

DEVELOPMENT AND TESTING OF AN INSTRUMENT FOR TRACKING NEAR FIELD BLAST WAVES

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ABSTRACT

Measurement of near field shock wave position from explosive charges is of interest when attempting to investigate any potential blast and fragmentation synergistic effects. Measurement of the shock velocity can also be used to provide an alternative way of determining peak overpressure produced by the charge. The task of taking these measurements is made difficult due to the extremely damaging environment. At these close distances the view is also obscured by the resulting fireball upon initiation, potentially limiting the effectiveness of optical methods of shock tracking. In addition to this, often during testing, the instrumentation layout around a charge can be crowded so it is not always possible to have a clear view of the fireball expansion without other instrumentation blocking the view. To overcome this, a dual purpose instrument has been developed to measure the shock wave position as a function of time and also record the time history of overpressure over a specific range. During testing the instrument has demonstrated good repeatability. The measurements have been compared with empirical data, showing good correlation particularly in the far field. Shock tracking and pressure measurements as close as 7.5 charge diameters have been measured for 250 g spherical un-cased explosive charges. Testing has also been conducted at larger ranges with uncased spherical charges up to 1 kg in size.