

## EXPERIMENTAL CHARACTERIZATION OF THE INTERACTION OF BLAST WAVES FROM MULTIPLE HIGH EXPLOSIVE CHARGES

S. Stojko, J. Freundt, J. G. Anderson and T. Delaney

*Weapons and Combat Systems Division, Defence Science and Technology Group, PO  
Box 1500, Edinburgh, South Australia, 5111, Australia.*

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Results of numerical modelling conducted previously by Qiu and Eliasson [1] showed that the interaction of multiple blast waves could be exploited to focus extreme overpressure on an intended target which could be over 20 times higher than what could be achieved from an equivalent unitary charge at the same stand off.

This paper presents the results of experiments conducted in the High Explosive Firing Complex at the Defence Science and Technology Group (DST Group) to characterize the interaction of blast waves from multiple high explosive charges that were detonated simultaneously. The Blast Evaluation and Shock Tracking Gauge developed by DST [2] was used to measure reflected pressure at the target surface. A modified shadowgraph technique was used to create High-Speed Video of the blast wave interaction. The primary purpose of the experiments was to provide a database of results for the validation of numerical modelling of the effects from multiple high explosive charges. While the experimental setup was not optimized to focus extreme conditions on the target surface, the results do show a significant increase in overpressure achieved from three 60 g high explosive charges compared with an equivalent 180 g unitary charge.

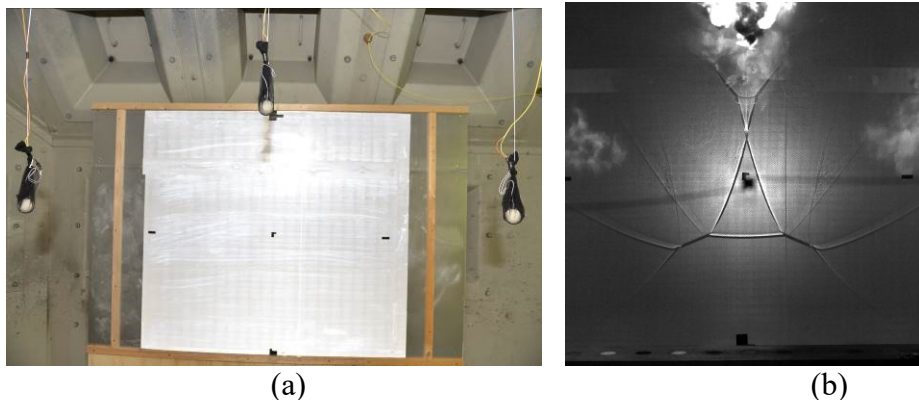


Figure 1. a) Experimental setup for three 60 g High Explosive Charges and b) Shadowgraph showing the blast wave interaction 1.4 ms after detonation

### References

1. Qiu, S. and Eliasson, V., 2015, Interaction and coalescence of multiple simultaneous and non-simultaneous blast waves, Shock Waves DOI 10.1007/s00193-015-0567-2.
2. Anderson, J. G., Parry, S. L. and Ritzel, D. V., 2016, Time Dependent Blast Wave Properties from Shock Wave Tracking with High Speed Video, 24<sup>th</sup> Conference on Military Aspects of Blast and Shock, Halifax, NS, Canada.