

Explosive Crater Prediction and Analysis
with Implications on Impulse and Combat Vehicle Design

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ABSTRACT:

Measuring and analyzing explosive cratering is a critical tool for assessing threat profiles. Important to commanders is the ability to know the type, size, and sophistication of the explosive devices employed by the enemy. Information gathered from these analysis can narrow searches for certain types of equipment and enemy personnel.

Examination of craters after the explosive event also provides information for predicting the net explosive weight for a given threat and environment. These predictions present engineers with data on possible levels of protection needed in certain operating environments. Damage from buried charges is related to the impulse imparted on the vehicle and the effect on the occupants inside. Parameters effecting crater formation include soil type, density, net explosive weight, explosive form factor, and burial depth. These associations were explored in order to identify and classify current threats and their capabilities in current operating environments.

Crater data from various tests already conducted at the Terminal Effects Division were compared to previous models for conventional explosive cratering such as the USACE's ConWep and the Westine Model. These models were analyzed to determine their usefulness in predicting explosive cratering from current threats such as buried artillery shells and other improvised devices.

KEYWORDS: explosive cratering, threat profiles, impulse

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