and/or AUs. These postings shall be inspected during the gauge inventory periods to ensure that they are visible and legible,

## TRAINING PROGRAM

### Radiological Protection Training

#### 40-Hour Advanced Authorized User (AAU) Training

Advanced Authorized User training authorizes a user to conduct installation, relocation, removal of the source holder, not involving the installation, replacement or disposal of the sealed sources containing radioactive materials used in the devices. The persons performing these functions will complete a 40-hour training course authorized by the Agency. Successful completion of the course requires obtaining a score of at least 70 percent on a closed-book test consisting of at least 50 questions that have not been provided to the students before the test. Documentation of compliance with this part of the regulation will be maintained for inspection by the Agency.

#### 8-Hour Authorized User (AU) Training

**Basic Authorized User Training:** A fixed gauge Authorized User (AU) is an individual qualified to perform (and supervise the performance of) general tasks

involving a gauge that presents minimal health and safety risks (lock-outs, inspections, surveys, shutter checks, leak tests, security, care & cleaning, minor repairs not involving removal of source holder). This includes the performance of repair of the electronic detector (not the source holder), cleaning the unit, replacing a radiation symbol metal plate, or other minor repairs performed in place. AUs may participate in "advanced" activities (gauge installations, relocations, maintenance, and repair of the gauge off the pipe) only in the direct supervision of and in the physical presence of an Advanced Authorized User (AAU). These advanced activities present an increased risk of radiation exposure requiring the presence of more highly trained individuals, such as the manufacturer's representative or a 40-hour trained person.

A minimum of 8 hours of formal training provided by a training program covering the subjects listed in Agency regulations is required to qualify as a fixed gauge AU. Training will be performed by a third party knowledgeable in fixed gauge usage. If appropriate, the third party may be approved by the Agency or an Agreement State. In addition, instructions will include Operating and Emergency procedures and supervised hands-on training. Documentation of compliance with this part of the regulation will be maintained for inspection by the Agency. Successful completion of the course requires obtaining a score of at least 70 percent on a closed-book test consisting of at least 20 questions that have not been provided to the students before the test.

#### Refresher Training

Refresher training will be provided by the RSO, AAU or radiation consultant biennially. The refresher training will include participating in "dry runs" of the emergency procedures and reviewing (1) operating and emergency procedures, including lock-out/tag-out procedures as appropriate, (2) changes in applicable regulations or license conditions, and (3) deficiencies identified during the performance of annual audits or Agency inspections of the radiation protection program. Refresher training may also include review of applicable Agency's Information Notices and Bulletins and update of HAZMAT Transportation of industrial gauges for the Authorized Users assisting with incoming or outgoing shipments. Typical refresher training will last 2-4 hours. Records will be kept of employees' satisfactory completion of refresher training.

#### Ancillary Workers

Ancillary personnel who help with the permitted activity (e.g., crane or hoisting operator, welder or helper) shall be authorized by the AAU and be given an orientation as the radiation hazards commensurate with the job. The ancillary worker cannot use a survey meter or make any decisions regarding dose levels. When evaluating the exposure rate from the locked out gauge, the AAU will calculate the amount of time to limit the worker so as to prevent the worker from exceeding 2 mrem/hour dose. (See the RWP checklist for details)

This is confirmation that the Company has reviewed NUREG 1556 which discusses, in general, licensee responsibilities before any non-routine activity is performed. Non-routine operations, which require specific authorization by the U.S. Nuclear Regulatory Commission (NRC) or an Agreement State, include gauge installation; initial radiation survey; repair and maintenance of radiological safety components; gauge relocation; replacement and disposal of sealed sources; gauge alignment; or removal of a gauge from service were also reviewed.

**APPENDIX B**

**RADIOACTIVE MATERIALS MANAGEMENT AUDIT CHECKLIST  
ALARA PROGRAM**

**FACILITY:** \_\_\_\_\_  
**COMPLETED BY:** \_\_\_\_\_

**DATE:** \_\_\_\_\_  
**SIGNATURE:** \_\_\_\_\_

**PLEASE CHECK CORRECT ANSWER**

- |   |                              | <u>On Hand?</u>             |                              |  |
|---|------------------------------|-----------------------------|------------------------------|--|
| 1. Facility Radioactive Materials License Number & amendments   | Yes <input type="checkbox"/> | No <input type="checkbox"/> | GL <input type="checkbox"/>  |  |
| 2. Is the license correspondence available?   | Yes <input type="checkbox"/> | No <input type="checkbox"/> | GL <input type="checkbox"/>  |  |
| 3. Are copies of the following available at the facility?   | Yes <input type="checkbox"/> | No <input type="checkbox"/> |                              |  |
| • USNRC Regulations.?   | Yes <input type="checkbox"/> | No <input type="checkbox"/> |                              |  |
| • Operating & emergency procedures for all sources?   | Yes <input type="checkbox"/> | No <input type="checkbox"/> |                              |  |
| 4. Has the facility received any radioactive sources in the last year?<br>If yes, attach receipt.   | Yes <input type="checkbox"/> | No <input type="checkbox"/> | GL <input type="checkbox"/>  |  |
| 5. Has each Cs-137, Co-60 and Cf-252 source been tested for leakage<br>and/or contamination at intervals not to exceed 6 to 36 months,<br>depending on the radioisotope? If not, state discrepancy. | Yes <input type="checkbox"/> | No <input type="checkbox"/> | N/A <input type="checkbox"/> |  |
| <hr/>   |                              |                             |                              |  |
| a. Has the RSO signed the leak test results page?   | Yes <input type="checkbox"/> | No <input type="checkbox"/> | N/A <input type="checkbox"/> |  |
| b. Do any of the tests reveal contamination of 0.005 microcuries or<br>more?  | Yes <input type="checkbox"/> | No <input type="checkbox"/> | N/A <input type="checkbox"/> |  |
| 6. Leak Test kit supplier _____   |                              |                             |                              |  |
| 7. Fixed gauge installation, relocation, maintenance, repair or initial<br>radiation survey was performed in last 12 months?  | Yes <input type="checkbox"/> | No <input type="checkbox"/> | N/A <input type="checkbox"/> |  |
| If yes, RWP completed for each?   | Yes <input type="checkbox"/> | No <input type="checkbox"/> | N/A <input type="checkbox"/> |  |
| 8. Is an inventory of all sources located at the facility performed within six<br>(6) months interval?  | Yes <input type="checkbox"/> | No <input type="checkbox"/> | N/A <input type="checkbox"/> |  |

*Dates of inventories:* \_\_\_\_\_

9. Any other inventories performed? Yes ☐ No ☐ N/A ☐

10. Are any sources received/ shipped this year? If so, provide details.

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## **WALK THROUGH**

11. Are the following forms posted?
- |   |                              |                             |                              |
|---|------------------------------|-----------------------------|------------------------------|
| • Notices of violation?   | Yes <input type="checkbox"/> | No <input type="checkbox"/> | N/A <input type="checkbox"/> |
| • Orders issued and responses to violations?                                  | Yes <input type="checkbox"/> | No <input type="checkbox"/> | N/A <input type="checkbox"/> |
| • Notice to Employees posted?   | Yes <input type="checkbox"/> | No <input type="checkbox"/> |                              |
| • Does Form include a location where the operation documents can be examined? | Yes <input type="checkbox"/> | No <input type="checkbox"/> |                              |
| • Yellow emergency sheet?   | Yes <input type="checkbox"/> | No <input type="checkbox"/> |                              |
| • Emergency Response document?  | Yes <input type="checkbox"/> | No <input type="checkbox"/> |                              |
| • Facility Lock Out Procedures for fixed gauges?                              | Yes <input type="checkbox"/> | No <input type="checkbox"/> | N/A <input type="checkbox"/> |
12. Are the following documents/labels attached to the incoming packages?
- |                                |                              |                             |
|--------------------------------|------------------------------|-----------------------------|
| • Proper labels?               | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| • Bill of Lading?              | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| • Other transmittal documents? | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
13. Does the package have the correct marking and labels? Yes ☐ No ☐
14. Are the fixed source holders marked with legible "Caution Radiation" signs? Yes ☐ No ☐
15. Are the facility lock-out procedures available for fixed gauges? Yes ☐ No ☐

**Comments:**

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**RSO:**

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**RADIATION WORK PERMIT**  
**APPLIES ONLY TO THE AREA SPECIFIED BELOW**

Permit File No.: \_\_\_\_\_

DATE: \_\_\_\_\_ TIME: \_\_\_\_\_  
 RWP EXPIRES: \_\_\_\_\_  
 WORK DESCRIPTION: \_\_\_\_\_

**GAUGE INFORMATION**

GAUGE LOCATION (old): \_\_\_\_\_ GAUGE SERIAL NO.: \_\_\_\_\_  
 GAUGE LOCATION (new): \_\_\_\_\_ SOURCE ACTIVITY: \_\_\_\_\_  
 GAUGE MANUFACTURER: \_\_\_\_\_ GAUGE MODEL NO. \_\_\_\_\_

☐ USERS INVOLVED IN WORK: \_\_\_\_\_

**PRECAUTIONS**

☐ 1. SHUTTER CLOSED AND LOCKED BY AN AUTHORIZED USER (AU)  
☐ 2. AREA SURVEYED WITH A CALIBRATED METER: \_\_\_\_\_ MODEL & S/N of METER \_\_\_\_\_  
 CALIBRATION DATE \_\_\_\_\_

MAXIMUM FIELD MEASURED AT GAUGE SURFACE \_\_\_\_\_ mR/hr  
 MAXIMUM FIELD MEASURED 1 FOOT \_\_\_\_\_ mR/hr

☐ 3. CALCULATE EXPOSURE LIMITS (to maintain hourly dose to < 2mrem):  

$$\left[ \frac{60 \text{ min/hr}}{\frac{\text{Maximum Field Measured at Gauge Surface ( ) mR/hr}}{2\text{mR}}} \right] = \text{ } \text{min}$$

$$\left[ \frac{60 \text{ min/hr}}{\frac{\text{Maximum Field Measured at 1 Foot Distance ( ) mR/hr}}{2\text{mR}}} \right] = \text{ } \text{min}$$

(example: if a gauge measures 12 mR/hr at surface and 1 mR/hr at 1 ft distance, contact with the gauge must be limited to 10 min/hr. There would be no limit for work 1 foot or greater from the gauge.)

☐ 4. PERSONNEL ADVISED THAT GAUGE IS VERY HEAVY AND NECESSARY TOOLS ARE AVAILABLE  
☐ 5. SAFE JOB PROCEDURES AND EXPOSURE LIMITS MUST BE DISCUSSED WITH ALL PERSONNEL INVOLVED WITH THE WORK  
☐ 6. GAUGE REMOVED IS TO BE STAGED IN A SECURE LOCATION PENDING REINSTALLTION.  
 STAGING LOCATION: \_\_\_\_\_  
☐ 7. STORAGE OR STAGING AREA HOLDING GAUGE IS POSTED WITH VISIBLE RADIATION HAZARD SIGNS  
☐ 8. GAUGES IN STORAGE HAVE SHUTTERS CLOSED AND LOCKED AND PERIMETER OF STORAGE AREA SURVEYED TO ASSURE < 2mR/hour

**SIGNATURE (only if source placed in storage)**

ADVANCED AUTHORIZED USER: \_\_\_\_\_ DATE: \_\_\_\_\_

**FINAL ACTION**

☐ UNLOCK THE SHUTTER AND RETURN THE GAUGE TO SERVICE  
☐ NEW OR RELOCATED GAUGE IS SURVEYED UPON INSTALLATION\*  
     \*Max. Field Measured @ Gauge Surface ( ) mR/hr  
     \*Max. Field Measured @ 1 Foot Distance ( ) mR/hr

☐ RADIATION CAUTION SIGNS POSTED AT 2 mR/HOUR LEVEL  
☐ THIS GAUGE IS READY FOR SERVICE.  
☐ FORWARD COMPLETED FORM TO FACILITY RSO TO RECORD EMPLOYEE DOSES IN SITE LOG

ADVANCED AUTHORIZED USER: \_\_\_\_\_ DATE: \_\_\_\_\_

RSO's Approval Signature : \_\_\_\_\_ DATE: \_\_\_\_\_

**DOSE REPORT (To Be Calculated By RSO only)**

Personnel	Task	Fraction of hour in 6 minute increments for each task	X	Exposure rate in mR/hr at surface	PLUS	Fraction of hour in 6 minute increments for each task	X	Exposure rate in mR/hr at one foot	EQUALS	Total dose (in mrem) for RWP