CONDITIONS FOR SYMPATHETIC INITIATION OF EXPLOSIVES IN SMALL DIAMETERS

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Abstract

Initiation of small diameter explosives by sympathetic shock pressure in water has been investigated under controlled laboratory conditions. Changes either in the geometry of the donor explosive or its point of initiation can alter the essential characteristics (amplitude and duration) of the resulting shock pressure pulse. The pressure signatures from both **spherical** and cylindrical explosives donors have been studied, in water as well as in various explosive matrices. This paper summarizes the investigations carried out with both 'primed' and 'non-primed' slurry and emulsion explosive matrices with various types of voids. These measurements serve the basis for predicting distances in water for sympathetic initiation for both spherical and linear charges. It is shown that the explosive-detonator system in combination has a far greater probability of initiation due to sympathetic shock pressure than either the explosive or the detonator alone. Various explosive matrices with air bubbles and glass microballoons have been examined and the differing sensitivities to shock pressure explained on the basis of these measurements. It is also concluded that explosives containing air bubbles instead of microballoons would be significantly more prone to sympathetic initiation.