



RDECOM

**US Army Natick Soldier Systems Center
Natick, Massachusetts**



Presentation to **NDIA**

May 2, 2012

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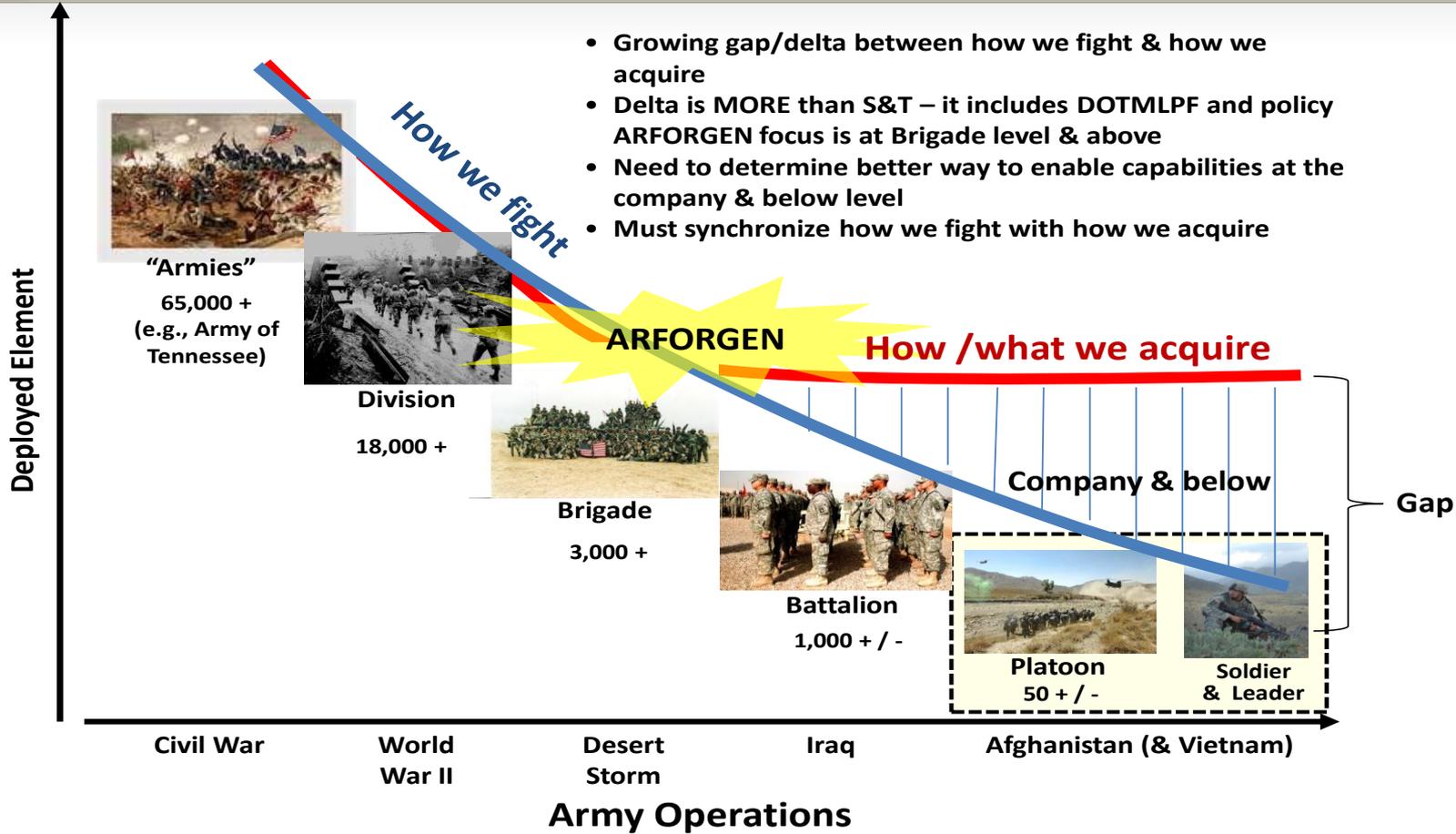
- Purpose: Provide an introduction brief for the Army Technology Enabled Capability Demonstrations (TEC-Ds)
- Agenda
 - Purpose of TEC-D's
 - What are they
 - Possible Future Initiatives

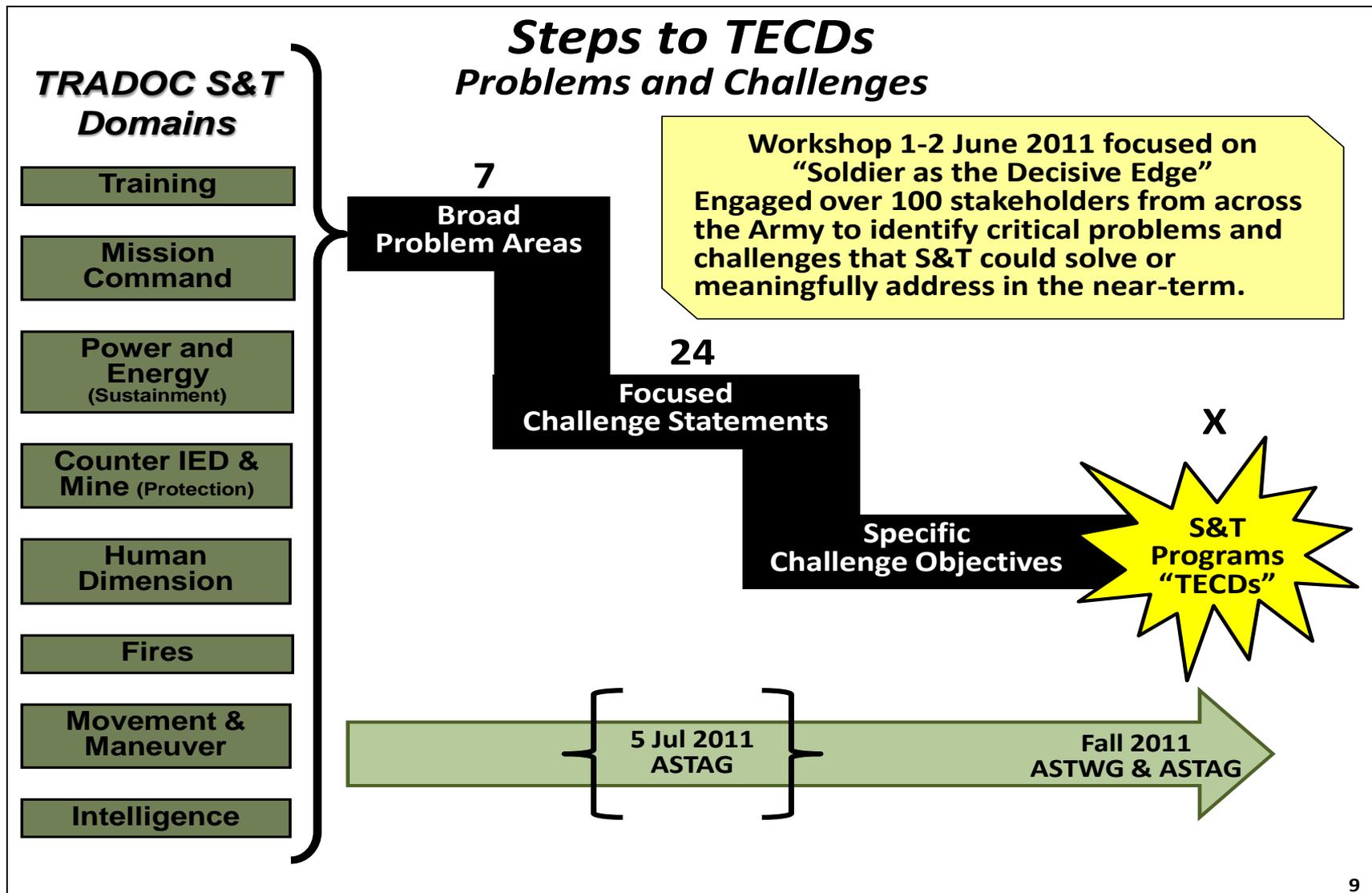
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Where should our focus be?

- Growing gap/delta between how we fight & how we acquire
- Delta is MORE than S&T – it includes DOTMLPF and policy
- ARFORGEN focus is at Brigade level & above
- Need to determine better way to enable capabilities at the company & below level
- Must synchronize how we fight with how we acquire





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Big Army Problems that S&T Must Help Solve **Current focus: "Soldier as the Decisive Edge"**



1. There is insufficient **FORCE PROTECTION** to ensure highest degree of survivability across the spectrum of operations.
2. Soldiers in Small Units (squads/fire teams/crews) are **OVERBURDENED** (physically and cognitively); this degrades performance and may result in immediate, as well as, long term consequences.
3. U.S. Army squads are too often **SURPRISED** in tactical situations. Soldiers in Small Units lack sufficient timely **MISSION COMMAND & TACTICAL INTELLIGENCE** to understand where their assets are, who and where the enemy is, who and where non-combatants are and to document and communicate this information to each other and higher echelons.
4. We spend too much time and money on **STORING, TRANSPORTING, DISTRIBUTING** and **WASTE HANDLING** of consumables (water, fuel, power, ammo and food) to field elements, creating exposure risks and opportunities for operational disruption.
5. Soldiers in Small Units have limited capability to integrate maneuver and fires in all environments to create **TACTICAL OVERMATCH** necessary to achieve mission objectives.
6. Operational **MANEUVERABILITY** (dismounted & mounted) is difficult to achieve in complex, austere, and harsh terrains and at high OPTEMPO.
7. We do not understand **WHAT MAKES THE HUMAN TICK** in a way that can lead to assured ability to perform operational, high OPTEMPO missions effectively and without secondary negative effects.

Problems listed in no particular order—validated by Senior Army Leadership



24 Army S&T Challenges



	Challenge #	Challenge Title
Top 5	1b	Force Protection – Soldier & Small Unit
	1c	Force Protection – Occupant Centric Platform
	2a	Overburdened – Physical Burden
	3a	Surprise/Tactical Intelligence – Mission Command
	7d	Human – Medical Assessment & Treatment
Next 5	1a	Force Protection – Basing
	7b	Human – Individual Training to Tactical Tasks
	3b	Surprise/Tactical Intelligence – Actionable Intelligence
	4a	Sustainability/Logistics – Basing
	4b	Sustainability/Logistics – Transport, Distribute & Dispose
Remaining 14	1d	Force Protection – On the Move (Ground)
	2b	Overburdened – Cognitive Burden
	3c	Surprise/Tactical Intelligence – Cultural / Linguistic
	3d	Surprise/Tactical Intelligence – Organic Combat ID
	3e	Surprise/Tactical Intelligence – Overwatch Persistent Surveillance
	3f	Surprise/Tactical Intelligence – METT-TC Data/Information/Knowledge
	3g	Surprise/Tactical Intelligence – Network
	5a	Tactical Overmatch – Deliver Decisive Effects
	5b	Tactical Overmatch – Targeting/Hand-off
	6a	Maneuverability – On the Move (Air)
	6b	Maneuverability – Degraded Visual Environment (brown-out)
	7a	Human – Strength-based Soldier Characteristic Assessments & Readiness
	7c	Human – Collective Training for Tactical Operations
	7e	Human – Trauma Management

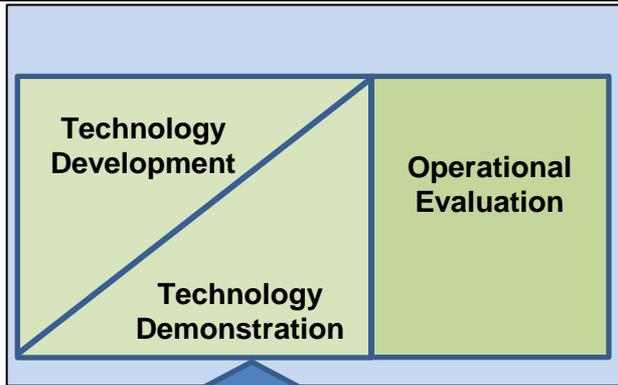


Characteristics of Technology Enabled Capabilities Demonstration (TECD)

Warfighter Outcomes



TECDs—Near-term integrated capability demonstrations—predominately 6.3, may have some 6.2



Field Limited Capability

Responsible PEO/PM Or Other mechanism

Continue Development

Acquisition PoR

Terminate

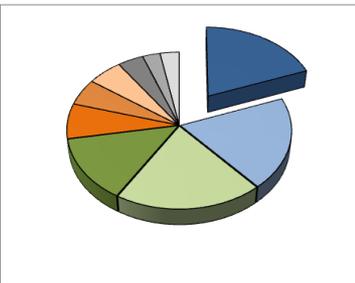


Army's Capability Portfolios

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- Integrated programs across all S&T
- Integrated solutions/multiple systems
- Output is a full capability
- High-level oversight, including TRADOC involvement



Current status – 9 TECDs approved against Top 10

Goal: ~50% Army S&T BA3 Invested in these programs

Technology Enabled Capability Demonstrations



Human –
Medical
Assessment and
Treatment



Force Protection –
Occupant Centric Platform



Overburdened –
Physical Burden



Force Protection - Basing



Human –
Individual Training to
Tactical Tasks



Surprise/Tactical
Intelligence –
Actionable Intelligence



Force Protection –
Soldier and Small Unit



Surprise/Tactical
Intelligence –
Mission Command



Sustainability/Logistics – Basing

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Define a **completely new paradigm** wherein Mobility, Lethality/Situational Awareness and Survivability are all factors in **PPE design and employment**, and all contribute to overall Soldier and Small Unit Effectiveness

- Identify trade space to enable holistic protection design and implementation
- Optimize level(s) and area of protection while minimizing weight and enabling mobility
- Demonstrate mature technologies to improve PPE with significantly improved performance over baseline

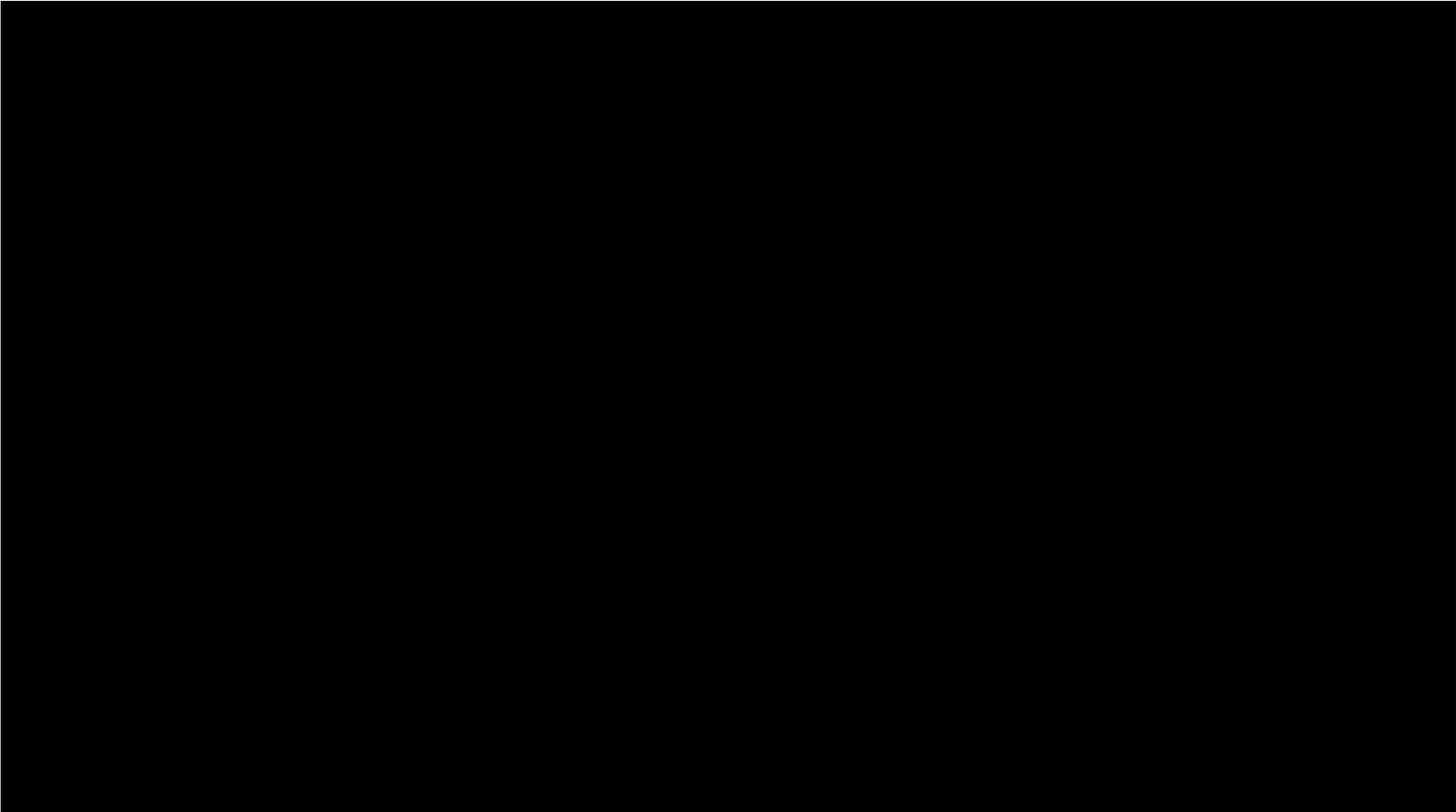


Payoff:

- **Increased Soldier/Small Unit Effectiveness (Mobility, Lethality, and Survivability)**
- **Improved PPE**



Protection



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Integrated capability that comprises a set of knowledge products for better decision making, materiel solutions for reducing load, and offload/resupply solutions that positively impact both individual Soldier and Small Unit performance

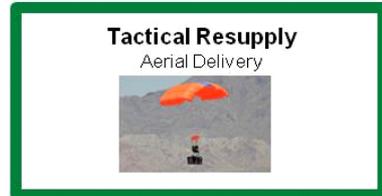
Why



**Stress-Induced
Casualties Reduce
Readiness**

**Performance
Degradation**

How



Extreme Physiological Stress

- Significant load reductions
- Improves operational mission effectiveness
- Mitigates risks of musculo-skeletal Injuries

Results



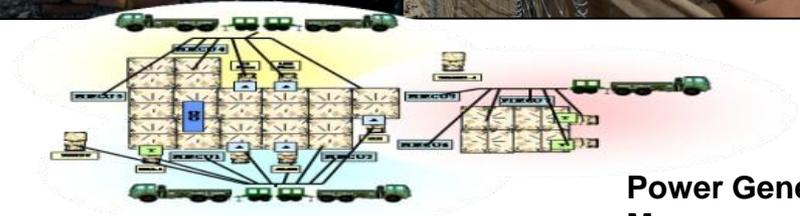
Airdrop



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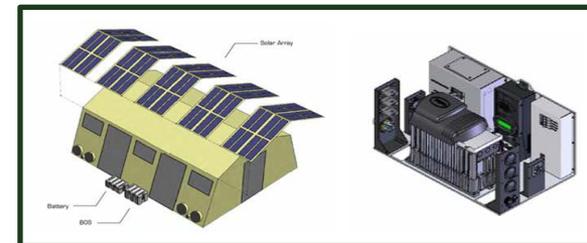
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Demonstrate an integrated approach to reducing sustainment requirements for small contingency base operations via a suite of capabilities that reduce the need to deliver water and fuel to the base and the burden of having to collect, manage, and dispose of solid and liquid waste.



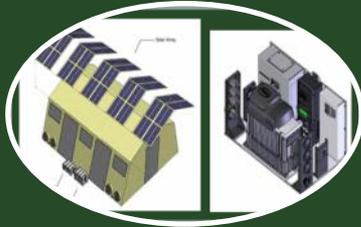
Power Generation & Management

- Reduce need for fuel for resupply by 25%
- Reduce need for water resupply by 75% and decrease waste by 50%
- Increase quality of life over 2011 COPs/PBs in Afghanistan



TeCD Focus Areas

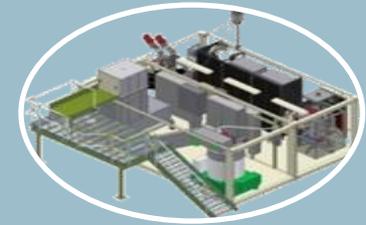
Fuel Demand Reduction 25%



Water Demand Reduction 75%



Waste Reduction 50%



TeCD Technology Thrust Areas

- Supply Side-Power Generation
- Supply Side-Alternative Thermal / Electric Energy
- Supply Side Power Control, Distribution, Storage
- Demand Side-HVAC
- Demand Side-Habitation Systems
- Demand Side-Organizational Systems

- Supply Side-Water Purification
- Supply Side-Water Generation
- Supply Side-Water Recycling & Repurposing
- Demand Side-Organizational Systems

- Source Reduction
- Waste Reduction and stabilization
- Waste to Energy
- Waste Re-purposing
- Water Based Liquid Waste Management
- Waste Management Analysis
- Planning and Management Tools

Enabling Technologies (Example)

- Microgrids
- Integrated Energy Efficient Shelters (Liners, HVAC, Lighting)
- Fixed and Flexible Photovoltaics
- Energy Efficient Organizational Systems (Kitchen, Laundry, etc)

- Water Recycling & Reuse
- Water Quality Monitoring
- Water Efficient Organizational Systems (Kitchen, Laundry, Hygiene)
- Water Generation (Air, etc)

- Waste Source Reduction
- Waste to Energy Conversion
- Blackwater Dewatering



Energy



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TECDs – Managed by a single organization with strong support from DoD partners...

... But new Industry and Academia partnerships are a must!

Sustainability & Logistics-Basing



Overburden - Physical Burden



Force Protection – Soldier and Small Unit





Approved TECDs



TECD	Lead	POC	Start Year
1c Force Protection – Occupant Centric Platform	RDECOM - TARDEC	Steve Knott steven.k.knott.civ@mail.mil 586.282.8726	FY12
2a Overburdened – Physical Burden	RDECOM - NSRDEC	Ms. Andra Kirsteins Andra.Kirsteins@us.army.mil 508.233.5258	FY14
4a Sustainability/Logistics – Basing	RDECOM - NSRDEC	Craig Rettie craig.rettie@us.army.mil 508.233.5451	FY12
1b Force Protection – Soldier/Small Unit	RDECOM - NSRDEC	Michael Codega michael.codega@us.army.mil 508.233.4224	FY12
1a Force Protection – Basing	ERDC	Pamela Kinnebrew pamela.g.kinnebrew@usace.army.mil 601-634-3366	FY14
3a Surprise/Tactical Intelligence – Mission Command	RDECOM - CERDEC	Michael Anthony michael.p.anthony8.civ@mail.mil 443.395.0577	FY13
7d Human – Medical Assessment & Treatment of Brain Injury	MRMC	Bob Vandre Robert.vandre@us.army.mil 301-619-7345	FY14
7b Human – Individual Training to Tactical Tasks	ARI	Scott Graham scott.e.graham.civ@mail.mil 706-545-2362	FY14
3b Surprise/Tactical Intelligence – Actionable Intelligence	RDECOM - CERDEC	Alan Hansen alan.s.hansen4.civ@mail.mil 443.861.0763	FY13



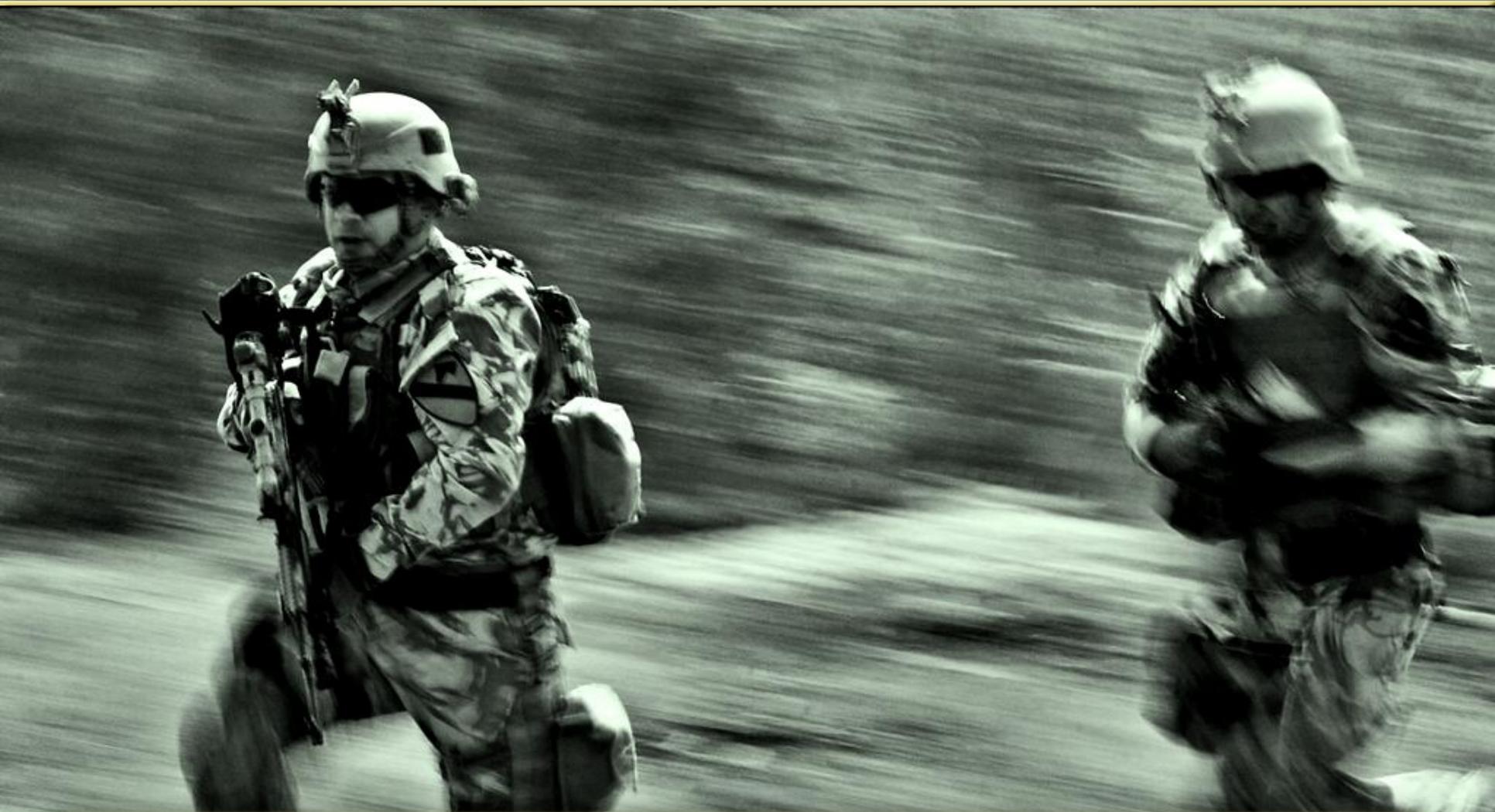
RDECOM Proposed TECDs



TECD	Lead	POC	Start Year
4b Sustainability/Logistics – Transport, Distribute & Retrograde	RDECOM - TARDEC	Wolf Petermann wolfgang.a.petermann.civ@mail.mil 586.282.8578	FY15
1d Force Protection – On the Move (Ground)	RDECOM - CERDEC	Michael Pocratsky michael.j.pocratsky.civ@mail.mil 703.704.2435	FY15
5a Tactical Overmatch – Deliver Decisive Effects	RDECOM - ARDEC	David Panhorst david.w.panhorst@us.army.mil 973.724.5525	FY15
3e Surprise/Tactical Intelligence – Overwatch Persistent Surveillance	RDECOM - CERDEC	Lorraine Kohler lorraine.s.kohler.civ@mail.mil 443.861.1517	FY15
6b Maneuverability – Degraded Visual Environment (brown-out)	RDECOM - AMRDEC	LTC Mark Snyder mark.s.snyder@us.army.mil 757.878.2019	FY15



Conclusions



EMPOWER

UNBURDEN

PROTECT

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