December 6, 2019

ARCOS

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

03006692

REC'D 12-23-19 #0655

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

Dear Ms. Ulrich:

This is in response to your letter of October 22, 2019 in which you provided addition clarifying information regarding the status of our request to amend the above referenced radioactive materials license.

First, this correspondence is being signed by the plant manager in accordance to your request.

Regarding our request to perform "non-routine" activities, such as relocations, installation, removal of source holders from service, this portion of our amendment request is being withdrawn. We may submit such a request later when more experience and training are evident and in full acceptance of the Agency's guidance document outlined in Appendix J.

Thus, our procedures have been altered from our initial submittal to indicate these changes. The first attachment shows the initial submittal plus those paragraphs that have been deleted. The second attachment is the finished correspondence that has "accepted" all the changes for easier reading.

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

Sincerely,

Harri Mootoor
V. P. Operations, North

Enc. Procedures performing gauge activities with fixed gauges (Rev. Dec. 2019)

Cc: Andrew Frye, RSO
Ben Warren, AEC

612632

NMSS/RGN1 MATERIALS-002

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

(Revised ~~September~~December 2019)

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 routine maintenance~~this~~ work by company personnel after approval by the Agency.

DEFINITIONS:

ADVANCED ACTIVITES 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 anciillary 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, when radiating devices are not to be directly supervised by an Advanced Authorized User or RSO. However, the RWP's 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).

SOURCE HOLDER is the shielding device that holds the radioactive source and usually possesses a shuttering mechanism. When used in conjunction with a mounted detector, it becomes a gauging device. The terminology may be different between manufacturers. Therefore, it is important to possess the Sealed Source & Device Registry sheet indicating that the source holder with the source has been evaluated by the USNRC or an Agreement State. This SSDR provides the details of source holder to include, but not limited to: Maintenance to be performed, leak test frequency, nomenclature of the unit assembly, limited purpose and use of the device, dimensions and isodose curves (anticipated radiation levels) at the surface and respective distances. At no times is the company to remove the radiation source from the source holder.

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 purpose of this procedure is to ensure that workers are not able to put their hands or parts of their bodies into a direct beam of the fixed gauge. So, the RSO shall ensure that 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 activity that the RSO determines to be necessary to calculate

work dose, 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 reinstalledthe completion of the task, 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. These activities will be performed by the manufacturer of the device or by other persons specifically authorized to do so. Surveys will be taken at 1 foot around the sources and at the surface of the source holder to verify that the source is property 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:~~

~~dioactive Material (element and mass number)~~

~~inufacturer & model number of the sealed source & device~~

~~vious location (building number, name, site in building)~~

~~w location (building no., location in bldg) - facility address~~

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

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.

Ancilliary 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 **as long as the total radiation dose does not exceed 125 mrem/qtr.** 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. **Personnel working in the immediate proximity of a source holder that is posted, are to notify the RSO and a "Proximity" RWP will be initiated. The RSO determine the radiation level the individual is being exposed and limit the amount of time of working, if appropriate. At the completion of the task, the RSO will calculate the amount of dose received by that worker(s) and record.**

"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.

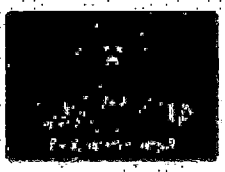
The RSO has the responsibility to ensure that proper instrumentation is on site for performing surveys of the gauges or incoming or outgoing shipments of sources. The instruments shall be calibrated yearly. Training in proper usage is required prior to usage. The manufacturer's manual will be the guide 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

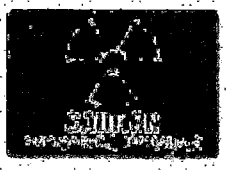
Radiation areas, such as hoppers, are required to have the following posting:



CAUTION - RADIATION AREA

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 to be the RSO and to initiate RWPs. 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) approved by the Agency or the manufacturer's representative. 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 routine~~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.

INFORMATION NEEDED TO SUPPORT APPLICANT'S REQUEST TO PERFORM ROUTINE OPERATIONS ON FIXED NUCLEAR DEVICES (OTHER THAN CF-252)
(Revised December 2019)

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 routine maintenance **work by company personnel after approval by the Agency.**

DEFINITIONS:

ADVANCED ACTIVITES 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, are authorized to perform advanced activities. **NOTE: Gauge maintenance or repair that requires removal of the source from the source holder is prohibited.**

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(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.
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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.

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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 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 purpose of this procedure is to ensure that workers are not able to put their hands or parts of their bodies into a direct beam of the fixed gauge. So, the RSO shall ensure that 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 activity that the RSO determines to be necessary to calculate work dose, 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

thethe completion of the task, a 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. These activities will be performed by the manufacturer of the device or by other persons specifically authorized to do so. Surveys will be taken at 1 foot around the sources and at the surface of the source holder to verify that the source is property 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.

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.

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.

Ancilliary 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 **as long as the total radiation dose does not exceed 125 mrem/qtr.** 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. **Personnel working in the immediate proximity of a source holder that is posted, are to notify the RSO and a "Proximity" RWP will be initiated. The RSO determine the radiation level the individual is being exposed and limit the amount of time of working, if appropriate. At the completion of the task, the RSO will calculate the amount of dose received by that worker(s) and record.**

"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, appropriate radiation signs shall have been installed and the gauge secured in its installed location.

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.

   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 or incoming or outgoing shipments of sources. 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.

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.

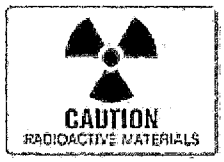
POSTINGS

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

CAUTION - RADIATION AREA

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 be the RSO and to initiate RWPs. The persons performing these functions will complete a 40–hour training course authorized 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) approved by the Agency or the manufacturer's representative. 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. 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.

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 routine 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.