Radiation Safety Program Example

Every gauge licensee must have an effective radiation safety program in place. It was a requirement of your license application and serves as your everyday guide for owning gauges. The radiation safety program should cover all aspects of gauge ownership, so virtually everything covered in this manual and training should be covered in the radiation safety program.

The RSO maintains, manages and is responsible for an effective radiation safety program. Because a license has only one RSO, most gauge workers taking this course will feel that it is not their responsibility to know this program material. But the gauge safety training class **does** qualify an individual to be a RSO and it likewise takes a collective company effort to achieve a successful program. The more you understand the radiation safety program, the more you will understand your role and responsibility as a gauge operator.

The APNGA example of a radiation safety program is based on the annual audit program presented in the NRC NUREG 1556 Licensing Guide. The annual audit, a required condition of your license, is performed annually by the company RSO to check the effectiveness of the radiation safety program. By using the audit checklist approach, which is used to look back at the past year's performance, you will be better able to institute, understand and manage an effective program.

Regulatory inspections likewise use the annual audit as a checklist for evaluating the effectiveness and performance of your radiation safety program. But inspectors also use live observations of gauge workers to assess how knowledgeable the workers are of safe gauge usage and license conditions. The RSO should make periodic observations of workers "in action". In essence, the RSO should be conducting periodic internal inspections. This is a very important part of evaluating the effectiveness of your radiation safety program.

Regulatory inspections, and violations, will be covered in a later section.

Although most Agreement States use the NRC material as a template it is important to familiarize yourself with the requirements of your regulatory agency. Go to their website or contact them about their specific requirements.

An Example of a Radiation Safety Program

Introduction

Some of the overall goals of the radiation safety program are:

a) Protecting the general public and environment from unnecessary exposure to radiation
b) Proper training and instruction to workers includes:
    1) The ALARA program and personnel radiation monitoring
    2) Safely and securely operating the gauge at the worksite
    3) Workers knowledge of emergency procedures and radiation detection equipment
    4) Safely and securely transporting gauges

5) Maintenance and leak tests

c) Inventory and disposal recordkeeping
d) Self-reporting, corrections and enforcement of the program
e) Annual Audits and inspections

The RSO – Manager of the gauge safety program.

I (Name of RSO), have been designated as the Radiation Safety Officer for (Name of licensee), and will carry out the duties and enforce the conditions of the license including:

The Annual Audit

I, along with senior management, will annually conduct an audit of the gauge safety program, as well as checking, reviewing and correcting any deficiencies. All copies of audits will be retained. I will conduct periodic internal inspections, including in person observations of worker actions with gauges during transport and transportation.

Organization & Scope of Program

I will ensure that the original conditions and information on the license stays current, or when needed, file for timely amendments including address changes, new ownership (in advance), bankruptcies, and notice of a new and properly trained RSO.

I will review the license to ensure that gauge models match and source quantities have not been exceeded and will ensure that the Sealed Source and Device (SSD) Certificate or Sheet for each type of gauge are on file.

I will check to make sure that manufacturer operation & maintenance manuals are on hand for each type of gauge.

I will make sure the gauges are used for the way they are intended.

RSO Responsibilities

I will stop activities that are considered unsafe.

I will review the license and Sealed Source and Device Registration and manufacturer's recommendations and instructions. I will make sure the conditions match up regarding the model/type of gauge, number of gauges allowed, the type of operations licensed for, storage requirements, and maintenance restrictions and schedule.

I will make sure all employees are thoroughly trained and training certificates are on file.

I will make sure all necessary personnel are using personnel monitoring devices (film badges, TLD's) and records is on file.

I will make sure all gauges are locked and secured during storage and transportation.

I, and all gauge workers, will have contact information on hand (including on file, in the storage area, and in gauge cases) for proper authorities (RSO, licensing agency, police) in case of accident, damage, fire or theft.

I will investigate all unusual occurrences involving the gauge (accident, damage, theft, oversights), determine the cause, identify corrective actions and implement such actions.

I will make sure gauges that are transported meet all USDOT Hazardous Materials requirements.

I will make sure that gauge transfers and disposals are properly documented.

I will make sure all records are accounted for and maintained.

I will keep the license up-to-date, check the expiration date, request renewals and amendments in a timely manner.

I will give advance notice of reciprocity.

I will give advance notice of desire to terminate the license.

Training & Instructions to Workers

I will make sure that all employees working with gauges and preparing gauges for transport or transporting gauges are properly trained.

> I will ensure, per Code of Federal Regulation (CFR) 19.12, that all employees expected to receive an excess of 100 mrem/yr occupational dose be given special instructions. Although gauge users typically receive less than this amount it is assumed that they may exceed this limit and are therefore subject to these instructions:

- Storage, transfer & uses of gauges
- Exposure issues and ALARA
- Required safety training
- How to report overexposure concerns
- workers know how to receive exposure reports
- workers receive emergency procedures training
- workers receive annual refresher training on these topics (The APNGA Annual Refresher Training Module can be used to guide you with this training – it is included with your annual dues)

- Each gauge operator must complete an approved gauge safety course before using the gauge. (The APNGA Gauge Safety Training Course is approved in most states & is included in annual dues – check the list for your state's status)
- I will have training certificates on file for each worker, including Initial Gauge Safety Training, HAZMAT Training and Annual Refresher.
- I will conduct interviews with each worker to determine if they are knowledgeable of emergency procedures (see the "Emergency Procedures" section under the "Regulatory" heading on the "APNGA homepage" and your regulatory agency for guidance).
- I will observe each worker operating the gauge in the field.
- I will observe each worker performing routine cleaning & lubrication.
- I will observe each worker transporting the gauge.
- I will observe each worker checking a gauge in and out of storage.
- I will make sure each worker demonstrates safe handling and security during operation, transportation and storage of the gauge.
- I will make sure USDOT HAZMAT (49 CFR 172.700-704) training is provided for each worker involved in preparing and/or transporting a gauge. (APNGA annual dues include a USDOT HAZMAT course that is accepted in every state).
- I will make sure HAZMAT training records are kept on file.

Radiation Survey Instruments

I will make sure the company owns a radiation survey meter. In the event of an accident it will be used to detect the location of a dislodged source, determine the Transport Index of a damaged gauge or determine the radiation levels around a storage area. It will also be used to determine if the gauge sliding block is malfunctioning.

I will make sure the survey meter meets the criteria of the regulatory agency. Typically this requires a survey meter that is able to detect gamma radiation and be recalibrated annually.

If we do not own your own a survey meter I will arrange for immediate access to one. I will have a plan for accessing a survey meter.

If we are licensed for and performing non-routine maintenance I will own a survey meter that is calibrated annually. I recognize that non-routine maintenance would include removal of the source rod. I will ensure that the source rod will not be removed if we do not have a special license to do so.

I will keep survey meter calibration records on file.

Gauge Inventory

I will complete an inventory of gauges every 6 months. I will keep an inventory sheet attached to a clipboard and place it at the storage area with the date of the next inventory. I will complete a hands-on inventory of each gauge and keep the completed document on file.

I will have a receipt for each gauge in inventory that shows the date each gauge was obtained and entered into your inventory?

Personnel Radiation Protection

I will provide, if required, personnel dosimetry to all gauge employees.

I understand that the dosimetry, typically in the form of a film badge, TLD (Thermoluminescent Dosimeter), or OSL (Optically Stimulated Luminescence) ensures that ALARA practices are being met and also creates a record that documents employees are receiving minimal exposure levels.

I understand that the key component of a sound Radiation Protection Program is a solid adherence to ALARA considerations. I will make sure that ALARA considerations (time, distance & shielding) are being taught and practiced and incorporated into the Radiation Protection Program.

I will make sure, that if any gauge workers are not provided dosimetry, documentation is provided confirming that they are receiving less than 500 mrem per year.

I will continually check to see if conditions of the activities of gauge workers not wearing dosimetry changed to where the possibility of receiving greater than 500 mrem per year exists.

If they did change I will perform a new evaluation.

If in use I will ensure that dosimetry is provided for gauge workers.
I will check if any workers are receiving more than 500 mrem.
I will make sure that the dosimetry supplier is NVLAP approved.
I will make sure that dosimetry is changed on time.
I will review the dosimetry reports as they are received.
I will make sure that NRC or equivalent Agreement State forms are being used:

NRC-4 “Cumulative Occupational Exposure History
NRC-5 “Occupational Exposure Record for a Monitoring Period”

Examples of these forms can be found in the appendices/attachments.

I will make sure that if a worker declared her pregnancy she was limited to a maximum of 500 mrem for

the term of the pregnancy. I will make sure embryo/fetus dose records were kept on file.

I will make sure all exposure, survey, monitoring and evaluation records kept on file.

Public Dose

I will take steps to protect the general public (non-gauge workers) from exposure to radiation.

I will ensure that exposure levels to the general public are below 100mrem in a year or 2mrem in any 1 hour.

I will make sure that gauges are stored in a manner to keep doses to the public below 100mrem in a year.

I will conduct a survey or evaluation of public access areas around the storage area to ensure that exposure levels are below 100mrem per year.

I will monitor any gauge additions or changes to the storage area, security or use of the surrounding areas that would necessitate a new survey or evaluation.

I will monitor public access area radiation levels to determine if any areas have exceeded 2mrem in any one hour.

I will make sure that gauges are stored in a manner that prevents unauthorized use or removal.

I will keep storage survey and evaluation records on file.

Operating & Emergency Procedures

I will develop, implement and maintain Company Operating & Emergency Procedures.

All workers will have a copy of these procedures and know what steps to take in the event of an emergency. (Please refer to Appendix H of the NRC's NUREG Guide 1556 Vol 1, "Operating & Emergency Procedures" for an outline or use your Agreement State procedures). The APNGA website also contains information to complement your regulatory agency requirements. Procedures should include these instructions:

Using & maintaining the gauge
Security during transport and storage
Control & surveillance during use
Keep exposures ALARA
Constant accountability during use

How to deny access to a damaged gauge
Steps to take and who to contact when a gauge is damaged

I will make sure the above required elements, as specified by the regulatory agency, are part of the procedures.

I will make sure each gauge worker and gauge case have a current copy of the operating & emergency procedures, including RSO office, cell & home telephone numbers as well as the manufacturer's and regulatory agency emergency contact numbers.

Leak Tests

I will make sure each sealed source on each gauge leak will be tested on time (per the time interval stated on the license) and make sure the leak test was performed per the descriptions and requirements of the regulatory agency and the license.

I will make sure all gauges have a current leak test before being removed from storage.

I will make sure leak test results are kept on file.

I will make sure that, if any sources are found to be leaking, the gauge will be pulled from service and the regulatory agency notified.

Maintenance of Gauges

I will make sure the gauges are routinely cleaned and lubricated per the manufacturer's procedures, thereby allowing optimum safety and performance. I will make sure that the source rod is not removed during cleaning, unless specifically licensed to do so.

If so, I will make sure to adhere to the special requirements pertaining to procedures, dosimetry, survey instruments, individuals and compliance.

I will make sure that 3rd party service providers are licensed to handle our gauge models and are escorted at all times. If we are possession of gauges that meet quantities of concern I will make sure that the service provider has an authorized background check.

Transportation

To assure proper compliance of transportation regulations I will on occasion accompany each worker while they transport a gauge and assure that HAZMAT requirements are understood and met.

The evaluation will commence at the storage area and conclude upon return to the storage area.

I will make sure that only undamaged, manufacturer-provided and approved, Type “A” Package gauge cases are used during every transport of a gauge.

I will make sure that Type “A” Package test results for every different type of gauge case in use is kept on file.

I will make sure that a “Certificate of Competent Authority” is kept on file for each different type of source used in the gauge. (This will satisfy the requirement for documenting special form certificates. These special form certificates can be obtained through the manufacturer and can usually be downloaded off their website).

I will make sure that every gauge case displays (2) Radioactive ll labels that **legibly** show the Transport Index (TI), source types & activities, and hazard class (7).

I will make sure that each gauge case displays a Type A package label denoting UN3332, “Radioactive Material”, “Special Form” and “RQ” requirements.

I will instruct workers that every gauge case will be closed and locked for every transport.

I will instruct that applicable bill of lading and emergency response sheets are to be used during every shipment.

I will assure that the shipping papers contain the proper entries: (Shipping name (Radioactive Materials), Hazard Class (7), UN ID Number (3332), Total Quantity (number of gauges), Package Type (Type A), Nuclides (Cesium137 and/or Am241), RQ (if necessary), Description (Radioactive Material), Special Form, Activity (in Becquerels and Millicuries), Yellow ll labels, Transport Index (TI), Shipper’s name, Certification and signature, Emergency Response Telephone number, Cargo Aircraft Only label.

I will instruct the workers to have the gauge case secured against movement during transport.

I will ensure that double, independent, locked cables, chains or other security devices are used during

transport.

I will instruct the workers to have the gauge concealed while transported in a vehicle.

I will make sure that any qualified transport incidents are reported to the USDOT.

Auditor's Independent Survey Measurements (if made)

If any independent auditor is used I will make sure that the survey measurements describe the type, location and result of measurements. I will note if any radiation levels exceed regulatory levels.

Notification & Reports

I will assure that required notifications of incidents are made to the regulatory agencies. This does **not** include non-emergency oversights that must be noted and corrected in your Radiation Safety Program.

I will make notifications of any lost or stolen gauges and make appropriate reports.

I will report any overexposures or high radiation levels and note the causes and take corrective actions.

In the event of any of the above occurrences I will contact the NRC Emergency Operations Center at 301-816-5100 as well as the Agreement State, if appropriate.

Posting & Labeling

I will post or make available certain documents and/or posters for public viewing. I will make sure I am familiar with the regulatory agency's requirements, be it NRC or Agreement State.

I will keep all originals under lock and key and only post **copies** of the documents and posters.

I will post the "Notice to Employees" poster in an area accessible to all employees.

I will post all regulations and license documents or post a notice as to where these documents can be viewed (post **copies** in a publicly viewable area).

I will be aware and post any documents required by the regulatory agency or other state or local authorities.

Recordkeeping for Decommissioning

I will be aware that regulatory agencies require a minimum of 60 days notice before terminating the license and transferring or disposing of all gauges. I will be aware of requirements and maintain all decommissioning, transfer and disposal documents.

I will maintain records important for decommissioning.

Bulletins & Information Notices

I will make sure that I am on the mailing list or email list for documents issued by the NRC and/or Agreement State. (Go to www.nrc.gov to sign up for NRC Bulletins, Information Notices and NMSS Newsletters. Do the same for your Agreement State).

I will make sure that appropriate training and actions are taken in response to these notices.

Special License Conditions or Issues

I will make sure to review any special license conditions or issues pertaining to your license (e.g., non-routine maintenance).

Deficiencies Identified in Audit and Corrective Actions Planned

If I discover any deficiencies or oversights during the year I will investigate, report, summarize and take corrective actions to rectify the issue. I will document the corrective actions. I will make sure that corrective actions will be taken at all licensed facilities. I will likewise provide any recommendations for improvements.

Evaluation of Other Factors

I will ensure that senior management is constructively involved and informed about the radiation safety program.

Senior management will assure that the RSO has sufficient time to perform Radiation Safety Duties.

Senior management will assure that the RSO has sufficient staff to support the Radiation Safety Program.

Senior Management and RSO Commitment to the Radiation Safety Program

I duly commit to upholding the Radiation Safety Program:

Title	Name	Date
RSO		
Sr Manager		