

Abstract Submitted
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A view on the functioning mechanism of EBW detonation - Part 1: Electrical Characterisation ELIZABETH LEE, RODNEY DRAKE, JOHN RICHARDSON, AWE Plc — This paper is the first of three characterising the initiation of PETN in an exploding bridgewire detonator to understand the underlying mechanism. The approach taken was to understand the transfer of energy through the system, beginning with the fireset / bridgewire interactions. The measurement of current, time to bridgewire burst and the transient voltage across the bridgewire at burst have enabled the determination of the energy used in bursting the bridgewire. This in turn has led to the calculation of the energy efficiency of the fireset bridgewire system and an estimate of the energy delivered post bridgewire burst. It was postulated that this post-burst energy was responsible for the decrease in detonator function time as the firing energy is increased from threshold to all-fire levels. A fireset was designed to allow the post burst energy to be diverted away from the detonator, thus permitting the effect of the post burst energy on detonator function time to be quantified. The results of the experimental work will be presented, together with the implications for the initiation mechanism of PETN in an exploding bridgewire detonator.

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