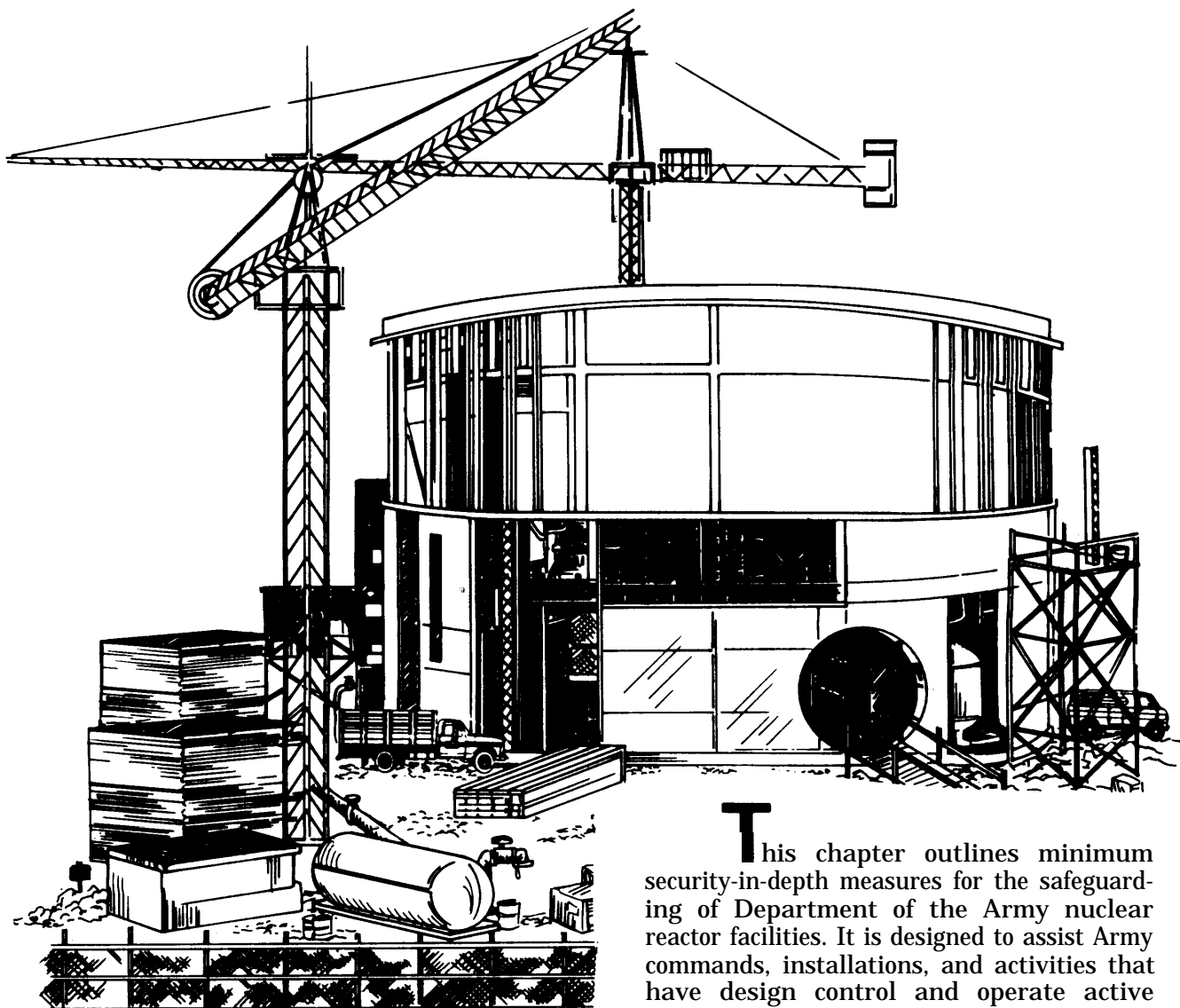


# Nuclear Reactor Facilities



**T**his chapter outlines minimum security-in-depth measures for the safeguarding of Department of the Army nuclear reactor facilities. It is designed to assist Army commands, installations, and activities that have design control and operate active nuclear reactor facilities. However, it is recognized that because of physical plant differences, not all requirements will apply.

## 15-1 Security Engineering

Security engineering begins with the selection of a site. It entails a security assessment of the construction blueprints and considers the following:

- Site isolation
- Access routes
- Security force location and response time
- Landscape
- Terrain characteristics
- Climate.

## 15-2 Responsibilities

**a. Security standards and measures** for US Army reactor facilities are provided by the Deputy Chief of Staff for Personnel. Supervision, guidance, and support for the protection of Army nuclear reactor facilities is provided by the responsible command and installation staffs. AR 385-80 outlines other Army staff agency responsibilities in protection of US Army nuclear reactor facilities.

**b. The reactor commander** must comply with all applicable physical security standards, measures, and procedures (ARs, DNA, DOD, NRC, etc.). He must develop and maintain a comprehensive security plan (chapter 3, AR 50-5).

## 15-3 Security Components For a Reactor Facility

- Guard forces (chapter 9).
- Access controls (chapter 4).
- Explosive and metal detectors (appendix D).
- Identification systems (chapter 4).
- Intrusion detection devices (chapter 7).

- Closed circuit television surveillance systems (appendix M).
- Computerized microwave system hardware and software.

## 15-4 Prevention and Protection

**a. Protect nuclear reactor facilities** from all forms of sabotage, espionage, and overt attacks.

**b. Prevent theft or diversion of special nuclear material.**

**c. Prevent unauthorized access and damage to nuclear reactor facilities.**

## 15-5 Essential Requirements

**a. Restricted areas** criteria.

☐ AR 380-20, Restricted Areas, establishes that exclusion/vital areas must be surrounded by structural barriers and have appropriate signs posted. (See chapter 4, also).

☐ Areas contain:

- Special nuclear material (SNM).
- Nuclear reactor(s).
- Control consoles.

☐ Contained within a limited area also surrounded by at least an additional structural barrier (see chapter 5, Protective Barriers).

**b. Special nuclear material storage areas.**

**(1)** If not installed in the reactor assembly, construction of walls, roof, and floor will be of one of the following

- Steel at least 1½-inches thick.
- Nonreinforced concrete at least 12 inches thick.



*Figure 86—Palm print readers help control access.*

**(2)** Access doors must meet these guidelines:

- Kept to a minimum.
- Constructed of steel at least 1 inch thick.
- Exclusive of the locking mechanism.
- Secured with at least 2 locking devices.
- Locks must consist of a three-position, manipulation-resistant, dial-type, built-in combination and any one high-security padlock with high-security hasps.

**c. Entry control** must be formalized and maintained. It must insure positive identification prior to admission and restrict access to limited and exclusion areas.

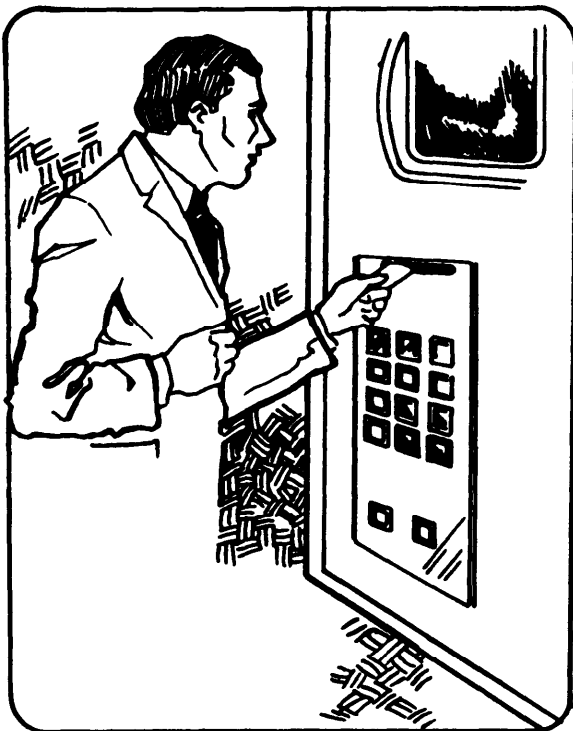
**(1)** Access control procedures and equipment are different from host installation badges (section XI, AR 606-5, and chapter 4 of this manual).

**(2)** Formal entry control rosters must be maintained.

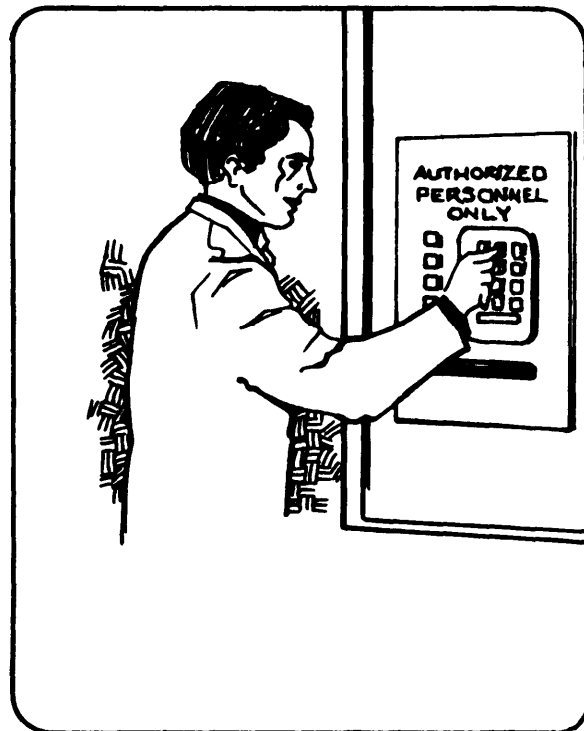
**(3)** A visitor control system must be established. The system should be periodically reviewed to determine who visits the facility most and when.

**(4)** Package, material and vehicle control must include:

- A positive system.
- Prevention of unauthorized removal of SNM—a necessity.
- Any sealed package requires a signed



*Figure 87—Electric card reader.*



*Figure 88—Example of digital code access control equipment.*

DA Form 1818, Individual Property Pass. **Authority to sign DA Form 1818** must be designated in writing. Reactor commanders may designate other items to be controlled by DA Form 1818.

● Other packages and material must be examined for unauthorized items.

(5) Vehicle entry to restricted area must be limited to mission-essential vehicles only.

(6) Types of equipment suitable for access control to a nuclear reactor facility.

- Palm print readers (figure 88)
- Signature identification devices
- Electric card readers (figure 87)
- Fingerprint readers
- Voiceprint identification

□ Digital code access control.

## 15-6 Intrusion Detection Systems

These systems were discussed at length in chapter 7. At this point we'll list their special application at nuclear facilities.

- Used in unoccupied nuclear reactor facility exclusion/vital areas.
- All alarms must sound in at least one continuously manned station.
- Station does not need to be located onsite.
- Alarm sounding must indicate where the alarm was caused and vital areas identified accordingly.



*Figure 89—Sample IDS application at a nuclear facility.*

■ Alarms must be:

- Self-checking king.
- Tamper-indicating.
- Functionally tested for operability and required performance at the beginning and end of each interval during which they are used.
- Tested not less frequently than once every 24 hours.

■ Alarm annunciator panel (monitor) location must be identified and secured.

■ Record must be maintained of each alarm (nuisance alarm, alarm check/test, tamper indication). The record must show the following information:

- ☐ Identify type of alarm
- ☐ Alarm location
- ☐ Alarm circuit

- ☐ Date and time of activation
- ☐ Details of response by security guards.

### **15-7 Lock and Control Key Control**

**a.** Each SNM storage structure entrance must be secured with at least two locking devices.

**b.** Other entrance doors or gates to the facility must be secured with a locking device that provides protection equal to MILSPEC 17802.

**c.** Custodian of keys and locks to buildings or ar33eas containing SNM must be designated

by the reactor commander, in writing. Keys must be available only to authorized individuals.

**d.** Key registers must be maintained.

**e.** During nonworking hours depositories must be available where keys are secured. Keys must not be removed from the facility and no **one** individual will have access to both keys and/or combinations of a structure containing SNM.

**f.** At the end of each operational shift or period, inventories must be made concerning key registers, key boards, and key depositories. Inventories must remain on file at least 60 days. In case of incidents involving investigations, they must be maintained on file until the investigation is terminated.

**g.** Six-month requirements:

- Key padlock rotation.
- Combinations on combination locks must be changed immediately upon compromise, transfer, or loss of individual with knowledge of combination.
- Records of the 6-month requirements must remain on file for 1 year.

## 15-8 Custodian and Inventories

□ A primary and alternate custodian must be designated in writing, concerning responsibility and accountability.

□ The primary custodian or his alternate must conduct weekly inventories.

□ Irregularity must be immediately reported to the proper authority.

□ A joint monthly inventory must be conducted by the custodian and a disinterested person.

□ Inventories must reflect the following:

- Serial numbers
- Quantity
- Weight
- Be recorded and authenticated.

## 15-9 SNM Hazard/ Inaccessibility

● If radioactive and it presents a health hazard, SNM item must be inaccessible.

● A joint inventory must be conducted by custodian and a disinterested person.

● Railway type seal (or equivalent) must be used and affixed through the high-security hasp.

● All seal serial numbers must be recorded.

● Excess seals must have the same degree of security as keys and high security locks and hasps.

● Seals must be inspected daily by custodian or alternate.

● Seal inspection results remain on file for at least 60 days, or longer, in case of an investigation.

## 15-10 Communications

**a.** Each individual controlling access into limited, exclusion or vital areas must maintain positive communications with an individual at a continuously manned location. The individual at the continuously manned location will call for assistance from other guards or the response force, if necessary.

**b.** As a minimum, one two-way voice radio communication link will be established in addition to conventional telephone service between security posts and supporting security agencies.

**c.** All communications equipment must be capable of remaining operable from independent power sources in the event of loss of primary power. Such independent power sources may be provided through standby generators or batteries.

**d.** Communications equipment will be tested for operability and performance not less than once at the beginning of each workshift.

**e.** Positive procedures must be developed to provide notice when a limited or exclusion area is in a state of duress.

**b.** Commanders must develop emergency procedures to cope with any unauthorized presence and/or activity in the limited exclusion/vital areas. As a minimum, a 15-man response force must be able to reach a security problem within 5 minutes of verified discovery. In the case of an unverified problem, the 5 minutes begin when two or three members of the force verify the problem and call for the remainder of the force. Security and response force personnel will use the force necessary to prevent any unauthorized attempts to remove special nuclear material from the facility. Commanders must make provisions for any additional response forces that may be required during times of emergency. These contingency provisions must be included as an annex to the physical security plan. Plans should be kept current and, as a minimum, tested semiannually.

**c.** Security and response forces should be armed with a mix of weapons suitable to the environment in which they will be employed.

## **15-11 Protective Lighting**

Security lighting must be provided to discourage unauthorized entry and to facilitate detection of intruders approaching or attempting to gain entry into the facilities. Perimeter and access control point lighting will be positioned to prevent blinding of sentries from glare and to avoid silhouetting or highlighting of sentries. Such lighting must be controlled by the security force. (See chapter 6 for specifics on protective lighting.)

## **15-12 Security Force**

**a.** Commanders will plan for an armed force of sufficient strength and composition to insure enforcement of established security measures and to detect unauthorized presence or activity of persons within the limited or exclusion area on a 24-hour basis.

## **15-13 Survey and Plan**

A physical security survey should be conducted by qualified physical security specialists of each facility. DA Form 2806, Physical Security Survey, should be used and copies of the survey, including reports of corrective action if required, forwarded through command channels to HQDA (DAPE-HRE), WASH DC 20310 (AR 190-13).

A physical security plan should be prepared for each nuclear reactor facility and be integrated with the plans of host military installations. Guidance and format for the physical security plan are contained in appendix F. Detailed specifications, photographs, drawings, guard orders, and sketch maps, as appropriate, should be included as annexes. Plans should be reviewed and approved at major command level.

## **15-14 Shipment Security**

**a.** Intra-installation transportation security is a command responsibility, and procedures should be developed accordingly.

**b.** All transfers of special nuclear material between security areas should be escorted by at least two people, one of whom is armed. Escorts should have radio communications capability, as appropriate.

**c.** Personnel must be trained in civil disturbance formations and small unit tactics (FM 19-15 and TC 7-1).

**d.** Security is governed by:

- AR 55-355, and Department of Transportation, Title 49, Code of Federal Regulations (CFR) when commercial camera are used.
- Nuclear Regulatory Commission (NRC), Title 10, Part 73, CFR, when SNM is transported in coordination with the NRC or when Department of Energy courier service is used.

## **15-15 Definitions**

See appendix S.