

Activity reference number	HFM-238	Activity Title	Approval
Type and serial number	RTG		2012
		Reducing the Dismounted Soldiers Burden	Start April 2013 IS
Location(s) and Dates		1st Mtg at CSO, Paris (FRA)	End April 2016
Coordination with other bodies		NAAG, COMEDS, NAAGLCG-1	
NATO Classification of activity		UU	Non NATO Invited Yes
Publication Data		TR	UU
Keywords		Soldier Systems, Load Carriage, Personal Protective Equipment, Equipment, Burden, Load	

I. Background and Justification (Relevance to NATO):

Throughout history, the dismounted soldier has had to carry heavy loads, often over long distances under demanding terrain and environmental conditions. Once they arrive at the enemy's destination, while they can doff their packs and much of their sustainment load, they must be fit to fight whilst still wearing significant assault or fighting loads. Contrary to expectations that advances in technology would reduce loads carried by the soldier, new technology has produced soldier capabilities that have contributed to increased loads. Whilst the use of mechanized transport is maximized, terrain and mission conditions have not eliminated the need to carry heavy loads long distances on foot, and the loads being carried by NATO soldiers on current operations are heavier than has been previously reported.

There are significant ongoing research programmes to address the problem of soldier burden in many NATO nations. A great deal of work is being undertaken to understand the nature of the burden, to measure it and to then reduce it whilst assuring delivery of battle-winning operational capability. However, there is a need to take a comprehensive and holistic approach, so that NATO can learn from, and build upon this work in a more concerted and co-ordinated way.

II. Objective(s):

The objectives are: [a] to scope the requirement; [b] to define the 'burden'; and [c] to identify those factors known to influence the size and nature of the burden. The aim is to establish a NATO consensus concerning the threat to soldier performance from 'burden' and to identify strategies to mitigate the threats in order to maintain operational effectiveness.

III. Topic To Be Covered:

- Review what is understood by soldier 'burden' (e.g. physiological, biomechanical, cognitive, ergonomic);
- Identify the NATO requirement for reducing burden with reference to extant research programmes from participating nations;
- Define measures of performance (e.g. reduced casualties/injuries) with which to assess the effect of strategies concerning the management of the 'burden';
- Consider the trade off between the proposed strategies for mitigating soldier burden (e.g. physical preparation, configuration control);
- Quantification of soldier burden (e.g. Operational Analysis);
- Each of the above points would be considered for different mission types (e.g. urban, jungle etc.).

IV. Deliverable (e.g. S/W Engage Model, Database,...) and/or end product (e.g. Final Report):

Technical Report, other deliverable(s) : none

V. Technical Team Leader And Lead Nation:

Chair : Mr Venturino R. NEVOLA United Kingdom

Lead Nation: United Kingdom



Technical Activity Proposal (TAP)



VI. Nations Willing/Invited to Participate:

NATO Nations and Bodies : Belgium, Canada, Germany, Norway, United Kingdom, United States

PfP Nations : all PfP invited

MD Nations : all MD invited

ICI Nations : none

Global Partners : Australia, Japan, New Zealand, Republic of Korea

Contact / Other Nations : Singapore

VII. National And/Or NATO Resources Needed (Physical and non-physical Assets):

Funding for travel and per diem for Technical Team Members

VIII. STO/CSO Resources Needed:

Funding for 2 experts during the PoW.

Additional Information

Panel Mentor:

Mrs Alison ROGERS, United Kingdom

Limited Participation Technical Team:

No

Comments:

Tasks:

- Review what is meant by soldier burden
- identify NATO requirements for reducing burden and reference to existing Nation's programs
- Define measurements of performance
- Consider trade offs between strategies for mitigating soldier burden (inform the CNAD/NAAG/LCG1 community on soldier fragmentation vulnerability analysis)

Follow-on to the HFM-ET 115

Approved at the 30 HFM-PBM, Fall 2012.

Approved by the STB in FT/SP December 2012.

Open to PfP/MD/GP and Singapore

Terms Of Reference (TOR)**HFM-238, RTG
on
Reducing the Dismounted Soldiers Burden****I. Origin****A. Background**

Throughout history, the dismounted soldier has had to carry heavy loads, often over long distances under demanding terrain and environmental conditions. Once they arrive at the enemys destination, while they can doff their packs and much of their sustainment load, they must be fit to fight whilst still wearing significant assault or fighting loads. Contrary to expectations that advances in technology would reduce loads carried by the soldier, new technology has produced soldier capabilities that have contributed to increased loads. Whilst the use of mechanized transport is maximized, terrain and mission conditions have not eliminated the need to carry heavy loads long distances on foot, and the loads being carried by NATO soldiers on current operations are heavier than has been previously reported.

There are significant ongoing research programmes to address the problem of soldier burden in many NATO nations. A great deal of work is being undertaken to understand the nature of the burden, to measure it and to then reduce it whilst assuring delivery of battle-winning operational capability. However, there is a need to take a comprehensive and holistic approach, so that NATO can learn from, and build upon this work in a more concerted and co-ordinated way.

B. Justification (Relevance for NATO)

Throughout history, the dismounted soldier has had to carry heavy loads. Marshall (1950) noted that the infantryman is a beast of burden but that his chief function in war doesnt begin until he delivers that burden on the appointed place on the battlefield. Soldiers often need to march long distances under very demanding terrain and environmental conditions. Once they arrive at the enemys location, while they can doff their packs and much of their sustainment load, they must still be fit to fight while wearing significant assault or fighting loads.

One would imagine that advances in technology would have reduced the loads carried by the soldier. However, technology has produced new soldier capabilities that have contributed to increased loads. Even twenty years ago, the combat loads carried by soldiers on operations (average of 45 kg) were more than three times the loads carried by ancient Greeks and Romans, an increase that may be partially attributable to the larger size and weight of modern males (Knapik, 2001). Ancient armies utilized carts and mules to haul heavy loads. Modern militaries maximize the use of transport, however, terrain and mission conditions have not eliminated the need to transport heavy loads great distances. And the loads carried by NATO soldiers on current operations are at record highs.

Several factors have contributed to this increase. Firstly, soldier modernization programs have fielded important new technologies and capabilities down to the individual soldier level, each of which has increased their combat load (e.g., increased lethality, GPS, soldier radio, night vision equipment, weapon-mounted sensing, aiming and illumination aids, etc). Secondly, the nature of counter-insurgency and adaptive dispersed operations can make re-supply difficult, particularly in immature theatres of operation. Soldiers are now carrying two to three times the doctrinal loads of ammunition perhaps due to a lack of confidence in their re-supply system. This is exacerbated by the hydration requirements imposed by operations in extremely hot temperatures and the requirement to maintain sufficient battery power for the range of powered devices now carried. Finally, NATO soldiers have been increasingly burdened by the design and employment of personal protective equipment (with increases in protection level, stiffness, coverage and bulk), driven by the omnipresent threat of exposure to Improvised Explosive Devices and doctrine that attempts to minimize combat losses.

Soldier loads are now well above the established recommended maximum loads (30 and 45% of body weight for fighting/assault loads and approach march loads respectively based on the average soldier body weight). However, not all soldiers are average, so even this load limit, if followed, would burden all those soldiers who are below the average. While clothing and PPE is sized to soldiers and is therefore lighter in weight for smaller soldiers, combat supplies like weapons, ammunition and batteries, among the heavier items carried, do not cater to the variability in soldier load-carriage capacity. Anecdotal evidence indicates that, at times and for some roles, current combat loads may be approaching the soldiers own body weight. And to make matters worse, soldiers rarely train for operations with loads representative of those carried on operations (probably out of unit concerns about injury), so they are dealing with serious physical overload for the first time in an operational theatre along with many other new stressors (demanding physical environment, enemy threat, psycho-social, etc). It is no wonder that many NATO nations are trying to tackle the problem of soldier burden with high priority.

II. Objectives

Review what is understood by soldier burden(e.g. physiological, biomechanical, cognitive, ergonomic);

Identify the NATO requirement for reducing burden with reference to extant research programmes from participating nations;

Define measures of performance (e.g. reduced casualties/injuries) with which to assess the effect of strategies concerning the management of the burden;

Consider the trade off between the proposed strategies for mitigating soldier burden (e.g. physical preparation, configuration control);

Quantification of soldier burden (e.g. Operational Analysis);

Each of the above points would be considered for different mission types (e.g. urban, jungle etc.).

III. Resources**A. Membership**

Chair : Mr Venturino R. NEVOLA United Kingdom

Lead Nation: United Kingdom

Nations Willing/Invited to Participate: Belgium, Canada, Germany, Norway, United Kingdom, United States

B. National And/Or NATO Resources Needed :

Funding for travel and per diem for Technical Team Members

C. STO/CSO resources needed

Funding for 2 experts during the PoW.

IV. Security Classification Level

The security level will be Unclassified/Unlimited

V. Participation By Partner Nations

This activity is open to PfP, MD, Global Partners (Australia, New Zealand, Japan and the Republic of Korea) and Singapore (Contact Country)

PfP Nations : all PfP invited

MD Nations : all MD invited

ICI Nations : none

Global Partners : Australia, Japan, New Zealand, Republic of Korea

Contact / Other Nations : Singapore

VI. Liaison

Liaison with the NAAG/LCG-1 as this activity is partially related to the "soldier fragmentation vulnerability analysis".