RESULTS OF CLOSE-IN EFFECTS OF ENHANCED BLAST WEAPONS, NUMERICAL SIMULATION OF BLAST AND RESPONSE OF FIELD STRUCTURES

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The Netherlands research program on 'Protection of field structures against the effects of enhanced blast weapons (EBW)' is strongly related to the Canadian Technology Program on 'Force protection against enhanced blast'. The Netherlands program is divided into four research topics:

- Threat/scenario analysis of EBW;
- Measurement techniques;
- Development of prediction models: explosion effects, blast propagation, structural response of field structures, ammo- and POL-storage;
- Development of a consequence/risk-analysis tool.

The overall program description is given in the companion paper presented by Van Dongen. This paper presents the results of the measurement techniques and the development of prediction models, which are closely related.

Particular in harsh explosion environments, in the fire ball of a thermobaric (TBX) or a fuel air explosion (FAE), the pressure measurements are a real challenge. These signals are necessary to develop and validate realistic models of EBW explosion effects. Numerical study of the physical effects has led to the implementation of TBX and FAE models into TNO's Blast3D code. The simulation results of the blast propagation show good correspondence to the measured pressures during the Elk Velvet 2.5 and 3.3 series at DRDC Suffield.

The experimental program, facilitated by DRDC Suffield, gave the opportunity to validate the blast vulnerability of various protective field structures. This paper outlines the results of a modular, mobile, 20 ft structure with additional armored protection loaded with various EBW. Two modular units were erected and instrumented in order to measure its response to contact charges of 2 kg TBX up to 1000 kg at 35 m stand-off. The preliminary results show that the structural response is small and personnel survivability is large.