Robotics Enhancement Program (REP) Update to NDIA Robotics Division
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PM Force Projection
Agenda

- REP Overview & Process
- REP 16.1 Progress
- Lessons Learned & Planning for REP 16.2 & Beyond
Robotic Enhancement Program (REP)

**Problem:** Robotic technology is rapidly evolving. The standard requirements/acquisition timeline of 3 to 7 years increases the risk that robotic systems will be obsolete before it is fielded or more likely, before it even reaches Initial Operational Capability (IOC).

**Mitigation:** Evaluate small quantities of state-of-the-art robotic systems and/or payloads to inform the requirement and acquisition process.

**Concept:**
- Concept based off of Soldier Enhancement Program
- REP is a special project (not a full life cycle acquisition program)
- Uses a “buy-try-inform” methodology to better inform future Army requirements

**Experiment Focus:**
- Protect the Force
- Reduce Warfighters’ Workload
- Enable Situational Awareness
- Sustain the Force
- Enable Lethal/Non-lethal Engagements
- Reduce Cost


Note: REP Counsel of Colonels (CoC) 16.2 in Feb 16
Submission Deadline: 31 December 2015
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REP Organizational Structure

Acquisition Community
- ASA (ALT)
- PEO Combat Support & Combat Service Support
- PM
- Force Projection

Requirements Community
- HQDA G-3/5/7
- MCoE, Director CDID
- Director Soldier Division

Council of Colonels

REP Working Group
- PdM Unmanned Ground Vehicles
- Soldier Division

REP Advisory Council
- ASA (ALT)
- PEO CS&CSS
- PM FP
- PdM UGV
- TCMs
- TRADOC/ARCIC
- MCoE
- MSoE
- ATEC
- CASCOM
- MANSCEN
- USASOC
- AMEDD
- HQDA G-3/5/7
- HQDA G-4
- HQDA G-8

Proposals reviewed & approved bi-annually (FEB and SEP)
Agenda

- REP Overview & Process
- **REP 16.1 Progress**
- Lessons Learned & Planning for REP 16.2 & Beyond
Fifty-Six (56) REP Submissions Received:

- **28 “No-Go”**: Did not meet selection criteria
- **20 Deferred**: Interested but lower priority
- **6 Recommended** for CoC 16.1 consideration: Meet Performance, Schedule, Cost
- **1 Recommended** for CoC out of cycle consideration (Wireless Personal Area Network (WPAN))
- **1 Recommended** for consideration if Advocate identified (Applique Pronto4 Uomo)

Summary of CoC Approved Experiments:

- **UxAutonomy Behaviors (AB)**: Meets the Autonomy, General Platform, and Power Gap capability (MCoE*).
- **Top Layer – Underground 3D Mapping Capability Payload**: Meets the Intelligent, Surveillance and Reconnaissance requirements (MCoE).
- **Underground Tactical Robotics Ground Team (UTRGT)**: Meets Sustainment capabilities (MCoE).
- **Stream Caster Multiple Input Multiple Output (MIMO) Mesh Radio**: Meets the requirement for a Universal Controller and Communications data link to operate multiple systems within a unit’s Area of Operation (MSCoE**).
- **UGVs “Breadcrumbs” – Communications Restrictive/Underground Signal Relay Kit**: Meets the Intelligent, Surveillance and Reconnaissance capability (MSCoE).
- **Tethered Mast ISR (UAS)**: Meets the Autonomy, General Platform, and Power requirements (MSCoE).

Experiment Information:

- Three Experiments Scheduled for 3QFY16 at Ft. Benning
- Three Experiments Scheduled for 3QFY16 at Ft. Leonard Wood

*MCoE = Maneuver Center of Excellence
**MSCoE = Maneuver Support Center of Excellence
### REP 16.1 Initiative 1
#### Requirements/Funding/Schedule

**Obstacle Avoidance & Mapping (OA&M) Capability**
Currently available Light Detecting And Ranging OA&M Capability to the future MTRS Inc II platform.

- **16.1-8: UxAutonomy Behaviors (AB)**
  *(Provides an IOP-compliant autonomous navigation capability in a small SWaP configuration.)*

  *(Compact operational imaging device capable of extracting depth and distance information and pairing it with a standard video of scenes for intuitive situational awareness in tunnel warfare.)*

- **16.1-47: Underground Tactical Robotics Ground Team (UTRGT®)**
  *(Provides tactical, squad level set of solutions to deal with the main challenges in the Sub-Terrainian environment: consists of 4 high mobility unmanned platforms, an underground repeater network, real time 3D mapping to enhance situational awareness and operational effectiveness in the subterranean environment.)*

**JCIDS Requirement for Initiatives 8, 40, 47:**
These support the subterranean CBA effort ongoing at CAID, MCoE. The CBA will lead to subterranean ICD with multiple CDD/CPD solutions from the ICD. Define how Unmanned Systems (UMS) will enable the warfighter in subterranean operations. UxAB also supports the KPP in SMET CDD for OCU for anti-spoofing.

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<th>Task</th>
<th>Time Frame</th>
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<tr>
<td>Acquire</td>
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<td>Integrate/Safety</td>
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Extending the Range of the Platform and Payload Capability

Currently available radio range extenders such as repeaters and/or re-transmitters that will increase overall standoff and range of the platform with its payloads.

✔ 16.1-3: Multiple Input Multiple Output (MIMO) Mesh Radio
   (Provides enhanced range, throughput, and range in a variety of environments including tunnels and extreme non-line-of-sight.)
✔ 16.1-39: UGVs “Breadcrumbs” – Communications Restrictive/Underground Signal Relay Kit (CRUSR)
   (Improves the capabilities of unmanned ground vehicles during subterranean operations.)
✔ 16.1-53: Tethered Mast (UAS)
   (Designed for the austere environment where high fidelity, persistent SA is required, but lack of infrastructure prevents use of existing, larger systems.)

**JCIDS Requirement for Initiatives 3, 39, 53:**
Extending the Range - 39 Supports the subterranean CBA effort. 3 supports the subterranean CBA effort and Universal Controller to control multiple platforms. 53 supports MRD effort to provide SA to mounted systems in hide/defilade/NLOS positions. This will lead to a separate JCIDS effort called Tethered Mast being pursued by MRD, MCoE.

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REP Lessons Learned from CoC 16.1

- COTS/GOTS/NDI Means:
  - Products are available within 6-8 weeks from contract award; not more than 6 months
  - Products are safe and easy for Soldiers to use within appropriate training
  - Can only fund integration but not development to “meet” a requirement

- Provides “Enhancement” capability over current inventory vs equivalent to a program of record
  - If already demonstrated to government, submission should indicate new capability over previous demonstration: We will check.

More Submissions are better than a single all inclusive.
Let us Bundle
REP Key Events

- 31 Dec: CoC 16.2 Industry Submission Cut-Off
- Jan 16: REP Working Group Open 17.1 Submission
- Jan 16: Stakeholders Working Group
  - Re-Assessment of 16.1 Active Deferred and Deferred
  - Assessment of 16.2 Submissions
  - Acquire 16.1 Initiative Products (Thru TARDEC)
- Feb 16: 16.2 CoC
- Mar 16: Integration of 16.1 Initiatives’ Products
- Apr 16.1: Evaluation of 16.1 Initiatives
- Aug 16: CoC 17.1 Industry Submission Cut-off
- Sep 16: CoC 17.1