Risk – Is That Really a Technical Issue?

Lieutenant Colonel Fredrik Johnsson\(^1\) & Professor Emeritus Bengt Vretblad\(^2\)

\(^1\)Swedish EOD and Demining Centre (SWEDEC), Sweden
\(fredrik.johnsson@mil.se\)

\(^2\)Swedish National Defence University (SNDU), Sweden
\(bengt.vretblad@fhs.se\)

Life is full of risks – in war and peace. Risks that we often try to avoid, eliminate or - at least - reduce. Military activities often include risks – in war requiring excessive countermeasures but also in peacetime situations and during international military missions where competent risk reducing actions must be searched for.

Military Technology within SNDU focuses research on military utility as a measure when evaluating technical systems for military purposes. The definition of military utility often must be different for different applications and measured in different units, e.g. economic costs, cost in time to complete a task or costs in human lives - or even combinations of units for different systems.

A recent research program at SNDU handles risks in explosive ordnance disposal (EOD) operations based upon the military utility.

The wide use of light anti-tank weapons and the scattering of sub-munitions have made clearance of unexploded ordnance containing shaped charge warheads - a frequent task for EOD personnel.

Several circumstances are characteristic for EOD operations and have to be taken into consideration when evaluating the military utility: the limited information availability, the short time frames, the working methods and the technology level.

Protective measures such as evacuation of a hazardous area or building of a protective construction often have to be executed to reduce risks. Two conditions are unique for protective constructions in EOD operations on shaped charge ammunition: constructions built from sandbags and long standoff distances.

As has been shown in earlier ISMS annual conferences measures to handle risks were identified and acted upon in the SNDU program\(^1.2\).

The result up until now is a tool meeting the military requirements - e.g. which can be used under field conditions, within a limited time frame and without access to advanced calculating equipment. The format is a simple diagram included in a complete design tool.

This tool is now being implemented in regulations and training for EOD personnel in the Swedish Armed Forces.

The result reached so far fill a gap, but it does not represent the ultimate solution for risk handling –it rather form a step forward within EOD operations. The tool, however transparent and based upon verified tests, only handles the two cases: either full countermeasures or no countermeasures. This binary approach to risk factors is not unique for this situation, many methods and tools are designed for extrema, nothing in between.

To establish a protective construction that completely eliminates the risk is often not possible, simply because the large dimensions require resources or time to complete the construction that are not available.
What if only partial protection is possible—what risk does that leave us with?

The surroundings also affect the actual risk. Infrastructure, terrain formations and vegetation can both decrease and increase the effects from the ammunition. Furthermore, what influence do different render safe procedures and applied clearance charges have on the risk? Only suitable tools that consider the actual influence of these aspects will provide the necessary foundation for estimation of a more correct risk. Here we are still without rules to apply.

Basic questions like “What risk is acceptable?”,” During what conditions?” and “How do we reach acceptable risk levels?” remain to be answered. Furthermore, we have to develop how we communicate the risk to decision makers, particularly in extreme situations. If a risk described in mathematical format is not rightly understood by everyone other formulations that are perfectly clear must be used.

We know that the attitude towards risks varies with individuals, with the situation and over time but we do not have vehicles to give us adequate quantitative measures. The answers to questions on acceptable risk not only relate to technical issues but also comprise military judgement, leadership and communications as well as they have judicial and ethical dimensions.

The objective for future research in the field is a dynamic risk management model comprising also other situations than those studied up until now and to evaluate and appreciate alternative mitigation measures along the chain of clearance activities.

A dynamic risk management concept developed for EOD operations should be a step in the handling of the general threat from explosive remnants of war, i.e. land mines, UXO:s and IED:s, which often have significant impact on a military operation as a whole. These threats exist on all levels of conflict and their constantly changing character requires a dynamic approach when it comes to risk handling.

War fighting is evolving, with a continuous struggle between our measures and the opponents countermeasures. There is no clear distinction between friend and foe, peace and war or danger and safety - military activities take place in a grey-zone. Supportive programs have to be adapted to this reality and methods for dynamic risk management tailored for military operations. The military utility of such a concept is obvious with good possibilities to generalisation, a worthwhile starting point for dynamic risk handling methods for other military activities.

The paper is focused on a dynamic risk management concept where not only technical issues are dealt with, but also other military concerns are addressed with the military utility as a basic measure.

**Key words:** Dynamic Risk Management, Military Utility, Explosive Ordnance Disposal, Protective Measures, Shaped Charge

---
