

NRAC Report

Lightening the Load

Executive Summary

This Naval Research Advisory Committee study, sponsored by the Deputy Commandant of the Marine Corps for Combat Development & Integration, sought to assess the weight and volume contributors of the Marine's combat load, and to evaluate technology initiatives and other changes to reduce the burden without having an unacceptable impact on combat effectiveness, safety, or tactics.

The operating premise was that the current loading on the individual combat Marine is excessive and that the trend will continue—unless positive action is taken. All available studies have recommended loads of no more than approximately 1/3 body weight be carried—for Marines and soldiers going into combat. There are numerous examples cited by military historians in which heavy loads directly or indirectly resulted in reduced performance, unnecessary deaths, and lost battles.

The NRAC Panel received over 100 briefings from experts who addressed the various aspects of this problem area, including: Marines returning from the Afghanistan and Iraq theaters of operation; Marine, Army and Industry Program Managers; Science and Technology Managers; Academicians; and Senior Marine Officers. The Panel also reviewed the numerous studies on this subject. It was clear to the Panel that a significant amount of study and a number of uncoordinated efforts have been conducted in an attempt to understand and mitigate the loading problem—which, unfortunately, has only gotten worse.

The focus of the mitigation effort from the Panel's perspective as well as the sponsor's should be on the Marine Rifle Squad as “the system”, as opposed to the individual Marine. This is because the Marine “riflemen” within the rifle squad have different tasks and hence their weapons and equipment or “load” differs from Marine to Marine. This approach also aligns with the recently formed Marine Expeditionary Rifle Squad (MERS) office within the Marine Corps System Command.

The NRAC Panel found only limited analytical data that address combat effectiveness as a function of carried load. However, there is considerable anecdotal information based on current combat operations that indicates the heavier loads severely reduce the effectiveness of the Marine or soldier, especially during long-duration patrols, in close-in urban combat, and other adverse situations.

The Panel's top-level findings were:

- (1) A Marine's current assault load varies from about 97 to 135 pounds vs. the recommended maximum of 50 pounds
- (2) This translates to the Assault Load for the Marine Rifle Squad of about 1,620 pounds, 900 pounds over the recommended maximum squad load
- (3) Squad and individual equipment are designed and procured independently and are not considered as a system
- (4) The most optimistic outcome of current and planned S&T efforts may result in a squad load reduction of about 300 pounds
- (5) Another 300 pounds could be transferred from the Marines in the squad to vehicles or other assets organic to the squad. This still results in the squad carrying 300 pounds more than the recommended maximum load
- (6) Over-matching threats exist and will persist – e.g., advanced Improvised Explosive Devices (IEDs) and improved sniper capability
- (7) The Program Manager, Marine Expeditionary Rifle Squad (PM MERS) does not have the directive authority to execute a systems engineering process encompassing all the components that are included in the Marine Rifle Squad loading

From the findings and deliberations, the NRAC Panel developed a set of recommendations and actions for the senior leadership:

Assistant Secretary of the Navy (Research, Development and Acquisition) (ASN (RDA)):

- Increase ONR investment in Lightening the Load
- Advocate with DDRE, an appropriately funded, multi-service S&T program for Lightening the Load

Commandant of the Marine Corps (CMC):

- Engage with the DARPA Director to nominate relevant Program Managers and achieve greater effectiveness from the Marine Liaison Officer

- Establish a partnership with DARPA on advanced ISR, lethality, and tactics to improve combat effectiveness and thereby reduce load weights

Deputy Commandant for Combat Development & Integration (DC CD&I):

- Establish maximum load weights for the Marine and the Rifle Squad
- Ensure Integration Divisions and MCWL are effectively coordinating with ONR
- Annually review all Marine Corps programs at ONR

Commander, Marine Corps Systems Command (MARCORSYSCOM):

- Assign total “Squad as a System” management authority to PM MERS
- Provide resources to create effective “Squad as a System” systems engineering capability

Chief of Naval Research/Vice Chief of Naval Research (CNR/VCNR):

- Develop, validate, and deliver three models to MARCORSYSCOM:
 - Squad combat effectiveness as a function of load, terrain, environment and other pertinent parameters
 - Impact of load on individual performance (endurance, mobility, combat effectiveness, etc.)
 - Models for system trade of studies (ISR capability, lethality, weight, mobility, survivability, etc.)