Future Trends in Network Centric Warfare

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The world is changing and so is the threat that confronts us today and tomorrow. The globalisation of society means that Sweden is becoming increasingly dependent on the world around us. Events that occur on the far side of the globe can affect us almost instantly. Regional conflicts can for example, have repercussions in the form of terrorism that can result in act of violence here in Sweden.

For the Swedish Armed Forces, this means they must adapt to new situations. The Swedish Armed Forces must be capable of acting in concert with other authorities and organisations both in Sweden and abroad. Further they must be able to respond more rapidly with sufficient capability and effect, than is the case today. The vision is to maintain world-class, battle winning Armed Forces that are valued in society and respected internationally. Our capabilities must be characterised by speed, precise effect and adaptability. The foundation stone of our capability will continue to be high calibre men and women who are motivated, well trained, properly equipped and infused with the fighting spirit that is so essential for success in combat, but which spirit will continue to characterise our approach to all operations.

Within this broad and fairly intuitive aspiration, each component of fighting power has both strengths and potential weaknesses, but in recent years the advent of the information age provides us with the possibility that some of the weaknesses, particularly a chronic lack of persistence and precision, particularly in the close Land-Air battle, can be overcome. We are clearly moving away from a linear, highly-structured and phased view of the battlespace toward a more fluid and flexible means to prosecute operations. It is this inherent flexibility that we are striving for, but it requires a responsive array of joint, well-integrated capabilities. Our Concept for achieving these well-integrated capabilities is based on Network Centric Warfare, NCW.

When the Swedish Parliament in 2002 released their guidelines for our Defence Forces, the concept was declared as Network Based Defence, NBD. Network Based Defence, NBD is the concept for developing capabilities that stems from today's force structure. NBD creates the conditions for a developed kind of defence – a defence based on flexible, rapid and controlled engagement capability. Networking the commanders and warfighters brings more and smarter use of effects at the right time and right place. Adaptation to changing situations over the time, requires a capability to continuously improve the Warfighting concept supported by technology improvement. Theoretically, small dispersed units will have access to effects from platforms that are available in the area of operation. Effects that will be designed as services in a network.

Lessons from recent conflicts.

Whilst we must be careful not to over-react to lessons emerging from recent conflict, we can begin to see that the nature of the battlespace and the way in which we operate is evolving over time - by looking first to the 1990/91 Gulf War and then more recent operations. The first Gulf War and to an extent operations in Kosovo were linear operations with distinct phases, lines of operation and deconfliction of the battlespace by forward planning. However, despite the highly politically charged debate about the commitment of ground forces, this was not an operation from which we could derive clear lessons about joint operations. However, it did expose the difficulty of targeting from the air low signature, well camouflaged and dispersed forces.

We talk in terms of air campaigns, about ground manoeuvre as if it was a discrete function or the value of being able to hold an adversary's capability at constant risk by manoeuvring from the sea. We dutifully inject so-called joint credentials into the debate, but there is a consistent tendency to underplay a single Services' weaknesses whilst overplaying its strengths.

Spatial precision is now being realised on a significant scale - enough now to consider it the norm for most targeting. Paradoxically, it is much easier to generate the wrong effects on the rare occasions that the weapons miss and this will place greater stress on information and media campaigns. But we must think now in terms of precise effect, not just precision *per se.* Targets are now relatively easy to acquire and strike - but it's generating and measuring the effect that really counts. The strong persistence of capabilities across all environments provided the key to more responsive targeting. UAVs will play an ever stronger role and they are beginning to realise their potential through closer integration into operations.

Air to air refuelling seems to be a potent force multiplier increasing both reach and persistence but now, in conjunction with information sharing, can provide the backbone of tactical responsiveness by allowing the necessary time on station to deal with the unforeseen. This is a subtle but important change that is being missed by many commentators.

We must strive to increase our ability to undertake this most demanding discipline and joint fires programmes - in all of their manifestations - are critical to future success. But there is some way to go yet with certain capabilities and the difficulties of employing air in urban terrain is a good example. We need to pursue weapon design, delivery techniques and even procedure to enable better use of tactical air in the deep urban battle.

Interesting in the most recent Iraq conflict is that robustness against low tech but high density platforms - in all guises – seems to be important. Those that perceive the end of heavy

armour must tread carefully. Whilst better integration of tactical information may allow more flexible combinations of fighting power, the value of physical protection must not be underplayed.

Finally, whilst much potential is unfolding at the tactical level, it is telling to note that some commentators perceived that events and speed in modern warfighting is emerging so quickly that tactical operations might frequently outstripp strategic decision making. A tend that sets a focus on C2 and methodology aspects. The question is how far down the timeline can we push planning and decision making.

The Future Battlespace

The future battlespace will be different in one significant way. It will be information rich. Given that the actions undertaken by the military are most often in the physical domain, the use of a physical frame of reference for the battlespace is an obvious and important choice. Effects Based Operations view the battlespace through lenses that represent the many dimensions of the strategic environment, because effects can be generated across them all.

The representations of each strategic dimension will enrich the physical frame of reference, providing areas of greater or lesser clarity depending on the level of information available and the ability of commanders to resolve the totality of what has been presented. The result could be likened to an unevenly lit landscape, with the level of illumination reflecting the amount of information resolution and understanding achieved. These illumination levels would be in a state of constant flux. The use of traditional ISR could increase the level of resolution, but it must be stressed that, as the battlespace must be viewed through all the dimensions of the strategic environment, increasing the information available in only one dimension might not lead to sufficient resolution overall. It appears certain that the entire battlespace will never be fully resolved; therefore the conceptual model is one of variable resolution. The zones of shadow and light within the battlespace will produce both problems and opportunities for the commanders of the future. Most important, the clarity of each lens through which a commander looks at the battlespace will be a function of his culture, training and experience.

Way ahead –a decisive will to implement doctrine and technology

The transformation will be an ongoing process and involving people, doctrine, units and technology. Training, exercises and experimentation will be standard procedures on the way ahead. Network Based Defence concept will affect the way we think, train and fight. Network Based Defence entails a way of operations that makes full use of modern technology. The key word in NBD is collaboration. Collaboration between commanders, warfighters, different systems – units from Army, Navy and Air Force services. Civil authorities and international missions will benefit from the NBD concept. The NBD concept is based on an ability to communicate and share information with a focus on generating capabilities to execute the Armed Forces missions whenever required.

NBD enables mission command to be improved through the use of shared information and by allowing the commander to communicate his intentions through out his unit and subordinates in a way that support the effectiveness in manoeuvre warfare. The development strategy to reach NBD capabilities is outlined with a focus on "learning by doing" process. Experimentation with new technologies and innovative solutions will be demonstrated at annual exercises as a part of the training concept. NBD changes the focus from Platform

Centric view to creating effects by networking Command and Control, platforms, weapons, sensors and communications. Initially the Armed Forces will focus on Situation Awareness and Command and Control. A following step will focus on engagement functions.

In summary

The overall objective is to generate capability to gain real information superiority. A good understanding of blue and red targets is the foundation for generating a single integrated situation picture. Thereby allowing Commanders and staff elements to observe the battlefield, share the information and take action in the most efficient way. Collected information from surveillance, intelligence and identification systems as well as commercial and other governmental sources all contribute to a common situation awareness. Technology is rapidly advancing in these areas today. Unmanned Vehicles such as UAVs represent technologies that bring new capabilities such as persistence and Battlespace awareness in air, ground and sea domains. Once information is available and fused it must be presented to Commanders and staff elements in an understandable manner. Units and Commanders in the chain of command are to be sharing their part of the single integrated picture related to their mission and role. In short that means that anyone connected into the network can access information and services needed for the action. A major challenge is to manage the information flow, reliability and security issues. Research and Technology development has to provide user-friendly applications.

The overall objective for Network Based Defence is to support the warfighters with the best state of the art of technology in order to Generate Joint Warfighting Effects – a successful concept for successful Armed Forces.

Thankyou