AN ENERGY FLUX METHOD FOR ESTIMATING TNT-EQUIVALENCE OF NONSTANDARD EXPLOSIVES

E. Bar-On[1] and J. Falcovitz[2]

[1]*Rafael - Advanced Defence Systems Ltd. P. O. Box 2250, Israel 3102102;*
[2]*Institute of Mathematics, the Hebrew University of Jerusalem, Jerusalem, Israel*

ABSTRACT

The need to determine an equivalent **TNT** charge often arises in vulnerability analysis of structures subject to a charge explosion (accidental or deliberate). It is well known that a single "Equivalent **TNT** charge" cannot account for all charge-structure effects of the actual charge (whether standard or nonstandard explosive). This study presents an energy-flux method (positive phase integrated) for analyzing the measured free-air blast pressure profile □□□□ from a "test charge", producing an estimated equivalent charge by matching the positive phase impulse □□, or positive phase energy flux values □□ (energy) and □□ (work). Our energy flux approach is an adaptation of an energy flux method proposed by Sadwin and Swisdak [1], that was subsequently shown by them to reduce the range-variation of the **TNT** equivalent values for a large **ANFO** test charge [2]. It also echoes ideas for analyzing blast wave in terms of their capability to perform mechanical work on structures, that had long been suggested by John Dewey and co-authors (see the Handbook of Shock Waves [5] and references therein).