



# Department of the Army Rapid Equipping Force to International Armaments Technology and Exhibition

16 June 2004

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# REF - A Short History



2002

Missions

2003

RIRS

REF

REF 2

10 May  
START

29 May  
\$s  
Received

28 Jun  
Contract

2 Jul  
Arrived

1 Aug  
Depart

23 Aug  
AAR

Oct Nov Dec

Feb Mar May

Aug

- 4 Bunkers
- 1 Cache
- 26 Caves
- 1 Compound
- 3 Buildings

Doctrine, TTPs  
System Refinement

Afghanistan

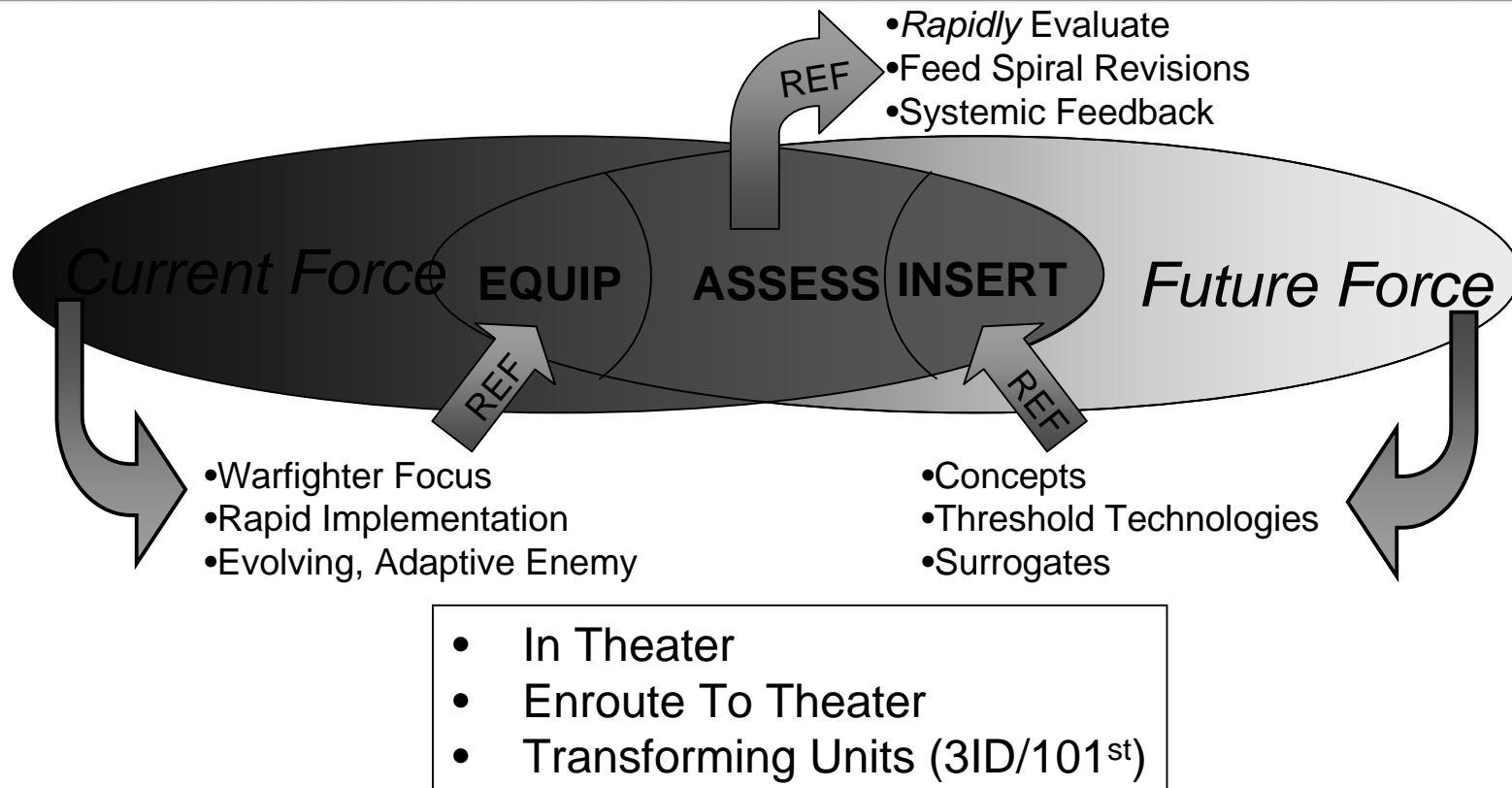
- Fwd Teams linked to units
- Continued to equip with new items

Kuwait / Iraq

- Teams established, pushed forward
- New threats, new requirements
- REF took equipment into battle



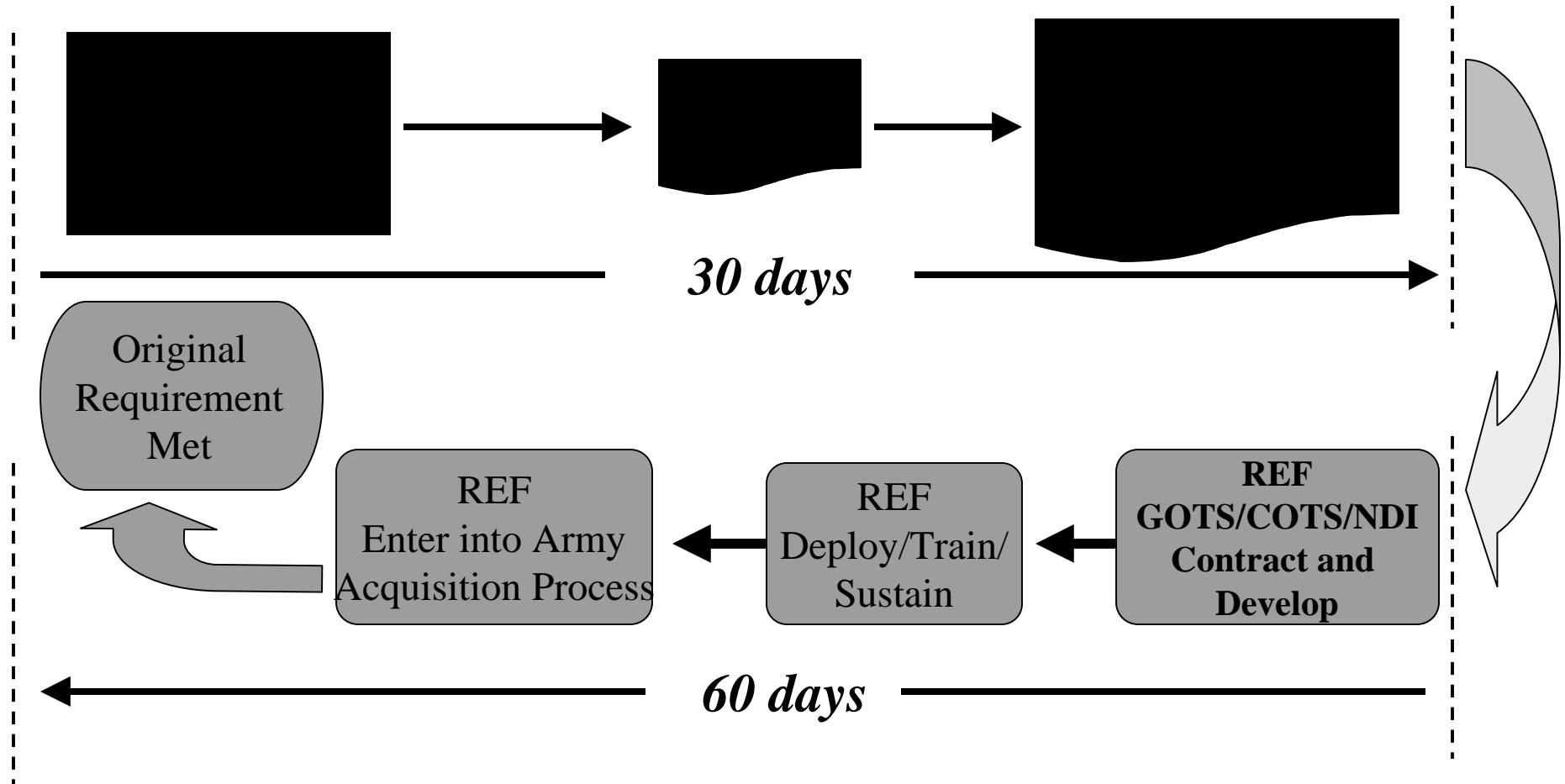
# The CSA's Guidance



**Mission: Provide operational commanders with rapidly employable solutions to enhance lethality, survivability and force protection through insertion of COTS-GOTS (Equip) and Future Force technologies (Insert) while informing Army stakeholders (Assess) to remain ahead of an adaptive enemy.**



# REF Uses Operational Commander's Near Term Requirement Process...



... and its own rapid fielding model



# REF Projects Mapped to Categories



IEDs	Counter Mine	Counter Sniper	Counter Mortar	Force Protection	
<ul style="list-style-type: none"> <li>• EHAT Kits</li> <li>• S –System</li> <li>• ASP Ammunition Marking (Powder &amp; Markers)</li> <li>• ASP Ammunition Marking Microencapsulated Malodorants</li> <li>• Product Acoustic Signature System (PASS)</li> <li>• Quantum Sniffer Explosive Detector</li> <li>• Specialized Search Dogs</li> </ul>	<ul style="list-style-type: none"> <li>• REF Mine Detecting Dogs</li> <li>• Medium Flail HW Upgrade</li> <li>• Mini Flail HW Upgrade</li> </ul>	<ul style="list-style-type: none"> <li>• Gunfire Detection System (PILAR)</li> <li>• Boomerang Shooter Detection &amp; Location</li> <li>• Auto Gun Mount</li> <li>• HMMWV Modifications</li> <li>• Picatinny Lightweight Remote Weapons Station</li> </ul>	<ul style="list-style-type: none"> <li>• Unattended Transient Acoustic MASINT System (UTAMS)</li> <li>• Hostile Artillery Locating System (HALO)</li> </ul>	<ul style="list-style-type: none"> <li>• Mobile MOUT</li> <li>• Joint Precision Airdrop System</li> <li>• Handheld Thermal Sight</li> <li>• Fiberscope</li> <li>• Expray</li> <li>• Magnetometers</li> <li>• Ferrotrace</li> <li>• Walk Through Metal Detectors</li> <li>• Itemizer3</li> <li>• Translators</li> <li>• Vapor Tracer</li> <li>• Entry Scans</li> <li>• HMMWV Modification</li> <li>• HMMWV Turret Protection</li> <li>• Armored Commercial Vehicle (ACV)</li> <li>• Underground Void Detection</li> <li>• Battery Powered Conditioner</li> <li>• Vehicle Protection Projects</li> </ul>	<ul style="list-style-type: none"> <li>• AN/VAS-5 Driver's Vision Enhancer (DVE)</li> <li>• EVD-3000</li> <li>• Jaws of Life</li> <li>• eTRES GPS</li> <li>• Mobile Vehicle and Container Inspection System</li> <li>• Quantum Sniffer Explosive Detector</li> </ul>

**Priority Threat: IED, RPG, Mortar, Small Arms and ManPads**



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# REF Projects Mapped to Categories cont.



UVAs	Biometrics	Robotics	Weapons	ISR	Communications
<ul style="list-style-type: none"> <li>• Raven</li> <li>• MAVARC</li> <li>• Vigilante</li> </ul>	<ul style="list-style-type: none"> <li>• Mobile AFIS and Fingerprint Live Scan</li> <li>• Automated Fingerprint Identification System (AFIS) ARC</li> </ul>	<ul style="list-style-type: none"> <li>• Packbot</li> <li>• Robot M-gator</li> <li>• MARKBOT</li> <li>• EODBOT</li> <li>• ODIS</li> <li>• High Mobility Tactical Micro-Robot</li> <li>• Railbot</li> <li>• REDOWL (Robot Enhanced Detection Outpost with Lasers)</li> <li>• Throwbot</li> <li>• Panther Tank Robot</li> </ul>	<ul style="list-style-type: none"> <li>• M4 Slings</li> <li>• CQBR Short Barrel M4</li> <li>• CMAG</li> <li>• AN/PSQ 18</li> <li>• Close Quarters Battle Sight (CQBS)</li> <li>• C-More CTAC Red Dot Sights</li> <li>• EO Sights</li> <li>• MK125 MOD 0 Tripod</li> <li>• FN303</li> <li>• Shoot around the Corner Sights</li> <li>• TWS Hide Monitor</li> <li>• Trap 50</li> <li>• Trijicon ACOGs</li> <li>• TLOS</li> <li>• E-50 Quick Change Barrel M2 50.cal.</li> <li>• M14-A1 (EBR) Stocks</li> <li>• Aiming Laser</li> <li>• AN/PAS 13B (V)</li> <li>• AN/TAS-6A NODLR</li> <li>• GEM Tech Suppressor</li> </ul>	<ul style="list-style-type: none"> <li>• Rapid Aerostat Initial Deployment (RAID)</li> <li>• Well Camera</li> <li>• Battlefield Optical Surveillance System (BOSS)</li> <li>• NS Microwave</li> <li>• MERLIN</li> <li>• ARL M6/MARSS IV</li> <li>• Change Detection</li> <li>• Acoustic Antenna</li> <li>• SASS Lite</li> <li>• Remote Acoustic Imagery</li> <li>• Tactical Exploitation System (TES) Lite</li> <li>• Search Lights</li> <li>• REAP</li> <li>• Sense through the Wall Radar (STTW)</li> <li>• CHEAP</li> </ul>	<ul style="list-style-type: none"> <li>• LRAD</li> <li>• RAMP 25</li> <li>• Advanced Robotic Controller</li> <li>• Breadcrumb</li> <li>• Satellite Internet</li> <li>• HT1000 Radio</li> </ul>

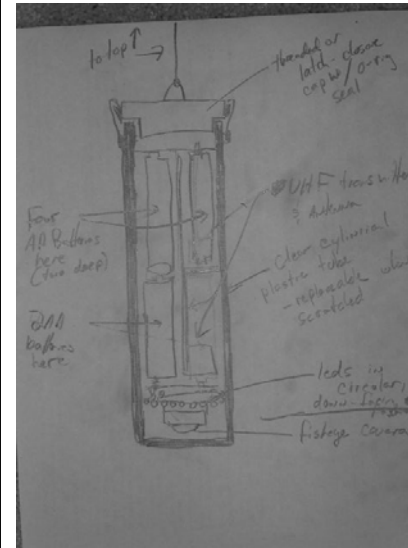
**Priority Threat: IED, RPG, Mortar, Small Arms and ManPads**



# REF: WELLCAMS

2 March 2003

US Soldiers moving too quickly to search Afghan wells



3 March 2003

REF Field Engineer makes first wellcam out of spare parts from the lab

4 March 2003

82<sup>nd</sup> ABN soldier finds weapon cache using REF proto-wellcam



NOW

Fifth-generation wireless Wellcams deployed with 82<sup>nd</sup>, 101<sup>st</sup>, and 10<sup>th</sup> MTN units in Afghanistan and Iraq





# REF: POCKET TERPS

*29 March 2003*

*Soldiers need more Pashtu interpreters to help with village search commands*

*1 April 2003*

*REF Field Engineers record Pashtu phrases on a PDA, interface using “web page” format*



*21 April 2003*

*3<sup>rd</sup>-gen rugged PocketTerps include High-Value Targets, EOD manuals, first aid; soldiers call it the “Magic Key”*



**NOW**

*Eighth-generation PocketTerps being developed in Iraq; now includes loudspeakers, multiple languages; now also being used in traffic checkpoints for safe standoff distance from vehicles*

**May 2003 feedback from Task Force Devil Squad Leaders: “I’d take this on every mission. Before I had to do charades for forty minutes. Now they listen and respond in forty seconds.”**



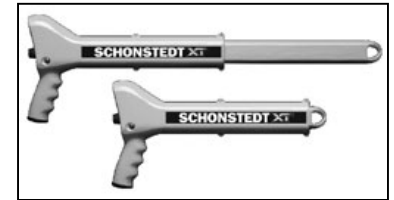
# REF: MAGNETOMETERS

*21 August 2003*

*BG Bagby (CJTF-180) sent a request to REF for a way to search hay, manure, dirt piles for hidden weapons*

*21-25 August 2003*

*REF conducted field research to find an appropriate COTS solution (Schonstedt GA-92XTD)*



*3-5 September 2003*

*Two prototype units ordered, delivered to REF and shipped to theater. CJSOTF then ordered fifty to support their operations*

*NOW*

*120 additional units have been shipped to theater for various units as part of the force protection package approved in 6 January Army Strategic Planning Board meeting*



# REF: PILAR

*May 2003*

*Operational Needs Statement from  
101<sup>st</sup> approved in Army Strategic  
Board meeting*

*June 2003*

*Twenty delivered to Iraq*



**NOW**

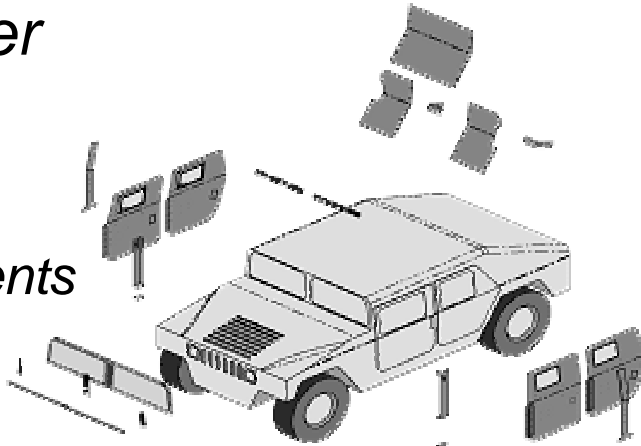
*Spiral development potential in  
counter mortar*



# REF: ARMOR KITS

*November  
2003*

*Initial  
Requirements  
Meeting*



*December  
2003*

*ASPB  
approved  
requirement*



*January 2004*

*First eighteen  
kits delivered to  
Iraq*



*NOW*

*Continuing to work with PM on  
emerging requirements.*

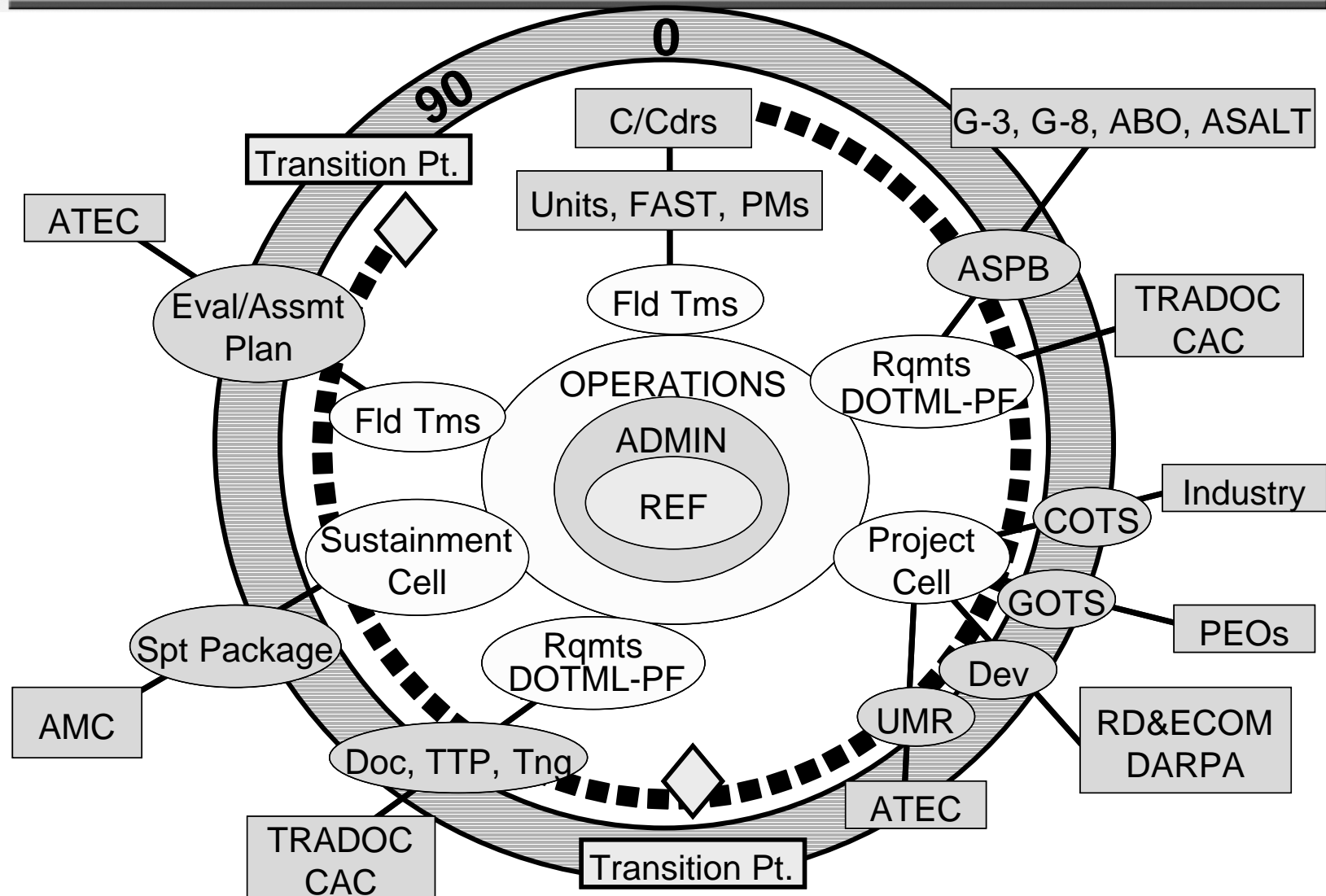
*Provided two underbody armor  
kits for testing*



# BACKUPS



# REF Program/Project Cycle





# REF Developmental/Experimental Cycle

