

RECENT STUDIES OF AIRBLAST FROM BURIED CHARGES, FOR ENVIRONMENTAL PROTECTION FROM HEST EVENTS

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For a number of years US. defense studies have used a variety of High Explosive Simulation tests (HEST) to experimentally model the effects of much larger explosions. Sheet configuration of HEST charges, in varied thicknesses, have been used, in round, square, or rectangular surface geometry, with various depths and qualities of overburden. We have found that HEST air blast source strength (overpressure amplitude) depends primarily on the overburden volume per unit of charge weight (yield), at distances which can be scaled in proportion to the cube root of yield. This relationship likewise holds for buried single or multiple charges, using crater volume. There is always, however, a large uncertainty (factor of two) caused by imponderables in the gas venting process of either HEST or crater shots.

Also, a large number (over 300= of smaller explosions (2.3 - 1135 kg) near and above the ground surface, were fired under well-instrumented conditions -- air blast and weather -- that showed how propagation amplitude and distance decay depended on the atmospheric layer structure of sound velocity versus height.

Results from these experiments have been used to develop a weather-watch-blast-prediction procedure that has allowed firing 50 Mg without undue up-set to the one million population residing within 50 km of the test site.