

Gauge Licensing

G-109 ***Self-Study Materials***

Gauging Devices

- **Used to measure, monitor, and control the thickness of sheet metal, textiles, paper napkins, newspaper, plastics, photographic film, and other products as they are manufactured.**
- **Non-portable gauging devices (i.e., gauges mounted in fixed locations) are designed for measurement or control of material density, flow, level, thickness, or weight, and so forth.**
- **The gauges contain sealed sources that radiate through the substance being measured to a readout or controlling device.**

Gauging Devices

- **Portable gauging devices, such as moisture density gauges, are used at field locations.**
- **These gauges contain a gamma-emitting sealed source, usually cesium-137, or a sealed neutron source, usually americium-241 and beryllium.**

This Module Will Discuss:

- Portable Gauge Licensing
- Fixed Gauge Licensing
- Generally Licensed Devices

Portable Gauge Licensing



Guidance Available to You, the Reviewer

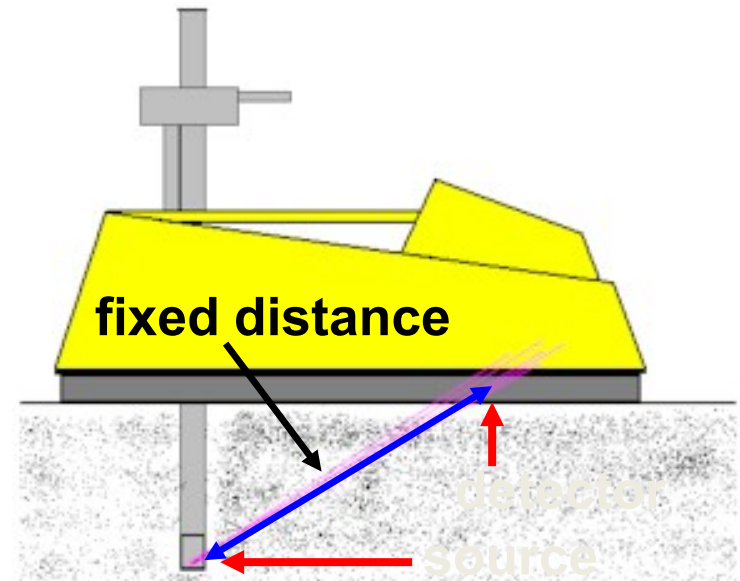
- [NUREG-1556, Volume 1, Revision 2, “Program Specific Guidance About Portable Gauge Licenses”](#)
- [10 CFR](#) Parts 19, 20 and 30
- [Sealed Source and Device Registry](#) (SSDR)
- [Information Notices](#)

What is a Portable Gauge?

- A device that uses RAM to measure something (... moisture ... density ... thickness) that is portable and designed for use in the field.
- Type of sealed source and orientation of source in device is based on its intended use
- Many different designs based on intended use
- Unique radiation safety problems

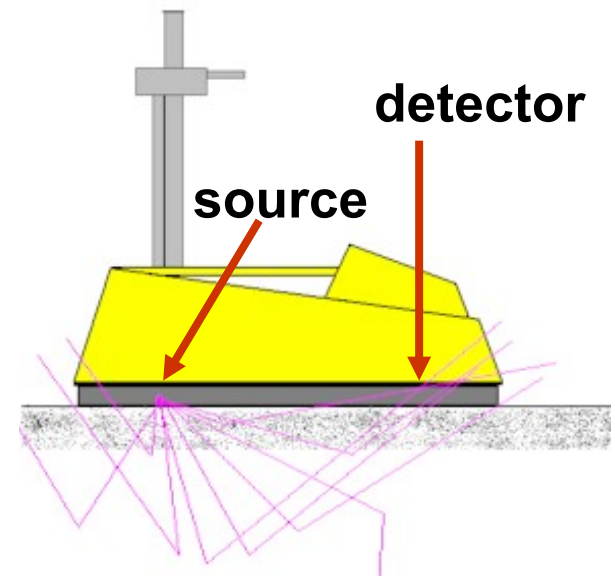
Direct Transmission

- most precise method
- to measure soil density, the source is placed beneath the surface through a punched hole - radiation travels a fixed distance to the detector on the base of the gauge
- density of the soil measured by amount of radiation transmitted



Backscatter

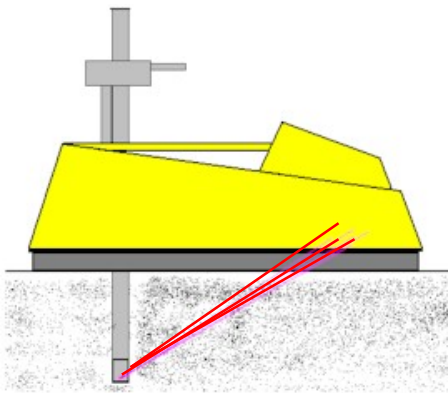
- eliminates punched access hole - both source and detector is on the surface
- radiation reflected (scattered) back to the gauge by the material being measured
- insensitive beyond a depth of a few inches



Moisture Density Gauges Typically Used In Construction

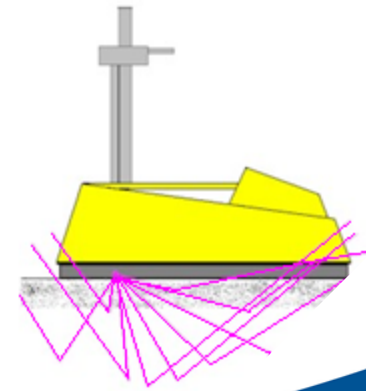
Cesium-137

- Typically 10 mCi
- Measures Density



Americium-241

- Typically 40-50 mCi
- Measures Moisture



Contents of Application

Use Appendix B checklist from NUREG-1556, Vol. 1, Rev. 2

- Name
- Mailing Address (P.O. Box is okay here)
- Address(es) of Use and Storage (P.O. Box is *not* okay here; must have specific address/location)
- Proposed use as identified in SSDR

Radioactive Material

- Identify radionuclide used in each sealed source
- Identify manufacturer's name and model number for each sealed source
- Identify manufacturer's name and model number for each device/gauge
- Source/device combination registered (SS&D)
- Maximum activity \leq approved SS&D and total number of sources/gauges/activity

Portable Gauges

➤ One or Two Sources

^{137}Cs Cesium (gamma) 8-10 millicuries

^{241}Am Americium/Beryllium (neutron) 40-50 mCi

or

^{226}Ra 4-5 millicuries

- **Potential hazard: In ~9 minutes, an unshielded 10 mCi ^{137}Cs source can deliver 5 rem to a worker's extremities at a 1 cm distance (radium gauges even higher doses)**

What is a “sealed source?”

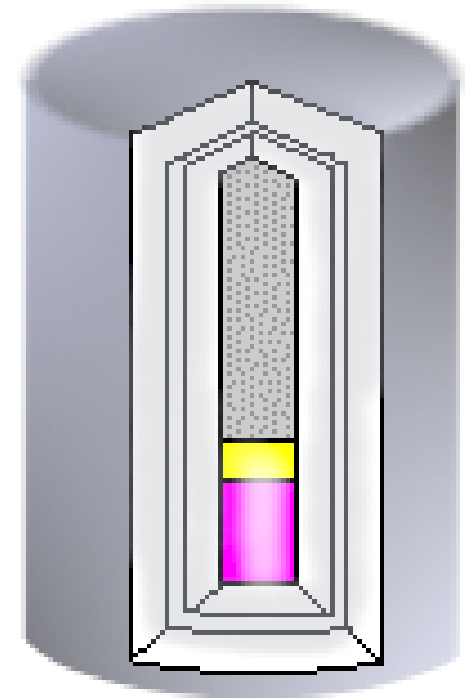
- 10 CFR 30.4, “Definitions,” states:
- *Sealed source* means any by product material that is encased in a capsule designed to prevent leakage or escape of the byproduct material

Sealed Sources Continued

- Not all “dry, solid” radioactive materials meet this definition
- Some licensees make research or calibration sources on planchets, for example, but these are *not* “sealed sources”
- Some sealed liquid sources *do* meet this definition, e.g., liquid scintillation sources containing hydrogen-3 and carbon-14

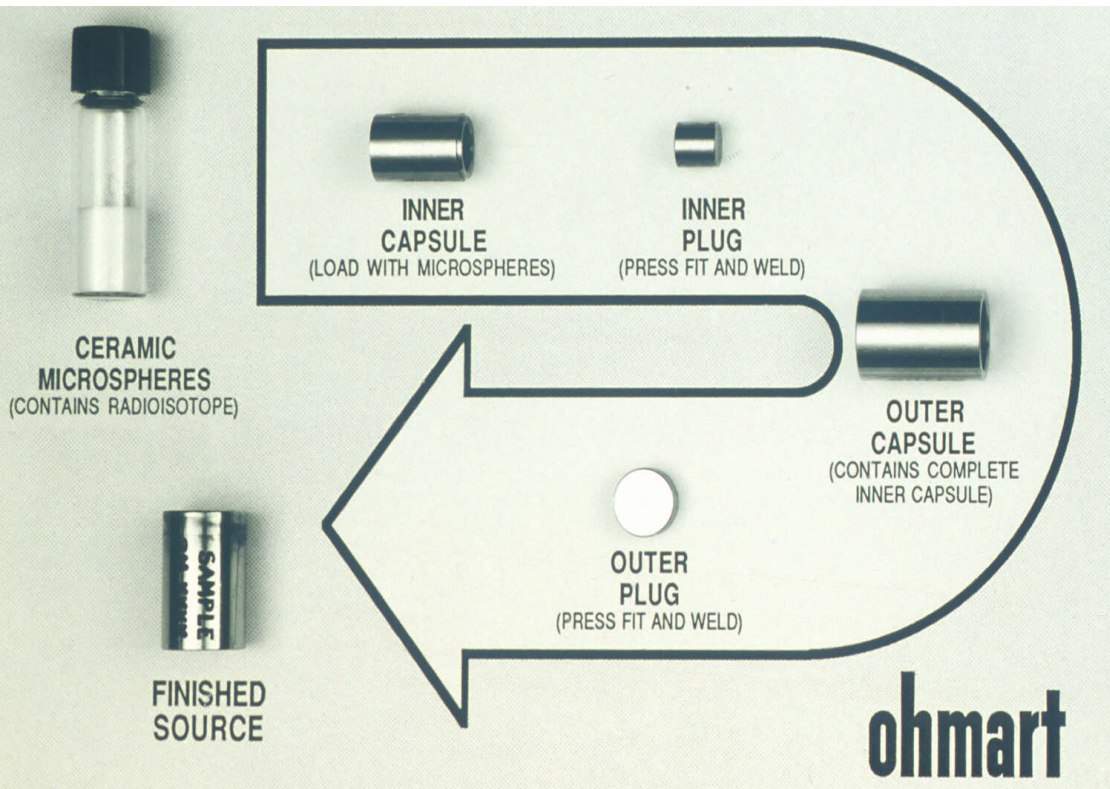
Overview Sealed Source

- Majority of industrial RAM applications use sealed sources
- Application involves a basic principle
- Uses a source & detector combination



**Sealed
Source**

Overview Sealed Source



Double Encapsulation Sealed Source Assembly

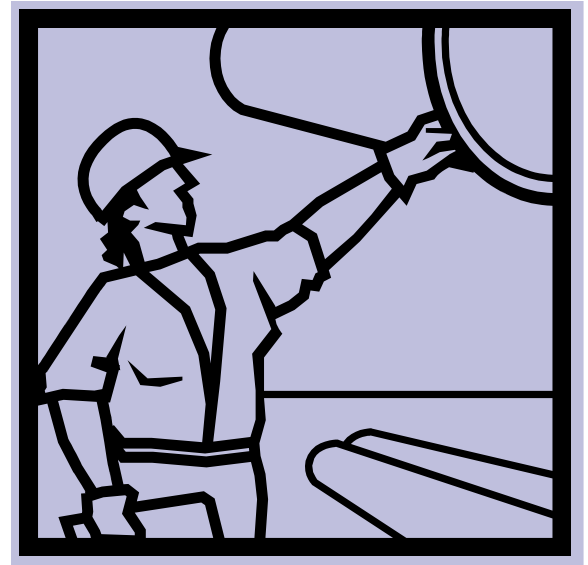


Possession Limits

- Financial assurance thresholds in [10 CFR 30.35\(d\)](#) 10 CFR Part 30, Appendix B Limits; for Sealed Sources
- 100,000 curies cesium-137
- 100 curies americium-241
- 100 curies californium-252

Radiation Safety Officer (RSO)

- Needs adequate training and experience
- Portable Gauge manufacturer's course for users or for RSO's with hands-on experience with portable gauges
- or Equivalent course that meets Appendix C criteria



Training for Authorized Users

- Portable Gauge manufacturer's course for users and hands-on training in the use of portable gauges;

or



- Equivalent course that meets Appendix C criteria

Appendix C - Criteria For Gauge User Training Courses

- **Content:**
 - **1.5-2 hrs Radiation Safety and Regulatory Requirements**
 - **1.5-2 hrs practical use, Operating & Emergency (O&E) procedures, maintenance, transportation**
- **Exam:**
 - **25-50 Questions**
 - **70% or better to pass**
- **Instructor qualifications**

Item 9: Facilities and Equipment

- Licensees must propose equipment and facilities that are adequate to protect and minimize danger to life or property.
- A facility diagram must be provided for each permanent storage location. The diagram should include the use of adjacent areas (including above and below), and information relevant to public dose and security.
- Public Dose is discussed in Section 8.10.5 and Operating, Emergency, and Security procedures in Section 8.10.6.

Application Items Not Needed

Items that need NOT be submitted with application:

- Item 10: Audit Program
- Item 10: Public Dose
- Item 10: Transportation
- Item 11: Waste Management – Gauge Disposal and Transfer

Instruments (Item 10)

- New Applicant/Licensee response should include:
- Commit to either possess and use or have access to and use, a radiation survey meter meeting the criteria from the section

OR

- Provide an alternative procedure for determining source integrity after an accident
- Radiation survey meter capable of detecting gammas and operational check before use



Material Receipt and Accountability (Item 10)

- Maintain records of receipt, transfer and disposal of gauges
- Physical inventory every 6 months (or other interval justified by applicant and approved by the NRC) to account for all sealed sources
- “Cradle to grave” accountability



Material Receipt & Accountability (Item 10)

Standard License Condition states that inventory should include:

- Radionuclide and amount
- Manufacturer's name, model number and serial number (if appropriate)
- Location of each sealed source and device
- Date of inventory
- Signature of individual conducting inventory

Material Receipt & Accountability (Item 10)

New Applicant/Licensee response should include:

- Commitment to conduct physical inventory every 6 months or at other interval approved by the NRC to account for all sealed sources and devices received and possessed by the license

OR

- A description and justification of an alternate frequency and/or procedure to account for all sealed sources and devices received and possessed under the license

AND

- Commit to developing, implementing and maintaining procedures for ensuring accountability of licensed material at all times.

Occupational Dosimetry (Item 10)

New Applicant/Licensee response should include:

- Commitment to maintain documentation, for inspection, demonstrating that unmonitored individuals are not likely to receive a radiation dose in excess of the limits in 10 CFR 20.1502. (10% of limit in 20.1201(a))

OR

- Provide dosimetry and use NVLAP approved processor.



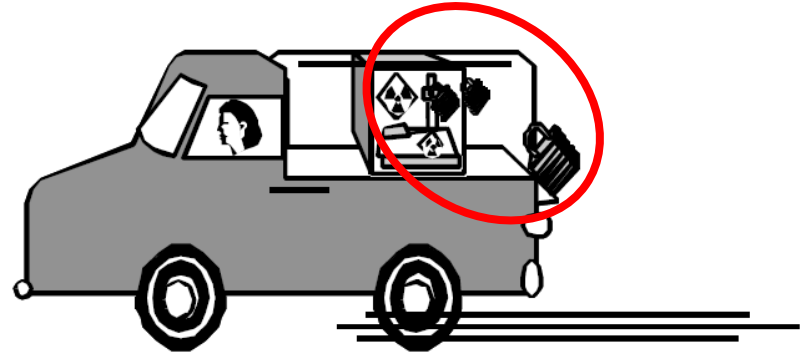
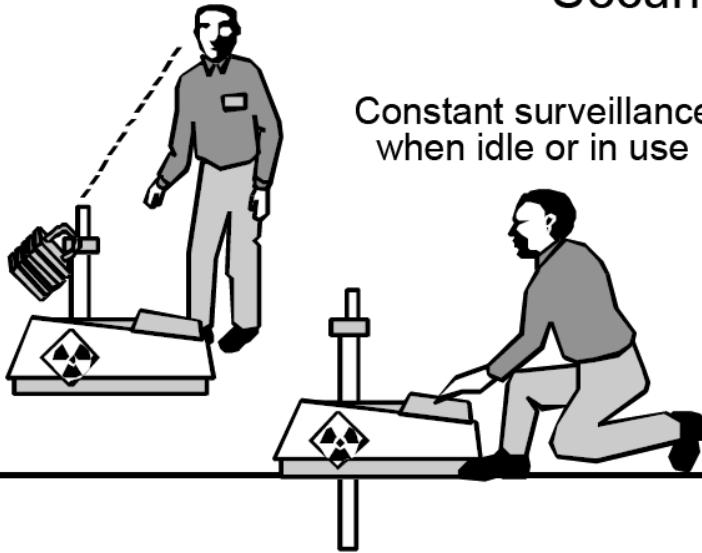
Operating, Emergency, and Security Procedures (Item 10)

- Use and Routine Maintenance per Manufacturer
- Security (Storage and Transport)
- Security During Use (Control and Surveillance)
- As Low As Reasonably Achievable (ALARA)
- Accountability During Use
- Access to Damaged Gauge
- Emergency Procedures and Who to Contact if Gauge is Damaged

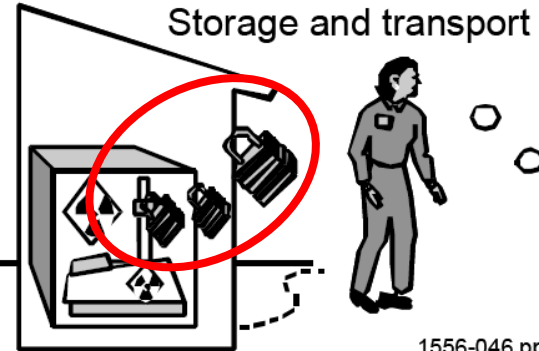
Portable Gauge Security

Security

Constant surveillance
when idle or in use



Storage and transport



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To avoid lost or stolen gauges, licensees must keep the gauges under constant surveillance, or secured against unauthorized use or removal.

10 CFR 30.34(i)

- In January of 2005, the Nuclear Regulatory Commission (NRC) issued an amendment to 10 CFR Part 30 regarding the security of specifically licensed portable gauges.
- The new requirements were published under 10 CFR 30.34(i)

10 CFR 30.34(i)

“Each portable gauge licensee shall use a minimum of two independent physical controls that form tangible barriers to secure portable gauges from unauthorized removal, whenever portable gauges are not under the control and constant surveillance of the licensee.”

10 CFR 30.34(i)

- **When a portable gauge is not in use at a temporary job site (or under direct surveillance), the licensee must secure the portable gauge using two independent physical controls.**
- **Examples of “two independent physical controls” (Appendix G of the NUREG) are:**
 - (1) securing the portable gauge in a locked storage facility located in a separate secured area in a warehouse;**

10 CFR 30.34(i)

(2) securing the portable gauge inside a locked van and secured to the vehicle with a steel cable;

(3) storing the portable gauge inside a locked, non-removable box and further securing the box with a steel cable or chain.

10 CFR 30.34(i)

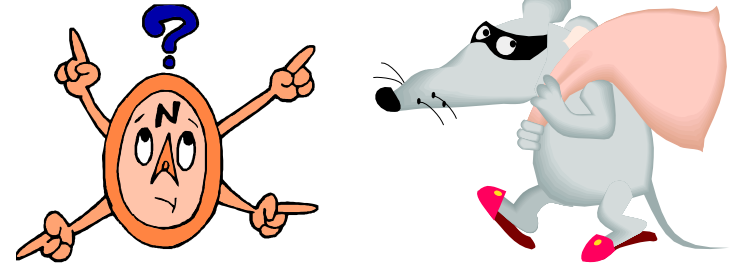
- **If chains or cables are used as a method of providing security, one of the two chains or cables used should be substantially more robust and more difficult to cut than the other.**
- **Simply having two chains or cables with locks would not satisfy the security rule, unless each chain and lock combination were physically robust enough to provide both a deterrence and a reasonable delay mechanism.**

Operating, Emergency, and Security Procedures (Item 10)

If gauges will be used for measurements with the unshielded source extended more than 3 feet beneath surface, a license condition must be added that addresses:

- Surface casing or alternative to prevent free movement of source
- Retrieval procedures for stuck sources
- Reporting requirement for irretrievable stuck sources (10 CFR 30.50 (b)(2))

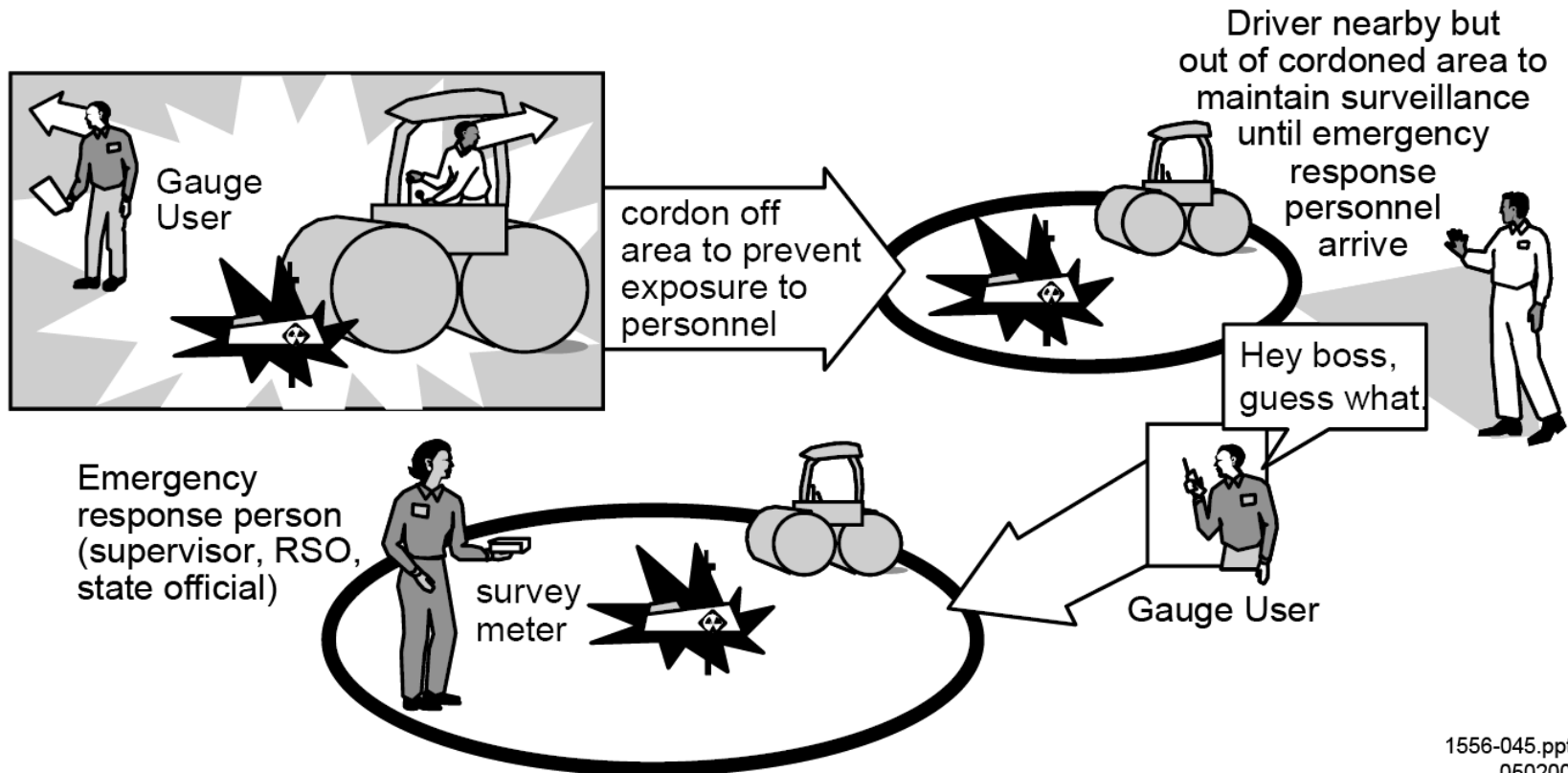
Radiation Safety Risks for Portable Gauges



- Lost or stolen gauges
- Gauges damaged by heavy equipment during use at temporary job site
- Operating, Emergency & Security procedures developed to minimize these risks
- NRC Information Notices on thefts, losses, and accidents involving portable gauges at:

<http://www.nrc.gov/reading-rm/doc-collections/gen-comm/info-notices/>

Incidents



Gauges are often damaged by heavy equipment at job sites and emergency procedures need to minimize radiation safety risk.

Operating, Emergency, and Security Procedures (Item 10)

New applicant/licensee response should include:

- Commit to implementing and maintaining the operating, emergency and security procedures in Appendix G.

OR

- Develop operating, emergency, and security procedures in accordance with the criteria section in 8.10.6

AND

- Commit to provide copies to all gauge users and availability of procedures at each jobsite.

Leak Tests (Item 10)

- Sealed sources are required to be tested for leakage at intervals specified in the SSDR
- For portable gauges, may be every 6 or 12 months, depending on the manufacturer and model.
- Licensed service provider or Appendix I

Leak Tests (Item 10)

New applicant/licensee response should include:

- Commitment to perform leak test at intervals approved by NRC, an Agreement State, or specified in SSDR. Sample analyzed by a licensed service provider

OR

- Implement a model leak test program published in Appendix I

OR

- Description of alternative equipment and/or procedures

AND

- Commit to maintaining leak test records.

Maintenance (Item 10)

Routine =

cleaning, lubrication, changing batteries or fuses, repairing or replacing the handle, cleaning and lubricating source rod and shutter mechanism (to remove mud, caked on dirt, asphalt or residues)

Maintenance (Item 10)

Non-Routine =

Any maintenance or repair (beyond manufacturer's recommended routine cleaning and lubrication) that involves detaching the source or source rod from the device

Performed by manufacturer or licensed service provider

Non-Routine Maintenance Appendix F

- Identify types of work to be done
- Identify who will do the work and their T&E
- Safe handling procedures for sealed sources
- Personnel monitoring
- Survey instrument appropriate & calibrated
- Surveys



Maintenance (Item 10)

- New applicant/licensee response should include:
- For routine cleaning and lubrication:
 - Commitment to implement and maintain procedures for routine maintenance of gauges according to manufacturers instructions.

OR

- Provide alternate procedures for review

Maintenance (Item 10)

- New applicant/licensee response should include:
- For nonroutine maintenance or repair operations that require detaching the source or source rod from the gauge:
 - Commitment nonroutine maintenance will be done by a qualified person
 - OR
 - Request to perform the work “in-house” using the information in Appendix F

For reference, see the portable gauge sample license “Blue Moon DOT”

NRC FORM 374		U.S. NUCLEAR REGULATORY COMMISSION		PAGE 1 OF 6 PAGES Amendment No. 11	
MATERIALS LICENSE					
Pursuant to the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974 (Public Law 93-438), and Title 10, Code of Federal Regulations, Chapter I, Parts 30, 31, 32, 33, 34, 35, 36, 37, 39, 40, 70 and 71, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, possess, and transfer byproduct, source, and special nuclear material designated below; to use such material for the purpose(s) and at the place(s) designated below; to deliver or transfer such material to persons authorized to receive it in accordance with the regulations of the applicable Part(s). This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954, as amended, and is subject to all applicable rules, regulations, and orders of the Nuclear Regulatory Commission now or hereafter in effect and to any conditions specified below.					
Licensee		3. License number: 48-99999-01		4. Expiration Date: August 31, 2021	
1. Blue Mountain Department of Transportation					
2. 2165 Main Street Goodland, WI 53888				5. Docket No.: 030-99909 Reference No.:	
6. Byproduct, source, and/or special nuclear material	7. Chemical and/or physical form	8. Maximum amount that licensee may possess at any one time under this license	9. Authorized use		
A. Cesium-137	A. Sealed Sources (AEA Technology/QSA, Inc., Model CDCW556; Isotope Products Laboratories, Model HEG-137)	A. 9 millicuries per source and 18 millicuries total	A. For use in Troxler Electronic Laboratories Model 3400 Series portable gauges for measuring physical properties of materials.		
B. Americium-241/ Beryllium	B. Sealed Neutron Source (AEA Technology/QSA, Inc., Model AMNV.997; Isotope Products Laboratories, Model AM1.NO2, 3021, or 3027)	B. 44 millicuries per source and 88 millicuries total	B. For use in Troxler Electronic Laboratories Model 3400 Series portable gauges for measuring physical properties of materials.		
C. Cesium-137	C. Sealed Sources (CPN International, Inc., Model CPN-131)	C. 10 millicuries per source and 20 millicuries total	C. For use in CPN International, Inc., Model MC Series PORTAPROBE portable gauges for measuring physical properties of materials.		



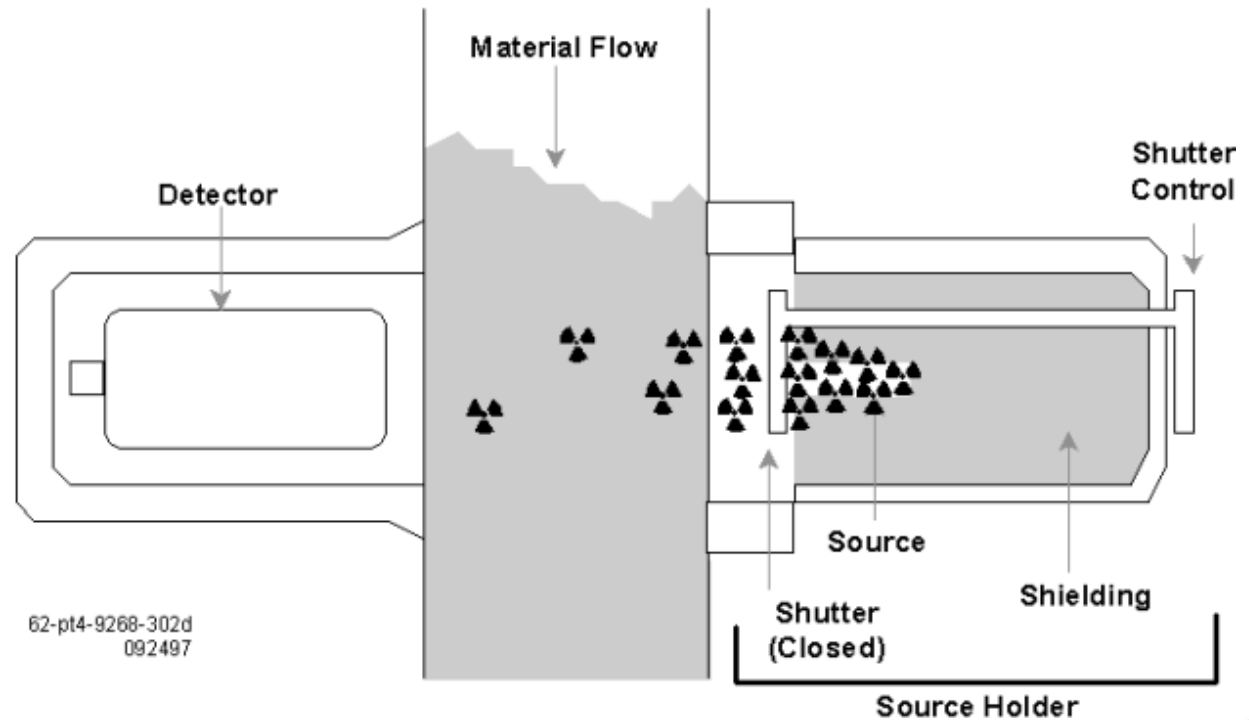
Fixed Gauge Licensing

Guidance Available to You, the Reviewer

- NUREG-1556, Volume 4, Revision 1, Program Specific Guidance About Fixed Gauges
- 10 CFR Parts 19, 20, and 30
- Sealed Source and Device Registry
- NRC's Information Notices

Fixed Gauge Components

- Source
- Source holder
- Detector
- Shutter
- Shielding



Fixed Gauge Typical Uses

- Process controls
- Thickness of paper
- Density of coal
- Level of material in a tank or vessel
- Volumetric flow rate

Radioactive Material

- Identify radionuclide used in each sealed source
- Identify manufacturer's name and model number for each sealed source
- Identify manufacturer's name and model number for each device/gauge
- Source/device combination registered (SSDR)
- Maximum activity \leq approved SSDR and total number of sources/gauges/activity

Possession Limits

- Financial assurance thresholds 10 CFR 30.35(d)
- 10 CFR Part 30, Appendix B Limits; for Sealed Sources
- 100,000 curies cesium-137
- 10,000 curies cobalt-60
- 1,000 curies strontium-90

Possession Limits and 10 CFR Part 37

- Authorized possession limits \geq Cat 2 thresholds require compliance with 10 CFR Part 37, whether materials are sealed or unsealed
- Compliance with 10 CFR Part 37 can be avoided when sources/gauges are not “aggregated”
- 10 CFR 37 can be found at <http://www.nrc.gov/reading-rm/doc-collections/cfr/part037/>

10 CFR 37.5, “Definitions” “Aggregated”

- As it applies here, sources/gauges are considered “aggregated” if they are accessible by the breach of a single physical barrier that would allow access to radioactive material in any form, including any devices that contain the radioactive material, when the total activity equals or exceeds a category 2 quantity of radioactive material

NOTE: Generally licensed devices also count!

NUREG-2155

- Implementation Guidance for 10 CFR Part 37, “Physical Protection of Category 1 and Category 2 Quantities of Radioactive Material,” can be found at:
<http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr2155/>
- Nicely organized into mostly “Question and Answer” format

NUREG-2155

- Appendix A has very helpful table of Cat 1 and Cat 2 (100x less than Cat 1 quantity) radioactive materials
- For example, the Cat 2 quantity of cobalt-60, by itself, is 8.10 curies (0.3 Terabecquerels)
- “Sum-of-fractions” methodology applies for multiple sources or multiple radionuclides

Proposed Use

- Typical uses identified in SSDR
- Specify use for each type of fixed gauge requested (e.g., measure thickness of paper, determine levels in a tank, measure weights, measure flow rates, density, etc.)

Radiation Safety Officer (RSO)

- Adequate training and experience
- Fixed gauge manufacturer's or distributor's course for users or for RSO's;

OR

- Equivalent course (Appendix D criteria)

Training For Authorized Users

- Fixed gauge manufacturer's or distributor's course for users

OR

- Equivalent course (Appendix D criteria)

Appendix D - Criteria for Gauge User Training Courses

- Content: radiation safety and regulatory requirements; theory and operation of gauge (O&E, routine and non-routine maintenance, lock-out procedures); “On-the-Job training” (OJT) (O&E, routine maintenance, lock-out)
- Training assessment: exam (oral or written) or by observation
- Instructor qualifications



Application Items Not Needed

Items that need NOT be submitted with application:

- Item 8: Training of Personnel in accordance with NUREG-1556, Vol.4, Rev. 1, Section 8.8
- Item 10: Audit Program
- Item 10: Public Dose
- Item 10: Transportation
- Item 10: Minimization of Contamination
- Item 11: Waste Management – Gauge Disposal and Transfer

Facilities and Equipment (Item 9)

- Locations/areas of use for installed sources and devices must be compatible with “Conditions of Normal Use” from SSDR
- Secured to prevent unauthorized access or removal (e.g., permanently mounted, locked room, secured storage)

Facilities and Equipment (Item 9)

- New applicant/licensee response should include:
- Commit to ensure location of each fixed gauge meets the criteria in Section 8.9.

OR

- Confirm that the fixed gauge is secured to prevent unauthorized removal or access and submittal of specific information demonstrating that the proposed conditions will not impact the safety or integrity of the source or device.

Instruments (Item 10)

- Usually it is not necessary for fixed gauge licensees to possess a survey meter unless they will be authorized for non-routine operations
- When authorized for non-routine operations, licensees must commit to either possess or have access to a survey meter
- Survey meter must be capable of detecting gamma, beta, neutron or alpha radiation (as appropriate)



Routine Maintenance (Item 10)

- Cleaning, removal of exterior residues, external lubrication of shutter mechanism, calibration and electronic repairs.
- Mounting of the gauge is considered routine maintenance.

Mounting vs. Installation

- **Mounting (Routine):**
 - Unpacking or uncrating gauge
 - Fastening, hanging or affixing gauge
 - No electrical connection, activation or operation of gauge
 - Shutter should never be opened during mounting
- **Installation (Non-Routine):**
 - Electrical connection and activation of gauge
 - First use of gauge
 - Specific NRC or Agreement State authorization

Non-Routine Maintenance (Item 10)

- Any maintenance or repair (beyond manufacturer's recommended routine cleaning, lubrication, calibration and electronic repairs) that affects components, including electronics, relative to the radiological safety of the gauge (e.g., source, source holder, source drive mechanism, shutter, etc.)
- Installation, relocation, alignment, initial radiation surveys, replacement, removal from service, disposal, etc. typically done by manufacturer
- See NUREG-1556, Vol. 4, Rev. 1, Appendix J

Appendix F

Survey Instrument Calibration Program

- If survey instrument(s) possessed or access is available, they must be calibrated
- Either outside licensed party should perform calibrations; or,
- If “in-house,” the training and experience qualifications of individual performing the calibration must be provided

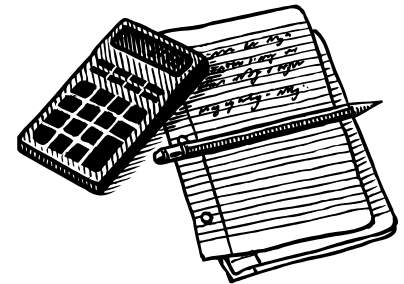
Appendix F

Survey Instrument Calibration Program

- Facilities and equipment to perform calibrations safely must be provided, including shielding and source of radiation to be used, if done “in-house”
- Calibration procedures (step-by-step)
- Error tolerance and calibration frequency should be described

Receipt and Accountability (Item 10)

- Maintain records of receipt, transfer and disposal of gauges
- Physical inventory every 6 months (or at other interval justified by applicant) to account for all sealed sources
- “Cradle to grave” accountability



Inventory Records



- Radionuclide and amount
- Manufacturer's name, model number and serial number (if appropriate)
- Location of each sealed source and device
- Date of inventory
- Signature of individual conducting inventory

Occupational Dose (Item 10)

- Documentation demonstrating that it is unlikely for an individual to receive in one year a radiation dose greater than 10% of 10 CFR Part 20, Section 20.1201 limits (Appendix G)

or

- Provide dosimetry, use NVLAP approved processor and specify exchange frequency

Occupational Dose (Item 10)

- For routine operations, personnel monitoring is not required for fixed gauge users
- For non-routine operations that are likely to result in workers receiving doses $> 10\%$ of 10 CFR 20.1201 limits, personnel monitoring is required

Operating and Emergency Procedures (Item 10)

Commit to develop, implement, and maintain the following procedures (not required to submit):

- Gauge operation, routine cleaning and maintenance
- Shutter checks, lock-out procedures
- Security (access control and surveillance)
- ALARA and accountability
- Warning signs visible and legible
- Emergency procedures

**See Appendix H
in NUREG 1556,
Vol. 4, Rev. 1**

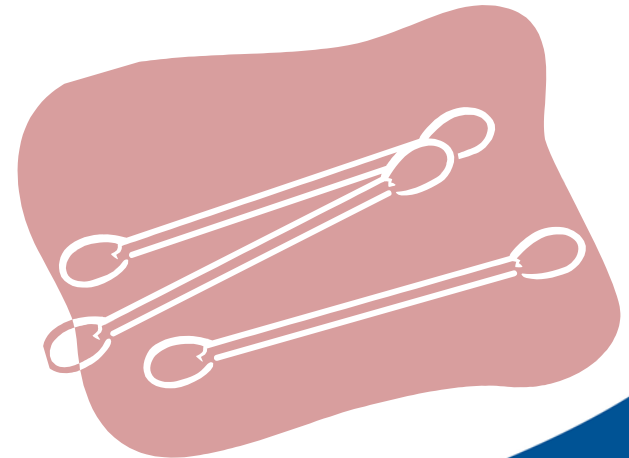
Significant Radiation Safety Risks For Fixed Gauges

- Lock-out procedures
- Shielding compromised due to environmental conditions (fire, corrosion, vibration, excessive cold)
- Non-routine maintenance
- Improper disposal or transfer
- [Information Notices](#) IN 81-37, 86-31, 88-02, 88-90, 94-15



Leak Tests (Item 10)

- Sealed sources required to be tested for leakage at intervals specified in the SS&DR
- For fixed gauges may be 12 months or once every 3 years
- Licensed service provider or
- Appendix I procedures





Generally Licensed Devices



References

- 10 CFR 31.3 - certain devices & equipment
- 10 CFR 31.5 - certain detecting, measuring, gauging or controlling devices and certain devices for producing light or an ionized atmosphere
- 10 CFR 31.6 - general license to install GL's
- 10 CFR 31.7 - aircraft luminous safety devices
- 10 CFR 31.8 - Am-241 calibration/reference sealed sources

References

- 10 CFR 31.10 - Sr-90 ice detection devices
- 10 CFR 31.11 - in-vitro testing
- 10 CFR 40.25 - certain industrial products (DU)
- 10 CFR 70.19 - calibration/reference sealed sources (plutonium \leq 5 microcuries)
- NUREG-1556, Vol. 16 “Program Specific Guidance About Licenses for Distribution to General Licensees”

What Is a Generally Licensed Device?

- A GL device usually consists of radioactive material (RAM,) contained in a sealed source, within a shielded device.
- Device is designed with inherent radiation safety features so there are no requirement for end-user radiation safety training or experience.
- Because of this, they fall under a simplified licensing process

Examples of GL Devices

- Certain fixed gauging devices
- Gas chromatograph units
- Static eliminators
- Self-luminous exit signs

Generally licensed devices

- Refer to Appendix K in NUREG-1556 Volume 16 “Program Specific Guidance About Licenses Authorizing Distribution to General Licensees”
- This NUREG is available at:
<http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1556>

GL Registration

- Applies to certain devices (10 CFR 31.5), depending on the type and quantity of RAM in the device
- Annual registration (NRC initiates)
- NRC Form 664 must be completed
- Annual registration fee must be paid

GL Devices Required to be Registered

Cesium-137	10 mCi
Strontium-90	0.1 mCi
Cobalt-60	1 mCi
Radium-226	0.1 mCi
Americium-241	1 mCi
Any other transuranic	1 mCi

10 CFR 31.5 General Licenses

- *No* specific (i.e., paper) license application for a general license (GL) is required for end-users
- However, the GL device must be manufactured or initially transferred and labeled in accordance with a *vendor's specific license* (10 CFR 32.51) or Agreement State equivalent

GL Device Label

(Refer to 10 CFR 32.51)

The receipt, possession, use and transfer of this device Model _____, SN _____, are subject of a general license or the equivalent and the regulations of the NRC (or Agreement State). This label shall be maintained on the device in a legible condition. Removal of this label is prohibited.

CAUTION - RADIOACTIVE MATERIAL
(manufacturer or initial transferor)

GL Requirements

- Routine maintenance
- Damaged device/shutter fails/leak test fails
- Reporting requirements (all 10 CFR 31.5 general licensees)
- Reporting requirements (registered GL's)

[See details in NUREG-1556, Vol.16, Appendix K](#)

Routine Maintenance for GLs

- Maintain label (keep it clean, legible, visible)
- Comply with all label instructions and precautions
- Leak test (every 6 months or specified frequency)*
- Shutter checks (every 6 months or specified frequency)*

**records required (3 years)*

THE END