



# MARKUS' Dual Paths

Sweden's MARKUS programme is progressing with a dual approach in which near term requirements are balanced with an ongoing systems engineering plan to develop and deliver an integrated capability from 2014

**Elisabeth Behm, MARKUS' Project Manager at the Sweden's Defence Materiel Administration (FMV) believes the project's incremental approach is analogous with the refurbishment of a house. "There are two important things you have to think on. You need to talk to the people who are living in the house to identify what the house is going to be used for, the functionality you need in the house and to inspect the house to determine the materials you will need. The owner of the house may want to keep the wooden floor but wants a new kitchen and to add insulation. It's the same way we work on the Swedish soldier modernisation**



Sweden has been acquiring new Night Vision Goggles throughout 2009 © AJB

**programme. We keep the good things we have and add new capabilities."**

At the end of 2005, Sweden surveyed its existing infantry capabilities and saw that different soldier subsystems, integral to a core soldier modernisation capability were being managed by disparate departments and organisations, which militated against the achievement of a truly integrated system.

Behm explained, "At that time, every procurement was looking at their objective alone, not the soldier system objective. What was needed was to co-ordinate all those procurement projects." For example, the Land Systems Procurement Command were responsible for weapon systems while the C3 Systems Procurement Command undertook the acquisition of C4I, sensors and radio communications while the General Service Procurement Command oversaw clothing and protection.

To rectify the problem, a systems engineering study to define the new soldier system was initiated although in parallel, further equipment procurements have still continued.

"When we started this project," Behm said, "we realised that we had to understand the whole enterprise for the soldier system. When we asked the Swedish armed forces, they said it was easy, that it was a dismounted soldier, equipped for ground combat. You can't define the future soldier systems if you don't know what the objective of the soldier system is and it took some time to convince the armed forces of that."

As part of that work, MARKUS is looking as much at legacy equipment as much as future procurement. "In defining the soldier system and we also have to define the systems of today, and the status of that equipment, its weight and how much power it consumes. Once this soldier system objective is defined, then we can compare the systems of today with the required capabilities, do a gap analysis, then we will describe the way forward in a Soldier System plan. My job is to write the technical requirements and procurements."

Under this approach, a Draft Technical System Plan and Soldier System Main Objective will be established in the second half of 2010, leading to the MARKUS Soldier Systems Version 1 in 2014.

In the meantime, Sweden is continuing with planned equipment purchase. The final delivery of the AK5C assault rifle upgrade is due for October 2010 which will operate with a range of weapon accessories which began procurement in 2009 will conclude in 2011. In addition to an assault rifle, a 5.56x45mm Light Machine Gun will be used to complement existing the in service 7.62x51mm FN MAG, as well as a Non Lethal Capability, which will also complete delivery in October 2010.

In terms of protection, a new body armour system is planned for the end of 2010. Behm said, "We are also having a very interesting project for a totally new body armour system, a modular system in which we cover all the protection levels and also have an architecture for riot control."

Sweden has also acquired a second generation of the Internal Group Radio, selecting the Harris RF Communications RF-7800S which was announced in June. This will be matched with a new squad level C4I system which will be used in trials during spring 2010. Night vision is also important, with Sweden acquiring new Night Vision Goggles throughout 2009.

Looking to the future, the next planned procurements for the immediate future will look at load carriage and clothing, adding new tactical vests and a new backpack system. The lethality will be revisiting in 2010 with plans for new hand grenades followed by the procurement of C4I systems, subject to successful trials. Other programmes include personal CBRN equipment and new anti-tank weapons with the latter project kicking off in 2011. Throughout the period, more night vision devices like goggles and IR sights and planned to be purchased.

A systems engineering project looking at power management for MARKUS is also planned for 2012 with a new Combat Helmet planned from 2013. Behm said, "That is something we haven't looked at very much. We

▶ currently have different batteries for different equipment. We also plan to buy prototypes for trials. We will also start a project where we will look at new combat helmets. I know that a lot of other countries have developed a new helmet and. We hope to get some help in doing that.”

In terms of formalised equipment procurements, Sweden is looking out to as far as 2017, at which point the current assault rifle will begin being replaced as part of a package of small arms capabilities designed to generate a family of small arms.

MARKUS struggles with the same problems as other programmes but it is already generating lessons learned from the systems integration.

Behm said, “We are in the systems definition phase, defining the future system. A lot of procurements are going on. We have lot of planned procurements but after the systems engineering work, the difference is that procurements in the future will be focused on what is best for the system and of course we want a modular system. We are working with an incremental approach, adding or increasing capabilities step by step. We will describe a way to do that in the systems plan, which will be a part of a systems development plan which will not only look at equipment but also the doctrine and training and personnel.”

“It is very important to have user representatives during that process. We have been working very closely with the armed forces and also our research agency. Soldier requirements need to be defined very early in the process, so we know what we are procuring, and when you break down the soldier enterprise you can associate all the activities with the required capabilities. Capability configurations are very important too because you don't want every soldier to have all the capabilities. You must also look into configurations because otherwise you will have a lot of weight on the soldier if every soldier has everything.” ■



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