

INJURY ASSESSMENT FOR BLAST OVERPRESSURE EFFECTS: EXPERIMENTAL APPROACH

J.R. van Deursen, M.J. van der Horst, J. Weerheijm, E.K. Verolme

*TNO Defence, Security and Safety
PO Box 45, Lange Kleiweg 137, 2280 AA Rijswijk, The Netherlands
Jolanda.vandeursen@tno.nl*

The human toll from anti-personnel mines and explosive devices is large. When an explosive device detonates, three threats emanating from the explosion are of concern: fragmentation, heat, and overpressure. The blast wave can damage the internal organs of the thorax, the auditory organs and can induce accelerative motion of the entire body and relative motion of body parts.

In the Netherlands, a five year research program “Safety assessment for personnel within Defence Infrastructure” has been initiated by the Dutch MOD and carried out by TNO. The aim is to develop a balanced methodology to assess the safety of personnel, in relation to ammunition and explosion effects. Within this research program, a small test project has been setup to gain experience in the measuring techniques for injury assessment and to gather data for comparison of different injury assessment methods. Blast overpressure tests with a Hybrid III crash test dummy and a Blast Test Device were performed in the blast simulator at TNO. Blast loading data as well as Hybrid III response data was gathered, analyzed and discussed using different injury models for the non-auditory organs (i.e Bowen, Axelsson and Stuhmiller).

This paper describes the blast simulator tests and focuses on the comparison of the use of the different injury models.