Response Requirements and Credit for Early Warning Systems

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NUCLEAR ENERGY INSTITUTE

Presentation Overview

- Terminology
- Methodology and Analysis
- Required Systems
  - Questions on Required Systems
- Voluntary Systems
  - Questions on Voluntary Systems

Terminology

The term early warning system (EWS) was used dating back to the mid-2010's to describe a system beyond the protected area barrier, which would be used to provide early engagement opportunities for some licensee's protective strategies and would be the point needed to effectively implement other licensee's response to ensure interdiction.

In 2016 the NRC and industry used the terms "voluntary system" and "required system" to differentiate between the two systems with different objectives.

Terminology

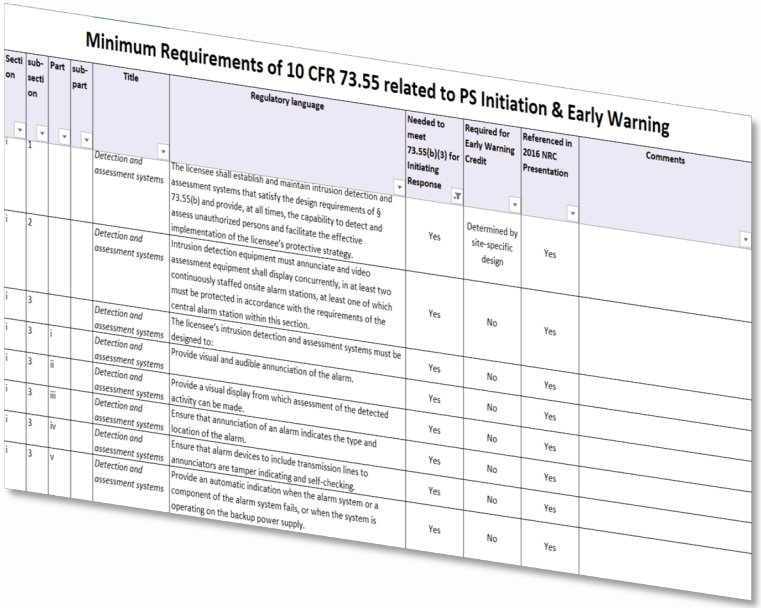
For purposes of this presentation the terms “voluntary system” and “required system” will be used to ensure a common understanding of the system being discussed, however these terms are not defined in the 10 CFR and do not adequately represent the description of each system in meeting the specific objective for the system.

The industry proposes new terms be developed that more closely represent the intend function of the systems.

Analysis of 10 CFR 73.55 related to Required and Voluntary Systems

Analysis

An excel spreadsheet (crosswalk) containing each section of 73.55 was reviewed to determine the minimum requirements as well as additional requirements a licensee may need to meet the specific objective of the site's required or voluntary system.



Minimum Requirements of 10 CFR 73.55 related to PS Initiation & Early Warning

Section	sub-section	Part	sub-part	Title	Regulatory language	Needed to meet 73.55(b)(3) for Initiating Response	Required for Early Warning Credit	Referenced in 2016 NRC Presentation	Comments
i	1			Detection and assessment systems	The licensee shall establish and maintain intrusion detection and assessment systems that satisfy the design requirements of § 73.55(b) and provide, at all times, the capability to detect and assess unauthorized persons and facilitate the effective implementation of the licensee's protective strategy.	Yes	Determined by site-specific design	Yes	
i	2			Detection and assessment systems	Intrusion detection equipment must annunciate and video assessment equipment shall display concurrently, in at least two continuously staffed onsite alarm stations, at least one of which must be protected in accordance with the requirements of the central alarm station within this section.	Yes	No	Yes	
i	3			Detection and assessment systems	The licensee's intrusion detection and assessment systems must be designed to:	Yes	No	Yes	
i	3	i		Detection and assessment systems	Provide visual and audible annunciation of the alarm.	Yes	No	Yes	
i	3	ii		Detection and assessment systems	Provide a visual display from which assessment of the detected activity can be made.	Yes	No	Yes	
i	3	iii		Detection and assessment systems	Ensure that annunciation of an alarm indicates the type and location of the alarm.	Yes	No	Yes	
i	3	iv		Detection and assessment systems	Ensure that alarm devices to include transmission lines to annunciators are tamper indicating and self-checking.	Yes	No	Yes	
i	3	v		Detection and assessment systems	Provide an automatic indication when the alarm system or a component of the alarm system fails, or when the system is operating on the backup power supply.	Yes	No	Yes	

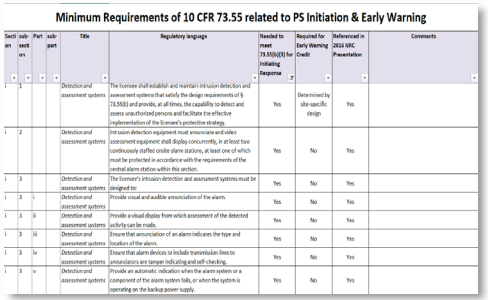
Benefits of using the Crosswalk

The crosswalk allows for:

- A clear indication of the licensee's system objective related to existing regulations
- A basis for system design and capabilities
- A tie to existing inspection criteria
- A foundation to develop a Security Plan summary
- Evaluation of when a licensing action may be required

Analysis

In 2016, the NRC proposed descriptions in the Security Plan as the method to inspect a required or voluntary system. Although the description would still be required, the crosswalk eliminates ambiguity in the description of the plan and provides direct ties to inspectable criteria based on the systems specific objective.



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NRC INSPECTION MANUAL NSIR/DSO

INSPECTION PROCEDURE 71130.05

PROTECTIVE STRATEGY EVALUATION AND PERFORMANCE EVALUATION PROGRAM

Effective Date: January 1, 2024

PROGRAM APPLICABILITY: IMC 2201 A

71130.05-01 INSPECTION OBJECTIVES

01.01 (U) To verify and assess the licensee's implementation of its protective strategy in accordance with the U.S. Nuclear Regulatory Commission (NRC)-approved security plans, regulatory requirements, and any other applicable requirements.

01.02 (U) To verify and assess the licensee's protective strategy to ensure that it has been appropriately developed, is being effectively implemented, and designed to meet the general performance objective of Title 10 of the *Code of Federal Regulations* (10 CFR) 73.55(b).

01.03 (U) To verify that the licensee has developed, implemented, and is maintaining a performance evaluation program (PEP) that describes and demonstrates assessment of the effectiveness of the onsite physical protection program and protective strategy.

01.04 (U) To evaluate the adequacy of the licensee's conduct of the annual force-on-force (FOF) exercises and assessment of performance via the critique process in order to identify and correct deficiencies of the onsite physical protection program and protective strategy.

01.05 (U) To evaluate the licensee's ability to implement a PEP that supports its assessment of the effectiveness of the onsite physical protection program and protective strategy.

01.06 (U) To verify that the licensee's physical protection program associated with this sample is designed and implemented to meet the general performance objective of 10 CFR 73.55(b).

Licensee's Physical Security Plan

Required Systems

Federal Register / Vol. 44, No. 230 / Wednesday, November 28 ,1979

10 CFR 73.55(h)(4) (1979)

(4) Upon detection of abnormal presence of activity of persons or vehicles within an isolation zone, a protected area, or a vital area, or upon evidence of intrusion into a protected area or a vital area, the facility security organization shall:

(i) Determine whether or not a threat exists,

(ii) Assess the extent of the threat, if any,

(iii) Inform local law enforcement agencies of the threat and request assistance, if necessary.

(iv) Require guards or other armed response personnel to interpose themselves between vital areas and any adversary attempting entry for purposes of industrial sabotage, and -

(v) Instruct guards or other armed response personnel to prevent or delay an act of industrial sabotage by applying a sufficient degree of force to counter that degree of force directed at them, including the use of deadly force when there is a reasonable belief it is necessary in self-defense or in the defense of others.

10 CFR 73.55(b)

(3) The physical protection program must be designed to prevent significant core damage and spent fuel sabotage. Specifically, the program must:

(i) Ensure that the capabilities to detect, assess, interdict, and neutralize threats up to and including the design basis threat of radiological sabotage as stated in § 73.1, are maintained at all times.

(ii) Provide defense-in-depth through the integration of systems, technologies, programs, equipment, supporting processes, and implementing procedures as needed to ensure the effectiveness of the physical protection program.

Required systems are designed to ensure one specific aspect of 10 CFR 73.55(b)(3) can be achieved. Specifically, the ability to interdict.

Required system vs. Protected Area

Objectives	Required System	Protected Area Barrier
Access Control		X
Detection	X	X
Assessment	X*	X
Initiate response	X	X
Storage for SNM		X
Unescorted Access		X
First barrier for Vital Area		X

** May be needed based on site specific design*

Minimum Requirements of a “Required System”

The minimum requirements for a required system are appropriate sections of:

- 73.55(i), Detection and assessment systems
- 73.55(n), Maintenance, testing, and calibration, and
- 73.55(o), Compensatory measures

Additional section of 10 CFR 73.55 may be applicable depending on the site capability to meet the specific objective of interdiction.

Additional Requirements as Applicable

In addition to 73.55(i), 73.55(n), and 73.55(o), licensees may need to meet additional sections of 10 CFR 73.55 depending on the site's capability to detect, assess, and interdict. These sections may include, as applicable:

- 73.55(e)(1)-(4), Physical barriers
- 73.55(e)(6), Owner controlled area
- 73.55(e)(7), Isolation zone
- 73.55(g), Access controls
- 73.55(h), Search programs

Alternative Measures and Exemptions

In certain circumstances a licensee may need a licensing action to meet the limited scope objective. In these instances, justification should be provided for NRC approval, as to how the system meets or exceeds the specific performance objective of which it was designed for. Possible licensing actions include:

- 73.55(r), Alternative measures
- 73.5, Specific exemptions

Documentation of a “Required System”

The crosswalk provides the appropriate sections of the existing 10 CFR 73.55 requirements the system is designed to meet. This crosswalk is essential for the licensee and regulator to have a common understanding of the design basis and intended capabilities of the required system.

This crosswalk can be used to develop a description in the security plan consistent with design and intended capabilities of the system. Inspection criteria is already available for each section of the code credited. NEI 03-12, Revision 8, will contain a section to document the description and design requirements of the site’s required system.

Questions?

Voluntary Systems

Minimum Requirements of a “Voluntary System”

Unlike a required system, voluntary systems are not needed to meet the performance objective of 73.55 and therefore have no minimum requirements, however, in addition to the specific sections the licensee identifies based on the sites enhancement, the following sections as applicable would apply to receive credit during inspections:

- 73.55(n), Maintenance, testing, and calibration, and
- 73.55(o), Compensatory measures

73.55(n) and 73.55(o) provides reasonable assurance that the system is adequately maintained and reliable.

Example of Voluntary System

In this example a licensee selected certain aspects that meet the design and objectives for the system that was installed.

These 73.55(i) requirements combined with applicable sections of 73.55(n) and (o) comprise the requirements of the licensee voluntary system to be inspected and therefore given credit during inspections.

Licensee's Requirements of Early Warning System

Section	sub-section	Part	sub-part	Title	Regulatory language	Licensee's Early Warning requirements	Comments
i	1			*Detection and assessment systems*	The licensee shall establish and maintain intrusion detection and assessment systems that satisfy the design requirements of § 73.55(b) and provide, at all times, the capability to detect and assess unauthorized persons and facilitate the effective implementation of the licensee's protective strategy.	No	
i	2			*Detection and assessment systems*	Intrusion detection equipment must annunciate and video assessment equipment shall display concurrently, in at least two continuously staffed onsite alarm stations, at least one of which must be protected in accordance with the requirements of the central alarm station within this section.	No	Alarms received at a single BRE
i	3			*Detection and assessment systems*	The licensee's intrusion detection and assessment systems must be designed to:	N/A	
i	3	i		*Detection and assessment systems*	Provide visual and audible annunciation of the alarm.	Yes	
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i	3	v		*Detection and assessment systems*	Provide an automatic indication when the alarm system or a component of the alarm system fails, or when the system is operating on the backup power supply.	No	
i	3	vi		*Detection and assessment systems*	Support the initiation of a timely response in accordance with the security plans, licensee protective strategy, and associated implementing procedures.	No	

Example of Voluntary System

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Section	sub-section	Part	sub-part	Title	Regulatory language	Licensee's Early Warning requirements	Comments
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i	3	vi		*Detection and assessment systems*	Support the initiation of a timely response in accordance with the security plans, licensee protective strategy, and associated implementing procedures.	No	

Documentation of a “Voluntary System”

The crosswalk used in the previous slide provides the appropriate sections of the existing 10 CFR 73.55 requirements the system is designed to meet. This crosswalk is essential for the licensee and regulator to have a common understanding of the design basis and intended capabilities of a voluntary system.

This crosswalk can be used to develop a description in the security plan consistent with design and intended capabilities of the system. Inspection criteria is already available for each section of the code credited. NEI 03-12, Revision 8, will contain a section to document the description and design requirements of the site’s voluntary system.

Documentation of a “Voluntary System”

There could be cases where the code does not provide a requirement applicable to system design.

Example: Alarms are received at a static post other than an alarm station.

In this case the licensee would describe the design feature in the security plan without citing a specific section of 10 CFR 73.55.

Questions?

