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MATERIALS PROTECTION CONTINGENCY MEASURES FOR URANIUM AND PLUTONIUM FUEL MANUFACTURING PLANTS

A. INTRODUCTION

Sections 73.40, "Physical Protection: General Requirements at Fixed Sites," and 73.50, "Requirements for Physical Protection of Licensed Activities," of 10 CFR Part 73, "Physical Protection of Plants and Materials," prescribe requirements for the physical protection of special nuclear materials (SNM) and the plants in which they are used or stored. Section 70.22, "Contents of Applications," of 10 CFR Part 70, "Special Nuclear Material," requires, among other things, that each application for a license to possess certain quantities of special nuclear material (SNM) contain a full description of the applicant's program for control of and accounting for SNM which will be in his possession under license and a physical security plan for meeting the physical protection requirements of 10 CFR Part 73. Section 70.51, "Material Balance, Inventory, and Records Requirements," requires, among other things, that certain licensees establish, maintain, and follow written material control and accounting procedures which are sufficient to enable the licensee to account for the SNM in his possession under license. Proposed §70.58, "Fundamental Nuclear Material Controls," would require, if adopted, that each licensee who is authorized to possess certain quantities of SNM establish material balance areas or item control areas for the physical and administrative control of nuclear material.

Essential to the protection of special nuclear material against theft are proper planning, implementation, and testing of measures designed to provide protection of special nuclear material even under emergency or other nonroutine conditions. This guide describes measures acceptable to the Regulatory staff for assuring continued protection of special nuclear material in such instances.

B. DISCUSSION

1. Scope of Materials Protection Contingency Measures

The basic philosophy of this guide to the establishment of design and operational measures for the protection of SNM under nonroutine conditions is that, since no system is immune to malfunction, backup measures should be provided to maintain the level of protection afforded by each of the normal materials protection systems. Further, since emergencies or non-routine situations may not follow anticipated patterns, such backup measures should provide flexibility to accommodate a variety of possible failure modes. For example, to provide adequate protection capability in the event of power failure, equipment malfunction, or guard incapacitation, the contingency measures should include, respectively, an alternative source of power, redundant hardware, and additional support personnel.

Protection of the plant against industrial sabotage that could endanger the public health and safety by exposure to radiation is beyond the scope of this guide, although some of the measures identified herein may provide protection against such acts as well. In addition, emergencies that may pose a threat to plant security or personnel health and safety but not to the protection of SNM are also beyond the scope of this guide. Emergencies that may be caused or utilized by a thief to conceal the removal (either previous or concomitant) of SNM, however, are considered.

2. Objectives of Emergency Materials Protection Measures

During emergencies, the effectiveness of normal security measures for protecting SNM may be reduced.

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an emergency that requires complete or partial evacuation of a material access area because of health and safety considerations may result in a necessary relaxation of exit control requirements. The possibility of evacuation procedures deleteriously affecting the protection of SNM can be minimized by proper planning and posting of emergency procedures and by a program of instruction and drills for personnel at the facility.

It also is possible that routine accountability measures for protecting SNM may be compromised by the sudden and unexpected movement, removal, or alteration of SNM or SNM records. Effective emergency measures that replace or supplement routine materials protection measures and are implemented in accordance with established emergency planning procedures can enhance the protection of materials in the following manner:

a. The likelihood of theft will be reduced. Measures taken to limit access to SNM and to provide surveillance over an area in which an emergency situation exists will tend to deter an individual from engaging in unauthorized or illegal acts.

b. Theft of special nuclear material can be detected. Emergency and postemergency measures can control and document the movement, removal, or alteration of SNM and the quantities involved.

c. The amount of damage to or accidental loss of SNM may be reduced, thereby further improving the likelihood that a theft will be detected. Emergency materials protection measures for locating and identifying an emergency condition, transmitting emergency information to responsible individuals, and taking actions necessary to protect material can minimize the extent of damage to or accidental loss of SNM.

d. The capability for recovering stolen material is improved. Emergency monitoring and postemergency assay and accountability measures can help to reconstruct the event, thereby aiding recovery of material.

e. If potential nonroutine conditions are thoroughly considered in the initial planning and established emergency operating measures are followed, a facility can be operated under certain nonroutine conditions without jeopardizing the protection of SNM.

3. Definitions

For the purpose of this guide, the following definitions are provided:

a. **NONROUTINE EVENT** means any condition that alters the approved features of a facility, the equipment, or the method of operation such that the requirements for materials protection are threatened or are not being met. For example, a power outage, damage to records,

equipment malfunction, guard incapacitation, or a change in equipment and plant structure that leads to a reduction in the capability to protect SNM can each represent a functional loss of part of the required materials protection system.

b. **EMERGENCY MEASURES** are those provisions that are taken to protect SNM in response to a nonroutine event. In addition, emergency measures include nonroutine measures taken to prevent the degradation of conditions that could result in a reduction or loss of materials protection if not controlled or if left untreated. Postemergency measures are taken to protect and account for SNM following events during which its protection may have been compromised.

c. **NATURAL EVENT** means a condition that results from natural causes such as severe weather conditions, floods, and earthquakes.

d. **NUCLEAR EVENT** means a condition resulting from a nuclear accident such as the sudden release of radiation (as in a criticality incident).

e. **FUNCTIONAL EVENT** means a condition resulting from fire, equipment failure, injury to personnel, or and contamination from SNM or other radioactive material following a spill or process malfunction, false alarm, or the functional loss of part of the materials protection system.

4. Emergency Materials Protection System

An emergency materials protection system, as with any security system, consists of detection, communication, and response elements (human or automatic), which together constitute a workable system. The failure or any one of these elements to function constitutes a system failure.

Warning of an impending or imminent emergency can be obtained from (1) detection measures based on sensors that automatically activate alarms or otherwise alert individuals that an emergency exists, (2) instruments that monitor normally varying conditions, and (3) surveillance of emergency indicators by either remote devices or direct observation. Such warning could include indications of severe weather conditions, processes that are out of control with respect to temperature or pressure, buildup of SNM approaching criticality limits, or the release of radioactive materials. Appropriate sensors may detect among other things, radiation, temperature changes, motion, interruption or alteration of an electric current, and electromagnetic changes. An emergency also may be detected by remote observation with the aid of closed-circuit television (CCTV) monitors or by direct observation by an individual at the scene.

When an existing or imminent emergency condition is detected, individuals responsible for taking appropriate

actions must be notified. The actions taken by security personnel, plant management, and employees at the time of an emergency depend on the alarms and information that are transmitted to them. Emergency instructions and actions usually are based on signal transmissions by wire or radio to visible and audible annunciating (warning) devices. Warnings and instructions also may be relayed during an emergency by direct voice communication.

The objectives of the response or emergency actions taken by individuals to deal with an emergency are, in order of priority, (1) to protect the health and safety of the general public and of individuals at the plant, (2) to assure overall security and protection of materials, (3) to assure that all SNM is accounted for, and (4) to reestablish routine materials protection procedures as soon as possible.

In protecting the safety and lives of individuals, measures taken to evacuate personnel, administer first aid, and protect personnel from radiation hazards also can help to protect SNM. The rapid deployment of the guard force and other emergency security personnel can assure continued materials protection during and following an emergency. Emergency actions by an emergency supervisor and by trained technical support personnel can assure a rapid assessment of the location, condition, and amount of SNM affected by the emergency, thereby aiding postemergency actions and the resumption of routine materials protection procedures.

5. Temporary Operation Under Nonroutine Conditions

Following a natural, operational, or nuclear event that results in a temporary loss of part of a materials protection system, it may be desirable to continue operation (cleanup, production in unaffected areas, etc.) of the facility on a temporary basis, provided the facility or equipment is properly designed to accommodate emergency measures adequate for the protection of material during such periods. Operating in such a condition also might be desirable during periods of plant construction, alteration, or equipment changes.

Whenever a system functions under conditions for which it was not designed, the possibility of component malfunction increases. In such cases a system failure can be averted by a fail-safe design and by proper action of individuals.

Nonroutine conditions may occur as a result of modification of process equipment and plant design, changes in operating or maintenance procedures, or the temporary loss of portions of the materials protection system (detection, communication, or response element).

Some nonroutine operating conditions may not be recognized as emergencies. However, any loss of capa-

bility to protect SNM requires immediate remedial measures if the materials are to be provided with continued protection.

Identification of appropriate contingency measures can be aided by consideration of the following non-routine conditions:

a. Functional loss of SNM isolation measures such as access control devices for materials processing or storage areas or remotely operated process or storage handling equipment.

b. Need for access by maintenance, installation, or construction personnel not authorized to have access to SNM and not normally permitted to work in a materials access area.

c. Reduced capability to inspect or test for compliance with requirements for processing, storing, transferring, measuring, or protecting SNM. This could be a result, for example, of process or equipment changes or relocation.

d. Compromise of keys, locks, or combinations to locks that are used to secure SNM or SNM accountability records.

e. Functional loss of personnel or package searching devices installed at passage points in the physical barriers.

f. Failure of remote surveillance equipment.

g. Unavailability of dock facilities normally used for isolating shipments and receipts of SNM or for isolating SNM from other materials.

h. Failure of the intrusion alarm protection system.

i. Loss of offsite communication capability at the central alarm station.

j. Commingling of SNM assigned to different material balance areas (MBAs) as a result of loss of identification or undocumented movement of SNM-bearing materials.

k. Loss of automatic data processing capability for control and accounting of SNM:

l. Reduced vault storage capacity that may be caused, for example, by a spill of radioactive material.

The materials protection measures that would apply to nonroutine operations are emergency substitutes for normal requirements. Operation under these measures are intended to proceed only during a temporary loss of routine protection capability.

C. REGULATORY POSITION

Backup or special measures and actions that can be taken to help assure the continued protection of SNM during an emergency or threatened emergency are described below. For each component of the normal materials protection system the failure mode that may result from fire, explosion, criticality, or contamination (either accidental or deliberate) should be identified. To provide protection, the backup measure for each system component should be invulnerable to the event that caused the failure of that component.

Emergency materials protection measures that affect activities in material access areas may, in some, cases, impact on necessary safety measures. If prescribed emergency materials protection measures (e.g., evacuation to a supervised assembly area or surveillance of rescue vehicles) would place individuals in further jeopardy, health and safety considerations¹ take precedence. Further, if prescribed materials protection measures are less stringent than other requirements (as, for example, health and safety requirements or local building codes) the more stringent requirements should apply.

1. Detection Aids

The following guidelines constitute measures acceptable to the Regulatory staff for detecting actual or potential conditions that would compromise routine materials protection measures.

a. Reports from offsite severe-weather warning or meteorological services should be used for predicting adverse weather conditions that could compromise materials protection. If a natural event that can jeopardize the protection of SNM is predicted, all SNM in process, to the extent practicable, should be placed in containers, sealed and locked in vaults, or located in other areas that will provide protection from theft and from physical damage that could reduce the effectiveness of postemergency procedures. (See also Regulation Position C.5, "Postemergency Materials Accountability Measures.")

b. Sensors should be installed to detect conditions of temperature, pressure, shock, release of radioactive materials, and interruption of vital services and equipment that could precipitate an emergency with a potential effect on the protection of SNM. (Although written for a different purpose, IEEE Standard 279-1971² contains useful guidance for the installation of sensors in Section 3, Items 3-6.)

¹Other regulatory guides that deal with emergency plans to protect the health and safety of workers and the general public from accidental radioactivity releases are under development.

²IEEE Standard 279-1971, "Criteria for Protection Systems for Nuclear Power Generating Stations." Copies may be obtained from the Institute of Electrical and Electronics Engineers, Inc., 345 East 47th Street, New York, New York 10017

c. In the event of failure of a sensor or other instrumentation, parameters that had been monitored by the failed device should be visually monitored by direct or remote means unless a redundant sensor is available to monitor the parameter.

2. Communication Measures

The following guidelines constitute emergency measures that are acceptable to the Regulatory staff for transmitting warning or alert signals and for communicating during and after a reported emergency.

a. Signals that indicate when and where an emergency condition exists should be a fail-safe, tamper-resistant design and should include both visible and audible annunciating devices. Transmission and annunciator equipment should conform to Interim Federal Specification W-A-00450B(GSA-FSS) dated February 16, 1973, entitled "Alarm Systems, Interior, Security, Components For."³

b. Tamper-resistant annunciators should be located in at least two places within a material access area such that they can be seen and heard by supervisory and operating personnel whose actions may be needed to protect material or to avert an imminent emergency that could compromise the protection of material. Additional annunciators for all emergency signals should be located at the continuously manned central alarm station.

c. Onsite one-way communications consisting of a plant-wide public-address system and portable battery-powered megaphones should be available for relaying instructions to evacuating and evacuated personnel.

d. At the time of an emergency, telephone usage should be restricted to essential messages having to do with the emergency.

e. In addition to systems required for communication with local law enforcement authorities,⁴ communication by telephone or radio should be available to notify key off-duty company personnel (to provide additional security, supervisory, technical support, or cleanup personnel, as needed to protect or account for SNM). A backup communication capability, e.g., designation of an offsite duty officer (supplied with company transportation) who would be contacted by the law enforcement agency, should be available for contacting key individuals in the event of a general telephone outage.

f. Security plans with local law enforcement agency authorities should provide for periodic "check-in" procedures and should assure that an inability of the

³Copies may be obtained from the Standardization Division, Federal Supply Service, General Services Administration, Washington, D.C. 20406.

⁴Paragraph 73.50(e)(3) of 10 CFR Part 73.

authorities to communicate with the continuously manned central alarm station will be treated by the authorities as a call for assistance. Contacts or liaison with local law enforcement authorities should include utilization of intelligence-gathering groups for possible warning or to aid in the recovery of stolen material.

3. Personnel Control

The following guidelines constitute emergency measures that are acceptable to the Regulatory staff for controlling access to SNM during or following an emergency.

a. Evacuation

(1) All personnel should be instructed and drilled in the salient features of the emergency materials protection plan. Since the plan may be quite complex and repetitive, an abstract, memo, manual, or list of rules should be published and distributed to all employees and visitors. In addition, key instructions for individual areas within the plant should be posted in conspicuous locations.

(2) If consistent with personnel health and safety considerations, emergency rendezvous areas should be located within the protected area.

(3) Personnel who are evacuated from a facility because of an emergency should leave according to established plans and routes with a minimum of travel through material access areas. Emergency exit routes from a material access area should avoid passage through other material access areas.

(4) Personnel evacuated from or through a material access area should be under surveillance wherever possible as they are being evacuated, should be kept under surveillance after they are evacuated, and should rendezvous at a single predetermined location until dismissed or instructed to return to work. Such personnel should be identified from area access control records and accounted for.⁵

(5) Emergency exits from the protected area should be designed to allow continuous visual surveillance of evacuating personnel during evacuation.

(6) Areas where individuals assemble following an evacuation should be clear of obstructions that would provide concealment such as buildings, fences, trees, or shrubbery and should be restricted from public access.

(7) All persons and vehicles leaving a protected area or emergency rendezvous area should be assumed to bear concealed SNM and should be accompanied by supervisory or security personnel until circumstances allow a search to be conducted.⁵ Personnel requiring offsite medical attention should not be exempted.

(8) If an emergency situation cannot be controlled adequately with the available onsite manpower, additional off-duty company personnel should be called in or support should be obtained from offsite local,

State, or Federal agencies. Offsite organizations may include local law enforcement authorities, fire departments, AEC personnel, State health departments, hospitals, and ambulance and rescue services.

b. Emergency Access Control

(1) Records of persons granted access to material access areas prior to, during, and after an emergency should be secured and maintained for later analysis.

(2) Measures should be taken to protect or provide backup for required intrusion detectors⁶ so that all exits from and entrances to an evacuated material access area can be closed, locked, and alarmed. If not alarmed, such areas should be kept under continuous direct or remote visual surveillance.

(3) Construction materials should be available on site for making emergency repairs to breaks in the physical barriers.

(4) Access to evacuated material access areas should be restricted to authorize security, supervisory, emergency materials protection, and rescue personnel in accordance with established emergency procedures.

(5) Emergency keys or lock combinations necessary for emergency personnel should be stored in tamper-resistant, alarmed enclosures and should be changed whenever there is reason to believe such an enclosure may have been compromised. (Disadvantages of master keyed locks is discussed in another regulatory guide.⁷)

c. Surveillance

(1) Emergency lighting from an alternative or secondary power source should be provided to all material access areas to provide illumination sufficient for surveillance⁸ during periods when the normal lighting system is inoperative. If an area-wide power failure would disrupt the secondary power supply, battery-powered floodlights designed to activate automatically if the normal lighting system fails should be installed throughout the material access area in a manner that provides general illumination of not less than 0.2 foot-candle.⁹ In addition, all security personnel should be provided with portable battery-powered spotlights. All battery-powered lights should be provided with a signal light to warn of weak batteries.

(2) Planning should include, as appropriate, the use of portable CCTV equipment to survey and to monitor activities in a material access area following an emergency in which sensors or other monitoring equipment have become inoperative and conditions exist that make extended occupancy hazardous.

⁶Paragraph 73.60(c) of 10 CFR Part 73.

⁷Regulatory Guide 5.12, "General Use of Locks in the Protection and Control of Facilities and Special Nuclear Material."

⁸Regulatory Guide 5.14, "Visual Surveillance of Individuals in Material Access Areas."

⁹Local safety codes may require higher levels of illumination to assure safe evacuation.

⁵See also Regulatory Guide 5.7, "Control of Personnel Access to Protected Areas, Vital Areas, and Material Access Areas."

(3) Additional security or guard personnel should be called in or other qualified plant personnel should be designated to support the regular security personnel as needed for performing backup guard functions, surveillance, and materials protection for a material access area that is threatened or affected by an emergency.

(4) All emergency vehicles (company-owned or owned by an offsite organization) that are brought into a protected area and are used for the transfer of equipment or personnel to or from a material access area during or following an emergency should be under continuous surveillance by supervisory or security personnel while within the protected area. If surveillance has not been continuous, exiting vehicles and any individuals therein should be accompanied until both can be searched for concealed SNM.

4. Nonroutine Operation

The following guidelines constitute measures that are acceptable to the Regulatory staff for assuring continued protection of SNM while a plant or process is temporarily operating under nonroutine conditions which could otherwise reduce the protection afforded by routine materials protection measures.

a. Necessary Nonroutine Operation

While certain nonroutine operations may be desirable (particularly cleanup after a natural or nuclear emergency), extensive use of emergency measures cannot justify long-term operation in noncompliance with AEC rules, regulations, license conditions, or orders.¹⁰

(1) The design of automated or remotely operated equipment for processing, transporting, or storing SNM should provide for access to equipment, as allowed by safety considerations, to facilitate removal or draindown of SNM. Manual operations or maintenance to equipment that may permit access to SNM should be performed within controlled material access areas by individuals authorized to have access to SNM.

(2) Material access areas should be designed with sufficient clearance to permit the installation of temporary physical barriers to isolate areas that might require postemergency cleanup or other nonroutine activities by personnel who are not authorized access to SNM. If deductive surveillance¹¹ is to be utilized for activities in such "isolated" areas, the area should be separated from other areas by barriers equivalent to those normally required for material access areas.¹²

(3) Where possible, SNM should be removed from process equipment and accounted for before any nonroutine activities are undertaken in that area. All hard-

ware and tools removed from a material access area should be examined for SNM, and all personnel should be searched for concealed SNM.¹³

(4) To provide for temporary handling of both shipments and receipts of SNM in the same dock area, physical separation should be provided between the dock platforms and material storage areas at the dock. Storage areas should be designed with clear space sufficient to accommodate operations normally done on the dock e.g., removal of outer packaging, gross measurement check, seal verification, etc.

(5) Process equipment in which in situ measurements or in situ calibration of instruments is normally performed should be designed with provisions for emergency access and working space to utilize alternative or duplicate sampling, measuring, and calibrating equipment or devices.

b. Protection System Component Failure

Continuous direct visual surveillance by security or supervisory personnel or other backup measures should be provided for all materials security devices, the operability or required level of performance of which cannot be verified.

(1) Whenever changes in process operations, equipment design, or equipment location can reduce normal inspection and testing capability, special design features and operating procedures implemented must be consistent with approved license amendments.¹⁴ To aid implementation and approval, duplicate or equivalent backup measuring and testing devices may be provided. Also, use of calibrated nondestructive assay equipment, or procedures which call for a partial shutdown for sampling, special calibration of instruments, or obtaining physical measurements, may be substituted for normal in-line or dynamic inventory measurements. Equipment also may be designed with supplemental viewing and inspection ports or openings that can take the place of primary access ports blocked owing to changes in equipment design or location.

(2) Provisions for manual searches or backup monitoring equipment should be available in the event of temporary malfunction of equipment routinely used to search individuals, packages, and vehicles exiting from material access areas. Equipment normally in use at two different control points may serve as backup for one another, provided either control point can be deactivated (blocked, locked, and alarmed) when not properly equipped.

(3) Backup equipment should be available for monitoring all waste streams for SNM. When not in use, this equipment should be stored in an area physically separated from primary monitoring equipment.

(4) Backup capability for surveillance of material processing or storage areas should be provided in the event of failure of an intrusion alarm or remote visual

¹⁰Paragraphs 70.32(c) and 70.32(e) of 10 CFR Part 70.

¹¹See Regulatory Guide 5.14, "Visual Surveillance of Individuals in Material Access Areas."

¹²Paragraph 73.2(f) of 10 CFR Part 73. (Standards for Barrier Construction are the subject of a regulatory guide under development.)

¹³Paragraph 73.60(b) of 10 CFR Part 73.

¹⁴Paragraph 70.32(b) of 10 CFR Part 70.

surveillance system. This backup may be a redundant intrusion alarm system and/or a capability for continuous on-location visual surveillance by security or supervisory personnel who can communicate with the continuously manned central alarm station.

(5) Security, supervisory, or authorized operating personnel such as storage or vault custodians should provide continuous direct surveillance of any normally locked or secured process or storage area for periods when keys are lost or unaccounted for, locks are damaged, or lock combinations are compromised. This surveillance should be continued until all affected locks are replaced or until lock combinations are changed by authorized security or management personnel.⁷

5. Postemergency Materials Accountability Measures

The following guidelines constitute actions that are acceptable to the Regulatory staff for assuring continued materials control and accounting following an emergency.

a. Accounting

(1) Emergency measures should assure the integrity of material accountability records so that a valid postemergency material balance can be made following conditions in which the identification of SNM items may have been lost or obliterated, SNM may have been relocated to another material balance area (MBA) without adequate transfer records, or equipment that may have contained SNM has been removed.

When SNM has been relocated to another area, a temporary MBA should be established that encompasses both the original area and the new area. This temporary MBA should be physically identified with suitable markings or barriers. All SNM within the temporary MBA should be physically inventoried and new records obtained and reconciled with the preemergency records. Measurements should be of sufficient quality that the uncertainty of the postemergency inventory is no greater than the uncertainty of the preemergency records. New separate MBAs with material transfer stations, custodians, and records may be necessary for SNM (or equipment containing SNM) that is relocated for post-emergency cleanup or recovery.

(2) If electronic data processing is used for SNM control and accounting, a master file should be maintained which can be updated from a log of transactions processed subsequent to the last updating of the file. A capability for the manual recording of data normally entered automatically may also be desirable.¹⁵

(3) As soon as possible after an emergency all SNM control records should be accounted for and placed in locked storage or kept under continuous direct or

remote surveillance until needed for inventory and SNM accountability.

b. Control and Documentation

(1) Emergency exits should be designed so that they may be used temporarily to replace normal access or exit control points. Inoperative access points should be barricaded or locked and, in either case, they should be alarmed consistently with requirements for material access areas.¹⁶ Direct visual surveillance should be maintained over any unalarmed, though inoperative or unused, access points (emergency as well as normal access points).

(2) Solid, liquid, and gaseous effluents from a material access area normally must be monitored to detect and measure SNM that may be released.¹⁷ Retention ponds and tanks should be provided as necessary to allow monitoring of liquid effluents from emergency-related activities such as fire fighting and decontamination.

(3) The location of all SNM in a facility should be determined as soon as possible after an emergency to assure continued surveillance and access control of such material. Temporary material access areas or boundaries should be established in the event that SNM must be moved or barriers removed during or as a result of an emergency.

(4) Nondestructive assay equipment should be available to assist in timely verification of SNM content of materials that may have been spilled, moved, or altered during an emergency.

(5) If SNM that is not in process cannot be protected because of temporary loss of normal vault or storage capability, emergency measures should be taken to assure that security and accountability requirements are met. Temporary storage areas should be designated and should be physically separated from process or other material access areas with a temporary isolation barrier that can be kept under continuous direct surveillance by security personnel or by an authorized vault custodian. If other areas approved for SNM storage are available, material should be relocated to these areas and afforded the full protection routinely required of SNM (access control, intrusion alarms, surveillance, etc.). While SNM is being relocated to temporary storage, sealed containers should not be opened unless there is reason to suspect that seals have been compromised. Unsealed containers of SNM should be identified, sealed, and listed before being relocated. All relocated containers should be locked⁷ (either individually or in a larger container with others) to physically isolate them from individuals who are authorized to have access to materials normally assigned to the temporary storage area. Similarly, SNM normally assigned to the area should be locked or otherwise protected from individuals who are authorized to have access to the relocated material.

¹⁶ Paragraph 73.60(c) of 10 CFR Part 73.

¹⁷ Paragraph 70.22(b)(1) of 10 CFR Part 70.

¹⁵ Regulatory guides dealing with material control and accounting records are under development.

When normal vault or other storage capability has been restored and the material is returned from temporary storage, the integrity of each seal should be verified.¹⁸

(6) In the event the relocated SNM has not been continuously isolated while in temporary storage or if there is reason to suspect that a seal has been compromised, all suspect and unsealed packages at that storage location, whether believed to contain SNM or not, should be opened if necessary and the contents remeasured to verify that no SNM has been stolen or

illicitly transferred to another container to aid later removal.

(7) All measures taken to protect SNM during an emergency, whether in accordance with established emergency plans or a departure from such plans, should be documented. This should include, where feasible, a record of instructions given and actions taken and should include interviews with individuals who were in the material access area immediately prior to the emergency. These records should be reviewed for post-accident or postemergency analysis of possible deliberate cause and for modifying emergency procedures as appropriate.

¹⁸Regulatory Guide 5.15, "Security Seals for the Protection and Control of Special Nuclear Material."