MITTLER REPORT

19th NATO LCM Conference

# Life Cycle Management in a Changing World - Ramping up - Delivering Volume, Speed and Innovation with LCM

**Speakers:** Axel Nyberg and Oskar Tengö, Systecon

**Subject:** Maximizing mission capability in new operational environments – Combined use of AI, simulation, and optimization.

**Abstract:** Analysis-driven LCM is a fundamental capability as we are striving to ensure getting the most bang for the increased defence funding buck. The capability to predict and assess the ability to handle different threats and engagement scenarios, and to optimize capabilities and resources, accordingly, will have a huge impact on future defence capabilities, readiness, and spending.

Predictive maintenance and machine learning strengthen the LCM-analysis toolbox needed to take on this challenge. Combined use of AI, simulation, and optimization can deliver game-changing decision support for both strategic and tactical planning. This presentation provides an example.

Robustness and agility require a capacity to adapt to different potential operational scenarios. For example, system utilization and sustainment during training exercises will be different than in a peace-keeping mission, which will differ from a conflict engagement. Wear and tear during operations in warm dry climates is different than in ice and snow. Hence, analyses derived from data from certain conditions, e.g. home base operations in a peace-time setting, do not necessarily offer appropriate decision support for others. For improved ability to handle this, we can collect sensor data from system usage in various scenarios and conditions, and use machine learning to identify patterns and predict failure rates for different mission types and environments. These predictions are then utilized together with simulation and optimization to decide on the optimal support resources to achieve the operational objectives.