



# OPERATION HELMET



The Honorable Kenneth J. Krieg  
Under Secretary of Defense  
Acquisition, Technology and Logistics  
3010 Defense Pentagon  
Washington DC 20301-3010

March 19, 2007

Dear Sir:

On March 13, 2007, we received a copy of your letter to the House Armed Services Subcommittee dated Feb 22, 2007 with the attached U.S. Combat Helmet Suspension System Comparison Summary and Findings dated Dec 2006. We have completed an initial review of the data and provide comments below. We have limited our discussion to the lightweight helmet (LWH) now used by the Marine Corps and to the Personal Armor System for Ground Troops (PASGT) helmets used by most of the services.

It is rather disturbing that no one contacted Operation Helmet to ask questions or confirm the facts. It appears that even a simple review of the web site did not occur. We clearly state in the on-line request form that each helmet requires a different pad system.

Since February of 2004, we have shipped BLSS kits to troops who have requested upgrades for Personal Armor System for Ground Troops (PASGT) helmets. We have shipped the BLU-6 kit if a troop has the Lightweight Helmet (LWH). Given the \$29 difference in our charity's cost in sending a \$71 BLU v. \$100 BLSS, it only makes sense to send what is needed. We have also sent 1,000 kits from Skydex to non-frontline, fixed base troops, primarily Air Force.

We chose the Oregon Aero BLSS/BLU kits as our preferred upgrade, as it had been used in combat conditions with excellent results for several years in the MICH, ACH and PASGT.

The current Marine upgrade is the Team Wendy (TW) pad which share the same dimensions and National Stock Numbers (NSN) as the Oregon Aero (OA) BLU pads, which we understand are each equally available. We also understand from field feedback that the USMC is now providing  $\frac{3}{4}$ " or 1" front, side, and rear pads and 1" crown pad, often requiring a larger sized helmet in order to fit the same head. The BLU kit is available with similar dimensions and provides the same degree of protection as the Team Wendy (TW) pads in both the PASGT and LWH, and adds comfortable wearability and stability.



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EIN 20-1756585



From the report, "Pad placement on the test form was done in accordance with that recommended for the ACH in airborne operations."

OH Comment: This placement emphasizes forehead and neck/occipital protection during a PLF (parachute landing fall), and does not take into consideration the manufacturer's recommendations for dispersal of pads in the helmet to mitigate blast/impact protection in the IED environment which is not mentioned in the report

From the report, "Within helmet system fitting types, the performance in blunt impact protections appear to be dependent on the test temperature conditions."

OH Comment: Cold temperature testing was done on headforms that reflect ambient temperature in the test environment instead of on headforms that simulate human body temperature. All foam pads become firmer in extreme cold, as water is an integral part of the foam itself. When the firm pad is placed on the warm human head, the pad quickly (2-5 min) assumes the temperature of the head and resumes its 'conforming' capabilities. The same can be said of the hot temperature testing. Pads do NOT assume the ambient temperature when worn, but reflect the head's cooling/heating ability on the pad temperature.

From the report, "A Helmet fitting system that allows water accumulation could alter blunt impact performance when saturated and/or the fitting system performance could change after drying."

OH Comment: This is perhaps the most important laboratory test, after blunt impact testing and was not included for reasons unknown to us. In the real world, pads are worn continuously in hot environmental atmospheres where sweat production is ongoing and pads are in danger of becoming waterlogged. An appropriate test should be designed in which the pads are immersed in water and subjected to continuous pressure equal to helmet weight on the wearer's head for a time equal to most combat patrols, then tested immediately.

Objective testing needs to include testing under realistic conditions. For example, test dry and wet pads; test new pads and pads that have been worn for at least 100 hours (about 8 days under combat conditions) to as long as 1000 hours (90 days).

From the report, "Additionally, the effects of ageing, and normal use wear and tear, on pad performance were not evaluated in this study."

OH Comment: An appropriate sample of used pads can be readily obtained from combat elements that have been used under combat conditions (not from

garrison based users) and sent to the test facility for testing. Ample amounts of used pads should be available in the real-world environment to render artificial lab replication of conditions unnecessary.

From the report, "...the Oregon Aero BLSS system includes an integrated chin and nape strap system attached to a 0.1 inch thick head band. The head band occupies space along the circumference of the inner shell surface and necessitates a thinner pad to accommodate the same head size".

OH comment: This is erroneous. The reason for the BLSS kit's ½" front, side, and rear pads is based on the PASGT and LWH's specifications which call for ½" 'standoff' between helmet and head. This is considered a safe distance to accommodate back-face-deformation if the helmet is struck by a non-penetrating ballistic missile such as a bullet or small ballistic fragment. The BLSS kit's pads meet that requirement.

Additionally, Operation Helmet has shipped BLSS kits with ½" and ¾" front, side, and rear pads.

From the report, "The comfort of the helmet fitting system is critical for proper and continuous wear of the protective equipment."

OH Comment: We propose a test format (below) to evaluate wearability and comfort. We have a number of reports from troops indicating that the Team Wendy pads are so firm and uncomfortable the troops smash them with hammers in an attempt to make them wearable for their long patrols. This is a dangerous practice and compromises the pad system. Helmet pad inserts must conform to the irregularities of the skull. When an area of skull/scalp is subjected to ischemia (lack of blood supply) due to continuous pressure, severe migraine-type headaches often occur, leading the wearer to loosen the chin strap, delete pads or remove the helmet for relief, all dangerous practices in the combat environment. Some variation in pad placement and orientation is allowable for comfort and fit as earlier tests have indicated.

Subjective testing is the only way comfort can be tested. It must be done in a double blind scientific way under realistic field conditions. For example, 25 troops in Group I test kit "A" for the first week, "B" for the second, and "C" for the third. Group II tests in the order "B" "C" "A" and Group III tests "C" "A" "B", etc. Subjects for each group should wear the helmet for at least eight hours per day preferably under field conditions. There should be no contact between groups during the test period. Testing should occur in hot and cold desert (29 Palms/Ft Irwin) and hot and cold temperate conditions (Camp Lejeune/Ft Bragg).

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We have contacted Oregon Aero, manufacturer of the BLSS and BLU systems, to see if they can elucidate the widely divergent test results when the BLSS kit is used in the LWH. In the USAARL testing, the BLSS failed the blunt impact tests, while in the manufacturer's and independent laboratory testing, the BLSS kit passed blunt impact requirements.

Finally, we want to help protect our troops and get them home safe and sound. Nothing more, nothing less.

A handwritten signature in black ink, appearing to read "R. Meaders, MD". The signature is fluid and cursive, with a large initial "R" and "M".

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cc:

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