Thunderstorm Program
Overview

Updated: SEPT 14, 2020
Background

- **Rapid Reaction Technology Office (RRTO)**
  - Develops prototypes and hosts technology demonstrations and experimentations to counter emerging and anticipated threats in order to accelerate the delivery of resilient solutions leading to affordable Warfighter capabilities.
  - The model for developing and demonstrating less mature, high-reward technologies that produce game-changing capabilities by leveraging non-traditional sources of innovation, interagency partnerships, and rapid prototyping.

- **Thunderstorm Demonstrations and Experimentations**
  - An enduring venue sponsored by RRTO for new technologies to be integrated, evaluated and assessed under real world conditions.
  - Focus areas are developed through partnerships with DoD entities to determine current deficiencies and areas of interest.
Why Thunderstorm?

Inform and accelerate DoD modernization through innovation discovery, demonstration and experimentation

- Venue for the Science & Technology, Acquisition, and User communities to identify and transition new Joint mission capabilities that address key modernization gaps
- Enable technology demonstration venues and experiments to explore new and emerging technologies, CONOPS and red team capabilities
- Foster collaboration for addressing shared gaps and challenges across DoD and other communities
- Facilitate the exploration of lower maturity, higher risk/higher reward alternatives and technology collaborations in operationally relevant environments
- Engage and leverage non-traditional, small business and allied technologies to accelerate the transition of innovative solutions

Accelerating the transition of emerging capabilities to the Warfighter
Methodology and Venues

Strategic Steering
• Guidance based on overarching objectives of the Under Secretary of Defense (Research and Engineering), Director of Defense Research and Engineering, Deputy Director, Developmental Test, Evaluation, & Prototyping

Analytical Gaming Workshop
• Think Tank Forum for SME’s to develop future Thunderstorm Concepts
• Creates a joint working group environment to share technologies and ideas
• Forum for analyzing new and emerging threats

Tabletop Experiment (TTX)
• Scenarios are used to focus on process, procedures and potential capabilities
• SMEs attend from various DoD agencies and operational partners from across the government
• Capability gaps are selected and prioritized in order to be considered for technology demonstrations

Technology Innovation Discovery Event (TIDE)
• Introduces end users to a wide breadth of new cutting edge technologies
• Interactive hands-on experience that allows end users to provide instant feedback to the vendor
• End user feedback will aid in the technology selection for the follow-on Field Demonstration and Experimentation

Technology Field Demonstration and Experimentation
• Platform for pairing technologies with potential end users
• Minimal cost to vendor, attractive to startup companies with minimum financial backing
• Uses operational environment to assess prototype technology capabilities with operational partners being readily available for feedback
Benefits the Government Stakeholders

- Collaboration for addressing operational environment challenges
- Opportunity to brainstorm and war-game in a controlled setting
- Venue to observe new and emerging technologies
- Opportunity to pair technologies for improving overall effectiveness
Benefits the Demonstrators

- Kicking the tires
- Scenario driven event (Red, Blue, White cells)
- Feedback that improves outcomes
- Accelerated development and fielding
- Creation of new opportunities
- Exploring tech across the TRL continuum
- Non-traditional and small business exposure

A Safe Space for Technological Exploration
<table>
<thead>
<tr>
<th>Focus Area</th>
<th>Operational Partners</th>
<th>Event</th>
<th>Location</th>
<th>Technologies Demonstrated</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY-09: Maritime Domain Awareness</td>
<td>JIATF-S</td>
<td>Field Demonstration</td>
<td>JIATF-S AOR; US SOUTHCOM AOR</td>
<td>10</td>
</tr>
<tr>
<td>FY-10: Maritime Domain Awareness</td>
<td>JIATF-S</td>
<td>Field Demonstration</td>
<td>JIATF-S AOR; US SOUTHCOM AOR</td>
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</tr>
<tr>
<td>FY-11: Border Security</td>
<td>CBP, JIATF-S</td>
<td>Field Demonstration</td>
<td>Southern AZ; CBP, Tucson Sector</td>
<td>4</td>
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<tr>
<td>FY-12: Border Security</td>
<td>CBP, USCG, JIATF-S</td>
<td>Field Demonstration</td>
<td>Southern TX; CBP, RGV Sector</td>
<td>6</td>
</tr>
<tr>
<td>FY-13: Border Security</td>
<td>10 Operational Partners</td>
<td>Two Field Demonstrations</td>
<td>Southern TX; CBP, RGV Sector</td>
<td>29</td>
</tr>
<tr>
<td>FY-14: Identifying Future Focusses</td>
<td>25 Organizations Participated</td>
<td>Analytical Panel</td>
<td>Reston, VA</td>
<td>N/A</td>
</tr>
<tr>
<td>C/B WMD via US SE Maritime Pathways</td>
<td>18 Operational Partners</td>
<td>Tabletop Experiment and Two Field Demonstrations</td>
<td>Florida USCG AOR; and Edgewood, MD</td>
<td>36</td>
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<tr>
<td>FY-15: Arctic Challenges</td>
<td>20 Operational Partners</td>
<td>Tabletop Experiment and Field Demonstration</td>
<td>US NORTHCOM; and Army CRREL, Hanover, NH</td>
<td>17</td>
</tr>
<tr>
<td>C/B Sensor UAS &amp; C-UAS (WMD)</td>
<td>35 Operational Partners</td>
<td>Field Demonstration</td>
<td>Camp Shelby, MS</td>
<td>11</td>
</tr>
<tr>
<td>Ground Area Denial</td>
<td>12 Operational Partners</td>
<td>Tabletop Experiment</td>
<td>Fort Leonard Wood, MO</td>
<td>N/A</td>
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<tr>
<td>FY-16: Arctic Challenges</td>
<td>7 Organizations Participated</td>
<td>Field Demonstration</td>
<td>Fort Wainwright ; USCG Cutter Hickory, Homer, AK</td>
<td>16</td>
</tr>
<tr>
<td>Dense Urban and Subterranean</td>
<td>23 Operational Partners</td>
<td>Field Demonstration</td>
<td>Fort A.P. Hill, VA, Joint Base Anacostia-Bolling, DC</td>
<td>22</td>
</tr>
<tr>
<td>Protection of Key Assets and Facility Security</td>
<td>22 Operational Partners</td>
<td>Field Demonstration</td>
<td>Kings Bay, GA</td>
<td>29</td>
</tr>
</tbody>
</table>
## Previous Events

<table>
<thead>
<tr>
<th>Focus Area</th>
<th>Key Operational Partners</th>
<th>Event</th>
<th>Location</th>
<th>Technologies Demonstrated</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FY-17:</strong> Dense Urban/ Subterranean</td>
<td>55 Operational Partners (Organizations Represented)</td>
<td>Field Demonstration</td>
<td>New York City, NY</td>
<td>20</td>
</tr>
<tr>
<td>Protection of Government Infrastructure and Facility Security</td>
<td>36 Operational Partners (Organizations Represented)</td>
<td>Field Demonstration</td>
<td>Blossom Point, MD</td>
<td>22</td>
</tr>
<tr>
<td><strong>FY-18:</strong> Small Unit Operations</td>
<td>60 Operational Partners (Organizations Represented)</td>
<td>Technology Discovery and Demonstration</td>
<td>Adjacent to Fort Bragg, NC</td>
<td>54</td>
</tr>
<tr>
<td>Dense Urban &amp; Subterranean Challenges</td>
<td>73 Operational Partners (Organizations Represented)</td>
<td>Field Demonstration</td>
<td>New York, NY</td>
<td>28</td>
</tr>
<tr>
<td>Sense Through the Wall and Color Night Vision</td>
<td>27 Operational Partners (Organizations Represented)</td>
<td>Limited Objective Field Demonstration</td>
<td>Adjacent to Fort Bragg, NC</td>
<td>10</td>
</tr>
<tr>
<td><strong>FY-19:</strong> Port &amp; Harbor Security Swimmer/Diver Detection, Tracking and Identification</td>
<td>30 Operational Partners (Organizations Represented)</td>
<td>Field Demonstration and Experiment</td>
<td>Truman Annex Key West, FL</td>
<td>9</td>
</tr>
<tr>
<td>Multi-Domain Operations</td>
<td>62 Operational Partners (Organizations Represented)</td>
<td>Field Demonstration and Experiment</td>
<td>New York, NY</td>
<td>27</td>
</tr>
<tr>
<td>Sense Through the Wall</td>
<td>23 Operational Partners (Organizations Represented)</td>
<td>Field Demonstration and Experiment</td>
<td>Maryland Fire and Rescue Institute, MD</td>
<td>9</td>
</tr>
<tr>
<td><strong>FY-20:</strong> OUSD R&amp;E Technology Focus Areas</td>
<td>100+ Operational Partners (Organizations Represented)</td>
<td>Technology Discovery and Demonstration</td>
<td>Chantilly, VA</td>
<td>76</td>
</tr>
</tbody>
</table>
Summary

- Since FY16, Thunderstorm has introduced 330 new and emerging technologies to over 1,132 DoD, IC, and other government representatives.

- Results have included:

  - Vendors:
    - Invited for additional testing at a government site
    - Invited to participate in future field events
    - Transitioned to the end-user
  
  - Government:
    - Introduced to new & emerging technologies
    - Introduced to non-traditional vendors
    - Discover DoD applicability of existing commercial products
    - Informed investment decisions
    - Formation of official Working Groups
Upcoming Events

- **Thunderstorm 20-2: AI/ML Enabled Sensor Technologies and Autonomous Operations**
  - Thunderstorm 20-2 is a technology field demonstration and experimentation event focused on autonomous operations of unmanned vehicles and equipment supported by artificial intelligence/machine learning (AI/ML) capabilities.
  
  - Event is scheduled for 26 Oct – 06 Nov 2020 at the Crucible training facilities located in Fredericksburg, VA

  - Please email [Thunderstorm@arl.psu.edu](mailto:Thunderstorm@arl.psu.edu) for more details
Upcoming Events

- **Thunderstorm 21-1: Virtual Reality (VR) Tools in Support of Enhancing Small Unit Lethality**

  - This virtual event will focus on Virtual Reality (VR) Tools in Support of Enhancing Small Unit Lethality leveraging autonomy and Artificial Intelligence/Machine Learning (AI/ML) technologies capable of providing the operator with ways to improve planning, decision making and efficiency; reduce cost, workload, and risk; improve safety of the operator and operating equipment, and enhance situational awareness in both the rapid response planning and execution of small unit operations.

  - Event scheduled for the week of Oct. 5th 2020

  - To RSVP please visit:

    [https://einvitations.afit.edu/inv/anim.cfm?i=564784&k=0767460E7353](https://einvitations.afit.edu/inv/anim.cfm?i=564784&k=0767460E7353)

  ****RSVP to receive the event link and additional demonstrator information****
Vendors with relevant technologies and capabilities are encouraged to respond to the Thunderstorm beta.SAM.gov postings.

For more information on the program and how to engage, please contact the:

Rapid Reaction Technology Office
osd.pentagon.ousd-atl.list.rrto-poc@mail.mil