# Expeditionary Basing & Collective Protection Overview

## JOCOTAS


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US ARMY RDECOM

US ARMY NATICK SOLDIER RD&E CENTER

# Mission & Vision

**Vision:**

We aspire to be the premier technology/capability developer in the world for Expeditionary Basing & Collective Protection and DoD's supplier of choice for rapid prototyping, fabrication and engineering services.

**Mission:**

We provide State of the Art technology, developmental services, global engineering support and world class rapid prototyping and fabrication services to an expanding DoD customer base.

**Natick Core Values:**

Integrity, Warfighter & Customer Focus, Excellence, and Teamwork

**Sheltering Warfighters World Wide**

TECHNOLOGY DRIVEN. WARFIGHTER FOCUSED.

# Expeditionary Basing

We provide **systemic** solutions and innovative technologies for **protective enclaves** in **hostile environments**.

All operations from **Small Combat Units** to **Battalion** emanate from **integrated, energy efficient Expeditionary Base Camp** force projection platforms.

We provide shelter systems and expeditionary base camp capabilities for Soldiers in all **types of environments**, through the in-house and commercial development of **concepts and technologies.**

# In the News…

- Quality of Life

  - **Army researchers measure quality of life** (www.army.mil May 2014)
  - Soldier Satisfaction, on a spreadsheet (www.armytimes.com June 16, 2014)

- Modular Ballistic Protection System

  - **Natick takes shelter ballistic protection to the 'X' level** (www.army.mil July 2014)

- Power Shade

  - **Army-green gets greener: USARPAC Soldiers test clean energy sources during RIMPAC** (www.army.mil July 2014)

# Expeditionary Self Sustaining Contingency Base Camp

- RDECOM Policy # 55, Enterprise Collaboration, 16 Jan 2014
  - Best relevant knowledge and expertise applied
  - Undesirable duplication of resources avoided
  - Successes and lessons learned are leveraged and retained
- RDECOM Director's Initiative for key Army priority areas establishes chartered, task organized Community of Practices (CoPs)
  - Self Sustaining Forward Operation Base (recommended name change)
- Kickoff meeting with Mr. Ormond on 15 April with all COP leads
  - Dr. Allender (SES lead), Mr. Gregg Gildea (Deputy lead)
- Build on success of TECD 4a collaborative environment – already supported by ARDEC, CERDEC, NSRDEC and TARDEC
- Next steps
  - Conduct scoping effort to determine what's in and what's out with all interested parties
  - Solidify participants
  - Initiate charter development (6 to 12 months to complete)

New Initiative!

# *Support for Self Sufficient Soldier Expeditionary Operations ($S^4EO$) Community of Practice*

## CURRENT S&T to FY 17

S&T focused on single AOR (SW Asia ) operational scenarios

Evolutionary, Incremental, near term development of mature, low risk technologies for:

- Fuel resupply reduction 25%
- Water resupply reduction 75%
- Waste back haul reduction 50%

Baseline Quality of Life modeling

Modeling, Simulation, Analysis Tools and Demonstrations to improve efficiencies to FY 12 operationally relevant baselines

Proposes integrated technology and non-material DOTmLPF solutions for improved base camp capabilities to FY17


## EVOLVING ARMY CHALLENGES

Previous AOR technology solutions not optimal for new, multiple AORs and varying geographical environments

Growing Power Demand

Leadership sustainment decision making capability for mission trade-off analyses

Base Camp self-sufficiency that also reduces the logistical tail

Retained overmatch with smaller Army

Short duration missions

Energy efficient and leaner capability

Soldier Quality of Life essential for ability to stay "Ready to Fight"

Significant fiscal constraints

## S&T FY 17 and Beyond

"Game Changing" Revolutionary S&T tailored to multiple AORs:

- Disrupting conventional baselines
- Higher Risk, high return on investment

Robust Quality of Life modeling informs Leadership on essential services for Soldier Readiness

Regional Specific Analysis supports:

- Comprehensive reduction of Logistics/Sustainment resupply
- Drastically Improved Tooth-to-Tail Ratio
- Return to Organic Capabilities
- Informed DOTmLPF
- Smaller Footprints for early entry

Interoperable/Integrated Base Camp Systems optimized for full range of all phases of joint operations

**"We have to be a globally responsive Army… leaner, smaller, tailorable, scalable.. We have to be expeditionary… We have to get there with the least amount of support possible" - Army Chief of Staff GEN Raymond T. Odierno, speaking to the AUSA – Institute of Land Warfare Breakfast, 23 January 2014**

# Sustainability/Logistics – Basing

**Problem Statement:** The Army needs improved capability to enable sustainment independence/"self-sufficiency" and to reduce sustainment demands at contingency bases. It is too costly, too unpredictable, and too labor intensive for a Small Unit to carry all required consumables (fuel & water) to last for weeks or months at a COP/PB to small FOB (up to 1000 PAX). As a result, contingency bases are highly dependent on resupply/backhaul, which can be unpredictable and are costly in terms of soldiers at risk in convoys, and reduced mission availability, etc.

**Challenge:** Formulate a S&T program to increase self-sufficiency, reduce supply demands, and reduce backhaul waste at COPs/PBs to small FOB and improve the ability to sustain the Small Unit for the duration of the mission at lower cost and lower risk to suppliers without adversely impacting primary mission Soldier availability (troop to task ratio).

**Challenge Boundary Conditions:**
**Who**: Small Units in expeditionary like (extreme/austere) environments
**What:** Identify tools, tactics, and techniques to achieve demand reduction
**How:** Measure demands for power, water and fuel; waste generated and/or waste-to-energy power; weight/volume of food; time to resupply.

**Objectives:**
**Near term (FY17** reduce need for fuel resupply by 25%, reduce need for water resupply by 75% and decrease waste generation/backhaul by 50% while maintaining Force Provider like quality of life (Note: metrics may differ for PB, COP, & FOB).

# Sustainability & Logistics-Basing 4a Concept – 0V1

***Integrated, Waste, Water and Fuel Management Solutions for Initial and Temporary Base Camps***

Extra Small (50 – 299 PAX ) | Small (300 – 1999 PAX)

## 50-149 Pax

- *Highly Mobile, Easy to Establish*
- *Initial Entry Operations*
- *Tailorable, Mission Specific*
- *All Organic Capabilities*
- *Basic Functions, Services and QOL – Improvement Options Available*
- *Small Unit Leaders Trained to Operate a Base (PSG, 1SG)*

XS - 64 PAX

## 150-599 Pax

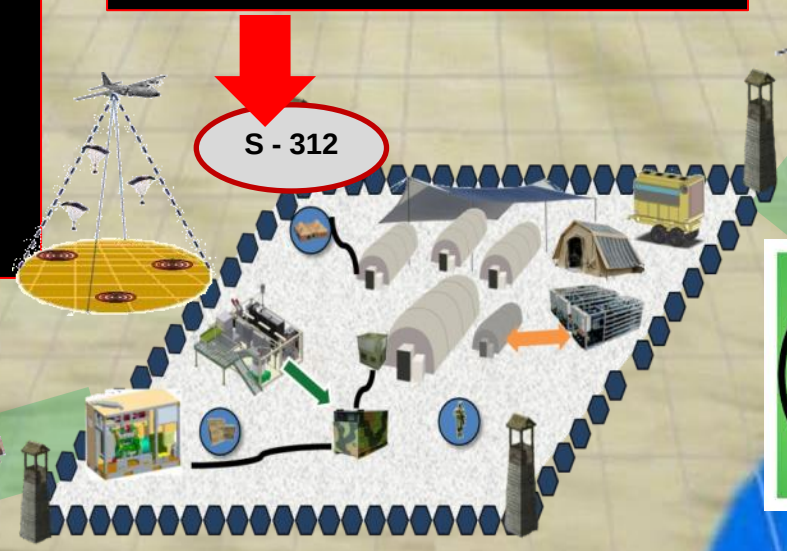
- *Highly Adaptable, Mobile & Scaleable*
- *Stand Alone & Integrated Capabilities*
- *Organic with possible Contractor Support /Maintenance*
- *Expanded Functions, Services and QOL Beyond Unit Capabilities*
- *Small Unit Leaders Trained to Manage Base Efficiency Efforts & Objectives*

S - 312

## 600-1000 Pax

- *Fixed Integrated Systems*
- *Adaptable to Existing Infrastructure & Utilities*
- *Organic and Contractor Support /Maintenance*
- *Expanded QOL is Standard*
- *Established Base Management Infrastructure*

S- 1160

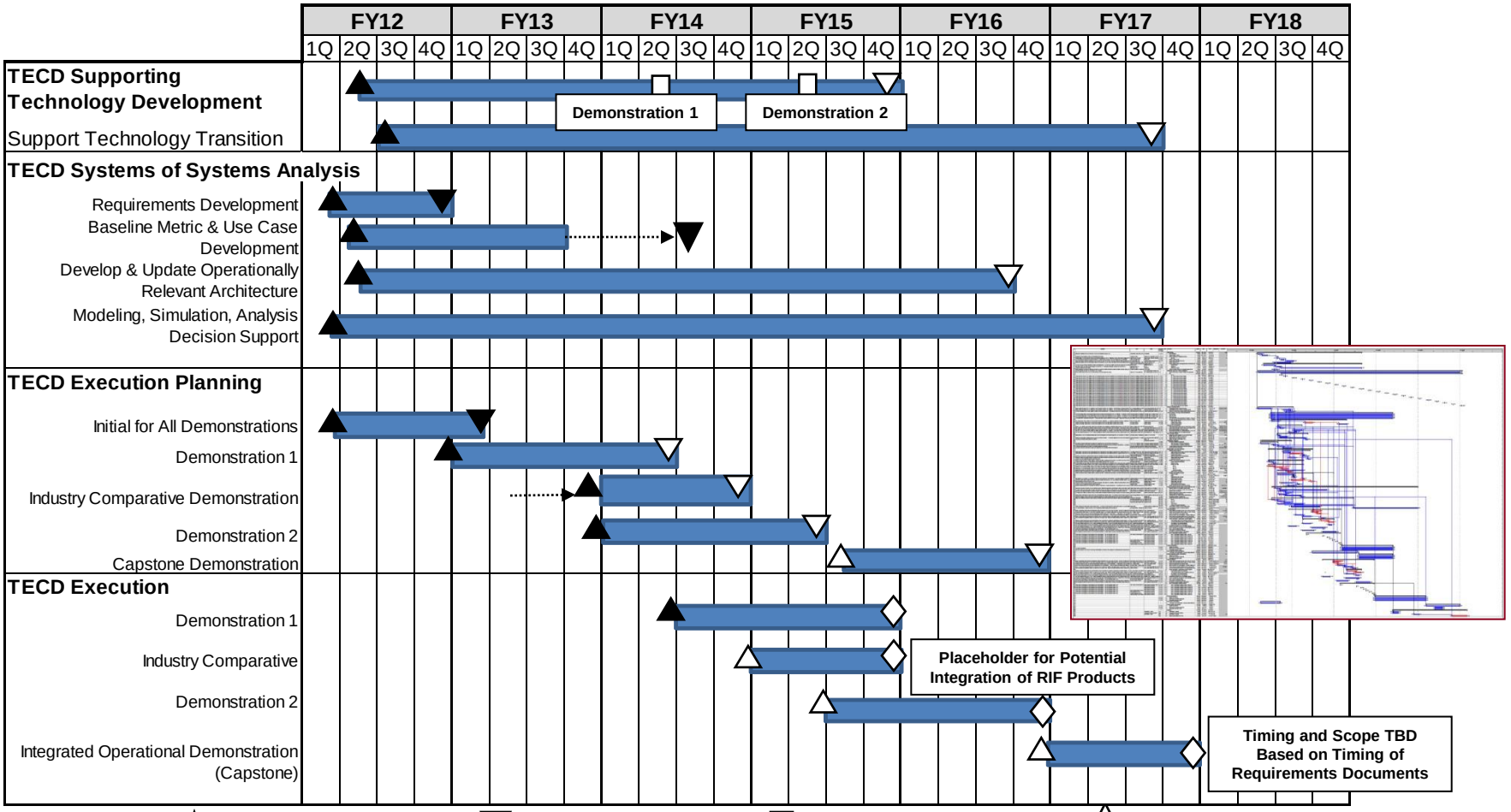



PAO U14-253 24 Jul 2014

# Vision For Success: Sustainability/Logistics-Basing

- Model Based ***Systems Engineering*** (MBSE) Approach
  - Analysis will show how we will meet our objectives
- Operationally Relevant ***Demonstrations***
  - Both systems and components
  - Materiel and non materiel solutions
- ***Modeling and Simulation*** Capabilities and Analytical Results will be critical components of our Demonstrations
- ***Knowledge and Technology Transition***, a key measure of success

# Critical Path: Overall Milestone Schedule



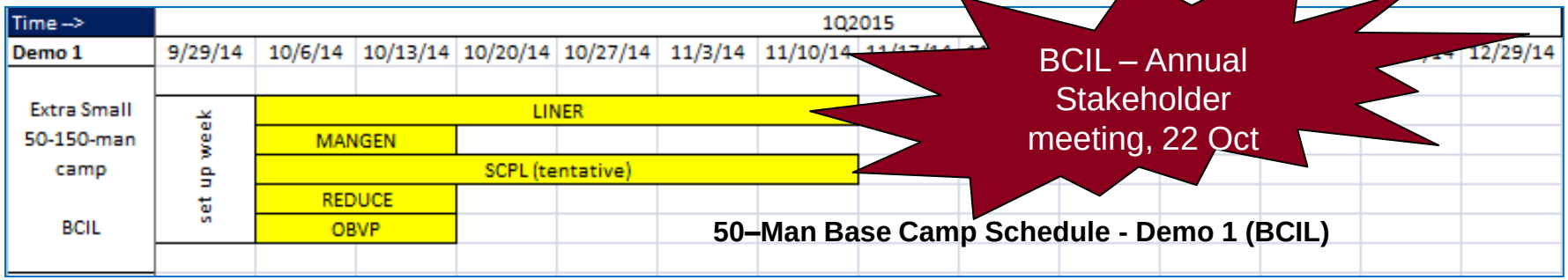

**Legend:**

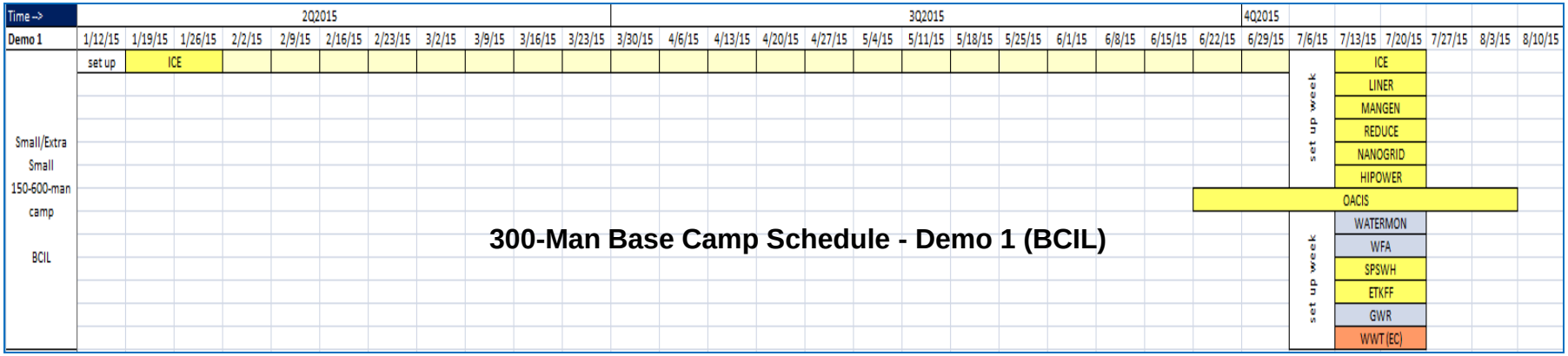
Planned Start | Planned End | Planned Milestone | Planned Significant Milestone

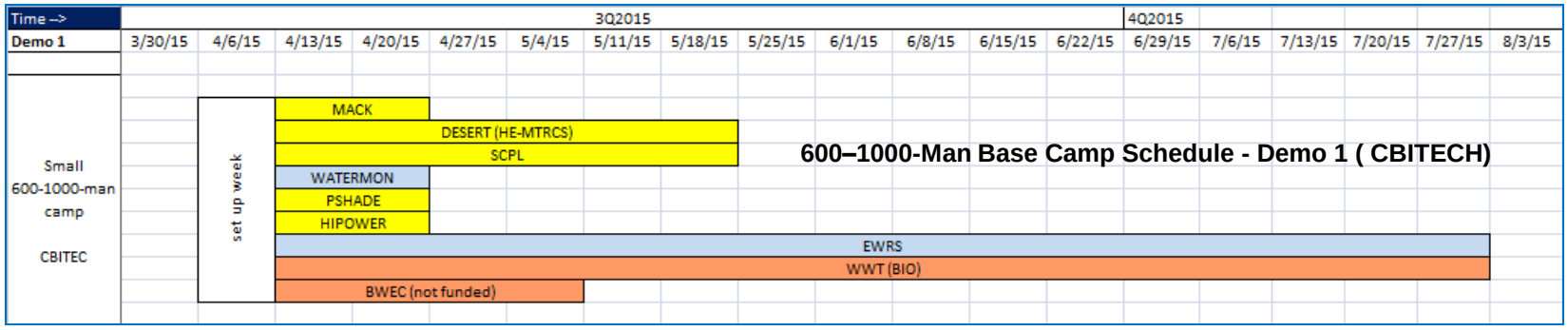
Schedule Slip | Actual Start | Actual End | Actual Milestone | Actual Significant Milestone

TECHNOLOGY DRIVEN. WARFIGHTER FOCUSED.

# Demo 1 Schedule and Venue



# DEMO 1 Technology Partner Feedback

| TECD ID (Link to Charts) | Demo 1 | | Your Organization's Level of Interest (None, Basic, Moderate, High) | | | | Transition Plan (Yes/No) | | | | Priority (1 - n) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Name of Technology | PMFSS | PM MEP | PM PAWS | CBI | PMFSS | PM MEP | PM PAWS | CBI | PMFSS | PM MEP | PM PAWS | CBI |
| TECD4a_070 | 1 | Modular Appliances for Configurable Kitchens (MACK) | High | | | Moderate | Yes | | | | 2 | | | 10 |
| TECD4a_068 | 2.1 | Desert Environment Sustainable Efficient Refrigeration Technology (DESERT) | Moderate | | | Moderate | | | | | 11 | | | 8 |
| TECD4a_068.5 | 2.2 | Onsite Automatic Chiller for Individual Sustainment (OACIS) | Moderate | | Basic | Basic | | | | | 10 | | | 19 |
| TECD4a_057 | 3 | Energy Efficient Expedient Shelters with Non-woven Composite Insulation Liners | Moderate | Basic | None | Moderate | | | | | 9 | 7 | | 12 |
| TECD4a_052 | 4 | Innovative Cooling Equipment (ICE) | Moderate | Moderate | None | Moderate | | | | | | 4 | | 13 |
| TECD4a_030 | 6 | Self-powered Solar Water Heater | High | | Basic | Basic | | | | | 4 | | | 16 |
| TECD4a_107 | 7 | 1 kWe JP-8 fueled, man-portable genset for power generation for expeditionary small unit operations | Low | High | | | | | | | | 1 | | - |
| TECD4a_006 | 8 | Single Common Powertrain Lubrication (SCPL) | Low | Basic | Moderate | | | | Yes/Staffing | | | 9 | 3 | - |
| TECD4a_005 | 9 | Renewable Energy for Distributed Under-supplied Command Environments (REDUCE) | Low | Moderate | | Basic | | | | | | 6 | | 18 |
| TECD4a_082 | 10 | Real Time Inline Diagnostic Technology | Low | | Moderate | Moderate | | | Yes/Staffing | | | | | 7 |
| TECD4a_085 | 11 | Water Conservation Technology (WCT) for Mobile Kitchens & Sanitation Centers | Moderate | | Basic | Moderate | | | | | 8 | | | 9 |
| TECD4a_086 | 12 | Gray Water Reuse | Moderate | | Moderate | High | | | Yes/Staffing | | 7 | | 1 | 4 |
| TECD4a_079 | 13 | Modular Force Water Generation Storage & Analysis (Water From Air) | Low | | Moderate | Moderate | | | Yes/Staffing | | | | 2 | 15 |
| TECD4a_098 | 14 | Wastewater Treatment | High | | Moderate | High | | | Yes/Staffing | | 5 | | 4 | 1 |
| TECD4a_094 | 15 | Waste to Energy Converter | High | Basic | | High | Yes | | | | 1 | 8 | | 2 |
| TECD4a_062 | 16 | Combat Support Hospital Energy Efficiency Improvements | Moderate | | | Moderate | | | | | | | | 11 |
| TECD4a_044 | 17 | Power Management and Control Technology | Moderate | Moderate | | Moderate | | | | | | 5 | | 6 |
| TECD4a_046 | 18 | Bi Directional Onboard Vehicle Power (OBVP) | Low | High | | | | | | | | 3 | | - |
| TECD4a_072 | 19 | Expeditionary TRICON Kitchen System Appliance Integration, Testing, and D | High | | | Basic | Yes | | | | 3 | | | 17 |
| TECD4a_029 | 20 | PowerShade Cost Reduction | Moderate | Basic | | High | | | | | 12 | 10 | | 3 |
| TECD4a_115 | 21 | Expeditionary Wastewater Recycling System (EWRS) | High | None | Basic | High | | | Developing | | 6 | | 5 | 5 |
| TECD4a_036 | 22 | HIPOWER - Add for Energy Security (OSD Directed) | High | High | | Moderate | | | | | | 2 | | 14 |

= Moderate Interest

= High Interest

= Formal Transition Planning