DTRA Test Science and Technology Department

Programs and Enabling Capabilities

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DoDD 5105.62 – DTRA Director:

- Manages and oversees *DTRA research, development, test, and evaluation (RDT&E)* and acquisition needed to support DoD mission areas in support of DoDD 2060.02 (DoD Combating Weapons of Mass Destruction (WMD) Policy), which states the ATSD(NCB), under the USD(AT&L), shall oversee DTRA in the management of *RDT&E needed to counter the threat and use of WMD*...

- Researches and develops technologies to *maintain readiness* to conduct effects experiments, including those needed if *underground nuclear weapons testing* is resumed

- Researches, develops, and *evaluates advanced weapons* and their *lethal or collateral effects*, including *analysis of delivery options and weapon/target interaction*, against the spectrum of WMD-related targets
DTRA J9 Strategic Plan: J9TS Tasks

- DTRA J9 provides a **unique National testing capability** for simulated WMD facility characterization, weapon-target interactions, WMD facility defeat, and asymmetric threat defeat
  - Conduct **operationally-relevant test and evaluation** supporting development of CWMD capabilities and technologies, including detection, tracking, and defeat systems and weapons, as well as tactics, techniques and procedures
  - Provide **end-to-end test and construction** program management, oversee construction and fielding activities, plan and direct test execution events, and ensure the collection and reporting of critical test data
  - Provide **state-of-the-art instrumentation** support, including engineering expertise for instrumentation plans and diagnostics tools
  - Provide research, studies, and **test science** support for RDT&E of CWMD systems and technologies, special weapons effects, survivable structures and systems, and treaty verification technologies
  - Use **robust processes** to provide test event planning, management, and execution, data analyses, and testbed/test article management that supports test objectives for DTRA and other DoD and U.S. Government agency customers.
J9TS Test Beds Kirtland AFB

Chestnut Site
up to a 2000lb NEW

GRABS Site
up to 900lb NEW
J9TS Test Beds Nevada National Security Site

https://www.nnss.gov/pages/resources/library/Media.html
J9TS Programs

Purpose of Establishing Programs:
• Efficiently meet customer test objectives:
  • Minimum test bed infrastructure to address mission needs
  • Low cost, “best value” testing
• Develop capabilities to meet evolving CWMD testing needs
• Partner with DTRA program managers to develop and start transition of test diagnostics to operational capabilities

Chemical/Biological Testing Program

Radiological/Nuclear Materials Detection Testing Program

Chemical/Biological Testing Program

- Program Goals:
  - Provide test validation to enhance CCDR confidence in pre-strike modeling and simulation tools for potential agent release
  - Develop and transition stand-off sensor capabilities to provide robust characterization of chem/bio plumes
  - Identify signatures and determine effectiveness of improvised devices containing chem/bio agents
  - Provide high-confidence, repeatable assessments of weapon performance for agent defeat effectiveness
  - Support TTP development for first responders/investigators

- Partners/Custumers: DTRA, FBI, ECBC, JPEO-CBD, Others
**Objective:** To provide *world-class venues* for the test and evaluation of developmental sensors and detection technologies, and the TTPs to use them, in a *realistic environment* with *realistic sources*

Partners/Custonmers: DTRA J9NTD, DNDO, NNSA, others
1. Mobile Instrumentation Integration
   - **Objective:** Support WMD testing anywhere in the world with State-of-the-art diagnostics capabilities

2. Remote Sensing Test Diagnostics
   - **Objective:** Develop & transition novel test diagnostics for further development & potential OPS
   - **Elements:** seismo-acoustic arrays, photogrammetry, RF characterization, optical/MSI/HSI sensors, integrated NTM

3. Explosives Expertise
   - **Objective:** Ability to produce desired source uniformity at any yield, and partner with IHEODTD for adapting IED designs & employing HME
   - **Customers:** J9CB, J9CX, J9NT, JIDO, FBI

4. UAS, UGS, and Autonomous Systems
   - **Objective:** Be a key DoD player in the T&E of autonomous systems & enable their integration as diagnostics in CWMD test events
   - **Elements:** Photogrammetry, Rad/Nuke Materials Detection/Characterization, Chem/Bio plume analysis
1. Dynamic Digital Photogrammetry
   • 2\textsuperscript{nd} UAS autonomously maintains appropriate altitude relative to piloted vehicle
   • Potential for adaptive jitter correction

2. Rad/Nuke Materials Detection in realistic environment
   • DTRA swarm for mapping area of interest: 3-D map generated in real-time
   • DTRA UAS with integrated DTRA radiation/SNM detector for source location, identification, and characterization
   • TEAMS Test events:
     • Initial event: Sources hidden in container stack
     • Culmination event: Sources above/below ground structures

3. Chem/Bio plume characterization
   • UAS-based LIDAR to characterize plume boundary and micro-wind field
   • On-board modeling to adapt swarm to evolving plume
   • UAS-based HSI to characterize plume constituents, and aerosol/vapor fractions
   • Individual UAS plume sampling with on-board analysis capability
QUESTIONS?

WWII “Manhattan Project” -- Cold War -- Gulf War I -- Terror Attacks -- Gulf War II -- Today

Nuclear Weapons -- Simulated Nuclear Weapon Air Blast -- AT/FP/CT -- CP/AD/CWMD -- HTD