



NUCLEAR ENERGY INSTITUTE

WHITE PAPER

DETERMINATION OF A SITE-SPECIFIC
SECURITY BOUNDING TIME

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¹ The Nuclear Energy Institute (NEI) is the organization responsible for establishing unified industry policy on matters affecting the nuclear energy industry, including the regulatory aspects of generic operational and technical issues. NEI's members include entities licensed to operate commercial nuclear power plants in the United States, nuclear plant designers, major architect/engineering firms, fuel cycle facilities, nuclear materials licensees, and other organizations and entities involved in the nuclear energy industry.

Purpose and Overview

This white paper describes a process that a licensee may follow to receive credit² for law enforcement tactical support during a physical attack on a nuclear power plant through the determination of a Security Bounding Time (SBT).³ An SBT is the elapsed time, measured from recognition of an attack, required for the licensee to preclude adversary interference sufficiently, with the assistance of law enforcement, to allow performance of operator actions that can prevent radiological sabotage. Once credit is achieved, the licensee may consider the planned law enforcement tactical support and SBT in the development of the site's physical protection program (e.g., target sets, protective strategy, engineered protection features, etc.).

As used within the context of security requirements and programs, operator actions are actions performed by licensee personnel in response to an attack for the purpose of preventing radiological sabotage. The criteria for assessing the acceptability of a proposed operator action are discussed in Regulatory Guide 5.81, "Target Set Identification and Development for Nuclear Power Reactors." If all the acceptance criteria are met, then the operator action may become a component of a target set. By completing the process described in this white paper, an operator action assessment may assume that adversary interference originating from the owner-controlled area, and outside the protected area, has been precluded when the SBT is reached.

The SBT process is focused on developing and maintaining a plan to facilitate the interdiction and neutralization of adversaries located outside the Protected Area by a law enforcement agency tactical team. Implementation of this plan will, at some point, preclude an adversary located beyond the Protected Area boundary from interfering with operator movement outside or between buildings, or otherwise threatening target elements. This capability notwithstanding, the process is not intended to create an integrated response program or plan for responding to Beyond Design Basis threats.

Licensees are currently required to liaise with law enforcement agencies and, to the extent practicable, document and maintain agreements to include estimated response times and capabilities. There are also requirements to describe available law enforcement assistance and initial response provisions in site Safeguards Contingency Plans. Compliance with these requirements notwithstanding, due to differences in protective strategies and law enforcement tactical response capabilities from site-to-site, the use of the SBT process by a licensee is voluntary.

Expected Benefits

² Credit means a determination that a licensee may rely on an action to be performed when developing a protective strategy and target sets. The determination should meet a "reasonable assurance" standard.

³ SBT was formerly referred to as Security Coping Time.

Regulatory Guide 5.81, Revision 0, does not provide criteria for determining the end of an attack timeline when developing and identifying target sets (i.e., when an attack could be expected to end). Through recognition of law enforcement intervention, the SBT process provides a method to bound the duration of an attack (interference) from adversaries located outside the Protected Area. By establishing a reasonable time limit, a site-specific SBT could offer one or more benefits to a licensee, including support for:

- Better risk-informed target sets and protection strategies.
- The addition of an operator action to a target set, thus increasing the number of barriers to radiological sabotage.
- Consideration of a law enforcement tactical response during the design, control and evaluation of tactical response drills and Force-on-Force (FOF) exercises, thus enhancing the realism and training value of these activities (e.g., risk-informed scenario selection or precluding unrealistic standoff times in exercises).
- Crediting the use of beyond-design-basis (BDB) event response strategies and equipment to mitigate damage caused by an attack (e.g., implementation of a FLEX strategy to prevent or mitigate the loss of a target set).⁴

Finally, the SBT process is expected to lead to enhanced planning and response coordination between a licensee and law enforcement agencies, enhancing overall response capabilities.

Relationship of SBT to the Physical Protection Requirements in 10 CFR 73.55

Following implementation of an SBT, a licensee will continue to maintain a physical protection program that complies with the requirements of 10 CFR 73.55, "Requirements for physical protection of licensed activities in nuclear power reactors against radiological sabotage." More specifically, the licensee will retain the ability to defend against the Design Basis Threat (DBT) of radiological sabotage. Compliance with the requirements of §73.55 notwithstanding, the rationale for establishing an SBT is the recognition that law enforcement tactical support will be available at some point during an attack to assist the licensee with threat containment and neutralization.⁵ By planning for this assistance, a licensee should be able to consider the credited law enforcement response as a component of its physical protection program.

Under the planning and response framework described in this document, the licensee will remain in control of the site physical protection program, including the onsite security force, during an attack. At the same time, the SBT process recognizes the reality that law enforcement tactical resources will be brought to bear during an actual event to support the licensee (i.e., a tactical team can aid the onsite security force with adversary neutralization or

⁴ This refers to strategies and equipment for mitigating the consequences of beyond-design-basis external events, or events leading to a loss of large areas of the plant due to explosions or fires, as required by NRC regulations, orders and licenses. The inclusion of BDB event response strategies and equipment within a target set would need to be assessed using the acceptance criteria discussed in Regulatory Guide 5.81.

⁵ This point is consistent with direction in SRM-SECY-17-0100 that NRC policy concerning credit for a tactical law enforcement response should take into consideration the NRC's codified recognition of "the reality that in an actual emergency, state and local government officials will exercise their best efforts to protect the health and safety of the public" in 10 CFR 50.47(c)(1)(iii)(B). It also reflects a statement from 72 Fed. Reg. 12,714 (March 19, 2007) that "The Commission is confident that a licensee's security force would respond to any threat no matter the size or capabilities that may present itself. The Commission expects that licensees and State and Federal authorities will use whatever resources are necessary in response to both DBT and beyond-DST events."

containment). To maximize the benefit of this support, the SBT process guides the development of a tactical response plan that addresses the coordination necessary between licensee and law enforcement agency personnel to affect implementation. The plan allows the licensee to credit law enforcement assistance specifically designed to enable the performance of actions that first require the elimination of adversary interference. These actions increase defense-in-depth by adding another layer of protection and further lowering the risk to public health and safety.

Relationship of SBT to Integrated Response

The SBT process provides credit for tactical law enforcement capabilities during threat incidents bounded by the DBT. It is realistic to expect support from tactical law enforcement personnel at some point during an attack from an adversary force within the scope of the DBT, and licensee security plans should be able to credit this support with proper planning; however, it should also be recognized that the activities associated with implementation of the SBT process can provide a sound basis for an “Integrated Response.” As this term is used by the U.S. Nuclear Regulatory Commission (NRC) within a security-related context, an Integrated Response means integrating tactical law enforcement capabilities with the site response to a beyond-DBT threat incident at a nuclear power plant.⁶

The planning and preparedness activities necessary to attain SBT credit for support during an attack bounded by the DBT would likewise facilitate a law enforcement tactical response during an attack by adversaries with beyond-DBT capabilities. Leveraging the hostile action-based (HAB) capabilities already described in a site emergency plan,⁷ a site that implements an SBT would be able to readily accommodate expanded law enforcement tactical support (i.e., beyond that described in an SBT tactical response plan) if such support became necessary. As an analogy, consider the NRC position that current Emergency Planning Zones (EPZs) provide a comprehensive emergency preparedness framework that would allow for expansion of the response efforts beyond the designated distances should an event warrant such an expansion (e.g., following a severe reactor accident). The ability to build upon an SBT tactical response plan to transition into an Integrated Response is another expected benefit of the SBT process.

Finally, to provide a broader perspective, the table below shows the relationship of SBT to Integrated Response as well as related existing requirements contained in Title 10 of the Code of Federal Regulations (10 CFR) Parts 50 and 73.

⁶ Integrated Response is discussed in several NRC documents; a good overview is presented in COMSECY-13-0005, “Integrated Law Enforcement Response at Nuclear Power Plants,” dated February 7, 2013.

⁷ The capabilities required by 10 CFR 50, Appendix E, “Emergency Planning and Preparedness for Production and Utilization Facilities.”

	SITE AND LAW ENFORCEMENT AGENCY COORDINATION	TACTICAL RESPONSES
DBT	10 CFR 73.55, and Appendices B & C 10 CFR 50, Appendix E <i>[Letters of Agreement and Hostile Action- Based Exercises]</i>	10 CFR 73.55, and Appendices B & C <i>[FOF Exercises]</i> Security Bounding Time
BEYOND-DBT	10 CFR 50, Appendix E <i>[Letters of Agreement and Hostile Action- Based Exercises]</i>	Transition to an Integrated Response

SBT Process

NOTE
Prior to beginning the process, Emergency Preparedness Department personnel should be requested to determine, through consultation with appropriate offsite response agencies, if the tactical team members have any existing commitments to support implementation of offsite emergency plans.

The SBT process steps are presented below.

Step #1 – Identify the Mission Objective: The mission objective for the law enforcement tactical team should be to eliminate adversary interference originating from outside the Protected Area. The goal is to permit the controlled movement of operators outside or between buildings to perform actions needed to maintain the plant in a safe condition, and otherwise terminate threats to target elements. The mission objective and goal should serve as the planning basis for completing the remaining steps listed below.

Step #2 – Planning and Procedure Development: In conjunction with law enforcement agency personnel, develop a tactical response plan⁸ and supporting procedures for briefing and deploying a tactical team during an attack on the site.⁹ Tactical team members are responsible for determining the mission parameters and means best suited to enable performance of the mission objective (e.g., perimeter establishment and control, area sweeps and searches, protective escorting, engaging the adversary, etc.). Planning for the team’s anticipated actions should be informed by site-specific mission needs (e.g., a breaching capability for a specific barrier or door). Consideration should also be given to building upon the capabilities in place to meet the hostile action planning and response requirements of 10 CFR 50, Appendix E, as described in the site emergency plan.¹⁰ The following elements should be addressed:

1. A staging area.
2. A briefing area with mission planning tools and materials (e.g., Contingency Response Tool and hard-copy

⁸ The elements of the tactical response plan may be included within an existing law enforcement response plan.

⁹ The development of the plan and procedures should leverage the information and resources already available from a site-specific Contingency Response Tool and Integrated Response Plan. Sites without a Contingency Response Tool should consider the guidance in Attachment 1, “Tactical Team Mission Planning Considerations” (not publicly available).

¹⁰ To identify and maximize potential synergies, an individual from the emergency preparedness department should be included in the planning and procedure development phase.

planning documents).

3. Provisions for dispatching licensee personnel to the briefing area, including arrangements to allow passage through offsite traffic control points and law enforcement checkpoints. Alternately, a licensee may support a briefing via telephone or a remote/virtual meeting technology.
4. Methods for licensee personnel at the briefing area to communicate with the Control Room and alarm stations to understand site conditions and priorities.
5. Roles and responsibilities for conducting a mission briefing, and topics to be covered.
6. The assignment and use of security officers or other site personnel as escorts/embeds, as requested.
7. Use of communications systems and protocols that consider potential site-specific impediments (e.g., signal attenuation, jamming by adversaries, high ambient noise levels, etc.).
8. Equipment and protocols to prevent fratricide by the onsite security force (e.g., provide an Identification Friend or Foe [IFF] capability) and provide mission updates.
9. Steps to expedite access to the site, including actions to address potential impediments (e.g., a vehicle barrier is in the deny access position).
10. Consideration of industrial and radiological safety hazards, including availability of dosimetry and other radiation protection equipment and supplies.
11. Communications and coordination with the site Emergency Response Organization (e.g., responders at an Alternative Facility or Emergency Operations Facility).
12. Pre-staging of site documents, equipment and supplies needed by the tactical team (e.g., create a “go-bag”). A plan for delivery of these items at the time of the event should be carefully evaluated to ensure that implementation is feasible under anticipated attack conditions.

The development of a tactical response plan and supporting procedures should consider the need for the following resources:

1. An armored vehicle.
2. Breaching equipment.
3. Ballistic shield/armor.
4. Night vision equipment, to include consideration of infrared light sources.
5. Aviation support, manned or unmanned (drone), for surveillance and intelligence collection.

6. Personal Protective Equipment (PPE) to enable tactical operations in an area contaminated with a hazardous material (e.g., responders are familiar with applicable PPE standards and practices established by their State or agency).
7. Supporting resources for perimeter control and containment, and a medical response.

NEI maintains operating experience and lessons learned documents that would be helpful to creating an effective tactical response plan and supporting procedures. Security personnel are encouraged to request these documents from NEI and consider them during development of site-specific plan and procedures.

Step #3 – Determine Required Tactical Team Composition and Capabilities: As informed by the tactical response plan and procedures developed in Step #2, the law enforcement agency should determine the composition and capabilities of the tactical team needed to have reasonable assurance of completing the assigned mission. The recommended minimum team composition and capabilities should meet the Capabilities and Personnel attributes for a Tier 2 Special Weapons and Tactics Team (SWAT) as described in “[Tactical Response and Operations Standard for Law Enforcement Agencies](#),” published by the National Tactical Officers Association (NTOA),¹¹ dated April 2018.¹²

A team meeting the above NTOA standard would be mission capable in the following areas:

- Barricaded gunman
- Sniper operations
- High-risk warrant service and high-risk apprehension
- High-risk security operations
- Terrorism response

The tactical team may be supplied by the law enforcement agency with jurisdictional authority over the site or made available through a mutual aid/support agreement with another law enforcement agency or a regional association. A State agency tactical team (e.g., from the State Police) may also be used. In cases where a team is explicitly chartered to meet a State or Federal tactical capabilities standard, credit may be extended if the basis

standard is reasonably equivalent to the NTOA standard (i.e., the State or Federal standard ensures mission capabilities in the areas listed above).

¹¹ As stated on their website, the NTOA is a U.S.-based non-profit organization serving the law enforcement community with a mission to “enhance the performance and professional status of law enforcement personnel by providing a credible and proven training resource as well as a forum for the development of tactics and information exchange.” Their membership includes State and local law enforcement agencies from across the U.S.

¹² This document was selected as a standard because it is prepared by knowledgeable law enforcement professionals, including representatives from Federal agencies. As an open source document, it will facilitate planning coordination and communications among participants, and support comparisons with other standards that may reference or be similar to it (e.g., a regional standard).

The required tactical team composition determined by the law enforcement agency for the site-specific mission may be greater or less than the recommended minimum above. In the latter case, the licensee should document why the law enforcement agency determined that the deviation is acceptable (e.g., the aspects of the site-specific mission that provide justification for less than the recommended minimum team staffing). The final team composition should be described in the tactical response plan.

Step #4 – Verify and Validate the Tactical Response Plan and Procedures: The licensee should verify and validate (V&V) the tactical response plan and supporting procedure content. This step is accomplished by conducting a tabletop drill and a practice drill with appropriate law enforcement officials and tactical team officers. Following completion of each activity, the tactical response plan and procedures should be revised to incorporate lessons learned.

The planning for the tabletop drill should consider the guidance in NEI 13-03, “Conduct of an Integrated Response Plan Table Tops and Limited Exercise,” and NEI 06-04, “Conducting a Hostile Action-Based Emergency Response Drill.” The practice drill should have the following attributes.

- The drill should be treated as a supervised instruction period aimed at developing skills needed for effective mission performance (e.g., no “win-lose” evaluation).
- The drill should be conducted at a walk-through pace to promote familiarity with the owner-controlled area, and identify and reinforce learning opportunities.
- The scenario should drive performance of both a mission briefing and the mission execution, and require the team to perform tactical maneuvering and engagement actions, albeit at a walk-through pace.
- Participants should include representatives from site departments that would be interfacing with the tactical team in a real event (e.g., from Security and Operations).
- In conjunction with the leadership of the tactical team, consider the training benefit of including simulated adversaries and engagements. For example, controllers could play the role of adversaries using established security drill equipment and techniques (e.g., use of a multiple integrated laser engagement system or “red guns,” resurrection of neutralized team members to continue participation and learning).
- Drill performance should be critiqued and deficiencies entered into a corrective action process.

Step #5 – Determine Training and Drill Requirements: The licensee and law enforcement personnel should determine and document the types and frequencies of training and drills that will be conducted to instill and maintain response proficiency. The following guidance should be considered:

1. The licensee may align tactical team training and drills with other law enforcement training and drill activities already performed to meet the requirements of their site-specific security plan.
2. The licensee should explore opportunities for the tactical team to obtain credit for participation in site

training and drills as a means to satisfy a State or Federal requirement. This approach may provide an external funding source for an activity.

3. NEI maintains operating experience and lessons learned documents that would be helpful to creating effective training materials; training developers are encouraged to request these documents from NEI and consider them during development of site-specific training briefings and lesson plans.
4. Training sessions should include tours to familiarize tactical team personnel with the areas in which they would be maneuvering and conducting operations (i.e., areas addressed in the tactical response plan).
5. Periodic practice drills should be conducted using the guidance presented in Step #4. The licensee should also offer the NRC an opportunity to observe a practice drill once every three calendar years; this offer should be made through contact with the Resident Inspector's office and no later than 90 days prior to the drill. There are several options for conducting an NRC-observed drill - it may be included within the scope of a site tactical response drill, an FOF exercise,¹³ an emergency preparedness hostile action-based (HAB) drill, or conducted as a stand-alone activity.
6. There should be provisions to conduct ad hoc training and drills as needed to address turnover of tactical team personnel. The goal is to always maintain a sufficient number of individuals with the requisite training and drill experience to provide reasonable assurance of successful mission execution.

Step #6 – Prepare SBT Process Documentation: The following documentation and records should be retained for inspection.

1. The tactical response plan and supporting procedures. The elements of the tactical response plan may be included within an existing law enforcement response plan.
2. A Letter of Agreement (LOA) / Memorandum of Understanding (MOU) between the licensee and law enforcement agency that addresses the following:
 - a. Acknowledgment that law enforcement tactical capabilities may be employed to assist the licensee with responding to an armed attack on the site.
 - b. The law enforcement agency will provide tactical capabilities necessary to implement the mutually agreed upon tactical response plan. The LOA / MOU should identify if these capabilities are supplied directly by the agency or through a mutual aid/support agreement with another law

¹³ An exercise performed in accordance with NRC Inspection Procedure (IP) 71130.03, "Contingency Response - Force-on-Force Testing," or IP 71130.05, "Protective Strategy Evaluation and Performance Evaluation Program."

enforcement agency.

- c. The normally expected response time needed for tactical team personnel to arrive at the designated staging area, referenced from the start time of the initial notification of the law enforcement agency. This time should be rounded up to the nearest whole-hour or half-hour (e.g., 30 minutes, 1 hour, 1.5 hours, 2 hours, etc.).
- d. A summary of the support and assistance that will be provided by Security and personnel from other site departments (e.g., Operations) to facilitate briefing and deployment of the tactical team.
- e. Designated site contacts to communicate with the tactical team (e.g., Shift Manager and Central Alarm Station Operator).
- f. A summary description of the training and drills provided by the licensee to the tactical team, and associated frequencies.
- g. A summary of responsibilities for maintenance of equipment and resources.
- h. Verification of the LOA / MOU on an annual basis, and timely notification to the licensee of any material changes to tactical team staffing, capabilities or response times.

The above topics may be added to an existing LOA / MOU or the subject of a new LOA / MOU, or a combination of the two.

3. As permitted by Step #2, the basis for deviating from the applicable NTOA SWAT standard, either in team composition or a capability, or both (e.g., what aspects of the site-specific mission provide justification for less team staffing or capability).
4. Training program materials (e.g., lesson plans, briefing agendas, etc.).
5. Records of offered training and drills, and attendance.
6. Drill reports and related corrective action program records.

Determination of an SBT

The licensee should determine the site-specific SBT, which is the sum of four components:

1. Notification Time: [redacted]; this is the assumed elapsed time from recognition of an attack by the site security force to initial notification of a law enforcement agency.
2. Team Response Time: The normally expected elapsed time from initial notification of the law enforcement agency to the arrival of the tactical team at the designated staging area, as documented in the LOA / MOU.

3. Mission Planning Time: The elapsed time from the arrival of the tactical team at the designated staging area to their arrival at the site, including receipt of a mission briefing and completion of other preparations for deployment. This time is assumed to be [redacted].
4. Mission Execution Time: The assumed elapsed time from tactical team arrival at the site to mission completion (i.e., elimination of adversary interference). This time is assumed to be [redacted].

An elapsed time sum that does not coincide with a whole or half-hour, should be rounded up to the next 30-minute time increment (e.g. a sum of 4 hours and 15 minutes should be rounded up to an SBT of 4.5 hours).

The assumed mission planning and execution times above are considered reasonable and bounding for a wide range of conditions. Using drills to determine these times is impractical given the number of variables and uncertainties associated with an actual attack (i.e., a very large number of scenarios are possible), and the inability to run all aspects of a drill at a “real world” pace (due to personal, industrial and radiological safety requirements). The availability of assumed times notwithstanding, the tactical team agency may determine times greater than the assumed times based on the application of professional judgement and experience to the planned mission profile and tasks. The licensee should confirm the times used to calculate the SBT with the tactical team agency prior to implementation.

The SBT, and the determination of each component, should be described in a controlled security program document.

Potential Uses of an SBT

As noted above, Regulatory Guide 5.81, Revision 0, does not provide criteria for determining the end of an attack timeline when developing and identifying target sets (i.e., when an attack could be expected to end). Through recognition of law enforcement intervention, the SBT process provides a method to bound the duration of an attack (interference) from adversaries located outside the Protected Area. By establishing a reasonable time limit, a site-specific SBT may be used in several ways to enhance the design and evaluation of a site physical protection program,¹⁴ including:

1. Support the addition of an operator action to a target set.
2. Inform the identification and protection of target elements within each target set (e.g., adjust protection requirements based on recognition that a post-SBT operator action could prevent or mitigate the loss of a target element).
3. Include as a design consideration for physical protection features.
4. Inform the design, conduct and evaluation of FOF drills and exercises (e.g., the protection against a prolonged standoff attack could be evaluated as successful if the adversaries did not compromise a target

¹⁴ The application of an SBT to physical protection program elements would be performed under existing licensee processes (e.g., the process used to develop and identify target sets).

set within the SBT).

5. Support the use of FLEX equipment in a post-SBT attack environment.
6. Consider the effect on an adversary's assessment of target set desirability.

When assessing potential changes, it is important to keep in mind that operator movement enabled by an SBT would not be "free movement;" rather, such movement would need to be controlled in accordance with site procedures and protocols developed to meet the requirements of 10 CFR 50, Appendix E, Section IV. I, "Onsite Protective Actions During Hostile Action." Background on these requirements can be found in the NRC's "Enhancements to Emergency Preparedness Regulations" rule.¹⁵

With respect to informing the identification and protection of target elements within each target set, an SBT should not be applied to the components of systems performing the following functions.

- Emergency AC power
- High pressure injection
- Residual (decay) heat removal
- Reactor core isolation cooling/isolation condenser (Boiling Water Reactor)
- Auxiliary/emergency feedwater (Pressurized Water Reactor)

In other words, the components of these systems should always be protected against threats up to and including the design basis threat of radiological sabotage as stated in § 73.1, regardless of the availability or duration of an SBT. The inclusion within a target set or protection of equipment supporting the operation of these systems may be informed by the availability of an SBT. This consideration is warranted when there is an operator action that can be performed after the SBT, and before the irreversible onset of radiological sabotage, to prevent or mitigate the loss of the equipment. Examples of such equipment include batteries, fuel sources, component cooling or flooding mitigation.

A licensee will need to consider the requirements of 10 CFR 50.54(p) when making a change to security plans, or the procedures or capabilities described in those plans, to incorporate recognition of an SBT.

Changes Impacting an SBT

A licensee should follow the fleet/site process for assessing changes to target sets if there is an anticipated or actual change to tactical team staffing or capabilities that may impact the team's response time or ability to implement the planned mission, and adjust the physical security program and site protective strategy as necessary.

¹⁵ 76 Fed. Reg. 72,560 (November 23, 2011)