Advanced Combat Helmet

Advanced Planning Brief for Industry

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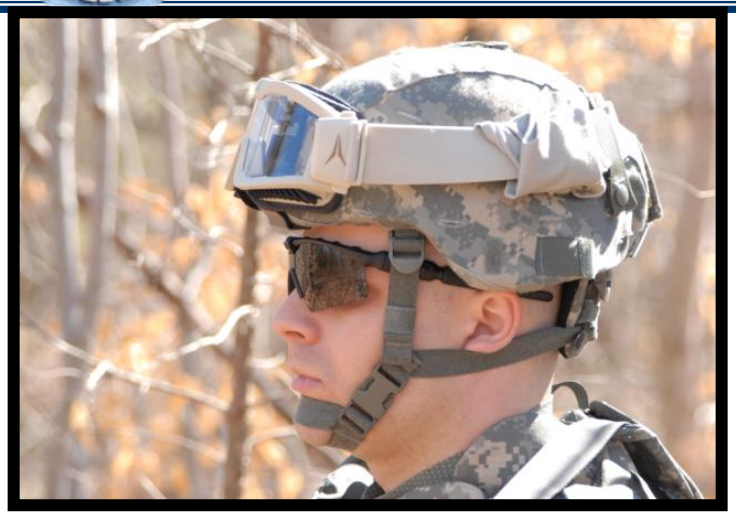
Soldier Survivability

Briefing Topics

- Ballistic Helmet and Accessories
- Head Protection Product Improvements
- ACH Suspension Systems
  - Evaluations
  - Results
- ECH Update
- Helmet Sensor Program Overview
- Program Milestones

Ballistic Helmet and Accessories



Capabilities:

- ACH: 9mm protection and increased fragmentation protection; Low velocity impact protection; Improves field of view, stability, hearing and interface with other individual equipment items
- NAPE Pad: 22 layers Spectra fragmentation and 9mm protection
- Pad Suspension System: Blunt impact force protection level of 150g max at 10 fps
- Helmet Sensor: Measure helmet acceleration and pressure associated with concussive events
- ECH: Improved fragmentation and ballistic protection against “selected small arms” threat

System Description:

- ACH/ECH: A modular helmet with suspension and neck protection pads provides improved fragmentation, ballistic, and impact protection while reducing weight, improving fit, and increasing comfort.
- Neck Protector: Provides fragmentation protection to the nape area of the neck, and improves overall stability of ACH.
- Pad Suspension System: Modular, lightweight, flame retard, and moisture resistant series of pads that act as the suspension system between the wearer’s head and the helmet.
- Helmet Sensor: Small, low power sensor suite mounts on both ACH and CVC to detect, measure and record impact and blast overpressure associated with concussive events

Objective:

- To improve the Soldier’s survivability

BOI:

- ACH: Based on guidance from VCSA will replace PASGT helmet as a one-for-one replacement system. AAO Completed.
- GEN I Helmet Sensor: Per VCSA guidance, one sensor per Soldier ACH (2 BCT’s) FY07
- GEN II Helmet Sensor: Per VCSA guidance, one sensor per Soldier ACH (6 BCT’s) FY09
- ECH: G3/5/7 requirement for 200K helmets.

Head Protection Improvements

Nov 2002

ACH Fielding (initial)

Helmet weight Decrease from 3.5 lb to 3.0 lb (approx.)

Dec 2006

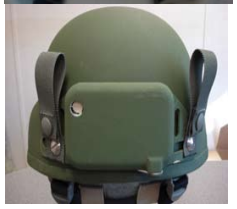
Pad improvement impact level increase to 150g max at 10 fps

Mar 2007

N.A.P.E. Pad™ Introduced

Sep 2007

Helmet Sensor Introduced



Oct 2009

Helmet Sensor GEN II

Feb 2010

ECH w/ increased protection against "selected small arms threats"

ACH Suspension Systems Evaluations

- In FY08, Congress directed the Secretary of Defense to conduct user evaluations of the qualified pad systems. Pursuant to H.R. 1585 Section 1048, during 14-25 Jul 08, the Army conducted a limited user assessment of the following four available pad systems:
  - NIB/Team Wendy (TW)
  - Mine Safety Appliances (MSA)
  - Oregon Aero (OA)
  - Skydex (SKY)
- Additionally, the Government conducted blunt impact testing on the four available pad systems during Aug 08 – Jan 09.
  - Conducted at three independent laboratories
  - Evaluated blunt impact performance at three temperature conditions—hot, cold and ambient
  - Evaluated blunt impact performance at three impact speeds—10, 14.1 and 17.3 ft/sec

Analysis of Results

- HFEE Results Analysis
  - No significant difference in performance
  - However, when Soldiers were asked about their overall preference of the evaluated ACH pad systems, results showed a fairly clear preference for the SKYDEX system and a consensus rejection of the MSA system.
    - The discussion of the MSA system focused on the issue of discomfort, especially the greater frequency of headaches that occurred with the MSA system.

- Blunt Impact Results Analysis (10.0 ft/sec)
  - All vendors had at least 1 failure (max acceleration > 150g)
  - NIB/TW pad had least amount of failures (4 out of 504 trials) and highest reliability (p)
  - Ranking by relative performance at 95 %confidence level:
    - TW (FR = 0.8%, p = 98.2%)
    - SKY (FR = 1.0%, p = 97.9%)
    - MSA (FR = 1.6%, p = 97.1%)
    - OA (FR = 2.2%, p = 96.4%)

Enhanced Combat Helmet (ECH)

- Proof of Concept
  - Material/processing study (2007)
    - Flat Panel testing from:
      - Dutch State Mines (DSM)—Dyneema® X31
      - Honeywell—Spectra Shield SR3124
      - Armacel—specialty composite
      - DuPont—new aramid-based composite
    - Resulted in the focus on UHWMPE (X31 x SR3124)
- ECH Phase I Prototype Study (2008)
  - UHWMPE provided as Government Furnished Materials (GFM)
  - Purchased 360 prototypes from each vendor—BAE, Gentex, MSA, ArmorSource, and Diaphorm
    - Gentex solution provided greatest level of ballistic and fragmentation protection
- Path Forward
  - Joint Effort with USMC as lead
  - Received Army requirement for 200K ECH (including spares) (MAR 09)
  - ECH RFP released 23 APR 09
  - FUE 2QFY10

Helmet Sensor Program Overview

Description:

- The Helmet Sensor is a small, lightweight, low power sensor suite that mounts to the Advanced Combat Helmet or the Combat Vehicle Crewman Helmet. The Helmet Sensor will detect, measure and record impact (acceleration in three degrees of freedom) and blast overpressure associated with concussive events/IED blasts that Soldiers may experience in operational environments. Data is downloaded via a USB port to any computer.

Objective:

- Collect data in theater from combat units to understand and characterize the events that may cause Traumatic Brain Injury (TBI) as a result of IED/blast impact and other occupational hazard events.

HS Variants:

- GEN I: 18-month OEF/OIF deployment for 2 BCTs has concluded. Current Status: Closeout Activities
- GEN II: 18-month OEF/OIF deployment for 6 BCTs to begin OCT FY10. Current Status: RFP release 3QFY09.
- GEN III: 18-month Advanced Research Initiative. Current Status: RFI posted 20 APR 09.

Milestones

SSV Products	Key Milestones	Projected Contract Actions
ECH (Army Focus)	Testing: OA Down Select: 4QFY09	1QFY10
GEN I HS	Data Collection: Phase II	None
GEN II HS	RFP: Posts 3QFY09	4QFY09
GEN III HS	RFI: Closes 15 May 09	Jul 09

QUESTIONS