



Soldier Systems Modernization in the Norwegian Armed Forces

How Norway is integrating lighter materials and measuring effect in its future soldier system

The investment process for NORMANS is like any other programme in Norway. Captain Vidar Engmo, Staff Officer Procurement NBD, Army Staff / Procurement and Development Division outlined that path, "To do an efficient acquisition which gives you the effect that you want in the organisation and operations, you need to have goals, strategy and a vision for defence. You need clear defence tasks, what defence is going to do, funds, expert knowledge and process, precise measurable objectives and target and the ability to evaluate what you have done."

NORMANS, again like any other programme has to achieve its goals within a constrained budget. Total procurement funds throughout Norwegian defence totalled \$1.6b in 2010-11 a level unlikely to change in the coming year. Different projects are organized into six portfolios or Programme Areas in defence. Very large projects such as the F-35 and Logistics Project are handled individually. NORMANS is part of the Special Forces and Soldier Systems (SOF/SOS) programme area.

Within Soldier Modernisation in Norway a number of individual programme come within the domain of soldier modernisation and Special Forces and Soldier Systems: P 4002 Digitization I, P 4003 Digitization II, P 4005 Medium Weight Machinegun, P 4013 Night Capacity, P 4014 Sustainability, P 4015 Mobility, P 4016 Less Lethal Weapons, P 4018 Self Defence Weapons II, P 4021 Pistol, P 4022 Anti-Tank Weapons P 4024 Crowd Control, P 4027 Close Quarter Combat Ammunition, P 4030 New Ammunition Types for International Operations, P 8317 Upgrade of 84 mm Carl Gustav and P 9517 NBC Protection.

The project models used in Norway is PRINSIX which covers different phases in the project from concept definition to the disposal of materiel.

NORMANS concept

The NORMANS concept is a modular concept where you have different soldier systems via modules which are both integrated and interchangeable with the different modules. This is the foundation for the Norwegian SMP and it is based on research and development.

Captain Engmo cited the integration challenges for NORMANS as ensuring Interoperable Interchangeable modular components, light weight systems and minimising volume, the stable supply of electric power, co-ordination and synchronization between projects and ensuring coordination and synchronization with other programme areas. Using the example of Project 4002 which starts this year he said, "We are going to acquire a PDA a digital platform for the soldier and of course we have to integrate the power supply, the individual network of the soldier and the radio network within the squad and the platoon and the connection to the vehicle, different sensor systems and also simulation systems. We would also like to connect them to simulation systems so that when you are training in the virtual battlespace or some other simulation, you can connect your system to that system."

The procurement of NORMANS has a number of organisations as participants. These include; the Norwegian Defense Research Establishment (FFI); Concept development and experimentation via the Army Combat lab and the Norwegian Battle lab and experimentation (NOBLE) and the procurement of

material, the Ministry of Defense (MOD) Norwegian Logistics Organization (NDLO).

In 2009-10 Captain Engmo explained that NORMANS had digitized the Telemark battalion and that the digitization of rapid reaction force was next. Norway attended Bold Quest in 2010 and in 2011 the NORMANS equipment and the BMS will be integrated with and tested at this year's Bold Quest.

Captain Engmo said, "We are now starting to use the results from 2009 and 2010 further develop the NORMANS project and the C4I systems they are going to be tested in the Bold Quest 2011. We are going to test NORMANS together with the BMS which are in the vehicles."

Research

In terms of R&D a new effort, P1163 led by Rune Lausund at the FFI recently began. This covers several tasks: supporting MoD Soldier C4I projects, MoD Soldier Clothing & Protection projects, establishing a common understanding for integrated soldier system development and long term Soldier System research.

Lt. Commander, Christoffer Eriksen, Technical Executive Officer, Norwegian Defence Logistics Organisation / Land Systems addressing the topic of reducing weight in Norwegian soldier systems said, "The baseline soldier carries approximately 35kg and that is not including his backpack and additional gear intended for the squad mission and specific equipment and so on. [In R&D] we are focusing mostly on clothing and protection and weapons systems to reduce weight." The 35Kg is made up of 15Kg for ballistic protection and clothing, 11kg for rifle ammunition and grenades, 6Kg for food water and

► medical supplies and a further 3Kg for communications and night vision.

Lt. Commander Eriksen said, "In C4I we are actually adding systems not reducing although we are trying to reduce the amount of batteries. However when it comes to sustainability by being clever with the protection and the clothing we hope that we might reduce the amount the soldier needs to carry. In clothing and precision, what we have already done is to procure new ballistic protection which is lighter than the one we used to have and it is modular so we can tailor the protection to the mission needs."

Norway has also recently procured the new 5.56mm HK416 which is much lighter than the previous old 7.62mm G3 and it also has a smaller calibre so the ammunition is lighter too. Beyond this, reducing weight in small arms technology is being addressed in three time phases. In the short term weight savings of 20-25 percent are being examined through the use of aluminium ammunition casings. In the medium term this switches to the use of composite barrels using metal inner liners and in the longer term case ammunition is being considered.

The FFI are also looking at new types of material and novel use of the existing materials for integrated chemical protection and they are trying to adopt a systems approach which enables modularity and tailoring of the actual protection. Instead of using one dedicated protection suit that Norway used to have in the armed forces the FFI are trying to use the current clothing as an outer layer and add an inner charcoal layer as the active protection. That has reduced weight by 40 percent over the baseline model.

Measuring effect in Soldier Systems

To stay on top of technological developments and also to measure the effect of the proposed technology for the project, the FFI use the NATO Soldier Modernisation Measurement for Analysis as the basis for the methodology for measuring effect. Lt. Commander Eriksen said, "It is not entirely sufficient on its own, it needs a lot of work but is a good testing point and they have developed it further and there are suggestions for changes to improve it."

"The document defines different tasks and the tasks

comprise missions and vignettes. Those vignettes are put together to create scenarios and they create scenarios based on the vignettes measuring effects based on the scenarios. We used this with great success during the NORMANS trials during October 2009 when we could document significant improvements in soldier effectiveness using the NORMANS C4I system with a baseline company and monitored every step to see how well they did in the mission. In the acquisition community, our ambition is to do the same with all our soldier systems projects. We are currently at the stage where we are describing how it can be done. We are saying that process is deliverable from the new P1163 research programme. If it is to happen it will require much better co-ordination between the organisations, much more requirements management and a truly integrated test and evaluation and acceptance programme. There is a lot of work ahead but this is the ambition that we have." ■

Capt. Engmo and Lt. Commander Eriksen were speaking at WBR's Soldier Technology US 2011.



NORMANS Light, shown here integrated with the Thales St@rmille soldier radio. Norway has opted for the Harris RF-7800S SPR in trials © AJB



Norway has one of the most sophisticated solutions for soldier modernisation in terms of the Situational Awareness access for individual soldiers © AJB