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DEFENSE THREAT REDUCTION AGENCY

# ***DTRA Research and Development 101***

*Executive Deck*

*Deter. Prevent. Prevail.*

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Approved For Public Release- 6176



# Agenda

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- Leadership and Organization
- Mission and Functions
- RD Departments
  - Chemical and Biological Technologies
  - Counter WMD Technologies
  - Nuclear Technologies
  - Test and Assessment
  - Operations
- Wrap Up



# RD Leadership

**Ms. Amanda Richardson**  
RD Director  
(Acting)



**COL Alex Wehmeyer**  
RD Deputy  
Director



**Mr. Carl Brown**  
RD Chief of  
Staff

## DEPARTMENT LEADERSHIP



**CHEM-BIO TECHNOLOGIES (RD-CB)**  
**Dr. Robert Kristovich**  
RD-CB, Director



**CWMD TECHNOLOGIES (RD-CX)**  
**COL Jeffrey Kendellen**  
RD-CX, Director (Acting)



**NUCLEAR TECHNOLOGIES (RD-NT)**  
**Mr. Marc Franciszkowicz**  
RD-NT, Director



**R&D OPERATIONS (RD-OP)**  
**Mr. Dustin Eward**  
RD-OP, Chief

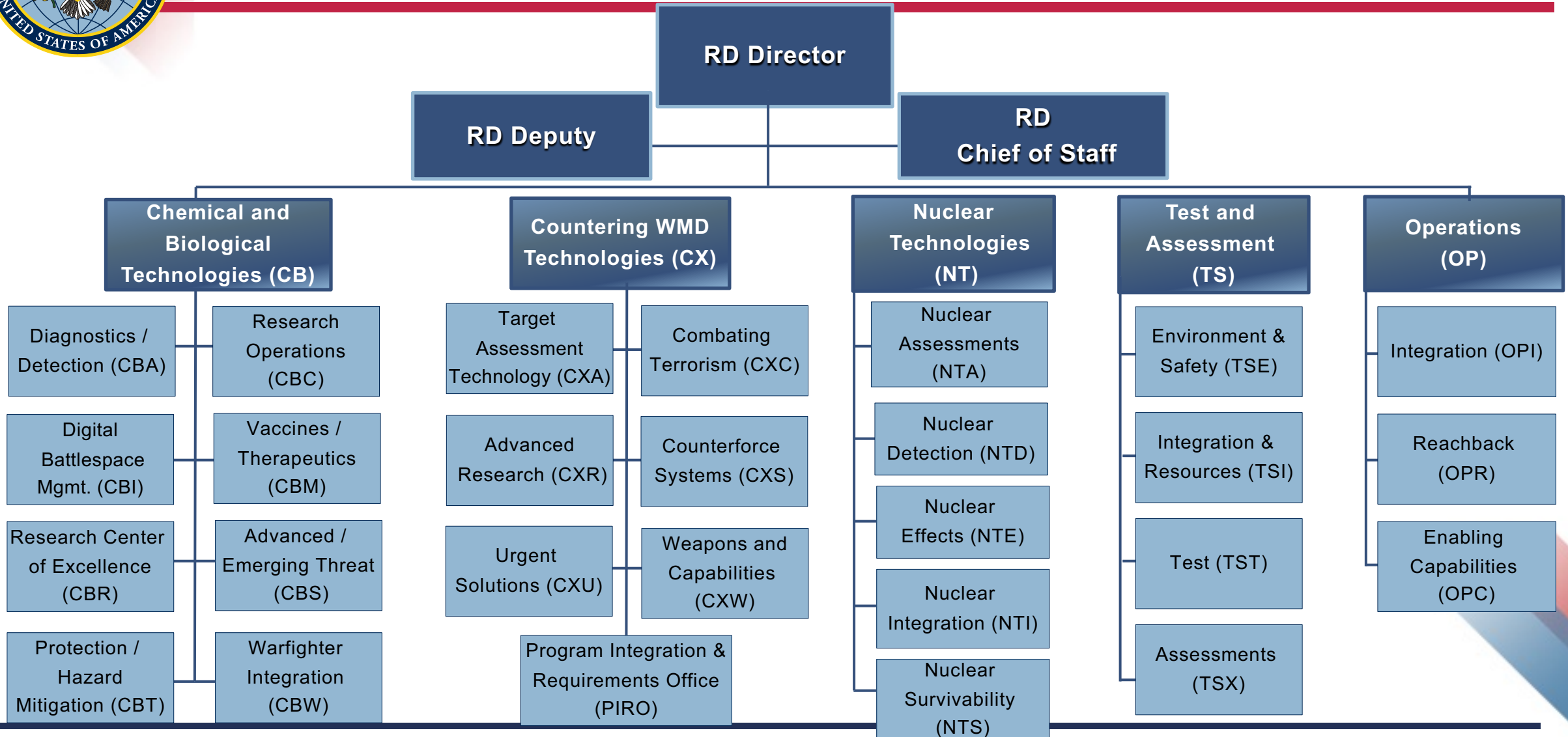


**TEST AND ASSESSMENT (RD-TS)**  
**Dr. Gary Hook**  
RD-TS, Chief



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# Research and Development Directorate



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# RD Workforce Locations



## Some Additional Workforce Locations

West Point, NY; Las Vegas, NV; Fort Liberty, NC; and Edgewood/Aberdeen Proving Ground, MD



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# RD Mission and Functions

*Provide 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 urgent technical requirements from the Joint Force.*



RD-CB: Chemical  
and Biological  
Technologies



RD-CX: Counter  
WMD Technologies



RD-NT: Nuclear  
Technologies



RD-TS: Test and  
Assessment



RD-OP: Operations

***RD executes its mission by DELIVERING INNOVATIVE SOLUTIONS that meet current mission requirements in a timely manner and by ANTICIPATING AND PREPARING FOR EMERGING AND FUTURE THREATS with a balance of fundamental and applied research across the portfolio.***



# RD Strategic Partnership

**RD partners with other U.S. Government agencies (such as National and Service Laboratories), and international S&T organizations to develop CWMD capabilities that address prioritized CCMD / Joint Force gaps.**







# RD-CB: Chemical and Biological Technologies Department

**RD-CB anticipates future threats & delivers capabilities that enable the Joint Force to survive, fight & win in chemical, and biological contested environments through a coordinated effort designed to neutralize adversarial CB threats**

## Detection and Diagnostics

- Develops minimally invasive sampling methods to predict the severity of disease, and advanced sequencing technology

## Digital Battlespace Management

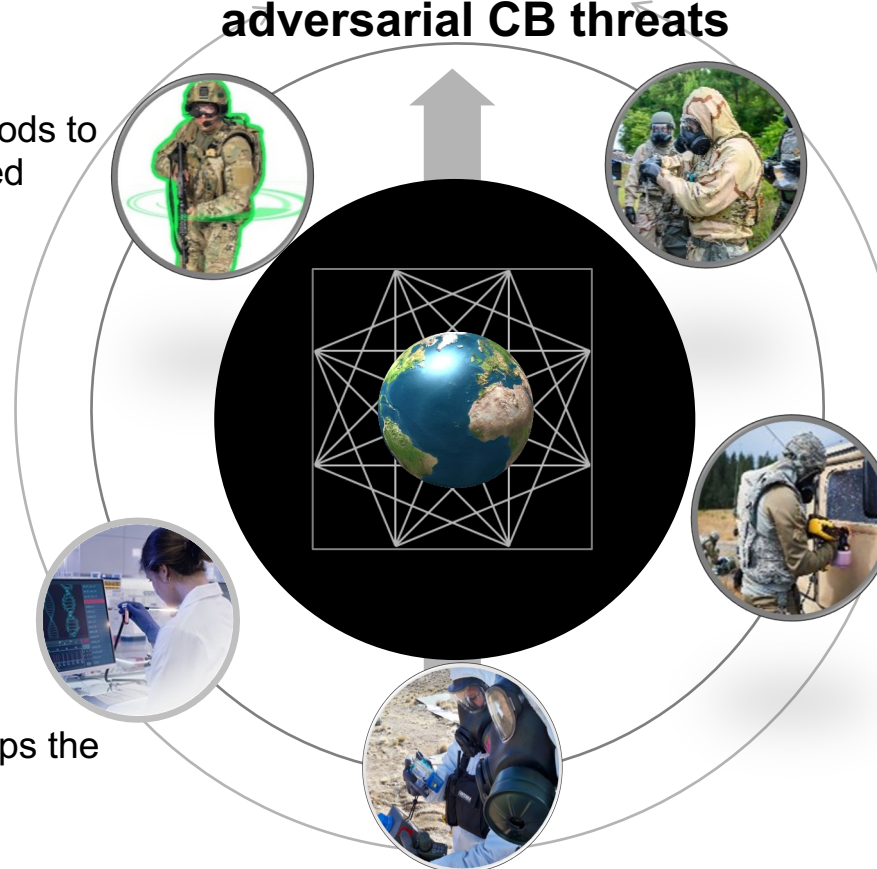
- Data fusion and analytics supporting situation awareness, decision-making, and threat management

## Protection and Hazard Mitigation

- Develops full-spectrum physical protection and hazard mitigation technologies

## Warfighter Integration

- Provides technology, education, and develops the CB workforce



## Vaccines and Therapeutics

- Investments to support medical countermeasure products, and enable recovery from current and emerging biological threats

## Advanced and Emerging Threats

- Develops and transitions products and information to address current and emerging CB threats

## Research Center of Excellence

- Develops the next generation of Department of Defense (DoD) scientists
- Conducts research in areas of interest to the Chem-Bio Defense Program and enhances Joint Force protection, and mission capabilities.

## Research Operations

- Manages daily operations of CB





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# RD-CX: Counter WMD Technologies Department

**RD-CX develops, demonstrates, and transitions innovative technologies and capabilities to actively counter the full spectrum of adversary activities across the WMD continuum**

## Target Assessment Technology

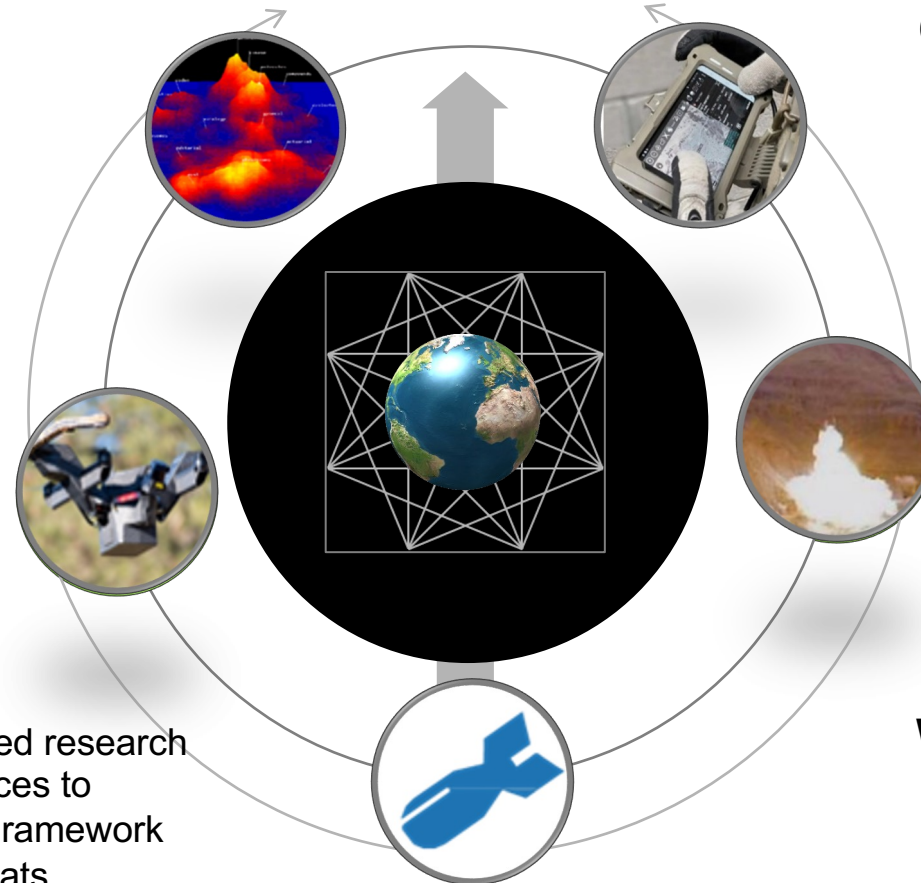
- Develop, apply, and transition innovative technologies to characterize and assess WMD threats and Hard & Deeply Buried Targets (HDBTs) in partnership with the Intelligence Community in support of Combatant Commands

## Combating Terrorism

- Provide Combatant Commanders improved offensive capabilities in support of counter-terrorism and counter-proliferation missions to combat WMDs

## Advanced Research

- Couples long-range fundamental and applied research with physical, life, and computational sciences to enhance the Offensive CWMD Capability Framework activities in combating emerging WMD threats



## Counterforce Systems

- Develop, integrate, demonstrate and transition CWMD advanced sensors, surveillance
- Defeat target planning technologies in support of Joint Force operations

## Urgent Solutions

- Execute collaborative research and timely capability development to illuminate threat WMD posture and capabilities
- Develop options to deter, disrupt, prevent WMD development / use
- Exploit adversary weaknesses
- Ensure the Joint Force prevails in conflict

## Weapons and Capabilities

- Offensive weapons and other capabilities to combat WMD while mitigating collateral contamination

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# RD-NT: Nuclear Technologies Department

**RD-NT researches, develops, and transitions nuclear weapons effects, survivability, detection, and monitoring capabilities to support and enable an effective nuclear deterrent**

## Nuclear Weapon Effects

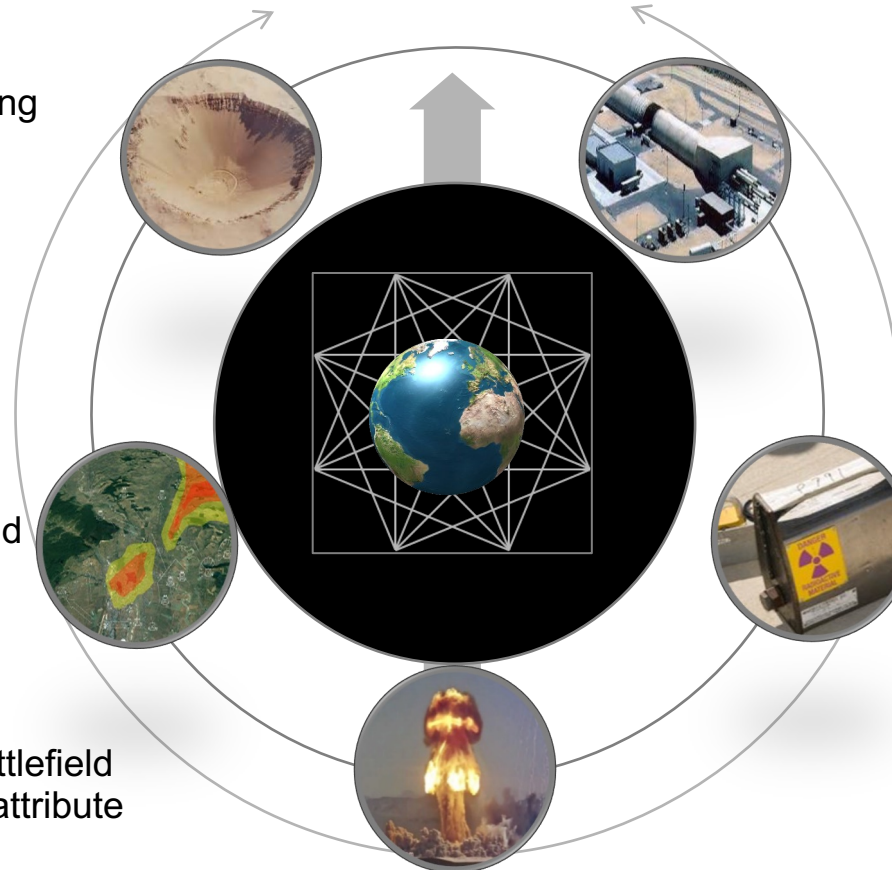
- Modeling & simulation tools for nuclear targeting and consequence of execution assessment
- Use existing test data to certify new nuclear capabilities without nuclear testing

## Nuclear Assessments

- Test concepts, capabilities, and plans through rigorous assessment and war gaming
- Integrate war gaming tools into exercises
- Nuclear Arms Control Technology Program and the U.S. International Monitoring System

## 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 the Joint Force to visualize the nuclear battlefield through an integrated Common Operating Picture



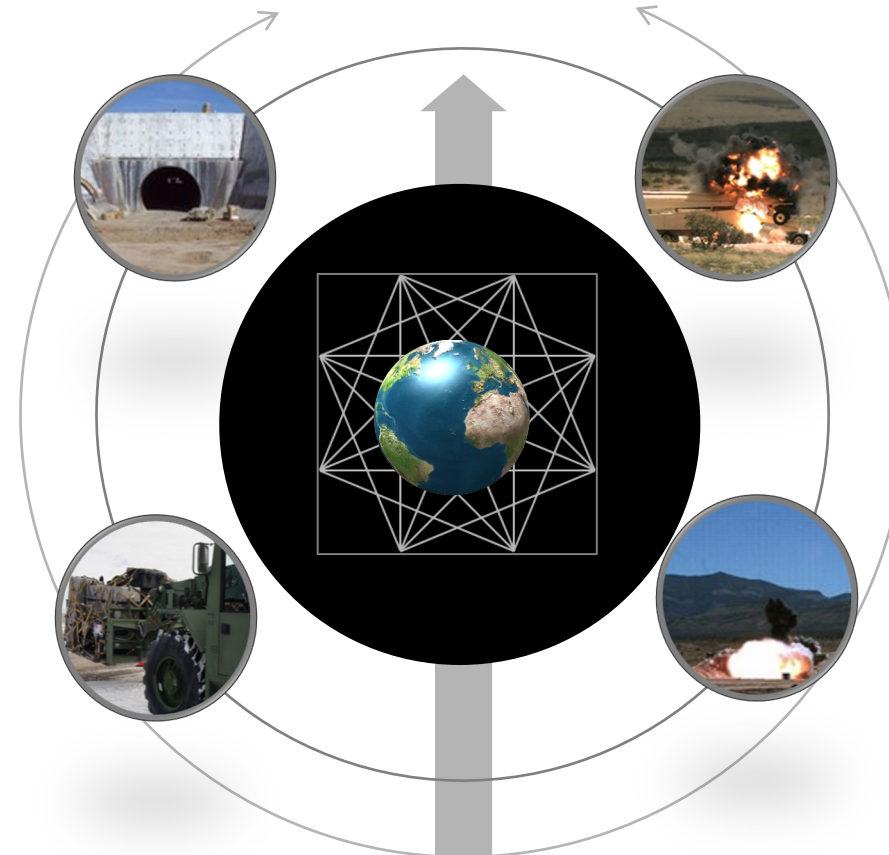
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# RD-TS: Test and Assessment Department

**RD-TS provides objective evaluations of new capabilities to support the DTRA mission and national priorities through tests and assessments**

## Environmental & Safety

- Eliminate or mitigate hazards in the workplace to reduce or eliminate the exposure of our employees to hazards associated with testing and the construction environment



## Test Division

- Conduct Test & Evaluation to maintain U.S. superiority in countering WMD and emerging threats
- Mitigate the risks of technology surprise
- Respond to Joint Force's urgent requirements

## Integration & Resource

- Ensure effective and efficient use of resources

## Sensitive Assessments

- Conduct rapid assessments to enable the DoD to deter, prevent, and prevail against WMD-armed adversaries and emerging threats





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# RD-OP: Operations Department

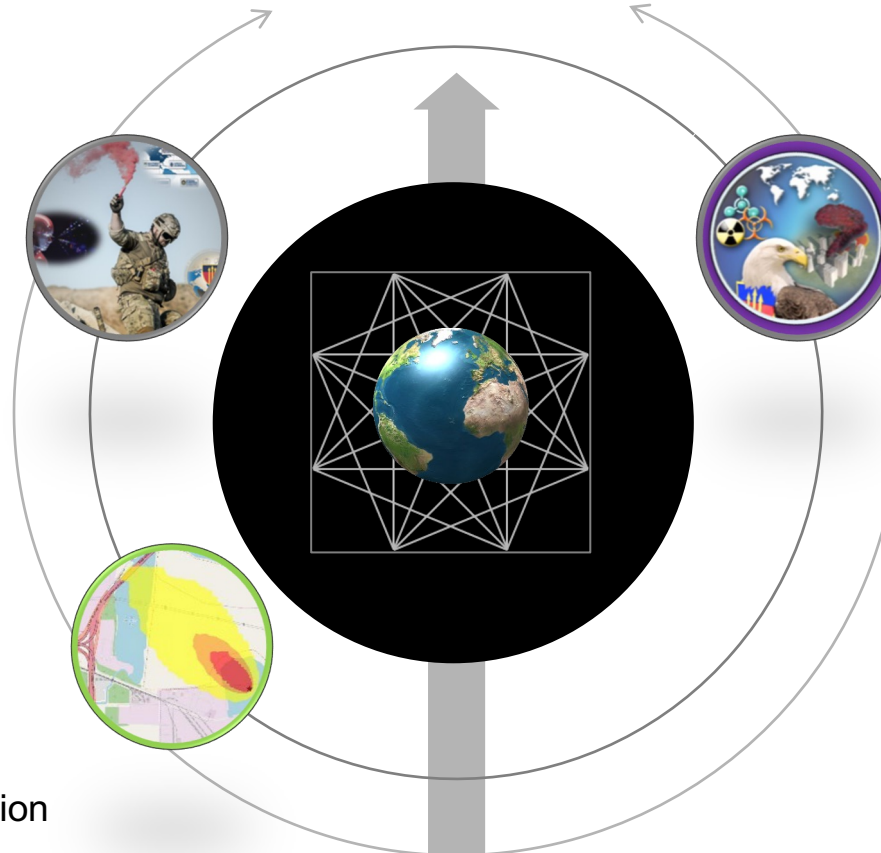
**RD-OP integrates RDT&E operations, activities and investments (OAI) across the RD Departments and the Agency, as well as with external customers**

## Integration

- Works across all RD departments and investments to ensure effective integration in areas including:
  - Directorate-wide acquisitions
  - Data visualization
  - Customer request management
  - International S&T Cooperation
  - Small business (SBIR/STTR)

## Technical Reachback

- Provides 24/7 manned CBRNE decision support capability for planning, operations, and post-event analysis
- Serves as the technical focal point for National CWMD Technical Reachback Enterprise analysis, modeling, and simulation



## Enabling Capabilities

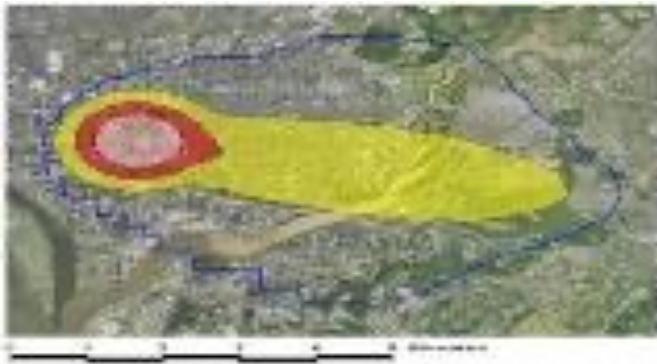
- Manages DTRA's basic research program and provides computational services, support, and coordination for the Directorate
- Includes supporting software development, through the DTRA Experimentation Laboratory (DEL), brokering access to High Performance Computing (HPC), and coordinating across programs harnessing Artificial Intelligence (AI).





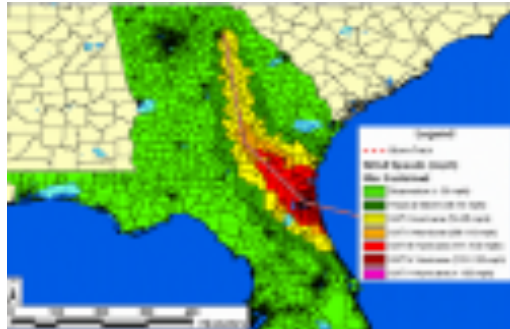
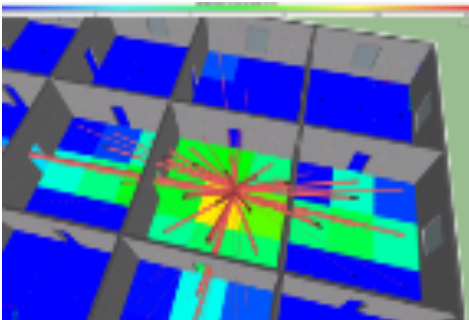
# RD-OP: Technical Reachback

Technical Reachback provides 24/7 CBRNE subject matter expertise, decision support capability for planning, operations, and post event analysis to OSD, the Combatant Commands, and other U.S. Government partners.



## Modeling Tools used by Reachback:

- Atmospheric Plume Modeling
- Waterborne & Natural Hazard Modeling



## Reachback Priorities:

- Operational support
- Enabling activities
- Epidemiological modeling
- Nuclear modeling
- Post event analysis



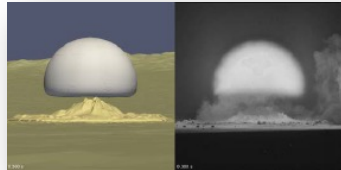
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# Developing Capabilities to Fight and Win on the CBRN Battlefield

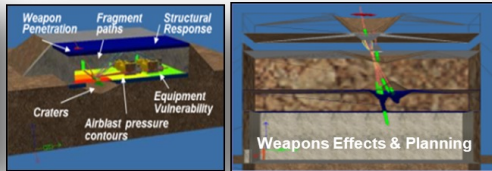
**Deliver tools that enable effective targeting of U.S. weapons and inform the consequences of attacks**

**Equip forces to operate effectively on the nuclear battlefield**

**Provide technologies, standards, historical data, and testing to ensure forces can survive and fight**



**Nuclear Effects**



**Conventional Effects**



**Mobile Field Kit-CBRN automates collection, sharing, and display of data**

**MERLIN / VIPER  
Standoff Radiation  
Detection**



**Test bed structure to support full-spectrum testing**

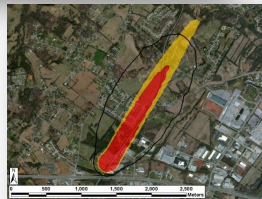
**Test concepts and plans through rigorous wargaming**

**M&S to enable planning and training**

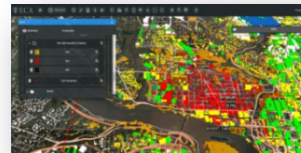


**24/7 technical analysis of CBRNE questions**

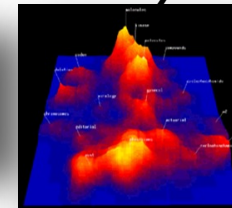
**24/7 Access to DTRA M&S tools & experts to interpret results**



**Deliver integrated, cloud-ready, AI-enhanced applications and data analysis**



**Situational Awareness Tools**



**Protect the U.S. Joint Force with advanced medical countermeasures and**



**Prophylactic and medical countermeasure treatment options unburden and protect the U.S. Joint Force**

**Rapid Analysis of Threat Exposures technology allows data from wearable devices to warn of COVID-19 infections prior to the onset of symptoms**



# DTRA R&D Summary

## DTRA Provides:

- Science, technology, and capability development investments that maintain the U.S. military's technological superiority
- An integrated and coordinated portfolio that leverages the DoD, Interagency, and international partners providing support to our U.S. Joint Forces.
- Comprehensive R&D investment to increase agility, respond to new or changing Combatant Command requirements, as well as national, and DoD CWMD priorities





**For more information, please visit us at  
[www.dtra.mil](http://www.dtra.mil)**

**Contact Information: RD Engagements Team  
[dtra.belvoir.rd.list.rd-opi-engagements-team@mail.mil](mailto:dtra.belvoir.rd.list.rd-opi-engagements-team@mail.mil)**



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