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STTC

DTRA Test Science and Technology Department

Programs and Enabling Capabilities

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July 13, 2017



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DTRA RDT&E – OSD Mandate

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



Department of Defense DIRECTIVE

> NUMBER 5105.62 April 24, 2013

> > DA&M

SUBJECT: Defense Threat Reduction Agency (DTRA)

References: See Enclosure 1

 <u>DURPOSE</u>. Pursuant to the authority vested in the Secretary of Defense by Title 10, United States Code (U.S.C.) (Reference (a)), this directive reissues DoD Directive (DoDD) 5105.62 (Reference (b)) to update the mission, organization and management, responsibilities and functions, relationships, authorities, and administration of DTRA.

2. <u>APPLICABULTY</u>. This directive applies to OSD, the Military Departments, the Office of the Chairman of the Joint Chiefs of Staff (CJCS) and the Joint Staff, the Combatant Commands (CCMDs), the Office of the Inspector General of the Department of Defense, the Defense Agencies, the DoD Field Activities, and all other organizational entities within the DoD (referred to collectively in this directive as the "DoD Components").

3. MISSION

a. The mission of DTRA is to safeguard the United States and its allies from weapons of mass destruction (WMD) threats globally.

b. DTRA has a unique role in DoD efforts regarding countering weapons of mass destruction (CWMD), and supports a broad range of activities across the CWMD mission. DTRA provides integrated technical and operational solutions, as well as intellectual capital, to inform and support both DoD and national-level policies and strategies to address WMD threats to the homeland as well as to the warfighter. As such, DTRA supports the CWMD activities of the U.S. Government (USG) and its allies at the news between WMD and terrorism.

4. ORGANIZATION AND MANAGEMENT

a. DTRA is a Defense Agency, in accordance with sections 191 and 192 of Reference (a), under the authority, direction, and control of the Under Secretary of Defense for Acquisition, Technology, and Logistics (USD(AT&L)), through the Assistant Secretary of Defense for



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



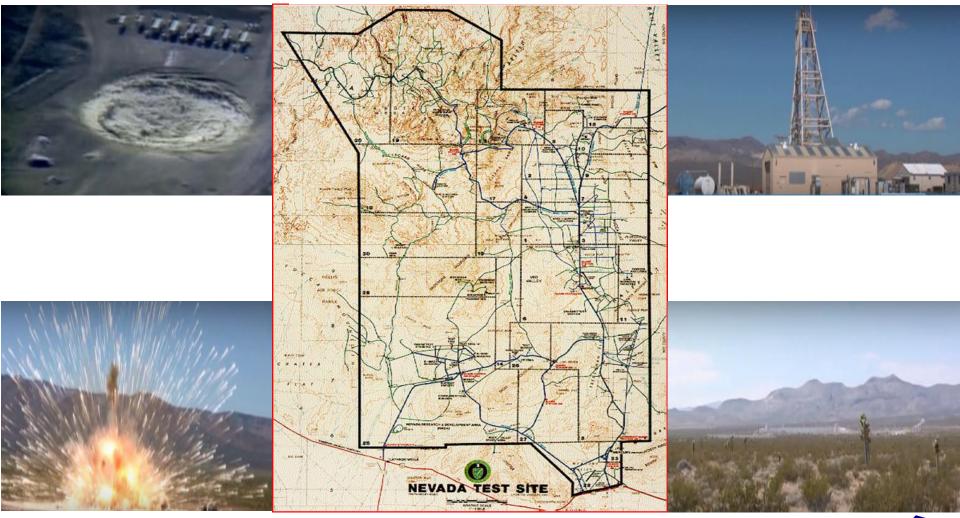
GRABS Site up to 900lb NEW





J9TS Test Beds Nevada National Security Site

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





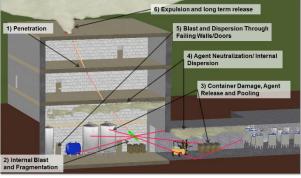
J9TS Programs

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



Radiological/Nuclear Materials Detection Testing Program



Chemical/Biological Testing Program

United States Nuclear Tests, July 1945 through September 1992, DOE/NV-209 (Rev. 14), December 1994



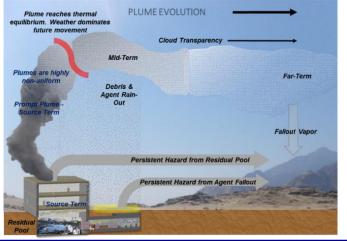
Nuclear Event Characterization Testing Program

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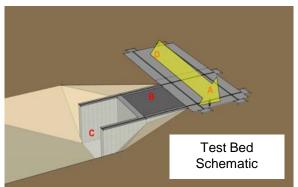
Chemical/Biological Testing Program

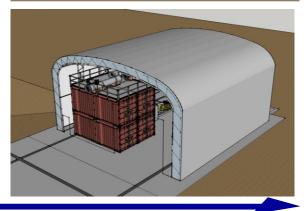
- Program Goals:
 - Provide test validation to enhance CCDR confidence in prestrike modeling and simulation tools for potential agent release
 - Develop and transition stand-off sensor capabilities to provide robust characterization of chem/bio plumes
 - Identify signatures and determine effectiveness 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/Customers: DTRA, FBI, ECBC, JPEO-CBD, Others











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Radiological/Nuclear Materials Detection Testing Program

Objective: To provide <u>world-class venues</u> for the test and evaluation of developmental sensors and detection technologies, and the TTPs to use them, in a <u>realistic environment</u> with <u>realistic</u> <u>sources</u>

Partners/Customers: DTRA J9NTD, DNDO, NNSA, others

Technical Evaluation Assessment Monitor Site (TEAMS)



Nevada National Security Site



Sources





Container Stack



J9TS Enabling Capabilities

- 1. Mobile Instrumentation Integration
 - Objective: Support WMD testing anywhere in the world with State-of-the-art diagnostics capabilities

2. Remote Sensing Test Diagnostics

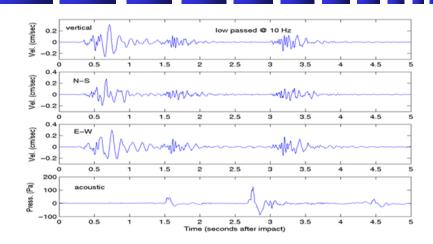
- Objective: Develop & transition novel test diagnostics for further development & potential OPS
- *Elements:* seismo-acoustic arrays, photogrammetry, RF characterization, optical/MSI/HSI sensors, integrated NTM

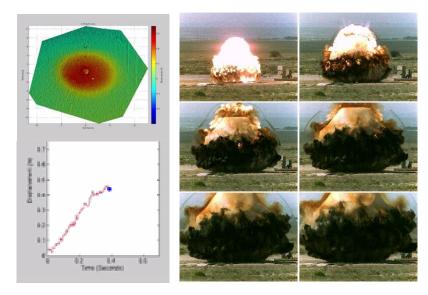
3. Explosives Expertise

- 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



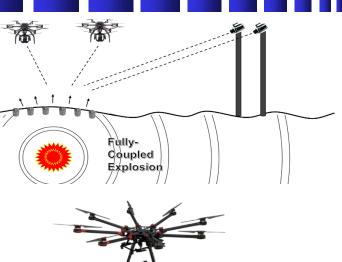


Autonomous Systems & UAS Development Path

- 1. Dynamic Digital Photogrammetry
 - 2nd 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:

ncreasing Complexity

- 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

