

# DTRA Research and Development



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**The Overall Classification of this  
Brief is Unclassified**

# Organization Hierarchy

**Mission: The Research and Development Directorate provides science, technology, and capability development investments that maintain the U.S. military's technological superiority in countering weapons of mass destruction & emerging threats, mitigate the risks of technical surprise, and respond to the warfighters' urgent technical requirements**





# NDS Alignment / DTRA Focus Areas



## Competition in the "Grey Zone"

- New Approaches to Conduct WMD vulnerability analysis to identify linkages between network nodes and associated "people, places, and things"
- Develop options to disrupt networks applying a whole of government approach
- Develop and deliver tailored capabilities to disrupt networks short of armed conflict



## Decisive Conventional Force

- Assessing/developing advanced warheads to defeat WMD targets with minimal collateral effects
- Providing targeting support to Combatant Commands focused on WMD and on Hard and Deeply Buried Targets (HDBT) facilities



## Strong Nuclear Deterrent

- Supporting Combatant Commands' responsibilities in conventional/nuclear targeting
- Providing planning tools and technologies to operate on a contaminated battlefield

Focus: DTRA has pivoted to the principal tenets of the National Defense Strategy and has key roles in each.

# Research and Development Departments



*Deliver innovative solutions that meet current mission requirements in a timely manner*

*Anticipate and prepare for emerging and future threats with a balance of fundamental and applied research across the portfolio*

# RD-CB: Chemical Biological Technologies Department



CB has a broad mission to lead the DoD science and technology to anticipate, defend and safeguard against chemical and biological threats for the warfighter and nation. We do this by focusing on our three strategic priorities: Integrated early warning, Integrated layered defense, and Prepare for surprise

As a department, our near-term priorities focus on:

- Protecting the warfighter through medical countermeasure development
- Integrated early warning

We accomplish this through:

- CB detection
- Diagnostics
- Wearable technologies



ExAnT: Expeditionary Analytical Toolkit



Unconventional Detection Modalities



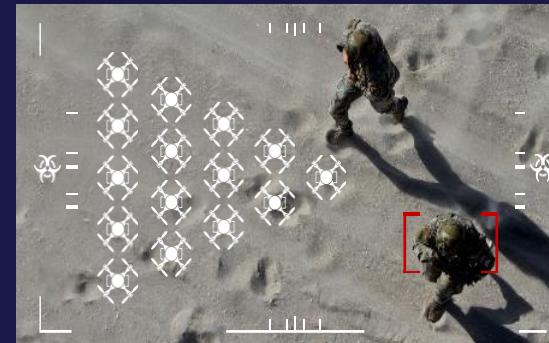
Enhanced/Emerging Biothreat Sensing



Distributed CB Reconnaissance



Unattended Perimeter Monitoring



Prepare for Surprise



# RD-NT: Nuclear Technologies Department



Develop capabilities that enable an effective nuclear deterrent, integrate conventional forces to operate effectively in a nuclear environment, and counter nuclear threat networks

## Nuclear Weapon Effects

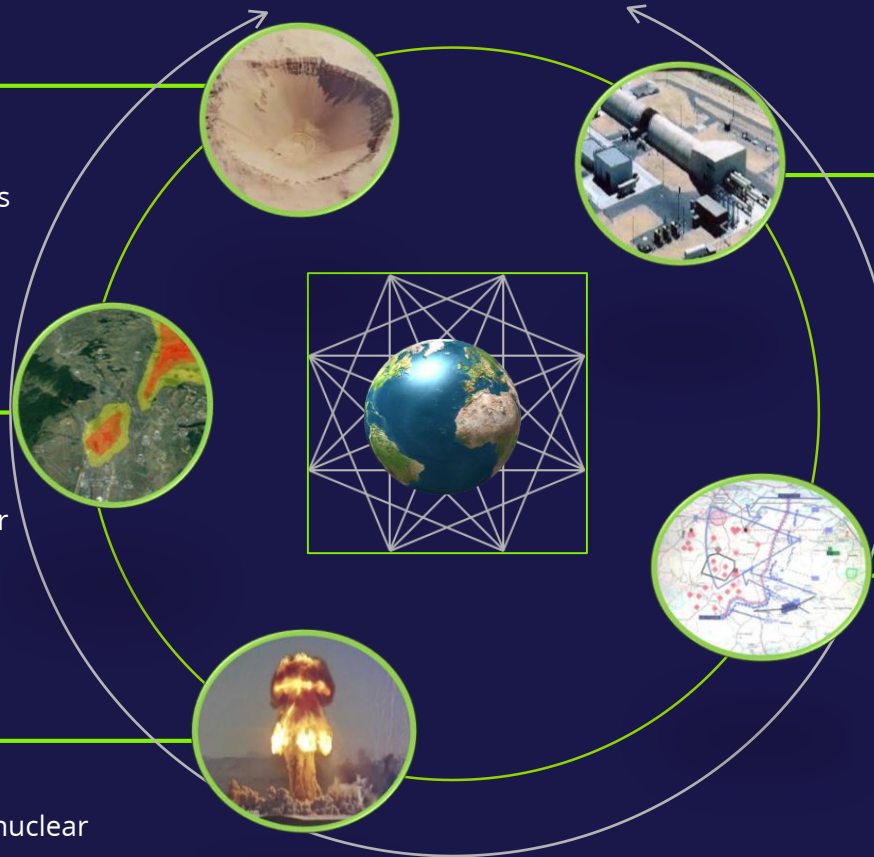
Modeling & simulation tools for nuclear targeting and consequence of execution assessment  
Use existing test data to certify new nuclear capabilities without nuclear testing

## Nuclear Assessments

Develop tools to integrate mission impacts of nuclear effects into DoD wargames, exercises and training  
Develop multi mission technologies to monitor nuclear detonation data and signals  
Install, operate, and improve U.S. International Monitoring System capabilities

## Nuclear Threat Detection

Sensors for characterization of the nuclear battlefield  
Technologies to collect, analyze, exploit, and attribute nuclear detonation data and signals



## Nuclear Survivability

Develop nuclear environments, protection standards, and handbooks  
Operate large pulsed power machines to produce intense bursts of radiation simulating a nuclear weapon  
Mission critical systems analysis to characterize nuclear survivability shortfalls

## Nuclear Technologies Integration

Provide cloud ready nuclear modeling interfaces and applications  
Deliver timely electronic access to nuclear testing archives  
Enable warfighter to visualize nuclear battlefield through integrated Common Operating Picture

# RD-CX: Counter WMD Technologies Department



Develop, demonstrate, and transition innovative technologies and capabilities to actively counter the full spectrum of CBRNE threats.

## Target Assessment Technology

Develop, apply, and transition innovative technologies to characterize and assess WMD threats and Hard & Deeply Buried Targets (HDBTs)



## Combating Terrorism

Provide Combatant Commanders\* improved offensive capabilities in support of counter terrorism and counter proliferation missions to combat weapons of mass destruction



## Counterforce Systems

Develop, integrate, demonstrate and transition Counter WMD advanced sensors, surveillance, and defeat target planning technologies in support of warfighter operations



## Weapons and Capabilities

Support CCMDs through research, development, and transition of offensive weapons and other capabilities to combat WMD while mitigating collateral contamination effects



## Urgent Solutions

Develop CWMD capabilities supporting CCMDs' ability to harness disruptive technologies for offensive advantage in Great Power Competition and provide urgent capabilities for competition below the level of armed conflict focusing on Irregular Warfare to defeat WMD threats



## Advanced Research

Couple long range fundamental and applied research with technology development in the physical, life, and computational sciences to enhance kill chain activities in combating emerging WMD threats



# RD-EC: Enabling Capabilities



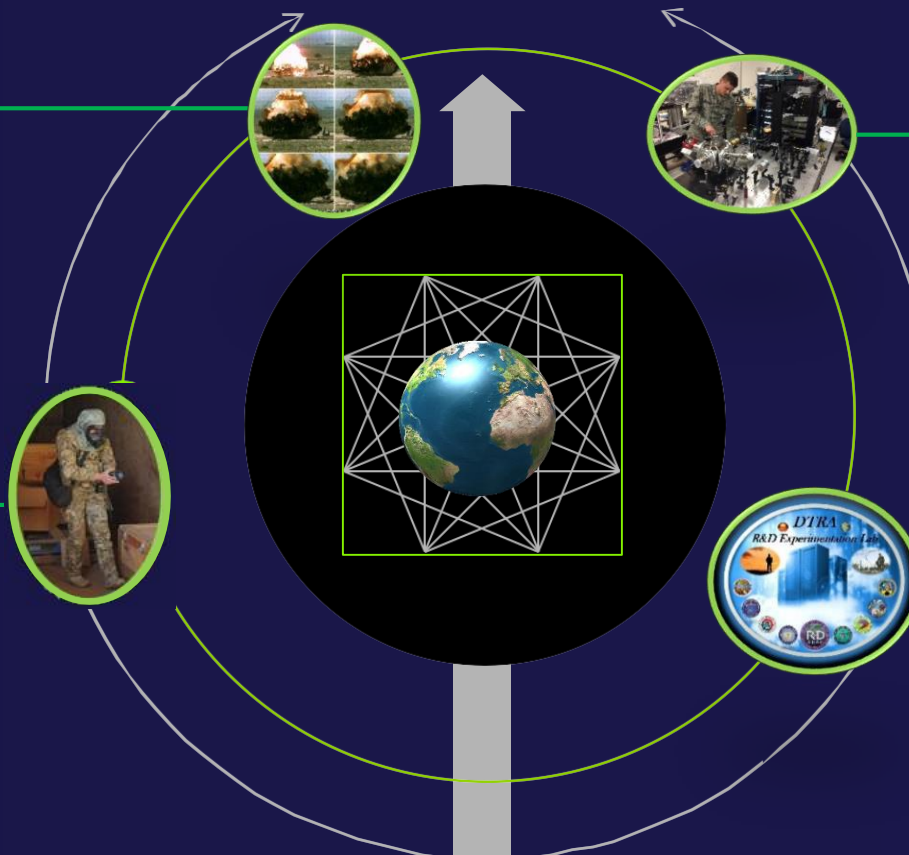
*Provide innovative science and technology to enable the development, evaluation, and validation of capabilities for DTRA, DoD, and federal partners that maintain U.S. superiority in countering weapons of mass destruction (CWMD) and emerging threats, mitigate the risks of technological surprise, and respond to the warfighter's urgent requirements*

## CWMD Test and Evaluation

Robust scientific and engineering expertise to design, construct and instrument threat representative WMD test environments. Capabilities cover the spectrum of chemical, biological, radiological, nuclear, high explosive and emerging threats. This mobile capability supports T&E efforts from development of initial test requirements to the final test report.

## Rapid Warfighter Assessments

Worldwide, rapid, and independent vulnerability, operational, and other specialized assessment support for urgent warfighter requirements. Detailed reporting for senior decision makers to maintain superiority and mitigate the risks of technological surprise.



## Basic and Innovative Research

Serves the warfighter through innovation and discovery in the basic sciences to reduce the threat of Weapons of Mass Destruction (WMD) and grow the next generation scientific workforce to lead the fight against mankind's most dangerous weapons. Strategic investment in basic research will lead to the scientific breakthroughs needed for future WMD threat reduction.

## DTRA Experimental Laboratory (DEL) and HPC

DEL supports computer hardware and software R&D to counter WMD and emerging threats, as well as 24/7 support to DTRA Reachback capability. HPC provides computational resources that enable numerical modeling and simulation in support of the Agency mission by providing access to the DoD High Performance Computing Modernization Program (HPCMP) and its five DoD Supercomputing Resource Centers.



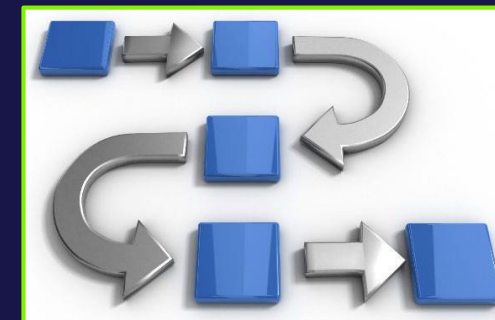
# RD-OP: RD Operations Department



Operations is a strategic enabler to improve HOW we do our work in RD – working smarter, not harder. We leverage Technical Reach back, CWMD Information Integration, Strategic Engagements, Requirements and Acquisition support across the Directorate. Operations works to best leverage resources to drive Directorate success by providing technical and operational expertise across RD.



*Technical Reachback*



*End to End Support:  
Requirements, to Acquisition,  
to Transition and Fielding*



*Advanced Data  
Science Tools for RD's  
Mission*

Combatant Command Customers



Service Customers



International Engagements



# How We Work Together (for Performers)



## How We Can Help You

- Ensure that DTRA understands how your capabilities/developments are relevant to the CWMD fight
- Help push new capabilities to interested stakeholders (e.g., organize tech demos with government sponsors together)
- Collaborate with international/interagency partners as appropriate
- Develop/Shape/Access DTRA and partner contract vehicles when possible

## How You Can Help Us

- Facilitate introductions to your government sponsors with similar capability requirements or development work (i.e. matchmaker)
- Share information: let us know where DTRA can share DTRA-sponsored capability development with other government sponsors and where DTRA can leverage work sponsored by other government entities
- Let DTRA know if you have the ability to work with the international community or have ITAR-approved products

# RD Directorate Future Requirements



- Four Annual R&D Broad Agency Announcements (BAAs)\*
  - Strategic Trends (End Feb 2025)
  - Research and Development Innovations – TRL 3-7 (End Feb 2027)\*
  - New Initiatives for Nuclear Detection Technologies (End Dec 2024)
  - Fundamental Research to Counter WMD – Basic Research in Chem/Bio (End Sept 2024)
- Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) Programs\*
- CWMD R&D Indefinite Delivery Indefinite Quantity (IDIQ) Contract\* (current)
  - 10 year effort with 6 Prime Contractors and over 150 Sub-Contractors
  - Current total awards \$1.6 Billion encompassing all aspects of DTRA CWMD R&D
- CWMD R&D IDIQ Contract\* (pending solicitation and award)
  - Comprised of 3 overarching Mission Pools to provide more tailored and focused development
  - Planned award – Nov/Dec 2022



# RD Summary



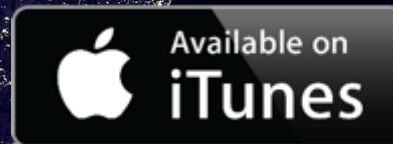
- DoD's sole R&D organization focused only on CWMD and emerging threats
- Conduct unique and essential CWMD and emerging threat technology development, test, and assessment efforts
- Integrated and coordinated portfolio leverages DoD, Interagency, and international partners to provide support to our warfighters
- Comprehensive R&D investment increases agility to respond to new/changing Combatant Command requirements and national and DoD CWMD priorities



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