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REGULATORY GUIDE

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SPECIAL NUCLEAR MATERIAL DOORWAY MONITORS

A. INTRODUCTION

Purpose

The U.S. Nuclear Regulatory Commission (NRC) developed this regulatory guide (RG) to describe a method that the NRC staff considers acceptable to implement the search requirement for concealed special nuclear material (SNM) applied to personnel, vehicles, packages and all other materials exiting a material access area (MAA).

For holders of a reactor license under Title 10 of the Code of Federal Regulations (10 CFR) Part 50, "Domestic Licensing of Production and Utilization Facilities" (Ref. 1), a combined license under 10 CFR Part 52, "Licenses, Certifications, and Approvals for Nuclear Power Plants" (Ref. 2), or a fuel cycle facility license under 10 CFR Part 76, "Certification of Gaseous Diffusion Plants" (Ref. 3), having the need to possess or use SNM within their facility, the NRC typically has included in their license a condition granting a general license to use SNM under 10 CFR Part 70, "Domestic Licensing of Special Nuclear Material."

Applicable Rules and Regulations

The requirements for physical protection found within 10 CFR Parts 50, 52, 70, and 76 refer to the physical protection requirements of 10 CFR Part 73, "Physical Protection of Plants and Materials." Part 73 (Ref. 4) requires, in part, in 10 CFR 73.46(d)(9) and 10 CFR 73.60(b), that each individual, package, materials and vehicle exiting an MAA is searched for concealed SNM. Specific testing and maintenance requirements, as stated in 10 CFR 73.20(b)(4), 10 CFR 73.46(g), and 10 CFR 73.60(d)(1) also apply.

Related Guidance

- Regulatory Guide 5.7, "Entry/Exit Control of Personnel Access to Protected Areas, Vital Areas, and Material Access Areas" (Ref. 5)
- NUREG 1964, "Access Control Systems: Technical Information for NRC Licensees" (Ref. 6)

Written suggestions regarding this guide or development of new guides may be submitted through the NRC's public Web site under the Regulatory Guides document collection of the NRC Library at http://www.nrc.gov/reading-rm/doc-collections/reg-guides/contactus.html.

Electronic copies of this regulatory guide, previous versions of this guide, and other recently issued guides are available through the NRC's public Web site under the Regulatory Guides document collection of the NRC Library at http://www.nrc.gov/reading-rm/doc-collections/. The regulatory guide is also available through the NRC's Agencywide Documents Access and Management System (ADAMS) at http://www.nrc.gov/reading-rm/adams.html, under ADAMS Accession No. ML14290A268. The regulatory analysis may be found in ADAMS under Accession No. ML12237A124 and the staff responses to the public comments on DG-5038 may be found under ADAMS Accession No. ML14288A653.

Purpose of Regulatory Guides

The NRC issues RGs to describe to the public methods that the staff considers acceptable for use in implementing specific parts of the agency's regulations, to explain techniques that the staff uses in evaluating specific problems or postulated accidents, and to provide guidance to applicants. Regulatory guides are not substitutes for regulations and compliance with them is not required. Methods and solutions that differ from those set forth in RGs will be deemed acceptable if they provide a basis for the findings required for the issuance or continuance of a permit or license by the Commission.

Information Collection Requirements

This RG contains information collection requirements covered by 10 CFR Part 73, "Physical Protection of Plants and Materials," that the Office of Management and Budget (OMB) approved under OMB control number 3150-0002. The NRC may neither conduct nor sponsor, and a person is not required to respond to, an information collection request or requirement unless the requesting document displays a currently valid OMB control number.

B. DISCUSSION

Reason for Revision

This RG is being revised because it was out-of-date with current related guidance and references in the CFR. Related specifications and standards for SNM monitors and metal detectors have been updated or developed since the previous revision was issued in 1974. This revision has been developed to provide detection practices and criteria that licensees may use to demonstrate compliance with NRC regulations in 10 CFR Part 73 and to augment programmatic information within the general reference, NUREG-1964, "Access Control Systems: Technical Information for NRC Licensees," (Ref. 6) issued in April of 2011.

Background

Special nuclear material doorway monitors provide an efficient, sensitive, and reasonably unobtrusive way of searching individuals for concealed SNM upon exit from an MAA. With proper installation and operation, gram quantities or less of SNM can be detected with a high level of reliability while maintaining a low false alarm rate. Portal type walk-through metal detectors are often used in conjunction with radiation detection to assure that personnel entering or leaving MAAs are screened for metallic nuclear shielding materials.

Theory of Operation

The doorway monitor comprises one or more detector unit(s), associated electronics, and alarm logic. The detector units are sensitive to the SNM radiation and responds to the emitted radiation (gamma rays and neutrons) by generating electronic current pulses. These pulses are amplified, filtered, and fed to alarm logic circuits that interpret the number (or rate) of pulses during a sampling. The alarm logic may be either a digital or analog system. In either case, if the rate of pulses exceed a set level, the alarm is triggered. Additional information pertaining to detector theory can be found in Knoll's, "Radiation Detection and Measurement." (Ref.7)

General Characteristics

Doorway Monitors

Doorway monitors detect gamma-ray radiation using scintillation or semiconductor detectors. To detect neutrons, plastic scintillators or gas-filled proportional counters are used. Geiger-Mueller counters have been used in this application; however, their lower intrinsic efficiency renders them less suitable than scintillation detectors. Scintillation detectors are often used for discriminating pulses based on imparted energy. Plastic scintillation detectors have the advantage of responding well to gamma-ray and energetic neutrons whereas the sodium iodide thallium-activated NaI(Tl) scintillation detectors have good gamma-ray sensitivity but poor neutron response. Helium-3 (He-3) gas is used in tubes as a proportional counter for neutron detection. The trend in industry is to use both scintillation detectors and He-3 detectors for doorway monitor systems.

Detectors are arranged so that a detection area is defined by a plane perpendicular to the line of passage of individuals through the doorway monitor. Various arrangements of the detectors are possible. However, specific placement of detectors should be based on the need to eliminate areas of no detection.

Commercially available doorway monitors are equipped with an automatic radiation background updating system that periodically monitors and averages the background count rate. A doorway monitor equipped with an automatic radiation background updating system is also provided with a treadle pad or beam break system to indicate that the zone of detection is occupied. When the zone of detection is occupied, the radiation level detected by the doorway monitor is compared to the mean background. If the level is greater than the mean background by a predetermined trigger level, an alarm is actuated. Alarm actuation point is usually determined by comparing the radiation levels within the zone of detection while occupied to the sum of the mean background while unoccupied and a factor to account for predetermined statistical accuracy.[1]

Thus, the condition for an alarm can be written as:

$$G>B+n(B)^{1/2}$$

Where B is the mean background, G is the radiation level within the zone of detection while occupied and n is a multiplier, usually between 4 and 10.[2]

Although the automatic background updating system allows unattended use of the doorway monitor, for technical reasons, the system may be less effective in certain situations. Techniques to prevent this are provided in the regulatory position.

Whether or not a doorway monitor is equipped with an automatic background updating system, high background activity will decrease sensitivity. Measuring activity in the zone of detection for longer

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1 The square root of the mean of a Poisson-distributed quantity is the unbiased estimate of the standard deviation of that quantity.

2 Note that, in general, for a count rate system, the condition for alarm should be modified to account for the response time of the instrument as follows:

$$G>B+n(B)^{1/2}\,(1-e^{-t/r})$$

Where t is the counting time and r is the time constant of the instrument. If, as should be the case, t/r>5, the added factor is essentially unity.

periods of time will compensate somewhat for a high radiation background. However, longer measurement periods can make the use of the doorway monitor less convenient. Because of the adequate radiation detection sensitivity and high-throughput capability associated with processing many personnel through the detection system on a daily basis, walk-through pedestrian monitors are the primary SNM detection system used in personnel portals at MAAs.

Hand-Held Monitors

Hand-held monitors can use detectors made of NaI(Tl), plastic scintillators, semiconductors, or He-3 gas-filled tubes. Commercially available systems have rechargeable batteries that assist in ensuring continuous availability. Training the operator of a hand-held monitor is essential. The operator must scan an individual in the correct way for a hand-held monitor to be fully effective. In addition, the operator must understand the capabilities of the equipment, when the equipment is working within acceptable parameters and when it is not.

Radioisotope identification systems that detect radiation with high purity germanium (HPGe) detectors can be hand-held. These monitors are commercially available and may have a special cooling device, instead of a cryogenic bath, to cool the semiconductor HPGe crystal. Special cooling devices (e.g., Stirling cooler) allow a light-weight design useful as a hand held detection system.

Hand-held monitors complement SNM search operations by enabling a more thorough search of an individual to locate the radiation source after a doorway monitor has alarmed, enabling pedestrian searches to continue when a doorway monitor is inoperative and, if technically outfitted to do so, identify specific radionuclide(s) causing a doorway alarm.

Because of the time required to scan an individual with a hand-held monitor, it is used as a secondary SNM detection system at an MAA personnel portal.

Vehicle Monitors

Two types of automatic vehicle monitors presently in use are the vehicle monitoring station and the drive-through vehicle monitor. Commercially available vehicle drive-through SNM portals generally consist of two vertical cabinets containing both large plastic scintillators and decision -making electronics. These scintillators continuously measure the gamma ray background intensity and adjust the alarm threshold to maintain a constant nuisance alarm rate. The sensitivity of SNM vehicle monitors vary for different types of vehicles and depends on the size, spacing, and number of detectors. For an individual detector configuration and vehicle, two of the dominate sensitivity factors are the occupancy background suppression and shielding provided by the components of the vehicle.[3]

Standards Associated with Monitoring

Selection of equipment, setup, operation calibration, testing and performance evaluation of portal monitoring systems should be performed using procedures designed for the specific facility and configuration. Guidance that pertains to the use of radiation detection and metal detection instrumentation is available from several standards organizations. The NRC staff finds that the following guidance, which has been successfully used by SNM licensees and is available from the American Society for Testing and Materials (ASTM), Conshohocken, Pennsylvania, acceptable for use:

3 LA-UR-96-4505: "An Optimized International Vehicle Monitor," (Ref. 8)

- ASTM C1189-11, "Standard Guide to Procedures for Calibrating Automatic Pedestrian SNM Monitors." (Ref. 9)

- ASTM C1112-99 (2005), "Standard Guide for Application of Radiation Monitors to the Control and Physical Security of Special Nuclear Material." (Ref. 10)

- ASTM C1237-99 (2005), "Standard Guide to In-Plant Performance Evaluation of Hand-Held SNM Monitors." (Ref. 11)

- ASTM C993-97 (2012), "Standard Guide for In-Plant Performance Evaluation of Automatic Pedestrian SNM Monitors." (Ref. 12)

- ASTM C1270-97 (2012), "Standard Practice for Detection Sensitivity Mapping of In-Plant Walk Through Metal Detectors." (Ref. 13)

- ASTM C1269-97 (2012), "Standard Practice for Adjusting the Operational Sensitivity Setting of In-Plant Walk-Through Metal Detectors." (Ref. 14)

- ASTM C1309-97 (2012), "Standard Practice for Performance Evaluation of In-Plant Walk-Through Metal Detectors." (Ref. 15)

In addition, ASTM C1236-99 (2005), Standard Guide for In-Plant Performance Evaluation of Automatic Vehicle SNM Monitors (Ref. 16) was withdrawn in 2014, but can be used by licensees as a development tool.

Harmonization with International Standards

The International Atomic Energy Agency (IAEA) has established a series of safety guides and standards constituting a high level of safety for protecting people and the environment. IAEA safety guides present international good practices and increasingly reflects best practices to help users striving to achieve high levels of safety. Pertinent to this RG, "IAEA Nuclear Security Series No. 13, Nuclear Security Recommendations on Physical Protection of Nuclear Material and Nuclear Facilities," issued January 2011, (Ref. 17) et. al., addresses considerations necessary for a nuclear material security program. While the NRC has an interest in facilitating the harmonization of standards used domestically and internationally, the NRC does not specifically endorse the IAEA document, and is only acknowledging that it may be useful as a reference for general information.

Documents Discussed in Staff Regulatory Guidance

This RG endorses the use of one or more codes or standards developed by external organizations, and other third party guidance documents. These codes, standards and third party guidance documents may contain references to other codes, standards or third party guidance documents ("secondary references"). If a secondary reference has itself been incorporated by reference into NRC regulations as a requirement, then licensees and applicants must comply with that standard as set forth in the regulation. If the secondary reference has been endorsed in a RG as an acceptable approach for meeting an NRC requirement, then the standard constitutes a method acceptable to the NRC staff for meeting that regulatory requirement as described in the specific RG. If the secondary reference has neither been incorporated by reference into NRC regulations nor endorsed in a RG, then the secondary reference is neither a legally-binding requirement nor a "generic" NRC approval as an acceptable approach for meeting an NRC requirement. However, licensees and applicants may consider and use the information in the secondary reference, if appropriately justified and consistent with current regulatory practice, consistent with applicable NRC requirements such as 10 CFR 50.59.

C. STAFF REGULATORY GUIDANCE

1. Considerations for SNM Doorway Monitors

a. General

(1) Metal detectors should be used in conjunction with an SNM doorway monitor as an SNM detection system and can be one of the two required separate searches for concealed SNM (10 CFR 73.46(d)(9)). The metal detector unit should be installed in the pedestrian passageway as described in RG 5.7, "Entry/Exit Control of Personnel Access to Protected Areas, Vital Areas, and Material Access Areas" with the SNM monitor in such a way that objects cannot be passed over, around, or under the detection area without being appropriately searched. The entire process begins when the individual, package, or other item approaches the monitoring area and ends when the individual, package or other item is exiting the monitoring area after the completion of a monitoring event.

(2) Alarm actuation for detectable metal mass should be the amount necessary to shield SNM that would allow a protracted theft of a formula quantity of strategic SNM to occur before the inventory process identifies it as missing.

(3) The detector elements should be designed and positioned so that detection sensitivity is as uniform as possible over the zone of detection; in no case should any area within the zone of detection not be able to detect SNM.

(4) Power, sensitivity, and other controls of the doorway monitor and metal detector should be tamper-safe when unattended. Doorway monitors and metal detectors that are secured behind locked and alarmed doors when unattended is an acceptable alternative measure to implementing tamper- safe devices on the SNM monitoring system.

(5) Metal and SNM detection equipment should be provided with uninterruptible power sources and/or emergency generator power.

(6) Signal lines connecting alarm relays to the alarm monitors for both metal and SNM detectors should be supervised electronically or by direct surveillance to detect tampering.

(7) Some doorway monitors may require an individual to occupy the detection area for a specified time (e.g., longer than what a normal walking pace would provide). In this case, the doorway monitor should be provided with a treadle pad and a timer to ensure that the zone of detection is occupied for the requisite time. Audible and visual alarms should actuate if the individual being searched does not occupy the detection area for the entire count period.

(8) The doorway monitor should be equipped with a high-background radiation alarm, which will announce if the measurement of the radiation background exceeds the appropriate maximum permissible background. The doorway monitor should not be used during periods of high background radiation. Calibration and determination of allowable background thresholds should be done in accordance with ASTM C1189-11, (Ref. 9)

(9) System specifications guidance for specific radioisotopes are identified below. See ASTM C1112-99(2005), (Ref. 10) for supporting information.

(a) Plutonium-239. A doorway monitor used to detect plutonium (Pu) should be capable of detecting 0.5grams of plutonium with an isotopic content of at least 93 percent Pu-239 and less than 6.5 percent Pu-240. The Pu should contain less than 0.5 percent impurities. The form of the material should be a metallic sphere or cube. The impact of Am-241, a Pu decay product that will build up over time and emit increasing amounts of 60-keV gamma radiation, must be minimized by including a cadmium filter 0.04 cm to 0.08 cm thick as part of the source encapsulation. Protective encapsulation should be in as many layers as local rules require of a material such as aluminum (≤0.32 cm thickness) or thin (≤0.16 cm thickness) stainless steel or nickel that minimize unnecessary radiation absorption. The source should be encased in a minimum of 3 mm brass and detected at a 50 percent probability of detection with a 95 percent confidence limit. The false alarm rate should be less than 0.1 percent.

(b) Uranium-235. A doorway monitor used to detect uranium-235 (U-235) should be capable of detecting highly enriched (i.e., 20 percent or more) uranium containing at least 93 percent U-235 and less than 0.25 percent impurities. The form of the material should be a metallic sphere or cube. Encapsulation should be applied in such manner that it minimizes unnecessary radiation absorption in the encapsulation. The source should be encased in a minimum of 3 mm brass and detected at a 50 percent probability of detection with a 95 percent confidence limit. The false alarm rate should be less than 0.1 percent.

(c) Uranium-233. Adequate sensitivity for uranium-233 (U-233) may be demonstrated by meeting the detection requirements for U-235.

2. Operations with Doorway and Hand-Held Monitors

In general, doorway monitors are the primary method used to search for concealed SNM, hand-held monitors are secondary, and a physical search is tertiary. Doorway monitors should be used in locations with minimum background radiation and minimum background radiation fluctuation. If circumstances dictate the use of a doorway monitor in an area of high background radiation, sufficient shielding should be provided to maintain necessary sensitivity.

a. The procedures, or changes to procedures developed to implement requirements of 10 CFR 73.46 should be prepared sufficiently in advance of intended implementation to provide verification of satisfactory performance.

b. The plan for metal detection equipment functionality and performance testing periodicity, procedures, and test sources should be submitted to the NRC for approval within 360 days for licensed operating facilities, 180 days before revising existing licensee SNM search programs, and 180 days before initial start of operations for newly licensed facilities.

c. During use, the doorway monitor system should check the radiation background and adjust the measurement offset at least every 15 minutes.

d. Doorway monitors shall be attended by two armed guards at an MAA (10 CFR 73.46 (d)(9)) within a facility containing a formula quantity of strategic SNM. The two armed guards may consist of a guard manning the SNM monitoring system and the other providing oversight of the SNM monitoring system activities by residing in an adjacent protective enclosure. Doorway monitors should be attended at non-power reactors.

e. Each individual to be checked should, in turn, enter the doorway monitor detection area and be required to remain still long enough for the device to operate properly.

f. With the individual in the doorway monitor detection area, an alarm should audibly and visually announce in the vicinity of the monitor if the activity in the detection area exceeds the set alarm threshold for radiation, possibly indicating the presence of SNM.

g. When a doorway monitor signals an alarm, the individual generating the alarm should pass through the monitor a second time to confirm the signal. If the second pass through the SNM monitor does not result in a detection, then a third pass through the monitor should be conducted to verify no detection. If the second pass through the monitor also generates an alarm, the individual should be retained and subjected to a body search, typically with a hand-held monitor, as described in ASTM C1237-99 (2005), (Ref. 11) to locate and identify the source of the signal. If the hand-held monitor does not confirm the alarm signals generated by the doorway monitor, the hand-held monitor should be tested against a known source to confirm it is working properly. If it responds to the source in the anticipated manner, it should be concluded that the doorway monitor should be tested, repaired if necessary, and retested before returning to service. The individual generating the alarm should be released after confirmation that no SNM was detected. If detection is suspected to be from SNM contamination, health physics personnel should verify this finding. A monitoring flow diagram is provided in Figure 1.

h. A hand-held SNM monitor should be used when the doorway monitor is not functioning as intended. Search personnel should be trained on the correct use of the hand-held monitoring. A hand-held monitor should have the capability to identify specific radioisotopes.

3. Physical Searches and Training

a. A physical search for concealed SNM should be conducted as necessary.

b. To enhance the probability of detection, random searches for concealed SNM at the protected area boundary may be conducted, including searches of hand-carried items.

c. At facilities with formula quantities of strategic SNM, personnel having search duties and responsibilities must be trained and qualified.(10 CFR 73.45(g)(1)(i)).

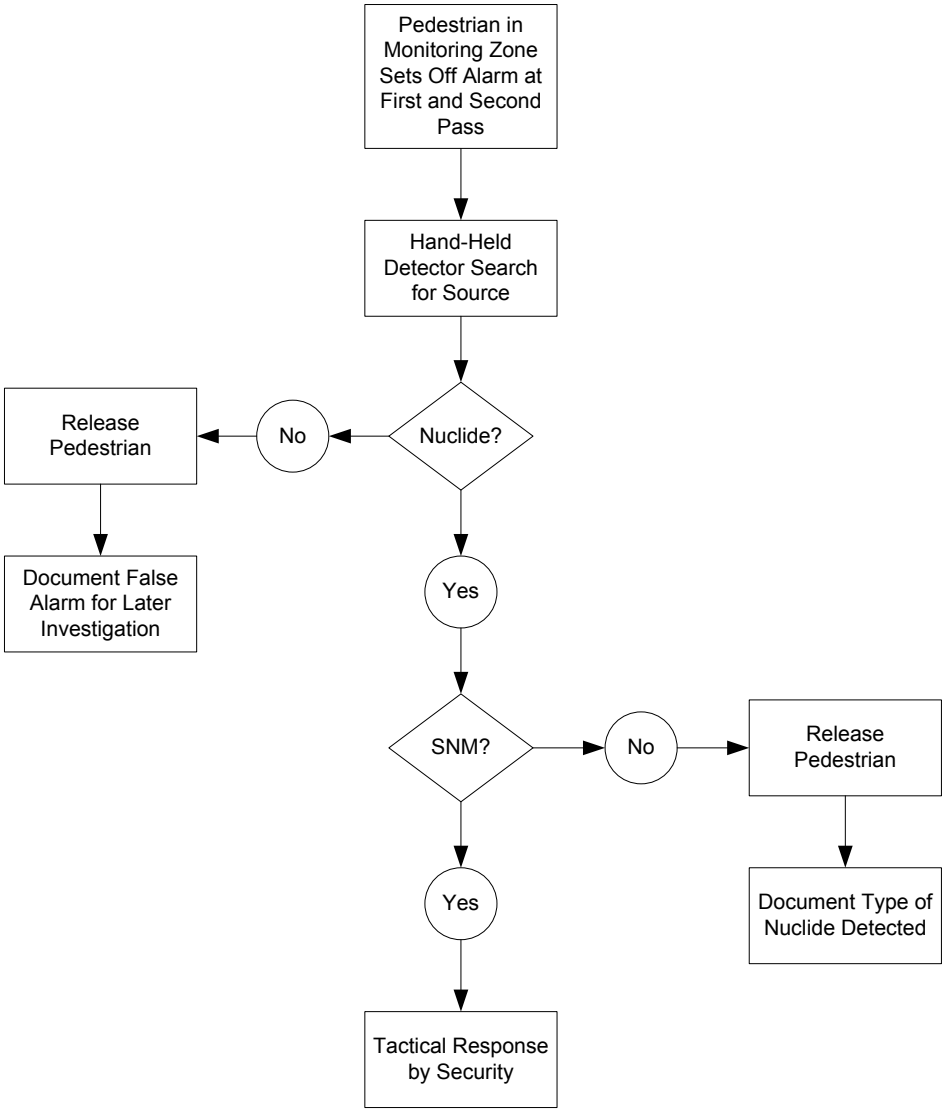

Figure 1 Flow diagram for SNM searches

4. Calibration, Testing, Maintenance, and Operating Instructions

a. Calibration

Doorway and hand-held monitors should be calibrated with a source of the amount, configuration, and variety of SNM to be detected. Doorway and hand-held monitor calibration should be conducted in accordance with Reference 7 or as recommended by the manufacturer. Calibration should be conducted before initial use and after monitor repair or maintenance. Calibration should be conducted at least every three months. As a quality assurance measure, consideration should be given to having SNM calibration standards traceable to certified reference standards or materials.

b. Testing

(1) Doorway, Hand-Held and Vehicle SNM Monitors

Methods of performance testing doorway and hand-held monitors are found within ASTM C993-97(2012), (Ref. 12) and Reference 9 (as well as reference 13). These references may be used to develop instructions for testing SNM monitors to assure system specifications are met. Daily testing should be a simple functional test (i.e. operational test) to assure the detector is working. Daily testing should be performed during each shift, or once per day if there is only one shift. Reference 9 describes an acceptable approach for daily testing. As described in reference 9 and reference 11, testing sources may be different than those used during calibration.

(2) Metal Detectors

Sensitivity mapping and operational sensitivity testing methods are described within ASTM C1270-97 (2012), (Ref. 13), ASTM C1269-97 (2012), (Ref 14) and ASTM C1309-97 (2012), (Ref 15). The references may be used to develop instructions for performance testing the metal detection system used to search for concealed, shielded strategic SNM. The metal detection system should be capable of detecting the minimum metal shielding concealed anywhere on an individual three times out of three trials. Performance testing should be conducted at least once every three months. The performance testing should include passing the minimum metal test source through a honeycomb configuration test apparatus that covers the entire detection area as described in references 13, 14 and 15. The honeycomb channels should be a maximum of 6 inches by 6 inches in dimension. The test source should be passed through the detection area as close as possible to the same rate (speed) as a pedestrian walking through the metal detector unit. Attaching the metal test source to a wooden dowel rod to conduct this test can facilitate the effective rate of passage of the metal source through the honeycomb test apparatus. A detection of the metal test source in each of the honeycomb test channels constitutes an acceptable performance test. Daily operability testing should be conducted once per shift, or at least daily.

c. Maintenance

Metal detection and SNM monitoring equipment shall be maintained to be operable and effective as intended (10 CFR 73.20(4), 10 CFR 73.46(g), and 10 CFR 73.60(d)(1)).

d. **Operating Instructions**

Operating instructions should be available near the search activity. The procedural elements listed below should be included in the procedures for the search activity. A management system shall provide for the development, revision, implementation, and enforcement of security procedures (10 CFR 73.46 (b)(3)). Written procedures detailing the duties of search personnel for operation of SNM monitors and metal detection equipment shall be developed (10 CFR 73.46 (b)(3)(i)). Procedures should address the following:

- metal detection threshold criteria,
- test sources and their use,
- monitor background reduction and sensitivity,
- searching pedestrians with doorway and hand-held monitors,
- recording, retention, and analysis of monitor performance data,
- recording and resolution of alarm events,
- quarterly performance testing,
- daily operational testing,
- environmental operating constraints (e.g., temperature and humidity),
- search operations during an emergency or loss of power,
- maintenance of monitors and metal detection equipment,
- security for the system equipment, communications, software, and data,
- training for operating personnel, and
- documentation requirements for authorized removals of SNM.

D. IMPLEMENTATION

The purpose of this section is to provide information on how applicants and licensees[4] may use this guide and information regarding the NRC's plans for using this RG. In addition, it describes how the NRC staff complies with the Backfit Rule found in 10 CFR 50.109(a)(1), 10 CFR 70.76(a)(1), and 10 CFR 76.76(a)(1) or any applicable finality provisions in 10 CFR Part 52.

Use by Applicants and Licensees

Applicants and licensees may voluntarily[5] use the guidance in this document to demonstrate compliance with the underlying NRC regulations. Methods or solutions that differ from those described in this RG may be deemed acceptable if they provide sufficient basis and information for the NRC staff to verify that the proposed alternative demonstrates compliance with the appropriate NRC regulations. Current licensees may continue to use guidance the NRC found acceptable for complying with the identified regulations as long as their current licensing basis remains unchanged**.** The acceptable guidance may be a previous version of this RG.

Licensees may use the information in this RG for actions which do not require NRC review and approval. However, voluntarily using the subject matter in the guidance may change the facilities

4 In this section, "licensees" refers to holders of, and the term "applicants" refers to applicants for, the following: (1) special nuclear material licenses under 10 CFR Part 70; (2) operating licenses under 10 CFR Part 50; (3) combined licenses under 10 CFR Part 52; and (4) certificates of compliance or approvals of a compliance plan for gaseous diffusion plants under 10 CFR Part 76.

5 In this section, "voluntary" and "voluntarily" means that the licensee is seeking the action of its own accord, without the force of a legally binding requirement or an NRC representation of further licensing or enforcement action.

security plan such that NRC review may be required under the provisions of 10 CFR Part 50.54, 10 CFR Part 70.32 or 10 CFR Part 76.68, and should be evaluated prior to incorporating the methods into the security plans. Licensees may use the information in this RG or applicable parts to resolve regulatory or inspection issues.

Use by NRC Staff

The NRC staff does not intend or approve any imposition or backfitting of the guidance in this RG. The NRC staff does not expect any existing licensee to use or commit to using the guidance in this RG, unless the licensee makes a change to its licensing basis. The NRC staff does not expect or plan to request licensees to voluntarily adopt this RG to resolve a generic regulatory issue. The NRC staff does not expect or plan to initiate NRC regulatory action which would require the use of this RG. Examples of such unplanned NRC regulatory actions include issuance of an order requiring the use of the RG, generic communication, or promulgation of a rule requiring the use of this RG without further backfit consideration.

During regulatory discussions on plant specific operational issues, the staff may discuss with licensees various actions consistent with staff positions in this RG, as one acceptable means of meeting the underlying NRC regulatory requirement. Such discussions would not ordinarily be considered backfitting even if prior versions of this RG are part of the licensing basis of the facility. However, unless this RG is part of the licensing basis for a facility, the staff may not represent to the licensee that the licensee's failure to comply with the positions in this RG constitutes a violation.

If an existing licensee voluntarily seeks a license amendment or change and (1) the NRC staff's consideration of the request involves a regulatory issue directly relevant to this revised RG and (2) the specific subject matter of this RG is an essential consideration in the staff's determination of the acceptability of the licensee's request, then the staff may request that the licensee either follow the guidance in this RG or provide an equivalent alternative process that demonstrates compliance with the underlying NRC regulatory requirements. This is not considered backfitting as defined in 10 CFR 50.109(a)(1), 10 CFR 70.76(a)(1), or 10 CFR 76.76(a)(1) or any applicable finality provisions in 10 CFR Part 52.

If a licensee believes that the NRC is either using this RG or requesting or requiring the licensee to implement the methods or processes in this RG in a manner inconsistent with the discussion in this Implementation section, then the licensee may file a backfit appeal with the NRC in accordance with the guidance in NUREG-1409, "Backfitting Guidelines," (Ref. 18) and the NRC Management Directive 8.4, "Management of Facility-Specific Backfitting and Information Collection" (Ref 19).

REFERENCES[6]

1. *U.S. Code of Federal Regulations*, "Domestic Licensing of Production and Utilization Facilities," Part 50 (10 CFR 50), Title 10, "*Energy.*"

2. 10 CFR 52, "Licenses, Certifications, and Approvals for Nuclear Power Plants," Title 10, "*Energy*"

3. 10 CFR 76, "Physical Protection of Plants and Materials," Title 10, "*Energy*"

4. 10 CFR 73, "Certification of Gaseous Diffusion Plants," Title 10, "*Energy*"

5. U.S. Nuclear Regulatory Commission (NRC), "Entry/Exit Control of Personnel Access to Protected Areas, Vital Areas, and Material Access Areas," Regulatory Guide (RG) 5.7, Washington, DC, Agencywide Document Access and Management System (ADAMS) Accession No. ML003739976.

6. NRC, "Access Control Systems: Technical Information for NRC Licensees," NUREG-1964, Washington, DC. (ML1115A078)

7. Knoll, Glenn F., "Radiation Detection and Measurement," 4th ed., John Wiley and Sons[7], 2010.

8. LA-UR-96-4505, "An Optimized International Vehicle Monitor," R. L. York, D. A. Close, and P. E. Fehlau, Los Alamos National Labs, Los Alamos, NM (1997).[8]

9. American Society for Testing and Materials (ASTM) C1189-11, "Standard Guide to Procedures for Calibrating Automatic Pedestrian SNM Monitors," West Conshohocken, PA. [9]

10. ASTM, C1112-99(2005), "Standard Guide for Application of Radiation Monitors to the Control and Physical Security of Special Nuclear Material," West Conshohocken, PA.

11. ASTM C1237-99(2005), "Standard Guide to In-Plant Performance Evaluation of Hand-Held SNM Monitors," West Conshohocken, PA.

12. ASTM C993-97(2012), "Standard Guide for In-Plant Performance Evaluation of Automatic Pedestrian SNM Monitors," West Conshohocken, PA.

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6 Publicly available NRC published documents are available electronically through the NRC Library on the NRC's public Web site at http://www.nrc.gov/reading-rm/doc-collections/ and through the NRC's Agencywide Documents Access and Management System (ADAMS) at http://www.nrc.gov/reading-rm/adams.html The documents can also be viewed online or printed for a fee in the NRC's Public Document Room (PDR) at 11555 Rockville Pike, Rockville, MD. For problems with ADAMS, contact the PDR staff at 301-415-4737 or (800) 397-4209; fax (301) 415-3548; or e-mail pdr.resource@nrc.gov.

7 Copies of this publication and, or current edition are available thru the Wiley website at: http://www.wiley.com/

8 Copies of this publication are available thru the US Department of Energy, Office of Scientific and Technical Information (OSTI) website at: http://www.osti.gov/scitech/servlets/purl/444040

9 Copies of American Society for Testing and Materials (ASTM) standards may be purchased from ASTM, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959; telephone 610-832-9585. Purchase information is available through the ASTM Web site at http://www.astm.org.

13. ASTM C1270-97(2012), "Standard Practice for Detection Sensitivity Mapping of In-Plant Walk Through Metal Detectors," West Conshohocken, PA.

14. ASTM C1270-97(2012), "Standard Practice for Detection Sensitivity Mapping of In-Plant Walk Through Metal Detectors," West Conshohocken, PA.

15. ASTM C1269-97(2012), "Standard Practice for Adjusting the Operational Sensitivity Setting of In-Plant Walk-Through Metal Detectors," West Conshohocken, PA

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10 Copies of International Atomic Energy Agency (IAEA) documents may be obtained through their Web site: WWW.IAEA.Org/ or by writing the International Atomic Energy Agency P.O. Box 100 Wagramer Strasse 5, A-1400 Vienna, Austria. Telephone (+431) 2600-0, Fax (+431) 2600-7, or E-Mail at Official.Mail@IAEA.Org