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F. Wade Hill



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

January 26, 1977

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MEMORANDUM FOR: Safeguards Working Group
FROM: L. J. Evans, Jr., Chief
Requirements Analysis Branch
SUBJECT: SAFEGUARDS UPGRADE RULE STRUCTURE AND FIRST
PERFORMANCE CAPABILITY NARRATIVE DRAFTS FOR
COMMENT

The first draft products to be circulated for comment to the Safeguards Working Group, as indicated in my January 24 memo, are the attached draft Safeguards Upgrade Rule structure and draft narrative of the first performance capability, integrated with illustrative safeguard system specifications from Part 73.

The attached Safeguard Upgrade Rule structure was drafted by Standards Development. It lays out a structure that identifies (1) the material covered; (2) general performance requirements (the design basis events) for licensees who possess such material; (3) performance capabilities and criteria; and (4) specific safeguard system requirements (which would include procedures, mechanisms, and personnel requirements). Alternative structures for the performance capabilities and system requirements sections which are being considered include: (a) a completely integrated regulation, where the specific safeguard systems would be completely integrated with the performance capabilities; and (b) a regulation with specific systems separated from performance capabilities, but referenced to the performance sections by introductory notes.

The January 24, 1977, draft narrative of a performance capability was drafted by Andy Poltorak. It is limited to the part of the first basic capability relating to personnel access control. The sections of Part 73 that directly pertain to each subsystem are indicated directly under that section. This format is an example of alternative (a) above.

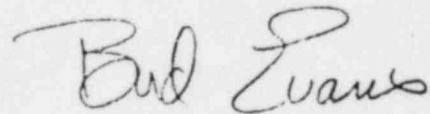
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January 26, 1977

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As stated in the earlier memo, comments on the drafts and issues discussed above, would be appreciated within three working days (February 1) because of the very restrictive schedule required to get a draft regulation to the Commission by March 30.

Thank you for your assistance.



L. J. Evans, Jr., Chief
Requirements Analysis Branch

Enclosure: 2, as stated

Addressees - Memorandum dated 1/26/77

Safeguards Upgrade Rule Working Group

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RBrightsen (SG)
EPerchonok (SG)
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MElliott (NRR)
NHaller (IE)
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EMcAlpine (SG)
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SAFEGUARDS UPGRADE RULE STRUCTURE

§ 73.50 Requirements for Physical Protection of Licensed Activities and Special Nuclear Material

In addition to any requirements of this part, each licensee who ~~is authorized to operate a fuel reprocessing plant pursuant to Part 50 of this chapter or who~~ possesses or uses uranium-235 (contained in uranium enriched to 20 percent or more in the U-235 isotope), uranium-233, or plutonium alone or in any combination in a quantity of 5,000 grams or more computed by the formula, $\text{grams} = (\text{grams contained U-235}) + 2.5 (\text{grams U-233} + \text{grams plutonium})$, including licensees who are authorized to operate a nuclear reactor pursuant to Part 50 of this chapter ^{and} who possess or store such material shall comply with the following requirements. The requirements of this section do not apply to such reactor licensees who possess such material only when it is located in the core of a nuclear reactor and/or who possess or store such material only when it is contained in irradiated fuel elements removed from the reactor core.

(a) General Performance Requirements.

(1) The licensee shall use the following design basis events to establish and maintain an onsite physical protection system and security organization which will provide protection with high assurance against successful theft of special nuclear material or industrial sabotage by both of the following:

(i) A determined violent external assault, or attack by stealth of ~~up to~~ persons with the following attributes, assistance and equipment: (A) Well-trained (including military

(training and skills) and dedicated individuals, (B) Inside assistance ~~of~~ knowledgeable individual^s who may attempt to participate in both a passive role (e.g., provide information) and an active role (e.g., facilitate entrance and exit, disable alarms and communications, participate in violent attack), (C) Suitable weapons, up to and including hand-held automatic weapons, ~~equipped with silencers and~~ having effective long range accuracy, (D) Hand-carried equipment, including explosives for use as tools of entry or otherwise destroying the facility security system integrity, and

(ii) An internal threat of ~~insider or~~ employees (in any position)

(b) Performance Capabilities and Criteria

In meeting the general performance requirements of paragraph (a) of this section, the onsite physical protection system and security organization shall include but not necessarily be limited to basic capabilities that will assure:

(1) Admission of only authorized personnel, ~~and materials~~, ^{and vehicles} into material access and vital areas, ~~including~~ ^{measures for relieving this capability will include:}

(i) Barriers designed to assure prevention or delay of penetration until appropriate response can be made,

(ii) ^{Access Controls} ~~Measures~~ to assure that only authorized vehicles, personnel, and materials are permitted access to protected areas, material access areas, and vital areas; and

(iii) Measures to assure detection of penetration or attempted penetration of protected areas, material access areas or

vital areas in sufficient time to permit appropriate response;

(2) ~~Timely detection and~~ ^{attempts at} effective response to unauthorized ^{to} ~~conditions of~~ access to special nuclear material or unauthorized activities within material access areas or vital areas including

(i) Measures to assure that special nuclear material is used, processed, and handled only by authorized personnel in an authorized manner;

(ii) Measures to assure that only those personnel whose immediate job function requires access to material access areas or vital areas can gain such access; and

(iii) Measures to assure detection of unauthorized activity or presence ^{- of what} in a protected area, material access area or vital area in sufficient time to permit an appropriate response;

(3) Removal of only authorized and confirmed materials from material access areas including:

(i) Material access areas within barriers designed to assure against unauthorized removal of material and to assure control of ingress to and egress from such areas;

(ii) Measures to assure that special nuclear material is not removable or removed from authorized areas except by authorized, controlled routes, at authorized times, in authorized quantities, and by authorized personnel;

(iii) Measures to assure that special nuclear material is used, processed, handled, and stored only in authorized

*difficult to remove this
and this is how
(b)(1)(ii)
This is the inverse
of (b)(2) so it really
is necessary.
I think so!*

areas for authorized purposes;

(4) Timely detection and effective response to breaches in the containment of special nuclear material including:

Is this DPA, fault tree, etc. if it is, is it a measure?

(i) Measures to assure the detection of unauthorized routes

by which special nuclear material could be removed from authorized locations in sufficient time to assure that such routes are not used for unauthorized removals;

(ii) Measures to assure the detection of unauthorized removal or attempted unauthorized removal of special nuclear material from authorized locations in sufficient time to permit a response that will prevent removal of the special nuclear material from the protected area; and

(iii) Measures to assure that emergency conditions cannot be used to compromise material containment systems to effect theft of the material; and

(5) Timely detection ~~and effective engagement~~ of intruders penetrating the protected area ~~including:~~

~~(i) Barriers designed to assure prevention or delay of penetration until appropriate response can be made;~~

~~(ii) Measures to assure detection of penetration or attempted penetration of the protected area in sufficient~~

time to permit a response that will permit ~~effective~~ engagement *and defeat* of the intruders;

and equipped
(iii) A security organization composed of personnel trained, ~~and~~ qualified to provide immediate and effective response to penetrations of the protected area;

(iv) Preplanned response measures to assure effective response to penetrations of the protected area; and

(v) Communications measures designed to provide for summoning of aid, if necessary, in response to a threat and for coordination of actions of response forces in counteracting a threat.

(c) Quality Assurance.

The applicant or licensee shall demonstrate the establishment and maintenance of a quality assurance program for special nuclear material safeguards systems to assure control over the activities affecting the effectiveness, reliability, and availability of such systems including demonstration that the quality assurance program will be maintained throughout the plant life to assure that any defective safeguards systems, subsystems, or components are promptly detected and corrected. The criteria for quality assurance programs set forth in Appendix B of Part 50 of this chapter, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," provides guidance regarding the essential elements of a quality assurance program.

(d) Redundancy and Diversity.

Safeguards systems shall be designed against common mode and single failures of subsystems or components that would render the system inoperable or ineffective. Subsystem or component diversity provides protection against common mode failure. For

example, an adversary cannot cut off communication with local law enforcement authority by eliminating the telephone service from the plant if there is also radio service. Subsystem or component redundancy provides protection against single failure. For example, an adversary cannot defeat an alarm system by cutting off the power if there is an emergency or back up power source for safeguards equipment.

(e) Specific Requirements

In meeting the general performance requirements of paragraph (a) of this section, and in assuring the basic capabilities of paragraph (b) of this section, the onsite physical protection system and security organization shall include but not necessarily be limited to capabilities to meet the specific requirements of paragraph (f) through (?) of this section. The Commission may authorize an applicant or licensee to provide measures for protection against theft of special nuclear material and industrial sabotage other than those required by this section if the applicant or licensee demonstrates that the overall level of system performance provides protection equivalent to that which would be provided by paragraphs (f) thru (?).

[Thru (?) would include the specific requirements now in §73.50 and §73.60.]

FIRST PERFORMANCE CAPABILITY NARRATIVE

Access Control subsystems shall provide the capabilities to detect and respond to unauthorized attempts to gain access or introduce unauthorized material into MAA_s and VAs. The licensee must provide safeguard systems that are able to detect unauthorized attempts to gain access or attempts to introduce unauthorized material in sufficient time to permit an effective response, and must be able to provide response in an effective and acceptable manner to prevent unauthorized personnel entry or introduction of material.

(Note: the following relates to the personnel access controls only, material access controls will follow later.)

The following safeguard subsystems are necessary to assure the above detection capability. To support this capability, the subsystems must perform the functions identified below. (See Section ____ for details of the response.)

A. To detect attempts to gain access by deceit, the following subsystems are needed:

- (1) Authorization Controls: The licensee shall provide authorization controls that will (a) establish accurate and updated entry lists, based on routine operational requirements and non-routine/emergency requirements; and (b) establish updated entry requirements based

on the immediate facility situation.

(4) Access to vital areas and material access areas shall be limited to individuals who are authorized access to vital equipment or special nuclear material and who require such access to perform their duties. Authorization for such individuals shall be provided by the issuance of specially coded numbered badges to control vital areas and material access areas to which access is authorized. 71.50. a. 4

(5) Admittance to a material access area shall be under the control of authorized individuals and limited to individuals who require such access to perform their duties. 71.60. a. 5

- (2) Entry Controls: The licensee shall provide entry controls to confirm the identity of persons presenting themselves for access, to assess the identity against the authorization and requirements lists, and to appropriately interface with reaction forces.

(c) Access requirements. The licensee shall control all points of personnel and vehicle access into a protected area including shipping or receiving areas, and into each vital area. Identification of personnel and vehicles shall be made and authorization shall be checked at such points. 71.50. a. 4

(5) Admittance to a material access area shall be under the control of authorized individuals. 71.60. a. 5

B. To detect attempts to gain access by stealth, the following subsystems are needed:

- (1) Barriers: The licensee shall provide barriers that will: (a) channel casual penetration attempts of unauthorized persons to MAA and VA entry controls; and (b) delay penetration attempts by unauthorized individuals sufficiently to permit the detection and response systems to function in an effective manner.

(b) *Physical barriers.* (1) The licensee shall locate vital equipment only within a vital area, which, in turn, shall be located within a protected area such that access to vital equipment requires passage through at least two physical barriers. More than one vital area may be within a single protected area.

(2) The licensee shall locate material access areas only within protected areas such that access to the material access area requires passage through at least two physical barriers. More than one material access area may be within a single protected area.

(3) The physical barrier at the perimeter of the protected area shall be separated from any other barrier designated as a physical barrier within the protected area, and the intervening space monitored or periodically checked to detect the presence of persons or vehicles so that the facility security organization can respond to suspicious activity or to the breaching of any physical barrier.

2. 5. 6. 1, 2, 3

- (2) Detection Systems: The licensee shall provide effective detection systems and procedures that will: (a) detect and annunciate in a timely manner to the reaction and response personnel unauthorized access or penetration attempts of MAAs or VAs; (b) permit the accurate and timely collection of sufficient information for assessment of adversary characteristics and intent; (c) provide for assessment of information and the resulting decisions regarding response force notification in a timely and efficient manner; and (d) permit communications with reaction and response forces in a timely manner.

Detection and requirement. Each unoccupied material access area shall be locked. Unoccupied vital areas and material access areas shall be protected by an active intrusion alarm system, and

All emergency exits shall be continuously alarmed.

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21.60.6

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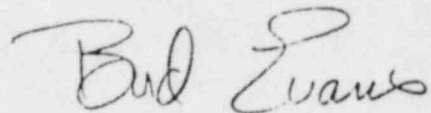
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