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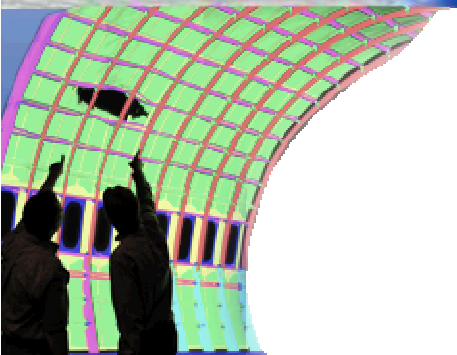
Sandia National Laboratories

Date 06/21/11

Sandia Science and Technology for Homeland Security

Peter Davies
Sandia National Laboratories



Sandia National Laboratories is a multi-program laboratory managed and operated by Sandia Corporation, a wholly owned subsidiary of Lockheed Martin Corporation, for the U.S. Department of Energy's National Nuclear Security Administration under contract DE-AC04-94AL85000.

Sandia has significant engagement across the full spectrum of Homeland Security missions and operational components

Biological & Chemical Security
DHS/S&T, DHS/OHA, NIH, EPA

Aviation & Explosives Security
DHS/S&T, DHS/TSA

Nuclear & Radiation Security
DHS/DNDO

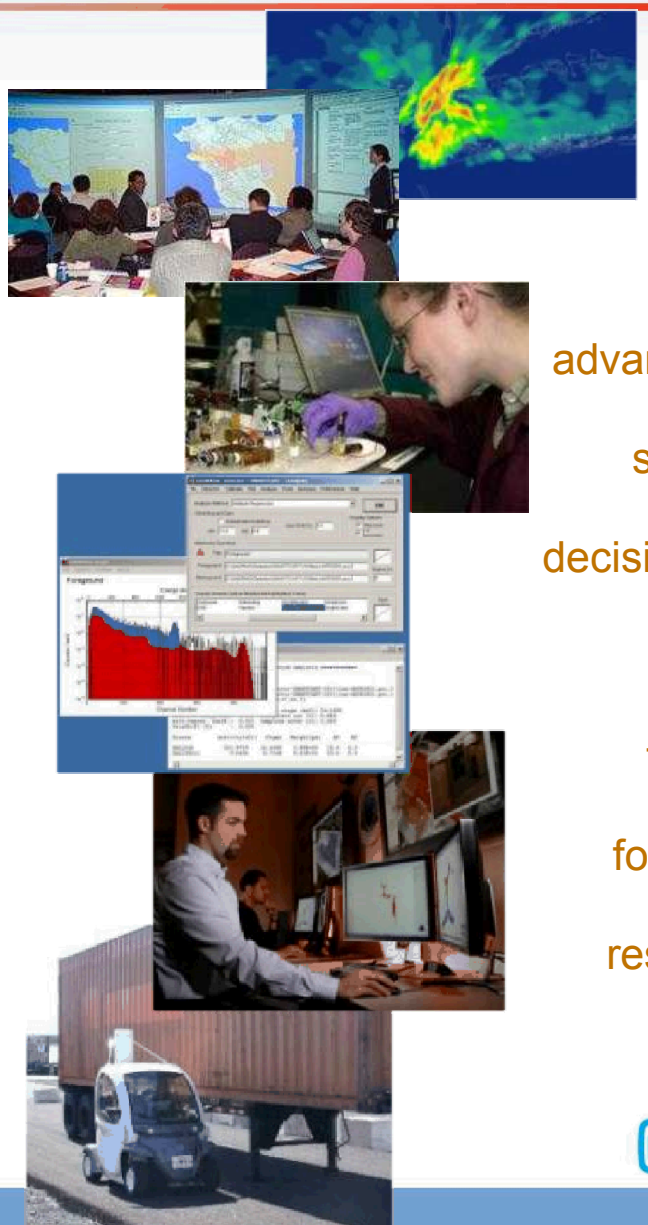
Cyber Security
DHS/NPPD, DHS/S&T

Borders & Physical Security
DHS/S&T, DHS/CBP

National Infrastructure & Analysis Center (NISAC)
DHS/NPPD

Preparedness & Decision Support
DHS/S&T, FEMA, VHA

Foundational Support & Partnerships
DHS/Office of Policy



systems analysis

risk assessment

field testing

advanced detection R&D

systems engineering

decision support systems

pilot deployments

technical reachback

forensics & attribution

restoration & recovery

cyber security S&T

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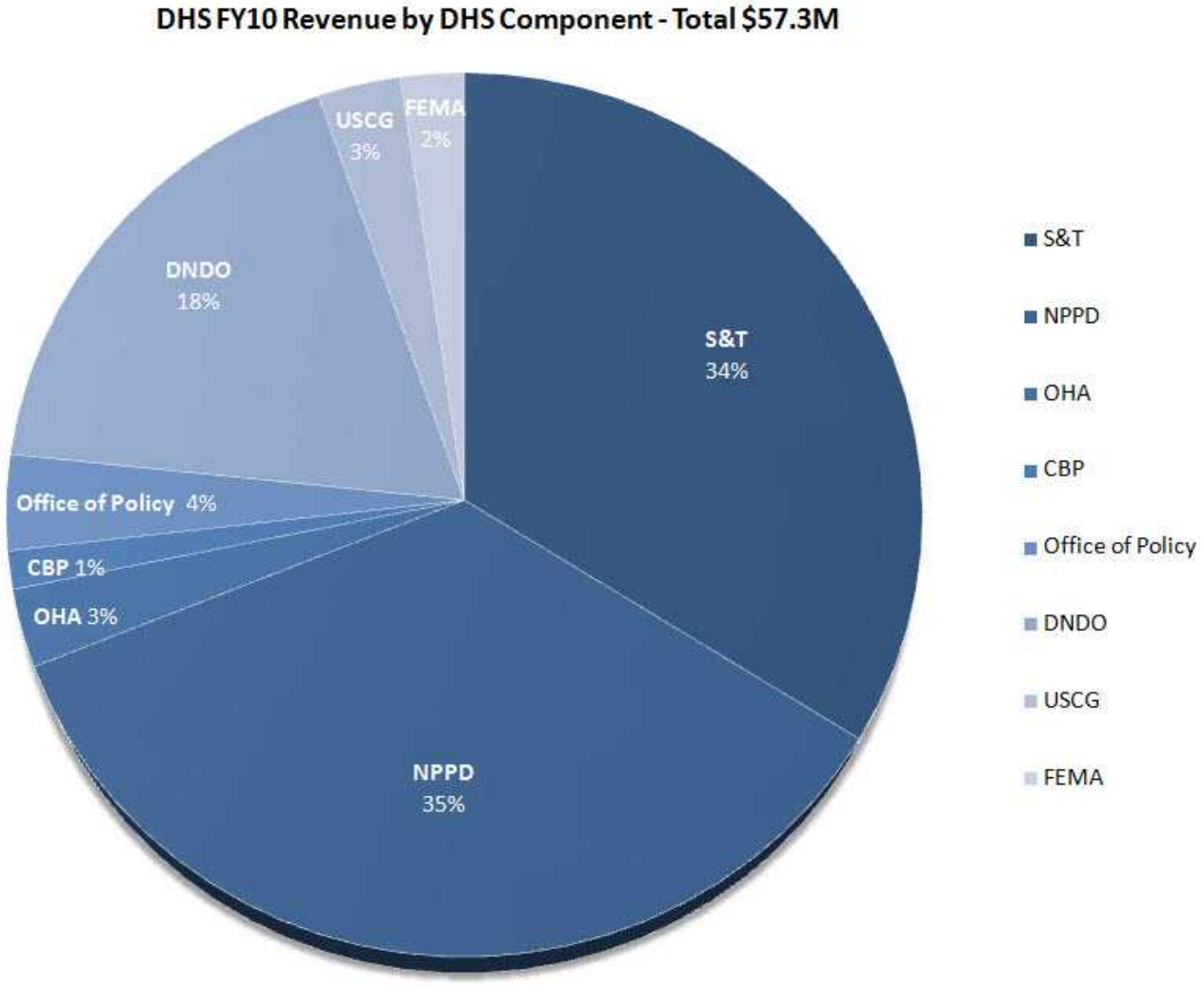
Sandia FY10 DHS funding levels across S&T and operational components



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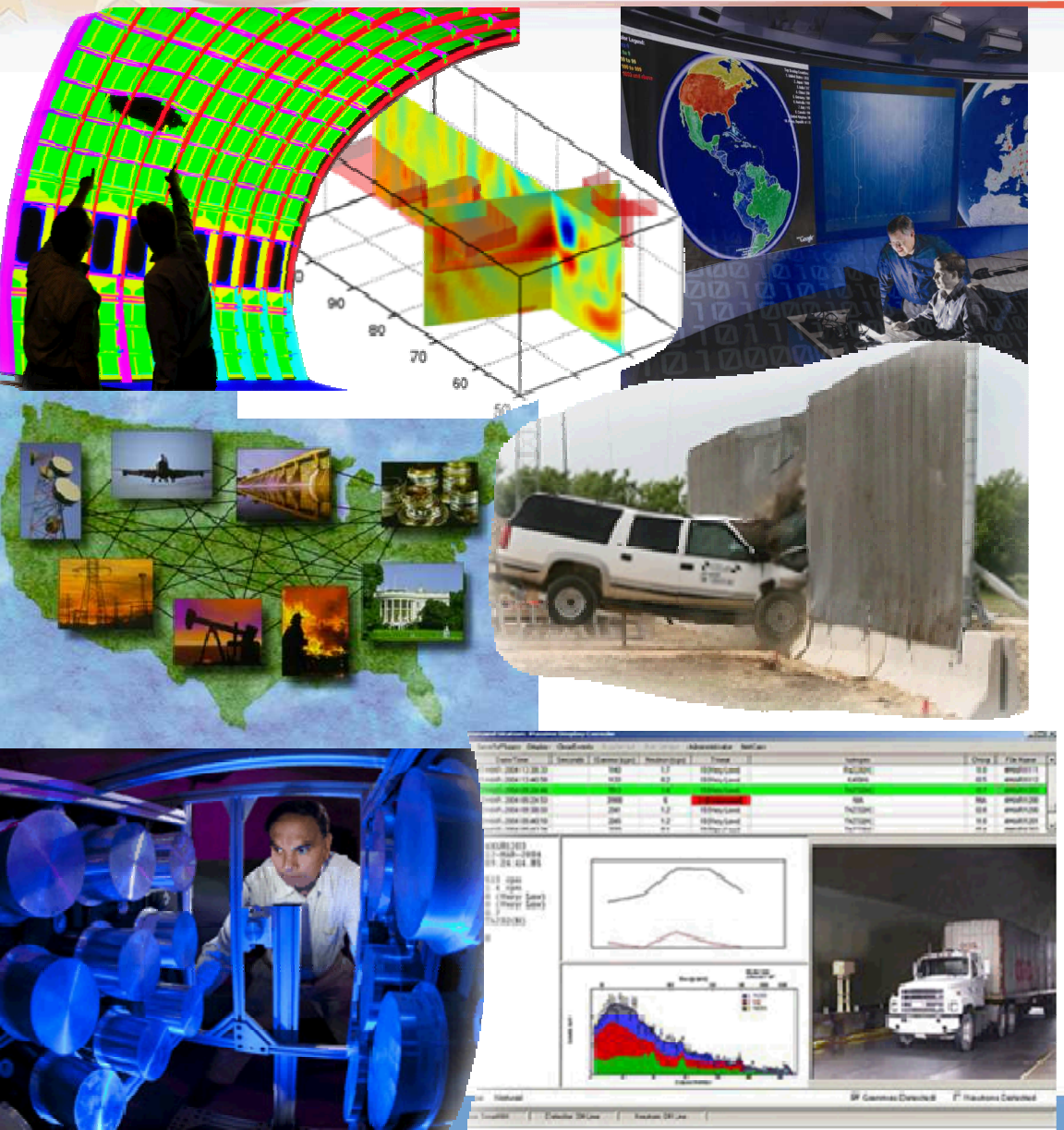
Sandia's DHS/S&T work leverages major capabilities, expertise and investments from a broad cross section of DOE, DoD, Intelligence and other missions



- micro fluidics
- computational biology
- advanced radiation detection R&D
- radiation source terms
- hydrodynamics blast loading codes
- transient dynamics codes
- SCADA security models
- systems analysis
- secondary reachback analysis
- facilities operational models
- security technology field testing
- secure systems & communications

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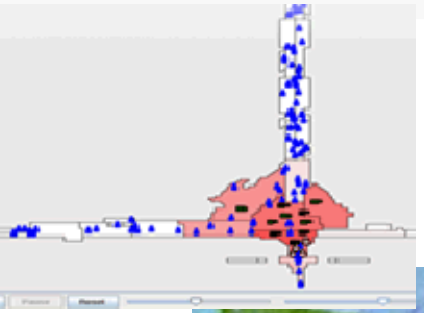
Sandia's systems analysis combines technical depth, cross-domain breadth, and multiple analytic disciplines to deliver products that inform decision makers in ill-defined problem areas



Systems Analysis Objectives

a) **Understand**– work with customers to refine understanding and definition of problem space

b) **Frame** – create and apply an analytic framework that utilizes "measures of effectiveness" germane to stakeholders objectives

c) **Evaluate** – analyze options within the framework developed

d) **Communicate** – explain options, insights, and trade-offs in a concise way that enables action

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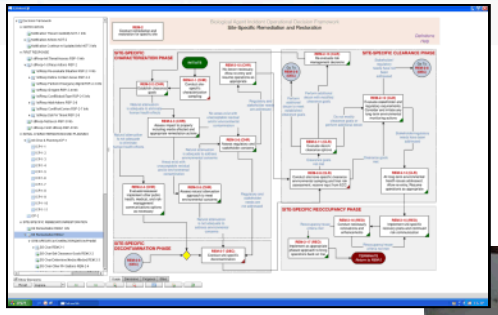
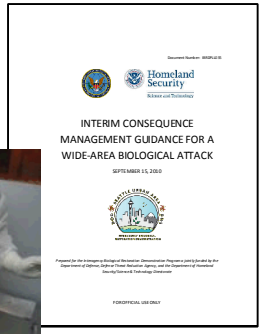
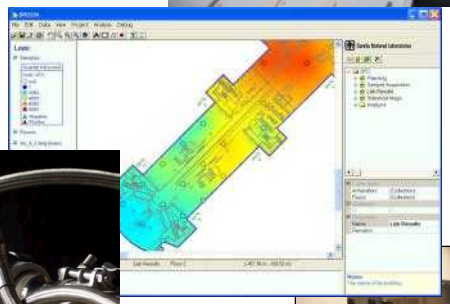
Sandia's systems engineering combines technical creativity with disciplined, rigorous engineering methodology to design, build, and deliver products that meet all customer expectations



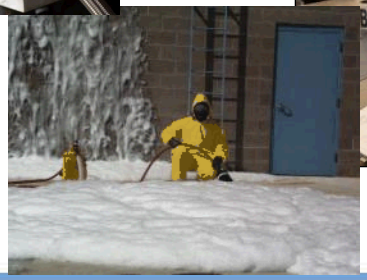
A robust system concept

Development of procedures, standards, & ConOPS





Development of technologies & tools



Testing & validation with users

System Engineering Key Elements

a) Define and validate customer requirements

b) Design, build, and test an engineered system

c) Oversee production, fielding, and life cycle issues

d) Qualify, demonstrate that the system meets customer requirements

e) Deliver the system and ensure continued performance

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Sandia carries DHS/S&T and other sources of S&T to direct utilization by both DHS operational components and end users

Mapping of S&T utilization for June 21st/22nd presentations to Undersecretary O'Toole

- **Bio/Chem Security**
  - Systems Analysis for Biodefense
    DHS/S&T → OHA
  - Advanced BioThreat Detection Study
    DHS/S&T → OHA
  - Interagency Biological Restoration Demonstration (IBRD) Program *DHS/S&T → State and Local Responder Communities*
  - Chemical Supply Chain Security and Resilience
    DHS/S&T → NPPD
- **Aviation Explosives Security**
  - Systems Analysis for Aviation Security Enhancement Program (ASEP)
  - NEXESS Overview
  - Explosives Field Testing
    DHS/S&T → TSA
- **Border Security**
  - Cargo Security Field Testing and Program
    DHS/S&T (APEX) → CBP
  - Advanced Gaming Simulation for Border Security (High Level Model)
    Sandia LDRD; DNDO Systems Studies → CBP
- **Cyber Security**
  - DHS Cyber Security Research & Development
    Coupled DHS/S&T and NPPD → Industry
- **Emergency Planning and Response**
  - National Infrastructure Simulation and Analysis Center
    NPPD → DHS Secretary's Office; White House; Emergency Response Communities
  - Integrated Modeling Mapping and Simulation (IMMS)
    DHS/S&T → FEMA