



DRAFT REGULATORY GUIDE

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DRAFT REGULATORY GUIDE DG-5027

(Proposed Revision 1 to Regulatory Guide 5.12, dated November 1973)

GENERAL USE OF LOCKS IN PROTECTION AND CONTROL OF FACILITIES AND SPECIAL NUCLEAR MATERIALS

A. INTRODUCTION

This guide describes a method that the staff of the U.S. Nuclear Regulatory Commission (NRC) considers acceptable for the selection, use, and control of locking devices in the protection of areas, facilities, and materials.

A license under Title 10, Part 50, "Licensing of Production and Utilization Facilities," of the *Code of Federal Regulations* (10 CFR Part 50) or a license for formula quantity of strategic special nuclear material (SNM), as defined under 10 CFR Part 70, "Special Nuclear Material," requires that a Commission-approved physical security plan demonstrate how the physical protection requirements of 10 CFR Part 73, "Physical Protection of Plants and Materials," are met. As required by 10 CFR 73.40, "Physical Protection: General Requirements at Fixed Sites," certain licensees must provide physical protection against radiological sabotage or theft of SNM, or both, at the fixed sites at which licensed activities are conducted.

Further, 10 CFR 73.55(a)(5) requires applicants for an operating license under the provisions of 10 CFR Part 50, or holders of a combined license under the provisions of 10 CFR Part 52, "Early Site Permits; Standard Design Certifications; and Combined Licenses For Nuclear Power Plants," to satisfy the same requirements before the receipt of SNM in the form of fuel assemblies. Specifically for nuclear

This regulatory guide is being issued in draft form to involve the public in the early stages of the development of a regulatory position in this area. It has not received final staff review or approval and does not represent an official NRC final staff position.

Public comments are being solicited on this draft guide (including any implementation schedule) and its associated regulatory analysis or value/impact statement. Comments should be accompanied by appropriate supporting data. Written comments may be submitted to the Rulemaking, Directives, and Editing Branch, Office of Administration, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; emailed to NRCREP@nrc.gov; submitted through the NRC's interactive rulemaking Web page at <http://www.nrc.gov>; faxed to (301) 415-5144; or hand-delivered to Rulemaking, Directives, and Editing Branch, Office of Administration, US NRC, 11555 Rockville Pike, Rockville, Maryland 20852, between 7:30 a.m. and 4:15 p.m. on Federal workdays. Copies of comments received may be examined at the NRC's Public Document Room, 11555 Rockville Pike, Rockville, MD. Comments will be most helpful if received by **60 days from issuance**.

Electronic copies of this draft regulatory guide are available through the NRC's interactive rulemaking Web page (see above); the NRC's public Web site under Draft Regulatory Guides in the Regulatory Guides document collection of the NRC's Electronic Reading Room at <http://www.nrc.gov/reading-rm/doc-collections/>; and the NRC's Agencywide Documents Access and Management System (ADAMS) at <http://www.nrc.gov/reading-rm/adams.html>, under Accession No. **ML08XXXXXX**.

power plants, the proposed revision to 10 CFR 73.55¹ sections (e), (g), (l) and Appendix C to Part 73, contain subparagraphs that state the requirements for locks. Locks are acceptable devices to be used in adhering to the physical protection requirements identified above to assist in controlling access to areas, facilities, and materials through doors, gates, container lids, and similar material or personnel access points, and are considered essential components of a physical barrier.

The NRC regulations that pertain to the protection of information include 10 CFR 95, "Security Facility Approval and Safeguarding of National Security Information and Restricted Data," for classified information and 10 CFR 73.21, "Requirements for the Protection of Safeguards Information," for safeguards information.

The NRC issues regulatory guides 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.

This regulatory guide contains information collection requirements covered by 10 CFR Part 73 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.

¹ The final proposed revision to 10 CFR 73.55 was conveyed from the NRC Executive Director for Operations to the Commissioners on July, 9, 2008, SECY-08-0099, package ADAMS accession number ML081780209.

B. DISCUSSION

Background

A lock is a mechanical latching device for securing moveable portions of physical barriers (e.g., doors, gates, drawers) in a secured position. Locks are very important components of a physical barrier but should be considered as delay devices only, rather than positive impediments to unauthorized entry, since any lock can be defeated by expert manipulation or force. Ideally, the lock delay capability should match the penetration resistance of the rest of the barrier. The effectiveness of locks, however, lies in their use in conjunction with other security measures such as multiple barrier systems, seals, intrusion alarm systems and response actions.

Locks are commonly categorized by the mechanism used to withdraw the latching system to allow access. The most common mechanisms are by entry of a specific sequence of numbers in the case of combination locks, manipulation with a key in the case of keyed locks, and presentation of electronic security tokens in the case of electronic locks. The following describes each type of lock, including advantages, disadvantages, and applicable standards and specifications, and discusses the control of locks, keys, combinations, and related equipment.

1. Combination Locks

1.1 General

In a combination lock, the locking mechanism is disengaged by entering a specific sequence of numbers (i.e., the combination). A combination lock should be designed to provide a large number of possible combinations. The number of possible combinations is determined by the number of numerals available for each number in the sequence and the length of the sequence. A lock having 100 possible numerals and a three-number sequence offers 1 million ($100 \times 100 \times 100$) combinations. Some combination locks require a four-number sequence; however, the added number of possible combinations does not proportionally improve the security of the lock, but it does increase the inconvenience of entering the combination.

Combination locks are designed for use in two basic forms. The first is a lock case, which is mounted on or into a door or container as a mortise or rim lock, and the second is a padlock. High-quality combination locks are tested for resistance to surreptitious entry (e.g., manipulation, radiological analysis, and emanations analysis) and forcible entry.

Protection against forcible attack on a mortise or rim-mounted lock can be increased if the lock is provided with hardened steel plates and if it is designed with relocking triggers or devices that dead lock the bolt or bolt-actuating mechanism upon forcible attack. These locks should use a deadbolt and not a dead-locking latch, which is more susceptible to force. The deadbolt should have a minimum 1-inch lateral throw or multiple vertical engagements with its strike. Astragals on outswinging doors and inswinging double doors without mullions provide additional protection to the lock bolt.

Provisions for easy change of combinations are desirable. Some locks permit a new combination to be directly entered when utilizing a special key inserted into the back of the lock. These locks are commonly termed "key-change" locks. Others require the replacement of internal parts to change the combination.

Combination locks may be vulnerable to compromise if the back of the lock is readily available (e.g., when the back of the lock is accessible or the lockable access is open). Removing the back cover from the lock may allow the combination to be determined. The combinations of some key-change locks can be changed directly when the lock is in the open position, while others must have the existing combination redialed to a different index when the access is in the open position to permit the combination change. The former type permits an intruder to quickly change the combination to one of his or her own choosing, thus permitting the intruder to enter following the closing of the lock but denying entry to an authorized user. For these reasons, backplates or other devices should be used to protect the back of the lock, and the door or container in which the lock is located should not be left unattended when open.

In a mechanical pushbutton lock, the pushbuttons activate linkages that connect a gate with an external knob to permit opening of the lock. This type of lock typically offers relatively few possible combinations, and it is difficult to include penalties for punching a wrong combination, as is done in electronic locks. Infrequent combination changes can lead to wear patterns on the pushbuttons which can further reduce the number of combinations an intruder would need to enter in order to gain unauthorized entry.

1.2 Standards and Specifications

Federal Specification FF-L-2740¹ “Locks, Combination,” covers changeable combination locks designed to be mounted on safes, security files, vault doors, and similar items and which are intended for the protection of national security information. General Services Agency (GSA)-approved security file cabinets, map and plan containers, vault doors, and doors for facilities approved for open storage of classified information must be secured with a lock that has been tested and approved under Federal Specification FF-L-2740. The only exception is field safes (safes specifically designed and built for the protection and storage of classified material in other than fixed facilities) which may use a lock meeting Underwriters Laboratories (UL) 768, “Standard for Combination Locks,” Group 1R.



Figure 1. Field safe.

¹ Standards that are cited in the Discussion and Regulatory Position section of this Regulatory Guide are cited in the reference section of this Regulatory Guide as the issue, and amendment (if applicable) in effect on the date of the issuance of this Regulatory Guide.

Locks meeting Federal Specification FF-L-2740 resist 20 manhours of manipulation, 20 manhours of radiological analysis, 20 manhours of emanations analysis, and 30 manminutes of covert opening. Three locks have been approved under Federal Specification FF-L-2740—models X-07, X-08, and X-09. All three models are self-powered electromechanical locks. While all three models are still approved, only the X-09 is currently being produced.



Figure 2. X-09 Lock

Pedestrian door deadbolts for protection of facilities approved for open storage of classified information must meet the requirements of Federal Specification FF-L-2890 “Lock Extension (Pedestrian Door, Deadbolt).” This specification is intended for deadbolts located on interior pedestrian doors used for normal entrance and egress during day-to-day operations. A pedestrian door deadbolt meeting Federal Specification FF-L-2890 consists of a mounting plate, a combination lock that meets Federal Specification FF-L-2740, and a strikeplate. The mounting plate is surface mounted to the inside face of the door. The deadbolt baseplate has two essential features. First, it provides a means of latching the bolt in the retracted position. This prevents the bolt from being inadvertently extended. Second, turning a knob on the baseplate will retract the bolt to allow egress. Proper deadbolt operation requires installation of the correct strikeplate. The strikeplate needed is dependent on the door bevel and whether it is a single- or double-door leaf, which must be correctly specified. Pedestrian door locks meeting the requirements of Federal Specification FF-L-2890 that feature single-motion egress for life safety are available and applicable for protection of facilities approved for open storage of classified information. These locks can be mated with a variety of access control devices.

New and existing GSA-approved weapons containers and armory vault doors for the protection of arms, ammunition, and explosives require locks that meet the requirements of UL 768, Group 1. Effective March 1, 2008, all GSA-approved weapons containers and armory vault doors, will be manufactured with a lock that meets Federal Specification FF-L-2937 “Combination Lock Mechanical,” Group 1 locks resist manipulation attempts for 20 manhours. In addition to this protection, these locks all have internal relock triggers that prevent retraction of the bolt if the dial is removed and the spindle is punched. Combination locks that meet the requirements of FF-L-2740 should not be used on weapons (i.e., firearms) containers and armory doors.

Federal Specification FF-L-2937, “Combination Lock, Mechanical,” is a relatively new specification. The requirements of Federal Specification FF-L-2937 correspond to the requirements of UL 768, Group 1. GSA-approved weapons containers and armory vault doors will use locks approved under Federal Specification FF-L-2937 effective March 1, 2008.

Federal Specification FF-P-110, “Padlock, Changeable Combination,” covers changeable combination padlocks designed to conform to the standards for security equipment set forth in the “National Security Council Directive Governing the Classification, Downgrading, Declassification and Safeguarding of National Security Information.” The padlocks are required to resist opening for not less than 30 manminutes by manipulation and 10 manminutes by surreptitious attack. The padlocks are not tested for forced opening. The padlocks are intended for use on shore and aboard ocean-going vessels, indoors or outdoors (in areas that are semi-protected by a structural overhang similar to eaves or a lean-to).

American National Standards Institute/Builders Hardware Manufacturers Association (ANSI/BHMA) A156.5-2002, “American National Standard for Auxiliary Bored and Mortise Locks, Rim Locks, and Cylinders and Push Button Mechanisms,” provides current guidance for mechanical pushbutton locks.

2. Key Locks

Most keyed locks fall into four general classes—warded locks, wafer (or disk) locks, lever locks, and pin-tumbler locks. In the United States, the most common type of keyed lock for security purposes is the pin-tumbler.

As in the case of combination locks, a key lock should be capable of being set for a large number of different keys. A high-quality six-pin lock with 10 key cutting levels per pin potentially permits 1 million different keys to be used. However, this large a number of key cuts is not as useful as a large number of combinations because less time-consuming techniques for defeating key locks are available. Beyond basic pin-tumbler locks, several high-security lock cylinders are available. These provide considerably increased resistance to covert and surreptitious attack. They also offer greater key control capability because key blanks may not be available commercially.

Licenseses choosing to use master keying and interchangeable core systems should be aware of the vulnerabilities created by such systems. Master keying must be done correctly to minimize the loss of security associated with such as system. Master-keyed systems and interchangeable core systems (which require a control key) should be set up so that distinct areas, programs, and the like are not under the same master key or control key. Likewise, some areas should not be master keyed at all. Further, where interchangeable core locks are not routinely monitored (e.g., a padlock on the gate at a remote site), the control key should be unique to that padlock. Control keys should only be issued to the individual in charge of the lock program.

Master keying is undesirable from a security point of view because disassembly and inspection of any lock in the system by a competent person provides access to all the other locks in a master-keyed system. In addition, termination of an employee who had access to a master key would require changing the bitting of all locks set for the master key. Changing the bitting of a large number of locks can be costly, but the convenience of master systems is such that there is strong pressure for using them. A compromise in this conflict between convenience and security may be to use a nonmastered set of locks for protected areas, material access areas, vital areas, and access to vital equipment and to permit master key sets for other less sensitive areas.

It is essential for a bolt of a lock to be retained in the locked position by positive means (deadbolt). In some locks, the bolt is held in a locked position by a spring only. This permits, in the case of padlocks, the use of appropriate rapping or shimming techniques, and, in the case of door locks, the opportunity to surreptitiously retract the bolt without the use of force.

A key lock, designed by the U.S. Army has great forced entry protection, it is the pneumatic deadbolt locking system PDLs. The PDLs is in compliance with Military Specification MIL-DTL-43607 “Padlock, Key Operated, High Security, Shrouded Shackle,” mentioned below. The PDLs typical configuration has six hardened steel bolts and the locking system behind the door panel. The steel bolts extend from brackets, located behind and on the door panel, into the surrounding structure. Delay attributes such as the Z-cage barrier system, smoke obscurants and other delay measures are usually implemented with the PDLs. The PDLs has been used by the DoD for securing nuclear weapon storage igloos. For more information on the U.S. Army designed PDLs and the Z-cage barrier system see Appendix D to draft Regulatory Guide DG-5025, “Physical Security Hardware, Inspections, Testing, Analyses and Acceptance Criteria.”

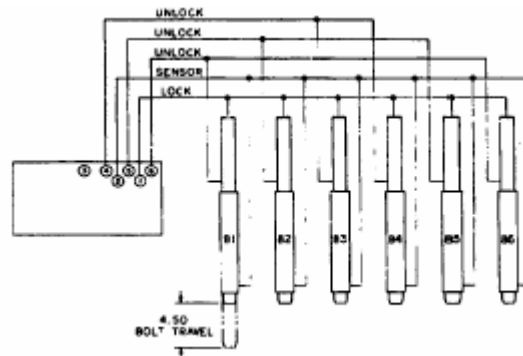


Figure 3. Pneumatic Deadbolt Locking System (PDLs)

UL 437, “Key Locks,” covers door locks and locking cylinders as well as other types of locks. It provides for testing in terms of security, endurance (cycle test), and salt fog test. A salt fog test provides a controlled corrosive environment which has been utilized to produce relative corrosion resistance information for specimens of metals and coated metals. Salt fog test is described in ASTM B-117 -07a, “Standard Practice for Operating Salt Spray (Fog) Apparatus,”.

American Society for Testing and Materials (ASTM) F883, “Standard Performance Specification for Padlocks,” covers key-operated padlocks and has provisions for graded testing in terms of security, endurance (cycle test), and environmental attack.

Federal Specification FF-P-2827, “Padlock, Key Operated, General Field Service,” covers key-operated padlocks intended for outdoor use. These padlocks are tested to the highest levels of environmental attack in ASTM F883 and provide moderate resistance to forced entry and picking.

Military Specification MIL-DTL-43607, “Padlock, Key Operated, High Security, Shrouded Shackle,” covers high-security, shrouded shackle padlocks intended for protection of military arms, ammunition, and explosives. These padlocks are intended to be used as a system with a high-security shrouded hasp that meets the requirements of Military Specification MIL-DTL-29181, “Hasp, High Security, Shrouded, for High and Medium Security Padlock.”

A key lock, designed by the U.S. Navy, provides great forced entry protection and is an internal locking device (ILD). In the ILD, the locking system is located behind the door panel or in a protected housing. The U.S. Navy designed ILD, in addition to possessing increased resistance to forced entry, is

resistant to surreptitious neutralization attempts by picking, shimming, impressioning, and bypassing methods the same as the DoD High Security Padlock in accordance with Military Specification MIL-DTL-43607, "Padlock, Key Operated, High Security, Shrouded Shackle," March 10, 1998. The DoD has approved the U.S. Navy designed ILD lock for protection of conventional arms, ammunition, explosives, nuclear weapons, and chemical weapons. For more information on the U.S. Navy designed ILD see Appendices B and D to draft Regulatory Guide DG-5025, "Physical Security Hardware, Inspections, Testing, Analyses and Acceptance Criteria."



Figure 4. Internal Locking Device (ILD)

3. Electronic Locks

An electronic lock is a system comprised of an automatic door closer on the door, an input device, a controlling device, and a lock, usually mechanical, which is released or activated when the correct combination is entered or correct token is presented. Various technologies are available in such systems, including biometric, magnetic-stripe cards with a unique identifier encoded on to the card, proximity cards containing a unique identification code in a microchip which transmits when the card is near a card reader, smart cards which contain a memory chip to store identification data, and combination entry. A good system will use two or more of these methods. For example, an employee's photo identification card can also serve as a smart card that awakens a digital scramble keypad into which the employee enters a personal identification number. A system using two technologies is referred to as a two-factor authentication system. The electric lock offers a number of advantages, including isolation of the lock part containing the code from the exposed part of the lock, versatility of programming, and ease of integration into alarm systems.

In the event of a power failure, an electronic lock system should "fail secure." That is, doors should remain locked to personnel on the unprotected side, but egress from the secure side should remain possible. The mechanical lock is often a rigid-function lockset in the door. The key to its cylinder is the emergency override key that is used to gain access to areas during a power outage. Only authorized personnel should have that key.

The actual unlocking and locking of the door is often accomplished by use of an electric strike. This is mounted in the frame, and the lock's bolt projects into it. It is released when electric current is sent to it, based on a valid opening (e.g., insertion of the correct card). The electric strike must be

selected depending on the amount of use it will get, and it should be periodically checked to see that it holds the door locked when it should.

If the system involves a person pressing buttons or switches to enter a code, a sight barrier should be present to prevent observation of the code as it is entered. A system in which each person presents a unique credential or enters a unique personal identification number is much better than one that allows anyone using an area to enter the same combination. In the former system, if an employee were to retire or be debriefed from the program, that employee's access can be removed from the system without affecting the other employees. In the latter system, all employees in the area would need to be given the new combination.

Pushbutton systems should incorporate devices/logic that prevent trial and error methods of surreptitious attack by activating an alarm after a certain number of unsuccessful attempts or by introducing a delay after each unsuccessful attempt which prevents operation of the lock for a period of time.

Current guidance and specifications for electric locks include UL 1034, "Burglary-Resistant Electric Locking Mechanisms," and ANSI/BHMA A156.25-2002, "American National Standard for Electrified Locking Devices."

4. Control of Locks, Keys, Key Cards, Combinations, and Related Equipment

Possession of keys, key cards, combinations, and other related equipment by unauthorized individuals severely affects security and neutralizes the primary purpose of an access control program. Additionally, information gained from spare locks and related equipment can allow unauthorized individuals to gain access. For this reason, distribution of keys, key cards, combinations, and other items allowing access and storage of spare locks and related equipment must be carefully controlled.

Effective lock, key, key card, combination, and related equipment control requires a formal process for distributing elements to only authorized personnel, accounting for spare components, and changing keys, key card processing systems, and combinations when an individual's authorization for access has been revoked or suspended for whatever reason.

C. REGULATORY POSITION

1. Selection and Use of Locks to Protect Facilities and SNM

The following guidelines are acceptable to the NRC staff for the selection and use of locks in the protection of facilities and SNM:

- a. Locks (locking systems) and all associated hardware should be properly installed, operable, and free of substantive indications of tampering. An explicit record should be maintained concerning such possible tampering marks and all service work rendered.
- b. The locks (locking systems) should be serviced and repaired by a regular employee competent in locksmithing or by a contractor locksmith whose assigned personnel have been processed/screened by the licensee for trustworthiness. Such processing or screening should be commensurate with that required for personnel granted unaccompanied access to vital areas.
- c. Combination locks installed in doors in, or leading to, national security information or restricted data areas shall meet Federal Specification FF-L-2740 (if in vault doors) or shall be pedestrian door deadbolts meeting Federal Specification FF-L-2890 (for doors to vault-type rooms). Combination locks on national security information storage containers (GSA-approved security containers) shall meet FF-L-2740.
- d. Locks on GSA-approved containers for arms and ammunition and armory vault doors shall meet Federal Specification FF-L-2937 or UL 768, Group 1. The requirements of FF-L-2937 include the requirements of UL 768, Group 1. Locks that meet FF-L-2740 should not be used to protect weapons/ammunition in storage.
- e. Combination padlocks, rather than key padlocks, should be used when practical on doors or gates to material access areas, in protected and vital area perimeters, and for access to vital equipment. Combination padlocks should be used on closed vehicles or containers holding SNM that are required to be locked. Combination padlocks should be three-position, dial-type changeable-combination padlocks meeting Federal Specification FF-P-110F.
- f. Key locks used in lieu of combination padlocks on doors or gates to material access areas, in protected and vital area perimeters, and for access to vital equipment should provide a high degree of resistance to opening by force and tamper techniques and should meet the requirements of UL 437. A lock that meets Military Specification MIL-P-43607 with respect to 15-minute surreptitious neutralization resistance can be used as an alternative to a key lock that complies with UL 437. Section B.2 of this draft regulatory guide describes two such locking systems.
- g. Key padlocks used in lieu of combination padlocks on doors or gates to material access areas, in protected and vital area perimeters, and for access to vital equipment should be of rugged and sturdy construction and designed for outdoor use, if necessary, and should meet Federal Specification FF-P-2827.
- h. Electric locks should be used inside the protected area as a means of access control only if a magnetic card key system is coupled with a pushbutton system and integrated into the alarm system. This lock combination should have features that resist tampering with the combination-changing mechanism and that alarm after a set number of errors in entering the combination is made. Specifications for electric locks include UL 1034 and ANSI/BHMA A156.25-2002.
- i. Mechanical locks used as panic locks on emergency exit doors within protected area perimeters should be operable only from the inside.
- j. Mechanical pushbutton locks should comply with ANSI/BHMA A156.5-2002.
- k. For general purposes (no special requirements such as (SGI, NSI, RD or SNM) emergency egress locks should be in compliance with ANSI/BHMA A156.2-2001, "American National Standard for Exit Devices," July 2, 2001.

2. Control of Locks, Keys, Key Cards, Combinations, and Related Equipment

- a. The licensee should establish a system to control and inventory locks, keys, and combinations, including combinations to mechanical and electronic locks, mechanical keys, key cards, key codes, and all devices used for locking purposes. The physical security plan should describe an approved lock and key control system.
- b. The lock and key control system should include the following elements, where appropriate:
 - i. A specific individual (usually a lock and key custodian) should be designated as responsible for all keys and locks, combinations, key cards, key codes, and keying records. All keys permanently assigned and not retained by the security organization should be receipted, and the key custodian should retain the original receipt.
 - ii. A record of all locks, cores, keys, and cards should be maintained and kept in a location secured by a combination lock. This lock and key control register should identify the number of keys for each lock and their location and should note whether a lock was changed, rekeyed, or rotated.
 - iii. A log of keys and key cards should be maintained that includes key identification, user, times issued and returned, dates, and other pertinent information.
 - iv. Keys, combinations, and key cards not in use should be protected adequately from theft, alteration, and measuring or reading.
 - v. Keys and combinations should be issued only to individuals whose official duties require use of the security key and who are authorized users.
 - vi. The licensee should maintain, supervise, and periodically review an authorized access list for this purpose.
 - vii. A lock and key control system should include procedures for determining whether individuals requesting keys are identified and have authorized access to all areas unlocked by the keys provided.
- c. Keys, key codes, key cards, and written combinations should not be removed from the site, except when specifically approved by the security plan.
- d. Keys should be issued daily, as required, and should be returned immediately thereafter or at the end of the duty shift.
- e. Licensees should report to the appropriate NRC regional office any incidents involving a lost, misplaced, or compromised key. The security organization should investigate the circumstances of such incidents.
- f. Only the required keys should be issued. An individual should not be given a “ring” bearing additional keys.
- g. Keys should be inventoried during change of custody (usually each shift change).
- h. Master keying should not be practiced, except when safety considerations are an overriding factor.
- i. Any lock hardware removed from service should go directly to the locksmith responsible for the system or be secured.
- k. Unused locks, cores, keys, and cards should be stored in a location secured by a combination lock.
- l. The licensee should conduct a semiannual physical inventory of those locks, cores, keys, and cards used for the protection of facilities and a bimonthly inventory of those locks used for the protection of SNM. The lock and key control register should confirm the results of the inventory.

3. Changing Locks, Keys, Key Cards, Combinations, and Related Equipment

- a. Licensees should change locks, keys, key cards, combinations, and related equipment used to control access whenever there is evidence that they may have been compromised. Determination of what constitutes possible compromise is subject to judgment; however, the security plan should describe such determination factors. Generally speaking, compromise has occurred when an unauthorized person has gained internal access to a lock and its cylinder, been informed of its combination or code, gained possession of its key, or when a lock, key, key card, or written combination or code has been removed from the site without authorization or has been lost.
- b. Locks, keys, key cards, key codes, combinations, and related equipment to which an employee had access should be changed upon termination or suspension of an employee's access authorization for any reason, including transfer. However, a licensee does not have to replace the affected locks.
- c. Locks should be immediately changed or cores replaced and an inventory conducted whenever a core, key, or card is lost or missing; the lock, core, key, or card has been compromised; or unrecorded keys or cards are found. In a mastered system, a complete remastering of the system should be conducted whenever a core, card, master or control key, or a lock is lost or compromised.
- d. Combinations should be changed before putting combination lock devices into service.
- e. The licensee should change key codes and combinations for locks or padlocks used on repositories containing SNM or used on gates or doors to material access areas, in protected and vital area perimeters, and for access to vital equipment at least once every 6 months. Keys and locks should be changed or rotated at least once every 12 months.
- f. Deadbolts securing doors should have either a 1-inch lateral throw or use multiple vertical engagements with its strike.
- g. Outswinging doors and inswinging double doors without mullions should be equipped with securely mounted astragals or guard plates.
- h. Exterior or exposed cylinders should be rim, bored auxiliary, or mortise lock mounted and should be protected with (1) a cylinder guard or (2) a substantial collar which is tapered, extends beyond the face of the cylinder, and rotates independently when torque is applied.
- i. When electronic locks are used on safety-related areas, the licensee must ensure prompt emergency ingress into the areas by essential personnel during any postulated occurrence by (1) using a combination of reliable and uninterruptable auxiliary power to the entire electrical locking system, including its controls, (2) providing the electrical locking devices, which are required to fail in the secure mode for security purposes, with secure mechanical means and associated procedures to override the devices upon loss of both primary and auxiliary power (e.g., key locks with keys held by appropriate personnel who know when and how to use them), or (3) providing periodic tests of all locking systems and mechanical overrides to confirm their operability and their capability to switch to auxiliary power.
- j. Unimpeded emergency egress should be assured from all parts of the facility, the security hardware and systems should be designed and installed so as to not degrade life safety, and such hardware and systems should conform to applicable (State/local) fire regulations and life safety codes.

D. IMPLEMENTATION

The purpose of this section is to provide information to applicants and licensees regarding the NRC staff's plans for using this draft regulatory guide. The NRC does not intend or approve any imposition or backfit in connection with its issuance.

The NRC has issued this draft guide to encourage public participation in its development. The NRC will consider all public comments received in development of the final guidance document. In some cases, applicants or licensees may propose an alternative or use a previously established acceptable alternative method for complying with specified portions of the NRC's regulations. Otherwise, the methods described in this guide will be used in evaluating compliance with the applicable regulations for license applications, license amendment applications, and amendment requests.

REGULATORY ANALYSIS

The NRC staff did not prepare a separate regulatory analysis for this regulatory guide. The regulatory analysis prepared for the amendment of 10 CFR Part 73 provides the regulatory basis for this guide and examines the costs and benefits associated with implementing the rule as described in this guide. A copy of that regulatory analysis is available for inspection and copying (for a fee) at the NRC's Public Document Room (PDR), which is located at 11555 Rockville Pike, Rockville, Maryland. The mailing address for the PDR is, USNRC PDR, Washington, DC 20555-0001. The PDR can also be reached by telephone at (301) 415-4737 or (800) 397-4209, by fax at (301) 415-3548, and by email to PDR@nrc.gov.

GLOSSARY

ANSI— American National Standards Institute - The coordinator of America's voluntary standards system. The system meets national standards needs by marshaling the competence and cooperation of commerce and industry, standards developing organizations, and public and consumer interests. ANSI specifications listed in this manual have been adopted by the United States Department of Defense (DoD).

astragal— A member fixed to, or a projection over, an edge of a door or window to cover the joint between the meeting of stiles; usually fixed to one of a pair of swinging doors to provide a seal against the passage of weather, light, noise, or smoke.

auxiliary lock— A lock installed on a door or window to supplement a previously installed primary lock. Also called a secondary lock. It can be a mortised, bored, or rim lock.

bevel (of a door)— The angle of the lock edge of the door in relation to its face. Bevel (of a latch bolt) is a term used to indicate the direction in which a latch bolt is inclined: regular bevel for doors opening in, reverse bevel for doors opening out.

BHMA— Builders Hardware Manufacturers Association - manufactures builders' hardware and publishes BHMA standards.

bolt— The part of a lock which, when actuated, is projected (or thrown) from the lock into a retaining member, such as a strike plate, to prevent a door or window from moving or opening.

case— The housing in which a lock mechanism is mounted and enclosed.

CFR— Code of Federal Regulations

core— the innermost part of a key lock where the key is accepted. The terms lock core and lock cylinder are sometimes used interchangeably but the cylinder is actually the part that surrounds the core.

cylinder— The cylindrical subassembly of a lock, including the cylinder housing, cylinder plug, tumbler mechanism, and keyway.

cylinder lock—

1. A lock in which the locking mechanism is controlled by a cylinder. A double-cylinder lock has a cylinder on both the interior and the exterior of the door.

2. A lock cylinder that has a threaded housing that screws directly into the lock case with a cam or other mechanism engaging the locking mechanism (mortise cylinder).

deadbolt lock— Any lock designed in such a manner that when the bolt is extended, it cannot be pushed back or opened with pressure against the end of the bolt.

double door— A pair of doors mounted together in a single opening.

knob— An ornamental or functional round handle on a door; may be designed to actuate, lock, or latch.

latch— Any spring or mechanical device used to secure doors and other openings. Latches can be key- or lever operated, and provide a low level of security.

latch (or latch bolt)— A beveled, spring-actuated bolt that may or may not include a deadlocking feature.

lock manipulation— The opening of the combination lock without alteration of the physical structure, or disarranging of parts. Ordinarily, manipulation would be done by moving the lock dial.

master key— A key that will operate two or more locks that can also be operated with their own change keys.

master key system— A method of keying locks that allows a single key to operate multiple locks, each of which will also operate with an individual change key. Several levels of master keying are possible:

- A single master key is one that will operate all locks of a group of locks with individual change keys.
- A grandmaster key will operate all locks of two or more master key systems.
- A great grandmaster key will operate all locks of two or more grandmaster key systems.

Master key systems are used primarily with pin tumbler locks.

mortise lock— A lock in which the case is recessed into the edge of a door in a recess specifically cut out to receive it.

mullion—

1. A movable or fixed center post used on double door openings, usually for locking purposes.
2. A vertical or horizontal bar or divider in a frame between windows, doors, or other openings.

Padlock — A detachable and portable lock.

security system — A term applied when all facets of a facility's physical security is considered (i.e., locks, safes, security containers, guards, alarms, etc.).

shackle— The movable part of a padlock that does the fastening.

strike— A metal plate designed to be secured to the door frame and accept the lock, bolt, or latch when the door is closed.

surreptitious entry— Gaining entry through a locked device or security container in such a manner that evidence of the act will not be readily discernible during normal operation of the locking unit or during inspection by a qualified person.

UL— Underwriters Laboratories, Inc. - A nonprofit national testing laboratory that tests and lists/labels various categories of equipment for safety and reliability. It also publishes standards for a wide range of products, including security products.

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Code of Federal Regulations²

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Title 10, "Energy," Part 52, "Early Site Permits; Standard Design Certifications, and Combined Licenses for Nuclear Power Plants"

Title 10, "Energy," Part 70, "Special Nuclear Material"

Title 10, "Energy," Part 73, "Physical Protection of Plants and Materials"

Title 10, "Energy," Part 73.21, "Requirements for the Protection of Safeguards Information"

Title 10, "Energy," Part 95, "Security Facility Approval and Safeguarding of National Security Information and Restricted Data"

General Services Administration Federal Specifications³

¹ Copies of American Society for Testing and Materials International (ASTM) standards may be purchased from ASTM, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, Pennsylvania 19428-2959; telephone (610) 832-9585. Purchase information is available through the ASTM Web site at <http://www.astm.org>.

² All NRC regulations listed herein are available electronically through the Electronic Reading Room on the NRC's public Web site, at <http://www.nrc.gov/reading-rm/doc-collections/cfr/>. Copies are also available for inspection or copying for a fee from the NRC's Public Document Room (PDR) at 11555 Rockville Pike, Rockville, MD; the mailing address is USNRC PDR, Washington, DC 20555; telephone (301) 415-4737 or (800) 397-4209; fax (301) 415-3548; and e-mail PDR@nrc.gov.

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MIL-DTL-43607H, "Padlock, Key Operated, High Security, Shrouded Shackle," March 10, 1998.

³

All current releases of the physical security directives and federal specifications listed herein are available electronically through the Documents section of the DoD Lock Program public website at <https://portal.navfac.navy.mil/go/locks>. Copies are also available from The DoD Lock Program at 1100 23rd Avenue, Port Hueneme, CA 93043-4370; telephone (800) 290-7607, (805) 982-1212, DSN: 551-1212; fax (805) 982-1253; and email NFESCLock-TSS@navy.mil. The physical security directives and federal specification numbers and titles are based on their current editions. These documents will typically be updated as needed and be assigned a different title and/or number that addresses the same subject. These documents are also available electronically from the websites listed below:
Department of Defense (DoD) - <http://www.dtic.mil/whs/directives/>
Department of Navy - <http://doni.daps.dla.mil/default.aspx>
Air Force - <http://www.e-publishing.af.mil/>
Army - <http://www.army.mil/usapa/epubs/index.html>
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All NUREG-series reports listed herein were published by the U.S. Nuclear Regulatory Commission. Most are available electronically through the Electronic Reading Room on the NRC's public Web site, at <http://www.nrc.gov/reading-rm/doc-collections/nuregs/>. Copies are also available for inspection or copying for a fee from the NRC's Public Document Room (PDR) at 11555 Rockville Pike, Rockville, MD; the mailing address is USNRC PDR, Washington, DC 20555; telephone (301) 415-4737 or (800) 397-4209; fax (301) 415-3548; and e-mail PDR@nrc.gov. In addition, copies are available at current rates from the U.S. Government Printing Office, P.O. Box 37082, Washington, DC 20402-9328, telephone (202) 512-1800, or from the National Technical Information Service (NTIS), at 5285 Port Royal Road, Springfield, VA 22161, online at <http://www.ntis.gov>, by telephone at (800) 553-NTIS (6847) or (703) 605-6000, or by fax at (703) 605-6900.