

THE EFFECT OF BLAST ON OPERATIONAL CAMP MUNITION AND FUEL STORAGE STRUCTURES

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Blast loading of protective structures, with consequent blast ingress and the personnel vulnerability (PV) threat, is of increasing priority due to the expanding role of the Canadian Forces (CF) in military operations in urban terrain and operations out-of-area. The growing threat of blast weapons, including terrorist-style bombing attacks targeting both military and civilian personnel, has resulted in a multi-faceted technology demonstration program (TDP) at DRDC Suffield for the blast threat assessment of military field fortifications. The threat includes both structural and/or PV susceptibilities. The program is titled “Force Protection Against Enhanced Blast”. Deliverables to the CF include: evaluation and modification of field defence structures, evaluation and modification of operational camp structures, provision of a rapid rating system for urban structures, and a Military Blast Effects Expert System (MBEES) to aid in the design and/or evaluation of operational camps.

A variety of operational camp structures have been evaluated as part of this TDP. These structures include temporary deployed munitions (TDM) and petroleum, oil and lubricants (POL) field structures. The TDM structure comprises conventional ISO containers in a CF-designed containment system based on concertainer baskets, while the POL structure comprises an off-the-shelf bladder system used by the CF during field operations.

This presentation outlines the results of the exposure of these TDM and POL structures to various simulated blast weapons, including fuel-air, thermobaric and improvised explosive device (IED - large vehicle bomb) weapons. The results are analyzed using computational fluid dynamics (CFD) and/or computational structural mechanics (CSM) methods. Suggestions for the improvement of the TDM and POL structure designs for resistance to large blast loads are included.