



Switzerland

Tools Up IMESS

Switzerland's IMESS programme completed exhaustive initial trials last year and is currently incorporating the lessons learned into the definition of the maturation phase for further trials in 2011

The IMESS soldier modernisation programme is designed to address a problem common to all militaries, namely that capabilities required to successfully fulfil diverse mission requirements are absent and that part of today's legacy equipment is obsolete and insufficient to face these new forms of warfare.

But what does that mean exactly? What are the objectives behind the project? Dr. Philippe Schmid from armasuisse, Project Manager IMESS explained, "We all know about the capability domains such as survivability, mobility, sustainability, etc. They are nothing new. What I think is very ambitious about IMESS is that we want to have these capability domains covered, mounted and dismounted at the squad and the platoon level and at the same time stay with a modular system."

IMESS incorporates more than 700 military requirements. The first requirements are that it is a system and that existing equipment should be kept and integrated as far as is sensible. Schmid commented, "I like the last part because it gives us a little bit of freedom."

While IMESS' core systems will require some customisation for specific needs, peripheral systems are required to be MOTS/COTS. Schmid said, "The system must be modular and expandable. It is very important that we keep a certain level of competition at the component level. We like to be able to replace or add new components at any time at the lowest possible cost."

Clearly information superiority has a part to play but it won't be a straightforward achievement, Schmid said, "Soldiers must be connected to the network, that is one of the constraints, it is not done yet, it is a big piece of work with data transfer, interoperability and connectivity,

for which we need to avoid proprietary solutions."

Switzerland's first real trials of a complete ensemble, in early 2005, during the project definition phase, used a small number of IdZ-BS systems, loaned for the purpose by the Bundeswehr. The project officially started in April 2006. In 2007, Switzerland issued the Request For Proposals for IMESS and subsequently selected EADS as prime contractor with the first contract covering 25 system prototypes and five integrated vehicles.

"We took delivery of these systems last summer [2008] and in the Autumn, we did our first field trials. In parallel, we continued working on some specific topics because they were not mature at the time we got the prototypes. Right now we are in the clarification and planning phase where we prepare for the next phase which is the maturation of the whole system."

Armasuisse plans to begin the next phase of trials in 2011. Schmid said, "I know that industry is not necessarily very happy about the fact that we have decided, for very good reasons, to reduce the time pressure. But it is important for us to consolidate this experience to understand what is good and what is bad in these systems and what consequences it has on training for example."

After the 2011 trials, a small series acquisition of about 100 systems will take place later in the year, which will be used in a test bed to help further define IMESS in preparation for a larger system acquisition planned for 2015-16.

The 2008 trials have provided a number of key lessons learned. Schmid said, "You could list a large number of goals, but the main one was to find out what we really had. We worked very closely with industry

during the development phase but we were not on the manufacturer's side 24 hours a day. It was really important for us to know what requirements had been fulfilled and what was still to be done. There was also a need to compare legacy systems with IMESS to establish the added value of such a system, compared to regular equipment. It also gave us our first experience with the system regarding engagement, organisation and structure. These topics will be heavily examined in the [2011 trials] but we started getting some experience in these trials. We now have good knowledge of the system before we start the maturation so that we are able to specify what we expect from this maturation phase."

The trials systems comprised a "maximum" configuration. Schmid explained, "Now it is our work to derive from this, the standard configuration and how we write the configuration for different types of engagement. We also need different exercises and different trials in an urban environment and with different types of transportation means, such as helicopters, which are not integrated into the system. How for example do we get people inside the helicopter and how long does it take to get the systems back on when they disembark?"

Generally speaking, Schmid said that the results were very positive. Shortcomings were however found in the C4I system. Schmid explained, "Some functionalities didn't work. The radio device was in a very early prototype phase when we decided to use it in IMESS. We took a risk as we knew it wasn't 100 percent ready. However we could work with the system and during the trials it was stable and most functionalities were available and working stable. One situation where it didn't work was in mounted displacements. As soon as you

- ▶ increased the distance between the systems and above a certain speed limit (significantly below highway speed limit), communications and navigation would not work. In parallel to the field trials, we therefore continued working on the technical issues, including the radio and I can now say that we are not in the red any more." Clear voice communication and quick data transfers are now possible at speeds higher than 80km/h and distances between vehicles longer than 1km.

Schmid explained that the trials had led to the identification of three "hot topics" for IMESS; weight, energy and vehicle integration. "Weight is very important, especially in the very early phases of your programme, as new capabilities add extra weight. Every single function can be related to weight, even software functions. If you have more software functions, you need a more powerful CPU, for which you need more power and if you need more power, you add more batteries which means more weight. There is always a function or capabilities to weight relationship."

The IMESS programme has grouped the system's weight budget into three broad areas; legacy "regular" capabilities to which a core IMESS "must have" capability will be added, namely the C4I element with a further grouping of three specific areas covering load carriage and a protection systems, sustainability equipment and optronics.

The legacy equipment that will continue in service as part of IMESS weighs 17.6Kg, equipment deemed obsolete which weighs 21.7Kg will be discarded and will be replaced by new kit weighing 18.6Kg, including Level 4 ballistic plate protection. The C4I suite including power supply and cabling weighs 7.7kg with the carriage/

protection area weighing 5.1Kg, optronics are at 4Kg and sustainability at 3.6Kg. To cover the whole engagement spectrum of Swiss Soldiers, IMESS will integrate a total of 60Kg of material. How this material will be made available to the soldier is part of the lessons to learn from future trials. What is certain is that no one will ever have to be permanently ready for all kinds of engagement and therefore wear all the components simultaneously.

In the trials, eight battery types were used; four rechargeable batteries powering the core systems, video sight, night vision goggles and Personal Digital Assistant with primary cells being used in the hand grip, holographic sight, laser pointer and digital camera. Schmid said, "That is the price you pay when you have COTS/MOTS components, it is difficult to tell manufactures that they now have to use the same battery. That may require customisation and that is expensive."

Regarding vehicle integration, Schmid states that while current vehicles were simply not designed for SMPs, particularly in terms of energy and volume, this is part of wider issue with platforms. "We realised that even without IMESS, our vehicles are at their upper limit. When you come with IMESS and which has quite high requirement, this very quickly creates problems. It's not that the IMESS system is a problem; it is that the vehicles were not designed for their use. We will continue working on the refinement of the integration with vehicles with which we can keep working, but they are at their very upper limit." ■

Past Activities & Milestones Achieved

- **Spring 2005:** Swiss Armed Forces trials with Germany's IdZ
- **April 2006:** Order from planning staff
- **February 2007:** Request for proposal (with technical requirements)
- **November 2007:** EADS selected as prime contractor for ISTAR programme supervision and contract signed for 25 IMESS-prototypes with options for maturation and series production of 100 – 5000 systems
- **August 2008:** Delivery of 25 IMESS-prototypes and five vehicles
- **Sept-Oct 2008:** Field trials
- **Sept-Dec 2008:** Further development of IMESS-Radio (Kongsberg); tests in close collaboration with armasuisse
- **Since Nov 2008:** Planning of maturation phase
- **Spring 2011:** Field trials and qualification
- **2011 –** Acquisition of a further 100 systems
- **2015/16 –** First series production