Risk
– Is That Really a Technical Issue?

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Military Utility

Effectiveness

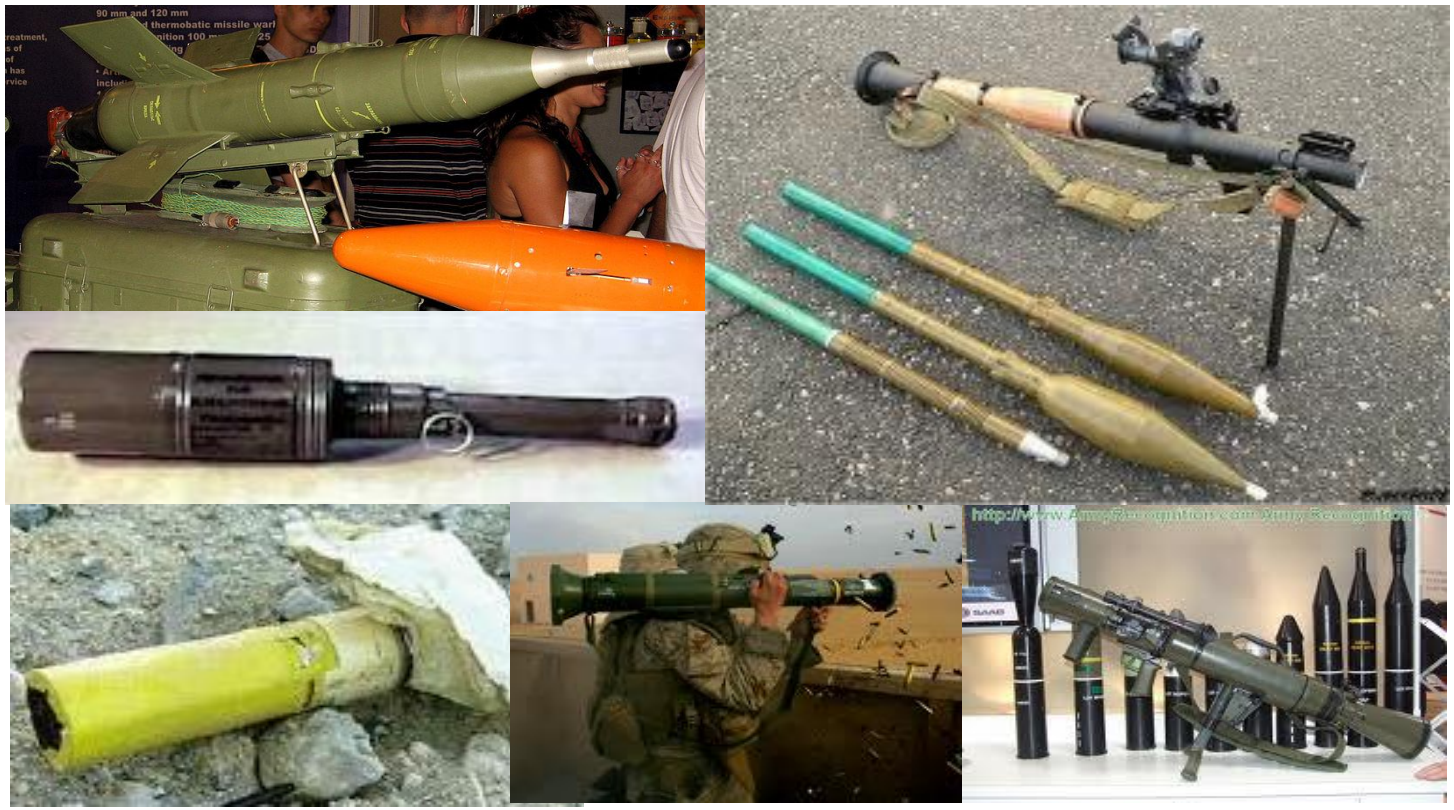
Suitability

Affordability

Military Utility

- Element of Interest
- Context
- Military Actor

An example



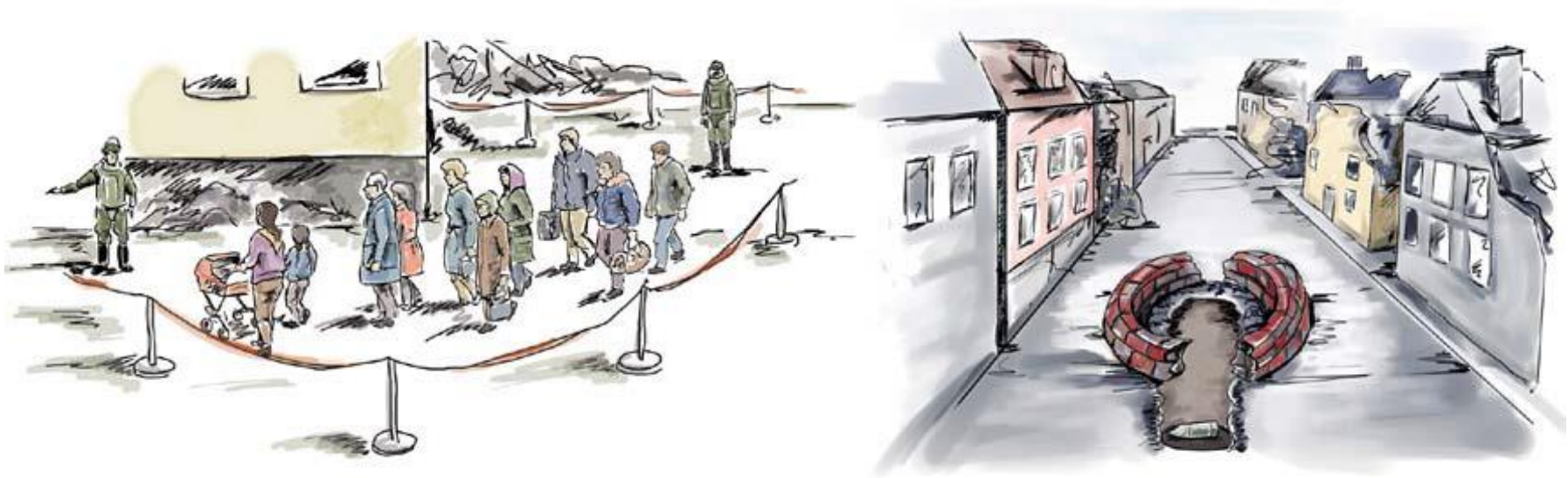
Clearance of shaped charge ammunition - a frequent EOD task

The problem

"When clearing ammunition containing a shaped charge you should:

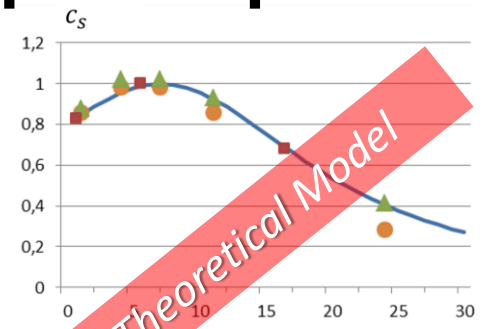
- *consider an extended hazardous area of the jet […]*
- *increase the depth of walls etc. […]"*[1]

No adequate means (tools) for the design of protective measures!



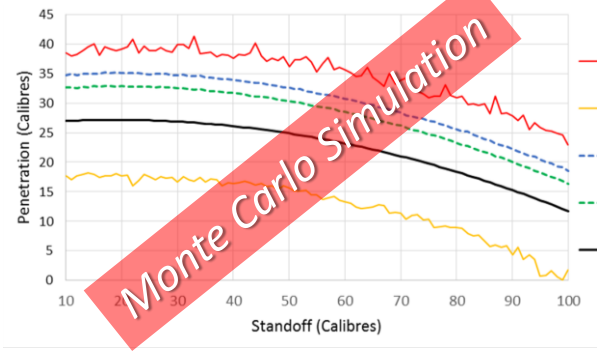
[1] Swedish Armed Forces, ***Handbook of Ammunition and Mine Clearance for the Swedish Total Defence – Precautionary Measures***, Swedish Armed Forces, Stockholm 2012.

The development process[1,2]



Theoretical Model

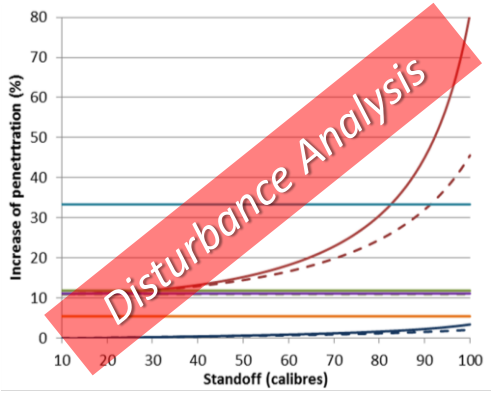
$$P = C \cdot c_j \cdot c_t \cdot c_S \cdot \xi \cdot \sqrt{\frac{\rho_j}{\rho_t}}$$



Monte Carlo Simulation

The Military Utility

Full Scale Experiments

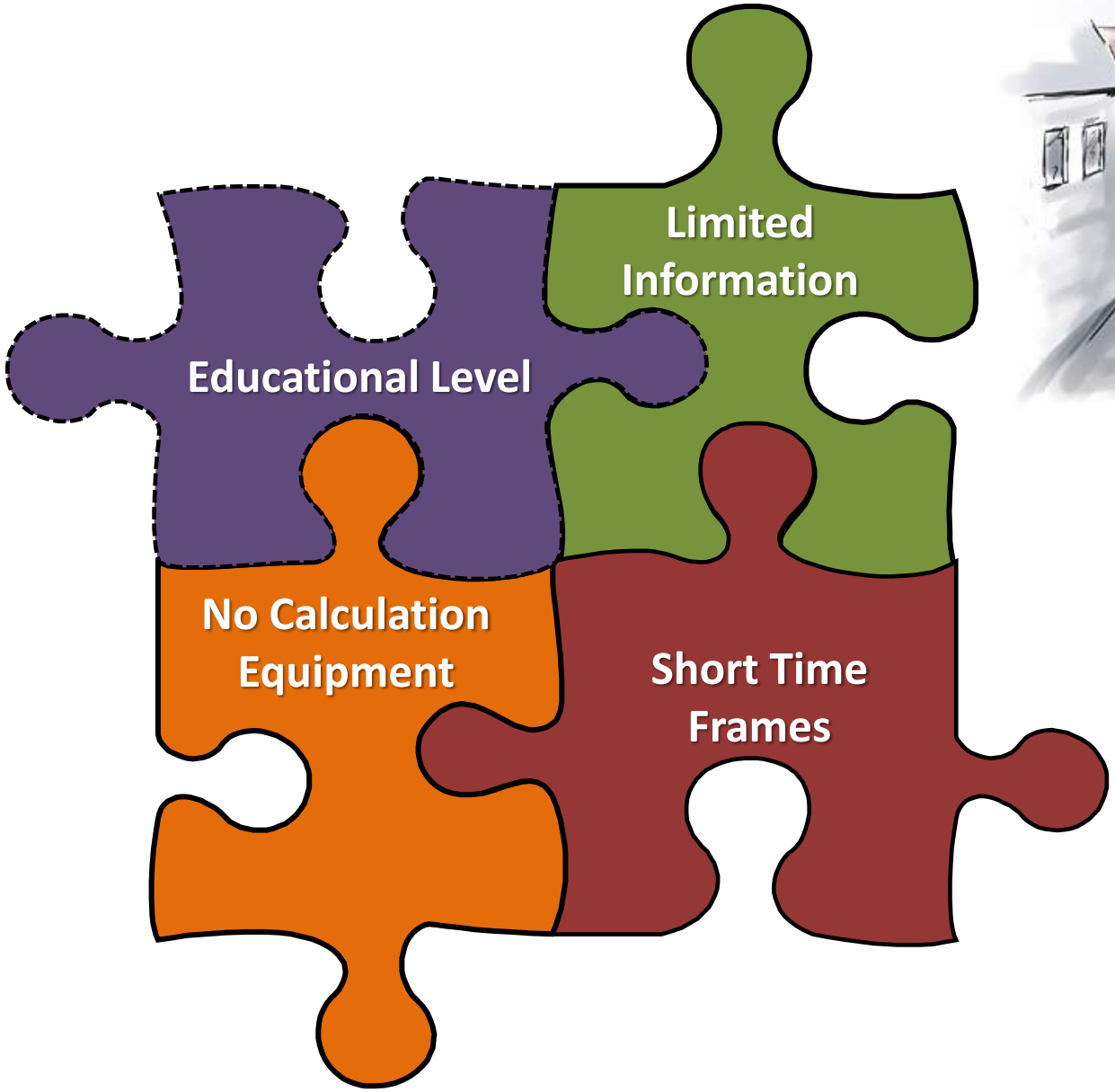


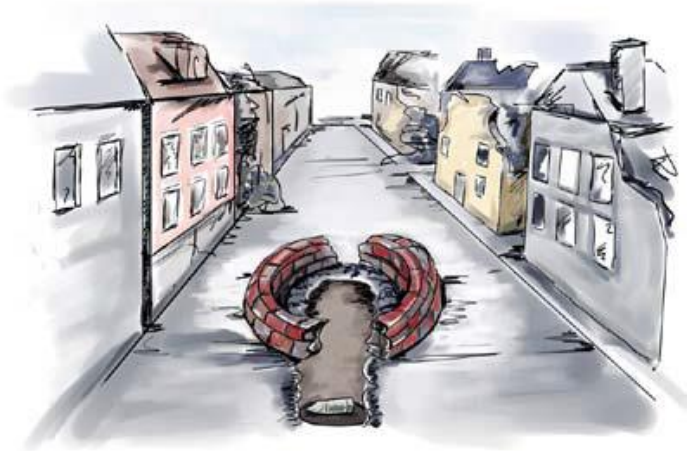
Disturbance Analysis

Result Analysis

[1]ISMS 2012. Kingston, Canada.
[2]ISMS 2014. Vienna, Austria.

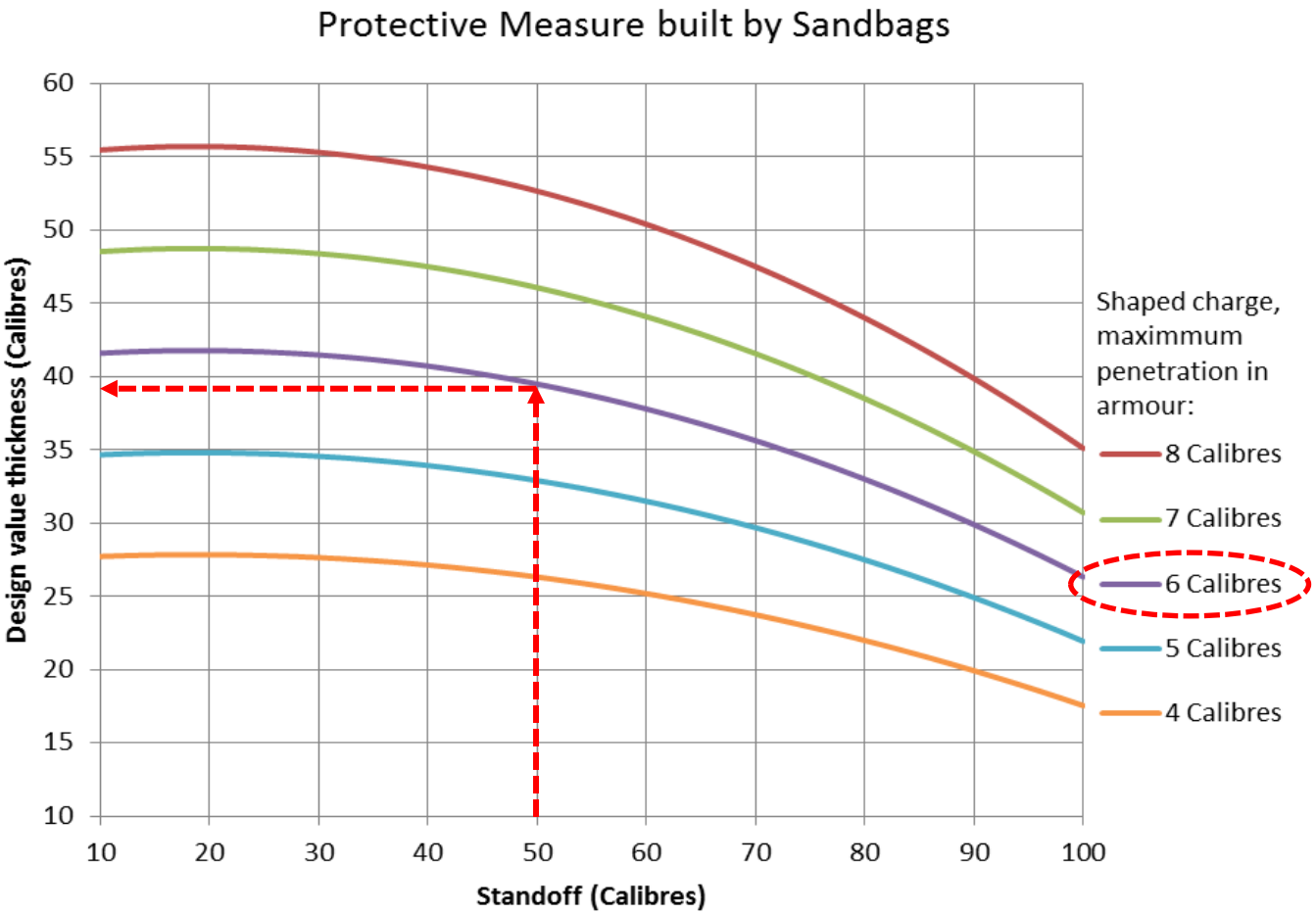
Military Utility - Requirements





The final tool

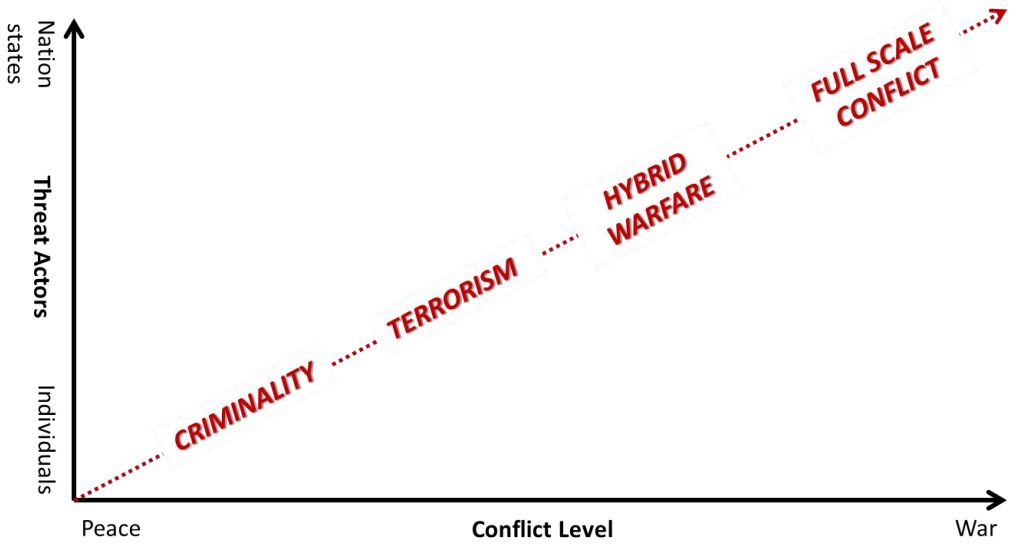
$$P_d = C \cdot c_j \cdot \frac{1}{\sqrt{\rho_t}} \cdot 95 \cdot (c_S + c_{design})$$



But, what if …

… only a partial solution is possible?

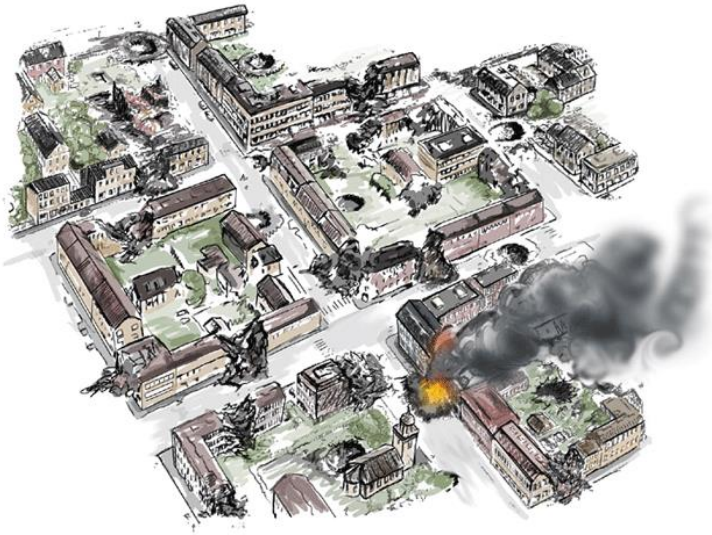
… another place in the conflict spectrum?



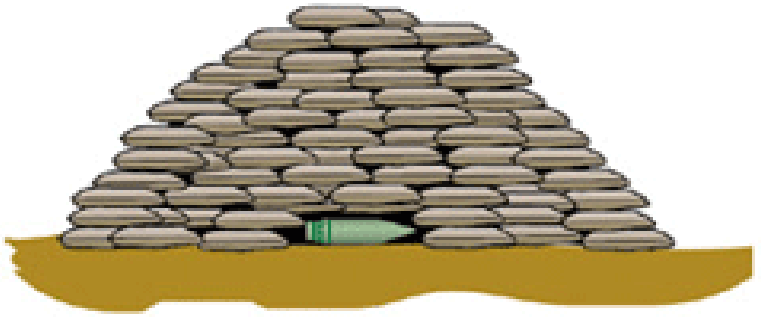
Acceptable Risk?

How To Communicate Risks?

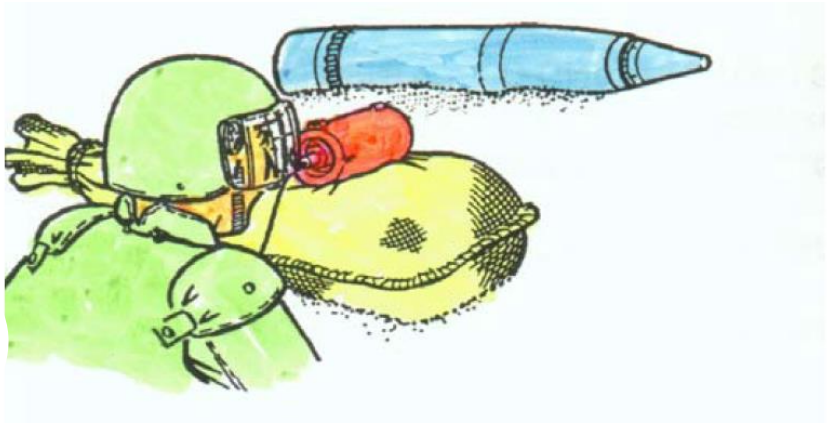
Terrain and Infrastructure

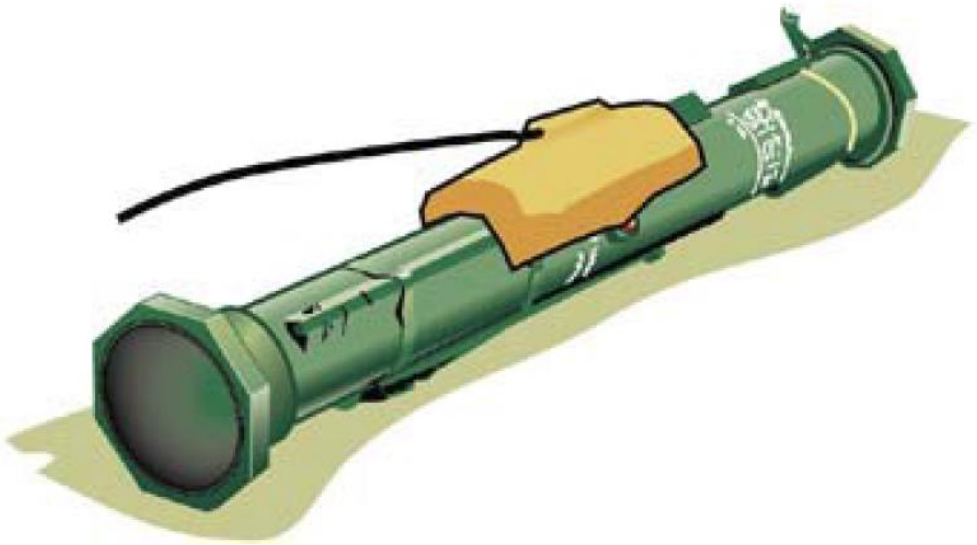


Protective Measures

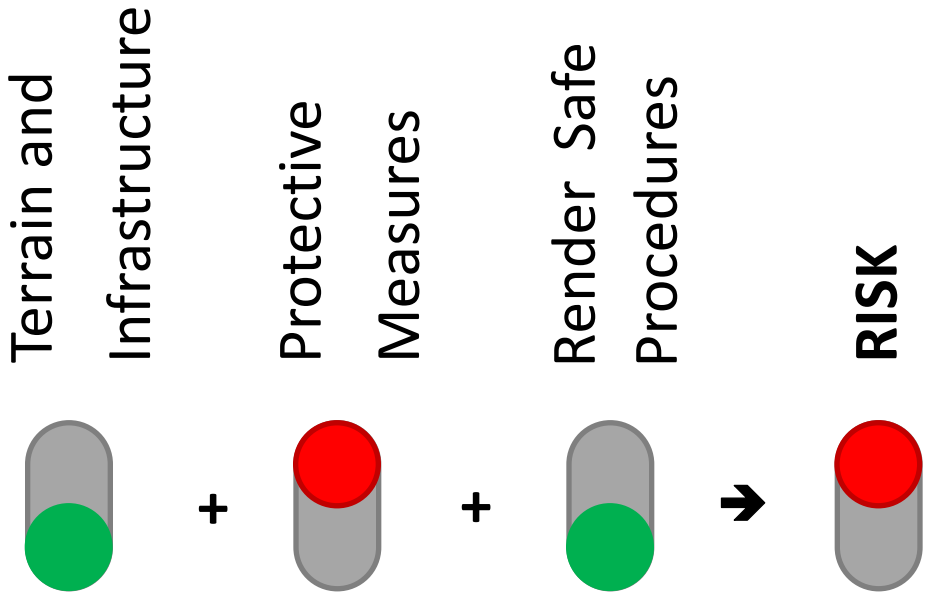


Render Safe Procedures

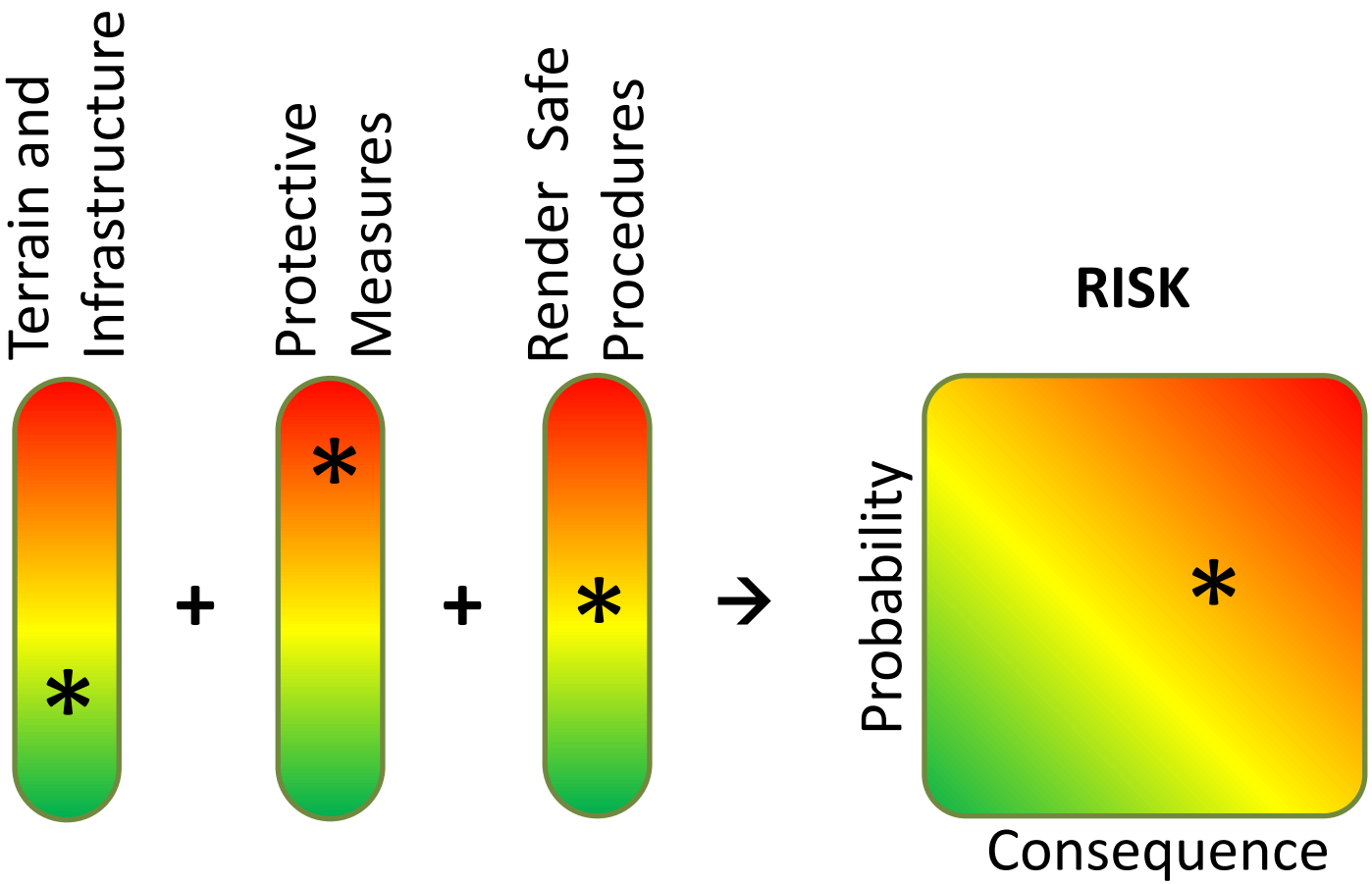




Today
- Binary Approach to Risk Factors



Tomorrow
- A Dynamic Risk Management Model



Conclusions

- Dynamic threats require dynamic tools!
- Military Utility - supportive programs must be adapted to the military reality!
- EOD operations – apt for dynamic risk concept development!
- Further research needed for a Dynamic Risk Management Model!

Discussion

- What inputs do you have for a dynamic risk management concept?
- How communicate risk to decision makers?