

Technologies from the National Labs to Wage the Long War

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National Laboratories Panel

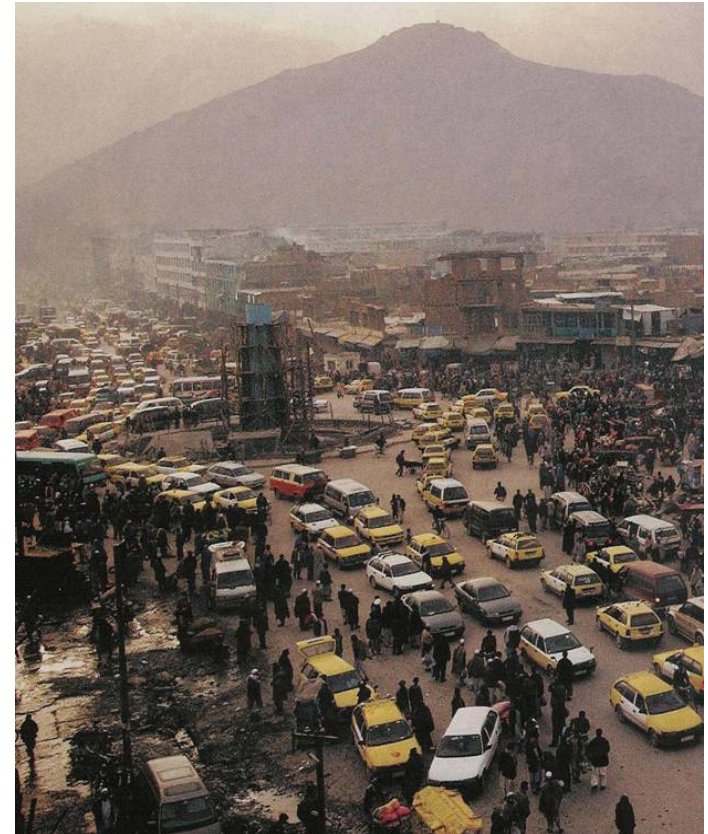
18th Annual NDIA SO/LIC Symposium and Exhibition

“Warfare in the Seams: Defense and Industry Partnering to Win the Long War”



Characteristics of the threat

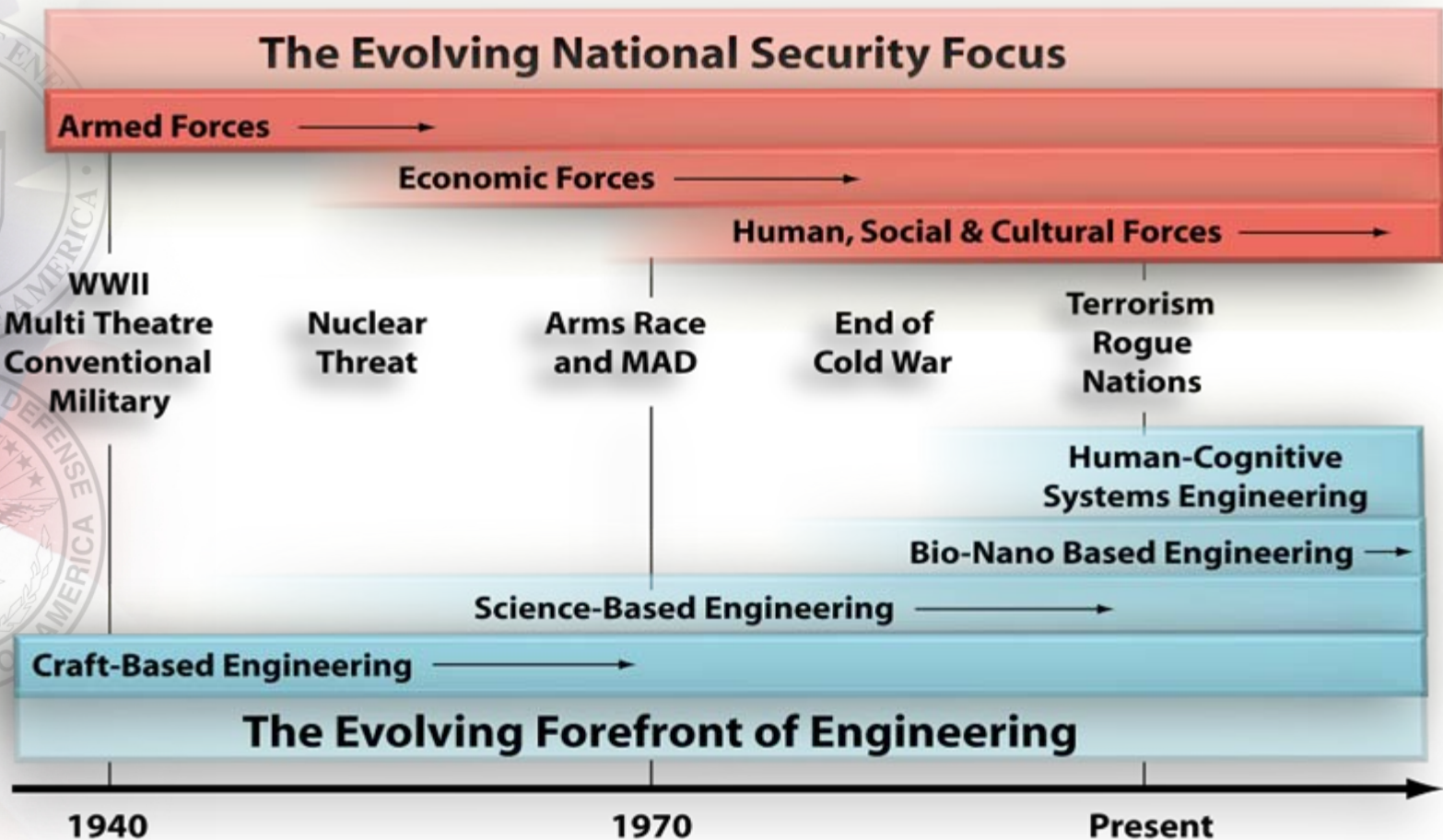
- Emerging from societies and people who remain disconnected physically but who share a common philosophy
- Philosophy enabled by ability to communicate
- Locus of violence has shifted to the individual actor
- Nuanced threat – vague, inconsistent, irrational, difficult to measure, not well understood
- Threats can adapt and evolve faster than we are transforming



**Impacts ALL national security agencies/departments
DoD, IC, DHS, ... and DOE!**



Sandia is evolving to meet these challenges



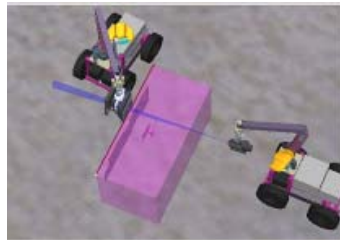
Creating unique national security systems solutions based on solid science for the Long War



Key competencies to meet our mission challenges



Modeling & Simulation



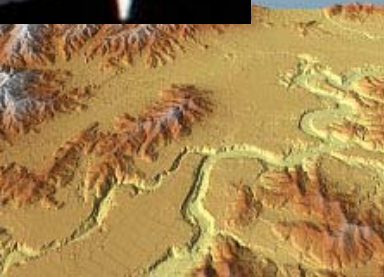
Design & Analysis



Fabrication



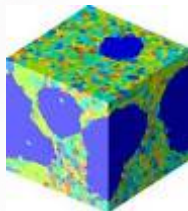
Environmental Testing



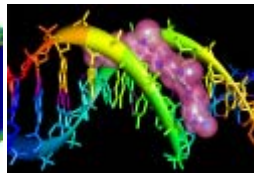
Sensing

**8,500+ employees
1,500+ PhDs; 2,500+ MS
~\$2.3B operating budget**

Foundational S&T:



Materials



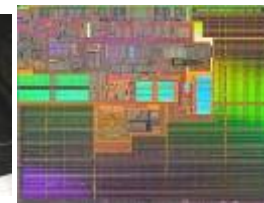
Computing, Information



Engineering



Pulsed Power



Microelectronics, Photonics



Cognition

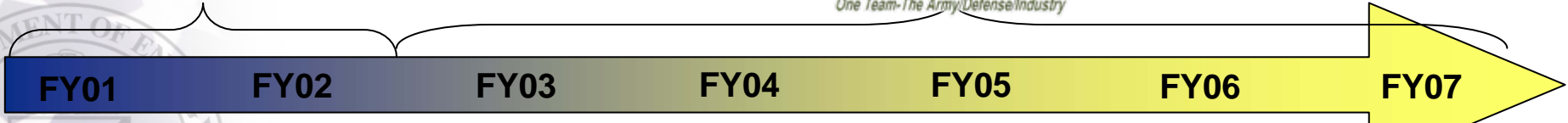


Test & Evaluation

Often partnering with DoD and industry



A DOE Labs team (FIST) has been part of the FCS program for over 6 years



Govt Tech Resource Analysis Team

Architecture

Combat ID

Network Vulnerability

System of Systems Engineering and Integration

Adv Decision Support System

Log & Supportability

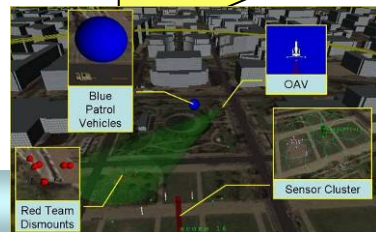
Countermine

Critical Technology Evaluations

M&S for SoS

MOUT Analytics, Mobile Network/Comms, UAVs, Humans

Future Spiral-In Concepts, Sensor Dart, EM Gun Tech Seedlings



Providing objective technical advice using complementary DOE capabilities



Sandia is partnering with industry to help address system sustainment & readiness challenges

System-of-Systems



RECAP/RESET



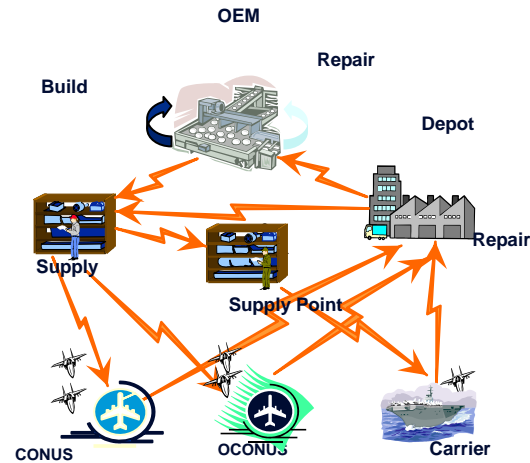
APACHE LONGBOW



High Mobility Multipurpose Wheeled Vehicle (HMMWV)



Enterprise & PBL



Manpower & Readiness



F/A-18 Propulsion Readiness



CVN 21 CVW Manpower



LCAC Readiness

A DOE Labs team is supporting the Joint IED Defeat Organization (JIEDDO)

Anticipating the Threat

- Continued emphasis on the network, adaptivity, systems solutions

Innovating Solutions

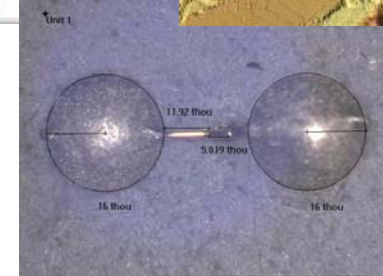
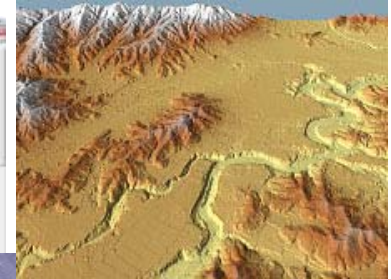
- Embedded staff at JIEDDO
- Reachback to our experts
- Technology contributions
- Systems assessment & recommendations

Creating Value

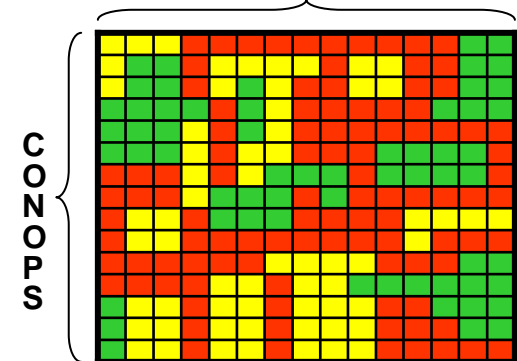
- NNSA/DOE lab team; industry partners

Informing the Debate

- Defense Science Board C-IED Task Force
- National Academy of Sciences Committee
- JIEDDO S&T Plan



Environmental Conditions



Ability of sensor modality to detect threat with sufficiently low false alarms

Leveraging complementary capabilities at DOE

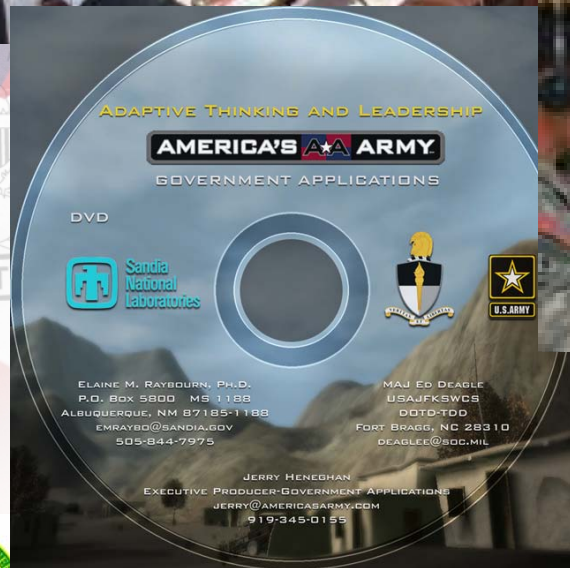


Sandia-led team developed non-kinetic training for Special Forces JFK Special Warfare Center and School



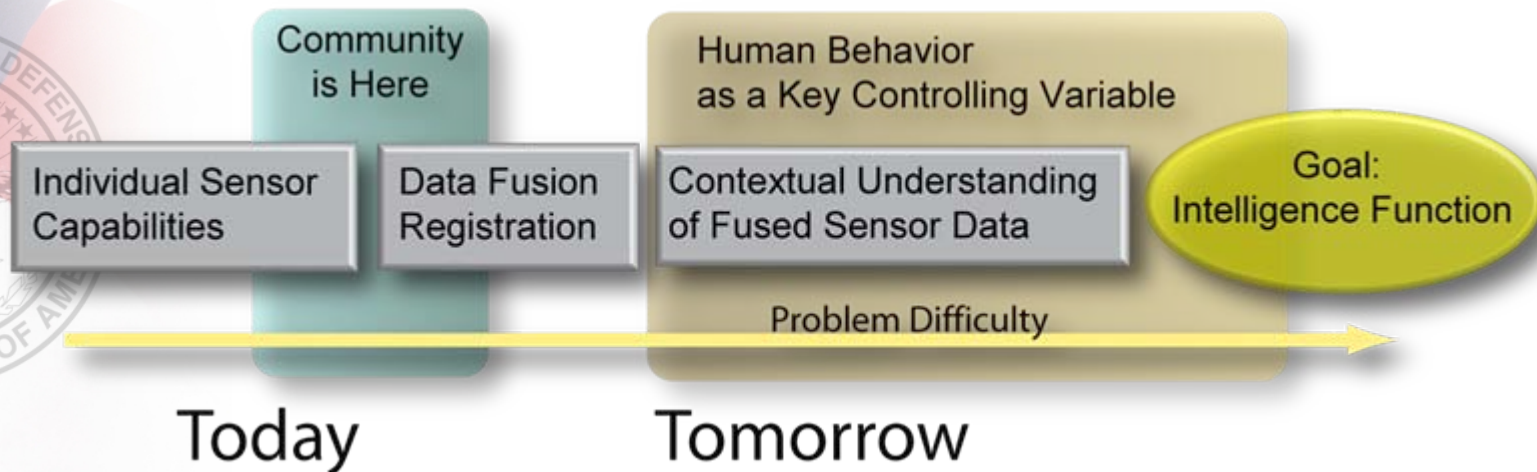
Adaptive Thinking and Leadership

Game-based training to augment warfighter situation awareness and negotiation skills through culturally relevant scenarios for future special forces officers and NCO's



The S&T base for the Long War must enable us to discern meaning from great complexity

- **Model processes**
- **Identify potential signatures or create new observables**
- **Develop sensor systems to measure the observables**
- **Fuse data to identify patterns of activities**



We must focus on understanding why (vs only what)



Summary

- **The Long War cuts across ALL national security agencies/departments**
- **Sandia is evolving to meet these challenges**
- **The DOE Labs are actively engaged with the services to meet requirements, often partnering with industry**
- **The challenges of the Long War are so great that it is in the national interest to work together**

