

## NOTATION VOTE

June 5, 2003

SECY-03-0092

FOR: The Commissioners

FROM: William D. Travers  
Executive Director for Operations RA/

SUBJECT: PROPOSED RULE - ENHANCED SECURITY REQUIREMENTS  
FOR PORTABLE GAUGES CONTAINING BYPRODUCT  
MATERIAL

### PURPOSE:

To request Commission approval to publish a proposed rule in the Federal Register that would amend 10 CFR 30.34, "Terms and conditions of licenses." This proposed rule is intended to enhance security requirements for portable gauges to reduce their opportunity for theft, by requiring licensees to 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.

### SUMMARY:

The number of incidents of stolen gauges reported per year (approximately 50) is small when compared with the total number of gauges in use (more than 22,000), and the amount of radioactive material used in a portable gauge is also relatively small. However, the theft of portable gauges is still a concern if the gauge is abandoned in the environment, is recycled in a steel mill, or is used inappropriately. In addition, given the public's increased interest in and sensitivity to such matters, as well as governmental concerns, after the events of September 11, 2001, the staff believes that it is prudent to further improve the security of portable gauges. A working group was formed in August 2002 to explore various options and

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requirements for the rulemaking. Personnel from the Agreement States of Florida and Arkansas represented the Organization of Agreement States (OAS) and participated as members of the working group along with NRC staff in formulating this proposed rule. In addition, the staff provided a copy of the proposed rule to the U.S. Department of Transportation (DOT) hazardous material transportation staff for consultation. The staff is requesting Commission approval to publish a proposed rule in the Federal Register that would amend 10 CFR 30.34, "Terms and conditions of licenses," to enhance security requirements for portable gauges.

#### BACKGROUND:

On January 25, 2002, the staff provided the Commission with proposed interim compensatory measures for various categories of NRC licensees, including materials licensees, to increase security in response to the September 11, 2001, terrorist attacks. A supplement to the interim compensatory measures was developed proposing that the Commission issue Orders under its retained authority to provide for common defense and security to four categories of material licensees. These include large irradiators, large unsealed sources, self-shielded irradiators, and industrial radiography and well logging. The supplement also proposed to undertake a rulemaking for portable gauges on a health and safety basis. The Commission approved the staff's proposal to initiate discussions with the Agreement States in a Staff Requirements Memorandum dated July 2, 2002.

Information in the NRC's Nuclear Materials Events Database reveals that more than two-thirds of the approximately 450 gauges reported stolen since 1990 were taken from vehicles while parked at locations other than the licensees' storage facilities or temporary jobsites. In most of these incidents, the gauge was stored in a DOT "Type A" transportation case, which was then secured with a metal chain to the open bed of a pickup truck. Frequently, the chain was cut and the gauge was stolen, along with its transportation case. The remaining stolen gauges (approximately one-third) were taken from a licensed facility or a temporary jobsite.

There are about 1100 NRC portable gauge specific licensees and an additional 4000 Agreement State specific licensees. Portable gauge licensees often possess multiple portable gauges under the same license, and may conduct business outside of their home States under the reciprocity provisions of 10 CFR 150.20 or equivalent Agreement State regulations. Currently, there are an estimated 22,000 to 25,000 portable gauges in use in the United States. The staff recognizes that the number of incidents reported per year is small when compared with the total number of gauges in use. A relatively small amount of radioactive material is used in a portable gauge, and the radioactive material is encapsulated in stainless steel. Nevertheless, the theft of a portable gauge may still pose a potential risk to public health and safety if the gauge is abandoned in the environment, is recycled in a steel mill (gauges have been found in scrap yards), or if the gauge is used inappropriately.

#### DISCUSSION:

A working group was formed in August 2002 to explore various options and requirements for the rulemaking. Personnel from the Agreement States of Florida and Arkansas represented the OAS and participated as members of the working group along with NRC staff in formulating this proposed rule. The working group developed a proposed rule that would amend 10 CFR 30.34, "Terms and conditions of [byproduct material] licenses," to specify security requirements for a

portable gauge while in storage, in transport, or in storage incidental to transportation. However, during the concurrence process, NRC offices and DOT staff raised concerns regarding the use of terms such as “transport” and “incidental to transportation” in the regulatory text. Based on the DOT/NRC Memorandum of Understanding (MOU) dated July 2, 1979 (44 FR 38690), DOT has jurisdiction over Type A packages. Based on discussions with DOT staff, the working group revised the draft proposed rule by replacing “whenever portable gauges are in storage, in transport, or in storage incidental to transportation” with “whenever portable gauges are not under the control and constant surveillance of the licensee.” The staff sent the revised proposed rule to DOT hazardous material transportation staff for review on February 13, 2003, and received additional comments on March 24, 2003, providing editorial suggestions and proposals for minor modifications to the discussion of the physical controls included in the Federal Register notice.

The draft proposed amendment of 10 CFR 30.34 would require licensees to use a minimum of two independent physical controls that form tangible barriers to secure portable gauges from unauthorized removal whenever the gauges are not under the control and constant surveillance of the licensee. This requirement would apply regardless of location of the portable gauge or type of activity involved. The staff expects the physical controls to be constructed of material suitable for securing the gauges from unauthorized removal. In addition, the staff’s expectation is that both of these controls would have to be defeated separately for the portable gauge to be removed. The staff believes that the additional barriers would require a more determined effort to remove the gauge, and thereby deter a thief from stealing it.

The proposed rule is both more specific and has broader application than the 10 CFR 20.1801 provisions, requiring security of stored material, because it specifies the number and type of physical controls and because it applies to situations where the portable gauge is not under the control and constant surveillance of the licensee. In addition, the proposed rule is consistent with 10 CFR 20.1802 regarding control of material not in storage because a licensee must either control and maintain constant surveillance of the portable gauge or secure the portable gauge by a minimum of two independent physical controls. The staff interprets “control and maintain constant surveillance” of portable gauges to connote a licensee’s immediate presence or remaining in such close proximity to the portable gauge as to prevent unauthorized removal of the gauge. This proposed rule is specific to NRC licensees who act as a private carrier transporting portable gauges as part of their normal course of operation. This rule would not apply to common or contract carriers, who will continue to be covered under the exemption in 10 CFR 30.13.

The NRC has issued several "Information Notices (IN)" to remind licensees of their responsibilities concerning the security of portable gauges. These INs were issued in response to numerous incidents in which portable gauges were taken from vehicles. However, the yearly number of reported incidents has not significantly decreased in response to these INs and the potential still exists for public health and safety risks. The proposed amendment is expected to reduce the opportunity for theft.

The proposed rule would be consistent with the NRC goal of a performance-based regulatory approach because each licensee would have the flexibility of selecting the two controls that are most suitable for its current practices. If necessary, a licensee could use different controls that are more appropriate for its specific job operations.

In addition, the proposed rule would further the NRC performance goal of “Maintaining safety, protection of the environment, and common defense and security,” by enhancing the security of portable gauges. It would also further the goal of “Increasing public confidence” by means intended to reduce the number of stolen gauges. As for the performance goal of “Reducing unnecessary regulatory burden on stakeholders,” although the proposed rule would increase regulatory burden (because of additional security control requirements), the staff believes that this minor increase in the regulatory burden is acceptable. It is expected that the proposed rule would promote the performance goal of “Making NRC activities and decisions more effective, efficient, and realistic,” because more stringent requirements would be more effective in controlling licensed material.

### Options Considered

In addition to the proposed rule, the working group has discussed and evaluated other options, such as prohibiting unattended storage of portable gauges in or on vehicles, prohibiting unattended storage at locations other than licensed facilities, or requiring use of a metal enclosure and a lock with a shielded/protected shackle. Detailed analyses of these options are included in the draft Regulatory Analysis. Several Agreement States provided comments to NRC suggesting other regulatory options such as prohibiting unattended vehicular storage (New York), prohibiting storage other than licensed facility (Ohio), and installing a “lojack” on gauges (California). The working group had already considered these suggested requirements when forming regulatory options and during the development of the draft proposed rule. Options evaluated are summarized below with their associated advantages and disadvantages.

Option 1. No Action. Under this alternative, NRC would take no new action, but instead rely on the current regulations for domestic licensing of byproduct materials, specific guidance on portable gauges, and individual portable gauge licenses. The rationale for no action is based on the fact that the number of stolen gauges reported per year is small (about 50 gauges per year) when compared to the total number of gauges in use (about 22,000 to 25,000 gauges).

#### Pros

- ! Stops the expenditure of resources associated with a rulemaking and allows the resources to be applied to other high-priority activities.
- ! Rulemaking may not be an effective use of resources since the amount of radioactive material used in portable gauges is relatively small [about 0.30 to 0.37 gigabecquerels (8 to 10 millicuries) of cesium-137 and about 1.48 to 1.85 gigabecquerels (40 to 50 millicuries) of americium-241/beryllium] and the radioactive material is encapsulated in stainless steel, minimizing the risk of contamination.
- ! Imposes no new burdens on licensees and no changes in their current practices and procedures.
- ! A theft rate of less than a quarter of one percent may be too insignificant to justify rulemaking; especially since many of the stolen gauges are recovered (about 40 percent).

#### Cons

- ! Portable gauges would continue to be stolen at the rate of about 50 per year.
- ! Does not address public concerns nor attempt to improve public confidence.

Option 2. Promulgate a Rule Requiring Physical Controls for Portable Gauges. Under this alternative, NRC would amend its regulations in 10 CFR 30.34, and revise current guidance for portable gauges during its next revision, to require a licensee to use a minimum of two independent physical controls that form tangible barriers to secure portable gauges from unauthorized removal whenever gauges are not under the control and constant surveillance of the licensee. Since the number of gauges reported stolen has not decreased through other NRC efforts, and given the heightened sensitivity after the events of September 11, 2001, the staff believes that a rulemaking is necessary to ensure adequate, legally binding, additional physical controls for portable gauges.

#### Pros

- ! Reduces the opportunity for theft of portable gauges by increasing the physical controls, thus making it more difficult for a thief to steal the gauge.
- ! Provides flexibility for licensees in selecting the specific controls used to secure the portable gauges.
- ! Sets a minimum requirement and allows Agreement States flexibility to determine if other requirements would be more suitable for their individual needs.
- ! Addresses governmental and public concerns about the security of radioactive devices, and thus improves public confidence.
- ! Increased control would reduce potential risk to the public health and safety resulting from a stolen gauge abandoned in the environment, recycled in a steel mill, or used inappropriately.

#### Cons

- ! Cost burden to licensees for installing additional physical controls to secure a portable gauge--an estimated one-time cost of \$200 per gauge, on average.
- ! Additional controls would not necessarily stop a determined thief from stealing a portable gauge, and portable gauges would still be stolen.
- ! Additional controls may not further reduce the current theft rate of less than one quarter of one percent.

Option 3. Promulgate a Rule Prohibiting Unattended Vehicular Storage. Under this alternative, NRC would amend its regulations to prohibit unattended storage of portable gauges in vehicles. The State of Washington has issued an order requiring its licensees to return portable gauges to a licensed storage location each day. Both New York's and Ohio's comments on the draft proposed rule package suggested that NRC should consider prohibiting vehicular storage and requiring the licensees to store portable gauges at the licensed facility or at temporary jobsites.

#### Pros

- ! May be the most effective method to reduce the number of thefts of portable gauges.
- ! Storage prohibition would be uniformly applied in all States.
- ! Addresses governmental and public concerns about lost sources, and improves public confidence.

Cons

- ! Portable gauges could still be stolen from licensed facilities or temporary jobsites.
- ! Major impact on licensees' operation. It is a common practice for licensees to store portable gauges in vehicles. Licensees would no longer be able to continue with their current practice. Regions and certain Agreement States may need to amend licenses that authorize such storage.
- ! Cost burden to licensees because of time spent in transporting portable gauges to a licensed facility and/or resources needed in obtaining an alternate location, closer to temporary jobsites, for storing portable gauges. An estimated annual cost burden per licensee could range from \$360 for leasing a self-storage unit to as much as \$10,000 for transporting the gauge from and back to the licensed facility each day.
- ! May limit the licensee's ability to conduct business at distant locations.
- ! No flexibility for the licensees or the Agreement States to institute alternative control methods, based on their needs.
- ! At least one Agreement State would strongly object to such a prohibition.
- ! The proposed rule would be a major rulemaking, because of its potential cost impact (an annual effect on the economy of \$100,000,000 or more), and because its impact on small entities would require additional time to conduct a detailed analysis on the impact on small entities under the Regulatory Flexibility Act and to complete a "Compliance Guide."
- ! Could result in extensive scrutiny of the rule by the Office of Management and Budget, the Small Business Administration, and Congress because it would qualify as a major rule that would have a significant economic impact on small entities.
- ! Effective Date will be no earlier than 60 days after the date Congress receives required material, or 60 days after publication of final rule in the Federal Register, whichever is later.

Option 4. No Rulemaking. NRC would not undertake any rulemaking for portable gauges, but instead would revise guidance for licensees, Agreement States, and NRC Regions, regarding portable gauge security. "Consolidated Guidance About Materials Licenses," NUREG-1556, Vol. 1, for "Program-Specific Guidance about Portable Gauge Licenses" would be revised to discuss NRC's expectation for security and control of portable gauges in meeting requirements under 10 CFR 20.1801 and 20.1802. Existing guidance could be revised to clarify NRC's expectation, and existing enforcement tools could be strengthened making it more desirable for licensees to act to prevent theft.

Pros

- ! May require fewer resources and less time revising the existing guidance than conducting rulemaking.

Cons

- ! Would not be as effective as Options 2 and 3, since guidance and policy directives are not legal requirements, and Agreement States are not required to adopt NRC guidance or policy directives in their regulatory programs.
- ! Lower rates of theft are not expected.
- ! May not be applied consistently among Agreement States or Regions.
- ! Potentially less public involvement than in rulemaking.

- ! May not improve public perception or confidence because of the lesser degree of effectiveness.

### Recommended Option

Based on the evaluation of each option, the staff recommends Option 2--Promulgate a Rule Requiring Physical Controls for Portable Gauges. The recommended option is intended to enhance the current level of security and control (e.g., the requirements in 10 CFR 20.1801 and 20.1802) for portable gauges while providing sufficient flexibility for licensees to implement these requirements without an unreasonable burden. NRC regulations in 10 CFR 30.34 would be amended to require each licensee to 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. The draft proposed rule has been developed and is attached for the Commission's approval.

### AGREEMENT STATE ISSUES:

NRC staff has analyzed the proposed rule in accordance with the procedures established within Part III of Handbook 5.9 to Management Directive 5.9, "Categorization Process for NRC Program Elements." Staff has determined that the proposed 10 CFR 30.34(i) should be classified as Compatibility Category "C." An Agreement State should adopt the essential objectives of the Compatibility Category "C" program elements to avoid conflict, duplication, gaps, or the conditions that would jeopardize an orderly pattern in the regulation of Agreement material on a nationwide basis. The staff has determined that the essential objective of the proposed 10 CFR 30.34(i) is to reduce the opportunity for theft by requiring a licensee to provide 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.

The working group crafted and distributed a survey to the Agreement States at an annual OAS meeting in order to gather information related to security requirements for portable gauges in each of the Agreement States. A majority of the Agreement States have security requirements for portable gauges. Several of these States impose restrictions by rule, license condition, or order that are more stringent than existing NRC requirements and this proposed rule. For example, Rhode Island does not permit its licensees to store a gauge overnight away from a licensed facility. Since September 11, 2001, the State of Arizona issued an advisory, and the States of Texas and Washington issued orders, all imposing additional security requirements. Other States have indicated to NRC staff that they are considering similar actions.

In the order to its licensees, the State of Washington requires three levels of controls, rather than the two levels that the draft proposed rule would require. Staff does not believe that this difference presents a conflict regarding the proposed rule. First, as noted above, the rule falls into Compatibility Category "C," under the Commission's policy on Adequacy and Compatibility; therefore, an Agreement State may impose more stringent requirements. Second, the Washington order allows the licensee to consider a lock on the transportation case as a control; the draft proposed rule would not. Thus, the two additional controls the Washington order requires are equivalent to the two controls the draft proposed rule would require.

COORDINATION:

This proposed rule was coordinated with DOT hazardous material transportation staff to ensure that the regulatory text is not in conflict with DOT regulations and the existing DOT/NRC MOU. The Office of the General Counsel has no legal objection to the proposed rulemaking. The Office of the Chief Financial Officer has reviewed this Commission Paper for resource implications and has no objections. The proposed rule would make no changes to information collection requirements in 10 CFR Part 30.

RECOMMENDATIONS:

That the Commission:

1. Approve for publication, in the Federal Register, the proposed amendment to 10 CFR 30.34 (Attachment 1).
2. Certify that, based on the information currently available, the proposed rule, if adopted, is not likely to have a significant economic impact on a substantial number of small entities.
3. Note:
  - a. That the proposed amendment will be published in the Federal Register, allowing 75 days for public comment.
  - b. That the Chief Counsel for Advocacy of the Small Business Administration will be informed of the certification and the reasons for it, as required by the Regulatory Flexibility Act, 5 U.S.C. 605(b).
  - c. That an Environmental Assessment has been prepared for this rulemaking (Attachment 2).
  - d. That a draft Regulatory Analysis has been prepared for this rulemaking (Attachment 3).
  - e. That appropriate Congressional committees will be informed of this action.
  - f. That the Office of Public Affairs will issue a press release when the proposed rulemaking is filed with the Office of the Federal Register.

- g. That the 0.8 full-time equivalent needed to complete this action is included in the current budget for fiscal year 2004.

***/RA by William F. Kane Acting For/***

William D. Travers  
Executive Director  
for Operations

Attachments:

1. Federal Register Notice
2. Environmental Assessment
3. Draft Regulatory Analysis

# ATTACHMENT 1

## Federal Register Notice

NUCLEAR REGULATORY COMMISSION

10 CFR Part 30

RIN: 3150-AH06

Security Requirements for Portable Gauges Containing Byproduct Material

**AGENCY:** Nuclear Regulatory Commission.

**ACTION:** Proposed rule.

**SUMMARY:** The Nuclear Regulatory Commission (NRC) is proposing to amend its regulations governing the use of byproduct material in specifically licensed portable gauges. The proposed rule would require a licensee to provide a minimum of two independent physical controls that form tangible barriers to secure portable gauges from unauthorized removal whenever the portable gauges are not under the control and constant surveillance of the licensee.

**DATES:** The comment period expires (insert date 75 days from date of publication in the Federal Register). Comments received after this date will be considered if it is practical to do so, but the NRC is able to assure consideration only for comments received on or before this date.

**ADDRESSES:** You may submit comments by any one of the following methods. Please include the following number (RIN 3150-AH06) in the subject line of your comments. Comments on rulemaking submitted in writing or in electronic form will be made available to the public in their

entirety on the NRC rulemaking website. Personal information will not be removed from your comments.

Mail comments to: Secretary, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, Attn: Rulemakings and Adjudications Staff.

E-mail comments to: [SECY@nrc.gov](mailto:SECY@nrc.gov). If you do not receive a reply e-mail confirming that we have received your comments, contact us directly at (301) 415-1966. You may also submit comments via the NRC's rulemaking website at <http://ruleforum.llnl.gov>. Address questions about our rulemaking website to Carol Gallagher at (301) 415-5905; e-mail [cag@nrc.gov](mailto:cag@nrc.gov).

Hand deliver comments to 11555 Rockville Pike, Rockville, Maryland 20852, between 7:30 a.m. and 4:15 p.m. Federal workdays. (Telephone: (301) 415-1966).

Fax comments to: Secretary, U.S. Nuclear Regulatory Commission at (301) 415-1101.

Publicly available documents related to this rulemaking may be examined and copied for a fee at the NRC's Public Document Room (PDR), Public File Area O1F21, One White Flint North, 11555 Rockville Pike, Rockville, Maryland. Selected documents, including comments, can be reviewed and downloaded electronically via the NRC rulemaking website at <http://ruleforum.llnl.gov>.

Publicly available documents created or received at the NRC after November 1, 1999, are available electronically at the NRC's Electronic Reading Room at <http://www.nrc.gov/NRC/ADAMS/index.html>. From this site, the public can gain entry into the NRC's Agencywide Document Access and Management System (ADAMS), which provides text and image files of NRC's public documents. If you do not have access to ADAMS or if there are problems in accessing the documents located in ADAMS, contact the NRC's PDR Reference staff at 1-800-397-4209, 301-415-4737 or by e-mail to [pdr@nrc.gov](mailto:pdr@nrc.gov).

**FOR FURTHER INFORMATION CONTACT:** Lydia Chang, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, telephone (301) 415-6319, e-mail [lwc1@nrc.gov](mailto:lwc1@nrc.gov).

**SUPPLEMENTARY INFORMATION:**

**Background**

*Uses of Licensed Material in Portable Gauges*

Portable gauges are devices containing licensed material that are used to determine physical properties (such as density and moisture content of soil, concrete, and other materials) in a field setting. The most typical portable gauges in use today contain two encapsulated sources of radioactive materials. The first is a sealed gamma source containing 0.30 to 0.37 gigabecquerels (8 to 10 millicuries) of cesium-137 (Cs-137) used to measure density. The second source is a sealed neutron source containing 1.48 to 1.85 gigabecquerels (40 to 50 millicuries) of americium-241/beryllium (Am-241/Be) used to measure moisture content. Other radioactive materials have also been used in portable gauges. Under the Atomic Energy Act of 1954, as amended, NRC regulates byproduct, source, and special nuclear material used in portable gauges. NRC does not, however, regulate naturally occurring radioactive material such as radium-226 (Ra-226) used in portable gauges because it is not a byproduct, source, or special nuclear material. Gauges containing Ra-226 may be regulated by individual States.

Portable gauges are of many different designs based on their intended use. Two basic methods of measuring the property of materials with these gauges are direct transmission and backscatter. For the direct transmission method, the source is located on a source rod. When the gauge is in use, the rod is extended and inserted beneath the surface material through an

access hole. Radiation emitted by the source beneath the surface material is measured by a detector in the base of the gauge. For the backscatter method, both the source and the detector remain on top of the surface material to be tested. Radiation is directed into the surface and some is reflected back to the gauge detector by the surface material.

When not in use, portable gauges are generally stored in a permanent storage location within a licensed facility. However, portable gauges are often also stored at a temporary jobsite if the job requires more than one day. When transporting a portable gauge from a licensed facility to a temporary jobsite in a vehicle, the gauge is often placed in a transportation case, and then is secured in or onto the vehicle. Sometimes, portable gauges are stored at a temporary storage location or on a vehicle.

#### *NRC and Agreement States Licenses*

As authorized by section 274(b) of the Atomic Energy Act of 1954, as amended, 32 States have assumed responsibility for regulating certain activities related to radioactive material by entering into agreements with the NRC. The activities regulated by these “Agreement States” include the use of byproduct material in portable gauges. Each Agreement State issues licenses to persons who use radioactive material in portable gauges in that State. The NRC issues licenses to persons using radioactive material in portable gauges in non-Agreement States. Requirements that are specific to the safe use of portable gauges are included as license conditions.

NRC and Agreement States issue specific licenses and certain general licenses. General licenses do not include an individual license document, and usually authorize only small quantities of licensed material. The subject of this rulemaking is for portable gauges that are specifically licensed. There are approximately 1100 NRC portable gauge specific licensees and

an additional 4000 Agreement State specific licensees. Portable gauge licensees often possess multiple portable gauges under the same license, and may conduct business outside of their home States under the reciprocity provisions of 10 CFR 150.20 or equivalent Agreement State regulations. There are an estimated 22,000 to 25,000 portable gauges in use in the United States.

### *Current Regulatory Practices*

Specific licenses for portable gauges are governed by NRC regulations in 10 CFR Part 30, "Rules of General Applicability to Domestic Licensing of Byproduct Material." However, other NRC requirements in 10 CFR Parts 2, 19, 20, 21, 71, 150, 170, and 171 also apply to a portable gauge licensee. In addition, all such portable gauge licensees must also comply with other applicable Federal, State, and local regulations (e.g., Department of Transportation (DOT) regulations, local zoning requirements for a storage location, etc.). At present, NRC reviews a licensee's program as described in the license application, and incorporates certain requirements into the license as license conditions. Equivalent State regulations apply to Agreement State portable gauge licensees. Agreement States follow a similar approach. In addition, certain Agreement States, such as Florida, have specific additional requirements in their regulations for the possession and use of sealed sources in portable gauges. Other States, including Texas and Washington, have issued orders imposing specific additional requirements for their portable gauge licensees.

### *Storage and Control of Licensed Material*

NRC regulations in 10 CFR Part 20, "Standards for Protection Against Radiation," contain requirements applicable to activities conducted under licenses issued by the NRC. Subpart I of Part 20 addresses storage and control of licensed material. Specifically, § 20.1801,

“Security of stored material,” requires licensees to secure from unauthorized removal or access licensed materials that are stored in controlled or unrestricted areas. Section 20.1802, “Control of material not in storage,” requires licensees to control and maintain constant surveillance of licensed material that is in a controlled or unrestricted area and that is not in storage. Despite these requirements, theft of portable gauges, as described below, continues.

### *Theft of Portable Gauges*

Reports in the NRC’s Nuclear Materials Events Database (NMED) reveal that there have been approximately 450 gauges stolen since 1990. More than two-thirds of these stolen gauges were taken from vehicles while parked at locations other than the licensees’ storage facilities or temporary jobsites. In most of these incidents, the gauge was in a DOT “Type A” transportation case, which was then secured with a metal chain to the open bed of a pickup truck. Frequently, the chain was cut and the gauge was stolen along with its transportation case. The remaining one-third of the gauges were stolen from a licensed facility or a temporary jobsite, stolen along with a vehicle, or taken by a disgruntled employee.

It is true that the number of incidents reported per year is small when compared to the total number of gauges in use, that the amount of radioactive material used in a portable gauge is relatively small, and that the radioactive material is encapsulated in stainless steel.

Nevertheless, the theft of portable gauges still poses a concern if the gauge is abandoned in the environment, is recycled in a steel mill, or is used inappropriately.

In light of these concerns, NRC has issued several “Information Notices” (IN-2001-11, IN-98-01, IN-93-18, IN-88-02, IN-87-55, and IN-86-67) to remind licensees of their responsibilities concerning the security of portable gauges. However, the yearly number of reported incidents has not significantly decreased in response to these notices and the potential still exists for

public health and safety risks. In addition, given the heightened sensitivity following the events of September 11, 2001, it is necessary to enhance security for portable gauges by reducing the opportunity for theft. Therefore, NRC is proposing additional security requirements for specifically licensed portable gauges in addition to the general requirements for security and control of licensed material in 10 CFR 20.1801 and 20.1802. A working group was formed in August 2002 to explore various options and requirements for the rulemaking. Personnel from the Agreement States of Florida and Arkansas represented the Organization of Agreement States and participated as members of the working group along with NRC staff in formulating this proposed rule. The proposed rule language was coordinated with DOT hazardous material transportation staff due to the intrinsic portability (i.e., transportation) of the portable gauge during the course of its utilization by licensees.

### **Discussion of Proposed Amendment**

NRC is proposing to amend its regulations in § 30.34, Terms and conditions of licenses, to impose specific security requirements for portable gauges to reduce the opportunity for theft. Specifically, NRC proposes revising this section by adding § 30.34(i) to the list of terms and conditions of licenses issued pursuant to 10 CFR Part 30, "Rules of General Applicability To Domestic Licensing Of Byproduct Material." This paragraph would require persons using portable gauges under specific licenses to 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.

This rule would apply to a licensee with a portable gauge regardless of the location, situation, and activities involving the portable gauge. At all times, the licensee would be required to either maintain control and constant surveillance of the portable gauge or use a minimum of

two independent physical controls to secure the portable gauge. The NRC staff expects that the physical controls would be designed and constructed of material suitable for securing the gauges from unauthorized removal. In addition, the NRC staff's expectation is that both of these controls must be defeated for the portable gauge to be removed to deter a theft by requiring a more determined effort to remove the gauge.

#### *Securing a Portable Gauge at a Licensed Facility*

Long term storage of a portable gauge is usually at a permanent facility listed in the license or license application. Routine storage of a portable gauge in a vehicle or at temporary or permanent residential quarters is usually reviewed and may be authorized by NRC or the applicable Agreement State during the licensing process. Under the proposed regulation, when a portable gauge is stored at a licensed facility, the licensee would be specifically required to use a minimum of two independent physical controls to secure the gauge. Examples of two independent physical controls to secure a portable gauge when stored at a licensed facility are-

1. The portable gauge or transportation case containing the portable gauge is stored inside a locked storage shed within a secured outdoor area, such as a fenced parking area with a locked gate;
2. The portable gauge or transportation case containing the portable gauge is stored in a room with a locked door within a secured building for which the licensee controls access by lock and key or by a security guard;
3. The portable gauge or transportation case containing the portable gauge is stored inside a locked, non-portable cabinet inside a room with a locked door if the building is not secured;

4. The portable gauge or transportation case containing the portable gauge is stored in a separate secured area inside a secured mini-warehouse or storage facility; or

5. The portable gauge or transportation case containing the portable gauge is physically secured to the inside structure of a secured mini-warehouse or storage facility.

### *Securing a Portable Gauge in a Vehicle*

Licensees commonly use a chain and a padlock to secure a portable gauge in its transportation case to the open bed of a pickup truck while using the vehicle for storage. Because the transportation case is portable, a theft could occur if the chain is cut and the transportation case with the portable gauge in it is taken. If the licensee simply loops the chain through the handles of the transportation case, a thief could open the transportation case and take the portable gauge without removing the chain or the case. Because the transportation case is also portable, it must be protected by two independent physical controls if the portable gauge is inside. A lock on the transportation case or a lock on the portable gauge source rod handle would not be sufficient under the proposed requirements because the case and the gauge are portable.

A vehicle should be used for storage only for a short period of time when a gauge is in transit. A portable gauge should only be kept in a vehicle overnight if it is not practicable to provide temporary storage in a permanent structure. Under the proposed regulation, when a portable gauge is being stored in a vehicle, the licensee would be specifically required to use a minimum of two independent physical controls to secure the gauge. Examples of two such independent physical controls to secure portable gauges in these situations are--

1. The locked transportation case containing the portable gauge is physically secured to a vehicle with brackets, and a chain or steel cable (attached to the vehicle) is wrapped around

the transportation case such that the case can not be opened unless the chain or cable is removed. In this example, the locked transportation case would count as one control because the brackets would prevent easy removal of the case. The chain or cable looped only through the transportation case handle is not acceptable;

2. The portable gauge or transportation case containing the portable gauge is stored in a box physically attached to a vehicle, and the box is secured with (1) two independent locks; (2) two separate chains or steel cables attached independently to the vehicle in such a manner that the box cannot be opened without the removal of the chains or cables; or (3) one lock and one chain or steel cable is attached to the vehicle in such a manner that the box cannot be opened without the removal of the chain or cable; or

3. The portable gauge or transportation case containing the portable gauge is stored in a locked trunk, camper shell, van, or other similar enclosure and is physically secured to the vehicle by a chain or steel cable in such a manner that one would not be able to open the case or remove the portable gauge without removal of the chain or cable. In this example, the transportation case would not count as one control because it could be easily removed.

#### *Securing a Portable Gauge at a Temporary Jobsite or at Locations other than a Licensed Facility*

When a job requires storage of a portable gauge at a temporary jobsite or at a location other than a licensed facility, the licensee should use a permanent structure for storage if practicable to do so. When storing a portable gauge in temporary or permanent residential quarters, the licensee should limit access by storing the gauge in a separate room away from residents and other members of the public. The licensee must also meet the radiation exposure limits specified in 10 CFR Part 20.

Under the proposed regulation, when a portable gauge is stored at a temporary jobsite or at a location other than an authorized facility, the licensee would also be required to use a minimum of two independent physical controls to secure the gauge. Examples of two independent physical controls to secure portable gauges at these locations are--

1. At a temporary job site, the portable gauge or transportation case containing the portable gauge is stored inside a locked building or in a locked non-portable structure (e.g., construction trailer, sea container, etc.), and is physically secured by a chain or steel cable to a non-portable structure in such a manner that an individual would not be able to open the transportation case or remove the portable gauge without removing the chain or cable. A lock on the transportation case or a lock on the portable gauge source rod handle would not be sufficient because the case and the gauge are portable;

2. The portable gauge or transportation case containing the portable gauge is stored inside a locked room within temporary or permanent residential quarters, and is physically secured by a chain or steel cable to a permanent or non-portable structure (e.g., large metal drain pipe, support column, etc.) such that an individual would not be able to open the transportation case or remove the portable gauge without removing the chain or cable;

3. The portable gauge or transportation case containing the portable gauge is stored in a locked garage, and is within a locked vehicle or is physically secured by a chain or steel cable to the vehicle in such a manner that an individual would not be able to open the transportation case or remove the portable gauge without removing the chain or cable; or

4. The portable gauge or transportation case containing the portable gauge is stored in a locked garage, and is within a locked enclosure or is physically secured by a chain or steel cable to a permanent or non-portable structure in such a manner that an individual would not be able to open the transportation case or remove the portable gauge without removing the chain or cable.

### *Controlling and Maintaining Constant Surveillance of a Portable Gauge*

Under the proposed regulation, when a portable gauge is not secured with a minimum of two independent physical controls, the licensee would be required to control and maintain constant surveillance of the gauge. This proposed rule would more specifically address the current requirements in 10 CFR 20.1801 for security, and satisfy the requirements of 10 CFR 20.1802, which states that the licensee shall control and maintain constant surveillance of licensed material that is in a controlled or unrestricted area and that is not in storage. Control and constant surveillance is required when the gauge is not in storage, e.g., is in use or undergoing maintenance. The NRC staff interprets “control and maintain constant surveillance” of portable gauges to mean being immediately present or remaining in close proximity to the portable gauge so as to be able to prevent unauthorized removal of the gauge.

### **Criminal Penalties**

For the purpose of Section 223 of the Atomic Energy Act (AEA), the Commission is proposing to amend 10 CFR Part 30 under one or more of Sections 161b, 161i, or 161o of the AEA. Willful violations of the rule would be subject to criminal enforcement.

### **Agreement State Compatibility**

Under the “Policy Statement on Adequacy and Compatibility of Agreement State Programs” approved by the Commission on June 30, 1997, and published in the Federal Register on September 3, 1997 (62 FR 46517), this proposed rule would be a matter of compatibility between the NRC and the Agreement States, thereby providing consistency among the Agreement State and NRC requirements. The NRC staff analyzed the proposed rule in accordance with the procedure established within Part III, “Categorization Process for NRC

Program Elements,” of Handbook 5.9 to Management Directive 5.9, “Adequacy and Compatibility of Agreement State Programs” (a copy of which may be viewed at <http://www.hsrdo.ornl.gov/nrc/home.html>). The NRC staff has determined that proposed 10 CFR 30.34(i) is classified as Compatibility Category “C.” An Agreement State should adopt the essential objectives of the Compatibility Category “C” program elements to avoid conflict, duplication, gaps, or the conditions that would jeopardize an orderly pattern in the regulation of agreement material on a nationwide basis.

The NRC determined that the essential objective of proposed 10 CFR 30.34(i) is to reduce the opportunity for theft of a portable gauge by requiring a licensee to provide 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.

The NRC believes that the proposed rule does not conflict with any existing State regulatory requirement. Personnel from Agreement States of Florida and Arkansas represented the Organization of Agreement States and participated as members of a working group along with NRC staff in the development of this proposed rule.

### **Plain Language**

The Presidential Memorandum dated June 1, 1998, entitled “Plain Language in Government Writing,” directed that the Government’s writing be in plain language. This memorandum was published June 10, 1998 (63 FR 31883). The NRC requests comments on this proposed rule specifically with respect to the clarity and effectiveness of the language used. Comments should be sent to the address listed under the heading “ADDRESSES” above.

## **Voluntary Consensus Standards**

The National Technology Transfer Act of 1995 (Pub. L. 104-113), requires that Federal agencies use technical standards that are developed or adopted by voluntary consensus standards bodies unless the use of such a standard is inconsistent with applicable law or otherwise impractical. In this proposed rule, the NRC would revise 10 CFR Part 30 to add certain requirements for the security of portable gauges containing byproduct material. This action does not constitute the establishment of a standard that contains generally applicable requirements.

## **Environmental Assessment and Finding of No Significant Environmental Impact**

The Commission has determined under the National Environmental Policy Act of 1969, as amended, and the NRC's regulations in Subpart A of 10 CFR Part 51, that this proposed rule, if adopted, would not be a major Federal action significantly affecting the quality of the human environment; therefore, an environmental impact statement is not required. The Commission has concluded on the basis of an environmental assessment that these requirements would not have any effects on the environment in which portable gauges are currently regulated under 10 CFR Part 30. The proposed rule would increase requirements to prevent the theft of portable gauges containing byproduct material.

The determination of this environmental assessment is that there will be no significant impact on the public from this action. However, the general public should note that the NRC is seeking public participation. Comments on any aspect of this environmental assessment may be submitted to the NRC as indicated under the **ADDRESSES** heading.

The NRC has sent a copy of the environmental assessment and this proposed rule to every State Liaison Officer and requested their comments on the environmental assessment.

The environmental assessment may also be examined at the NRC Public Document Room, Public File Area O1F21, One White Flint North, 11555 Rockville Pike, Rockville, Maryland. Single copies of the environmental assessment are available from Lydia Chang, Office of Nuclear Material Safety and Safeguards, telephone (301) 415-6319, e-mail [lwc1@nrc.gov](mailto:lwc1@nrc.gov).

### **Paperwork Reduction Act Statement**

This proposed rule does not contain new or amended information collection requirements subject to the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.). Existing requirements were approved by the Office of Management and Budget, approval number 3150-0017.

### **Public Protection Notification**

The NRC may not conduct or sponsor, and a person is not required to respond to, a request for information or an information collection requirement unless the requesting document displays a currently valid OMB control number.

### **Regulatory Analysis**

The Commission has prepared a draft regulatory analysis on this proposed regulation. The analysis examines the costs and benefits of various alternatives. In addition to the proposed regulation, the NRC staff also considered alternatives such as: prohibiting unattended storage of portable gauges in or on vehicles; prohibiting unattended storage at locations other than licensed facilities; or requiring use of a metal enclosure and a lock with a shielded/protected shackle. However, these alternatives were found to be overly prescriptive and excessively burdensome for most NRC licensees. The option selected is requiring a minimum of two independent

physical controls whenever the portable gauge is not under the control and constant surveillance of the licensee. This proposed rule would enhance the current level of security and control (e.g., the requirements in 10 CFR 20.1801 and 20.1802) of portable gauges while providing sufficient flexibility for licensees to implement the requirements without an unreasonable burden.

The Commission requests public comment on the draft regulatory analysis specifically on the costs to licensees. Comments on the draft analysis may be submitted to the NRC as indicated under the **ADDRESSES** heading. The draft regulatory analysis is available for inspection in the NRC Public Document Room, Public File Area O1F21, One White Flint North, 11555 Rockville Pike, Rockville, Maryland. Single copies of the draft regulatory analysis are available from Lydia Chang, Office of Nuclear Material Safety and Safeguards, telephone (301) 415-6319, e-mail [lwc1@nrc.gov](mailto:lwc1@nrc.gov).

#### **Regulatory Flexibility Act Certification**

As required by the Regulatory Flexibility Act of 1980, 5 U.S.C. 605(b), the Commission certifies that this rule, if adopted, will not have a significant economic impact upon a substantial number of small entities. The proposed rule would affect about 1100 portable gauge specific licensees and an additional 4000 Agreement State specific licensees. These licenses are issued principally to companies involved in road constructions and maintenance. Many portable gauge licensees would qualify as small business entities as defined by 10 CFR 2.810. However, the proposed rule is not expected to have a significant economic impact on these licensees. Based on the draft regulatory analysis conducted for this action, the costs of the proposed amendments for affected licensees are estimated at \$200 per gauge. The NRC believes that the selected alternative reflected in the proposed amendment is the least burdensome, most flexible alternative that would accomplish the NRC's regulatory objective. The draft regulatory analysis also notes that the proposed requirements would result in potential cost savings for

portable gauge licensees, particularly for the replacement of stolen gauges. These savings would offset the implementation costs for portable gauge licensees. The NRC staff also notes that several Agreement States have imposed similar or more stringent requirements on their portable gauge licensees either by rule, order, or license condition.

Because of the widely differing conditions under which portable gauge users operate, the NRC is specifically requesting public comment from licensees concerning the impact of the proposed regulation. The NRC particularly desires comment from such licensees, who qualify as small businesses, as to how the proposed regulation will affect them and how the regulation may be tiered or otherwise modified to impose less stringent requirements on small entities while still adequately protecting the public health and safety. Comments on how the regulation could be modified to take into account the differing needs of small entities should specifically discuss--

(a) The size of the business and how the proposed regulation would result in a significant economic burden upon it as compared to a larger organization in the same business community;

(b) How the proposed regulation could be further modified to take into account the business's differing needs or capabilities;

(c) The benefits that would accrue, or the detriments that would be avoided, if the proposed regulation was modified as suggested by the commenter;

(d) How the proposed regulation, as modified, would more closely equalize the impact of NRC regulations as opposed to providing special advantages to any individuals or groups; and

(e) How the proposed regulation, as modified, would still adequately protect the public health and safety.

Comments should be submitted as indicated under the **ADDRESSEES** heading.

## **Backfit Analysis**

The NRC has determined that the backfit rules (§§ 50.109, 70.76, 72.62, or 76.76) do not apply to this proposed rule because this amendment would not involve any provisions that would impose backfits as defined in 10 CFR Chapter 1. Therefore, a backfit analysis is not required.

## **List of Subject Terms for Part 30**

Byproduct material, Criminal penalties, Government contracts, Intergovernmental relations, Isotopes, Nuclear materials, Radiation protection, Reporting and recordkeeping requirements.

For the reasons set out in the preamble and under the authority of the Atomic Energy Act of 1954, as amended; the Energy Reorganization Act of 1974, as amended; and 5 U.S.C. 553; the NRC is proposing to adopt the following amendments to 10 CFR Part 30.

## **PART 30-RULES OF GENERAL APPLICABILITY TO DOMESTIC LICENSING OF BYPRODUCT MATERIAL**

1. The authority citation for Part 30 continues to read as follows:

**AUTHORITY:** Secs. 81, 82, 161, 182, 183, 186, 68 Stat. 935, 948, 953, 954, 955, as amended, sec. 234, 83 Stat. 444, as amended (42 U.S.C. 2111, 2112, 2201, 2232, 2233, 2236, 2282); secs. 201, as amended, 202, 206, 88 Stat. 1242, as amended, 1244, 1246 (42 U.S.C. 5841, 5842, 5846).

Section 30.7 also issued under Pub. L. 95-601, sec. 10, 92 Stat. 2951 as amended by Pub. L. 102-486, sec. 2902, 106 Stat. 3123 (42 U.S.C. 5851). Section 30.34(b) also issued under sec. 184, 68 Stat. 954, as amended (42 U.S.C. 2234). Section 30.61 also issued under sec. 187, 68 Stat. 955 (42 U.S.C. 2237).

2. In § 30.34, paragraph (i) is added to read as follows:

**§ 30.34 Terms and conditions of licenses.**

\* \* \* \* \*

(i) *Security requirements for portable gauges.*

Each 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.

Dated at Rockville, Maryland, this \_\_\_\_\_ day of \_\_\_\_\_, 2003.

For the Nuclear Regulatory Commission.

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Annette Vietti-Cook,  
Secretary of the Commission.

# ATTACHMENT 2

## Environmental Assessment

**ENVIRONMENTAL ASSESSMENT AND  
FINDING OF NO SIGNIFICANT IMPACT  
FOR THE PROPOSED RULE  
AMENDING 10 CFR PART 30  
Rules of General Applicability to Domestic Licensing of Byproduct Material**

**Office of Nuclear Material Safety and Safeguards  
U.S. Nuclear Regulatory Commission**

**SUMMARY:** The U.S. Nuclear Regulatory Commission (NRC) is planning to publish in the Federal Register a proposed rule amending its regulations that govern the use of byproduct material in specifically licensed portable gauges. The proposed rule would require a licensee to provide a minimum of two independent physical controls that form tangible barriers to secure the gauges from unauthorized removal whenever the portable gauges are not under the control and constant surveillance of the licensee. NRC has prepared an environmental assessment to support this action.

## **I. INTRODUCTION**

Portable gauges are devices containing licensed material that are used to determine physical properties such as density and moisture content of soil, concrete, and other materials in a field setting. The most typical portable gauges in use today contain two encapsulated sources of radioactive materials. The first is a sealed gamma source containing 0.30 to 0.37 gigabecquerels (8 to 10 millicuries) of cesium-137 (Cs-137). This source is used for density measurement based on the attenuation of gamma radiation due to Compton scattering and photoelectric absorption, which is directly related to the electron density of materials. The second is a sealed neutron source containing 1.48 to 1.85 gigabecquerels (40 to 50 millicuries) of americium-241/beryllium (Am-241/Be). This source is used for moisture content measurement based on the thermalization or slowing down of fast neutron radiation, which is a

function of the hydrogen content of the material. Other radioactive materials besides Cs-137 and Am-241/Be have also been used in portable gauges.

When not in use, portable gauges are generally stored in a permanent storage location within a licensed facility. Portable gauges are often stored at a temporary jobsite if a job requires more than one day. A portable gauge being transported from a licensed facility to a temporary jobsite in a vehicle is first placed in a transportation case, and then is secured in or onto the vehicle. Sometimes, portable gauges are stored at a temporary storage location or on a vehicle.

Specific licenses for portable gauges are governed by NRC regulations in 10 Code of Federal Regulations (CFR) Part 30, "Rules of General Applicability to Domestic Licensing of Byproduct Material." However, other NRC requirements in 10 CFR Parts 2, 19, 20, 21, 71, 150, 170, and 171 also apply to a portable gauge licensee. At present, NRC reviews a licensee's program as described in the license application, and incorporates certain requirements into the license as license conditions. Equivalent State regulations apply to Agreement State portable gauge licensees. In addition, all such portable gauge licensees must also comply with other applicable Federal, State, and local regulations (e.g., Department of Transportation regulations, zoning requirements for a storage location, etc.). Agreement States follow a similar approach as NRC. In addition, certain Agreement States, such as Florida, have specific additional requirements in their regulations for the possession and use of sealed sources in portable gauges. Other States, including Texas and Washington, have issued orders imposing specific additional requirements for their portable gauge licensees.

Reports in the NRC's Nuclear Materials Events Database reveal that there have been approximately 450 cases of stolen gauges since 1990. Although the amount of radioactive materials used in a portable gauge is relatively small and is encapsulated in stainless steel, the

gauge still poses a concern for public health and safety and/or environment whenever it is stolen.

## **II. PROPOSED ACTION**

Under the proposed action, NRC would amend its regulations to include specific security requirements for handling portable gauges in order to reduce the opportunity for theft. The proposed rule would require 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. This rule would apply to a licensee with a portable gauge regardless of the location, situation, and activities involving the portable gauge. At all times, the licensee would be required to either maintain control and constant surveillance of the portable gauge or use a minimum of two independent physical controls to secure the portable gauge.

## **III. NEED FOR THE PROPOSED ACTION**

The theft of portable gauges poses a potential health and safety concern if the gauge is abandoned in the environment, is recycled in a steel mill, or is used inappropriately. The yearly number of reported incidents has not significantly decreased in response to NRC guidance reminding licensees of their responsibilities concerning the security of portable gauges. In addition, given the heightened sensitivity following the events of September 11, 2001, it is necessary to enhance security for portable gauges by reducing the opportunities for theft. Therefore, the NRC is proposing security requirements for specifically licensed portable gauges in addition to the general requirements in for security and control of licensed material in 10 CFR 20.1801 and 20.1802.

#### **IV. ALTERNATIVES TO THE PROPOSED ACTION**

The NRC considered alternatives to the proposed action including the no rulemaking alternative, and an alternative to adopt more stringent requirements than those proposed. Under the no rulemaking alternative, the NRC would rely on the current regulations in 10 CFR 20.1801 and 20.1802 for security and control of licensed materials and may consider revising existing guidance on portable gauge licenses. The no rulemaking alternative is not preferable because it may not help to reduce the potential risk to public health and safety and the environment due to the theft of portable gauges containing radioactive sources. Under the alternative to adopt more stringent requirements, the NRC would require a licensee to use, for example, a metal enclosure and a lock with a shielded/protected shackle for storage of a portable gauge in a vehicle, or NRC would prohibit a licensee from unattended storage of portable gauges in vehicles. Adoption of these more stringent requirements is not preferable because the NRC desires to allow licensees the maximum flexibility possible in achieving a reduction in the theft of portable gauges. The preferred alternative is to undertake a rulemaking to amend 10 CFR Part 30 regulations to require 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. The preferred alternative would enhance the current level of security and control of portable gauges while providing sufficient flexibility for licensees to implement the requirements.

#### **V. ENVIRONMENTAL IMPACTS OF THE PROPOSED ACTION AND ALTERNATIVES**

This proposed rulemaking would not have a significant environmental impact. This action would reduce opportunities for the theft of portable gauges and, therefore, reduce the number of stolen sources. Therefore, potential health and safety hazard to the public may be

reduced due to unintentional exposure to the stolen sources. Although most stolen gauges are abandoned on the roadside or in woods, the potential release of radioactive materials into the environment is still small because the rate of recovery is high and because radioactive sources used in portable gauges are relatively small and robustly encapsulated. However, reducing the number of stolen gauges could further reduce the potential impact to the environment. The no rulemaking alternative would not change the potential risk to public health and safety or the potential impact to the environment due to the continued risk of theft. Adoption of a more stringent requirement is expected to have similar environmental impacts to those of the preferred alternative.

## **VI. AGENCIES AND PERSONS CONSULTED, AND SOURCES USED**

Two representatives from the Agreement States of Florida and Arkansas represented the Organization of Agreement States (OAS) and participated in the development of the proposed rule and drafting of the environmental assessment. The OAS is an organization of Agreement States providing support for its members and communication among Agreement States, NRC, and others. In addition, the staff provided a copy of the proposed rule to the U.S. Department of Transportation hazardous material transportation staff for consultation. The NRC has sent a copy of the draft environmental assessment along with the proposed rule to every State Liaison Officer and has requested their comments on the environmental assessment.

## **VII. FINDING OF NO SIGNIFICANT IMPACT**

Based on its review, the Commission has determined under the National Environmental Policy Act of 1969, as amended, and the NRC's regulations in Subpart A of 10 CFR Part 51, that the proposed amendment is not a major Federal action significantly affecting the quality of the

human environment, and therefore, an environmental impact statement is not required. The Commission believes that the proposed action would not have a significant environmental impact. The Commission has determined that the proposed action of requiring specific controls for the security of licensed materials in portable gauges is the appropriate alternative to select.

The determination of this environmental assessment is that there will be no significant impact to the public from this action. However, the general public should note that the NRC welcomes public participation. Comments on any aspect of the environmental assessment may be submitted to: Secretary, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, Attn: Rulemakings and Adjudications Staff. For further information on the proposed rule for portable gauge or this environmental assessment, contact: Lydia Chang, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, telephone (301) 415-6319, e-mail [lwc1@nrc.gov](mailto:lwc1@nrc.gov).

# ATTACHMENT 3

## Draft Regulatory Analysis

**DRAFT REGULATORY ANALYSIS**  
for  
**AMENDMENT to**  
**10 CFR 30: RULES OF GENERAL APPLICABILITY TO DOMESTIC LICENSING OF**  
**BYPRODUCT MATERIAL**  
for  
**SECURITY REQUIREMENTS FOR PORTABLE GAUGES**

**I. STATEMENT OF THE PROBLEM AND OBJECTIVE:**

Portable gauges are devices containing licensed material that are used to determine physical properties such as density and moisture content of soil, concrete, and other materials in a field setting. The most typical specifically licensed portable gauge in use today contains two sources of radioactive materials: a sealed gamma source containing 0.30 to 0.37 gigabecquerels (8 to 10 millicuries) of cesium-137 (Cs-137) used for density measurement and a sealed neutron source containing 1.48 to 1.85 gigabecquerels (40 to 50 millicuries) of americium-241/beryllium (Am-241/Be) used for moisture content measurement. Other radioactive materials have also been utilized in portable gauges.

There are approximately 1100 U.S. Nuclear Regulatory Commission (NRC) portable gauge specific licensees and an additional 4000 Agreement State specific licensees. Since portable gauge licensees often possess multiple portable gauges under the same license, there are an estimated 22,000 to 25,000 portable gauges in use in the United States. Reports in the NRC's Nuclear Materials Events Database (NMED) reveal that there have been approximately 450 gauges stolen since 1990. It is true that the number of incidents reported per year is small when compared to the total number of gauges in use, that the amount of radioactive material in a portable gauge is relatively small, and that the radioactive material is encapsulated in stainless steel. Nevertheless, theft of a portable gauge still poses a concern for public health and safety and/or the environment, especially, if the gauge is abandoned in the environment, is recycled in a steel mill, or is used inappropriately.

Under the proposed action, NRC would amend its regulations to include specific security requirements for handling portable gauges in order to reduce the opportunity for theft. The proposed rule would require 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. This rule would apply to a

licensee with a portable gauge regardless of the location, situation, and activities involving the portable gauge. At all times, the licensee would be required to either maintain control and constant surveillance of the portable gauge or use a minimum of two independent physical controls to secure the portable gauge.

## **II. EXISTING REGULATORY FRAMEWORK:**

Specific licenses for portable gauges are governed by NRC regulations in 10 CFR Part 30, "Rules of General Applicability to Domestic Licensing of Byproduct Material." However, other NRC requirements in 10 CFR Parts 2, 19, 20, 21, 71, 150, 170, and 171 also apply to a portable gauge licensee. In addition, all such portable gauge licensees must also comply with other applicable Federal, State, and local regulations (e.g., Department of Transportation regulations, zoning requirements for a storage location, etc.). At present, NRC reviews a licensee's program as described in the license application, and incorporates certain requirements into the license as license conditions. Equivalent State regulations apply to Agreement State portable gauge licensees. Agreement States follow a similar approach as NRC. In addition, certain Agreement States, such as Florida, have specific additional requirements in their regulations for the possession and use of sealed sources in portable gauges. Other States, including Texas and Washington, have issued orders imposing specific additional requirements for their portable gauge licensees.

## **III. IDENTIFICATION AND PRELIMINARY ANALYSIS OF ALTERNATIVES:**

A working group was formed in August 2002 to explore various options and requirements for the rulemaking. Personnel from Florida and Arkansas represented the Organization of Agreement States and participated as members of the working group along with NRC program offices and one Regional representative. The working group has discussed and evaluated various options such as: no action, only issue guidance, require physical controls, prohibit unattended storage of portable gauges in or on vehicles, prohibit unattended storage at locations other than licensed facilities, and require use of a metal enclosure and a lock with a shielded/protected shackle. These options were grouped into three major alternatives.

**Alternative (1)** -- No rulemaking alternative. Under the no rulemaking alternative, the NRC would rely on the current regulations on domestic licensing of byproduct material and specific guidance on portable gauge licenses. This alternative would require no current resources to conduct a rulemaking. However, resources for reporting, recovery, and investigation of stolen gauges will continue to be expended by the licensee, and local, state, and federal regulatory and law enforcement agencies. Within this alternative, NRC may issue a policy statement or revise existing guidance to emphasize the need for securing portable gauges. Resources for issuing a policy or guidance would be much less than for a rulemaking. It is estimated to be less than 0.5 full-time equivalent (FTE). However, this approach would not be as effective as rulemaking because policy and guidance are not legally binding. In addition, Agreement States are not required to adopt such policy or guidance into their regulatory programs.

**Alternative (2)** -- Amend NRC regulations to adopt more specific and more prescriptive requirements such as the use of a permanently installed enclosure and locks with shielded/protected shackle to secure specifically licensed portable gauges. Another example would be to prohibit the unattended storage of portable gauges in or on vehicles or at locations other than licensed facilities. These more prescriptive requirements would clearly delineate exactly what is required for the security and control of portable gauges. For these prescriptive requirements, licensees may be required to modify their existing vehicles used for transporting portable gauges and to purchase new locks for securing these gauges. If unattended storage would be prohibited, licensees may be required to return the portable gauge each day to a licensed facility or to an alternate location for storage. Specific requirements would be applied uniformly to licensees without consideration of differing practices and operating situations that may exist. Although alternative (2) provides less degree of flexibility than alternative (3), it is anticipated that it would further reduce the number of stolen gauges than alternative (3).

This alternative would require the development of a proposed rule followed by a final rule. Public involvement would be through the publication of the proposed rule in the Federal Register for notice and comment as provided by the Administrative Procedure Act. The resources needed in the development of a rulemaking would be higher than the current staff resources. NRC staff resources needed for this alternative are estimated to be 1.7 FTE staff years.

**Alternative (3)** -- Amend NRC regulations in 10 CFR 30.34 to require licensees to use a minimum of two independent physical controls that form tangible barriers to secure specifically licensed portable gauges from unauthorized removal, whenever the portable gauges are not under the control and constant surveillance of the licensee. This alternative would be consistent with the NRC goal of a performance-based regulatory approach. Under this alternative, each licensee would have the flexibility of selecting the two controls that are most suitable for its current practices. If necessary, a licensee could use different controls that are more appropriate for its specific job operations.

Although the term “unauthorized removal” can describe situations other than theft, the primary focus of the amendment would be the reduction of theft. This alternative, similar to alternative (2), would require the development of a proposed rule followed by a final rule. Public involvement would be through the publication of the proposed rule in the Federal Register for notice and comment as provided by the Administrative Procedure Act. The resources needed in the development of a rulemaking would be higher than the current staff resources. NRC staff resources needed for this alternative are estimated to be 1.7 FTE staff years.

#### **IV. ESTIMATION AND EVALUATION OF VALUES AND IMPACTS OF ALTERNATIVES:**

The NRC staff has evaluated each attribute listed in Chapter Five of the *Regulatory Analysis Technical Evaluation Handbook*, NUREG/BR-0184. Alternative (1) would have no or minimal impact to the current situation and is considered as a baseline for comparing with other alternatives. Both alternatives (2) and (3) would require controls to reduce the opportunity for theft of specifically-licensed portable gauges. Alternatives (2) and (3) would also amend existing regulations through a rulemaking process that would have cost impacts. With the number of stolen gauges expected to decrease, alternatives (2) and (3) would have some positive impacts. Each attribute is summarized in Table 1 below, and then followed by a more detailed discussion on the impacted attributes.

**Table 1: List of Attributes and their Impacts**

Attribute	Potential Impact for Alternatives (2) and (3)
Public Health (Accident/Event)	May reduce the number of stolen gauges that an individual may be exposed to.
Public Health (Routine)	No impact.
Occupational Health (Accident)	No health impact expected to workers due to stolen gauges or consequent recovery operations.
Occupational Health (Routine)	No impact.
Offsite Property	May reduce the number of stolen gauges that may be abandoned and could potentially damage property.
Onsite Property	No impact.
Industry Implementation	Cost increase to install added controls. Cost avoidance due to reduction in number of stolen gauges requiring recovery operations, replacement, or potential cleanup.
Industry Operation	For alternative (3), slight cost increase due to the use of additional physical controls. For alternative (2), larger cost increase due to the use of more stringent controls and due to the need to return gauges to a storage location each day.
NRC Implementation	Cost associated with rulemaking activities.
NRC Operation	No significant impact to routine inspection due to added controls. Certain cost avoidance due to potential reduction in number of stolen gauges that need investigation and recovery operations.
Other Government	Cost impact to Agreement States due to the need to adopt the essential objectives of the program elements. Certain cost avoidance to various agencies due to potential reduction in number of stolen gauges that need investigation and recovery operations.

Attribute	Potential Impact for Alternatives (2) and (3)
General Public	No significant impact.
Improvements in Knowledge	May improve general knowledge of licensees and the public through rulemaking process where examples and expectations are addressed.
Regulatory Efficiency	May improve general knowledge of licensees will enhance regulatory efficiency.
Antitrust Consideration	No Impact.
Safeguards and Security Consideration	Not a safeguard concern.
Environmental Consideration	Reduction in the number of stolen gauges may also reduce the number of gauges being abandoned in the environment.

## **COSTS**

The two primary costs associated with alternative (2) or (3) are -- (1) implementation cost to the industry in installing the required physical controls for the portable gauges; and (2) resources spent by both NRC and Agreement States on development and implementation of the rule. Additionally, for alternative (2), there would be costs to the industry if a licensee were required to return portable gauges to the licensed facility every day.

**Cost for Industry Implementation and Operation** -- Both alternatives (2) and (3) would result in a one-time cost increase to the industry in providing physical controls for existing portable gauges and a smaller annual cost increase in providing physical controls for any new gauges. In addition, alternative (2) would have an increased burden on industry resources if unattended overnight storage of portable gauges in or on vehicles or at locations other than licensed facilities were prohibited. It is expected that alternatives (3) would result in a slight increase in cost to industry operations since the industry may alter its current security practice for portable gauges. Alternative (2) is expected to result in greater impact to industry operations due to more stringent security controls and the need to return gauges to a storage location each day.

There are approximately 1100 NRC licenses in non-Agreement States and 4000 State licenses in Agreement States authorizing the use of portable gauges containing radioactive material. Multiple portable gauges may be included on a single license. It is estimated that there are approximately 22,000 to 25,000 specifically licensed gauges in service and that the industry will acquire and put in service an additional 1,000 new gauges every year.

Alternative (2) Cost: For prescriptive requirements, staff assumed that all licensees would be required to install enclosures and a lock with shielded/protected shackle for each existing gauges in service. Based on a survey from several vendors, the unit cost for an enclosure ranges between \$100 to \$900 with a typical cost of about \$300. It is assumed that the cost to install the enclosure onto the vehicle is about \$100. The unit cost for a lock is about \$15 based on prices from two hardware stores.

As shown in Table 2, the one-time cost for installing the additional controls on the existing portable gauges as required by the prescriptive requirements of alternative (2) would be around nine to ten million dollars. The cost for installing the controls on new gauges would be around \$415,000 per year.

**Table 2: Cost Summary to Portable Gauge Licensees due to Prescriptive Requirements**

One-Time Cost for Adding Enclosure and Lock to 22,000 to 25,000 Existing Gauges					
Unit Cost for An Enclosure		No. Gauges	Additional Cost	No. Gauges	Additional Cost
Typical Cost	\$300	22,000	\$6,600,000	25,000	\$7,500,000
Installation Cost	\$100	22,000	\$2,200,000	25,000	\$2,500,000
Lock	\$15	22,000	\$330,000	25,000	\$375,000
<b><i>One-time Cost Impact for Existing Gauges Ranges from \$9,130,000 to \$10,375,000</i></b>					
Annual Cost for Adding Enclosure and Lock for 1,000 New Gauges					
Unit Cost for An Enclosure		No. Gauges	Additional Cost		
Typical Cost	\$300	1,000	\$300,000		
Installation Cost	\$100	1,000	\$100,000		
Locks	\$15	1,000	\$15,000		
<b><i>Annual Cost Impact for New Gauges is \$415,000</i></b>					

For prohibiting unattended overnight storage of portable gauges in or on vehicles or at locations other than licensed facilities, the licensee would have to pick up the portable gauges from the licensed facility before going to temporary jobsites and would have to return the gauges to the licensed facility at the end of each day. It is estimated that a licensee could spend an additional 2 to 5 hours each day driving back and forth between the licensed facility and the temporary jobsites. There are also costs associated with wear and tear of the vehicle and gasoline when additional time is spent traveling in the vehicle. Further, such a prohibition may limit the licensee in conducting business located at greater distances. For ease of calculation, only the added time is included in cost impact to the industry due to the storage prohibition of alternative (2), and the estimated cost impact is calculated based on the assumption of an hourly rate of \$20 and 250 working days per year. Cost may be lowered if locations other than the licensed facilities (e.g. private residence, motel, or a leased self-storage unit) were permitted for storage.

**Table 3: Cost Summary for Prohibiting Unattended Storage in or on Vehicles**

Annual Cost for Additional Time Spent Traveling Between Licensed Facility and Jobsites						
Rate	Time	Days	No. Gauges	Additional Cost	No. Gauges	Additional Cost
\$20/hr	2 hrs	250	22,000	\$220,000,000	25,000	\$250,000,000
\$20/hr	5 hrs	250	22,000	\$550,000,000	25,000	\$625,000,000
<b><i>Annual Cost Impact Ranges from \$220,000,000 to \$625,000,000</i></b>						
Annual Cost for Additional Time Spent Transporting Gauges to Storage Facilities and Leasing Cost for a Self-Storage Unit						
Storage Location		Percent Assumed		Cost Range		
Licensed Facilities-2 hrs at \$20/hr for 250 days		30% of 22,000 to 25,000 gauges		\$66,000,000 to \$75,000,000		
Other Locations-no cost, and no added travel time		50% of 22,000 to 25,000 gauges		0		
Other Leased Locations-\$30/month for 12 months		20% of 5,100 licensees		\$367,200		
<b><i>Annual Cost Impact Ranges from \$66,367,200 to \$75,367,200</i></b>						

Table 3 shows the estimated cost impact to the industry of prohibiting unattended overnight storage of portable gauges in or on vehicles. Cost may vary depending on locations allowed for storage. If storage in only licensed facilities is permitted, the potential cost impact for the licensees to transport the gauges back to the licensed facility each day would be around \$220 to \$625 million per year. If locations other than the licensed facilities are allowed for storage, the cost impact would be around \$66 to \$75 million dollars.

Alternative (3) Cost: Under this alternative, each licensee would be required to use a minimum of two independent physical controls that form tangible barriers to secure portable gauges from unauthorized removal, whenever these portable gauges are not under the control and constant surveillance of the licensee. A wide range of cost increases is anticipated for licensees depending on the type of controls the licensee will utilize.

It is assumed that for 20% of the gauges, the licensee would use existing systems and equipment to meet the new security control requirements. Therefore, no cost increase would be incurred by these licensees. It is assumed that for 40% of the gauges, the licensee would use an additional independent chain, steel cable, or bolt to secure the transportation case. A unit cost of \$15 for a lock and \$100 for 40 feet of chain or steel cable is based on a survey from two hardware stores and is used for this analysis. No installation cost is anticipated. For the remaining 40% of the gauges, it is assumed that the licensee would install an enclosure and a lock with shielded/protected shackle. Based on a survey from several vendors, the unit cost for an enclosure ranges between \$100 to \$900 with a typical cost of about \$300. It is assumed that the cost to install the enclosure onto the vehicle is about \$100.

With the assumed ratios, Table 4 shows the one-time cost impact associated with existing gauges that are currently in service. Table 5 shows the cost impact associated with new gauges that are estimated to come into service per year in the future.

**Table 4: One-Time Cost Summary to Portable Gauge Licensees for Adding Two Controls**

No Changes Needed for 20% of 22,000 to 25,000 Existing Gauges					
Unit Cost		No. Gauges	Additional Cost	No. Gauges	Additional Cost
No Change	\$0	4,400	\$0	5,000	\$0
Adding Lock/Chain/Cable for 40% of 22,000 to 25,000 Existing Gauges					
Unit Cost		No. Gauges	Additional Cost	No. Gauges	Additional Cost
Lock	\$15	8,800	\$132,000	10,000	\$150,000
Chain/Cable	\$100	8,800	\$880,000	10,000	\$1,000,000
Adding Enclosure and Lock for 40% of 22,000 to 25,000 Existing Gauges					
Unit Cost		No. Gauges	Additional Cost	No. Gauges	Additional Cost
Enclosure	\$300	8,800	\$2,640,000	10,000	\$3,000,000
Installation Cost	\$100	8,800	\$ 880,000	10,000	\$1,000,000
<b>One-time Cost Range from \$4,532,000 to \$5,150,000</b>					

**Table 5: Annual Cost Impact to Portable Gauge Licensees for New Gauges**

No Changes Needed for 20% of 1,000 New Gauges			
Unit Cost		No. Gauges	Additional Cost
No Change	0	200	\$0
Adding Lock/Chain/Cable for 40% of 1,000 New Gauges			
Unit Cost		No. Gauges	Additional Cost
Lock	\$15	400	\$6,000
Chain/Cable	\$100	400	\$40,000
Adding Enclosure and Lock for 40% of 1,000 New Gauges			
Unit Cost		No. Gauges	Additional Cost
Enclosure	\$300	400	\$120,000
Installation Cost	\$100	400	\$40,000

**Annual Cost Impact \$206,000**

Under this alternative, each licensee would also be required to control and maintain constant surveillance of portable gauges whenever portable gauges are not secured with a minimum of two physical controls. This portion of the revised requirements is consistent with the existing requirement in 10 CFR 20.1802; therefore, no cost impact to the licensees is anticipated for such control and surveillance.

Based on the 20%, 40%, and 40% assumed ratio of control methods selected by the licensees as discussed above, the estimated national impact for implementing alternative (3) would range from \$4.5 to \$5.1 million. There are approximately 5100 affected NRC and Agreement State licensees. Licensees may have as little as one gauge or as many as ten or more gauges, with a national average of about five gauges per licensee. Depending on the security control method selected, each licensee may incur between \$0 to \$4000 to ensure implementation for all of its licensed portable gauges. Based on the assumptions stated above, an average one-time unit cost on a national basis will be around \$200 per gauge with a corresponding national average of about \$1000 per licensee assuming five gauges per licensee for implementing alternative (3). Total annual costs for providing security for new gauges is estimated at \$206,000 assuming the same ratio for control methods selected as for the existing gauges.

**Cost for NRC Implementation and Operations** -- Both alternatives (2) and (3) would result in NRC implementation costs. Specifically, NRC would incur costs to develop a rule and to revise the existing guidance on portable gauges. NRC staff resources needed for developing the proposed rule, completing the final rule, and revising the guidance is estimated to be 1.7 FTE staff years at \$77/hr and 1,776 hrs/FTE for an estimated total cost of \$232,000. No increase in NRC resources is anticipated for implementation of the revised requirements. The staff also anticipates no significant impact on NRC resources expended on routine inspection for compliance with the new requirements.

**Cost for State Implementation** --Both alternatives (2) and (3) would result in Agreement States adapting their regulations to the NRC revised rule. The proposed rule would have compatibility category "C" requirements; therefore, an Agreement State should adopt the essential objectives

of the rule. The compatibility category “C” requirements would be needed to avoid conflict, duplication, gaps, or the conditions that would jeopardize an orderly pattern in the regulation of agreement material on a nationwide basis. Adoption of the essential objectives can be done through promulgating a comparable rule, issuing orders, revising state guidance, or adding or revising individual license conditions. Since each of the 32 Agreement States may choose different implementation mechanisms, it is difficult to estimate the implementation costs for each Agreement State. However, it is anticipated that implementation costs for each state would be much lower than the implementation cost for the NRC because the Agreement States do not need to spend resources in developing and evaluating various alternatives to come up with the revised requirements. It is assumed that 75% of the Agreement States would promulgate state regulations with an average expenditure of one quarter FTE, and the remaining Agreement States would use other mechanisms at 0.1 FTE per state on average. The total estimated state implementation costs would be around \$680,000 using an assumed hourly rate of \$50 and 250 working days per year.

Calculation:

$$[(32 \text{ states} \times 75\% \times 0.25 \text{ FTE} + 32 \text{ states} \times 25\% \times 0.1 \text{ FTE}) \times \$50/\text{hr} \times 2,000 \text{ hrs}] = \$680,000$$

**BENEFITS**

By requiring additional controls, it is expected that both alternatives (2) and (3) would reduce the number of stolen gauges. The primary categories of the benefits of reduced incidents of theft are economic benefits and exposure aversion benefits. In addition, there are less tangible benefits. Since incidents involving theft occur in the public domain, incidents to be averted have a significant impact on the public’s perception of the risks associated with the use of radioactive material. This, in turn, can improve the credibility of NRC and the Agreement States. Therefore, this rulemaking could further the goal of increasing the confidence of the public.

**Summary of Economic Benefits** -- Economic benefits result from reduction in costs associated with the theft of portable gauges through reduction in the incidence of theft. These costs are--

To licensees: for event notification, recovery operations, follow-up investigations, corrective actions, and leak testing and servicing of recovered sources/gauges or replacing sources/gauges not recovered;

To NRC: for event notification review, follow-up inspections, and enforcement actions, and for investigation upon discovery of abandoned sources/gauges;

To Agreement States: for event notification review, follow-up inspections, and enforcement actions, and for investigation upon discovery of abandoned sources/gauges;

To local law enforcement and fire departments: for investigation upon discovery of abandoned sources/gauges;

To landfill and municipal incinerator operators: for investigation upon discovery of abandoned sources/gauges; and

To the scrap metal industry: for investigation upon discovery of abandoned sources/gauges and for potential cleanup of contaminated material cause by a melted source.

**Savings to Affected Industry** -- Both alternatives (2) and (3) are expected to save the industry in costs associated with gauge replacement and/or gauge recovery operations. Reports in the NMED reveal that there were approximately 450 cases of stolen gauges since 1990 with an average of about 50 cases per year for the past five years. The recovery rate is estimated at 40%. For each incident, it is assumed that an operator, a radiation Safety Officer, and a manager of a licensee will spend around 40 hours at an average hourly rate of \$50 for the reporting, investigation, recovery, and mitigation activities for a stolen gauge incident. The estimated cost would be \$2000 per event. Often times, the licensee will typically offer a reward of \$500 for the return of a stolen gauge. Since no data is available on how often a reward is paid, it is not included in this analysis. Even for a gauge that is recovered, there is an associated cost (e.g., leak test and servicing) of approximately \$50, in order to bring the gauge back to service. A typical gauge costs between \$5200 to \$8400. For every stolen gauge not recovered, the licensee may need to replace it at a cost of approximately \$7000 average per gauge. For the purpose of this analysis, it is assumed that alternative (2) would achieve a 70% reduction in stolen gauges while alternative (3) would achieve 50% reduction because alternative (2) is expected to be more effective in reducing opportunity for theft by imposing more stringent requirements. The total cost savings per year would be \$217,700 for alternative (2) and \$155,500 for alternative (3).

Calculations:

Alternative (2) projected savings per year = \$70,000 + \$700 + \$147,000 = \$217,700

(50 events/yr x 70% reduction x 40 hrs/event x \$50/hr) = \$70,000/yr for recovery operations

(50 gauges/yr x 70% reduction x 40% recovery x \$50 testing) = \$700/yr

(50 gauges/yr x 70% reduction x 60% not recovered x \$7,000/gauge) = \$147,000/yr for replacement.

Alternative (3) projected saving per year = \$50,000 + \$500 + \$105,000 = \$155,500

(50 events/yr x 50% reduction x 40 hrs/event x \$50/hr) = \$50,000/yr for recovery operations

(50 gauges/yr x 50% reduction x 40% recovery x \$50 testing) = \$500/yr

(50 gauges/yr x 50% reduction x 60% not recovered x \$7,000/gauge) = \$105,000/yr for replacement.

**Savings to NRC and the States** -- Both alternatives (2) and (3) would result in NRC and Agreement State savings associated with reporting and investigation efforts due to the anticipated lower number of stolen gauges. On average, NRC or an Agreement State spends approximately eight hours at an hourly rate of \$77 and \$50, respectively, for the initial investigation of each stolen gauge. Since follow-up investigation and enforcement action depends heavily on the nature of the incident and the resources spent vary widely, they are not captured for this analysis. Based on the 40% recovery rate, it appears that stolen gauges are often abandoned by the thief. NRC or Agreement States are often involved in investigation of the discovery of an abandoned gauge. It is estimated that approximately 4 hours will be spent in investigating an abandoned gauge. With a 70% and 50% reduction in incidents for alternatives (2) and (3), respectively, there are savings associated with the initial investigation of a stolen gauge and a corresponding savings associated with the discovery of an abandoned gauge. Assuming a split of one-third NRC lead and two-thirds Agreement State lead, the total savings per year would be approximately \$19,820 for alternative (2) and \$14,160 for alternative (3).

Calculations:

Alternative (2) projected savings per year = \$16,529 + \$3,304 = \$19,824

[(50 events/yr x 70% reduction x 8 hrs x (1/3 x \$77/hr + 2/3 x \$50/hr))] = \$16,520/yr

[(50 events/yr x 70% reduction x 40% recovery x 4hrs x (1/3 x \$77/hr + 2/3 x \$50/hr))] = \$3,304

Alternative (3) projected savings per year = \$11,800 + \$2,360 = \$14,160

[(50 events/yr x 50% reduction x 8 hrs x (1/3 x \$77/hr + 2/3 x \$50/hr))] = \$11,800/yr

[(50 events/yr x 50% reduction x 40% recovery x 4hrs x (1/3 x \$77/hr + 2/3 x \$50/hr))] = \$2,360

**Savings to Local Law Enforcement and Fire Departments** -- Law enforcement and fire department personnel are likely to be the first responders upon discovery by a member of the public of an abandoned gauge, which may have been stolen. By reducing the theft of portable gauges, the corresponding rate of abandonment should also be reduced. Therefore, less responses would be needed from law enforcement and fire department personnel. For every abandoned gauge discovered, it is assumed that on an average four fire fighters and two policemen would be at the scene for two hours at \$50/hr. For the purpose of this analysis, a 40% discovery rate of abandoned gauges is assumed along with a 70% reduction for alternative (2) and 50% reduction for alternative (3) in stolen gauges. The estimated cost savings due to fewer responses by law enforcement and fire department would be \$8400 and \$6000 for alternatives (2) and (3), respectively.

Calculations:

*Alternative (2) projected savings =*

$$50 \text{ events} \times 70\% \text{ reduction} \times 40\% \text{ discovery} \times 6 \text{ people} \times 2 \text{ hrs} \times \$50/\text{hr} = \$8400.$$

*Alternative (3) projected savings =*

$$50 \text{ events} \times 50\% \text{ reduction} \times 40\% \text{ discovery} \times 6 \text{ people} \times 2 \text{ hrs} \times \$50/\text{hr} = \$6000.$$

**Potential Cost Savings to Scrap Industry** --By reducing the number of stolen gauges, there could be potential cost savings to the scrap metal industry from a reduced possibility that gauges might inadvertently be sent into scrap metal processing. Although quantitative estimates of such savings are not being made in this analysis, some information indicates that avoidance of melting of a gauge could save the scrap metal industry considerable decontamination costs.

In 1995, a joint NRC-Agreement State working group evaluated the issue of the loss of control of radioactive sources. The working group's final report NUREG-1551, "Final Report of the NRC-Agreement State Working Group to Evaluate Control and Accountability of Licensed Devices" (October 1996), included a recommendation to increase the oversight of sources and devices meeting certain criteria. The report also contained cost estimates to the steel industry resulting from the melting of improperly disposed of sources. The cost estimate for decontamination and clean-up from the melting of sources in steel mills was about \$12 million per year from 1983 to 1995 based on experience (as reported by the steel industry) but with high uncertainties. The report included both specifically and generally licensed devices for the risk of source meltings in steel mills. The cost estimates reported did not include incidents at large

integrated steel mills for which the resultant clean up could cost as much as \$100 million for a single incident. There was a more recent incident involving a steel manufacturing company in Baldwin, Florida that spent approximately \$10 million in July 2001 on a clean-up due to melting of a cesium source mixed in with recycled metal scraps.

Since portable gauges have a theft rate of 50 per year and since most stolen gauges would be abandoned by the thief, they are likely to end up in such places as scrap yards and smelters. The radioactive material in the typical portable device to which this rule would apply is similar to the types and quantities of material considered to be contributing to the costs to the steel industry resulting from the inadvertent melting of radioactive sources. Thus, these gauges would be expected to represent a portion of the risk from the loss of control of sources, particularly the significant cost of property damage resulting from the melting of sources. It is noted that the total number of sources in use is increasing, that the relative contribution between generally licensed and specifically licensed sources may have changed, and that the likelihood of a source melting depends on the monitoring effort performed by the metal manufacturers and recyclers. The cost estimates in NUREG-1551 still give an indication of the magnitude of the potential costs for decontamination and clean-up.

However, given the uncertainties involved in estimating the likelihood of portable gauges being sent to scrap metal processing, no cost savings are assumed in this regulatory analysis.

**Potential Savings to Landfill and Municipal Incinerator Operators** -- A fraction of stolen devices may end up at landfills and municipal incinerators. These facilities currently use monitors to detect the presence of radioactive material in order to prevent the inappropriate disposal of radioactive sources. When a monitor trip occurs, resources are spent to find and identify the source and determine the appropriate means of disposal. If there is a reduction in the number of stolen gauges, the likelihood of such a gauge ending up in these facilities should be reduced, thus reducing any associated costs to the operations.

**Other Potential Savings** -- Other costs, though less significant, associated with stolen sources also could be reduced by this rulemaking. For example, a stolen gauge may become an "orphaned" source if it is abandoned and its owner cannot be tracked down. By reducing the theft rate, the number of "orphaned" sources could also be reduced. The cost for disposal of orphaned sources often falls on government agencies (e. g., Environmental Protection Agency

or Department of Energy, or individuals or organizations). Therefore, there is a potential cost savings to government agencies for managing less “orphaned” sources.

**Regulatory Efficiency** -- Both alternatives (2) and (3) would require promulgation of an amendment to a rule that would enhance regulatory efficiency. Through the rulemaking process, new requirements for physical controls will be proposed and discussed with specific examples of sufficient controls. There will also be an opportunity for comments from the industry and the public, and the NRC’s regulatory expectations for licensee implementation of the rule will be provided in the statements of consideration. All of these steps will increase regulatory consistency, and hence, improve the efficiency of portable gauge licensees in complying with NRC regulations.

**Environmental Considerations** -- Alternatives (2) and (3) would likely result in the environmental effect of an insignificant reduction in the unnecessary release of radioactive material. Although NMED data show that most of the stolen gauges were abandoned on the roadside or in woods, the potential for a significant release from the radioactive source into the environment is very low because the rate of recovery is high and because the quantity of radioactivity in portable gauge sources is relatively small and robustly encapsulated. Therefore, reducing the number of stolen gauges will only have an insignificant impact on the environment.

**Safeguards and Security Considerations** -- The goal of this proposed rule is to enhance the physical control of the portable gauges by reducing the opportunity for theft. Because of the small quantity of radioactive material in a portable gauge, the potential for its malevolent use is small. Theft of a large number of gauges would be required to acquire sufficient material to construct a useful radiological dispersion or exposure device. Therefore, there are no safeguards consideration in this rulemaking.

**Public Health (Accident)** -- Both alternatives (2) and (3) would require improved security controls for portable gauges to reduce the opportunity for theft. As a result, the number of stolen gauges would likely be reduced, potentially averting radiation exposure to the public. When a gauge is stolen, it may become available to a member of the general public. Although it is reasonable to assume that a member of the public would not deliberately expose himself or herself or someone else to radiation, in some cases, these individuals might not understand that

a gauge is a potential source of radiation. Provided the radioactive material sealed source remained in the gauge and the shutter mechanism remained closed, no significant radiation exposure could result. If a gauge with a significant source of activity were to end up in the public domain, and a person was unknowingly exposed to the source, a significant exposure could result. However, radiation exposures due to improper handling would not be expected to exceed 1 mSv (100 mrem) in most cases. The improper handling of a limited number of the devices in use could conceivably result in doses on the order of a few rem. However, the likelihood of situations which could result in the highest doses is very low. Nonetheless, as the number of cases of stolen gauges would be reduced, the likelihood of unnecessary accidental exposure to the public would also be reduced.

## **V. DECISION RATIONALE:**

The no-rulemaking alternative is not preferable because efforts such as issuing Information Notices have not significantly decreased the yearly number of reported incidents of stolen gauges. It is true that the number of incidents reported per year is small when compared to the total number of gauges in use, that the amount of radioactive material in a portable gauge is relatively small, and that the radioactive material is encapsulated in stainless steel. Nevertheless, theft of portable gauges still poses a concern if the gauge is abandoned in the environment, is recycled in a steel mill, or is used inappropriately. In addition, given the current heightened sensitivity following the events of September 11, 2001, it is necessary to enhance security of portable gauges by reducing the opportunity for theft. The adoption of alternative (2) is not preferred because it would create a large burden to the licensees' current operations. Alternative (3) is selected as the preferred option because the added controls would enhance the security of portable gauges by reducing the opportunity for theft, and yet at the same time providing flexibility for the licensees in selecting the controls that are most suitable for them.

It is estimated that adoption of this regulatory action will result in a one-time up-front rulemaking development and implementation costs of \$232,000 to the NRC and of \$680,000 to the Agreement States. No significant impact to NRC or Agreement State resources expended on routine operations is anticipated for this revised requirement. For the industry, there is an estimated one-time cost of four to five million dollars for installing controls for existing portable

gauges currently in service, and an estimated annual cost of \$206,000 for installing controls for new gauges as they come into service in the future.

Although the primary benefit of reduced incidents of theft is economically based, there are other benefits such as radiation exposure aversion, reduced public concerns, increased public confidence, and enhanced NRC credibility. It is estimated that the economic benefits for the industry would be around \$155,500 per year for cost avoidance due to a reduced number of incidents requiring recovery operations and/or replacement of stolen gauges. The estimated savings for NRC and the States would be around \$14,160 for the reduced number of incidents requiring investigation or responses. The corresponding savings for local fire department and law enforcement would be around \$6000 for the reduced number of incidents requiring responses. In addition, there are potential cost savings associated with the steel industry due to inadvertent melting of sources, with landfill and incinerator facilities for monitoring improperly disposed of sources, and with government agencies for managing "orphaned" source.

## **VI. IMPLEMENTATION:**

The regulatory action is not expected to present any significant implementation problems. A number of control methods may be utilized by the licensee to best fit its situation. NRC and the Agreement States could monitor compliance through current operations.