CANADIAN RESEARCH TO CHARACTERISE MINE BLAST OUTPUT

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During the past 50 years, Canada has been a major participant to United Nation peacekeeping missions. The last decade, however, has seen a substantial increase of casualties, particularly due to land mines. Canada has suffered nearly 50 mine strikes [1] since 1992, either against vehicles or against dismounted soldiers. Something had to be done, which is why Defence MD Canada (DRDC) started a research program to increase the level of mine protection for its soldiers, whether they be riding in vehicles or carrying out dismounted operations. The Canadian program covers a broad range of activities, from fundamental physics to the design of specific protection systems. In this paper, the authors present key results from two experimental programs conducted to understand and quantify some of the fundamental physics of mine blast.

These test programs are part of a greater program to design mine protection systems. As a general rule, requirement documents for mine protection systems state a protection level in terms of threat, e.g., "protection against a x kg TNT anti-tank mine". While this kind of statement clearly identifies the interest of the end user, engineers tasked to design the system find it difficult to translate the requirements into technical specifications for design and engineering purposes, i.e., loading functions and material response. This is further complicated by the fact that the blast output of the same mine is greatly influenced by how it is buried, what the soil conditions are, the geometry and materials implicated, etc. Hence, the goals of the experiments described below were to:

- Develop insight into the mine detonation process;
- Measure the effective mine blast output delivered to the target; and
- Quantify the effects of soil characteristics, explosive type and depth of burial on mine output.