

**NUCLEAR REGULATORY COMMISSION**

**10 CFR Part 30**

**RIN: 3150-AH06**

**Security Requirements for Portable Gauges Containing Byproduct Material**

**AGENCY:** Nuclear Regulatory Commission.

**ACTION:** Final rule.

**SUMMARY:** The Nuclear Regulatory Commission (NRC) is amending its regulations governing the use of byproduct material in specifically licensed portable gauges. The final rule requires a portable gauge licensee to use 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. The primary intent of this rulemaking is to increase licensees' control of portable gauges to reduce the opportunity for unauthorized removal or theft.

**EFFECTIVE DATE:** This final rule is effective on **(insert 180 days from date of publication)**.

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## **SUPPLEMENTARY INFORMATION:**

### **Background**

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 commonly used portable gauges contain two encapsulated sources of radioactive material. One source 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. Another 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 sources have also been utilized in portable gauges. When not in use, portable gauges are generally stored in a permanent storage location within a licensed facility. Sometimes, portable gauges are stored at a jobsite, at a temporary storage location, or on a vehicle. When transporting a portable gauge in a vehicle, the gauge is often placed in a transportation case, and then is secured in or onto the vehicle.

Under the authority of the Atomic Energy Act of 1954, NRC, together with the 33 Agreement States, regulates byproduct material used in portable gauges. There are approximately 1100 NRC specific licensees for portable gauges in non-Agreement States and approximately 4000 State specific licensees for portable gauges in Agreement States. There are an estimated 22,000 to 25,000 portable gauges in use in the United States.

Subpart I of 10 CFR 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, the theft of portable gauges continues at a rate of approximately 50 gauges per year with a less than 50-percent recovery rate, based on reports in NRC's Nuclear Materials Events Database (NMED). More than two-thirds of the stolen gauges were taken from vehicles parked outdoors. In most of these incidents, the gauge was in a U.S. Department of Transportation (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 or the transportation case was broken, and then the gauge was stolen. NRC has issued several "Information Notices" to increase licensees' awareness of security concerns regarding portable gauges. However, the yearly number of reported incidents has not changed in response to these notices.

Although the amount of radioactive material used in a portable gauge is relatively small, and the radioactive material is encapsulated in stainless steel, unauthorized removal of portable gauges still poses a potential public health and safety concern. A portable gauge that is not under the control of a licensee poses a potential radiation hazard to individuals that may come in close contact with the source. It also creates a concern if the portable gauge that is removed without authorization is abandoned, inadvertently recycled, or used inappropriately.

## **Discussion**

To reduce the potential risk to public health and safety, a working group with participation of personnel from the Agreement States of Florida and Arkansas developed the proposed rule to impose security requirements for portable gauges to increase licensees' control, which would reduce the opportunity for unauthorized removal of the gauges. The security requirements would require that the portable gauge licensees must use 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. The primary intent of this rulemaking is to increase the control of portable gauges and thereby reduce the opportunity for and the number of unauthorized removals or thefts of portable gauges and, as a result, reduce the potential impact to public health and safety. NRC published a notice of proposed rule (68 FR 45172; August 1, 2003) in the Federal Register with the opportunity for comment on the proposed amendment to 10 CFR § 30.34.

After considering all comments received on the proposed rule and evaluating recommended alternative methods to increase the control of portable gauges, NRC finds that the requirements in the proposed rule are the preferred alternative because they provide the most flexibility for licensees (permitting a choice from a wide range of physical controls) without imposing excessive costs in implementing the controls. Therefore, the final rule contains the same requirements as the proposed rule.

### **Summary of Public Comments on the Proposed Rule**

NRC received eleven comment letters on the proposed rule. The commenters included a member of the public, members of an industry advisory group, three licensees, a radiation service company, two manufacturers, and three States. Copies of the public comments are available for public inspection and copying for a fee at the NRC Public Document Room, 11555 Rockville Pike, Rockville, MD, 20852.

Among the eleven comment letters, six state that they fully support the goal to reduce lost or stolen gauges; two state that current requirements are adequate; one indicates that the rule is well intended; one expresses the view that a double lock requirement may be excessive;

and one believes that the current practice of using a chain to secure a portable gauge in an open-bed pickup truck is not adequate. Among comments from the three States, one indicates that the NRC proposed measures do not go far enough; one states that the current regulatory requirements are adequate; and one supports the goal of the rule but believes the proposed rule to be impractical. A discussion of the comments and NRC's responses follow:

**Current Requirements Adequate.**

Comment: One commenter believes the security procedures to be adequate, but is confident that he can also comply with the language of the proposed change.

Response: Although certain licensees may have adequate procedures for securing the portable gauges, NRC does not believe the current practice of having one physical control is sufficient to reduce the current rate of portable gauge theft.

Comment: The Virginia Department of Transportation (VDOT) has not had any gauges stolen in the past 8 years, and believes that the current security measures are adequate.

Response: NRC disagrees that current security measures are adequate. Although no portable gauge was reported stolen from VDOT over the past 8 years, NRC notes that in the Commonwealth of Virginia, one incident of a lost gauge and two incidents of stolen gauges were reported in 2003, and two incidents of stolen gauges were reported in 2004. To reduce the overall rate of unauthorized removal or theft of portable gauges, NRC believes it is necessary to increase controls for portable gauges.

**Malevolent Use of Portable Gauges.**

Comment: Four commenters stated that portable gauges are not likely to be used for malevolent purposes. One commenter stated that no credible study supports the conclusion that portable gauges might be used for malevolent purposes or that gauges are a substantial risk of such use. That commenter also stated that there is no identifiable pattern to support the idea that individuals are stealing portable moisture/density gauges for malevolent use. One

commenter questioned what resulted in the need for a very prescriptive rule for increased security of these gauges since a report to Congress indicated that sources in a single portable gauge are small, and unlikely to be suitable for an effective radiological dispersion device (RDD). Another commenter stated that the potential for the stolen gauges to be used in a radiological dispersion device is minute because it takes such a significant effort to steal a large number of gauges and remove the radioisotopes to manufacture a “dirty bomb.” Another commenter indicated that there has not been an increase in gauge thefts in recent years, and that there is no evidence that thefts are for malevolent purposes, but rather it is likely that thefts are more for personal or monetary gain.

Response: NRC agrees. As stated in the regulatory analysis for the proposed rule: “Because of the small quantity of radioactive material in a portable gauge, the potential for its malevolent use is small.” Due to the quantity and physical characteristics of the radioactive material used, portable gauges do not pose a substantial risk for malevolent purposes such as a “dirty bomb.” Similarly, NRC has not identified any trend or information indicating that reported thefts of portable gauges containing licensed material over the last 2 years resulted in a substantial health and safety consequence. However, NRC is still concerned with the continued loss of control of the licensed materials due to unauthorized removal or theft of portable gauges, the multiple resource impacts in response to such events, and the potential exposure to an individual, who come in close contact with the source in the portable gauge. NRC believes that these additional requirements are needed to improve the control of the licensed material and thus better protect the public from a potential health and safety risk.

Comment: One commenter stated that the International Atomic Energy Agency (IAEA) has published guidance on the security of radioactive sources, on categorization of radioactive sources, and on graded security measures based on potential hazard, vulnerability of the source or device, and potential consequences of malevolent acts. In the interim guidance

document on security of radioactive sources, the IAEA has categorized portable gauges as Security Group C. Security measures that the IAEA recommended for Group C include one technical measure that separates the source from unauthorized personnel. The commenter stated that NRC's proposed rule exceeds the security measures recommended by the IAEA, and believes that one technical measure is sufficient.

Response: In addition to one technical measure separating the source from unauthorized personnel for Security Group C material (such as portable gauges), the IAEA also recommends access control at the source location as a sufficient security measure based on the potential hazard, vulnerability of the device, and potential consequences of malevolent acts. This final rule is not based on common defense and security, but is based on protecting public health and safety from the potential of radiation exposure as a result of unauthorized removal or theft of portable gauges. Instead of one technical measure and access control as recommended by IAEA, NRC believes that two technical measures are needed to sufficiently control the portable gauge from unauthorized removal or theft in the United States. The IAEA guidance on the Security of Radioactive Sources (TECDOC-1355) is an interim guidance for comment by its Member States, and has not been accepted by the United States. In general, NRC may modify IAEA standards, as necessary, to meet NRC's regulatory needs. NRC's current regulatory framework already requires licensees to use one measure of control in securing the portable gauges and has concluded that an additional measure is necessary to reduce the instances of unauthorized removal or theft of portable gauges. NRC has issued several Information Notices to portable gauge licensees to emphasize the importance of adequate control of the portable gauges; however, the number of unauthorized removals or thefts of portable gauges has not decreased. NRC believes that an additional measure of control is needed to reduce the current number.

### **Rule Will not Prevent Thefts.**

Comment: Although several commenters support the NRC's security concerns, one commenter stated that licensees are already required to secure gauges, but that does not prevent carelessness in their control. Securing gauges with two layers of security will not prevent thefts.

Response: NRC agrees that the requirements would not necessarily prevent carelessness in the control of gauges or human error, or ensure compliance by all licensees. Although NRC also agrees that additional security measures can not totally prevent the unauthorized removal or theft of the portable gauges, requiring an additional layer of physical control should deter the likelihood of the unauthorized removal or theft.

Comment: One commenter stated that the rule would not deter insider or opportunistic thefts that occur because of lapses such as leaving the keys in a vehicle that contains a gauge.

Response: Although background checks and hiring practices could potentially deter theft by insiders, NRC does not believe that the very small number of thefts committed by insiders warrants such additional requirements. Requiring licensees to use two independent physical controls should reduce the risk of unauthorized removal or theft of portable gauges from a variety of causes.

Comment: One commenter stated that licensees are already required by regulations to maintain "adequate security." However, the current practice of leaving the gauge in the open bed of a pickup truck chained to the side of the truck is not "adequate security," because gauges have been stolen from the open bed of a pickup truck after the chain was cut.

Response: NRC agrees that all licensees are required to maintain adequate security and control of the licensed material. It appears that the current practices are not sufficient for control of portable gauges. NRC evaluated various alternatives in developing the proposed rule. Based on the cost/benefit analysis in the regulatory analysis, NRC believes that adding



one additional layer of control would make it more difficult for a thief to defeat, and the total cost impact would be acceptable.

Comment: One commenter believes that not all licensees would strive to comply with the new requirements. The portable gauge theft rate will not change because the new requirements would not affect these types of licensees, who will ignore the new regulation.

Response: NRC expects the rate of unauthorized removal or theft of portable gauges to decrease once the amendment becomes effective. Not all of the unauthorized removals or thefts of portable gauges are caused by lack of compliance by licensees with security requirements, but are also due to defeating the current security measures allowing the use of one locking device to secure the portable gauge. NRC believes that adding an additional measure would reduce the number of unauthorized removals or thefts by making it more difficult and more time-consuming to defeat the security measures. Requiring two independent physical controls is the most effective alternative based on cost and flexibility to licensees in implementing the rule.

Comment: One commenter stated that additional regulations are unlikely to significantly reduce the number of [stolen] gauges. The commenter believes that a large percentage of the gauges reported stolen were probably left unsecured, and the loss occurred as a “theft of opportunity,” rather than a “determined thief.” The gauges that were stolen by defeating one security measure would most likely be stolen regardless of the number of independent security systems because a “determined thief” is just as likely to defeat two security systems as one.

Response: NRC believes that increasing physical controls provides a delay and deterrent mechanism making it more difficult for a thief to defeat. At a minimum, two controls would delay the thief by drawing attention from bystanders, which may deter the thief.

Comment: One commenter believes that gauges will continue to be stolen from careless gauge owners and by persistent thieves, regardless of the increased security

requirements and that the new requirements adversely affect the diligent and vigilant gauge owner.

Response: NRC agrees that no measure is absolute in stopping persistent and determined thieves, but increasing the security controls would make theft more difficult. NRC believes that the financial impact on gauge owners from enhancing security requirements is small when compared to: the financial consequences to the gauge owners due to unauthorized removal or theft of the portable gauges; the potential health and safety risk to the public from these incidents; and the resource impacts on law enforcement and regulatory agencies.

**Not Commensurate with Risk.**

Comment: One commenter stated that the double-lock requirement may be excessive from a security standpoint. Another commenter stated that the proposed rule is inconsistent with a risk-informed approach to regulation because it imposes tighter security requirements on low-activity portable gauges than high-activity devices such as radiography cameras, which pose far greater hazards. It would be far easier and more likely for someone with malevolent intent to steal a single, high-activity radiography device than many low-activity portable gauges, and much less likely to raise suspicions. The commenter does not believe that moisture-density gauges merit security requirements more restrictive than those required for higher-activity portable devices.

Response: NRC disagrees with the commenters. Since the terrorist attacks of September 11, 2001, NRC has issued Orders to enhance security measures for certain licensed facilities. Based on the IAEA Code of Conduct on the Safety and Security of Radioactive Sources and IAEA Categorization of Radioactive Source (TECDOC-1344), NRC considers that portable gauges are not high risk sources if used for malevolent purposes. NRC is still concerned with the number of unauthorized removals or thefts of portable gauges. Even though a typical portable gauge contains much lower activity than a radiography camera,

unauthorized removal or theft of such gauge still poses a potential health and safety risk to the public. As for higher-activity devices, NRC is taking appropriate actions to enhance security and protect the common defense and security.

Comment: One commenter stated that even if the stolen gauge rate is reduced from approximately 50 gauges per year to 25 gauges per year, it would not represent a meaningful reduction in risk in the absence of any evidence that any harm has ever occurred to any individual from a stolen portable gauge.

Response: NRC disagrees with the comment that the reduction would not represent a meaningful reduction in risk. On an average, 50 portable gauges are stolen per year. Every gauge that is not recovered from unauthorized removal or theft poses a potential hazard to the public. It is true that severe radiation injury has not been associated with unauthorized removal or theft of portable gauges. Because the recovery rate is low, the number of unrecovered gauges will continue to grow, posing potential risk to the public.

#### **Change in Gauge Design.**

Comment: One commenter indicated that if grocery-cart manufacturers can make the wheels of their grocery carts lock if the cart is taken off the property, then portable gauge manufacturers could make it easier for licensees to secure their gauges.

Response: NRC agrees that perhaps portable gauge manufacturers could make it easier for licensees to secure the gauges, but it is not an NRC requirement that such changes take place. Manufacturers are required to design the sealed sources and the devices to operate safely. Because portable gauges are used by licensees in different situations and stored in various locations, the licensees are in a better position to select the security measures best suited for their situation.

Comment: One commenter stated that manufacturers must be required to make gauges “idiot-proof” and less attractive to thieves. The commenter suggests the portable gauges be designed so that if a gauge is stolen, the radioactive material portion is sequestered.

Response: With the current portable gauge design, the sealed sources are inaccessible and can not be readily removed by a member of the public when the gauge is in its locked configuration. Because the commenter did not provide any details on the “sequestering” technology, it is uncertain if it is feasible to implement or sufficient to protect the public health and safety.

Comment: One commenter suggested the gauge be designed so that the source rod has to be removed and stored separately.

Response: NRC does not believe that it is necessary to remove and store the source rod separately. With the current design, the sealed sources are kept within a shielded compartment inside the portable gauge providing protection for the workers. If the sealed source and the source rod would have to be removed and stored separately, it would greatly increase the radiation exposure to workers from removal of the source rods and from having multiple storage sites. Additionally, the removed sealed source and the source rod would present a greater risk to the public if the licensee were to lose control of the material. Therefore, NRC does not believe there would be sufficient benefit from requiring removal of the sealed source or the source rod.

Comment: A commenter suggests that a “secured key” be required for locks.

Response: NRC does not believe that it is necessary to require a secured key for locks. Based on the NMED data, stolen gauges are not linked to a stolen key. Therefore, it would not be cost effective to incorporate a secured key system as means to reduce the opportunity for unauthorized removal or theft of a gauge.

Comment: One commenter stated that “there’s some psychology to be reckoned with” because merely the suggestion for redesign of an important engineering tool might make management much more amenable to require employees/authorized users to ensure that gauges were secure.

Response: NRC’s regulatory requirements are based on technical information and are not based on psychological reactions of certain individuals. NRC believes that having two independent physical controls is a tangible requirement that can be easily inspected and evaluated.

### **More Enforcement.**

Comment: Three commenters stated that stricter enforcement action against non-compliant licensees would be better than more rules and would dramatically reduce the number of gauges stolen. One commenter stated that rules are only as effective as their enforcement and that current rules already require that gauges be secured against unauthorized removal. Those licensees that are diligent about security do not have gauges stolen. The annual stolen gauge rate is extremely low (about 0.2 percent), so most licensees are doing a good job. Those licensees that are not diligent or vigilant are unlikely to change as a result of a new rule. Only increased emphasis on inspection and enforcement of the security requirements is likely to cause those licensees to change their ways.

Response: NRC does not believe that the existing security requirements are sufficient, and therefore, enforcement alone will not dramatically reduce the number of unauthorized removals or thefts of portable gauges. NRC believes that it is necessary to increase the current security measures to reduce the opportunity for unauthorized removal or theft. NRC does agree that more frequent inspections and increased enforcement would reduce licensees’ future security lapses, but would not affect thefts where all procedures were followed and the thief still defeated the security measures. NRC disagrees that licensees, who are diligent about

security, do not have gauges stolen. Many gauges were stolen from compliant licensees by thieves defeating current security measures. NRC has and will continue to enforce security requirements for portable gauges.

**Information Notice.**

Comment: One commenter recommended that NRC rescind the rule and use Information Notices to reduce the number of stolen gauges.

Response: NRC disagrees with the suggestion to use Information Notices as a means to reduce the number of unauthorized removals or thefts of portable gauges. As indicated in the notice of proposed rule (68 FR 45172; August 1, 2003), NRC has issued several Information Notices in the past to remind licensees of their responsibilities concerning the security of portable gauges, and there has been no change in the number of reported incidents annually.

**Root Cause Not Addressed.**

Comment: One commenter claimed the proposed rule has not effectively addressed the root cause of the problem nor is it consistent with a risk-informed, performance-based approach to regulation.

Response: NRC disagrees with the comment. The NRC working group evaluated various alternatives in developing and evaluating the proposed rule in light of comments. Although certain alternatives might be more effective than the chosen one, the associated cost impacts to the licensees' operations from such alternatives would be immense. For example, the alternative of prohibiting the storage of portable gauges in vehicles might be more effective, but the total resource impact on licensees is estimated to be more than \$200 million per year. This assumes each portable gauge operator would spend an additional 2 hours daily in transporting the portable gauge to and from the licensed facility. NRC believes that requiring

two independent physical controls will reduce the likelihood of unauthorized removal or theft of portable gauges while minimizing cost impacts to the licensees.

**Visibility Issue.**

Comment: Four commenters suggested that the rule should address the visibility of the gauge (e.g., thief sees it, thinks it's valuable, and steals it). One of the commenters also stated that methods that reduce the visibility of devices are just as important as tangible barriers in preventing theft because most thefts occur when gauges are highly visible (i.e., in open-bed trucks). Keeping a gauge inside a box where it is not visible is an effective physical control.

Response: NRC agrees that portable gauges are often stolen because the thief perceives that the transportation case contains valuable commercial equipment. NRC also agrees that there could be benefits from keeping the portable gauge and its transportation case out of sight or covered any time they are not under the control of the operator. NRC considered this and other various approaches to address the visibility issue, but rejected them as costly, impractical, or contrary to other regulatory requirements, and of questionable effectiveness. For example, NRC considered requiring that the gauge and its transportation case be covered, but the DOT staff informed the NRC staff that such covering of portable gauges during transport would be inconsistent with DOT regulations and defeats the intent of the requirements for labels and markings of portable gauges containing radioactive materials. Requiring the use of a cover to conceal the portable gauge and its transportation case could place licensees in non-compliance with DOT requirements. NRC also considered requiring use of an "enclosure" as a means to address the visibility problem. However, requiring the use of an enclosure would have significant cost impacts on licensees that might not be commensurate with the potential benefit gained. Because the rule does not prescribe specific methods for physical control, a licensee will have the flexibility to select an enclosure as one of the two independent physical controls if it were deemed beneficial for its situation. NRC believes it is necessary to have this

flexibility for licensees because of the high number of licensees affected, each of which may vary in its operating and financial conditions.

There are many methods that could be used to secure the gauge and its transportation case, which could also keep the gauge and its transportation case out of sight. NRC does not believe it is cost-effective to require additional requirements for such purpose. NRC believes that regulations should provide sufficient flexibility to allow licensees to select the two independent physical controls to prevent the unauthorized removal of the portable gauges that best fit a licensee's needs.

**Accessibility Issue.**

Comment: According to an Agreement State, it requires portable gauges to be returned to an approved storage location after work when the temporary job-site is within 93 kilometers (50 miles) of an approved storage location.

Response: NRC considered requiring the return of portable gauges to an approved storage location daily. However, NRC believes that making it a requirement applicable to all licensees would not be feasible and would not be cost efficient due to the time spent transporting the gauges back and forth from licensed facilities. In the regulatory analysis performed for the proposed rule, NRC evaluated several options including the option of daily return of portable gauges to a permanent storage location. Based on the estimated cost impact of this option, NRC determined that the cost would be excessive considering potential benefits gained from such a requirement.

Comment: One commenter stated that the rule is not likely to be effective because it does not address the critical factors that lead to theft. Clearly, two key factors in the theft of gauges are visibility (open-bed truck) and accessibility (parking location). The fact that chains are frequently cut indicates that physical controls alone are not sufficient to deter a determined individual. The NRC rule does not address visibility or accessibility, but focuses on tangible



barriers. NRC states that having to defeat two tangible barriers will deter thefts by requiring a more determined effort to remove the gauge. However, if a thief is able to cut one chain or lock, a second chain or lock hardly seems like much of an additional deterrent.

Response: NRC agrees that using two metal chains as physical barriers instead of one may not be the most effective means of control. Although the use of metal chains is not the most desirable control method, NRC does want to give licensees flexibility to select the controls that are suitable for them. NRC encourages licensees to store gauges in a permanent location and not in vehicles, but NRC does not want to make it a requirement because of the potential economic impacts on licensees. However, since this is a performance-based rule, licensees must ensure that the two physical barriers chosen clearly increase the deterrence value and would make the gauge more difficult to steal.

**Too Prescriptive and Not Performance-Based.**

Comment: Three commenters indicated that the rule is too prescriptive. Specifically, one commenter stated that the rule would not be effective in all cases and would lead to misunderstandings about what is being required. Another commenter stated that the rule dictates too much detail and would severely limit the licensees' ability to be creative in controlling portable gauges. Another commenter stated that the rule is inconsistent with the NRC's performance-based regulatory philosophy. The rule is far more prescriptive than the existing rules in 10 CFR 20.1801 and 20.1802, which address the security of radioactive material in a performance-based manner without specifying the methods to be used. This rule specifies both the method of control and the number of controls required, which prescriptively limits the licensee's choice of methods for complying with the rule. The commenter suggested that other methods, such as reducing the visibility of devices are just as important. Keeping a gauge inside a box where it is not visible is an effective physical control. Audible and visual alarms are also effective physical controls for deterring theft. Security experts recommend

layers of protection involving a variety of methods, such as these. By narrowly prescribing that tangible barriers as the only method of compliance, the rule may reduce a licensee's incentive to use other effective means to deter thefts. Deterrence of theft is largely a matter of common sense, which cannot be mandated by rule or regulation. The situations under which portable gauges may be used and stored vary so widely that no prescriptive rule will be practical or effective for all situations.

Response: NRC disagrees with the commenters that the rule is too prescriptive. This rule does not prescribe a specific physical control that needs to be used to secure portable gauges. Licensees have options in selecting from a wide range of physical controls. Of course, there are some physical controls that are more effective than others. Although options such as storing gauges inside a building or in an enclosure may be effective control methods, factors such as cost impact and variation in licensees' operations must also be considered when considering the control methods. Therefore, requiring "a minimum of two physical controls" affords a licensee the flexibility to choose the appropriate independent physical controls to meet its situation, and at the same time provide sufficient security for the portable gauges. Licensees can use more controls in addition to the requirements of the rule. While developing the rule, the working group considered various control methods including audible and visual alarms for vehicles. NRC believes that it would not be cost effective to make these requirements when considering that: (1) a small percentage of unauthorized removals or thefts of portable gauges was associated with vehicles being stolen; (2) the public tends to ignore alarms; and (3) the alarms would have no, or limited, impact on unauthorized removal or theft of portable gauges from open-bed trucks.

**Requirements Not Practical.**

Comment: One commenter stated that methods proposed for securing gauges in vehicles are impractical or costly. Portable gauges must be loaded and unloaded from vehicles

frequently; therefore, methods of securing the gauge must be simple and quick. Most portable gauges are transported in open-bed pickup trucks. Any method that requires permanent installation of boxes or attachment would not be practical. The commenter also stated that it is almost impossible to secure a gauge transportation case with a chain or cable without running it through the case handles, which can be removed with ordinary hand tools. In addition, wrapping chains around cases may stress and damage the case requiring replacement to comply with DOT rules for Type A containers.

Response: NRC disagrees with the commenter that methods proposed for securing gauges in vehicles are impractical and/or costly. A licensee is free to choose any physical control methods best suited for its purposes regarding cost and ease of use. The rule does not impose use of a specific physical control such as a metal box or metal chains to secure the gauge. For example, a licensee could use as a tangible barrier the cab area of an open-bed truck for storage of the portable gauge. Although many licensees have chosen to use a metal enclosure as one of the physical controls, it is only one of many possible options that a licensee can select. The use of metal chains as an additional means of physical control may be more practical for certain licensees than other options. Based on the regulatory analysis, NRC believes that requiring two physical controls to secure portable gauges from unauthorized removal would not significantly increase the current burden or be cost prohibitive to implement.

Regarding the comment that wrapping chains around cases may stress and damage the case, NRC notes that transportation boxes are designed to be robust enough to safely transport the intended material. The DOT has design and testing requirements for Type A packages such as portable gauge transportation cases. Among the general design requirements, DOT has stated that each lifting attachment that is a structural part of the package must be designed with a minimum safety factor of three against yielding when used to lift the package in the intended manner. Type A packaging, with contents, must be capable of withstanding the water-

spray, free-drop, stacking, and penetration tests. For example, for a stacking test, packaging must be subjected for a period of at least 24 hours to a compressive load equivalent to the greater of: (1) five times the mass of the actual package; or (2) the equivalent of 13 kilopascals (1.9 pounds per square inch) multiplied by the vertically projected area of the package. For a penetration test, a bar of 3.2 centimeters (1.25 inches) in diameter with a mass of 6 kilograms (13.2 pounds) must be dropped and directed to fall onto the center of the weakest part of the case. Based on the rigorous testing requirements, it would appear that the transportation boxes for portable gauges are designed to withstand various stresses.

Comment: One commenter stated that the prescriptive procedures are not practical for the wide variety of vehicles used for nuclear gauges.

Response: NRC disagrees that the rule contains prescriptive procedures. The rule only requires the licensee to use two independent physical controls and does not prescribe what methods or procedures for control must be used. The licensee may choose from a wide range of physical controls to meet its specific needs as long as the controls form tangible barriers to secure the portable gauge. Physical controls may include, but are not limited to, metal chain with a lock, steel cable with a lock, a secured enclosure, a locked tool box, a locked camper, a locked trailer, locked trunk of a car, a locked vehicle, a locked shelter, a secured fenced-in area, a locked garage, a locked cabinet, a locked room, or a secured building.

Comment: One commenter stated that California requirements for electronic security systems and alarms are impractical in trucks on construction sites. They are damaged and rendered useless by travel over uneven surfaces.

Response: NRC is not requiring the use of electronic security systems nor alarms as one of the independent physical controls. Each licensee has the flexibility to select any two independent physical controls based on its operation, condition of its facilities, financial capability, and degree of control desired.

Comment: Licensing authorities are making and enforcing rules that could only be done by trained security experts or mechanical engineers, even if they were justified.

Response: NRC does not believe that the additional security requirements will call for security experts or engineers to implement. However, licensees and their operators are required to have proper training to safely manage the nuclear materials including properly securing and controlling the portable gauges.

### **Cost Implications.**

Comment: One commenter stated that the NRC estimates of savings resulting from the rule are speculative. The saving estimates from implementing the rule are based on the optimistic assumption of a 50 percent reduction in the stolen gauges. This is speculative, as there is no way to predict the actual reduction that may be achieved.

Response: The percent reduction will be dependent, in part, on the type of physical controls that licensees elect to use. If more enclosures are used to secure gauges, a higher reduction in the percentage of unauthorized removal or theft of portable gauges would most likely be achieved. In any event, NRC believes that adding one more tangible barrier as a physical control will reduce the opportunity for unauthorized removal or theft. Given the wide range of physical controls available for the licensees to select, NRC believes that an assumption of a 50 percent reduction is reasonable.

Comment: One commenter stated that the cost is greater than what NRC proposes.

Response: Because the commenter did not provide any data in support of a higher cost impact, NRC cannot perform a comparison. NRC's cost estimate is based on the actual price of an item listed by the vendors. The regulatory analysis for the proposed rule contains the assumptions and unit costs used in calculating the total cost impact on licensees.

Comment: Two commenters believe that the rule would have a negative economic impact. One commenter believes that increased regulatory requirements and costs will have a

negative impact on the sales and use of portable gauges. The other commenter believes that the economic impact on the construction material testing industry will be wide-spread. The commenter stated that the use of portable gauges provides significant benefits in terms of the quality, safety, and longevity of roads. No other technology is as effective for measurement of the properties of materials in road construction as nuclear gauges.

Response: NRC disagrees with the comment. In determining viable options, NRC considered cost to industry versus any potential benefit. The rule would be unlikely to have a major impact on sales and use of portable gauges. Based on estimates, a \$200 average increase in the cost of portable gauge use per licensee is relatively small when compared to the cost of a gauge of approximately \$7000. Throughout this rulemaking, NRC has remained mindful of cost impacts on licensees. NRC's goal in this rulemaking is not to decrease portable gauge use. This regulation may slightly increase the cost of portable gauge use, but this cost must be balanced against improving the security and control of portable gauges.

Comment: One commenter stated that additional regulations represent an undue hardship to portable gauge licensees. A financial burden to a large licensee at a cost of \$114 thousand is unacceptable given the limited potential in reducing the number of stolen gauges.

Response: The NRC disagrees with the comment. With the estimated cost impact of about \$200 per gauge, NRC does not believe the increased cost would result in an undue hardship for portable gauge licensees. There are more than 5,000 portable gauge licensees in the United States. The majority of these licensees owns about five to six portable gauges; therefore, the one-time cost impact to a portable gauge licensee would only be about \$1000. Other than manufacturers or distributors, it is unusual for a licensee to own hundreds of portable gauges. To minimize cost impact, NRC is providing a 6-month period from the date of publication as the effective date to implement the rule. Along with the flexibility provided in the

rule for a licensee to select physical controls most suitable for its situation, NRC does not believe that the new requirements would create an undue hardship to portable gauge licensees.

Comment: A State commenter indicated that making changes to meet the new requirements would result in a large expenditure to taxpayers.

Response: NRC disagrees with the comment. An average of \$200 increase per gauge is small when compared to the resources spent by State and Federal law enforcement and regulatory personnel in response to, and in investigating, incidents involving unauthorized removal or theft of portable gauges.

Comment: One commenter predicts an increase in reporting of lost and stolen gauges as licensees find they cannot afford either compliance with the proposed rules or lawful disposal of the gauge sealed source.

Response: NRC disagrees with the commenter's prediction of increased reporting due to cost to comply with the rule requirements or to dispose of the source material. NRC does not believe that the increased costs will force licensees to dispose of the devices improperly. Depending on the physical control selected, the cost impact may be as low as \$100 per gauge for using a chain/cable with a lock or \$500 per gauge for use of a secured metal enclosure. The disposal cost for each gauge is about \$450.

#### **Impact on Landfills, Steel Mills, Scrap Yard, and the Environment.**

Comment: Three commenters indicated it is unlikely that a stolen gauge would be smelted in scrap-steel processing facilities. According to one commenter, there is no evidence that stolen gauges are more likely to end up at these facilities than gauges which are not stolen. NRC claims that most stolen gauges would be abandoned by the thief and are likely to end up in such places as scrap yards and smelters. In fact, the majority of gauges (51 percent) are recovered according to NRC figures for the last 2 years (SECY-03-0060). That the remainder are likely to end up in smelters, scrap yards, or incinerators is speculative. The second

commenter believes that most nuclear devices end up in scrap yards due to the difficulty of disposing of the equipment and the associated cost. Another commenter stated that it is unlikely that a discarded moisture/density gauge would be smelted down because of the use of sensitive monitoring systems.

Response: NRC agrees that the probability is small for a portable gauge obtained by unauthorized removal or theft to be smelted down and contaminate a steel processing plant. However, the potential does exist. Based on historical data, less than half of the unauthorized removals or thefts of portable gauges are recovered. After the September 2001, terrorist events, more resources have been spent in recovery efforts to retrieve portable gauges from unauthorized removal or theft due to heightened security concerns about loss of control of radioactive materials. As a result, the recovery rate for portable gauges may have improved slightly over the past 2 years. Most gauges from unauthorized removal or theft are abandoned or resold. This raises a concern about the potential public health and safety risk. In past years, there have been cases where gauges were found in the environment and in landfills, scrap yards, or recycling plants. For example, in June 2002, a portable gauge containing a Cs-137 source was found at a steel mill's scrap-metal stream, and, in May 2002, a portable moisture gauge containing Am-241 was discovered at a landfill by landfill personnel sorting through the refuse. In both cases, the gauges were removed for proper disposition. Many facilities are now equipped with radiation monitors, and sources are often detected and removed early in the process. Nonetheless, the potential for radioactive material to enter a metal recycling plant still exists. In fact, in 2001, a radioactive source was melted in a steel mill in Florida. The total cost of the cleanup was more than \$10 million. The State of Florida suspected that the contamination was from a sealed source from a fixed gauge. Once the radioactive source is melted, it is extremely difficult to determine the type of device that may have contained the source. Although steel mill contamination has never proven to be caused by a portable gauge



from unauthorized removal or theft, an abandoned portable gauge still poses a potential concern if it ever gets into a steel mill melt.

Comment: One commenter stated that if an abandoned gauge is deposited in a landfill, the environmental impact would be insignificant.

Response: NRC disagrees with the comment. All licensed materials are required to be properly controlled to ensure protection of public health and safety and the environment. Any uncontrolled licensed material abandoned in the environment or disposed of in a landfill not designed for managing licensed material poses a potential hazard to public health and safety and to the environment. In accordance with 10 CFR Part 61, an Am-241 source used in a portable gauge would be classified as a “greater than Class C waste” and is not generally acceptable for near-surface disposal (e.g., landfill).

#### **X-Ray Fluorescence.**

Comment: One commenter is concerned about controlling lost or stolen generally licensed devices because there are more in circulation than specifically licensed portable devices. There are hundreds, perhaps even thousands, of portable X-Ray Fluorescence (XRF) analyzers that have been distributed as generally licensed devices.

Response: Based on the NMED database, the number of reported incidents of lost or stolen XRF analyzers is extremely low, and in general, the amount of radioactive material used in XRF analyzers is much smaller than the amount used for portable moisture/density gauges. Therefore, there is a considerably reduced risk to public health and safety. Additionally, because XRF analyzers are very small and are usually hand-held units, they can be easily stored in the glove compartment or trunk of a vehicle. XRF analyzers stored in this manner are not visible or easily accessible, which reduces the possibility of opportunistic theft. For these reasons, NRC does not believe that additional security requirements are needed for generally

licensed XRF analyzers at this time; therefore, this comment is not within the scope of this rulemaking.

Comment: An Agreement State commenter indicated that it specifically licenses all portable nuclear gauges including lead paint analyzers.

Response: Whether a nuclear device is specifically or generally licensed depends on the design of the device and other factors. In general, most moisture/density gauges are specifically licensed whereas most chemical detectors and lead paint analyzers are generally licensed by either NRC or the Agreement States. NRC regulations establish the basic requirements. Depending on the compatibility categories, individual Agreement States may impose more stringent requirements depending on their specific needs.

## **The Final Rule**

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

After considering public comment and continuing informal discussion with the DOT staff, it was decided that no changes would be made to the proposed rule. The final rule contains the exact same requirements as the proposed rule. Therefore, the requirements state that each portable gauge licensee shall use a minimum of two independent physical controls that form tangible barriers to secure portable gauges from unauthorized removal, whenever portable gauges are not under the control and constant surveillance of the licensee.

## **Criminal Penalties**

For the purpose of Section 223 of the Atomic Energy Act (AEA), the Commission is amending 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 final rule is a matter of compatibility between NRC and the Agreement States, thereby providing consistency among the Agreement State and NRC requirements. The NRC staff analyzed the final 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.hsr.d.ornl.gov/nrc/home.html>). The NRC staff has determined that amendment to 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.

NRC determined that the essential objective of 10 CFR 30.34(I) is to reduce the opportunity for unauthorized removal or theft of a portable gauge by requiring a portable gauge 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.

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

### **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 final rule, NRC is revising 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.

### **Finding of No Significant Environmental Impact: Availability**

The Commission has determined under the National Environmental Policy Act of 1969, as amended, and the Commission's regulations in Subpart A of 10 CFR Part 51, that this rule is not 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 effect on the environment in which portable gauges are currently regulated under 10 CFR

Part 30. The final rule would increase requirements to reduce opportunity for unauthorized removal or theft of portable gauges containing byproduct material.

NRC requested the views of the States on the environmental assessment for this rule. No comments were received on the environmental assessment. Because no changes were made in the requirements from the proposed rule to the final rule, the environmental assessment has not been changed. The environmental assessment and finding of no significant impact are available for inspection 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 and finding of no significant impact are available from Lydia Chang, telephone (301) 415-6319, e-mail [lwc1@nrc.gov](mailto:lwc1@nrc.gov), of the Office of Nuclear Material Safety and Safeguards.

#### **Paperwork Reduction Act Statement**

This final 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 (OMB), approval number 3150-0017.

#### **Public Protection Notification**

NRC may not conduct nor 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**

In the proposed rule, the Commission requested public comment on the draft regulatory analysis specifically on the costs to licensees. No comments were received on the draft regulatory analysis. However, one of the comments received on the proposed rule indicated that the cost per unit in most cases will be substantially greater than NRC's estimate. Because a licensee has flexibility in selecting the physical controls to be used in securing a portable gauge, the actual cost would depend on the controls selected. The cost per unit could range from \$100 for a metal cable to \$400 for a simple metal tool box, to even a higher cost for a more elaborately designed metal enclosure. In the regulatory analysis, an average of \$200 was used.

The Commission has finalized the regulatory analysis on this regulation. The analysis examines the costs and benefits of the alternatives considered by the Commission. The analysis is available for inspection in the NRC Public Document Room, Public File Area O1F21, One White Flint North, 11555 Rockville Pike, Rockville, MD. Single copies of the regulatory analysis are available from Lydia Chang, telephone (301) 415-6319, e-mail, [lwc1@nrc.gov](mailto:lwc1@nrc.gov), of the Office of Nuclear Material Safety and Safeguards.

## **Regulatory Flexibility Certification**

As required by the Regulatory Flexibility Act of 1980, 5 U.S.C. 605(b), the Commission certifies that this rule will not have a significant economic impact on a substantial number of small entities. The final rule would affect about 1100 portable gauge specific NRC licensees and an additional 4000 Agreement State specific licensees. These licenses are issued principally to companies involved in road construction and maintenance. Many portable gauge

licensees would qualify as small business entities as defined by 10 CFR 2.810. However, the final rule is not expected to have a significant economic impact on these licensees. Based on the regulatory analysis conducted for this action, the costs of the final rule for affected licensees are estimated at \$200 per gauge. Among various alternatives considered, NRC believes that this final rule is the least burdensome and most flexible means of accomplishing NRC's regulatory objective. The regulatory analysis also notes that the requirements would result in potential cost savings for portable gauge licensees, particularly for the replacement of portable gauges due to unauthorized removal or theft. 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.

In the published proposed rule (68 FR 45172; August 1, 2003), NRC specifically requested public comment from licensees concerning the impact of the proposed regulation because of the widely differing conditions under which portable gauge users operate. NRC particularly was seeking comment from licensees, who qualify as small businesses, as to how the proposed regulation would 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. However, no comments were received on these issues.

### **Backfit Analysis**

NRC has determined that the backfit rule (§§ 50.109, 70.76, 72.62, or 76.76) does not apply to this final rule because this amendment does not involve any provisions that would impose backfits as defined in the backfit rule. Therefore, a backfit analysis is not required.

## **Small Business Regulatory Enforcement Fairness Act**

In accordance with the Small Business Regulatory Enforcement Fairness Act of 1996, NRC has determined that this action is not a major rule and has verified this determination with the Office of Information and Regulatory Affairs of OMB.

### **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. 552 and 553, NRC is adopting 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); sec. 1704, 112 Stat. 2750 (44 U.S.C. 3504 note).

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 (l) is added to read as follows:

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

\* \* \* \* \*

*(l) Security requirements for portable gauges.*

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

Dated at Rockville, Maryland, this 6<sup>th</sup> day of January, 2005.

For the Nuclear Regulatory Commission.

*/RA/*  
Annette Vietti-Cook,  
Secretary of the Commission.