



**Helmet and Electronics and Display
System – Upgradeable Protection
(HEaDS-UP)
Army Technology Objective (ATO)
Advanced Planning Brief to Industry**

Mr. Donald R. Lee II
don.lee@us.army.mil
(508) 233-6299

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1. What is the problem?

- Head-borne protection and functional capabilities have not been designed as an integrated platform utilizing Soldier-centric design principles. This has prevented optimization of weight and sub-component integration.

2. What are the barriers to solving this problem?

- Lack of lightweight, ballistic materials, impact protection materials and knowledge to provide protection from current threats at acceptable weights
- Lack of CBRN filtration media and materials at acceptable weights
- Individual components are designed separately, and are compatible but not optimized for Warfighter acceptance and weapon compatibility.
- Lack of mature technology, algorithms to replace Soldier's hearing ability while providing hearing protection
- Lack of miniaturized, high-resolution, low-power sensors and displays

3. How will you overcome those barriers?

- Leverage resources: ARL (ballistic materials, shock sensor, ATO-R&M) PM SSL (miniaturized low-power sensors and displays), NSRDEC & TMD (ballistic materials), PM SSV (TBI sensor), PM SWAR (comms). Leverage emerging MPMC knowledge on TBI, then combine with NSRDEC, ARL, and Industry ballistic and energy absorbing materials to form a combination of materials, processing and shapes to provide the Soldier the necessary protection
- Leverage JSTO and JPM-IP resources to provide necessary CBRN protection.
- Ensure all headgear upgrades (mask and filter, mandible, sensors and displays, eye and hearing protection, communication, etc.) are considered in the design and are optimized for CG/MOI and Soldier acceptance and weapon compatibility.
- Mature hearing restoration technology, develop algorithms to replace/enhance hearing while providing hearing protection.
- Leverage NVESD, ARL, DARPA and industry for high-resolution, miniaturized low-power sensors and displays.

4. What is the capability you are developing?

A Soldier-centric designed ballistic protection platform that provides:

- Upgradeable protection (Impact and Ballistic)
- Optimized display and sensor input for actionable info to the Warfighter via audio and visual inputs.
- Modular, integrated CBRN protection.
- Eye, face and hearing protection.
- Optimized sensor packages for use in all natural and man-made (obscurants) conditions.

Supports FOC 07-01 Personnel Protection and supports WFOs: Improved Soldier Protection, Soldier Hearing Protection and CBRN Filters and Subcomponent Filtration Systems

6. Transition Milestones:

- Technology Transition Agreement: To be prepared in FY10
- Transition tech to PEO Soldier: PM-SWAR, PM-SSL, PMSSV & JPEO-CBD FY13

5. Quantitative Metrics: * May reduce Traumatic Brain Injury (TBI)

<u>Measure</u>	<u>Current</u>	<u>Prog. Obj.</u>	<u>Army Obj.</u>	<u>TRL</u>
*Impact Protection	10 ft/sec, max 150 g's	17 ft/sec max 150 g's	T = 14 ft/sec, max 150 g's O = 17 ft/sec max 150 g's	Start: TRL 5 End: TRL 6
Headgear Weight	5.5.lbs (Helmet, ENVG, Eyewear, CEPS)	5.5 lbs Increased Capabilities/ Better CG/MOI	5.5.lbs	Start: TRL 4 End: TRL 6
CBRN Weight	6.5.lbs (Helmet, CBRN, ENVG, Eyewear, CEPS)	6.5 lbs Increased Capabilities/ Better CG/MOI	6.5. lbs	Start: TRL 4 End: TRL 6
Hearing Protection	CEPS	Protect against steady state & impulse events (>85dB)	Protect against steady state & impulse events (>85dB)	Start: TRL 4 End: TRL 6

7. Endorsements:**8. Other ATO Attributes:****Modeling and Simulation**

- Utilize NSRDEC dismounted Soldier simulation facility
- Simulation (DIS) Soldier Battle Lab environment evaluations
- Utilize NVL characterization facility
- Headgear Area of coverage Analysis
- Human Figure Modeling Ingress/Egress from vehicles

Technology Protection Plan (TPP): Critical Program Information (CPI) will be assessed and if CPI determined, TPP will be prepared.

International Program: Collaboration on TBI Sensor

- ATO kicked-off in Oct 09

- Fully funded

- Integrated headgear design Phase I effort has completed
 - ❖ Two design concepts were selected for the ATO

- Hearing Protection/Hearing Enhancement Communications System design Phase I effort has completed
 - ❖ One system was selected for the ATO

- Non-ballistic impact liner material R&D Phase I effort has completed
 - ❖ Two design concepts were selected for the ATO

- FY11 funding obligated, FY12 funding available

- Looking for improvements in:
 - Ballistic materials
 - Non-ballistic impact liner materials and designs
 - See-thru and projected heads-up display technologies
 - CBRN mask technologies
 - Hearing protection/hearing enhancement

- Natick Broad Agency Announcement (BAA)
 - Vehicle for proposal submissions
 - <https://www3.natick.army.mil/nsrdecbaa.html>

POC: Mr. Donald R. Lee II
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