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Safeguards Performance Assessment Program

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NOTICE

EXECUTIVE SUMMARY

In 1999 the Nuclear Regulatory Commission directed a comprehensive review of 10 CFR 73.55. It was expected that regulations would be modified to require power reactor licensees to identify target sets, develop protective strategies and exercise these strategies on a periodic basis. The Commission also authorized a pilot program to test these modifications.

This guide provides an interim assessment program that supports the modifications envisioned for 10 CFR 73.55. Using this guide, over a three-year cycle, a plant will be able to demonstrate that their Physical Security Plan protective strategy is effective for protection of public health and safety.

Licensee participation in this interim program is voluntary.

TABLE OF CONTENTS

APPENDIX

SAFEGUARDS PERFORMANCE ASSESSMENT PROGRAM

1 INTRODUCTION

In 1999 the Nuclear Regulatory Commission (NRC) directed its staff to develop a regulation requiring power-reactor licensees to develop protective strategies by identifying target sets of equipment that serve as risk-significant factors for reactor safety in order to maintain safe operation or shutdown of the reactor and exercise these strategies periodically. To achieve this objective, the NRC staff conducted a review of regulatory requirements and provided the Commission with three options:

1) develop an exercise rule and, upon its publication as a final rule, begin a comprehensive review of 10 CFR 73.55 and associated security regulations;
2) develop an exercise rule and, upon its publication as a proposed rule, begin a comprehensive review of 10 CFR 73.55 and associated security regulations; and
3) begin a comprehensive review of 10 CFR 73.55, including exercise requirements, and associated security regulations.

In November 1999, the Commission approved a comprehensive review of 10 CFR 73.55, which is potentially the most effective approach. This review and subsequent rulemaking should take about 3 years to complete. In the interim, the Commission directed the NRC staff to consider a shift from NRC directed performance-assessment exercises to an industry program which benefits from self-assessment of performance and is independently evaluated by the NRC. This shift was contingent on developing a process acceptable to both the industry and the NRC staff. This interim Safeguards Performance Assessment (SPA) program has been developed to address that need.

The Safeguards Performance Assessment program provides an acceptable approach for a licensee to evaluate its protective strategy. The guidance outlined below provides a process by which a licensee can demonstrate that programs are effective for the protection of the public health and safety. A series of evaluated drills and evaluated exercises will be used to evaluate the performance of the protective strategy against attempts at radiological sabotage.

Industry objectives include a process that allows licensees to focus resources in those areas that most directly support protection of public health and safety. This program will also ensure that these resources are available, operable and adequate by a series of evaluated drills and evaluated exercises. Performance insights and full plant response will be considered in developing and evaluating the protective strategy.

The Safeguards Performance Assessment program is expected to last three years. This document provides an evaluation program for industry use.

2 PURPOSE

This guide provides an interim Safeguards Performance Assessment program with tools for a licensee-developed program to assess the effectiveness of its protective strategy. A standardized Safeguards Performance Assessment program approach will use evaluated drills and exercises to assess a licensee's ability to protect identified target sets to prevent significant core damage.

This program provides a uniform basis for licensee-developed target sets which must be protected to prevent significant core damage. The program includes integration of licensee actions that mitigate the consequences of a determined malevolent event. Using these guidelines, licensees will perform self-assessments to evaluate their ability to protect the plant against the Design Basis Threat described in 10 CFR § 73.1(a). In drill and exercise scenarios, postulated adversaries who are attempting to commit radiological sabotage shall be credited with having equipment, capabilities and characteristics as described in the OSRE Adversary Characteristics (OAC).

3 SCOPE

The Safeguards Performance Assessment program is designed to test each key program element of the licensee's protective strategy over a three-year period, with the licensee conducting an evaluated exercise on a triennial basis. Exercises shall be structured in a manner to ensure that they provide a credible, realistic, thorough test of the protective strategy. The evaluated exercise shall consist of a sufficient number of separate scenarios to ensure that key program elements have been satisfied. The licensee shall provide measures to assure the integrity of the exercise process. Licensee evaluated exercises shall be demonstrated with the number of security force personnel committed to in the approved security plan.

The NRC will observe drills as opportunity permits. However, the NRC is expected to observe evaluated exercises conducted on a triennial basis to meet the requirements of this document. Licensees will coordinate the scheduling of the triennial exercise with the NRC at least 6 months in advance.

Training deficiencies will be corrected through the licensee's ongoing training program. Tracking deficiencies in key program elements will be accomplished through the licensee's Corrective Action Program. Licensees shall develop and maintain records of evaluated drill and evaluated exercise results as described in Section 9.5.

If operator actions are required to credit placing mitigation equipment in service or for recovery actions, such credit should be given only if the following criteria are met:

- sufficient time is available to implement these actions;
- environmental conditions allow access where needed;
- approved procedures or guidelines exist;
- training is conducted on the existing procedures or guidelines; and

- equipment needed to complete these actions is available and ready for use.

Other features of the safeguards defense-in-depth program, such as access authorization, behavioral observation, fitness-for-duty and perimeter intrusion detection systems are adequately addressed in the NRC Baseline Inspection Program or a Security Performance Indicator and are not included in this Safeguards Performance Assessment program .

4 DEFINITIONS

Corrective Action Program (CAP)—A licensee program used to identify nonconformances and programmatic weaknesses, including ascertaining causes and actions necessary to correct and prevent recurrence.

Drill—Activity aimed at perfecting or evaluating the skill, knowledge and capability of an individual or group. Drills, such as a tabletop or force-on-force, may also be used to validate the protective strategy.

Evaluated Drill—A structured drill that evaluates at least one key element of the protective strategy capability. The elements to be evaluated must be clearly identified before conducting the drill.

Evaluated Exercise—A force-on-force exercise used to evaluate the plant's integrated response to a contingency event or defense against element(s) of the spectrum of the OAC. The exercise is evaluated against a set of key elements to determine if required capabilities and training objectives have been met.

Exercise—An integrated force-on-force response aimed at perfecting or demonstrating the licensee's capability to defend against the OAC or components of the OAC. An exercise includes multiple force-on-force drills with a mock adversary force.

Integrated Response—The planned, organized and controlled actions of plant employees across disciplines to minimize or mitigate a threat and/or prevent adversarial actions that could result in a radiological release that would endanger public health and safety. The plant response may be augmented, within committed time frames, by law enforcement, other government agencies having jurisdiction and off-site licensee resources.

Key Elements—Those elements of the plant protective strategy needed to protect against radiological sabotage.

OSRE Adversary Characteristics (OAC)—The specific equipment, capabilities and characteristics of a malevolent team of adversaries considered in developing the protective strategy. The adversary force capabilities of the Design Basis Threat are provided in the OAC which is Supplement A to IP 81110 dated September 8, 2000. The OAC is protected as Safeguards Information.

Other Elements—Those elements of the plant protective strategy, other than key elements, which support protection against radiological sabotage.

Protective strategy—The plan developed by a licensee that is used to implement the intended actions of the organization's members in response to attempts to commit radiological sabotage.

Structures, Systems and Components (SSCs)—The assemblage of equipment and buildings such as valves, pumps, switches, electrical power sources, containment and buildings, piping and electrical busses that could make up the Target Set.

Tabletop Drill—A drill conducted using appropriate training aids such as site structure models or drawings aimed at perfecting skills and knowledge pertaining to tactical response strategy.

Target Set—A licensee defined grouping of SSCs that are developed based on a safety focused approach considering design, operational capabilities, security characteristics, and physical layout of the facility such that all elements must be rendered nonfunctional to achieve significant core damage.

Timeline—A mechanism for marking elapsed time from initiation of an event through one or more points or activities. For example, the time for an adversary's progress from perimeter alarm until neutralized or to a specific target destruction. Timelines are also used for the armed response force to ensure interdiction is possible.

5 SAFEGUARDS PERFORMANCE ASSESSMENT PROGRAM

The same set of performance objectives used to develop target sets and the protective strategy provide a basis for evaluating a licensee's protective strategy. The two overarching program criteria are provided in 10 CFR 73.55(a), Design Basis Threat and protection of public health and safety.

Preventing significant core damage provides an acceptable method to prevent a significant radiological release that would endanger public health and safety. This is consistent with the approach used in other areas of plant design. Analysis identifies target sets that, if all targets within a target set are destroyed, could lead to significant core damage. Using these target sets provides a basis for evaluating the protective strategy and assessing the significance of issues based on the risk involved. If an entire target set is compromised, thorough analysis of the protective strategy shall be conducted to identify and correct any weaknesses that may exist.

The Safeguards Performance Assessment program assumes a plantwide approach in response to attempts at radiological sabotage. Full plant capability and personnel actions may be included in this response strategy. An adequate response strategy is demonstrated if the adversary is unable to disable all targets within the target set for the time necessary to cause significant core damage. For example, if a target set contains six components that must be compromised and an adversary was able to eliminate five of those components before they were contained or neutralized, then the response strategy would be considered successful to protect the public. Integrated licensee response may be

considered in determining if significant core damage would result. Analysis may show that other contingency measures would prevent significant core damage. However, identified deficiencies should be entered into the CAP and corrected, commensurate with their evaluated risk significance.

Periodic evaluated drills and exercises are used to determine the effectiveness of the protective strategy. The following key program elements of the protective strategy will be used in developing evaluated drills or evaluated exercises:

- Sufficient number of security personnel
- Responding within appropriate timelines
- To protected positions
- With appropriate armament
- Provide Target Set Protection
- Integrated Response

To be an effective evaluation tool, each evaluated drill must include at least one key program element. An evaluated exercise shall include all six key program elements.

Other program elements, which may contribute to the successful demonstration of a key element, shall be evaluated over the three-year review cycle. These include:

- Coordination and Planning
- Command and Control
- Communications
- Alarm Station Operations
- Individual Responder Tactics
- Team Response Tactics
- Use of Deadly Force
- Alarm Assessment and Intrusion Detection Equipment
- Weapons Handling and Proficiency
- Controller Participation
- Post Drill/Exercise Briefing/Critiques
- Defensive Positions
- Deployment of Responders and Equipment
- Training

Licensees will develop a program of evaluated drills and exercises that provide for assessment of program elements over a three-year period. The program of integrated security drills and exercises may include tabletop drills, limited scope (no separate drill players and on-duty shift) shift drills or exercises.

The adversary force capabilities of the Design Basis Threat are used to develop scenarios for the drills and exercises. A range of adversary force capabilities should be used in developing scenarios. Although not required in every evaluated drill, the capabilities described in the OAC will be exercised when considering the entire set of evaluated drills and exercises conducted during a three-year cycle.

For each evaluated drill, the licensee will develop, in advance, a written scenario to test some portion of the licensee's capability to defend against attempted radiological sabotage by adversaries with characteristics defined in the OAC. Each scenario must clearly identify those key elements of the protective strategy being evaluated and the capabilities of the adversaries being used in that drill.

Each licensee shall provide for an evaluation of the plant's response during the drills and exercises, and ensure that appropriate actions are taken to address areas where key or other program elements are not met. Assessment of the actions needed and follow-up should be through use of the corrective action program.

Since security contingency measures can create barriers or delay to plant personnel responsible for responding to plant events, a safety versus safeguards evaluation of security response plans must be conducted.

Drills conducted for other purposes, such as initial training or familiarization, shall not be included as part of the Safeguards Performance Assessment program.

6 TARGET SET DEVELOPMENT

Protective strategies have shifted to a focus on protection of target sets. Use of target sets provides a more meaningful tool for evaluating the consequences of attempted radiological sabotage. Clearly defined target sets are key to the evaluation process, providing a basis for determining the effectiveness of the protective strategy.

Target sets are developed based on a safety-focused approach considering design, operational capabilities and physical layout of the facility. Target set development is independent of the threat. Each target set is developed to provide assurance that, if any element is protected, public health and safety will not be endangered by a significant radiological release.

For the Safeguards Performance Assessment program, licensees may develop target sets using the process similar to that described in Appendix A, some other similar process using PRA insights or use the target sets that have already been developed and reviewed as part of the NRC oversight process.

Some licensees may want to update target sets to take advantage of full plant response capabilities. For example, the fact that procedures call for a plant to be shut down when a malevolent act is confirmed could be considered in target set development.

7 ADVERSARY CHARACTERISTICS

The Design Basis Threat described in 10 CFR 73.1 provides a general description of the adversary. To develop and evaluate protective strategies, precise definition of key factors such as the adversaries' physical capabilities and skills, armament, equipment and understanding of plant systems and operations is needed. These adversary force capabilities are defined in the OAC.

Scenarios are developed to test up to the full range of adversary force capabilities. Adversary capability for some scenarios may be less than the full capabilities, depending on the program elements being tested. A variety of scenarios shall be used to ensure that the full range of adversary characteristics is tested over a three-year period. A combination of the target sets and adversary force capabilities provides the basis for evaluating the effectiveness of elements of the protective strategy consistent with the OAC.

8 PROTECTIVE STRATEGY

Because each nuclear plant is unique, it is not possible to develop a generic protective strategy. The licensee develops target sets based on plant design and physical layout. The OAC provides specific adversary force capabilities that serve as the basis for determining adversary timelines. Using this information, licensees will develop a protective strategy to protect target sets by ensuring that response timelines place an adequate number of responders that will respond to protected positions, in time, with appropriate equipment to defend target sets. One goal of this guide is to develop a standardized effectiveness evaluation. To do this, certain elements of the response strategy must be defined and available for evaluation. These include:

- Establish a timeline for adversaries carrying their required weapons, explosives and equipment to reach and destroy each of the targets in a target set. The composite timeline should consider times to:
  - breach various points along the Protected Area perimeter to entrances to buildings and structures that contain parts of the assemblage of SSCs that make up a target set,
  - defeat the barrier at that entrance and along the paths to the equipment,
  - destroy that equipment, and
  - reach the next component of a target set.
- Determine the timelines for armed responders from deployment points to response positions where they can engage adversaries during the attack. If responders were required to obtain equipment in different locations or complete other activities before responding, this shall be factored into the timelines.
- Conduct a safety vs. safeguards evaluation of all defensive strategies to ensure that the strategy is in harmony with the remainder of the licensee's efforts to protect the health and safety of the public.

9 EVALUATED DRILLS AND EXERCISES

This section provides a process to develop, conduct, and assess drills and exercises used in support of the Safeguards Performance Assessment program. Only evaluated drills and evaluated exercises that directly support the Safeguards Performance Assessment program are discussed. Drills used for other purposes, such as training new responders, shall not be included as part of the Safeguards Performance Assessment program.

The evaluated drill and exercise program is used by the licensee as a tool for evaluation of key elements of its protective strategy and to assess the effectiveness of the protective strategy. To support this evaluation goal, a standard approach is provided for developing, planning, conducting, and assessing drills and exercises.

Personnel and plant safety must be the top priority throughout the planning and execution phase of a drill or exercise. Detailed planning is required to ensure that there is no inadvertent use of live weapons and that drill participants are made aware of licensee safety requirements and the existence of any unsafe conditions.

9.1 SCENARIO DEVELOPMENT

Each licensee shall develop scenarios prior to each evaluated drill or exercise that evaluate key elements of the licensee's protective strategy. These scenarios shall be credible and realistic to be representative of adversary force capabilities with respect to target set selection and attack strategies. These scenarios shall challenge the licensee's protective strategy by simulating various adversary assaults to include proper response equipment and integrated licensee response, as appropriate. The scenarios will clearly identify the key elements that are being challenged and the evaluation standards used for key elements.

An acceptable method for developing scenarios can be found in Appendix B of this document.

9.2 PLANNING

The first step in planning and coordinating is to determine the objective of the drill or exercise. The purpose of the drill could be continuing training, performance evaluation or validation of a new strategy. Realism and credibility are critical with respect to adversary target selection, tactics, equipment, physical ability, response tactics, positioning, equipment and barriers. Proper planning and coordination of drills and exercises are required to ensure adequate resources and personnel are available to safely conduct drills or exercises.

Planning elements that should be considered are included in Appendix B of this document.

9.3 PREPARATION FOR DRILLS AND EXERCISES

Prior to initiation of a drill or exercise, briefings must be conducted in the following areas:

- Safety briefings before drills or exercises. Ensure that necessary safety equipment is issued. Conduct walk-downs of drill area if necessary. Identify conditions under which the drill may be terminated due to safety concerns.
- Verify that drill participants are briefed on their responsibilities before conducting drills or exercises.
- Communicate with plant operations or the control room before initiating the drill, if the drill will involve plant activities
- If an on-duty shift and drill players are used during a drill or exercise, ensure that all participants understand their responsibilities for drill participation.

In force-on-force drills, the mock adversary force should be provided adequate assistance and time to prepare its approach to the selected scenario. Adversaries should understand the drill objectives and be provided a reasonable degree of freedom in developing their tactics.

9.4 CONDUCT OF AN EVALUATED DRILL OR EVALUATED EXERCISE

The evaluated drill or evaluated exercise shall be conducted in a realistic and challenging manner, with adequate considerations for personnel safety. In force-on-force drills or exercises, the adversary and their controllers should be provided adequate flexibility to meet the overall drill or exercise objectives.

9.5 ASSESSMENT OF AN EVALUATED DRILL OR EVALUATED EXERCISE

Critiques should be used both as a tool for training and as a means of program assessment. A critique shall evaluate and document the licensee's performance in each of the program elements identified in the scenario. Critiques of evaluated exercises shall be formal and address evaluated elements, identifying areas of demonstrated quality as well as areas needing improvement. Critiques of limited scope drills or tabletop drills will normally be less formal and include only areas covered by the drill.

Post evaluated drill or evaluated exercise critiques shall normally include input from each evaluator, controller and key players to ensure lessons learned can be incorporated into the final drill or exercise report. The Lead Controller, or designee, will normally facilitate the post drill or exercise critique.

Only operator actions listed in a target set shall be used in determining whether an entire target set was compromised. If credit is taken for operator actions, careful evaluation must be conducted to ensure actions credited for mitigation or recovery are achievable under the postulated scenario conditions. Items to consider include:

- the time available to take the action;
- procedures and guidelines that are available;
- operator experience and training;
- availability of needed equipment; and
- environmental conditions where the action is to be taken, including any unconstrained adversary activity.

Examples of information normally found on critique forms are located in Appendix B.

Post drill or exercise critiques should be formally documented using the site's format so that evaluated elements of performance are measured and appropriately assessed. The initial draft report should be reviewed by the principles participating in the drill and comments gathered through a cross-review process. At a minimum, documented evaluated drill or evaluated exercise reports shall identify areas needing improvement and areas of demonstrated quality. Licensees will use the lessons learned in these reports for appropriate changes to response strategy, training and the development of future drills and exercises. The final evaluated drill or evaluated exercise report will be retained for three years.

9.6 FREQUENCY

Evaluated drills should be performed with sufficient regularity to demonstrate proficiency for key security personnel. A minimum of one evaluated drill shall be conducted annually for each shift. An evaluated exercise shall be conducted triennially. A maximum allowable extension of the time interval of up to 25 percent is acceptable. The combined time interval of three consecutive, related drills or exercises will not exceed 3.25 times the interval.

10 CORRECTIVE ACTION

Deficiencies identified during an evaluated drill or exercise will be handled consistent with the site's corrective action, self-assessment or training program. Training deficiencies are normally addressed as part of the training program. Key element deficiencies will be included in a corrective action program.

APPENDIX A

Target Set Development Process

A group of site-specific target sets provides a tool for developing a protective strategy. Target sets also provide valuable insights for use in evaluating drills and exercises. Target set development considers the consequences of groups of structures, systems, and components not being functional. The consequences are not dependent on whether the failure was caused by a broken component or attempted radiological sabotage. Target set analysis may take advantage of risk insights developed from comprehensive plant reviews.

1 EXPERT PANEL

The target set development process starts with an expert panel to identify the necessary structures, systems, and components (SSCs) to be protected. The expert panel shall include members with expertise in security and key areas of plant design and operations. Other disciplines such as systems engineering, maintenance, regulatory affairs, licensing, emergency response planning and training shall be considered where their expertise can aid in target set development or revision. Some members of the panel should be able to view the target sets from the adversary view.

The analytical approach taken by the expert panel will also influence the membership. For example, several facilities have taken advantage of insights from the probabilistic risk analysis (PRA) used for plant IPEE and IPEEE evaluations. If this approach is used, a PRA expert would be needed on the panel.

2 PERFORMANCE CRITERIA

The performance criteria used in developing a site's target sets should be fully documented as part of the process. These criteria will provide for some margin to protection of public health and safety by preventing core damage that would result in a significant radiological release. Some of these criteria will be provided to the expert panel as a starting point for their work. For example, preventing significant core damage is a key performance criteria to be used in the Safeguards Performance Assessment program. The panel may develop other criteria as part of the project.

Examples of the types of items to be considered in developing site performance criteria used at the site are:

- Loss of offsite power may occur concurrent with attempts at radiological sabotage.
- Different divisions or trains of redundant systems are considered separately when they are located in different rooms or geographical areas.

- Cable runs in trays and conduit need not be considered if identification is not reasonable in a short period of time.
- All site systems are available. Random failures do not occur simultaneously with an act of radiological sabotage.
- Alternate equipment configuration is available within the time frame that it would be needed to function to mitigate conditions.

NUREG-1178, "*Vital Equipment/Area Guidelines Study*" provides insights on things to consider in developing target set performance criteria. It was used by NRC staff in review of licensee target sets during evaluations. Since NUREG 1178 focuses on vital areas, not all the assumptions are applicable when considering elements of target sets. For example, items outside vital areas but inside the protected area and under the licensee's control can be considered in developing target sets.

3 TARGET IDENTIFICATION

This step produces a list of structures systems and components that support the plant's ability to meet the selected performance criteria. The expert panel should first identify the radiological sources that could lead to a radioactivity release that exceeds limits. The reactor core will always meet the criteria. Consider both operating and shutdown conditions. Analysis for other areas, such as the spent fuel pool, needs to determine whether there is a sufficient radioactivity release to exceed limits. Next the barriers to release should be identified. For example, for the reactor core there is fuel cladding, reactor coolant system piping, and containment integrity.

The expert panel develops a list of SSCs that affect barrier integrity or impact other performance indicators. Examples of SSCs to consider are:

- Reactor coolant inventory sources (tanks, pools, etc.)
- Power sources (electrical, steam, etc.)
- Physical barriers (containment, system piping, etc.)
- Equipment (pumps, fans, etc.)
- Key plant personnel (credit for personnel action)
- Sufficient equipment that provides the capability to perform the functions that are necessary to achieve and maintain hot shutdown for a minimum of eight (8) hours.

The objective is to identify all SSCs that can be used to mitigate the impact of loss of other equipment. Areas considered in developing this list include:

- The plant's normal and abnormal operating procedures and processes. What equipment would be used to mitigate accident conditions and where is it located?
- The electrical support requirements for mitigating equipment, including AC, DC, and instrument control power.

- The non-electrical support requirements for mitigating equipment, including equipment and room cooling, water sources, vulnerable/remote pipe sections, etc. and their locations.
- Emergency planning insight into plant vulnerabilities, potential mitigating activities and the range of recovery actions that could be reasonably assumed to occur under conditions associated with postulated events.
- Operating alternatives for degraded plant conditions.
- Accident sequences and potential mitigating activities and the time frames that would be required for significant core damage to occur.
- For potential mitigating activities, provide security coordination and interface with operations.
- Contingency plans for alternate equipment lineups and describe potential mitigating activities.
- Consider using the existing list of SSCs and remaining capabilities currently used in the performance program in the reactor safety.

4 TARGET SET ANALYSIS

The targets identified from the previous step shall be used to identify sets of multiple targets whose concurrent damage could prevent fulfilling a key requirement, such as providing core cooling. The Expert Panel organizes targets within logical target sets which show the relationships and dependencies between systems. This may be a listing of targets in a prioritized logical format or the targets may be organized in a Sabotage Fault Tree.

A Sabotage Fault Tree is a graphical, Boolean logic diagram, which identifies the combinations of target sabotage events that would lead to significant core damage. The Sabotage Fault Tree is relatively simple and has been developed from a site-specific PRA.

The targets are organized into common elements such as location, power source, and subsystem dependencies between the SSCs. When evaluating a specific system or component, the team should consider an adversary's ability to damage a system from remote geographical locations. For example, the Emergency Diesel Generators could be disabled not only directly but also by destroying a support system: cooling water, fuel supply, control panels/wiring, or the exhaust system. This consideration of dependencies should be applied to each potential target. Other criteria to consider include ease of access, the degree of probability for success, and the value of the target to plant shutdown.

An example of four targets organized into 10 target sets is shown in table A-1.

In this example there are four typical SSCs that will prevent significant core damage. All four of the SSCs must be rendered non-functional to complete the target set. Target set one (column 1) demonstrates a successful target set because the power is removed from three of the four SSCs and the fourth is made non-functional by disabling the controls.

A successful security strategy would be to prevent the adversaries from disabling at least one of the SSCs within each target set so it will remain available to cool the core.

This example does not take into account any subsystem dependence.

Structures, Sys. & Comps.	1	2	3	4	5	6	7	8	9	10
High Pressure supply										
Power					X			X		
Control	X	X				X				
Suction				X						X
Discharge			X						X	
Location							X			
Emergency HP supply										
Power	X				X			X		
Control		X				X				
Suction				X						X
Discharge			X						X	
Location							X			
Low pressure supply										
Power	X									
Control				X		X				
Suction		X			X			X		X
Discharge			X							
Location							X		X	
Alternate LP supply										
Power	X				X					
Control				X		X				
Suction		X						X		X
Discharge			X							
Location							X		X	

Table A-1 Sample Target Sets

5 PROTECTIVE STRATEGY SUPPORT

The matrix of target sets can be quite large and needs to be further refined to support a reasonable number of target sets to support the protective strategy. Physical location and access need to be considered in this phase. If in the example shown above, the suction and discharge were in the same location as the equipment then the three could be combined as one element. Viewing the target sets from an adversary's vantage point can help in this refinement.

APPENDIX B

Evaluated Drill and Exercise Scenario Development

The effectiveness of a drill or exercise as an evaluation tool is highly dependent on the scenario development phase. The program elements to be tested must be identified and the proposed scenario reviewed to ensure it adequately challenges the selected program elements. With a properly planned scenario, the critique and evaluation can provide meaningful insights into the effectiveness of the protective strategy.

Scenarios can be developed for a variety of environmental conditions such as inclement weather or darkness. Plant conditions may range from operating at power to refueling or other major maintenance activities, but drills should only be run when plant conditions are stable. Drills can also be conducted during various conditions of security readiness such as day, night or backshifts. Some scenarios should be run involving less than full adversary characteristics. Some examples include:

- unarmed intruder with ecological or media exposure goals;
- a single individual with simple tools, weapons and improvised explosive devices and no special adversary skills;
- threats of adversary actions such as bomb threats or attack; or
- a disgruntled employee who may attempt workplace violence.

1 PLANNING ELEMENTS THAT SHOULD BE CONSIDERED:

During the planning phase of a specific drill or exercise, key elements to be evaluated must first be identified, as well as the evaluation standards to be used. Tab 1 provides factors to consider in developing evaluation standards for a drill or exercise. Planning details will be dictated by whether the primary purpose is to provide training, evaluation or testing.

The following are planning elements that should be considered depending on the nature of the drill or exercise:

- safety and development of a safety briefing,
- adequate simulation equipment,
- communications support for drill participants,
- identifying security plan commitments to be met during the drill,
- defining drill participant roles,
- advance notifications of required personnel,
- development of evaluation standards,
- target sets,
- adversary characteristics description,
- adversary entry point, and
- adversary tactics.

In planning the evaluated drill or exercise involving force-on-force, personnel must be specifically identified to fill each of the following roles needed to support the selected scenario.

- **Lead Controller**—The drill or exercise leader with overall knowledge of security shift operations. This individual may be selected from the security staff or other organization as appropriate.
- **Controllers**—Individuals with required knowledge of their assigned area whose responsibility is to assist the lead controller in drill safety and operation. May be selected from the security staff or other organization as appropriate. Controllers may concurrently serve as evaluators.
- **Evaluators**—An individual with knowledge of his/her assigned area who observes and documents drill participant performance and reports his/her observations to the lead controller. May be selected from the security staff or other organization as appropriate. Evaluators may concurrently serve as controllers.
- **Adversaries**—Appropriately equipped and trained mock attackers with the required physical abilities to engage the licensee drill players in an armed attack to test their ability to defend against the DBT.
- **On Duty Force**—Non-drill personnel who are used during a force-on-force exercise to ensure that all requirements identified in site specific Physical Security Plan and procedures are met during an exercise.
- **Players**
  - **CAS/SAS Players**—Security force members stationed in the alarm stations that will perform CAS/SAS duties as drill players during the drills and exercises. They will be briefed on drill conditions as required.
  - **Drill Players**—Security responders equipped with exercise response gear or equipment that respond to the security contingency event
  - **Plant Operations Personnel**—Single SRO who would normally be assigned to a command and control function. This player is only required when significant simulated plant operations are expected from the scenario.

In some cases the scope of a drill may be more narrowly focused and not involve an adversary team. In those cases, only the relevant planning elements need to be included. For example, tabletop drills can have a relatively simple structure. During scenario planning, attention on evaluation standards is key to the drill or exercise being an effective evaluation tool.

2 EXAMPLES OF INFORMATION NORMALLY ON CRITIQUE FORMS

The following are examples of information normally found on critique forms:

- Name of controller/evaluator
- Players evaluated

- Date of drill or exercise
- Quantified evaluation standards for each element
  - Strengths
  - Element demonstrated
  - Demonstrated with conditions
  - Not demonstrated or needs improvement which ever is applicable
- Contain all performance areas such as command and control and communications
- Comments or lessons learned section so enhancements or weaknesses can be tracked and documented for further evaluation or used to enhance the training program.

3 EXAMPLES OF TYPES OF EVALUATED DRILLS

The following are examples of types of evaluated drills:

- **Timeline Drills**—Conducted for individuals or portions of shift to ensure that responders are knowledgeable of their response strategy and are capable of meeting their response timelines.
- **Tabletop Drills**—Can be used to evaluate knowledge of response strategies. This type may also be used as an evaluation tool for the protective strategy.
- **Limited Scope Shift Drills**—Conducted as needed for each individual, group or shift to validate/test the protective strategy.

4 DETAILED EVALUATION CRITERIA

Immediately following the drill or exercise, a formal evaluation including the controllers, evaluators, participants, supervisors and others will occur. The following are measures, depending on which key elements were selected, used in determining if overall performance is adequate.

- Sufficient number of personnel: The required number of licensee personnel necessary to adequately implement the response strategy. This number will vary from plant to plant based on plant design and characteristics.
- Responding within appropriate timelines: Do response personnel have adequate time in their response timelines to get to their response positions in advance of the adversary timelines?
- From protected positions: Do response personnel use appropriate protection and cover en route and at final destinations?
- With appropriate armament: Do responders have the weapons and equipment necessary to execute their responsibilities?
- Provide Target Set Protection: Does the response plan provide protection for target sets such that the plant is protected against significant core damage?
- Integrated Response: Were any integrated responses properly coordinated and effective?

The critiques should begin with an overview or restatement of the scenario describing the purpose, objectives, general observations and specific results. The lead controller should conduct the overview so that the evaluation is meaningful and orderly. Each evaluator and controller should review his/her individual observations.

Each key player or participant should be allowed to add clarification for actions demonstrated and be encouraged to ask questions. If safety issues are identified, the lead evaluator should document these findings in the sites corrective actions program. Critique forms should be collected and combined with the drill package for retention and review. These results constitute the basis for the final report.

A post critique discussion made up of the evaluators and controllers should take place to review the drill performance. This review should determine if the objectives were met or not met, identify if any key elements were missed that could require immediate actions and review supporting elements for enhancements or strengths. The group should then prepare the initial report.

The initial report should be reviewed as appropriate and comments gathered through a cross-review process. Consideration will be given to comments for inclusion into the report. The final drill/exercise reports will be retained for three years.

The licensee's critique process will involve standards for supervisors and drill controllers to ensure results of tests, drills and exercises are factored into the training process. Controllers and supervisors will provide feedback to individuals, shifts and management using objective critique criteria for all elements of the exercise from adversary detection through drill completion. Controller critique information will be made a part of the drill and exercise records.

The evaluation process is against defined performance criteria, should be as objective as possible, and will cover the following as a minimum: CAS/SAS officers, armed responders, command and control personnel, operations personnel (if involved) and adversaries.

- CAS/SAS Officers will be evaluated to determine that they can adequately acknowledge, access and dispatch responders to the threat.
- Armed responders will be evaluated to determine that adequate responders are available to respond to protect the required elements of the target sets with weapons and equipment capable of meeting their intended function, and that they are trained to use that equipment under conditions encountered in the plant, and that they have an understanding of response plans.
- Command and control personnel will be evaluated to determine that they can direct a contingency response force.
- Operations personnel will be evaluated to determine that they are capable of taking mitigating actions.
- Adversaries will be evaluated to determine that they are creating a realistic challenge for the response force by simulating the adversary force capabilities.

APPENDIX B TAB 1

Drill Evaluation Considerations

The following are examples of a checklist that could be used in evaluating standards for drills and exercises. Each site may wish to develop its own checklist and use it to provide for continuing improvements.

1 EXERCISE CONTROL

a. Security personnel participation meets expectations?
b. Controllers' participation meets expectations?
c. Adversaries' participation meets expectations?
d. Pre-exercise briefings meets expectations?
e. Control during drill/exercise meets expectations?
f. Debriefing and evaluation of drill/exercise meet expectations?
g. Overall exercise control and evaluation meet expectations?

2 EXERCISE ADMINISTRATION

a. Written scenarios demonstrate key elements?
b. Written drill/exercise plans meets expectations?
c. Target sets have been reviewed and determined to be adequate?
d. Drill/exercise guidelines meets expectations?
e. Safety briefing meets expectations?
f. Controller checklists meets expectations?
g. Post exercise documentation meets expectations?
h. Debriefs meet expectations?

3 PLANNING

a. Were response plans in place for the security force to deal with this type of scenario?
b. Were these plans demonstrated?
c. Did all personnel understand the plans?
d. Was plant vulnerability properly assessed?
e. Were defensive positions established and integrated with response plan to meet the plant vulnerability?
f. Were plans and procedures made for defense-in-depth?
g. Were necessary improvised plans rapidly developed?
h. Did CAS/SAS utilize available contingency plans and checklists?
i. Were plans carried out to notify/use local law enforcement agencies?
j. Did adversaries develop plans to challenge the response plans?
k. Did overall plans contribute to or detract from the resolution of this scenario?

4 COORDINATION, COMMAND, AND CONTROL

a. Were affected portions of the plant notified before initiation of the drill/exercise?
b. Were coordination and command within the security force demonstrated?
c. Was coordination between security and LLEA demonstrated?
d. Were security personnel knowledgeable of line of authority?
e. Did overall command and control contribute or detract from the resolution of this scenario?
f. Was communication and coordination between security and operations demonstrated?

5 EVALUATING PROTECTIVE STRATEGY

The following are methods to use in evaluating protective strategy in setting the plant's initial strategy and in response to changing plant conditions or increases in threat levels.

a. Were barriers and perimeter intrusion detection systems and assessment systems adequate to delay, detect and provide capability to assess the adversary?
b. Did response plans contain both initial and follow-up plans?
c. Did communication plans and equipment exist to facilitate a protective strategy plan?
d. Did a command and control plan exist to direct a protective strategy plan?
e. Could CAS/SAS officers acknowledge, assess and dispatch responders to the threat?
f. Were responders available to respond to protect the required elements of the target sets?
g. Did responders have weapons and equipment capable of meeting their intended function and were they trained to use that equipment under conditions encountered in the plant?
h. Did responders have response plans for all developed scenarios, including knowledge of target set components?
i. Were operations personnel capable of taking mitigating actions should elements of target sets be destroyed?
j. Did effective communications exist between responders in the field, CAS/SAS, command personnel and operations?

6 COMMUNICATIONS

a. Was alarm acknowledged and information relayed to security force?
b. Was the adversary target identified?
c. Were communications between CAS/SAS and the security force demonstrated?
d. Were communications between supervisors and the security force demonstrated?
e. Were communications between security force members demonstrated?
f. Were communications understandable?
g. Did security force members relay information/intelligence to CAS/SAS?
h. Was communication security discipline maintained?
i. Were communications between adversaries demonstrated?

j. Were communications between CAS/SAS and operations demonstrated or simulated?
k. Were communications between the site and LLEA demonstrated or simulated?
l. Were radio communications relied on too heavily?
m. Were alternate means of communications used?

7 ALARM STATION RESPONSE

a. Did alarm station operators assess the number of intruders?
b. Were intruders described?
c. Did alarm station operators track intruders?
d. Did alarm station operators identify zone of penetration?
e. Did alarm station operators identify armament or equipment?
f. Were plant notifications made?
g. Did alarm station operators use contingency plans, procedures?
h. Was information gathered from cameras?
i. Was information gathered from response officers?
j. Did alarm station operators utilize station equipment to fullest advantage?

8 INDIVIDUAL TACTICS

a. Did the officer respond to the initial alarm tactically?
b. Did the officer make appropriate notification?
c. Did the officers appropriately defend their positions?
d. Were available cover and concealment used?
e. Were selected defensive positions tactically sound?
f. Was minimum exposure maintained?
g. Were danger areas crossed tactically?
h. Did the officer simulate firing the weapon? Reloading?
i. Did the officer shoot properly through smoke?
j. Did the officer respond to adversary tactics/weapons?
k. Did the officer relay adversary intelligence?
l. Were terrain and/or the physical plant utilized for cover and concealment or movement?
m. Overall, did individual tactics contribute to or detract from the resolution of this scenario?
n. Did the officers interpose between targets and the adversary force with adequate presence and effective fire/counterforce (situation dependent)?

9 TEAM TACTICS

a. Did the security force work together as a team?
b. Did the security force work with operations as a team?
c. Were tactical deployment techniques used (cover and concealment)?
d. Were alternate response routes planned or available?
e. Were correct defensive positions achieved in a timely manner based upon the adversary target and plant vulnerability?

f. Was supporting fire used?
g. Did the security force take action to protect critical plant safety systems?
h. Did the security force maintain control of key targets?
i. Overall, did team tactics contribute to or detract from the resolution of this scenario?
j. Were team tactics effective in denying or otherwise neutralizing the adversary force?

10 USE OF DEADLY FORCE /APPLICATION OF FORCE

a. Was the necessary level of force used?
b. Did the force applied minimize danger to security force and plant personnel/equipment?
c. Did security force personnel maintain fire control and discipline, tactics, target acquisition and selective fire?

11 RESPONSE TO INTRUDERS WITHOUT IDENTIFIED WEAPONS

a. Did the response team interpose between the intruder and target sets?
b. Did the response team control the situation?
c. Was a proper distance between the responders and the intruder maintained?
d. Did response team members cover the intruder?
e. Was the intruder contained?
f. Did the response team employ use of nonlethal controls?

12 PHYSICAL SECURITY AND EQUIPMENT

a. Did the security force take full advantage of the physical security systems capabilities?
b. Did assessment systems provide information about adversaries for security force interdiction?
c. Were communications systems adequate?
d. Were the correct security force weapons used in this scenario?
e. Did barriers provide denial or delay to allow security force interdiction?
f. Did response positions provide protection for security force personnel?
g. Were alternate routes to response positions available?
h. Did overall physical plant and security equipment provide an opportunity for the security force to accomplish its mission?

13 CONTROLLER PARTICIPATION

a. Were controllers trained and/or briefed on responsibilities for drill/exercise?
b. Were controllers trained and/or briefed on rules of engagement?
c. Did controllers ensure drill/exercise participants were equipped with appropriate simulated weapons and perform safety inspections and briefings?
d. Were controllers prepared to stop actions for any safety hazards?
e. Did controllers coach or advise drill/exercise participants?
f. Did controllers resolve disputes immediately and effectively?

g. Did controllers provide objective critique at post drill/exercise briefing?
h. Did controllers provide feedback to assigned participant?
i. Did controllers evaluate individual and team tactics?

14 POST DRILL/EXERCISE BRIEFING

a. Were drill/exercise participants present for briefing?
b. Were notifications made to plant personnel at conclusion of drill/exercises?
c. Were scenarios and expectations explained?
d. Did drill/exercise participants relay their participation and responses?
e. Were drill/exercise deficiencies reviewed in briefing?
f. Were participants responsive in briefing?
g. Was briefing conducted in a professional manner?
h. Did exercise participants maintain a professional attitude?
i. Did overall briefing contribute to or detract from the overall resolution of this scenario?
j. Did the drill/exercise sufficiently evaluate the site's ability to prevent significant core damage from occurring during this scenario?