



DEPARTMENT OF DEFENSE EXPLOSIVES SAFETY BOARD
2461 EISENHOWER AVENUE
ALEXANDRIA, VIRGINIA 22331-0600

25 SEP 2003

DDESB-KT

MEMORANDUM FOR ARMY BOARD MEMBER, MR. JAMES C. KING
NAVY BOARD MEMBER, CAPTAIN MARK HELMKAMP
AIR FORCE BOARD MEMBER, COLONEL DANIEL TOMPKINS
MARINE CORPS BOARD MEMBER, MR. JERRY MAZZA

SUBJECT: Approval of Hazards of Electromagnetic Radiation to Ordnance (HERO) Criteria

References: (a) DDESB-KT memorandum dated 09 June 2003, Subject: Proposed Criteria for Hazards of Electromagnetic Radiation to Ordnance (HERO) in DoD 6055.9-STD – Vote by Correspondence Action

(b) MARCORSSCOM letter 80202043 of 11 June 2003, Subject: Proposed Criteria for Hazards of Electromagnetic Radiation to Ordnance (HERO) in DoD 6055.9-STD - Vote by Correspondence Action

(c) E-mail from Col Tompkins, Air Force Board Member, of 27 June 2003, Subject: Vote by Correspondence Action for Proposed Criteria for HERO - AF Concur

(d) CNO memorandum 8020 Ser N411C1/3U572 of 2 July 2003, Subject: Proposed Criteria for Hazards of Electromagnetic Radiation to Ordnance (HERO) in DoD 6055.9-STD - Vote by Correspondence Action

(e) E-mail of 22 August 2003 from Mr. J.C. King, Army Board Member, Subject: Vote by Correspondence – HERO

(f) PHONECON between Mr. Eric Deschambault and Mr. Brent Knoblett, DDESB Secretariat, and Mr. J. C. King of 23 September 2003

Reference (a) provided proposed Hazards of Electromagnetic Radiation to Ordnance (HERO) Criteria to Board members and requested their review and written response by 18 July 2003, as to their acceptance of the attached HERO criteria. References (b), (c), and (d), respectively, provided Marine Corps, Air Force, and Navy Board Members' approvals for the proposed HERO criteria. Reference (e) provided Army Board Member concurrence, subject to acceptance of proposed minor revisions. An additional slight modification to the first sentence of C6.6 of the Army's proposed wording, changing "... protected from electromagnetic radiation (EMR) that could cause..." to "...designed or protected such that electromagnetic radiation (EMR) does not cause their..."", was discussed during reference (f).



The Secretariat has reviewed the minor revisions proposed by the Army and determined their inclusion could be accommodated with no negative impact to the proposed criteria previously provided by reference (a) and already concurred in by the Marine Corps, Air Force, and Navy. Consequently, the new HERO criteria shown in the attached document are approved and will be incorporated into the "Rewrite" version of DoD 6055.9-STD.

My point of contact on this matter is Mr. Eric Deschambault, DSN: 221-1369, commercial phone: (703)-325-1369; fax: (703)-325-6227; and e-mail: Eric.Deschambault@ddesb.osd.mil.



WILLIAM E. WRIGHT
Captain, US Navy
Chairman

Attachment
As stated

cc:

Alternate Army Board Member, LTC Susan Carlson
Alternate Navy Board Member, CAPT Robert M. Honey
Alternate Air Force Board Member, Mr. Eric Olson
Alternate Marine Corp Board Member, Mr. Thierry Chiapello
JCS (J-4-SMPD)
DTRA (Cdr Gatski)
DCMA (DCMA-O)
TRANSCOM (TCJ4-LT)
DA, Director of Safety (Mr. J. Gibson)
USADAC/ SJMAC-ES (Mr. Stroo)
NOSSA/N7D (Mr. Richard T. Adams)

Approved HERO Criteria

C6.6. Hazards of Electromagnetic Radiation to Ordnance (HERO) – Military Munitions (at times also referred to as ordnance or ammunition and explosives) containing electrically initiated devices (EID) shall be designed or protected such that electromagnetic radiation (EMR) does not cause their inadvertent initiation, degradation or disablement. Both direct radio frequency (RF) induced actuation of the EID or electrical coupling to and triggering of the associated firing circuits can occur, especially in a tactical radiated electromagnetic environment (EME). Examples of EID include: exploding foil initiators, laser initiators, burn wires, fusible links, and electro-explosive devices (EED), such as, hot bridge wires, carbon bridges, and conductive compositions.

C6.6.1. During acquisition, HERO testing and certification shall be accomplished, both for routine employment mission profiles, and for any anticipated joint- or combined-operational employment to include transshipment exposures through EME differing from the employment environment.

C6.6.2. During subsequent phases of life cycle munitions management, additional HERO testing and certification shall be accomplished when legacy munitions are redesigned or before they are employed through EME for which they were not previously HERO certified.

C6.6.3. Minimally, HERO certification shall involve exposure, without adverse effects, of the munitions to the EME relevant to all life cycle configurations, including packaging, handling, storage, transportation, checkout, loading and unloading, and launch.

C6.6.4. All HERO test and certification data shall be compiled in a centralized data repository to support the Joint Spectrum Center Ordnance Electromagnetic Environmental Effects (E3) Risk Assessment Database (JOERAD), for subsequent use in information applications supporting Combatant Commands and the DoD Components.

C6.6.5. DoD Components shall take measures (e.g., identifying susceptibilities, quantifying electromagnetic environments, evaluating risks associated with operating procedures, and establishing tailored emission control (EMCON) instructions) to ensure that HERO effects on munitions are resolved during the planning of joint or combined operations or training exercises.

**Seven new definitions and related acronyms to be added to the "Glossary" and
"Abbreviations and/or Acronyms":**

Hazards of Electromagnetic Radiation to Ordnance (HERO) - Situations in which transmitting equipment (for example, radios, radar, electronic countermeasures, electronic counter-countermeasures, ground penetrating radar, etc.) or other electromagnetic emitting devices can generate radiation of sufficient magnitude to: induce or otherwise couple electromagnetic energy sufficient to exceed specified safety and/or reliability margins in electrically initiated devices (EID) contained within ordnance, or cause radiation-induced damage or degradation of performance in military munitions containing EID. (MIL-HDBK-240)

Electro-Explosive Device (EED) - An explosive or pyrotechnic component that initiates an explosive, burning, electrical, or mechanical train and is activated by the application of electrical energy. (JP 1-02, DoD Dictionary)

Electrically Initiated Device (EID) - An EID is a single unit, device, or subassembly that uses electrical energy to produce an explosive, pyrotechnic, thermal, or mechanical output. Examples include: electro explosive devices (such as hot bridge wire, semiconductor bridge, carbon bridge, and conductive composition), exploding foil initiators, laser initiators, burn wires, and fusible links. (MIL-HDBK-240)

Electromagnetic Environment (EME) - The EME is the resulting product of the power and time distribution, within various frequency ranges, and includes the radiated and conducted electromagnetic emission levels that may be encountered. It is the totality of electromagnetic energy, from man made and natural sources, to which a platform/system, or subsystem/equipment will be exposed within any domain, that is, land, air, space, and sea, while performing its intended mission throughout its operational life cycle (in the case of munitions, during its stockpile-to-safe separation sequence). When defined, the EME will be for a particular time and place. Specific equipment characteristics, such as operating frequencies, emitter power levels, and receiver sensitivity, operational factors such as distances between items and force structure, and frequency coordination all contribute to the EME. In addition, transient emissions and their associated rise and fall times such as from EMP, lightning, and p-static also contribute. (MIL-HDBK-237)

Electromagnetic Environmental Effects (E3) - E3 is the impact of the EME upon the operational capability of military forces, equipment, systems, and platforms. It encompasses all electromagnetic disciplines, including electromagnetic compatibility (EMC) / electromagnetic interference (EMI); electromagnetic vulnerability (EMV); electromagnetic pulse (EMP); electronic protection (EP); hazards of electromagnetic radiation to personnel (HERP), military munitions--ordnance (HERO), and volatile materials such as fuel (HERF); and the natural phenomena effects of lightning and precipitation static (p-static). (MIL-HDBK-240)

Electromagnetic Radiation (EMR) - Radiation made up of oscillating electric and magnetic fields and propagated with the speed of light. Includes gamma radiation, X-rays, ultraviolet, visible, and infrared radiation, and radar and radio waves. (JP 1-02, DoD Dictionary)

Emission Control (EMCON) - The selective and controlled use of electromagnetic, acoustic, or other emitters to optimize command and control capabilities while minimizing, for operations security: a. detection by enemy sensors; b. mutual interference among friendly systems; and/or c. enemy interference with the ability to execute a military deception plan. (JP 1-02, DoD Dictionary)

3 New References:

MIL-HDBK-240, Hazards of Electromagnetic Radiation to Ordnance (HERO) Test Guide

JP 1-02, DoD Dictionary

MIL-HDBK-237, Electromagnetic Environmental Effects on Platforms, Systems, and Equipment