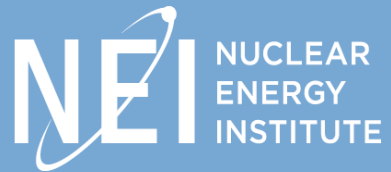


Development of NEI Guidance for Determining Adversary Timelines

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Topic Areas

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- Desired Outcome, Current Practice, and Basis for Change
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Presentation Purpose

This presentation provides an overview of NEI's effort to conduct performance-based testing as means to develop defined adversary travel speeds based on the number of engaging officers as permitted by Regulatory Guide (RG) 5.81, *"Target Set Identification and Development for Nuclear Power Reactors,"* Revision 1 (dated December 2019).

Use of adversary timelines is discussed in RG 5.81, Revision 1 (dated December 2019).

The project goal is to create uniform adversary travel speeds that may be used to support development of site-specific protective strategies.

Overview of Adversary Timelines

- Adversary timelines are a key factor in the development of a site's protective strategy. Adversary timelines drive responder timelines, which are used:
 - To inform the location of officer fighting positions (e.g., bullet resistant enclosures), placement of barriers, and implementation of other strategy features to ensure defense-in-depth
 - In protective strategy assessments to ensure security officers can interdict adversaries with a high likelihood of success
- Development of adversary timelines are necessary to meet the physical protection program requirements contained in 10 CFR 73.55

Desired Outcome

NRC-approved guidance that:

- Establishes defined adversary travel speeds based on the number of engaging security officers.

Current Practice

- RG 5.81, dated November 2010, made no allowance for considering interdiction effects on adversary timelines
- To date, adversary timelines have typically been based on two factors:
 - Travel Speed – how quickly a DBT adversary can sprint without a break
 - ◆ 15 feet per second travel speed is the historical standard for a mock adversary
 - Breaching Time – time taken to cut a fence, breach a door/barrier, etc.
 - ◆ Consistent with Regulatory Issue Summary (RIS) 2003-06

Basis for Change

Section 5.5.3 of RG 5.81, Revision 1, describes considerations for Adversary Interference and states:

- “As an alternative method, licensees can perform an assessment to compare the timeframe associated with the delays to the adversary provided by implementation of the licensee’s entire physical protection program, including the delays provided by both the physical barriers and the response of the licensee security personnel, to the time required for the operator to arrive at the location.”

Industry Approach

- Conduct performance-based testing to provide the technical basis to incorporate the delay to the adversary that results from the interdiction of licensee security response force into timelines
- Develop defined adversary travel speeds based on the number of engaging security responders

Data Collection

- Forty-two drills were conducted at three nuclear power reactor sites
- Testing protocols were consistent with the attributes of the Design Basis Threat
 - The site's mock adversary force was used
 - The adversary carry weight was consistent with the chosen target set/element
- A variety of travel paths were tested
 - Varied to assess a range of barriers and responder engagement(s)
- Consistent with RG 5.81, Revision 1, the testing only considered physical barriers and responders with engagement opportunities

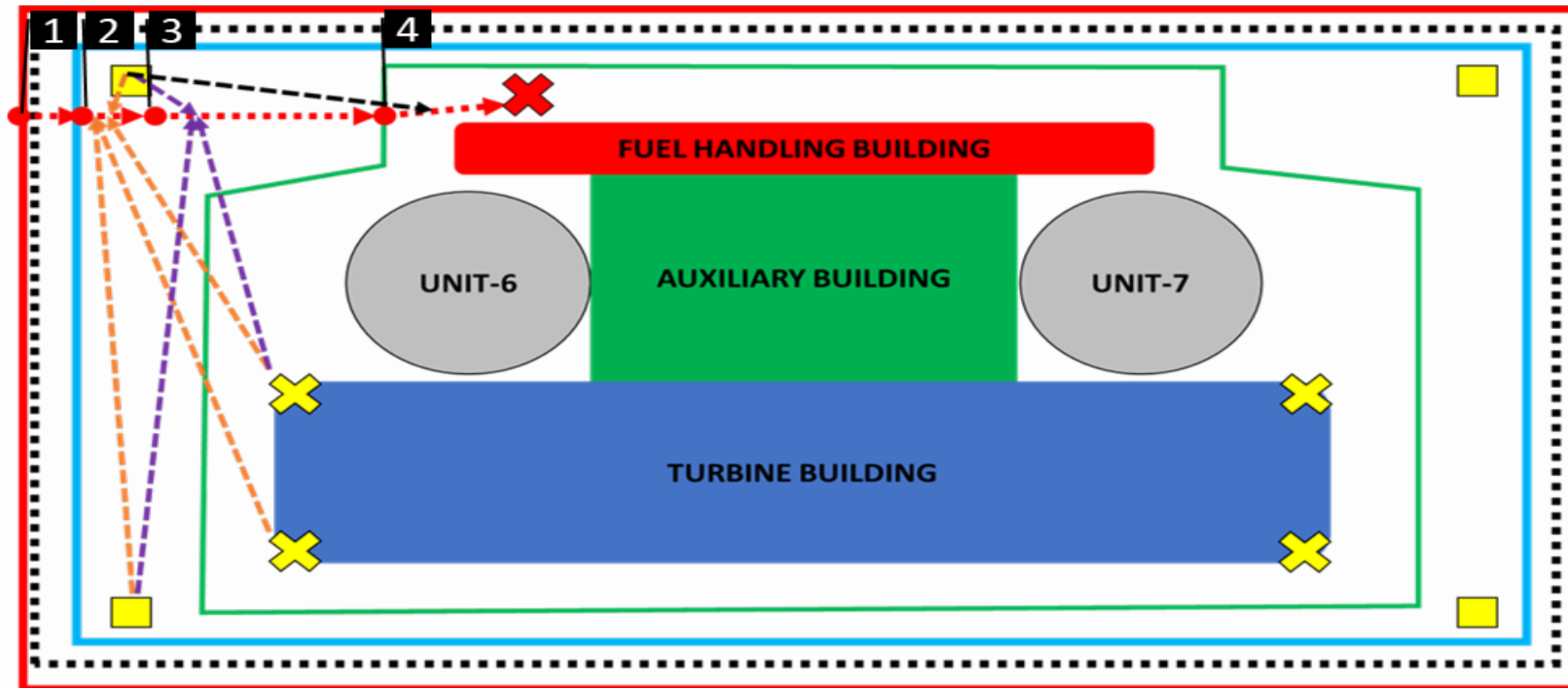
Data Collection

- Adversaries ran multiple runs for each target element pathway
 - Each pathway was ran an average of three times for each travel path
- Elapsed times started at the first point of credited detection (e.g., Early-Warning System (EWS) or Protected Area Intrusion Detection System (PIDS)) and terminated at the outer edge of the building where the target set element is located
- Adversaries were moved in a phased approach to ensure distance and speed could be documented and calculated in segments

Initial Findings

- With no engaging responders, the adversary travel speed was determined to be 17 feet per second (ft/s)
- Adversary(s) travel speeds slowed as responders engaged
- Adversary travel speed as a function of the number of engaging responders was relatively consistent across all three sites
 - With a large number of engaging responders, adversary movement was too slow to reasonably incorporate
- Timelines developed using performance-based adversary travel speeds were longer than those developed using the current practice (i.e., assumed speed of 15 ft/s)

Example Using Travel Speeds Identified Through Testing



Site Example Legend

Solid Red Line	Nuisance Fence
Black Dotted Line	Intrusion Detection System (IDS)
Blue Line	Protected Area Fence (10 second breach time)
Green Line	Delay Fence (20 second breach time)
Yellow Square	Bullet Resistant Enclosure
Yellow "X"	Defensive Fighting Position
Red "X"	Target (20 second task time)

Licensee Implementation

- The guidance may be used to support:
 - Changes to a site protective strategy through revisions of required responder timelines; or
 - The addition of an operator action to a target set
- This guidance does not preclude licensees from using other approaches to develop adversary timelines
- Site-specific changes would be evaluated and documented in accordance with 10 CFR 50.54(p) and 10 CFR 50.90, as applicable

Proposed Path Forward

- Incorporate changes resulting from this public meeting
- Submit for NRC review and approval – 2Q2021
- NRC observation of methodology at site – 3Q2021
- Conduct, if necessary, testing at a fourth site – 3Q2021
- Revised document submitted (if applicable) – 3Q2021
- Conduct implementation workshop – 1Q2022

Questions?

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